

CHAPTER 19

Cross-Country Evidence of the Multiple Causes of Inequality Changes in the OECD Area

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Abstract

This chapter provides a thorough survey of what recent international (i.e., cross-country) studies can tell us about the multiple causes of income inequality in the OECD area with regard to both levels and trends. The survey covers economics literature in particular but also relevant evidence from sociology and political science. We provide an overview of drivers of inequality in six areas: (i) structural macro-economic sectoral changes, (ii) globalization and technology change, (iii) labor market and other relevant institutions, (iv) politics and political processes, (v) tax/transfer schemes, and (vi) demographic and other microstructural changes. We find that the literature, while extremely rich in partial analysis of all six areas, provides very few analyses with truly multivariate and multicountry specifications for the joint section of the OECD and EU countries. Suggestions include more cross-discipline reflections on various findings. This is now well facilitated by the spectacular development of data, as well as in relation to methodological harmonization across disciplines.

Keywords

Income distribution, Globalization, Labor market institutions, Political economy, Redistribution, Demographic structure, Multivariate models, Cross-country comparisons, OECD countries

JEL Classification Codes

D30, D31, D63, I32, I38, J31, O15

19.1. INTRODUCTION

In their review of income inequality in richer and OECD countries, [Brandolini and Smeeding \(2009\)](#) concluded that “attempts to model and understand causal factors and explanations for differences in level and trend in income inequality across nations

is the ultimate challenge to which researchers on inequality should all aspire” (p. 97). This sentence summarizes well the aim of the literature review in this chapter.

The chapter aims to provide a thorough survey of what international (i.e., cross-country) studies can tell us about the drivers and underlying causes of income inequality with regard to levels and, in particular, trends. The survey intends to be interdisciplinary, focusing on economics literature in particular but also on relevant evidence from sociology and political science.¹ While the overview intends to be comprehensive, some important research decisions limit its scope with regard to coverage and focus:

- The geographical coverage of the chapter is limited to the joint set of OECD and EU countries. Driving factors of inequality in emerging and developing countries and issues of world development are covered by Chapters 9, 11 and 20 in this volume.
- The chapter provides an update of existing reviews of literature with mostly recent studies, focusing largely on cross-country analyses that became available since the turn of the century.
- The chapter basically provides a meta-analysis based on review of the relevant literature. It does not produce a new data analysis within the frame of this survey. However, the chapter presents and provides a numerical analysis of the key findings of the literature.
- The focus of the chapter is on inequality of outcomes rather than inequality of opportunity. The analysis of the latter is provided in Chapter 4.
- Research results on determinants of poverty are not reviewed here. While it is acknowledged that (relative) poverty is a feature of inequality, we keep the focus here to studies aiming to explore the determinants of the full range of the dispersion of incomes. On poverty literature, see [Nolan and Marx 2009](#), and Chapters 3, 8, 9, and 23 in this volume.
- When dealing with “inequality,” the emphasis is on inequality of household income as much as possible, following the main focus of the Handbook. Given the scope of the empirical literature at hand, results of the determinants of the distribution of income subaggregates such as labor earnings also are reported. The determinants of the distribution of individual wages are, however, discussed in [Chapter 18](#).
- The chapter focuses on the size distribution of personal incomes, leaving the vast range of literature on functional income distribution to other studies.
- While there is a trade-off between country coverage (N) and the length of the time series (T) in an analysis (given the limitations of data for large cross-country data sets for a long time series), the chapter draws practical boundaries here. A large cross-section of countries is relevant, even if only one or a few points in time are covered.

¹ The interdisciplinary approach applied here has forced us to make some difficult choices with regard to different methods and approaches applied by various strands of scientific analysis and that are rooted in the history of disciplinary accounts of inequality. Choosing as a starting point a frame that is (mostly) applied by economists might seem procrustean for representatives of other disciplines. With due acknowledgements, though, we hope our approach is useful.

On the other hand, analyses of only a few countries but for a long time series may be relevant for the review. The issue of this trade-off, however, is discussed further later in the chapter.

- The chapter reviews findings on the driving factors of inequality under several aspects: cross sections of within-country inequalities, quasi panels of countries and cross-country comparisons of longitudinal surveys (the data background of the studies is discussed in [Section 19.3.2](#), covering the comprehensive data background of the income distribution literature). We do not include studies of cross-country differentials such as gross domestic product (GDP) convergence.

The structure of the chapter follows a broad classification of research questions of the literature. The chapter ends with a concluding section that attempts to summarize and classify the wealth of findings from the literature and to provide a critical assessment of the findings.

When selecting the empirical studies to be reviewed, we considered four elements as crucial: (i) the analyses had to show empirical results on income (or at least earnings) inequality; (ii) they had to cover a multiple of countries; (iii) they had to be at least multivariate; and (iv) their coverage had to relate to the joint set of OECD and EU countries. This led, obviously, to painful omissions of many excellent reports of driving factors of inequality.²

19.2. THE RESEARCH QUESTION AND METHODS TO EXPLAIN INEQUALITY AND ITS CHANGE

This chapter sets out the problem of a multicausal explanation of income inequality in a cross-country context. First we present the structure of the problem and then we provide an outline of the methods used in the literature we review.

19.2.1 The Structure of the Research Question

To understand and place the formulation of the research questions of the literature, it is useful to start with a very general flow chart showing the major elements of inequality formation (see [Figure 19.1](#)); this deliberately ignores potential causality directions at this stage. As the figure illustrates, income inequality (at all levels of economic development) is a product of macro processes (such as supply and demand processes, globalization, trade,

² However, these selection criteria could not always be fully respected. For example, the data background of certain studies we reviewed seemed at first glance to not properly fit the above criteria, for example, when a model of an important political process (such as corporatist agreements) is tested with individual wages rather than incomes. However, the line of argument dealing with the political economy of interest groups remains of interest even if it refers to the effect on wages only. Also, in some cases, especially in the frame of the debate on globalization and technological change, lessons from developing countries may be important for theoretical or methodological reasons, so some of those studies with coverage of countries outside of our prime target have not been excluded. The general guidelines from the above limitations, however, remain to be held.

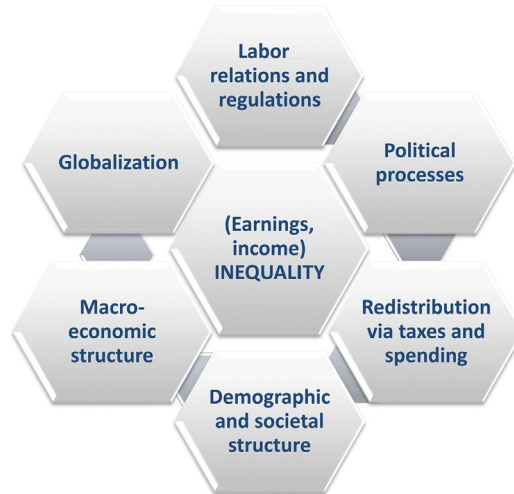


Figure 19.1 Stylized description of determinants of income distribution.

and sectoral change in the economy); structural conditions (in terms of economic and social structures as well); and institutional constructs (political institutions for the aggregation of collective preferences, labor market institutions to assist an efficient utilization of human capital endowments, and tax/transfer schemes for institutionalizing redistribution in society).

Schematically, [Figure 19.1](#) numerates six families of potential key drivers of earnings and income distributions. From left to right, “globalization” is primarily meant to cover the economic dimensions of globalization, such as increased trade integration, outsourcing or financial integration. Technological changes also fall into this family. Next, under the heading “labor relations and regulations,” we also discuss institutional features of the labor markets, such as the level of unionization, the potential role of wage-bargaining institutions, or levels of corporatism embedded into the political system. “Political processes” include preference formation (of voters and of parties), political representation, and interest group politics. “Redistribution and tax-transfer policies” involve various policy arrangements aimed at altering the “original” distribution that came about as a result of market processes. “Demographic and societal structure” refers to the way individuals (with their own incomes) combine into families and households (household structure by age, employment, income levels) and how the society is composed of various sociodemographic variables (such as age, gender or education). Finally, the “macro-economic structure” of societies (characterized by sector distribution of employment, by degrees of labor market attachment, etc.) is of central importance for the determination of overall inequalities. With this schematic we illustrate the complexity of factors that

affect income distribution and highlight the partial nature of most empirical analyses we found in our literature search.³

The overwhelming majority of the articles we reviewed model inequality (or inequality changes) and regress a chosen inequality measure on selected driver variables, usually among one (rarely more) of the driver families. Among this literature, the list of 48 articles with key features analyzed and that come closest to satisfying the criteria above can be found in [Annex Table A19.1](#). Many of them focus on some particular parts of [Figure 19.1](#). Few of them, however, aim to cover the full range of potential variables explaining changes in income distribution ([Cornia, 2012](#), or [OECD, 2011](#), are among these exceptions; see [Annex Table A19.1](#) for further details). Nevertheless, it is useful to keep the full picture in mind when certain specific parts are analyzed.

A general formulation of the approach taken can be written in the form of a generalized regression equation ([Equation 19.1](#)).

$$INEQ_{i,t} = \alpha + \beta * X_{i,t} + \gamma * Z_{i,t} + \lambda * Q_{i,t} + \eta_i + \mu_t + \varepsilon_{i,t} \quad (19.1)$$

where $INEQ_{i,t}$ is a properly chosen measure of inequality of household incomes within country i at a certain point in time t , and $X_{i,t} = \{x_{j,i,t}\}$ is the vector of population characteristics aggregated from individual (or household) attributes (age, education, sex, household type, etc.). On country level these attributes define the structural conditions to inequality development in a certain country. $Z_{i,t} = \{z_{j,i,t}\}$ is the vector of macroeconomic (GDP, trade, financial globalization, technology, etc.) and institutional variables (policies, redistribution, wage-setting mechanisms, etc.). In a cross-country comparison, where the unit of analysis is country, these variables enter as attributes of the macro units (countries); $Q_{i,t} = \{q_{j,i,t}\}$ is the vector of specific historic/contextual variables (history, size location, composition, etc.). η_i And μ_t stand for the inclusion of country and time dummies, respectively (these occasionally entail, as fixed effects, a large variety of country-specific attributes and year-specific effects). $\varepsilon_{i,t}$ Represents the error term, i is $1, \dots, N$ for countries, and t is $1, \dots, T$ for years. For later use we denote [Equation \(19.1\)](#) as a grand inequality regression equation (GIRE).⁴

³ By nature, our account of the literature—while covering a wide range of areas, as shown in [Figure 19.1](#)—remains superficial from a specialist point of view. We are, however, in a favourable position insofar as a number of chapters in this Handbook provide more in-depth detail for all six areas. For instance, although we discuss the effects of labor market institutions on income distribution, some particular elements such as wage policies are further detailed in [Chapter 18](#). Similarly, while we include a discussion of the effects of redistribution and analysis of tax/benefit schemes, these are not exhaustive given that [Chapters 24 and 25](#) are devoted to these issues. Further examples of complementarities could be listed.

