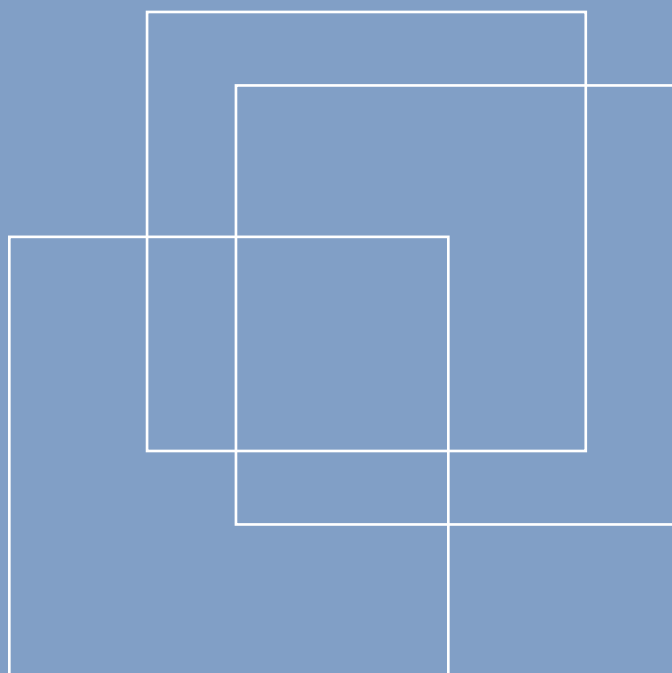ILO Research Paper No. 15

Decomposing income inequality into factor income components: Evidence from selected G20 countries

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Acknowledgements

Abstract

Income inequality has been rising in a number of countries in recent years and has been a growing concern. The total income of high-income households has increased faster than that of low-income households in a number of countries. Similarly, the wage gap between the top 10 per cent and bottom 10 per cent of wage earners has also widened. This paper investigates the factors that have contributed to the level of inequality and its changes over time in 13 selected G20 countries in order to address this issue at the policy level. The results show that labour income is the most powerful factor contributing to inequality in all countries under analysis. Transfers and benefits are the most important factors contributing to reducing inequality, but these alone cannot address the issue of rising inequalities in countries where unemployment continues to be high, which requires intervention in the labour markets. Furthermore, the paper also analyses the factors that contributed to the rise in labour income inequality and the results show that employment status and education are important factors contributing to inequality in the majority of the countries, though age, sex and industry group are also contributing to inequality in some countries.

1 Introduction

Income inequality and the extent to which it is influenced by several sources of income has evoked the interest of economists for several decades (see e.g. Rao, 1969; Fei et al., 1978; Pyatt et al., 1980; Shorrocks, 1982, 1983; Lerman and Yitzhaki, 1985). In recent years there has been rising concern about income distribution in academia and international organisations and a vast number of studies have addressed this issue.[1] Some researchers have argued that persistently high and rising inequalities threaten social and political stability (Pieters, 2010) and the sustainability of democracies (Kapstein and Converse, 2008).

There is a strong belief that the benefits of economic growth should be equally distributed in terms of incomes, assets and opportunities. However, between the early 1990s and the mid-2000s—a period of rapid economic growth—the total income of high-income households expanded faster than that of low-income households in the majority of countries (ILO, 2008). A recent study shows that between 2010 and 2015, the wealth of the bottom 50 per cent declined by 38 per cent while that of the top 1 per cent increased by 45 per cent (Oxfam International, 2016). This is true also for wage incomes: the wages of the top 10 per cent of wage earners have risen faster than those of the bottom 10 per cent, leading to a wider wage gap (ILO, 2008; OECD, 2008). The past decade has seen an increase in market income and/or disposable income inequality in many countries, especially in advanced countries (ILO, 2015a,b; OECD, 2015).

In this paper, we focus on G20 countries, and our analysis of 13 selected G20 countries shows that since the mid-2000s the Gini coefficient of market income[2] has risen in Italy, Mexico, the Republic of Korea, Spain, the United Kingdom (UK) and the United States of America (USA), while it has remained the same in France and declined in Argentina, Brazil, China, India, South Africa, and Turkey. Inequality in disposable income has declined or remained the same in most of the countries under analysis over the past decade, except for France, Mexico, and Spain, where it has increased (Figure 2). These trends raise a number of interesting questions: Why is inequality increasing in some countries while it remains stagnant or declines in others? What is the overall contribution of the different factor sources to income inequality? Which policies have led to an increase (or decrease) in inequalities since the 2008 global economic crisis? Addressing these questions in the context of G20 countries could provide interesting insights into different regions as they account for around 85 per cent of the gross world output, 80 per cent of world trade and two-thirds of the world population. The policies introduced in the G20 countries could also have an impact in other countries in the region, as there is a tendency to learn and emulate from neighboring countries. Due to data limitations, we restrict the analysis to 13 of the 19 G20 countries for this paper.[3]

At the macro level, the factors driving income inequality could be skill-biased technological change, new information technology, trade globalization, financial globalization or financial deepening, educational opportunity, redistributive policies and changes in labour market institutions (Dabla-Norris et al., 2015). At the micro level, the factors driving income inequality could be labour share, personal income

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[1] See for example, Berg (2015); Dabla-Norris et al. (2015); ILO (2015a,b, 2012, 2008); OECD (2015, 2011, 2008); Ostry et al. (2014); Piketty (2014); ADB (2012, 2007); Gasparini et al. (2011); Gustafsson et al. (2008).

[2] Market income is defined as labour income (wages and self-employment income) plus capital or investment income and private transfers (see Figure 1).

[3] For the analysis in this paper we use household income surveys, which often provide detailed information about the different sources of income at the individual and/or household level. While this information is collected by most of the countries, the data are not always made available. As a result we had to restrict our analysis to countries where we could get the necessary data.

distribution, labour market policies and institutions including collective bargaining, social security institutions, redistributive policies, education, etc. (Berg, 2015). In this paper, we explore the sources of income inequality for the selected G20 countries by decomposing household income and personal income distribution by factor sources at the micro level. The various factor sources include: labour income (wage and self-employment income), capital income, private transfers, and state transfers. We identify which factors contribute positively/negatively to the level of income inequality and which factors account for the increase/decrease in income inequality over time. Analysing income inequality in this way allows us to identify the factors contributing to inequality, whether increased labour income/earnings dispersion was accompanied by increased income inequality and what policies could be formulated to address this. We also analyse the factors that account for inequality in labour income, such as employment status, education, region and other individual characteristics.

The paper is organised in the following way. Section 2 reviews the literature on different methodologies used for decomposing income and labour income inequality and identifies the different factor sources that have an impact on inequality. Section 3 provides the data sources and discusses some of the methodological issues. Sections 4 and 5 discuss the methodologies we apply to decompose inequality in disposable income and labour income, respectively, and present our empirical results. The final section concludes.

2 Literature review

There exists quite a substantive literature on what factors contribute to income inequality, and this literature has been growing since the global economic crisis. The research question raised determines to a large extent what method is used to analyse the factors contributing to income inequality. In this section, we provide a brief review of the empirical literature over the past decades and the different methodologies that were used to examine income inequality, labour income inequality and its changes over time. As we focus on the inequality decomposition by income source and the decomposition of labour income by individual characteristics, our main emphasis is on this field of research. An important caveat that needs to be kept in mind while comparing results of different studies is the diverse measures of income used—per capita household expenditures, per capita household income, labour income, and wages, among others. The measures of inequality used also vary across studies and include the Gini coefficient, the ratio of the income shares of the highest and lowest quintiles, the Theil index, Atkinson's index and the coefficient of variation. As a result, it is not always easy to compare the results of different studies.

2.1 Decomposing income inequality

Earlier empirical works on income inequality have tried to decompose functional income sources (labour, capital and land) for developing countries using the additive decomposition method (Rao, 1969)[4] in order to understand how different components of income influence income inequality. Fei et al. (1978) showed that in Taiwan (China) during the period 1964–1972, unequal distribution in property ownership contributed the most to income inequality, while transfer incomes reduced inequality, and that wage incomes contributed relatively less. However, in urban Colombia (1967–68) functional income decomposition showed labour income to be the major source of inequality (Fields, 1979).

The rise in income inequality in Western Europe in the 1980s and 1990s, and the spread of neo-liberal policies in many countries renewed interest in understanding the drivers of income inequality in Europe

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[4] This method disaggregates the Gini coefficient by income source, measuring the relation of an income source with the rank of its recipients in total income—i.e. the concentration coefficient—and weighing these coefficients by the share of the respective income source in total income.

and advanced countries. As a result, new approaches were developed to decompose income inequality by factor components (Shorrocks, 1982; Lerman and Yitzhaki, 1985). Shorrocks (1982) proposed a method to decompose inequality, as measured by the coefficient of variation, into different income sources which provides a better understanding of the relative importance of different income components to total income inequality.[5] He empirically assessed the influence of earnings, capital income, transfer income and taxes on household income inequality in the USA for the period 1968–77 (Shorrocks, 1983). The factor contribution derived using different inequality measures shows that the Theil index (R_t) and Gini coefficient (R_g) are similar to the unique decomposition rule (R_v), except that the values are larger for Theil and smaller for Gini. The most striking contrast between the different rules was for direct taxes, where both R_v and R_t indicate substantial equalising effects and R_g a substantial disequalising effect. The results show that the choice between the inequality measures largely depends upon whether one should accept equal receipts for a given source to be associated with a zero inequality contribution (R_v) or with a negative contribution (R_t). Extending Shorrocks' results, Lerman and Yitzhaki (1985) provided a similar decomposition rule for the Gini coefficient.

Jäntti (1997) used Shorrocks' (1982) decomposition of the squared coefficient of variation to examine the drivers of income inequality in Canada, the Netherlands, Sweden, the UK and the USA for the early 1980s and the late 1980s, also analysing the factors contributing to the change in inequality. The increase in household income inequality observed in Sweden, the UK and the USA was largely explained by an increase in labour earnings inequality, especially among the household heads (employed and unemployed). Another factor explaining the increase in inequality was the spouse's earnings, either due to relatively higher wages or increases in the number of working hours. Both tax and transfer policies had an inequality-decreasing effect. García-Peñaloso and Orgiazzi (2013) extended Jäntti's (1997) work, covering six industrial countries (Canada, Germany, Norway, Sweden, the UK and the USA) for three decades. They applied a double decomposition (income sources and age), with the decomposition by age groups nested in the factor income decomposition using Shorrocks' (1982) approach. They found that the importance of wage and self-employment incomes varied substantially across countries and that these two sources together accounted for a large part of overall inequality, and that increased capital income inequality was an important factor explaining the increase in household income inequality in Norway and Sweden during the 1990s.

Since the global economic crisis, there has been renewed interest in examining income inequalities. Studies have used Shorrocks's and Lerman and Yitzhaki's method along with the income accounting framework[6] (Förster and Whiteford, 2009; Fuest et al., 2010; Standing et al., 2010). Fuest et al. (2010) used both the standard approach and Shorrocks' factor source decomposition method for their analysis of 26 EU countries and found contradictory results. Using the accounting framework, benefits were found to be the most important factor contributing to a reduction in income inequality, while using the factor source decomposition approach taxes and social contributions were the most important factor, with benefits playing a negligible role or in some cases even having an inequality-increasing effect. The reason for these contradictory results is that the accounting approach applies the different components sequentially, while the decomposition approach accounts for them simultaneously. Besides, the accounting method actually measures effective distribution of the tax and transfer systems, while the factor decomposition approach looks at the overall distribution effect of all the income sources. Further, due to Shorrocks's (1982) assumption of normalization of equal factor distributions, uniform transfer incomes have a zero inequality contribution because their correlation with disposable income is zero. For transfers to make a

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[5] He presents a unique decomposition rule, which is applicable to any inequality measure.
[6] This is also called the standard approach and in this approach income components are added one after another and inequality measures are computed at each step.

negative contribution to overall inequality, the income component has to be higher in absolute terms for households with lower incomes.

While Latin American countries have long displayed very high levels of inequality, they have experienced a decline in income inequality since the late 1990s, giving rise to a plethora of studies that have tried to analyse what factors helped to reduce it. Analysing income inequality in six Latin American countries for the years 1990, 2002 and 2011 using both the decomposition of the squared coefficient of variation (SCV) and the Gini coefficient, Amarante (2013) found labour income to be the most important source of inequality using either measure. In most cases, the results obtained by using the Gini coefficient and the SCV were qualitatively similar, with only few cases of divergence. For example, the importance of different types of labour income (formal wages, informal wages, and self-employment income) depended to some extent on the inequality measure used. The decomposition of the SCV generally found self-employment to be more important than did the Gini decomposition, while the reverse was often true for wages.[7]

Similarly, Keifman and Maurizio (2012) used Lerman and Yitzhaki's (1985) methodology to decompose the Gini coefficient for Argentina, Brazil, Chile, Mexico and Uruguay for the period 2003–10. Labour income—especially formal wages—was the most important source of inequality, followed by government transfers in Brazil, Chile, and Mexico. Ferreira de Souza (2012) decomposed income inequality for Brazil using Shorrocks' (1982) decomposition method for the period 1995-2009. His analysis showed that all income components tied to the minimum wage and Bolsa Familia were very progressive. However, social security pensions, which were higher than the minimum wage were found to be quite regressive, which could be due to public sector (civil servants') social security.

Lustig et al. (2013b) reviewed the empirical evidence of six country studies (Argentina, Bolivia, Brazil, Mexico, Peru, and Uruguay) using the accounting framework for the year 2009.[8] The results show that taxes and transfers reduce inequality by substantial amounts in Argentina, Brazil and Uruguay, with a smaller effect in Mexico and little effect in Bolivia and Peru. The reduction in disposable income inequality in Brazil and Uruguay is mainly due to the impact of cash transfers with in-kind transfers (access to free or quasi-free services in education and health) playing an important role in reducing inequality in Argentina, Brazil and Uruguay. Azevedo et al. (2012) proposed a non-parametric method to decompose the change in inequality (or any other welfare measure). They generate counterfactual distributions, which allow them to distinguish between changes related to different income sources and changes related to demographics and occupation. They apply this methodology in Azevedo et al. (2013b) to assess the main determinants of the reduction in household per capita income inequality in 14 Latin American countries and to quantify the contribution of these determinants. They find that the main contributor to declining inequality was the strong growth in labour earnings at the bottom end of the income distribution.

Some attempts have been made at analysing the factors contributing to inequality in the Asian region. The ADB. (2007) analysed income inequality measured by the Gini coefficient at the micro level for India, the Philippines and Viet Nam, using Fields' (2003) regression decomposition technique. The analysis

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[7] There was variation for the components using the two measures. For instance, in Bolivia, the relative contribution of self-employment income to inequality was 49.7 in 1990, 21.7 in 2002 and 64.2 in 2011 using the SCV, while it was 53.3, 34.1 and 36.5 using the Gini coefficient. These differences between the two measures are due to the fact that the SCV is quite sensitive to extreme observations. Similar differences were also observed for the changes in inequality. For Bolivia, both the Gini and the SCV showed an inequality-decreasing effect of self-employment between 1990 and 2002. However, for the period 2002 to 2011, the contribution of self-employment income to the SCV increased while its contribution to the Gini coefficient decreased. Notwithstanding the example of Bolivia, there were other countries, like Uruguay, for which the results of both the SCV and the Gini decomposition were very similar.

[8] The authors call it "standard benefit-tax incidence analysis".

showed education to be the single most important factor accounting for income inequality in all three countries. The other important factors were state or region and social group in India; and rural/ urban location in Viet Nam and the Philippines. Bigotta et al. (2015) decomposed income inequality measured by Atkinson's index, using Fields' decomposition method[9] and found that in both rural and urban areas education and household size were the two most powerful contributors to income inequality.

2.2   Decomposing labour income inequality

The use of regression-based estimates in analysing wage or labour earnings inequality dates back at least to Oaxaca (1973). In the past decade, renewed interest in wage and labour income inequality has led to a number of studies which decompose labour income or wage inequality using (log-)linear income-generating functions, i.e. regression-based decomposition methods (e.g. ADB., 2007; Fields, 2003; Morduch and Sicular, 2002).

Morduch and Sicular (2002) re-examined the properties of inequality measures as well as their decomposition by income source and proposed a general approach to regression-based decomposition that can be used with a number of inequality indices. Their method, which is an extension of the Oaxaca (1973) decomposition, decomposes inequality by income source, using estimated income flows rather than actual income flows. Analysing income inequality in rural China over the period 1990–93, they showed that human capital and demographic variables have a strong inequality-reducing effect for Theil-T decomposition, while the Gini decomposition results show those variables to have an inequality-increasing effect; the contribution of regional variations was quite large for both methods. However, their findings show that the results of using different measures of inequality can differ qualitatively and come to divergent policy implications, depending on whether or not the decomposition rule of the inequality measure satisfies the property of uniform additivity.

Fields (2003) also used a regression-based method of inequality decomposition, based on Theorem 3 from Shorrocks (1982). This method allows for decomposing the level of inequality as well as its changes over time. The decomposition of the inequality level is not dependent on the inequality measure used (as long as it fulfills certain axioms), but this does not hold for the decomposition of the change in inequality. Applying this method to analyse labour earnings inequality in the USA between 1979 and 1999, Fields' found that schooling, followed by occupation, experience and gender were important determinants of the level of labour income inequality, while region, age and industry did not seem to play a big role. Schooling further proved to be the single most important variable in explaining the increase in labour income inequality.

Some studies have also used semi-parametric and other methods for decomposing wage inequality. DiNardo et al. (1996) extended the traditional Oaxaca (1973) decomposition, focusing on the entire wage distribution rather than the mean, and used a semi-parametric procedure for analysing inequality in the USA for the period 1979–88. They found that unionisation rates, changes in the composition of the workforce, changes in labour supply and demand, and the declining real value of the minimum wage were important in explaining changes in the wage distribution in this period. Machado and Mata (2005), on the other hand, used quantile regression to estimate decomposition effects on the entire wage distribution for Portugal for the period 1986–95. They found that both changes in individual's attributes and the returns to those attributes, especially education, contributed equally to the observed increase in wage inequality. Azevedo et al. (2013a) analysed the changes in labour income inequality for 15 Latin American

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[9]   They proposed a solution on how to derive the shares for Atkinson's inequality index, using Shorrocks' (1982) weak consistency assumption.

countries between 1995 and 2010.[10] They found that, on average, the decline in labour income inequality in Latin America was driven by falling returns to skills acquired through education and experience.

Our review of empirical evidence on income inequality suggests that there are a number of factors which influence income inequality, with labour income being the most important. Moreover, if one further disaggregates labour income in some of the developing countries, it is formal wages that contribute the most to inequality. However, each factor's influence depends, to some extent, upon the country-specific level of development, labour market structure and welfare regime. For example, transfers and taxes play an important role in reducing inequality, but their effects are quite different depending upon the welfare policies or social programmes that have been put in place. The empirical results can also vary or be contradictory depending upon the measure and method used: the disaggregation of labour income using the SCV found self-employment to be more important than did the one using the Gini coefficient and the reverse was true for wage income, because the SCV is more sensitive to extreme values. Similar differences are found when comparing the results obtained using different methods: benefits were an important factor reducing inequality, while taxes and contributions contributed to inequality, according to the accounting method, but transfers played a negligible role in reducing inequality and taxes and contributions reduced inequality according to the factor decomposition approach. These contradictory results largely depend on the question that is raised: whether one is interested in studying the overall distribution effect of the tax and transfer system, as done in the factor decomposition, or just their impacts, as in the accounting framework. With regard to labour income inequality, the empirical evidence suggests that education and experience are important factors contributing to inequality.

This paper contributes to the existing literature with regard to three aspects. First, most of the studies analysing the sources of income inequality focus on a set of countries with similar regional or economic features. The 13 countries we cover comprise both advanced and emerging economies, and we use the same measures and methods of analysis for all of them. This enables us to explore completely different systems, with varying levels of development and diverse social policies, in which different factors could influence income inequality. Second, we compare the trends in inequality and factors contributing to inequality over the past decade, and assess the extent to which some of the policies, including those introduced since the global economic crisis, have helped to reduce inequality in the selected countries. Finally, we analyse whether increased wage/earnings dispersion was accompanied by increased income inequality in these countries.

3   Data

We use micro-data from household surveys in 13 G20 countries, namely Argentina, Brazil, China, France, India, Italy, Mexico, the Republic of Korea, South Africa, Spain, Turkey, the UK and the USA. These countries were selected because they have data on different sources of income at the individual or household level. For each country, we have two points in time: a year in the mid-2000s and the most recent year for which comparable data are available.[11] When analysing the level of inequality, we only present the results for the latest year available,[12] while we take into consideration both of the years for the change in income inequality. We also ran the entire analysis for different starting/ending years in order to test the sensitivity of the results, and we found the results to be similar. The household income inequality analysis

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[10] They decompose labour income inequality into a quantity effect, a price effect, and an unobservable effect, as suggested by Juhn et al. (1993).

[11] However, there are two countries, Spain and the USA, for which we do not use the latest data available due to comparability issues (explained in more detail later).

[12] The results for the earlier period are presented in the Appendix.

is undertaken for all 13 countries, while the labour income inequality analysis is undertaken only for 11 countries, as the disaggregated information on labour income was not available for India and the Republic of Korea. The analysis for all the countries is nationally representative except for Argentina, where the survey is conducted in 31 large urban areas, and for China, where the survey was undertaken for six major cities in urban areas. The details of the survey and the years used for each country are available in Appendix Table A1. In order to adjust for differences in household sizes and to obtain a better proxy of a household's welfare, we adjust household incomes using the square root equivalence scale for the analysis in Section 4. Cross-country comparative analysis using different data sources invariably raises issues relating to data limitations and methodology. Here, the first three methodological issues relate to the comparability of data across countries: the method of data collection, the variables collected and the way in which data are reported, which differ from country to country. With regard to the first issue, we rely on data that is collected using country-specific surveys that are either completed and returned by respondents or completed through an interview with the respondent. While in some cases only one person is asked to answer the questions for all household members, in other cases each household member above a certain age is asked to answer the questionnaire. This implies that although we often have detailed individual level data, in some cases certain variables might only be available at the household level, as it is the case with labour income in India.

This directly links to the second issue—the variables collected—as not all countries collect data on all of the variables required to conduct a complete analysis of each income component presented in Figure 1. For example, South Africa lacks information on contributory social transfers, taxes and contributions to social security. Even though a question on the amount of contributory pensions received has been included in the General Household Survey since 2010, we decided not to include it in the analysis for reasons of comparability with previous years. Furthermore, Argentina and Mexico lack information on taxes and contributions to social security, while in Brazil data on taxes are not available.[13] Therefore, though for some countries we have both the gross and net income values, for others, like Argentina, Brazil, India, Mexico and South Africa, only gross incomes are reported and this lack of data limits our analysis in some parts of the paper.

The third issue relates to the way in which the data are treated or harmonized. As Verma and Betti (2010) note, for the EU-SILC dataset there is no standardized procedure across countries regarding the manner in which negative, zero and very large values are treated. The USA is the only country in our sample that already provides top and bottom coded variables. However, top or bottom coding of income variables is a delicate issue: on one hand, it leads to lower inequality figures, but on the other, the presence of some very high or very low values on the income variables can affect the precision of our results. In order to address the latter issue without compromising on the former, we excluded households on a case by case basis by looking at the distributions of the income variables, generally not excluding more than ten households per country/year.[14]

A fourth issue relates to comparability across time periods. As countries adapt their survey over time, this might lead to changes in some variables, addition of new variables or omission of previously existing variables. In countries where we observed such a change, we tried to be as consistent as possible over time. For example, Spain changed its method of data collection from household surveys to using register

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[13] The Brazilian survey does not include any question that captures the value of contributions to social security at the individual level. However, the amount contributed could be imputed using the information on whether the individual contributed to social security through his/her job and the percentage contribution rates for different income groups of employees and self-employed.

[14] With a sample size of between 6'769 (USA 2005) and 116'543 (Brazil 2014) households (16'787 to 408'148 individuals, respectively), the proportion of excluded households (and individuals) does not exceed 0.1 per cent of the sample.

data in 2012. As changes in inequality might arise not only because of actual changes in the distribution of the variables, but also because of the change in the data collection method, we use 2011 survey-based data to eliminate this source of potential bias.[15] Similarly, for the USA, we decided not to use data for 2013 or 2014, but rather to resort to data for 2012, as there were some changes in the income variables reported in 2013 and 2014 compared to previous years.

A fifth issue is related to the disaggregation of some of the income components. For example, with regard to social transfers, Eurostat requests countries to provide aggregate variables for the EU-SILC database. They follow the approach of the European system of integrated social protection statistics (ESSPROS; see Eurostat, 2008), where social benefits are classified by function rather than by the basis on which a person is eligible for benefits (contributory vs. non-contributory schemes).[16] As a result, in some cases, this leads to a mix of contributory and non-contributory benefits, and it becomes difficult to separate their effects. Finally, one of the challenges of undertaking cross-country analysis across a diverse group of countries is that the years considered for analysis are not exactly the same for all countries. As far as possible we have tried to have the same years, but in countries where this was not possible, we chose the closest year.

4 Decomposing disposable income inequality

In this section we briefly describe the methods used for decomposing the level of, and change in, income inequality and then discuss the empirical results, which show what factors influence the level of income inequality and the change over time.

4.1 Decomposition methods

The basis of the household income decomposition (Sections 4.1.1 and 4.1.2) is the premise that total household income Y consists of $k = 1, ..., K$ different sources y_k, such that $Y = \sum_{k=1}^{K} y_k$. As displayed in Figure 1, total household income can be decomposed into: employee incomes (wages and bonuses),

self-employment incomes (profits plus value of production for own consumption), capital/investment incomes (interests, dividends, shares and rents), income from private transfers (inter-household transfers such as remittances and alimony, income from charity organizations etc.), income from contributory social insurance (retirement pensions and unemployment insurance) and from non-contributory social security benefits (child allowance, unemployment assistance and social pensions). In order to compute disposable income, contributions to social security as well as taxes are subtracted from the total household income. All the income concepts are at the household level, and the square root equivalence scale is used in order to account for different household sizes.

4.1.1 Method for decomposing the level of income inequality (Gini coefficient)

As we are interested in understanding the overall contribution of the different factor sources to inequality, we use Lerman and Yitzhaki's (1985) method to decompose the Gini coefficient. This factor decomposition

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[15] A test comparing the results obtained using the 2011 survey with the 2011 register data confirmed our suspicion that using survey data for 2006 and register data for 2011 might be misleading, in particular with regard to self-employment income and capital income, which are generally captured more accurately in register data than through surveys.

[16] Eurostat has changed this approach in the 2014 operation, differentiating income variables for benefits and pensions by entitlement, distinguishing between contributory and non-contributory as well as between means-tested and non means-tested benefits.