⁴ Although it looks very general, the way the equation is formulated here is, to some extent, also very specific. More refined formulations, of course, also have to take nonlinearities and potential interactions between explanatory variables into account. We, however, offer the formulation here as a heuristic device only, to help structure the frame for the chapter. Another caveat is that the implications for inequality depend on the specification of the left-hand side. This is discussed later in [Section 19.4](#).

19.2.2 Notes on the Arguments and Parts of the Grand Inequality Regression Equation (GIRE)

Atkinson and Brandolini (2009) advise readers hoping to understand the empirical inequality literature that they should consider theory, data and estimation together, meaning that data have to be sufficient and adequate to theory, and estimation methods have to be adequate to available data. This requirement is key for the interpretations of empirical articles in all disciplines (economic, sociological and political science literature). When going through the various empirical accounts, we focus attention on this requirement.

19.2.2.1 *The Usefulness of the General Formulation*

An important point concerning the regression approach should be addressed at the outset. Some scholars may argue that cross-country regressions fail to capture adequately the cross-country differences because historical and institutional specificities define completely different relationships between dependent and independent variables. Others argue that the relationship between variable X and variable Y will be the same when controlled for all other potential factors. We think that well-specified regressions can help in understanding links (even if not causalities) between various factors, but, at the same time, caution is warranted, and country specificities always have to be taken into account. Classifications of various welfare regimes (going back to the seminal work of Esping-Andersen, 1990, differentiating between the conservative, the liberal and the socialist regimes) or differentiations between such complex settings as varieties of capitalism (Hall and Soskice, 2001) can add important parameters, and they do describe different sets of circumstances, but controlling for them (in an ideal data case) leaves sufficient room for the relationship between X and Y to operate uniformly across countries.⁵

Taking—admittedly—to the extreme the welfare regime literature, however, makes it quite difficult to identify the contribution of the various single factors to income distribution (or a change in it). Given that welfare regimes are defined as a complex interplay and a joint product of the state, the market and the family (Esping-Andersen, 1990; Esping-Andersen and Myles, 2009), the proper methodological analogy would be cluster analysis rather than regression. Clusters built from a wide array of country attributes could show similar and dissimilar country examples of inequality, together with the other observed factors (Kammer et al., 2012 is a prominent example of this type of analysis of welfare regimes). However, no causality directions could even be attempted. Without even hints to any judgments on this, we try to comply with the logic highlighted above to help structure the discussion of determinants of income distributions.

⁵ In fields where institutional complexities of the subject and the training background of scholars induce widespread use of qualitative methods, an explicit mention of this caveat is important (see, for example, Rueda and Pontusson, 2000 warning for political scientists or Kenworthy, 2007 message to sociologists).

19.2.2.2 *The Units of Analysis*

In cross-country explanations of inequality drivers, the units of analysis (data points) are countries, characterized by various inequality measures as left-hand variables and other macro characteristics such as GDP, shares of economic sectors, globalization, institutions or redistribution as right-hand variables. In most of these analytic attempts a time dimension is introduced on the right-hand side with the use of multiple data points for various periods. This in some cases allows for a macro-level analysis of changes.⁶ Many reviewed studies belong to this class. It would, however, be ideal to have analyses of pooled micro-data to identify cross-country differences of determinants of income inequality. Surprisingly enough, we did not find articles that fit into the latter category.

Another strand of analysis, again using micro rather than macro variables to explain the underlying drivers of inequality (and of changes in inequality), makes use of decomposition methods. Decomposition can be a powerful instrument to disentangle mathematically the different components that make up overall inequality. Decomposition can be used to identify the relative roles of several income sources to overall income inequality (tracing back to [Shorrocks, 1982](#)) or else to analyze the contribution of different population subgroups to levels of and trends in inequality.

19.2.2.3 *Regression Methodology*

The majority of macroeconomic cross-country panel studies reviewed use ordinary least square (OLS) regression with pooled cross sections in a macroeconomic setting to gauge causal factors impeding between- and within-country inequality. However, simple pooled OLS approaches have been judged unsatisfactory by many authors of multicountry studies of trends, especially if the analysis contains a larger sample of countries that differ in a systemic way—either in measuring inequality or in institutional or macroeconomic specificities. For example, there may be unobserved time-invariant, country-specific heterogeneity that forces an error term relating to a same country over time being correlated, leading to biased estimates of traditional OLS methods. Moreover, there may be panel heteroscedasticity because (i) error variances for a given country may display time dependence (i.e., serial correlation) and/or (ii) error variances may systematically

⁶ When change in country level inequality indexes is of interest, using the notations of Equation (19.1), a the following relationship is estimated:

$$\delta(INEQ_i) = f(\delta X_i, + \delta Z_i, + Q_i, + \eta_i, + \varepsilon_i), \quad (19.2)$$

which should be read that change in inequality (on a country level) is dependent on a specifically weighted portfolio of the following factors:

δX = change in structural attributes (age, education, sex, etc.) from t to $t + 1$; and

δZ = change in macro and institutional variables (policies, redistribution, wage-setting mechanisms, etc.) from t to $t + 1$.

The other arguments remain the same as in Equation (19.1).

differ across countries. Both patterns would lead to inefficient OLS estimates if not treated properly.

To assign country-specific factors to country-specific intercepts rather than constraining all countries to the same intercept, a large majority of the macroeconomic panel approaches reviewed here apply fixed effects in their models. [Gourdon et al. \(2008\)](#), for instance, put forward as one of their main conclusions that “results from studies that do not control for effects of omitted variables via fixed effects are biased” (p. 352).

However, some authors consider fixed-effects methodology overly conservative because any variation between countries is disregarded in the data and the effect of some factors that are constant over time but differ between countries, such as institutions, are likely to be overlooked. This is the line of argument of, for example, [Nielsen and Alderson \(1995\)](#) and [Alderson and Nielsen \(2002\)](#), who propose as an alternative a random effects model (“random” in the sense that it treats unobserved effects as random variables because they are treated independent of the explanatory variables). Such a model removes only a fraction of the country-specific means, not the whole mean, and is thus considered as “less wasteful of between-country variation” ([Alderson and Nielsen, 2002](#), p. 26).

There also has been more general criticism of the usefulness of time series regression methodology for explaining inequality determinants. One issue is that of identifying long-running relationships and cointegration of series. A problem with the standard panel regression approach is how to account for the timing of the effect of the explanatory variables. Globalization or deregulation, for instance, may well be “significant” factors but they may take some time to affect the distribution; furthermore, the delay may not be the same across countries and across factors. This may be less of a problem if long-enough time series were available, but this is generally not the case.

A related issue is that of the nonstationarity of data points, that is, that they have means and variances that change over time, either in trends, cycles or at random. [Parker \(2000\)](#), for instance, argues that the fact that many explanatory variables are likely to be nonstationary produces spurious regression results in that they may indicate a relationship between two variables where there is none. Further, the power of integration and cointegration tests tends to be low when small sample sizes are used, which is often the case in studies of inequality.⁷ One possible solution is to combine OLS with the method of error correction models proposed by [Hox \(2002\)](#) and applied, for instance, by [Rohrbach \(2009\)](#) or [Cassette et al. \(2012\)](#). This method regresses the lowest-level variable on covariates from all other levels simultaneously.

Similarly, [Jäntti and Jenkins \(2010\)](#) argue that direct estimation of parameters in time series analysis can be problematic because of the nonstationarity of both left- and

⁷ As an alternative going beyond the OLS approach, [Parker \(2000\)](#) proposes turning to decomposition and cross section regression analyses.

right-hand variables. Further, left-hand variables are typically bounded, usually to the unit interval, which involves problems for tests of stationarity and also raises more general issues about the appropriate specification.⁸ Jäntti and Jenkins (2010) propose returning to parametric distribution functions instead. Applying the latter approach to UK data, they found a lesser distributive effect of macroeconomic factors than is suggested when commonly used methods are applied.

That said, even if cross-country panel regressions entail a number of interpretational problems and often, taken together, provide inconclusive findings, especially with regard to the role of globalization, much has been learned from the studies undertaken during the past decades. As Eberhardt and Teal (2009) put it (referring to controversial findings of cross-country growth regressions), “the lesson of incomplete success is not to abandon the “quest” but to seek to understand why success has been so limited” (p. 28).

The most common approach to explaining changes in inequality in the studies reviewed is with aggregate inequality measures. By doing so, however, one might miss important changes in the distribution. From that point of view, it may be worth pursuing more comprehensive approaches, such as the reweighting procedure proposed by DiNardo et al. (1996), as well as the recentered influence function regressions by Firpo et al. (2009) for labor market analyses or the microeconomic approach by Bourguignon et al. (2005) to the household income distribution in the microeconomics of income distribution dynamics project. All these approaches aim to shed light on the drivers behind changing income distributions by simulating counterfactual distributions in a controlled manner.

Such approaches remain on a partial equilibrium view. Another challenge today, therefore, is to bring together macro- and micro-based regression methodologies and their findings. To that aim, new tools of macro-micro models have been developed (see Bourguignon et al., 2010). These models analyze, for example, the distributive effect of “macro” events, such as migration, by integrating a macro framework with a micro-simulation model that uses household or individual data, either by implementing a sequential approach (e.g., first computing the macroeconomic variables in a computable general equilibrium model and then using estimated values as input for a microsimulation model that distributes the effects of macro changes among micro units), or via full integration of microsimulation models within computable general equilibrium models.