Figure 1: Income components used for the analysis
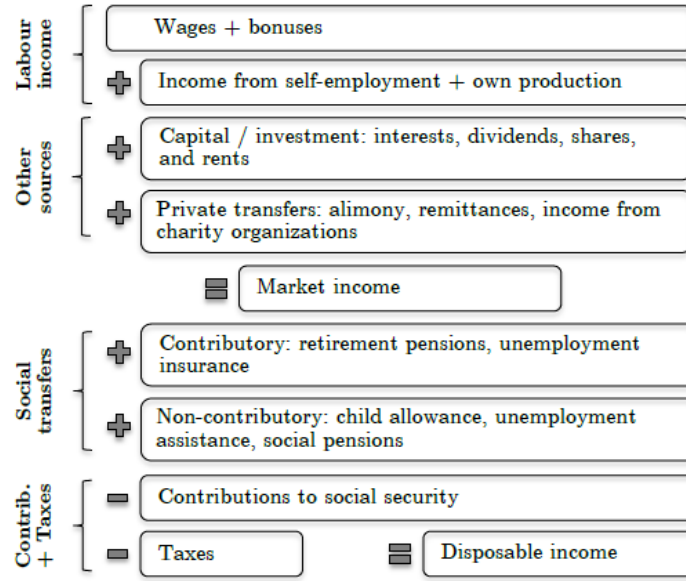
Note: All income components are at household level and equivalised
(square root scale). Source: Authors' definition based on literature.

method is similar to the one proposed by Shorrocks (1983, 1982), the difference being that Shorrocks'
decomposition rule applies to the coefficient of variation, while Lerman and Yitzhaki's approach applies
to the Gini coefficient. Our literature review shows that the results using either method are qualitatively
quite similar in their values and directions for most of the variables. The possibility of contradictory
results arises as the coefficient of variation is more sensitive to extreme values compared to the Gini. As
the inequality measure we use for the analysis is the Gini coefficient, we use the factor decomposition
method proposed by Lerman and Yitzhaki. According to this method the Gini coefficient for total income
inequality, G, can be expressed as:

$$G = \sum_{k=1}^{K} S_k G_k R_k \qquad (1)$$

where S_k represents the share of component k in total income (i.e. $S_k = \mu_k/\mu$), G_k is the Gini coefficient
of income source k, and R_k is the Gini correlation[17] between income source k and total income. This
equation allows for decomposing the influence of any income component k upon total income inequality
as the product of three terms:

   i how important the source is with respect to total income (S_k);
  ii how equally or unequally distributed the income source is (G_k); and
 iii the extent and direction of the correlation of the income source with total income (R_k).

We apply this decomposition method using the different components of household income as displayed in
Figure 1, and this approach calculates the contribution of the different income components to income
inequality simultaneously.

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[17] The Gini correlation is a form of rank correlation coefficient, similar to Pearson's rank correlation. It measures the
extent to which the relationship between Y_k and the cumulative rank distribution of Y coincides with the relationship
between Y_k and its own cumulative rank distribution: $R_k = cov(y_k, F)/cov(y_k, F_k)$. R_k assumes the range $[-1, 1]$.

4.1.2 Method for decomposing the change in income inequality (Gini coefficient)

While it is important to understand what factors account for the level of income inequality, it is also crucial to shed light on which factors contribute to the change in inequality over time. Our literature review showed that there are several methods used for decomposing the change in inequality (the regression decomposition, the non-parametric method, and decomposition of the Gini by shares and concentration effect), depending on the research questions addressed. As our focus is on the different income sources rather than changes in individual characteristics or in returns thereto, we use the non-parametric method proposed by Azevedo et al. (2012). The starting point is that any measure of inequality θ, generated by the function $\phi(\cdot)$, depends on the cumulative density function $F(\cdot)$ of income across households:

$$\theta = \phi(F(Y(y_1, y_2, ..., y_K)))\tag{2}$$

Following Barros et al. (2006), the distribution of inequality can be simulated by changing each of the income sources at a given time. Since the distribution of household income and its different sources for periods 0 and 1 are known, counterfactual distributions for period 1 can be generated by substituting the observed level of a given income source y_k by its observed level for period 0, $\hat{y}_k$. For each counterfactual distribution, the inequality measure is calculated and these counterfactuals can be interpreted as the level of inequality that would have prevailed in the absence of change in the given income source. For instance, to evaluate the impact of the change in the distribution of income source 1, we compute $\widehat{\theta}_1$, where the value for y_1 is substituted by its value in period 0, $\hat{y}_1$:

$$\widehat{\theta}_1 = \phi(F(Y(\hat{y}_1, y_2, ..., y_K)))\tag{3}$$

The effect of the change in income source 1 can then be calculated as $\widehat{\theta}_1 - \theta$. Similarly, the contribution of each income component to the change in total income inequality can be computed as shown in Table 1. The assignment of values from period 0 to period 1 is done using a rank-preserving transformation. In particular, for each period, households are ordered by their household income, and then the average value of each income source y_k for each quantile in period 0 is assigned to each household in the same quantile in period 1.

Table 1: Proposed methodology along one possible path

$\theta = \phi(F(Y(y_1, y_2, ..., y_K)))$	Initial inequality rate
$\widehat{\theta}_1 = \phi(F(Y(\hat{y}_1, y_2, ..., y_K)))$	Contribution of income source 1: $\widehat{\theta}_1 - \theta$.
$\widehat{\theta}_2 = \phi(F(Y(\hat{y}_1, \hat{y}_2, ..., y_K)))$	Contribution of income source 2: $\widehat{\theta}_2 - \widehat{\theta}_1$
...	...
$\widehat{\theta}_K = \phi(F(Y(\hat{y}_1, \hat{y}_2, ..., \hat{y}_K)))$	Contribution of income source K: $\widehat{\theta}_K - \widehat{\theta}_{K-1}$

The computation suggested in Table 1 is path-dependent; the effect of an income source depends on the ordering of the sources. With K income sources, there are $K!$ potential decomposition paths. In order to address this path-dependency, we calculate the decomposition for all possible paths and take the average of the estimates (Shorrocks, 2013; Shapley, 1953). After addressing the problem of path-dependency, one caveat remains: as we change one element at a time, the counterfactuals are not the results of an economic equilibrium and thus suffer from equilibrium-inconsistency.

4.2 Empirical results

4.2.1 Income inequality and household income shares

Before discussing the inequality decomposition results, we present the trends in income inequality over the past decade (Figure 2; see also Appendix Figure A2 for the evolution of income inequality) and the share of each component in total household income for the most recent year (Figure 3, see also Appendix Table A3). The European countries (France, Italy, Spain and the UK) and the Republic of Korea display low levels of disposable income inequality (around 0.30) compared to other G20 countries. In France, Spain and the Republic of Korea disposable income inequality increased while it remained the same in Italy. In the UK, disposable income inequality declined despite an increase in market income inequality over the past decade, which could be due to certain tax and transfer policies that were introduced. In Turkey and the US, disposable income inequality is around 0.40 for the most recent year. Though market income inequality in the European countries and the US is almost similar (around 0.50), disposable income inequality in the European countries is almost 10 percentage points lower than that in the US, which is probably due to differences in the nature of welfare policies.

Figure 2: Market and disposable income inequality
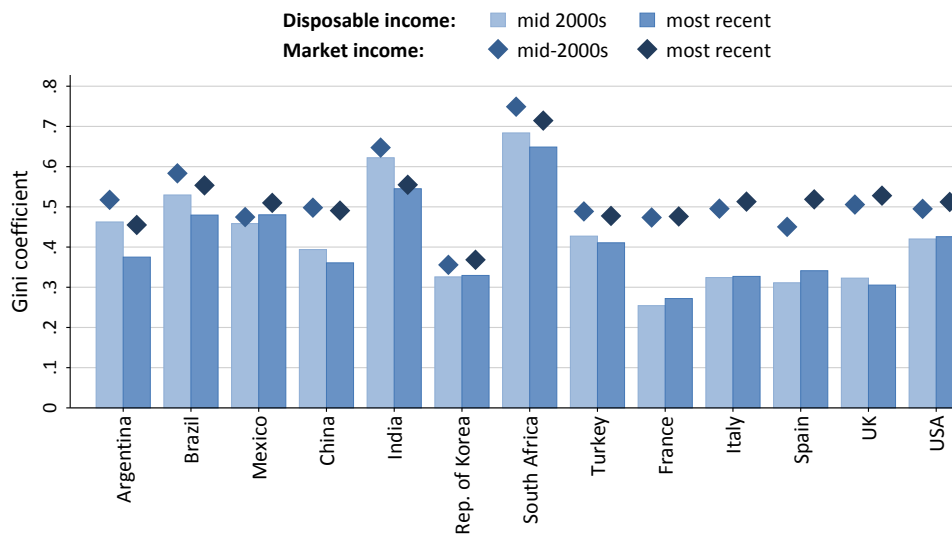
In China and India, disposable income inequality is 0.36 and 0.54, respectively, for the most recent years, and it has declined in both countries. The comparatively low level of income inequality observed in China is attributable to the fact that the survey covers only six major cities. As there is a large urban-rural income gap in China (Xie and Zhou, 2014; Sicular et al., 2013), inequality would be higher if one were to include the rural areas. In India, the income inequality figures are much higher compared to the national survey, which is about 0.33 for 2009–10 (Chotikapanich et al., 2014). This is because the analysis in this paper uses the income method to compute inequality, while the national surveys use the consumer expenditure method.[18] While Latin America is often cited as the region with the highest degree of inequality in the world, significant reductions in inequality can be observed in many countries of the

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[18] The National Sample Survey in India collects information on consumer expenditure for the year, which includes durable and non-durable goods, rent, entertainment, educational and medical expenses. The India Human Development Survey, which captures income, takes into consideration income received from different sources like labour income (wages and self-employment incomes), rents and income from investments, and all kinds of transfers, including remittances, which is more comprehensive. Due to this, inequality of income is greater than inequality of expenditure. While the lower

region over the past decade, though the levels continue to be high compared to the European countries. In Argentina and Brazil, disposable income inequality declined to 0.37 and 0.48, respectively, over the past decade, while it has slightly increased in Mexico (0.48). The highest disposable income inequality among our 13 selected G20 countries was observed in South Africa (0.65) although its inequality has decreased by 3 percentage points over the past decade. In South Africa and Latin American countries, a number of social assistance programmes, along with other policies introduced over the past decade have indeed helped to reduce inequality.

If we look at the shares of the various income sources in total household income, then labour income constitutes a large part of household income—between 60 (France) and 87 per cent (India). A large proportion of labour income consists of wages, while self-employment income is less important, especially in Europe and the USA, where the share of self-employment is lower than in most emerging economies. The relative importance of income sources other than labour income depends on the country or region. In most countries, contributory social transfers make up a comparatively large part of total income, except for India, Mexico and the Republic of Korea.[19] In China, the European countries, Turkey and the USA, this share ranges between 16 and 29 per cent, while in Latin America it varies between 6 and 16 per cent. In the Republic of Korea and India it only makes up 2 and 3 per cent, respectively.

Figure 3: Income shares, latest year available
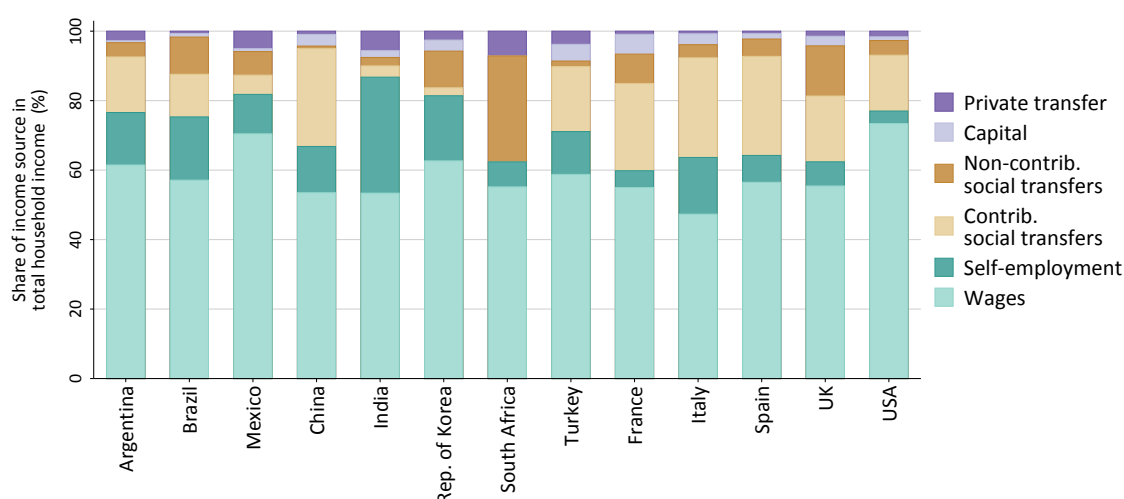
Non-contributory social transfers account for between 0.7 and 31 per cent of total household income. The share of these transfers is the highest in South Africa (31 per cent), followed by the UK, the Republic of Korea and Brazil, where it varies between 11 and 14 per cent. The shares of capital income in total income vary between 0.6 per cent (Argentina) and 6 per cent (France). Private transfers make up less than 4 per cent in all countries except India, Mexico and South Africa, where dependence on private transfers has increased since the mid-2000s (from 5 to 7 per cent). In advanced economies, these private transfers mainly comprise alimonies, while in emerging economies they consist of remittances, intra-household transfers and transfers from social institutions, and are found to play an important role, especially in times of crisis.

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income households often spend all their income and at times also borrow to meet their basic needs, the higher income households have a tendency to save or invest part of their income.

[19] As explained in Section 3, contributory social transfers were not considered in the latest year for South Africa as they were not available in the earlier years. If one were to include contributory pensions, these accounted for about 2 per cent of the total household income in 2014, thus representing only a very small share.

4.2.2   Factors accounting for the level of disposable income inequality

In this sub-section we analyse how much income inequality is accounted for by the different factor incomes, using Lerman and Yitzhaki's decomposition method. The estimated factor contribution of each income source to inequality in household income is presented in Figure 4 (see also Appendix Table A5). The analysis shows that labour income, both wages and self-employment income, is the most important factor contributing to inequality, irrespective of the country or region. Within labour income, a substantial proportion of the contribution to income inequality comes from wages and bonuses in all countries. However, in Brazil, India, Italy, the Republic of Korea and Turkey, the contribution of self-employment income to income inequality was quite sizeable compared to the other countries under analysis, and it represents a substantial share of total income (see Figure 3).

Figure 4: Factor decomposition of inequality in total household income by income source, latest year available
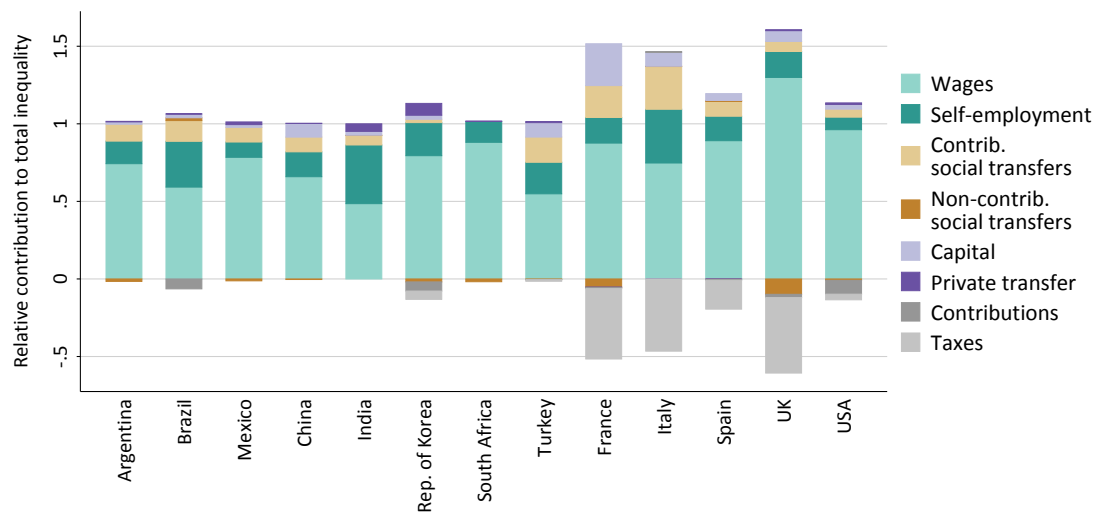
Contributory social transfers account for between 2 and 28 per cent of the income inequality across the different countries. The positive factor contribution of contributory social transfers to income inequality in these countries could be due to the fact that these transfers often mainly benefit a small proportion of the workforce that has better secured jobs, work benefits and high incomes. Additionally, the amount of payments are often linked to contributions, thereby reinforcing inequality generated in the labour market. However, one has to keep in mind that contributory forms of social transfers combine an insurance element where covered workers (and/or their employers) pay into the schemes and then later collect the benefits. As a result, at the aggregate level they might have a redistributive element if the contribution is larger than the payout, and this helps fund the benefits for lower paid contributors or those with breaks in service, including women. Extending access to contributory social transfers to all households could thus reduce inequality.

Non-contributory social transfers had a reducing effect on income inequality in all of the countries under analysis except for Brazil, India, Italy, and Spain. If one looks at Equation 1, the only term that can negatively contribute to inequality is R_k, the Gini correlation. The results show that while in Brazil, India, Italy and Spain this correlation is positive ($R_k > 0$), in most countries non-contributory social transfers are negatively correlated with disposable income ($R_k < 0$). It is possible that in some of these countries some of these transfers could be poorly targeted, which can have a negative impact on inequality

and also undermine some of the good initiatives that are put in place. On the other hand, the negative correlation observed in many countries indicates that these transfers target households at the lower end of the income distribution, as in South Africa, where social assistance programmes such as the child support, disability and old-age grant are means-tested and help to reduce inequality and poverty (ILO, 2016a, 2015b; Levy et al., 2014; Patel, 2013).

Capital income was unequally distributed in some countries (France, Italy, Turkey and the UK) and it contributed to income inequality in all countries. The factor contribution was as high as 27 per cent in France and ranged between 7 and 10 per cent in China, Italy, Spain, Turkey and the UK. In other countries it was much lower. The wide dispersion in capital income in some of these countries probably accounts for its significant contribution to overall income inequality.[20]

Private transfers widen inequality in all countries except France and Spain. The factor contribution of private transfers to income inequality is comparatively high in India (4.9 per cent) and the Republic of Korea (7.7 per cent). In the absence of a strong contributory social insurance scheme in these countries, retired and old-aged households depend upon their extended family for support, and there are differences in the ability of lower income and well-off households to transfer incomes to old-age parents, this could have contributed to widening inequality. In all the other countries, the factor contribution of private transfers does not exceed ±1 per cent, which also reflects the small share of this income component in total income (see Figure 3).

Contributions to social security and taxes help to mitigate income inequality in all countries for which these data are available. The factor contribution of these redistributive measures on inequality is above 45 per cent for France, Italy and the UK, and about 28 per cent in Spain, while it is much lower in the Republic of Korea, Turkey and the USA. For the countries in Latin America, Africa and Asia, we do not have information on these redistributive measures and cannot comment on their effects. Overall, the factor decomposition shows that redistribution is achieved mainly by taxes and to an extent by non-contributory social transfers.

4.2.3 Factors accounting for the change in disposable income inequality

In the previous section, we analysed the factor contribution of the different income components to the level of disposable income inequality. We now complement these findings with an analysis of how much of the difference in income inequality over time is accounted for by the different income components. Figure 5 presents the contribution of each income component to the change in disposable income inequality (measured by the Gini coefficient) between the mid-2000s and the latest year available (see also Appendix Table A7). If we look at the contributions of different income components, wages and incomes from self-employment are the most important factors accounting for changes in inequality. These results are consistent with some of the other recent available evidence, which shows that about half of the growth in overall income inequality is due to growth in earnings inequality (ILO, 2015a).

As observed earlier on the European countries, inequality increased to varying extents in France, Italy and Spain, while it declined in the UK. In Spain, inequality increased by 3 percentage points, and wages and incomes from self-employment were the most important factors accounting for this change.

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[20] In the data set that we use for South Africa, capital income is not available. However, Leibbrandt et al. (2012), using a different data set, suggest that capital income in South Africa constituted a small share of total household per capita income in 1993 and 2008, and that it was very unequally distributed. It amounted to less than one per cent of total income at the lower decile and to 11 per cent in the top decile. Using the factor decomposition of the Gini coefficient, they show that the relative factor contribution of capital income to inequality was 9.7 per cent in 2008, and this was due to the high inequality of capital income (G_k of 0.97) and the high Gini correlation (R_k of 0.83).

Figure 5: Factor decomposition of the change in inequality in disposable household income, mid-2000s to latest year available
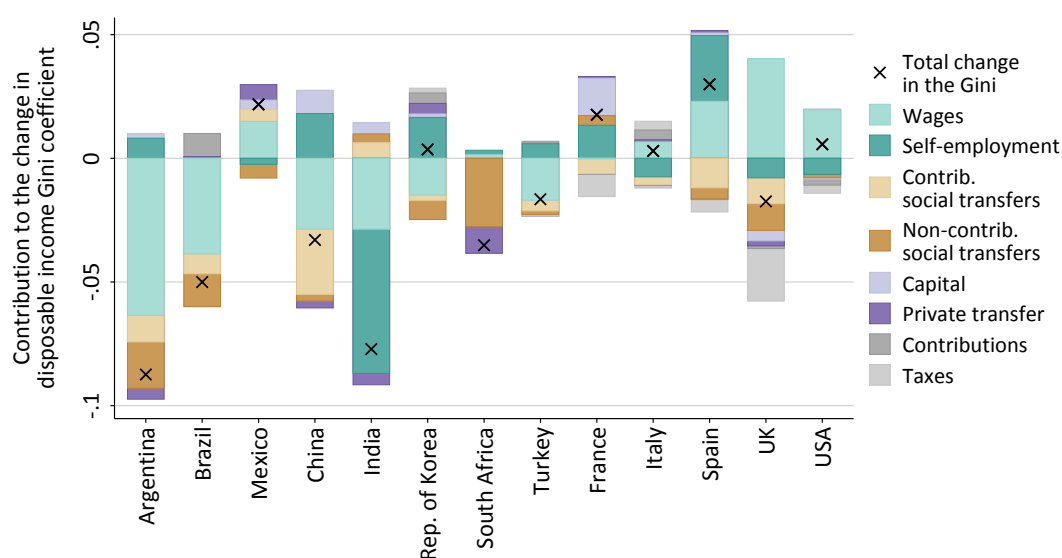
This could be due to the sudden and huge employment losses that were experienced in Spain after the global economic crisis, which had a huge impact on household incomes (Malo, 2015). In France, where income inequality increased by almost 2 percentage points, self-employment income and capital income contributed the most. While in Spain redistributive social transfer and tax policies played an important role in mitigating the overall increase in inequality, in France only contributory social transfers and taxes had an inequality-reducing effect, whereas non-contributory social transfers had an inequality-increasing effect. In the UK, where income inequality declined by 2 percentage points, redistributive social transfer and tax policies were important factors accounting for the decline, despite the dispersion in wages. Redistributive policies such as the 50 per cent tax band for yearly incomes above £150,000 introduced in 2010 and the expansion of cash transfer programmes and other benefits for pensioners since 2008 has helped in reducing inequality (García Rodríguez, 2015). In the USA and the Republic of Korea, income inequality increased by 0.6 and 0.4 percentage points, respectively, and the dispersion in wages and self-employment income, also respectively, were the factors accounting for the increases. Non-contributory transfers, on the other hand, had a somewhat mitigating effect in the Republic of Korea.

In Latin America, Argentina and Brazil experienced a comparatively large decline in income inequality by 9 and 5 percentage points, respectively, while it increased by 2 percentage points in Mexico. In Argentina and Brazil, wages and non-contributory social transfers were the important contributing factors, followed by contributory social transfers: rising minimum wages, promotion of collective bargaining and the process of labour formalisation led to a strong decline in wage inequality (Beccaria et al., 2014; Gasparini et al., 2011), and the regular revision of minimum wages led to an increase in real minimum wages by more than 50 per cent between 2004 and 2010 in Brazil (Levy and Schady, 2013; see also Maurizio, 2014; Ferreira de Souza, 2012). Additionally, between 2000 and 2015, Argentina and Brazil significantly reduced their unemployment rates through a number of active labour market policies, which contributed to reducing inequality at the household level (ILO, 2016b). In Mexico, by contrast, the real value of the minimum wage declined over the period (Bosch and Manacorda, 2010), and unemployment rates have increased (ILO, 2016b). These might be the reasons for wage income to induce an inequality-increasing effect. In Argentina, the coverage of non-contributory transfers increased substantially in the past decade, through

a pension extension reform known as "moratoria" that came into effect in 2007 and the introduction of the universal child allowance (AUH) in 2009 (Bertranou et al., 2016). In Brazil, the increased level of social benefits, which is tied to minimum wages, and the Bolsa Familia have helped in reducing income inequality, as already observed by other studies (Ferreira de Souza, 2012; Keifman and Maurizio, 2012; Soares et al., 2009). In Mexico, despite the full coverage of Progresa/Oportunidades since 2004 and the introduction of the non-contributory pension system in 2008 (Levy and Schady, 2013), such policies were not enough to offset the effect of the increased dispersion in wage and contributory transfers. Overall, our findings are consistent with other studies that find that an increase in the level and progressiveness of government transfers as well as a reduction in labour income inequality were the most important factors accounting for the decline in income inequality in Latin America (Lustig et al., 2013a).

Both China and India also reduced inequality over the past decade by 3 and 8 percentage points, respectively. In China, the important factors were wages, social transfers and, to a lesser extent, private transfers. The rapid rise in wages and the introduction of minimum wages in 2004 may have helped to reduce wage dispersion (Lin and Yun, 2015). In addition, China also developed a five-pillar social insurance system targeting urban employees and urban residents, which tends to extend more widely in terms of personal coverage, benefit level and contingency packages (UNDP et al., 2011; ISSA, 2010), thereby helping to cushion the effects of inequality. In India, it is labour incomes, both wages and self-employment income, and private transfers which have contributed to the reduction in income inequality. Wages have grown over the past decade in both rural and urban areas, and the implementation of the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) has ensured minimum days of work at minimum wages in rural areas, which has also reduced wage dispersion (Rani and Belser, 2012). South Africa also witnessed a decline in income inequality, by 3.5 percentage points, largely due to non-contributory social transfers and private transfers. This was achieved by increased access to social grants, like the child support grant and old-age pension (see Levy et al., 2014; Patel, 2013; UNDP et al., 2011) and the resulting higher share of such income in total household income, especially at the bottom deciles (ILO, 2015b), along with private transfers, largely from remittances (ILO, 2015a; Leibbrandt et al., 2012).