In terms of the presentation of results from cross-country panel regression studies, in addition to indicating the significance of coefficients, many studies try to gauge the *relative* importance of the different variables that have been estimated to affect inequality. Because the variables under examination often are measured in different units, a common approach is to calculate standardised coefficients (which are obtained by first

⁸ Following Atkinson et al. (1989, p. 324–325), there is a case for using a log-logistic formulation of the type $\log[INEQ/(1 - INEQ)]$, which allows unbounded variation.

standardizing all variables to have a mean of 0 and a standard deviation of 1). Moreover, simple simulations or a back-of-the-envelope calculation often are used to quantify the effect of an individual factor. For instance, [IMF \(2007\)](#) and [Jaumotte et al. \(2008\)](#) calculated the contributions of various factors to the change in inequality as the annual average change in the respective variable multiplied by the corresponding coefficient, and the averages across country groups were weighted by the number of years available for each country (to increase the weight of countries with longer observation periods in these averages). The [OECD \(2011\)](#) makes use of the same computation approach to show the relative size of the contributions of different factors to the increase in overall earnings inequality.

19.3. DATA SOURCES FOR CROSS-COUNTRY STUDIES

This section provides an overview of data available for multivariate analysis of within-country inequality in an international comparison.

19.3.1 Different Strategies for Multicountry Studies

At the outset, although seldom explicitly, research needs to decide on the precise coverage of a country sample to be analyzed. While this choice may be constrained (but should not be motivated) by the availability of data, two different strategies exist when using multicountry samples to explain variations in inequality. First, the sample may be formed by a set of countries sharing similar systemic characteristics (e.g., the OECD area), a strategy called “most similar design” by [Przeworski and Teune \(1970\)](#). Conversely, the aim can be to test a hypothesis such as the Kuznets-type relationship between development and inequality on a set of countries with a maximum of differing systemic characteristics, a “most dissimilar design” strategy.

While many earlier studies of global causes of inequality aimed to include as many countries as possible to the analyses, they still had an overrepresentation of developed countries in the sample. Coverage of African countries in particular was very low. In a typical study with “universal” coverage of inequality observations in the 1990s and early 2000s, OECD countries represented half up to two-thirds of the whole data set. This has changed in more recent studies, but the OECD area still makes up typically a third of all country observations. While this choice is dictated by data availability, the precision and generalization in the interpretation of empirical results suffers.⁹ Depending on the nature of a research question and following a thorough examination of underlying data and their quality, a reduced sample of countries may be a preferred option, or, as [Atkinson and](#)

⁹ A good example is the discussion by [Tsai et al. \(2012\)](#), who replicate the same model on the same data as [Zhou et al. \(2011\)](#) but find different and partly contradictory results by adding dummy variables for developed, transitional and developing countries rather than pooling all 60 countries included in the study.

Brandolini (2006a) propose, “A deeper understanding of national sources . . . may lead us to analyze a carefully matched subset of countries, rather than to seek to maximize their number.”

In that sense, even the focus on an apparently more homogenous country panel such as the group of OECD or EU countries may involve interpretational problems, especially if new member countries are included in the analysis. The results from empirical analyses of the importance of sector dualism and sector bias between agriculture and industry as a driver of inequality (see Section 19.3.2) very much depends on how the OECD area and the EU area are defined. Empirical findings may be blurred if these definitions include not only the “traditional” OECD member countries or the “old” EU member states but also newer member countries such as Poland or Mexico, where the share of agricultural employment is still important (more than half the OECD average) and the dualism model may have some salience. In what follows we go through the “menu” of the available data sets for inequality research.

19.3.2 Data Sources: The Fast Development of Data Availability in the Last Decades

In the concluding remarks of his seminal article on economic growth and income inequality, Simon Kuznets (1955) acknowledged that his “paper is perhaps 5 per cent empirical information and 95 per cent speculation” (p. 26). Until the early 1990s, the availability of internationally comparable income inequality data still was scarce. During the past two to three decades, however, a substantive amount of household surveys became available, and much progress in distributional data collection and standardization has been made in OECD countries. The situation is still far from being ideal, but today’s research and results may perhaps mirror 50% empirical information and 50% speculation.

This section is about the former 50%. It describes the main sources of data on income inequality and other key variables used in cross-country studies of the drivers of inequality. It reviews international data sets of income inequality: *ex ante* standardized data, *ex post* standardized data, data standardized on best national sources, and secondary data sets. The review focuses on data sets that include at least most of the group of OECD countries. It will also become clear how some of these new data sources open prospects for new types of research questions and application of new types of analytic methods (notably the use of longitudinal panel data).

19.3.2.1 Standardized Microdata

Despite continuing progress, the availability of comparable primary data sets for inequality research is still limited. The major initial and pioneering effort was launched 30 years ago by the data collection of the Luxembourg Income Study (LIS). Since the mid-2000s, the Statistical Office of the European Union (EUROSTAT) launched a harmonized household survey on income and living conditions (EU-SILC), which is available for

the 28 member countries and some additional European countries. Equally, since the mid-2000s, OECD has made available a detailed set of standardized household income and poverty indicators for their 34 member countries.

19.3.2.1.1 Luxembourg Income Study

The LIS, formerly known as the Luxembourg Income Study, is a data archive and research centre dedicated to cross-national analysis (<http://www.lisdatacenter.org/>). The project collects income microdata from household surveys and standardizes those into a common framework of income, demographic and employment variables. The standardization is undertaken ex post. The key concept is that of disposable income, and detailed income aggregates are available. When the project started, it included data from seven countries. Today, LIS stores microdata for over 40 countries, for 8 points in time, starting with a year around 1980, in approximately 5-year intervals. Access to the LIS microdata is granted to researchers of financially contributing countries and institutions and students worldwide upon registration. Use of the microdata is permitted for scholarly, research or educational purposes but not for commercial purposes.

One of the key assets of the LIS database is that it allows researchers the access to the microdata, via a remote access system. The scrutiny of the ex post standardization also allows a high degree of comparability of the micro variables. One main disadvantage is the somewhat limited geographical and time coverage, although the recent inclusion of a number of middle-income and emerging countries as well as a more frequent update (3-year rather than 5-year intervals) will allow more extensive panel data analysis (<http://www.lisdatacenter.org/our-data/lis-database/documentation/list-of-datasets/>).

19.3.2.1.2 EU Statistics on Income and Living Conditions

The EU-SILC is an annual survey that collects microdata on income, poverty, social exclusion and living conditions in the 28 EU member countries and 4 non-EU countries. It has been implemented since 2004 for 15 countries and since 2007 for 32 countries (http://epp.eurostat.ec.europa.eu/portal/page/portal/microdata/eu_silc). The EU-SILC surveys are “output” rather than “input” standardized. This implies that the data are not collected with a single survey across all countries; rather, countries are provided a list of variables that they can collect using national surveys and definitions, and the necessary standardization is made on this basis by EUROSTAT. EU-SILC includes longitudinal information insofar as the surveys are based on a rotational panel (usually with a duration of 4 years). In contrast to most other longitudinal surveys, cross sectional and longitudinal data are released separately in the EU-SILC.

Access to the anonymized EU-SILC microdata (the so-called user database) is not granted to individuals but only to research institutions (or similar entities) inside the EU and European economic area countries by means of research contracts. For other kinds of organizations inside the EU and organizations outside the EU, approval for

access needs to be requested from the European Statistical System Committee, which takes about 6 months. A detailed set of indicators on incomes and other living conditions from these data is available from the EUROSTAT databank (http://epp.eurostat.ec.europa.eu/portal/page/portal/income_social_inclusion_living_conditions/data/database).

The main assets of the EU-SILC are the high degree of standardization, especially with regard to income concepts; the availability of annual data; and the availability of a longitudinal part of the data. One disadvantage for researchers today is simply the fact that the project is still relatively young: microdata are generally available for less than 10 years, thus preventing the analysis of long-term series.¹⁰ There are also a few remaining problems that have to do with the loss of some information when the wealth of original microdata is transformed into a more restricted final data set for which the underlying methodology of such transformations as well as treatment of data at the national level (e.g., imputation procedures) are not always exhaustively documented. That said, it has been suggested that most of the latter set of problems can be easily overcome with a greater consistency and clarity in documentation in the years to come (Iacovou et al., 2012).

19.3.2.1.3 OECD Data (Income Distribution Database)

The OECD income distribution database (IDD) builds on regular data collection undertaken by the OECD through a network of national consultants who provide standard tabulations from national microdata considered the “most appropriate” data source in each country and are based on comparable definitions and methodological approaches. This is done via a detailed data questionnaire consisting of tabulations on income distribution and poverty indicators, together with standardized terms of references. The main concept of the data collection is that of equalized household disposable income, including wages and salaries, self-employment incomes, realized property incomes and cash transfers from the general government less taxes and social security contributions paid by households. The definitions used in calculating these income components are based on the recommendations for household income statistics adopted by the Canberra Group (see <http://www.unece.org/stats/groups/cgh.html>).

A detailed set of variables for the 34 OECD member countries is available from the OECD “data cube” (<http://www.oecd.org/social/income-distribution-database.htm>). It includes several summary inequality and poverty measures (on a before and after tax/transfer basis) as well as data on income levels and population ventilations. Data

¹⁰ Doubts as to the comparability of EU-SILC with a predecessor survey, the European Community Household Panel, which covered 15 EU countries for the years 1994 to 2001, remain. It should also be noted that the current practice of EUROSTAT publications is to report the EU-SILC survey year n for indicators but not the income year, which is $n - 1$ in all countries except Ireland and the United Kingdom. This can create confusion when comparing EU-SILC-based indicators with results from other surveys.

are available in approximately 5-year intervals back to the mid-1990s and, for a subset of countries, to the mid-1980s and mid-1970s. From the mid-2000s, data are available on a more frequent basis, depending on the underlying surveys but, in general, annually (for 28 of the 34 countries). Access to these data is free.

The method of data collection used by the OECD IDD allows coverage of the entire region of OECD countries with harmonized data that facilitate cross-country comparison, based on information that is both more up to date relative to that available through other statistical sources and better suited for assessing changes in income distribution over time. However, data are available only on an “equivalized” household basis, which renders comparison with indicators on a “per capita” basis (used in many of the more global data sets) very difficult. The main disadvantage of the OECD database is that it does not allow access to the original microdata, which constrains the analyses that can be performed. In that sense, the OECD income distribution database constitutes its own category between primary and secondary data sets.