5   Decomposing labour income inequality

Section 4 has shown that labour income is not only the largest source of household income, but also the most important factor determining the level of, and change in, inequality. It is indeed interesting to observe that in all countries except South Africa and the UK, the decline/increase in income inequality was largely accounted for by labour income inequality (see Figure 5). Within labour income the most important factor contributing to inequality was wages in all the countries, though self-employment incomes were also contributing factors in Brazil, India, Italy, the Republic of Korea and Turkey. Therefore, in the present section we analyse the factors that account for the inequality of labour income. While in Section 4 we dealt with inequality at the household level, in this section we focus on inequality at the individual level, as we are interested in the determinants of labour income, which are specific to an individual rather than an entire household.

5.1   Method

A number of different methods for decomposing labour income has been proposed in the literature, as mentioned earlier. We use Fields' (2003) decomposition method, which allows us to decompose the level of inequality as well as its change over time in a country. As it relies on a regression framework, it has

the advantage of using a large number of explanatory variables, and to express inequality levels and changes as a function of the most commonly used income determinants. In the first step, the log income is regressed on a set of explanatory variables, similar to a Mincerian equation:

$$ln(Y_i) = \alpha + \sum_{j=1}^{J} \beta_j X_{i,j} + \epsilon_i \tag{4}$$

where Y_i is individual i's labour income (wages and self-employment income including other work-related benefits), α is the constant, the $X_{i,j}$'s are the covariates, where $j = 1, 2, ..., J$, and ϵ_i is the error term. This Mincerian equation is run for every country and for the two years under analysis. For all countries under analysis, we use the following covariates: sex (dummy), age (in years) and age squared, household size, educational level (dummies) and employment status (dummies). In almost all countries, we also include a rural/urban dummy, industry group, number of jobs, and marital status.[21] For countries where regional economic differences are prevalent we further include regional dummies. Similarly, where we expect differences in the earnings between different ethnic groups or nationalities, dummies for different ethnic groups/nationalities are added. We could not include any of institutional factors like minimum wage coverage, collective bargaining coverage and union membership as this information is not available in the data sets. See Appendix Table A2 for a detailed list of variables and definitions.

Using the $\hat{\beta}_j$ from Equation 4, one can then compute $\hat{s}_j$, the "relative factor inequality weights":

$$\hat{s}_j = \hat{\beta}_j \frac{\widehat{Cov}(X_j, ln(Y))}{\widehat{Var}(ln(Y))} \quad \text{with} \quad j = 1, ..., J \tag{5}$$

with the share of the residual (unexplained part) given by:

$$\hat{s}_\epsilon = 1 - \sum_{j=1}^{J} \hat{s}_j \tag{6}$$

These relative factor inequality weights show how much of the total inequality in income is explained by each covariate in the regression.[22] Furthermore, in order to account for the role of a given determinant in explaining the change in inequality, one can calculate the proportion of the rise or fall in inequality which is accounted for by each explanatory factor, $\hat{\pi}_j$:

$$\hat{\pi}_j = \frac{\hat{s}_{j,1} I_1 - \hat{s}_{j,0} I_0}{I_1 - I_0} \tag{7}$$

where I_0 and I_1 are the levels of inequality in period 0 and 1, using any given inequality measure I, and $\hat{s}_{j,0}$ and $\hat{s}_{j,1}$ are the relative factor inequality weights as given in Equation 5 for periods 0 and 1, respectively.

5.2   Empirical results

In most of the developing and emerging countries under analysis, except Mexico, labour income inequality between individuals declined to varying degrees, while in most of the advanced countries inequality increased, except in the UK and the USA where it marginally declined (see Figure 7). In this context, we analyse what factors contribute to inequality in labour income and to changes therein.

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[21] The reason why these variables are not included in some of the countries is because they are not available in their data sets.

[22] Note that for ease of display and interpretation, the $\hat{s}_j$'s of the different groups of categorical variables (region, industry, education, employment status, marital status) were aggregated. Detailed results are available from the authors upon request.

5.2.1 Factors accounting for the level of labour income inequality

As mentioned in Section 5.1, we first run a semi-logarithmic regression of (log)income on a number of covariates. We then use the regression coefficients to calculate the relative factor inequality weights, in order to address the question of how important each of these variables is in accounting for the level of labour income inequality. Appendix Table A8 presents a summary of the regression results for each country. In general, all the coefficients have the expected signs and almost all are economically and statistically significant at conventional levels. All the variables together explain between 28.6 and 50.5 per cent of the variance in labour incomes, depending upon the country.[23] As one might suspect multicollinearity between some of the covariates, especially employment status and education, we ran some tests which indicated that there is no problem of multicollinearity.[24] The employment status for this analysis is defined as comprising wage employees and self-employed. Within self-employed, we further distinguish between employers and own-account workers. Within employees, depending on the data availability and the relevance in the country context, we distinguish between formal/informal, permanent/temporary, full- and part-time, and public/private employees (see Appendix Table A2 for details).

The factor inequality weights of the estimating Equation 5 are presented in Figure 6 (see also Appendix Table A9). Apart from the residuals, the employment status is one of the most important factors determining labour income inequality in all countries except for China. The relative factor inequality weights of this variable accounts for between 8.8 (South Africa) and 21.7 (the UK) per cent of the labour income inequality. This finding is similar to other studies where employment status or the composition of the workforce were found to be important factors contributing to earnings inequality (Bigotta et al., 2015; DiNardo et al., 1996). However, these results contrast sharply with some of the findings of the literature for the period 1970s to 1990s, wherein education was identified as the most important factor contributing to inequality (Fields, 2003; Juhn et al., 1993).

There are differences across countries and regions. Among the Latin American countries—Argentina, Brazil and Mexico—employment status (differences between formal and informal employees) and education were the important factors contributing to inequality, with a combined factor inequality share of more than 25 per cent. Employment status was more important in Argentina and Mexico than in Brazil, where education was more important. In China, it was the rise in average educational attainment and regional differences which contributed the most to inequality, with factor inequality shares of around 12 per cent each. Similar patterns were also observed for an earlier period in China (Morduch and Sicular, 2002). In South Africa and Turkey, education and employment status (differences between permanent and temporary employees) were almost equally important factors contributing to inequality, with combined factor inequality shares of 17.8 and 31.1 per cent, respectively.

In European countries and the USA, employment status (differences between permanent and temporary employees, and between full-time and part-time, respectively) was the most important factor contributing to income inequality, with factor inequality shares ranging between 13.2 per cent (Italy) and 21.7 per

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[23] The R^2 can be computed as the difference between 1 and the relative factor inequality weights of the error term (residual), i.e. $R^2 = 1 - \hat{s_\epsilon}$.

[24] In particular, the decomposition was done using different model specifications. When running the full model, both education and employment status are highly significant in almost all cases (see Appendix Table A8). The exclusion of employment status or education does somewhat affect the values of the other variables' regression coefficients, but not their significance level. However, the exclusion of education and in particular employment status reduces the predictive power of the model, thus also increasing the relative factor inequality weights of the residual (+3.8 to +8.7 when excluding education, +3.8 to +16.3 when excluding employment status). For most of the variables in the model, the relative factor weights do not change much. Even for those variables that showed a change, like industry in some countries, age in the USA and sex in the UK, it was less than ±5 percentage points.

Figure 6: Factor decomposition of labour income inequality, latest year available
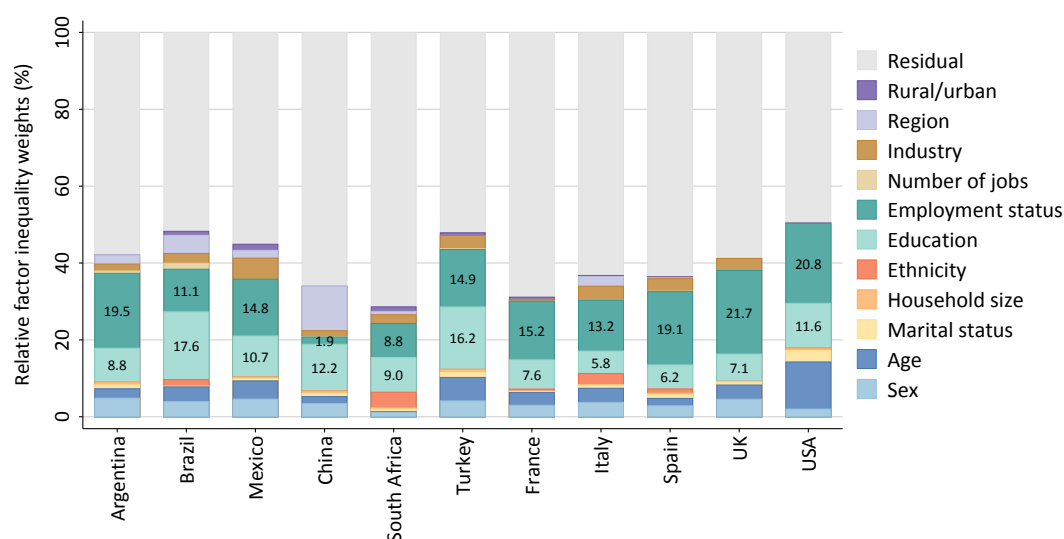
cent (UK). The factor contribution of employment status was more than double that of education in all four European countries, and the data suggest that the returns to education in these countries have declined over the past decade.[25] In the USA and Turkey, age was also an important factor, while in South Africa it was ethnicity. In the USA, the factor contribution of age was 12.2 per cent in 2012 (latest year), indicating that there is a huge difference in wages between younger and older workers, as younger workers are more likely to be in temporary or part-time work.[26] Other variables with sizeable factor inequality shares, at least in some countries, were industry (0.6 to 5.6 per cent) and sex (1.2 to 4.8 per cent). The remaining variables, like marital status, household size, the number of jobs and the rural/urban dummy had very limited effects, not exceeding 2 per cent in most countries.

5.2.2 Factors accounting for the change in labour income inequality

When we look at how much of the difference in labour income inequality over the past decade is attributable to each of the different factors, the results are quite mixed across countries. Figure 7 displays the relative contribution of each variable to the change in labour income inequality (see also Appendix Table A11). Notwithstanding the direction of the change in inequality, the employment status is the main factor accounting for the change in labour income inequality. Employment status explains between 7.8 (France) and 42.9 per cent (Mexico) of the total change in labour income inequality. An important point to note is that despite the fact that a relatively large part of the *level* in inequality is not explainable (residual between 59.8 and 67.8), the variables analysed here explain between 52.1 and 88.9 per cent of the *change* in labour income inequality.

In the Latin American countries under study, changes in employment status were the most powerful factor accounting for change in labour income inequality. In all three the share of self-employment reduced in favour of wage employment. While Argentina and Brazil observed a steep decline in informality, in Mexico informality rates increased slightly. Changes in educational structure and/or the returns to education explain between 10.5 and 21.5 per cent of the total change in inequality. These trends have also been observed by other empirical studies, which show that declining returns to education, the process of labour

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[25] See Appendix Table A10.
[26] We ran the analysis excluding employment status and found that the factor inequality share of age increased by 5 percentage points.

Figure 7: Contribution of different factors to the change in labour income inequality
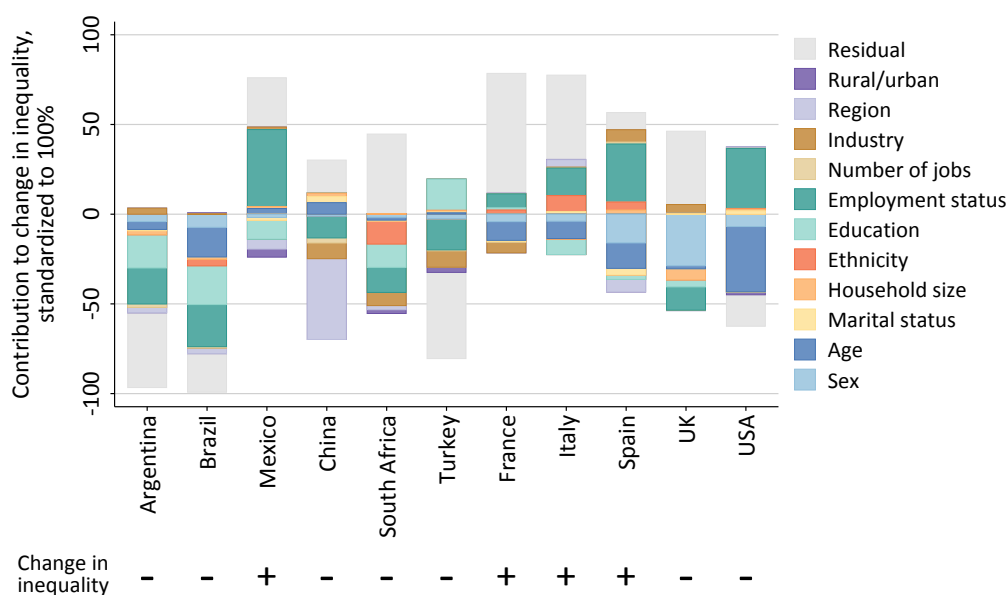
formalisation and rising minimum wages are some of the significant developments that have helped to reduce labour income inequality in Argentina and Brazil over the past decade (Beccaria et al., 2014; Maurizio, 2014; Bertranou et al., 2013; Levy and Schady, 2013; Ferreira de Souza, 2012; Gasparini et al., 2011). In Mexico, the most important factor contributing to the increase in labour income inequality was employment status (43 per cent). Studies have shown that, in some instances, the introduction of non-contributory social transfers can discourage formal employment (Levy and Schady, 2013). This seems to be the case for Mexico's universal health insurance Seguro Popular, which was introduced in 2002, extending health coverage to the self-employed and informal workers. A recent analysis estimates that, between 2002 and 2010, Seguro Popular relocated between 0.4 and 1 per cent of employment from formal to informal jobs, i.e. between 8 and 20 per cent of the total formal jobs created during that period (Bosch et al., 2014). This apart, minimum wages in Mexico are quite low and not revised regularly (Bosch and Manacorda, 2010). As a result, wage dispersion between formal and informal employees and the self-employed widened, leading to increased labour income inequality.

In China, the reduction of regional differences (45.0 per cent) was the most important factor accounting for the decline in labour income inequality, followed by employment status (12.2 per cent). Interestingly, education which was an important factor in most developing and emerging countries, was not an important factor in reducing inequality in China. By contrast, returns to education, employment status, and ethnicity were important factors accounting for the decline in labour income inequality in South Africa. In Turkey, while the returns to education increased labour income inequality, employment status (reduction of self-employed and increase in permanent employees) and the type of industry a worker was engaged in helped to reduce inequality. In the European countries, employment status was the most important factor contributing to the increase in labour income inequality, accounting for between 7.8 per cent (France) and 32.3 per cent (Spain). The increase in non-standard work since the 2000s has led to differences in contract type (ILO, 2015b), with a rise in part-time and temporary work and a decline in permanent employment, which could be associated with increased inequalities in wages, and therefore in household income (ILO, 2015a,c; OECD, 2015).

The other factors accounting for the change in labour income inequality are age and sex, especially in the advanced economies and in Argentina and Brazil. The reason for sex to be an important driver in reducing inequality could be due to the fact that female employment was less affected by the crisis than was male employment, and the gender pay gap kept narrowing.[27] Nopo and Hoyos (2010) also observed a 7 percentage-point decline in earnings differentials across gender in Latin American countries over the past decade (2000–10). This could partly be due to the effect of minimum wage policies—especially since the global economic crisis, in both developing and advanced economies—which have benefited low-paid workers, among whom women are over-represented (ILO, 2016c, 2015a,b, 2012). It could also be because the average wages of male workers are declining as men also increasingly experience temporary and part-time employment, especially in advanced countries (ILO, 2015a). Other individual or geographical characteristics—e.g. marital status, household size, the number of jobs, region, rural/urban—have less explanatory power. Inequality between ethnic groups seems to be on the decline in Brazil and South Africa, contributing to the overall decline in labour income inequality in both countries. For South Africa, this accords well with the findings of Leibbrandt et al. (2012), which show that the between-race component of inequality declined in the post-apartheid period. As the last year of their study was 2008, our results suggest that this trend is continuing despite the global economic crisis.

6 Conclusion

This paper has analysed the contributions of different factors to income inequality and labour income inequality in 13 G20 countries over the past decade. In all of the countries except South Africa and the UK, the decline/increase in income inequality was largely accounted for by labour income inequality, with regional differences regarding the policies that led to a decline in inequality. In Argentina and Brazil, regular revision of minimum wages and active labour market policies introduced over the past decade led to a reduction in wage dispersion. In China, it was the introduction of minimum wages in 2004, while in India it was the MGNREGS, which stipulated minimum wages for all workers engaged in this programme that helped in reducing wage inequality. The high economic growth in these countries over the past decade also resulted in substantial wage increases and increased opportunities for the self-employed, leading to a reduction in labour income inequality.

In South Africa and the UK, social transfers played a very important role in the reduction of income inequality. Both of these countries put in place non-contributory social transfer policies that also helped to reduce inequality. Non-contributory transfers were also important in reducing inequality in Argentina and Brazil. Contributory social transfers played an important role in containing inequality in the European G20 countries and also helped in reducing inequality in China. The importance of contributory social transfers also necessitates the need to extend these transfers to all workers in a country and develop it in countries where they are weak, so that the full potential of these benefits can be realised both for the workers and the households. In some of the advanced economies tax policies played an important role in reducing inequality, and especially in the UK, the tax policies introduced after the global crisis helped to arrest the widening of inequality.

Private transfers played quite an important role in reducing inequality in emerging economies and the Republic of Korea. These transfers, which are often in the form of remittances or transfers from extended family, are quite important for lower income households to meet their basic needs. However, the sustainability of these transfers is a concern which needs to be addressed carefully, as they are largely dependent on incomes from working age family members, which are also under severe strain as jobs

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[27] See e.g. Checchi and Leonardi (2015) for evidence on Italy, Coquet (2015) for France, Malo (2015) for Spain, and García Rodríguez (2015)for the United Kingdom.

become more and more insecure and precarious, reinforcing the importance of having a broader access to social transfers.

Our analysis of the factors accounting for labour income inequality shows that one of the most important contributing factors to inequality in all countries except China is employment status (employee/self-employed, formal/informal, temporary/permanent, part-time/full-time). These results are contrary to what one observed in the 1980s and 1990s, when education was found to be the dominant factor contributing to labour income inequality. These changes coincide with the rise in part-time and temporary work and other forms of 'irregular' employment over the past decade. Compared to education, the effect of employment status is quite strong: almost 3 times as strong in Spain and the UK and 2 times as strong in Argentina. In our analysis of the past decade, we find education to be the second most important contributing factor to inequality, but its contribution has declined over time in many countries. In some countries, like South Africa, ethnicity or race is also an important contributing factor, as certain ethnic groups enjoy only limited access to education or work in the labour market, remaining unemployed or operating in the fringes with low incomes and no social security. However, the magnitude of this effect has declined by 9 percentage points over the past decade, although it remained quite high compared to other countries in the analysis.

The analysis shows that labor markets dominate the determination of inequality and should be the first priority for policy makers' attention. In many emerging economices, the core challenge is to tackle unemployment and underemployment by providing economic opportunities to the poor and disadvantaged, in order to reconfigure the distribution of market incomes (Goñi et al., 2011). The second challenge in these economies relates to addressing increasing informality. Countries could learn from some of the policies that have been introduced in the Latin American countries like Argentina and Brazil that have helped to reduce informality. Finally, the importance of strong minimum wage policies to address inequality cannot be undervalued in these economies. In countries where minimum wages were regularly revised or introduced, they had a strong impact in reducing wage dispersion as compared to other countries where minimum wages were not regularly revised. This requires that minimum wages are set at the right level, covering all the workers and ensuring that there is full compliance, all of which requires strong institutional setup. In the advanced economies, policies would require to address the increase in precarious employment and to incentivize better terms for all employees, e.g. the extension of benefits to temporary and part-time workers.

While sound labor market policies are a necessary foundation for addressing inequality, social transfers and taxation also need attention. In emerging economies, this would mean extending social transfers, for instance through contributory schemes that are more inclusive and do not encourage workers or enterprises to stay informal. In advanced economies, it would require strengthening contributory and non-contributory social transfers, more progressive tax regimes, etc. Finally, addressing inequality also requires attention to other factors, like discrimination based on ethnicity, gender, etc. The analysis shows that inequality between ethnic groups has declined in some countries, which could largely be due to the affirmation policies, but still steps need to be taken to ensure that certain ethnic groups continue to have access to education and opportunities to work. While we do observe a decline in the gender wage gap, this could be partly due to the implementation of minimum wages as it affects low paid women workers, or due to other factors like decline in the average wages of male workers. However, much more needs to be done to ensure that women are not discriminated, both within and outside the labour market.

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Appendix

Table A1: Data sources and years covered

Country	Data source	Years
Argentina	Enquesta Permanente de Hogares, INDEC, www.indec.gov.ar	2004, 2014
Brazil	Pesquisa Nacional por Amostra de Domicilios (PNAD), Instituto Brasileiro de Geografia e Estatística (IBGE)	2004, 2014
Mexico	Encuesta Nacional de Ingresos y Gastos de los Hogares (ENIGH), Instituto Nacional de Estadística y Geografía (INEGI)	2004, 2014
China	China Urban Labour force survey, Chinese Academy of Social Sciences (CASS)	2005, 2010
India	India Human Development Survey (IHDS), S. Desai, R. Vanneman and NCAER, New Delhi	2004-05, 2011-12
Rep. of Korea	National household income and expenditure survey data, National Statistics Office, Seoul	2006, 2012
South Africa	General Household Survey and Labour Force Survey, Statistics South Africa	2004, 2014
Turkey	Income and Living Conditions Survey, Turkish Statistical Institute	2005, 2011
France	EU Statistics on Income and Living Conditions (EU-SILC), Eurostat	2006, 2013
Italy	EU Statistics on Income and Living Conditions (EU-SILC), Eurostat	2006, 2013
Spain	EU Statistics on Income and Living Conditions (EU-SILC), Eurostat	2006, 2011
United Kingdom	EU Statistics on Income and Living Conditions (EU-SILC), Eurostat	2006, 2013
Unites States of America	Consumer Expenditure Survey, Bureau of Labor Statistics (BLS)	2005, 2012

Table A2: List of variables used in the labour income regression

Income	Annual labour income, i.e. employee income (wages and bonuses) plus self-employment income (profits plus value of the production for own consumption).
Sex	Sex of the individual. Dummy variable, indicating female=1, 0 otherwise.
Age	Age of the individual.
Age^2	Age of the individual, squared.
Marital status	Four groups: single (reference category), married, separated/divorced, widowed.
Household size	Number of people living in the household.
Ethnic group	The classification into ethnic groups is country-specific. Distinctions are made between Mulato (a), White (b), Black (c), Asian (d), and Indigenous (e) for Brazil; African/Black (a), Coloured (b), Indian/Asian (c), and White (d) for South Africa; national (a), non-national EU citizen (b), and non-EU citizen (c) for EU countries; and White (a), Black (b), Asian (c), and others (d) for the USA. There is no information on ethnic groups in the datasets used for Argentina, Mexico, China, and Turkey.
Education	Educational levels are (0) illiterate, (1) literate but not a graduate, (2) completed primary, (3) lower secondary, (4) upper secondary, and (5) university degrees for Argentina, Brazil, Mexico, South Africa and Turkey. For China, they are (2) primary school and below, (3) junior high school, (4) senior high school, and (5) college and above. For the US, the levels are (0) primary school and high-school drop-outs, (1) high school graduates, (2) some college without degree, (3) associate's degree, (4) bachelor's, and (5) master's degree and higher. In the EU, the levels are (2) pre-primary and primary education, (3) lower secondary, (4) upper secondary, and (5) tertiary education. Additionally, for Italy there is a category for post-secondary non-tertiary education (level 4, shifting the other levels down compared to the France and Spain). The lowest level available in the UK dataset is lower secondary education (level 3). In each country the lowest educational level is used as reference category.
Employment status	Due to differences in the surveys across countries, the employment status categories vary between countries or regions: The self-employed are subdivided into own-account workers and employers in all countries expect China and the USA, where this division is not possible. However, in the latter the distinction is between full-time and part-time self-employed. The categories used for employees are the following: In Argentina, Brazil, and Mexico the distinction is based on the sector (formal vs. informal); in France, Italy, Spain, Turkey, and the United Kingdom the distinction among employees is based on the combination of contract duration (permanent vs. temporary) and type (full-time vs. part-time); in South Africa, on the combination of sector (formal vs. informal) and contract duration (permanent vs. temporary); in the USA, on contract type (full-time vs. part-time) and the type of employer (private vs. public); and in China, as no information on contract type or sector is available, the type of employer is used (public administration, state-owned enterprise, private enterprise, and foreign-funded enterprise).

Table A2 continued: List of variables used in the labour income regression

Number of jobs	We distinguish between individuals holding one, two, and three or more jobs. Dummies are created for 'two' and 'three or more', with one job being the reference category. Only the Argentinian and Brazilian datasets allow distinguishing between two and three or more; for all other countries the distinction is only between one and two jobs. No information is available for the USA.
Industry	We aggregate the industry (main occupation) into six industry groups with similar qualitative characteristics: agriculture (comprises agriculture, forestry and fishing); mining (comprises mining and production and supply of electricity, gas and water); manufacturing; construction; low-skilled services sector (comprises trade, hotels and restaurant, transport and personal services) and high-skilled services sector (comprises banking and insurance, communication, real estate, business services and public administration). The categorization of the service sector into two groups is justified on the basis of skill and capital requirements. 'Agriculture' is used as the reference category and we constructed five dummy variables for each of the other industry groups. For Argentina, as the dataset covers the urban population and only a few individuals reported working in agriculture, agriculture was put together with mining. For France, Italy, Spain and the UK mining is included in the manufacturing category as distinction between the two is not possible in the EU-SILC data. For China, the distinction is made between: mining and quarrying (reference category); manufacturing; production and supply of electricity, gas, and water; labour intensive services; non-labour intensive services; and other service industry. The US consumer expenditure survey does not contain information on industry. Occupation was considered as an alternative, but due to the high correlation with education and ethnicity it was not included in the final regression.
Region	The following regions are considered. Argentina: (a) Northeast, (b) Northwest, (c) Cuyo, (d) Pampeana, (e) Gran Buenos Aires, and (f) Patagonia. Brazil: (a) Northeast, (b) North, (c) Southeast, (d) South, and (e) West Central. China: (a) Shanghai and Gunagzhou, (b) Fuzhou, (c) Wuhan, (d) Shenyand and Xi'an. Italy: (a) South and (b) North. Mexico: (a) Southwest, (b) Southeast, (c) Centre , (d) North, (e) Capital, and (f) Border. South Africa: (a) Free State and Northern Province, (c) Western Cape, (d) Guateng, and (b) others. Spain: (a) others, (b) Madrid, and (c) Northeast. USA: (a) South, (b) Northeast, (c) Midwest, and (d) West. In each country, region (a) is used as reference category.
Sector	We distinguish between rural and urban areas using a dummy variable indicating urban=1, 0 otherwise. It is not available for Argentina as the survey only covers urban areas, and not added in the final regression model for China as it was highly correlated with the education variable.