19.3.2.2 Secondary Datasets

With regard to the difference of the data sets described above, secondary datasets are based on a collection of published or otherwise available summary key inequality indicators. These usually include the Gini coefficient, quintile share ratios and/or percentile ratios and, more rarely, other summary measures such as the Theil index. Often, alternative series for the same country and year point are proposed alongside recommendations of “preferred” series, along the lines of, for instance, the A–B–C typology used by [Atkinson \(2008\)](#).¹¹ Typically, such data sets aim to collect indicators for the greatest number of countries. The trade-off is that there is necessarily less room available for verification of data quality and consistency, which leads to issues of data comparability between and within countries.

19.3.2.2.1 The Deininger-Squire Data Set (Measuring Income Inequality Database)

Klaus Deininger and Lyn Squire brought together a large set of worldwide inequality indicators in 1996. Their data set (DS) compiled Gini coefficients and cumulative quintile shares for 138 developed and developing countries, adding summary information on the nature of the data (population coverage, income or consumption base, net or gross income base). Most of the data cover the period between the 1960s and early 1990s.

With regard to earlier data compilations,¹² the DS data set imposed “minimum standards for quality,” namely that indicators are based on household surveys, on

¹¹ [Atkinson \(2008\)](#) undertakes an in-depth review of available data sources on earnings inequality and classifies them into three groups: (A) most appropriate, (B) acceptable if not ideal and (C) rejected.

¹² In the early 1970s, the first major improvements of international data comparisons were achieved by [Jain \(1975\)](#) and when [Adelman and Morris \(1973\)](#) and [Paukert \(1973\)](#) tested the Kuznets hypothesis.

comprehensive coverage of the population, and on comprehensive coverage of income sources (Deiningering and Squire, 1996, p. 567). On this basis, among the entire data set of 2630 observations, Deiningering and Squire identify a subset of “high-quality” observations, with 693 observations for 115 countries. Those observations labelled “accept” in the DS data set nonetheless include indicators based on different definitions and methodologies, which impedes the comparability of these data.¹³

The DS data set is freely available at the World Bank’s website (<http://go.worldbank.org/UVPO9KSJJ0>). It became a major data source for international inequality research during the early 2000s, including many of the cross-country panel studies reviewed in this chapter. While there were further developments on the basis of the DS data sets in the frame of follow-up projects (see 19.3.2.2.2), the above-mentioned version has not been updated or revised for corrections.

19.3.2.2.2 UNU-WIDER Database

In the vein of the DS data set and partly based on it, the United Nations University-World Institute for Development Research (WIDER) World Income Inequality Database (WIID) collects a secondary inequality data set for developed, developing and transition countries. The project started in the late 1990s and led to a first release of data for 155 countries (WIID1), extending the time frame to the early 2000s and augmenting the number of distributional indicators: calculated and reported Gini coefficients, decile and quintile shares, as well as survey means and medians, along with the income shares of the richest 5% and the poorest 5%. In addition to income and consumption, the data set also includes indicators for earnings.

A second and substantially revised version of WIID was compiled in the mid-2000s and resulted in the release of WIID2. The currently available version—World Income Inequality Database V2.0c (May 2008)—proposes data series up to 2006 and is described by the authors as a “new” rather than “updated” data set. It adds, where possible, a second Gini coefficient estimate calculated using a method developed by Shorrocks and Wan (2008) to estimate the Gini coefficient from decile data. An update of the database to WIID3.0 is pending at the time of writing.

¹³ Deiningering and Squire accept both person- and household-based Gini coefficients because the mean difference between these estimates turned out to be not too large (<2 points), and they therefore do not expect a large systematic bias in empirical work. A similar argument leads to the inclusion of both gross income- and net income-based indicators, with an average difference of 3 points found in 19 developed countries, and on the grounds that redistribution is more limited in developing countries. The DS data set also includes both income- and consumption-based indicators because 39 countries (136 observations) report only the latter. Because the bias can be larger in this case, one suggestion was to add the mean difference of 6.6 points found between the expenditure-based and income-based coefficient to the former (Deiningering and Squire, 1996, p. 582).

Similar to the DS data set, WIID defines three quality criteria—(i) whether the underlying concepts are known, (ii) coverage of concepts and (iii) survey quality—but provides a more detailed quality ranking from 1 (underlying concepts are known and the quality of the income concept and survey can be judged as sufficient) to 4 (unreliable).¹⁴

The WIID dataset is freely available at the UNU/WIDER website (<http://www.wider.unu.edu/research/Database/>). It has been increasingly used in international inequality research and, with the merge with the former DS data set, constitutes the most widely known secondary inequality data set. One of four articles reviewed in [Annex Table A19.1](#) make use of this data set.

19.3.2.2.3 All the Ginis Data Set

The All the Ginis (ATG) data set has been put together by Branko Milanovic from the World Bank since 2004. It includes combined and harmonized Gini coefficients (but no further inequality indicators) from seven original sources: the LIS, the Socio-Economic Database for Latin America, the EU-SILC, the World Bank Europe and Central Asia data set, the World Income Distribution (WYD), World Bank PovCal, and the WIDER.

The most recent version of the ATG data set was released in 2013 and includes close to 4000 Gini observations for 164 countries for the period from 1950 through 2012. Almost 2000 of these observations have been considered “consistent.” Rather than classifying observations as “accept” (DS) or “reliable” (WIID), this “consistent” classification is based on an approach described as “choice by precedence.” This approach takes the Gini values in overlapping cases in order of preference of the seven data sources, namely in the order as they are listed above.¹⁵ The ATG data set presents the Gini values along with key dummy variables defining the type of welfare aggregate (income or expenditure, net or gross) and recipient unit (household or individual). Another specific feature of the ATD data set is that it includes a variable that allows the survey to be distinguished from the income year.

The ATG data set is freely available in form of a stata file at <http://econ.worldbank.org/projects/inequality>.

19.3.2.2.4 WYD Data Set (World Bank)

The WYD database was created as part of the World Bank’s work on global income distribution. The objective of this work is to gather and analyze detailed household survey data for as many countries as possible for several benchmark years to calculate estimates of global inequality. Currently, data exist for five benchmark years (1988, 1993, 1998, 2002

¹⁴ Regarding the difference of the DS data set, there can be more than one observation labelled 1 for the same country and the same year. In some cases there can be up to six observations with label 1, such as in the case of Germany for 1984.

¹⁵ The database allows the user to define any alternative “choice by precedence.”

and 2005). The objective of the WYD database was to create “rich” (numerous in terms of countries) and “dense” (ventiles or percentiles for each country’s distribution) coverage for the benchmark years, not to maximize the number of Gini observations or provide longer-term series for individual countries. The WYD series are integrated into the ATG data set described earlier.

The WYD data are freely available in form of a stata file at <http://go.worldbank.org/IVEJIU0FJ0>.

19.3.2.2.5 The PovCal Database (World Bank)

The PovCal database covers the period since 1978 and includes 124 low-income, lower-middle-income and upper-middle-income countries, thus excluding higher-income OECD countries. In general, PovCal shares the same underlying survey data sources as WYD. There are over 800 Gini observations, most of which are calculated from direct access to household surveys. The PovCalNet tool is available at <http://iresearch.worldbank.org/PovcalNet/index.htm>.

19.3.2.2.6 World Development Indicators (World Bank)

The World Development Indicators (WDI) is the primary World Bank collection of development indicators compiled from officially recognized international sources. These also include the Gini index. However, data on OECD countries are scarce, with many countries missing data in all years. A priori, WDI Ginis also should come from the same underlying microdata used by WYD and PovCal. The data are available at <http://databank.worldbank.org/data/home.aspx>.

19.3.2.2.7 Sociómetro-BID (Inter-American Development Bank)

Sociómetro-BID is a diverse data set of social indicators derived from national household survey data, covering 21 Latin American and Caribbean countries from 1990 to 2009. While the Sociómetro includes traditional global indicators including the millennium development goals, the database also includes information on Gini coefficients for per capita household income. The data are freely available at <http://www.iadb.org/research/sociometroBID/tables.cfm?indicator=4&lang=en>.

19.3.2.2.8 TRANS-MONEE Database (UNICEF)

The TransMonEE (Transformative Monitoring for Enhanced Equity) database collects a vast range of data relevant to social and economic issues in 28 countries of Central Eastern Europe and the Commonwealth of Independent States. The database was initiated by the UNICEF Innocenti Research Centre in 1992 and is updated annually. The 2012 version of the database contains 180 economic and social indicators divided into 10 topics (population, natality, child and maternal mortality, life expectancy and adult mortality, family formation, health, education, child protection, crime and juvenile justice, economy).

It includes data on Gini coefficients, covering the period 1989–2009. In general, these data are based on interpolated distributions from grouped data from household budget surveys. The data are freely available at <http://www.transmonee.org/>.

19.3.2.2.9 International Labor Organization Database

Since 2012, the International Labor Organization (ILO) database provides recent data for over 100 indicators and 230 countries. It includes a series of D9/D1 and D9/D5 percentile ratios for earnings for employees (although the precise definition and concept are not clear from the description). The data are freely available from <http://www.ilo.org/ilostat/faces/home/statisticaldata>. The former ILO database LABORSTA (<http://laborsta.ilo.org/>) included both decile values and Gini coefficients for selected years up to the early 2000s.

19.3.2.2.10 The GINI Inequality and Poverty Dataset

The GINI Inequality and Poverty Dataset is a very recent outcome of the “Growing Inequalities’ Impacts” (GINI) project completed within the 7th Framework program of the European Commission between 2009 and 2013. The project produced in-depth case studies for the 30 participant countries, which include 25 of the 28 EU countries together with 5 non-European countries: Australia, Canada, Japan, Korea and the United States. The country case studies followed a predetermined template specifying the most important variables to be monitored over a 30-year time span (from 1980 to 2010). The variables related to inequality cover Gini coefficients and relative income poverty. For both Gini coefficients and poverty, the preferred income concept is net/disposable equivalized household income. The income sharing unit is the household, whereas the unit of analysis for the computation of various indexes is the individual member of the household. In each case the figures refer to national coverage and thresholds rather than, for example, regions or specific social groups. For most of the countries and for most of the data points these requirements are met (for further details see [Salverda et al., 2014](#) and [Tóth, 2014](#)).