Table A3: Share of income source in total household income [%], latest year available

	Argentina	Brazil	Mexico	China	India	Rep. of Korea	South Africa	Turkey	France	Italy	Spain	UK	USA
Wages	61.5	57.1	70.5	53.5	53.4	62.7	55.2	58.8	55.0	47.3	56.5	55.4	73.4
Self-employment	15.1	18.2	11.3	13.3	33.4	18.7	7.2	12.3	4.8	16.3	7.7	6.9	3.6
Capital	0.6	1.0	0.8	3.3	2.0	3.2	n.a.	4.8	5.7	3.1	1.5	2.8	1.1
Private transfers	2.7	0.7	5.0	1.0	5.6	2.6	7.1	3.8	0.9	0.8	0.7	1.5	1.6
Contributory ST	16.0	12.3	5.5	28.2	3.2	2.3	n.a.	18.7	25.1	28.7	28.5	18.9	16.1
Non-contributory ST	4.1	10.7	6.8	0.7	2.4	10.5	30.5	1.6	8.5	3.8	5.0	14.4	4.2

Note: ST = social transfers.

Table A4: Share of income source in total household income [%], mid-2000s

	Argentina	Brazil	Mexico	China	India	Rep. of Korea	South Africa	Turkey	France	Italy	Spain	UK	USA
Wages	63.0	58.2	69.9	54.5	62.3	61.7	53.8	54.0	55.5	48.0	62.8	58.2	75.1
Self-employment	18.2	19.4	15.9	14.1	26.7	20.4	10.5	16.8	5.7	17.7	9.5	7.2	4.3
Capital	0.9	1.2	0.8	0.6	2.4	2.1	n.a.	6.7	2.8	2.5	1.7	3.5	1.5
Private transfers	3.3	1.1	6.0	3.3	2.2	1.7	4.4	4.4	0.8	1.2	0.6	0.4	1.7
Contributory ST	12.5	11.1	4.2	24.8	2.5	2.5	n.a.	16.6	24.8	27.2	22.8	17.8	14.3
Non-contributory ST	2.2	9.0	3.2	2.6	3.9	11.6	31.2	1.5	10.4	3.4	2.6	13.0	3.2

Note: ST = social transfers.

Figure A2: Gini coefficient over time, mid-2000s to latest year available
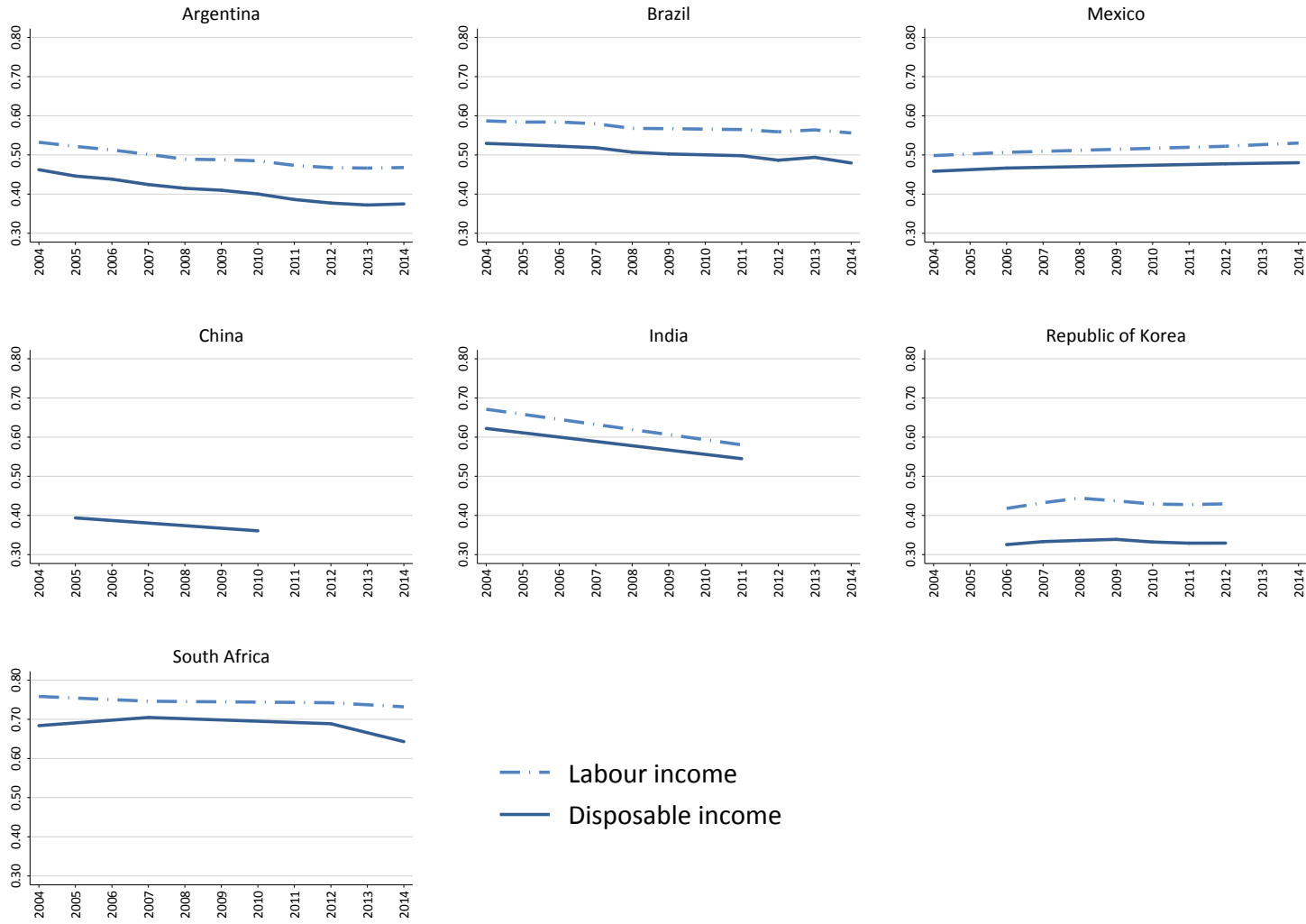
Figure A1 continued: Gini coefficient over time, mid-2000s to latest year available

Legend:
- – · – Labour income
- ——— Disposable income
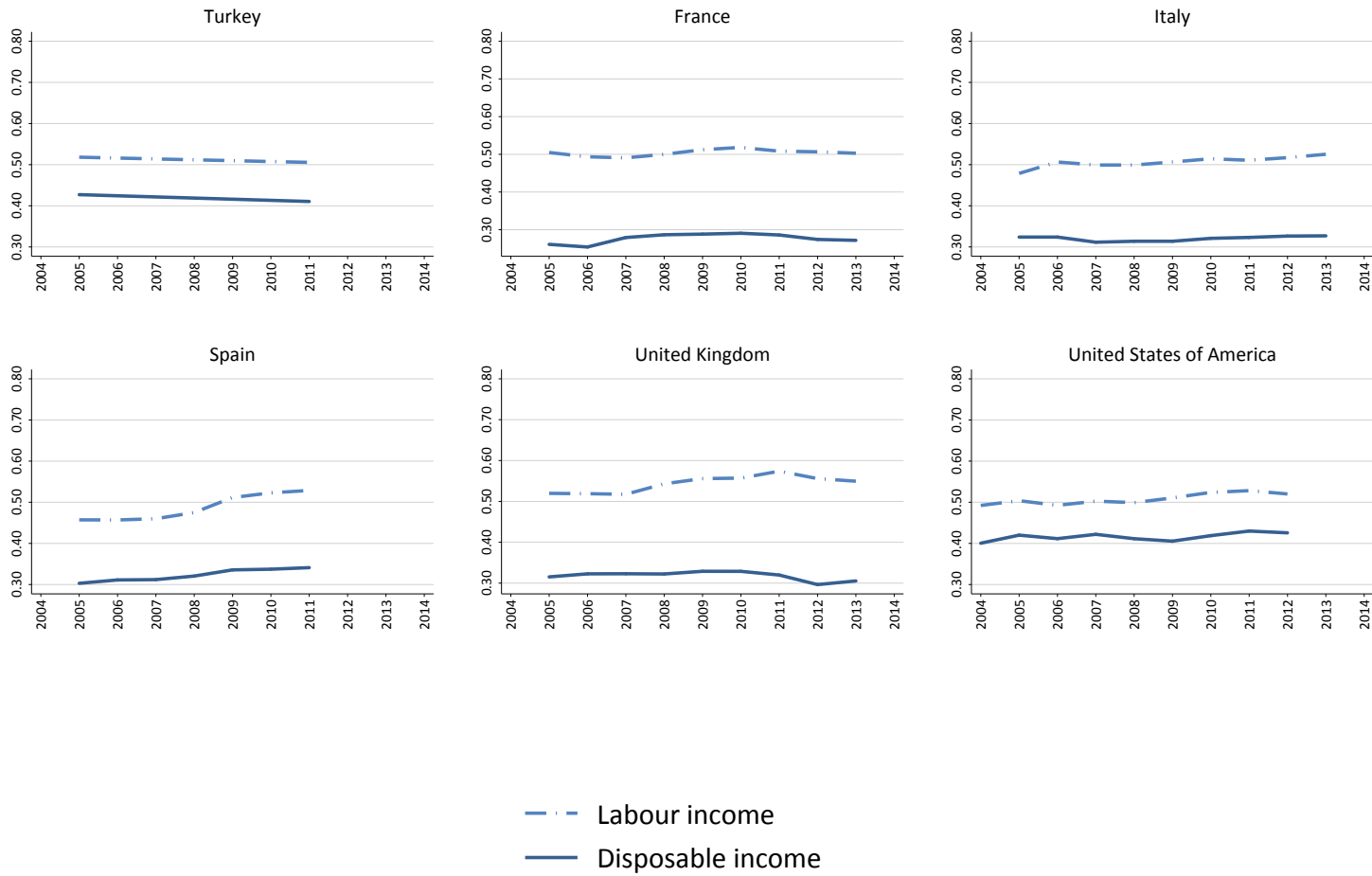
Table A5: Factor decomposition of inequality in total household income, latest year available

	Argentina	Brazil	Mexico	China	India	Rep. of Korea	South Africa	Turkey	France	Italy	Spain	UK	USA
Wages	74.3	59.2	78.4	65.9	48.5	79.5	88.1	54.9	87.6	74.7	89.1	129.9	96.2
Self-employment	14.6	29.5	9.8	16.0	37.8	21.3	13.4	20.4	16.5	34.7	15.8	16.7	8.1
Capital	1.5	2.4	1.7	8.8	2.5	2.6	n.a.	9.3	27.0	9.0	4.4	7.0	3.1
Private transfers	0.4	0.1	1.7	0.2	4.9	7.7	0.3	0.7	-0.2	0.0	-0.1	0.6	1.0
Contributory ST	10.9	13.4	9.5	9.5	6.1	2.2	n.a.	16.2	20.5	27.5	9.5	6.5	5.2
Non-contributory ST	-1.6	1.8	-1.2	-0.4	0.2	-1.9	-1.8	-0.4	-5.3	0.2	0.6	-9.9	-0.9
Contributions to SSec	n.a.	-6.4	n.a.	n.a.	n.a.	-5.9	n.a.	-0.1	-0.8	0.5	-0.7	-2.1	-8.9
Taxes	n.a.	n.a.	n.a.	n.a.	n.a.	-5.4	n.a.	-1.0	-45.4	-46.5	-18.6	-48.7	-3.7

Note: ST = social transfers; SSec = social security.

Table A6: Factor decomposition of inequality in total household income, mid-2000s

	Argentina	Brazil	Mexico	China	India	Rep. of Korea	South Africa	Turkey	France	Italy	Spain	UK	USA
Wages	64.3	54.4	68.9	84.1	57.6	81.3	80.6	47.0	102.2	78.1	107.7	124.4	94.8
Self-employment	22.8	30.2	21.1	5.0	30.6	19.5	19.8	26.5	17.2	40.0	6.5	20.7	12.1
Capital	2.4	3.3	2.0	1.0	2.6	2.6	n.a.	12.5	8.0	6.2	5.0	10.2	3.5
Private transfers	1.5	0.4	2.2	1.2	1.6	6.6	0.1	0.9	-0.3	0.1	0.2	0.2	1.0
Contributory ST	9.4	14.5	6.4	9.9	4.9	1.3	n.a.	14.3	23.6	19.4	2.8	1.3	2.7
Non-contributory ST	-0.3	3.6	-0.5	-1.1	2.7	-1.2	-0.4	-0.4	-6.9	-0.2	0.6	-6.8	-0.7
Contributions to SSec	n.a.	-6.4	n.a.	n.a.	n.a.	-5.1	n.a.	0.0	-0.1	-0.7	-1.4	-1.3	-9.0
Taxes	n.a.	n.a.	n.a.	n.a.	n.a.	-4.9	n.a.	-0.9	-43.7	-42.9	-21.4	-48.7	-4.4

Note: ST = social transfers; SSec = social security.