19.3.2.2.11 Chartbook of Economic Inequality Data

Atkinson and Morelli (2014) created a chartbook of economic inequality that includes indicators beyond income inequality measures for 25 countries (of which 17 are OECD countries) and covers series for up to 100 years until the present. These refer to earnings inequality (usually D9/D5 ratios for OECD countries) and overall inequality (usually Gini coefficients of household income) as well as poverty, pretax top income shares and wealth. These series are based on “preferred” definitions, which are documented for each country included in the data. The focus of this data collection is on over-time comparability rather than between-country comparability. The underlying data are freely available at www.chartbookofeconomicinequality.com.

19.3.2.2.12 World Top Incomes Database

Long-run data series on pretax top incomes ranging back 80 years or more have been collected and prepared by Facundo Alvaredo, Tony Atkinson, Thomas Piketty, Emmanuel Saez and various collaborators and are available online (<http://topincomes.parisschoolofeconomics.eu/>). The database includes information on top income levels and top income shares (such as the top 1%, top 0.1% or top 0.01%) for 27 countries, of which 18 are OECD countries.

Two main limitations of these data sets are that they cannot be used to describe the whole distribution (and hence do not include summary inequality measures) and that data refer to pretax incomes. Further limitations of tax data for inequality analysis are that tax-exempt income is typically not reported and consequently is left out of the indicators; cross-country differences (and changes over time) in the concept of income that is measured; the extent of tax planning and tax evasion; and the definition of the tax unit. For a summary of the main results from analyses of these data and a discussion of the underlying data, see, for instance, [Atkinson et al. \(2011\)](#).

19.3.2.3 Secondary Synthetic Data Compilations

Synthetic data compilations are based on regression-based procedures to estimate time series from existing inequality data sets.

19.3.2.3.1 University of Texas Inequality Project

The University of Texas Inequality Project data set, which is associated with the work of James Galbraith, is based on a project concerned with measuring and explaining movements of inequality in wages and earnings and patterns of industrial change around the world. It uses microdata available based on industrial statistics from the United Nations Industrial Development Organization. The project establishes a relationship between these measures and the broader concepts of inequality, such as income inequality, which is considered reasonably reliable. The data use the Theil's T statistic to compute inequality indexes from industrial, regional and sectoral data. It produces data sets on pay inequality at the global level; at the national level, including data for Argentina, Brazil, Cuba, China, India, and Russia; and at the regional level for Europe. Data on pay inequality were used as an instrument to estimate measures of household income inequality for a large panel of countries from 1963 through 2008. This global data set has around 4000 country-year observations. All data sets are available at <http://utip.gov.utexas.edu/data.html>.

19.3.2.3.2 SWIID Database

The SWIID database standardizes the WIDER data (described earlier) and other inequality data while minimizing reliance on problematic assumptions by using as much

information as possible from proximate years within the same country.¹⁶ It uses the data collected by the LIS as the benchmark standard. The SWIID currently incorporates Gini indexes of gross and net income inequality for 173 countries for as many years as possible from 1960 to the present, as well as estimates standard errors for these statistics. The SWIID data and the procedure used to generate it are available at <http://myweb.uiowa.edu/fsolt/swiid/swiid.html> and are described by Solt (2009).

There are other, more one-off exercises to build synthetic cross-country data compilations from existing inequality data sets, such as the Standardized Income Distribution Database. This database was created by Babones and Alvarez-Rivadulla (2007) on the basis of the UNU-WIDER dataset (WIID) but is not available online. It can be requested from the authors.

19.3.3 Concluding Remarks

There is no single “ideal” data set for international research on the multiple causes of inequality, despite the rapid development of international data sets of primary and secondary inequality data over the past 20 years. Opting for one or the other of the above-described data sets depends on the nature of the research question as well as on the target group of countries that are to be compared. If a study is confined to the group of EU and/or OECD countries, one of the primary data sets may reveal the first choice because of their higher degree of standardization. For more global country coverage, secondary data sets provide a necessary starting point but great care needs to be taken, and not all series can be integrated in econometric analysis. In particular, compared with primary data sets, generally fewer resources can be devoted by the suppliers of these data sets to ensure data quality and consistency.

Many of the criticisms regarding quality and consistency in secondary income distribution data put forward by Atkinson and Brandolini (2001) and later by Francois and Rojas-Romagosa (2005) are still valid. More generally, it also has been argued that survey estimates that build the basis for both primary and secondary data sets often only partially portray the income distribution (Pyatt, 2003). In addition, the fact that secondary data sets include indicators based on different concepts and definitions is often tackled by applying “dummy variable” adjustments. Atkinson and Brandolini (2001) conclude that such adjustments are not satisfactory because “differences in methodology may affect not only the level but also the trend of variables (so that it may not be sufficient to apply a fixed-effect correction in panel data estimation)” (p. 295). Rigorous sensitivity analyses are therefore required because data choices can impede both levels and trends in distributional indicators, which in turn can greatly affect the identification and interpretation of causal factors in an internationally comparative context. Primary users of the databases discussed above should not take the series collected at face value; they need to carefully

¹⁶ Such a procedure can, however, occasionally result in dubious estimates, especially for earlier periods for which data sources are rare and less comparable.

examine the downloaded data. In turn, secondary users of the research based on one or the other of these databases (“meta-users”) need to verify to what extent the researchers validated the data they used.

19.4. DEFINITION OF INEQUALITY MEASURES AND THEIR VARIABILITY

19.4.1 Definition of the Dependent Variable

This section describes how the dependent variable—household income inequality—is measured in the empirical work under review. It is important to note right from the outset that in an overwhelming majority of cases researchers do not have full discretion over which inequality measure they will analyze or include in their models. This is, in most of the cases, limited by the availability of the data, and it is especially so in the case of country-level comparisons of secondary data. The variable list of the large international secondary data sets (such as WIID, for example) hugely constrains the choice. The larger the data set in terms of country coverage, the more this is likely to be the case (because the possibility of having new, harmonized indicators diminishes with the size of the surveys). There are only a few measures usually available, of which the Gini coefficient is by far the most often used, followed by various decile shares (S80/S20 or S90/S10) and, sometimes, percentile ratios such as P90/P10 or ratios of some other percentile values.

None of the above-mentioned measures are overly sensitive to the tails of the income distribution, and therefore the analyses based on them may miss important changes within the distribution. This could partly be overcome by the use of more tail-sensitive measures such as D9/D5 ratios, generalized entropy-type measures of inequality (Theil, MLD), or Atkinson-class measures. However, it also became important to pay attention to polarization measures comparing the values of a comparison distribution to the values of a reference distribution (Alderson and Doran 2013; Handcock and Morris, 1999; Morris et al., 1994; Wolfson 1997). The share of population classified by cutpoints of the comparison distribution can show how it falls in similarly defined categories of the reference distribution, allowing us to compare relative positions of people at various parts of the distribution.¹⁷

Studies investigating developments of tail-sensitive overall inequality measures or polarization measures, however, remain rare in the literature, given the fact that these measures are, unlike Gini coefficients, much less available for international comparisons.¹⁸ On the

¹⁷ For some analyses inequality is measured by the relative welfare-to-material-to-income ratio of various social subgroups (elderly/children, higher educated/lower educated, gender, etc.).

¹⁸ A recent attempt to construct a more tail-sensitive measure is the one suggested by Palma (2011). The Palma index compares the top decile share with the share of the bottom four deciles and is suggested to better reflect developments in the upper tail compared with the majority. However, its calculation requires the availability of decile shares (i.e., generally microdata), and because the top decile average—especially in small samples—is very vulnerable to accidental inclusion of outliers, care is warranted with the Palma index as well.

other hand, using the Gini and other middle sensitive measures does also have advantages, especially when sampling variability due to small sample sizes is an issue.

Further, in some studies, such as, for example, political science explanations, or in analyses of the effects of redistribution, it is not the actual value of the inequality measure such as the Gini coefficient (of net disposable incomes) in itself but the difference between the pre-tax and -transfer Gini on the one hand and the post-tax and -transfer Gini on the other that is used as the dependent variable. This is a measure of redistribution for many analytic papers (e.g., [Bradly et al., 2003](#); [Iversen and Soskice, 2006](#)) and a proxy of how politics and policies affect inequalities.

The range of available inequality indicators also constrain the features of inequality that can be analyzed in international comparisons. If only inequality measures insensitive to the tails are available and analyzed, there is a risk that important changes in the income distribution are missed or noticed too late.

19.4.2 Variability of the Dependent Variable

Trends and patterns of inequalities in countries in the OECD area are analyzed in depth in Chapters 7–9 of this volume. Overviews of the developments of income inequality have been presented in a large number of studies; some of the recent core publications include [OECD \(2008, 2011\)](#),¹⁹ [Alderson and Doran \(2013\)](#), [Brandolini and Smeeding \(2009\)](#), [Ward et al. \(2009\)](#), [Tóth \(2014\)](#), [Ferreira and Ravallion \(2009\)](#), [Salverda et al. \(2014\)](#), and [Nolan et al. \(2014\)](#).

One of the most fundamental questions of comparisons of inequality is the variability of the measures used to characterize inequality in society, both across countries and over time as well. The large and rapidly growing income distribution literature ([Atkinson and Bourguignon, 2000](#); [Salverda et al., 2009](#)) presents various narratives about the development of income inequality. The major narrative dominating the literature is proposed by the landmark studies of the [OECD \(2008, 2011\)](#) and by various papers based on the data collections of the LIS. According to this, within-country inequalities have increased in a majority of OECD countries since the 1980s, and at least until the breakout of the Great Recession ([OECD, 2008, 2011, 2013a](#); see also [Atkinson, Rainwater and Smeeding, 1995](#); [Gottschalk and Smeeding, 2000](#); [Brandolini and Smeeding, 2009](#); Chapter 8 of this volume). As the most recent [OECD \(2011\)](#) study stresses, in a large majority of OECD countries the income of the richest 10% of households has grown faster than that of the poorest 10%. The Gini coefficient increased on average from 0.286 in the mid-1980s to 0.316 in the late 2000s. Of the 22 countries for which a long time series is available, 17 have witnessed increasing inequality. For seven of these the Gini coefficient increased by more than four points over the period. In only five of these countries

¹⁹ For a summary, see [Förster \(2013\)](#).

did inequality not increase or even decline. This is a narrative proposing inequality trends, which are dominant in the era of the “great U-turn” of inequality developments.

After an analysis of the GINI Inequality and Poverty Database, [Tóth \(2014\)](#) concludes that over the past three decades, inequality has indeed increased on average across the countries included in the analysis (25 EU countries, to which the United States, Canada, Korea, Japan and Australia are added); the whole range of Gini coefficients were at a higher level at the end of the period (from a minimum/maximum level of 0.20/0.33 to 0.23/0.37). The above work also stresses that the growth in inequality was far from uniform. In some countries (mostly in continental European welfare states such as Austria, Belgium, France), the level of inequality remained largely unchanged or fluctuated around the same level, whereas in others it increased substantially. The latter trend was experienced by some European transition countries (Bulgaria, Estonia, Lithuania, Latvia, Romania and Hungary) and to a lesser but still a considerable extent by the Nordic countries, most notably Sweden and Finland. It also was found that the pattern of inequality change may sometimes show declines for shorter or for longer periods. Such spells of decline were observed in Estonia, Bulgaria and Hungary, for example, sometimes after sharp increases.

Finally, over time it seems possible indeed that countries shift between inequality regimes ([Tóth, 2014](#)). After decades of a gradual but incessant increase of inequality, some of the Nordic countries, for example, while still being part of the group of low-inequality countries, no longer are at the lowest end of the inequality “league table.” The United Kingdom moved from being a middle-level inequality country in the 1970s to the group of high-level inequality countries by 1990. Also, some of the transition countries such as the Baltic countries, Romania or Bulgaria witnessed very large changes that have put their inequality levels in a different range (see also [Tóth and Medgyesi, 2011](#)). Chapter 8 of this volume provides a more detailed account of post-1970 trends in within-country inequality in OECD and a range of middle-income countries.

19.4.3 Reliability of the Dependent Variable

Population surveys from which data on inequality are computed cover only a sample of the population. Originating basically from this fact, there is always a sampling variance of the statistic chosen to describe features of the distribution. The variability of the sample estimate about its expected value in hypothetical repetitions of the sample (the sampling variance) may be due to sampling and nonsampling errors. Most surveys are based on complex sample design (allowing, for example, a stratification of base populations to draw the sample, of a clustering of cases, of differential techniques providing equal probability of getting into the sample, etc.) Nonsampling errors (of coverage, wording, nonresponse, imputation, weighting, etc.) add to the uncertainty of the selected statistics.

All inequality measures (Gini figures, P90/P10 ratios, etc.) used in international comparisons are estimates from samples that are, in most cases of different designs, based on

partially (or not at all) harmonized surveys. In addition, inequality indices are not like simple ratios from samples; for most of them the calculation is based on complicated formulae, leading to nonlinearities of the indexes. It is therefore very important to understand to what extent secondary uses (i.e., multivariate and multicountry analyses of drivers of inequality) can account for such uncertainties.

Inference for inequality and poverty measures calculated from properly documented microdata can be tested by “direct” or formula-based (asymptotic) methods and by experimental methods (based on resampling techniques such as bootstrapping or Jackknife, for example) (see [Kovacevic and Binder, 1997](#); [Biewen and Jenkins, 2006](#); [Osier et al., 2013](#); and others). Both types of methods are used in various research contexts, but none of the results are frequently reported in official statistics and in secondary datasets. While it is shown that the way inference is calculated is important—[Davidson and Flachaire, 2007](#), for example, found that in the case of complex sample design, bootstrapping may lead to not accurate estimates of inference, even for very large samples—sticking to point estimates only is clearly problematic, in part because it creates false images of certainty in inequality statistics and in part because it misguides interpretations of intertemporal change and cross-country differentials. While the degree of accuracy that may be worth pursuing is open to discussion (as [Osier et al., 2013](#) stress, there is need to address a trade-off between statistical accuracy and operational efficiency when choosing estimation methods for standard errors), overlooking the issue is clearly the worst option.

To properly estimate sampling variance, sample design, weighting procedures, imputation practices and the actual computation formula of the statistic is to be taken into account. The effects of these factors are tested in various papers. As [Goedemé \(2013\)](#) and [Biewen and Jenkins \(2006\)](#) stress, ignoring the effect of clustering of individuals in households for poverty indexes (that are derived from incomes measured at the household level but analyzed at the individual level) may lead to a serious underestimation of standard errors for the analyzed poverty measures. Taking clustering into account leads to fairly good proxy of “true” estimations to settings when sample design variables are not missing. Little is known on similar tests for inequality measures.

[Van Kerm and Pi Alperin \(2013\)](#) tested how their measures of inequality reacted to the presence or elimination of extreme values from the surveys they analyzed, and they found their measures were arbitrarily large when they left outliers in their sample. However, other measures such as poverty rates remained more robust for the presence or elimination of extreme values ([Van Kerm, 2007](#)).

An essential requirement for computation of variance estimates for inequality measures is that microdata be available for analysis. Most secondary data sets lack any indication of not only the standard error estimates but also essential properties of the samples they have been drawn from. This makes it especially difficult for comparative studies using secondary data sets to assess reliability of their findings.

Further, the Gini coefficient, by construction, is a variable with a relatively small range. Even if inequality may change significantly in the long run, when shorter periods are taken into account and when many data points within the longer period are considered, the adjacent Ginis (in time or across countries) may not (in statistical terms) be significantly different from each other. Therefore, if these values are put into a variable on the left-hand side of a regression, there is a serious risk that a large “noise” enters the estimates.²⁰

Also, when using secondary datasets, where there are no microdata at hand the researchers have to apply some rule of thumb to decide what can be considered a “real” change over time. There is no agreement in the literature, however, about how over-time changes or cross-country differences of Gini coefficients (normally arrived at from heterogeneous sample designs and greatly varying samples) could be defined as significant in statistical terms. Bootstrap (or, better, linearization) estimates of confidence intervals of Gini would suggest roughly ± 1 Gini point differences in EU-SILC samples to be registered as “significant,” but little is known on how this could be applied to changes over time given the lack of information in necessary detail about sample designs.

Atkinson (2008) proposed a simple metric of changes in the case of considering changes in percentiles (relative to the median) over a period of decades. He requires a 5% change to be “registered,” a 10% change to be qualified as “significant,” and a 20% change to be qualified as “large.” The bottom decile falling from 50% to at least 47.5% of the median thus would “register” as a change, be considered “significant” if falling below 45%, and being considered “large” if falling below 40%.

Breaks in series pose a serious challenge for cross-country comparisons as well as for intertemporal tracking of inequality, as already noted (Atkinson and Brandolini, 2001). A break in a series may provide an obvious basis for suspicion if accompanied by a sudden change in the level of inequality that subsequently does not continue in the same direction. However, in other cases one must rely on expert judgements as to whether such breaks have in fact masked an underlying change in inequality.

A way of constructing long-term data series of inequality is to link subsequent data series stemming from different data sources or definitions together with use of information on overlaps of these series (Atkinson and Morelli, 2014; Förster and Mira d’Ercole, 2012), a method often called “data splicing.”²¹

A proper definition of *inequality change* in empirical studies (in addition to knowledge of sample sizes and sample designs) also has to be based on careful examination of annual increments of the inequality measure at hand, on the length of the data spells, and on

²⁰ In general, the articles reviewed do not publish confidence intervals for the inequality measures.

²¹ The OECD Income Distribution Database (IDD) described earlier also applies data splicing (when needed) (see OECD, 2013b).

many other “accidental” factors. As [Tóth \(2014\)](#) stresses, a year-to-year difference up to a magnitude of 1 Gini point can be considered as no change, especially if variation in subsequent years go in different directions. However, consistent year-to-year changes, even if small ones (say, half a point) from 1 year to another, may accumulate into a five-point change or more in the Gini over 10 years, which is a substantial change indeed. Such longer-run consistency of increments over time may also change the interpretation of short-term comparisons. Consider long-term fluctuation of the Belgian or the Irish Gini series (resulting in longer periods of “no change” in inequalities) and compare those with the very small but consistent year-to-year increments of Ginis in Sweden or Finland, and it becomes clear how important it is to pay attention to even small and insignificant Gini changes ([Tóth, 2014](#)).

Nevertheless, when the Gini index is used as left-hand variable in regressions, spell contexts (as defined above) cannot always be taken into account, and the actual interpretation of the parameter estimates depends heavily on statistical inference. Careful and balanced evaluation: this is the main lesson that can be drawn and the only suggestion that can be given at this stage.

19.5. DRIVERS OF INEQUALITY: MAIN EXPLANATIONS

This section sets out the main arguments of inequality drivers in OECD countries put forward in cross-country studies and reports the results from recent empirical work supporting or not supporting these arguments. We focus our review of the literature including studies undertaken in the past 10–15 years, with no pretention of exhaustiveness. In particular, this review updates [Atkinson and Brandolini \(2009\)](#) and extends the literature review by [Chen et al. \(2013a\)](#).

The section introduces the main factors put forward to explain international differences in levels and trends of income inequality. The discussion is structured along six main headings: structural macroeconomic sectorial changes; globalization and technical change; changes in institutions and regulations; political processes; redistribution via taxes and transfers; and structural societal changes. [Annex Table A19.1](#) gives an account of the wealth of findings for a subset of 48 selected studies that are considered to be the most pertinent ones undertaken in the past 10–15 years. The selection criteria relate to coverage (i.e., the studies should include a critical mass of countries and should focus on the joint OECD and EU areas); multivariate explanations (i.e., monocausal studies were excluded); and timeliness (i.e., preference was given to more recent studies not yet included in literature surveys available elsewhere).

When talking about “main drivers,” it is useful first to make a distinction between direct, or proximate, drivers and indirect, or underlying, factors resp. causes behind changes in income distribution (see [Cornia, 2012](#) for the same distinction). Direct drivers can be gauged, for instance, by decomposing summary income inequality measures by

income components or by calculating the first-order effect of changing household structures on income distribution, for example, by using shift-share analyses. A variety of such direct factors for growing inequality in OECD countries has been identified by the OECD (2008). While usually analyzed in isolation, such identification of factors—especially if as exhaustive as possible—provides a useful checklist of “hints” (Cornia, 2012) at indirect factors or causes that lie behind inequality changes. In the following subsections, we classify the main underlying factors into six overall headings, following the presentation in Figure 19.1.