Table A7: Factor decomposition of the change in inequality, mid-2000s to latest year available

	Argentina	Brazil	Mexico	China	India	Rep. of Korea	South Africa	Turkey	France	Italy	Spain	UK	USA
Wages	-0.063	-0.039	0.015	-0.029	-0.029	-0.015	0.001	-0.017	0.000	0.007	0.023	0.040	0.020
Self-employment	0.008	0.000	-0.002	0.018	-0.058	0.017	0.002	0.006	0.013	-0.007	0.027	-0.008	-0.006
Capital	0.002	0.000	0.004	0.009	0.005	0.001	n.a.	-0.001	0.015	-0.001	0.001	-0.004	-0.001
Private transfers	-0.004	0.000	0.006	-0.003	-0.005	0.004	-0.011	0.000	0.001	0.001	0.001	-0.002	0.000
Contributory ST	-0.011	-0.008	0.005	-0.026	0.006	-0.002	n.a.	-0.004	-0.006	-0.003	-0.012	-0.010	0.000
Non-contributory ST	-0.019	-0.013	-0.006	-0.003	0.004	-0.008	-0.028	-0.001	0.004	0.000	-0.004	-0.011	-0.001
Contributions to SSec	n.a.	0.009	n.a.	n.a.	n.a.	0.004	n.a.	0.001	0.000	0.004	0.000	-0.001	-0.003
Taxes	n.a.	n.a.	n.a.	n.a.	n.a.	0.002	n.a.	0.000	-0.009	0.004	-0.005	-0.021	-0.003
Change in inequality	**−0.087**	**−0.050**	**0.022**	**−0.033**	**−0.077**	**0.004**	**−0.035**	**−0.017**	**0.018**	**0.003**	**0.030**	**−0.017**	**0.006**

Note: ST = social transfers; SSec = social security.

Table A8: Regression results. Dependent variable: labour income.

		Argentina		Brazil		Mexico		China		RSA		Turkey		France		Italy		Spain		UK		USA	
		2004	2014	2004	2014	2006	2014	2005	2010	2004	2014	2005	2011	2006	2013	2006	2013	2006	2011	2006	2013	2005	2012
Sex	male	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	female	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
Age	age	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	age²	−	−	−	−	−	−	+	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
Marital status	single	●	●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	married	+	+			−	−	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	separated/divorced	+	+			−	+	+	+	−	+	+	+	+	+	+	+	+	+	+	−	+	+
	widowed	+	+			−	+	+	+	+	−	+	+	−	+	−	−	+	+	+	+	+	−
Household size		−	−	−	−	−	−	−	−	−	−	−	−	−	+	−	−	−	−	−	−	−	−
Ethnic group	group a			●	●					●	●			●	●	●	●	●	●	●	●	●	●
	group b			+	+					+	+			+	−	−	−	+	−	−	−	−	−
	group c			−	−					+	+			−	−	−	−	−	−	−	−	−	+
	group d			+	+					+	+											−	−
	group e			+	+																		
Education	level 0	●	●	●	●	●	●					●	●									●	●
	level 1	+	+	+	+	+	+			●	●	+	+			●	●					+	+
	level 2	+	+	+	+	+	+	●	●	+	+	+	+	●	●	+	+	●	●			+	+
	level 3	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	●	●	+	+
	level 4	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	level 5	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

Note: ● reference category; **+/−**, +/− , and +/− indicate positive/negative coefficients that are statistically significant at $p < 0.01$, $p < 0.05$ and $p < 0.10$, respectively; +/− indicate positive/negative coefficients that are not statistically significant ($p > 0.1$). See Table A2 for an explanation of the different variables.

Table A8 continued: Regression results. Dependent variable: labour income.

		Argentina		Brazil		Mexico		China		RSA		Turkey		France		Italy		Spain		UK		USA	
		2004	2014	2004	2014	2006	2014	2005	2010	2004	2014	2005	2011	2006	2013	2006	2013	2006	2011	2006	2013	2005	2012
Employment status	informal employee	●	●	●	●	●	●																
	formal employee	+	+	+	+	+	+																
	own-account s-e	+	−	+	+	−	−			+	+	+	+	+	+	+	+	+	+	+	+		
	employer	+	+	+	+	+	−			+	+	+	+	+	+	+	+	+	+	+	+		
	temp. partt. emp.											●	●	●	●	●	●	●	●	●	●		
	perm. partt. emp.											+	+	+	+	+	+	+	+	+	+		
	temp. fullt. emp.											+	+	+	+	+	+	+	+	+	+		
	perm. fullt. emp.											+	+	+	+	+	+	+	+	+	+		
	temp. informal emp.									●	●												
	perm. informal emp.									+	+												
	temp. formal emp.									+	+												
	perm. formal emp.									+	+												
	partt. public emp.																					●	●
	partt. private emp.																					+	+
	fullt. public emp.																					+	+
	fullt. private emp.																					+	+
	partt. self-employed																					+	+
	fullt. self-employed																					+	+
	emp. pub. admin.							+	+														
	emp. pub. ent.							+	+														
	emp. priv. ent.							+	+														
	emp. for.-fund. ent.							+	+														
	self-employed							+	+														
	other							●	●														

Note: ● reference category; **+/−**, +/−, and +/− indicate positive/negative coefficients that are statistically significant at $p < 0.01$, $p < 0.05$ and $p < 0.10$, respectively; +/− indicate positive/negative coefficients that are not statistically significant ($p > 0.1$).
perm. = permanent; temp. = temporary; partt.= parttime; fullt.= fulltime; emp. = employee; s-e = self-employed; pub. = public; priv. = private; admin. = administration; ent. = enterprise; for.-fund. = foreign-funded. See Table A2 for an explanation of the different variables.

Table A8 continued: Regression results. Dependent variable: labour income.

		Argentina		Brazil		Mexico		China		RSA		Turkey		France		Italy		Spain		UK		USA	
		2004	2014	2004	2014	2006	2014	2005	2010	2004	2014	2005	2011	2006	2013	2006	2013	2006	2011	2006	2013	2005	2012
Number of jobs	one	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
	two	+	+	+	+	+	+	+	+	−	−	+	+	−	+	+	+	+	+	+	+		
	three or more	+	+	+	+																		
Industry	agriculture	+	+	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•		
	mining			+	+	+	+	•	•	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	manufacturing	+	+	+	+	+	+	−	+	+	+	+	+										
	construction	−	+	+	+	+	+			+	+	+	+	+	+	+	+	+	+	+	+		
	low skill services	•	•	+	+	+	+			+	−	+	+	+	+	+	+	+	+	−	−		
	high skill services	−	+	+	+	+	+			+	+	+	+	+	+	+	+	+	+	+	+		
	lab. int. services							−	+														
	consumption serv.							−	−														
	production serv							−	+														
	other services							−	+														
Region	region a	•	•	•	•	•	•	•	•	•	•					•	•	•	•			•	•
	region b	+	+	+	+	+	+	+	+	+	+					+	+	+	+			+	+
	region c	+	+	+	+	+	+	+	+	+	+							+	+			+	−
	region d	+	+	+	+	+	+	−	+	+	+											+	+
	region e	+	+	+	+	+	+	−	+														
	region f	+	+			+	+																
Sector	rural			•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
	urban			+	+	+	+			+	+	+	+	+	+	+	+	+	+	−	−	+	+

Note: • reference category; **+**/**−**, +/−, and +/− indicate positive/negative coefficients that are statistically significant at $p < 0.01$, $p < 0.05$ and $p < 0.10$, respectively; +/− indicate positive/negative coefficients that are not statistically significant ($p > 0.1$).

Ls = low skill, hs = high skill. See Table A2 for an explanation of the different variables.

Table A9: Factor decomposition of labour income inequality, latest year available

	Argentina	Brazil	Mexico	China	South Africa	Turkey	France	Italy	Spain	UK	USA
Sex	4.8	3.9	4.6	3.4	1.2	4.1	3.0	3.7	2.9	4.6	2.0
Age	2.5	3.8	4.7	1.8	0.2	6.1	3.3	3.7	1.9	3.7	12.2
Marital status	1.0	n/a	0.6	0.8	0.7	1.3	0.3	0.8	1.0	0.8	3.0
Household size	0.7	0.4	0.4	0.6	0.4	0.8	0.0	0.0	0.3	0.1	0.5
Ethnicity	n/a	1.6	n/a	n/a	4.0	n/a	0.6	3.0	1.1	0.1	0.2
Education	8.8	17.6	10.7	12.2	9.0	16.2	7.6	5.8	6.2	7.1	11.6
Employment status	19.5	11.1	14.8	1.9	8.8	14.9	15.2	13.2	19.1	21.7	20.8
Number of jobs	0.6	1.6	-0.1	0.1	0.0	0.3	-0.1	0.0	0.1	0.0	n/a
Industry	1.8	2.5	5.6	1.5	2.3	3.4	0.6	3.7	3.2	3.1	n/a
Region	2.3	4.8	2.0	11.6	0.9	n/a	n/a	2.5	0.2	n/a	0.1
Rural/urban	n/a	1.0	1.6	n/a	1.2	0.7	0.6	0.2	0.3	0.0	0.1
Residual	57.9	51.7	55.1	66.0	71.4	52.1	68.9	63.2	63.6	58.8	49.5

Note: The numbers represent each explanatory factor's contribution to labour income inequality, $\hat{s}_j$, as defined in Equation 5.

Table A10: Factor decomposition of labour income inequality, mid-2000s

	Argentina	Brazil	Mexico	China	South Africa	Turkey	France	Italy	Spain	UK	USA
Sex	4.7	4.7	5.1	3.3	2.3	4.1	4.4	5.1	4.8	6.8	2.4
Age	3.2	6.6	4.7	-0.3	1.3	5.3	6.3	6.2	3.7	3.8	14.4
Marital status	0.9	n/a	0.8	-0.3	1.0	1.1	0.5	0.6	1.5	0.8	2.8
Household size	1.3	0.6	0.3	0.0	0.1	0.5	0.0	0.1	0.1	0.6	0.4
Ethnicity	n/a	2.0	n/a	n/a	13.0	n/a	0.1	1.4	0.5	0.0	0.1
Education	12.4	18.5	12.6	10.7	17.8	11.1	8.4	8.4	6.6	7.3	11.5
Employment status	20.2	13.8	10.7	5.3	18.3	16.5	15.5	11.5	15.5	22.6	18.3
Number of jobs	1.1	1.4	-0.1	0.9	0.0	0.3	0.0	0.0	0.0	0.0	n/a
Industry	0.0	2.0	5.7	4.0	7.4	4.8	2.1	4.0	2.5	2.7	n/a
Region	2.6	4.4	2.8	23.6	2.5	n/a	n/a	1.9	1.1	n/a	0.0
Rural/urban	n/a	0.7	2.2	n/a	2.6	1.2	0.6	0.2	0.3	0.0	0.2
Residual	53.6	45.3	55.3	52.8	33.6	55.2	62.2	60.5	63.4	55.3	49.8

Note: The numbers represent each explanatory factor's contribution to labour income inequality, $\hat{s}_j$, as defined in Equation 5.

Table A11: Factor decomposition of the change in labour income inequality, mid-2000s to latest year available

	Argentina	Brazil	Mexico	China	South Africa	Turkey	France	Italy	Spain	UK	USA
Sex	-4.1	-7.3	-1.8	-1.0	-1.7	-2.6	-4.1	-3.9	-16.0	-28.8	-6.9
Age	-4.4	-16.6	3.2	6.4	-1.6	0.8	-10.4	-9.7	-14.2	-1.7	-36.3
Marital status	-0.7	n/a	-1.6	3.4	-0.5	0.4	-0.6	1.4	-3.7	0.1	1.9
Household size	-2.3	-1.4	1.1	1.9	0.3	1.0	0.2	-0.4	2.3	-6.2	1.1
Ethnicity	n/a	-3.6	n/a	n/a	-12.9	n/a	2.1	8.9	4.5	0.4	0.3
Education	-18.5	-21.5	-10.5	0.3	-13.0	17.4	1.2	-8.6	-2.5	-3.8	-0.2
Employment status	-20.1	-23.5	42.9	-12.2	-14.0	-17.3	7.8	15.3	32.3	-13.0	33.5
Number of jobs	-1.9	-0.8	0.0	-2.8	0.0	-0.5	-0.5	0.0	1.1	0.1	n/a
Industry	3.4	0.1	1.4	-8.8	-7.3	-9.1	-5.9	0.5	6.9	4.8	n/a
Region	-3.0	-3.1	-5.5	-45.0	-2.3	n/a	n/a	4.1	-7.0	n/a	0.9
Rural/urban	n/a	0.7	-4.5	n/a	-2.1	-2.9	0.3	0.1	0.0	-0.2	-1.5
Residual	-41.7	-21.5	27.5	18.2	44.4	-48.0	66.8	47.0	9.6	40.9	-17.5
Change in inequality (%)	-19.6	-13.3	3.4	-5.0	-5.4	-6.6	4.7	4.1	0.6	-0.3	-1.0

Note: The numbers represent each explanatory factor's contribution to the change in labour income inequality, based on $\hat{\pi}_j$, as defined in Equation 7 . They were re-scaled so that in each country the sum of their absolute values is 100. For the ease of interpretation, the signs were changed for countries where labour inequality declined over time, so that all negative values represent an inequality-decreasing effect, while positive values denote an inequality-increasing effect.