The subsections below resume the arguments put forward in the literature and report the results from empirical analyses. The main “culprits” tested in the literature have been subsumed under the different subheadings enumerated above, each observing single sets of drivers of inequality and inequality changes, thus defining more monocausal explanations of inequality. Of course, none of the studies reviewed is monocausal in nature, and all test the significance and relative importance of several drivers, but the point of departure is often related to one particular area, for example, the impact of globalization versus technology or versus institutions.

Our review focuses on OECD and EU countries. The country coverage in some studies is limited to only a subset of OECD countries, whereas many other studies include a larger sample of countries, including notably middle-income and developing countries. Given the focus of this chapter, we review below results pertaining to the OECD area, also when obtained from the second strand of studies insofar as results for OECD countries are reported separately.

Though our preferred explanatory variable is dispersion of household disposable income, we also report findings that explain changes in the distribution of earnings. While the use of one or the other of these two income concepts may alter the findings (net income estimates also are affected by household structure and tax/transfer changes), and definitions within these two aggregates differ (full-time wages or annual earnings; gross or net incomes), a number of studies refer exclusively to the effect on earnings, especially those looking at the causal role of trade and technology. Findings referring to income and earnings are presented separately below.

19.5.1 Structural Macroeconomic Sectoral Changes

For a long time, the quest to identify driving factors of inequality looked primarily at the association between economic development and inequality and was focused on testing the hypothesis that Kuznets (1955) put forward. According to this hypothesis, inequality follows an inverted *U*-shaped relationship with increased development. This is linked to a sectoral move from a “traditional” sector (agriculture) to a “modern” sector (industry). Insofar as the traditional sector is less productive, it will provide lower wages than the modern sector (sector dualism); it is expected that the traditional sector has lower

inequality within it (sector bias). Consequently, it is expected that development first increases and subsequently decreases inequality.

Usually, economic development is proxied by real income or GDP per capita (y). To capture the parabolic shape of the relationship, the quadratic form of y is added. Following [Hellier and Lambrecht \(2012\)](#), in the frame of a panel of country studies, the relationship can be written as:

$$INEQ_{i,t} = \alpha + \beta_1 y_{i,t} + \beta_2 y_{i,t}^2 + AX_{i,t} + \varepsilon_{i,t} \quad (19.3)$$

where i and t are country and time, y is per-capita real income (or GDP) and $X_{i,t} = \{x_{j,i,t}\}$ a vector of variables j that affect the inequality measure $INEQ$. These variables seek to control for shocks as well as institutional and regulatory differences across countries. Equation (19.1) is a specific variant of the general regression equation GIRE described earlier in [Section 19.2.1](#). The Kuznets hypothesis then is confirmed if the estimated values β_1 and β_2 are such that $\beta_1 > 0$ and $\beta_2 < 0$. The turning point, where inequality attains its highest value and begins to decrease, can then be estimated to correspond to the period Ω , such that $y_\Omega = y_0 - \beta_1/2\beta_2$ (for a start of the estimation at time $t=0$ with the income per capital y_0).²²

Evidence from studies of the inequality/development relationship remains broadly inconclusive. Around half of the studies reviewed by [Atkinson and Brandolini \(2009\)](#) estimate such relationship, with or without other controls. Some of these studies support the Kuznets hypothesis but others reject it. [Hellier and Lambrecht \(2012\)](#) undertake a review of studies testing the Kuznets hypothesis. Studies based on cross-sectional analysis of countries in their majority tended to support the Kuznets hypothesis (although some clearly reject it), whereas the evidence from panel data estimations is more mixed. In a study of the EU member states between 2000 and 2005, [Medgyesi and Tóth \(2009\)](#) suggest absence of a clear relationship between the economic growth rate and inequality within EU member states in the first half of the 2000s. [Bourguignon \(2005\)](#) concludes that, overall, the analyses of the available data at hand “do not suggest any strong and systematic relationship between inequality and the level of development of an economy” (p. 1733).

Empirically, the past 20–30 years were characterized by a considerable increase in earnings and income inequality in a large majority of OECD countries ([OECD 2008, 2011](#)), a development that is sometimes called “the great U-turn” (but see [Section 19.4.2](#) on variability of inequality measures). Even if one considers the

²² In discussing the appropriate specification of the Kuznets relationship, [Anand and Kanbur \(1993\)](#) derive functional forms of and conditions for the turning point for six different inequality indexes. They show that under the Kuznets assumptions, different indices of the Lorenz class increase at the start of the development process, but the behaviour at the end of the process—and the existence of a turning point—is ambiguous. Importantly, each index is shown to have its own functional form and turning point condition.

inequality/development relationship to be accurately described as an inverted *U*-shaped curve, this picture needs to be amended and replaced by an *N*-shaped (Alderson and Nielsen, 2002) or tilde-shaped (Hellier and Lambrecht, 2012) curve.

Alderson and Nielsen (2002) test the Kuznets hypothesis by applying a measure of sector dualism (shift of employment out of agriculture) for 16 OECD countries for the period 1967–1992. They find that sector dualism has no significant effect on income inequality unless none of the globalization variables are controlled for. At the same time, sector bias (measured as the share of the labor force in agriculture) has a strong and positive effect. The latter surprising positive sign is explained by Alderson and Nielsen by the fact that dualism in agriculture has become less relevant for OECD countries for overall inequality, and its meaning now is more likely to be a measure of agrarian traditionalism than a component of the dualism model.

The “great U–turn” may then better be explained by other phenomena such as globalization or institutional change (see the next section). Still, issues of sector dualism and sector bias can be expected to play an important role when analyzed in terms of a sectoral change from a postindustrialized to a knowledge society. Nollmann (2006) and Rohrbach (2009) propose a model similar to that of Alderson and Nielsen (2002) but focus on sector dualism in terms of the wage differential between the knowledge sector and the remainder of the economy and on sector bias in terms of employment shares in the knowledge sector. For a panel of 19 OECD countries for 1970–2000, Rohrbach finds support for the sector bias hypothesis but no support for sector dualism. Moreover, and in contrast to Alderson and Nielsen (2002), Rohrbach (2009) finds no significant effect of globalization (in terms of trade openness), concluding that factor effects remain central determinants for understanding inequality. This traces back to the original argument by Kuznets that through the segmentation of factor markets sectorial changes can be important drivers of inequality changes. However, while there is some segmentation of the labor market in OECD countries, it does not appear across large sectors of activity. The high-tech/low-tech distinction seems more important but less easy to implement analytically.

19.5.2 Globalization and Technical Change

Since the 1990s, economic globalization has been intensively analyzed as one of the main potential drivers of increased earnings and income inequality in the OECD area. “Globalization” is, however, a multifaceted phenomenon and cannot be reduced to a single variable.²³ There are different aspects of it and they are likely to affect trends in earnings and income inequalities in different ways and in possibly opposing directions:

²³ Note that the discussion here and later refers to the “new age” of globalization (or Globalization II). It has been suggested that the distributive effects of the earlier Globalization I during the late nineteenth century up to World War II have been very different (Milanovic 2012).

- trade integration (goods and services mobility)
- financial integration (capital mobility)
- production relocation (firm mobility)
- technology transfers (information mobility)
- political aspects of globalization

The following subsections consider these aspects in turn.²⁴

19.5.2.1 Trade

Increased trade integration is often taken as a main sign and sometimes as the sole proxy for the degree of economic globalization. The share of world trade in world GDP has grown from about one third to over half in the past 30 years (IMF, 2007). In most OECD countries, the extent of trade integration has doubled or tripled during this period, and the increase was especially stark during the 1990s (OECD, 2011).²⁵

The standard reading of traditional international trade theory is that increased trade integration is associated with higher relative wages of skilled workers in advanced countries, thus contributing to increased inequality in those countries and higher relative wages of unskilled workers in developing countries with an associated decrease in inequality (for a discussion of the relationship between skill differentials and globalization, see, for instance, Krugman, 1995, 2000 and Kremer and Maskin, 2003). This is based on predictions of the Heckscher–Ohlin (HO) model, or variants of it. This model expects that countries export goods that use intensively the factor with which they are most abundantly endowed and import those that intensively use their scarce factors. Advanced countries with abundant highly skilled labor will therefore import products from countries with lower endowments of skills and export products made by skilled workers. Combined with the Stolper–Samuelson theorem, which predicts that trade increases the real returns to relatively abundant factors, increased trade integration should then reduce the demand for less-skilled workers and increase the demand for skilled workers in advanced countries and the inverse in developing countries Heckscher–Ohlin–Samuelson (HOS) model. Second, less-skilled workers are predicted to migrate to advanced countries. Third, capital would flow from advanced countries with large capital-to-labor ratios to developing countries with small capital-to-labor ratios. All three processes are predicted to lead to increased inequality in advanced countries and to decreased inequality in developing countries.

However, most studies found it difficult to reconcile the empirical evidence on earnings and income inequality trends with the traditional HOS model, which typically does not capture technology diffusion. A number of cross-country studies find trade globalization

²⁴ There are additional features of globalization that may have indirect and direct effects on the distribution of income, such as cultural aspects of globalization or migration, which are, however, beyond the scope of the detailed discussion in this chapter. The issue of migration is discussed partially (as a trend having composition effects on societies) in Section 19.5.6.

²⁵ Note, however, that the increase in the GDP share of trade would be much lower if trade was measured in terms of value added.

to have increased income inequalities in high-wage and low-wage countries alike, which is at odds with traditional trade theory (for a review, see [Milanovic and Squire, 2007](#)). Furthermore, all sectors tended to become more skill intensive (as already reported by [Krugman, 1995](#)). [Chusseau et al. \(2008\)](#) relate this to the fact that trade between advanced and developing countries still accounts for a lower share than trade between advanced countries, thereby playing a lesser role in the shift of factor demand ([Chusseau et al., 2008](#)).

Some of the shortcomings of the traditional HOS model have been put forward by, for instance, [Davis and Mishra \(2007\)](#). The particular assumption of growing capital flows from developed to developing countries and their equalizing impact (in developing countries) has been challenged, notably on the grounds of capital market imperfections ([Lucas, 1990](#); [Alfaro et al., 2008](#)). During the past 15–20 years, new approaches in trade models have been developed to overcome analytical shortcomings of the HOS model in several areas. The first one is to take account of heterogeneity of firms within industries in both developed and developing countries based on the development of dynamic industry models, as in the work of [Melitz \(2003\)](#). The coexistence of more productive firms that are expanding and entering the export market and contracting less productive firms within the same industry has an effect on how trade influences the wage and income distribution ([Pavcnik, 2011](#)). Exporting firms can employ more productive workers and offer higher wages, with a possible sizeable effect on increased wage inequality within sectors.

This calls into question the assumption of competitive labor markets underlying the HOS model, which expects an equalizing wage distribution in developing countries through higher unskilled wages. Newer trade theories therefore accounted for labor market imperfections by including efficiency wage models or models of fair wages in their framework (e.g., [Verhoogen, 2008](#); [Egger and Kreickemeier, 2009, 2010](#)). In a next and complementary step, attempts were made to relate the exporting firms' wage premium to search frictions as a source of labor market imperfection, introducing search and matching models ([Helpman et al., 2009](#)). In both streams of work, trade liberalization can be consistent with increasing residual wage inequality, that is, inequality between workers with the same skills and other characteristics.

Empirically, however, both these channels, which are related to the recognition of heterogeneity of firms, can only be observed and analyzed at the micro level, going beyond models based on “representative firms.” A number of studies reporting results for particular countries, mainly Latin American countries and Indonesia, were published in the later 2000s. Most of these studies (reviewed by [Pavcnik, 2011](#)) suggest that increased export market access was associated with greater wage inequality in a given country. But there are no cross-country studies available so far.

There are channels other than the HOS model through which trade can affect income inequality. One is increased competition, which tends to reduce the relative prices of consumption goods and can also diminish the monopoly position enjoyed by the upper class—both processes would reduce income inequality ([Birdsall, 1998](#)). A more indirect argument refers to the second-order effects of decreases in the relative wages of unskilled

workers; this may lead to incentives for workers to up-skill and for employers to hire more unskilled labor, leading to lower inequality (Blanchard and Giavazzi, 2003). There are also other theories and models that predict that inequality would decrease in both advanced and developing countries, namely through the effect of specialization; such division of labor could generate increasing returns to scale, whereby labor has a higher marginal productivity (Francois and Nelson, 2003).

In the following, the empirical results of selected pooled cross-country studies are summarized, distinguishing effects of trade globalization on wage dispersion on the one hand and on income inequality on the other. When discussing the effect on wage dispersion, the notions of “wage differential” and “wage distribution” need to be distinguished. The models described above (in particular the HOS theory) yield predictions about the wage differential (i.e., on wage ratios between various skill or occupation groups), but the effect on the distribution of wages also depends on quantities (i.e., the number of people earning these wages). If quantities are fixed (as assumed in a static trade theory), one can read the distribution of wages directly from the wage differential. But if people migrate and change across sectors, one cannot predict distributional effects directly from changing wage differentials. Most of the empirical studies reviewed below test the potential effect of trade integration on wage distribution.

19.5.2.1.1 Wage Dispersion Effects

For a set of 23 OECD countries 1980–2008, OECD (2011) suggests that trade integration²⁶ has no significant effect on trends in wage dispersion at the aggregate level within countries once the effects of technological change and institutions are controlled for. This result holds for both top and bottom sensitive indicators of earnings (interdecile ratios) and when imports and exports are examined separately. An insignificant distributive effect of trade integration is also estimated for the overall earnings distribution among the entire working-age population (i.e., including the unemployed), insofar as trade had neither a significant positive or negative effect on employment.

On the other hand, Cassette et al. (2012) suggest a positive relationship between trade and wage dispersion for a subsample of 10 OECD countries between 1980 and 2005, which, however, differs between goods and services as well as in short- and long-run estimates. In the short run, wage dispersion is widened by increased trade in goods, whereas trade in services has no effect. That differs from long-run effects, where trade in services increases inequality, in particular at the top of the earnings distribution (i.e., between top and median earnings).

For OECD countries, a subaggregate of total trade may be a more pertinent indicator, namely the share of imports from low-income developing countries (LDCs). However, Rueda and Pontusson (2000) suggest that its increasing share had no effect on wage

²⁶ Trade integration is measured as trade exposure, that is, a weighted average of import penetration and export intensity.

dispersion, at least for the period up to 1995. Similarly, [Mahler \(2004\)](#) shows that, for a subset of 14 OECD countries for the period 1980–2000, imports from LDCs had no significant distributive effects on either earnings or disposable incomes. For the more recent period up to 2008, [OECD \(2011\)](#) reports similar findings, although with nuances: overall the effect of LDC imports is distribution neutral, but considering the institutional context, such imports tend to compress the wage dispersion in countries with stronger employment protection legislation (EPL) but widen it in countries with weaker EPL. For [Golden and Wallerstein \(2011\)](#), however, trade with LDCs is one of the key drivers of increased wage dispersion within 16 OECD countries during the 1990s.²⁷ Their results distinguish the period of the 1990s from the decade of the 1980s, when trade played no role but institutions did (see [Section 19.5.3](#)). Among those finding a moderate disequalizing role of imports from LDCs are [Alderson and Nielsen \(2002\)](#), although their results refer to income rather than earnings inequality.²⁸

19.5.2.1.2 Income Distribution Effects

Few studies estimate the effect of trade openness for the group of OECD countries on the distribution of income directly. For the subgroup of advanced countries analyzed by the [IMF \(2007\)](#), economic globalization overall (trade and financial globalization taken together) contributed to increasing income inequality, but this was entirely because of foreign direct investment (FDI) trends, which more than outweighed the equalizing effects of trade: both exports and, in particular, imports from LDCs (but not trends in tariffs) were associated with decreasing income inequality in advanced countries. Similarly, for 24 OECD countries for the period 1997–2007, [Faustino and Vali \(2012\)](#) found that trade liberalization decreases income inequality, making use of both static and dynamic regression estimates. In a study of 16 OECD countries, the [ILO \(2008\)](#) included tariff liberalization as only a proxy for trade openness, finding no significance for an effect on income inequality.

19.5.2.2 Trade Openness and Inequality in an Enlarged Country Sample

There are somewhat more findings attributing distributive effects to increased trade integration when the country sample is enlarged from the group of OECD countries.²⁹

²⁷ Their results suggest a one percentage point increase in trade, with LDCs being associated with a one percentage point increase in wage inequality.

²⁸ Results suggest that increasing LDC import penetration by 1 standard deviation increases the Gini coefficient of income inequality by 0.6 points.

²⁹ When analysis is restricted to the OECD area, a group of relatively homogenous economies in terms of their development status, it is reasonable to disregard differences in national income levels when assessing the contributions of factors such as trade globalization on the income distribution. Enlarging the country sample, however, needs to take into account that trade and other globalization variables may have different effects on inequality depending on a country's level of development. That is what is at least predicted by the traditional HOS theorem or variations of it. Estimating the effects of globalization on income distribution in both richer and poorer countries together therefore requires analysis of the interaction with GDP/capita and economic growth.

Evidence is mixed, and for a full sample of 129 countries for three points in time in the 1980s and 1990s, [Milanovic \(2005\)](#) suggests that as national income increases, the inequality effects of globalization reverse, enhancing inequality at poorer income levels but dampening inequality at higher levels.³⁰ This runs counter to the hypotheses of the classical HOS model.

[Milanovic and Squire \(2007\)](#) investigated the effect of trade (measured with the unweighted average tariff rate) on interoccupational and interindustry wage differentials for the period between 1980 and 1999. For both indicators, a decrease in tariff rates tended to have a positive association with wage dispersion in poorer countries but a negative association in richer ones. Institutions (union density and coverage) do not play a role in interoccupational wage disparity but reinforce the disequalizing effect on interindustry wage differentials.

For a panel of 51 countries, [Bertola \(2008\)](#) found that trade openness is positively associated with inequality of both gross income and disposable income (for a smaller set of countries) and that government expenditure is less redistributive in countries with a higher degree of trade openness. [Spilimbergo et al. \(1999\)](#) suggested that the effects of trade openness on inequality depend on factor endowments, increasing income inequality in skill-abundant countries but reducing it in capital-abundant countries. Based on newer data and a larger country sample, [Gourdon et al. \(2008\)](#) nuanced this finding. Measured as a lagged ratio of tariff revenues to imports, they found that trade openness is associated with increases in income inequality in both high skill-abundant and capital-abundant countries. By contrast, [IMF \(2007\)](#) suggests that the role of trade globalization in the last two decades of the twentieth century was insignificant overall, but some elements actually contributed to decreasing income inequality, in particular lower tariffs and higher agricultural exports.

For the specific country group of Latin American countries, [Cornia \(2012\)](#) found, perhaps contrary to expectations, that the gains in terms of trade realized during the 1990s and 2000s contributed significantly, albeit modestly, to the recent decline in income inequality. This is explained by relaxed external constraints on growth and consequently increased incomes, employment, and revenue collection.³¹

19.5.2.3 Financial Openness

There are mechanisms other than trade through which economic globalization can accelerate earnings and income inequality. One such mechanism is cross-border movement of capital, a factor that is overlooked in the basic trade model, which assumes that labor and capital are mobile within a country but not internationally. Factors such as deregulation,

³⁰ [Milanovic \(2005\)](#) identifies the “turning point” as around US\$8,000 per capita in 1985 PPPs.

³¹ However, the reversal of the skill premium as well as a shift towards more progressive labor and fiscal policies are identified as the main factors for the decrease in inequality ([Cornia, 2012](#)).

privatization and advances in technology all contributed to the rapid growth of capital movement, in particular FDI, over the past decades. If the utilization of capital as well as embodied technology requires the use of skilled workers, and capital and skilled labor are complementary, the increase in inward capital will increase demand for skilled workers (Acemoglu, 2002).

Much like HOS models of trade, models of FDI usually predict different effects in advanced and developing countries. If FDI flows are directed to countries with relative abundance of low-skilled labor, this should a priori increase the demand for the abundant factor and hence have an equalizing effect in developing but a disequalizing effect in developed countries. However, less skill-intensive outward FDI from advanced countries can appear as relatively high skill-intensive inward FDI in developing countries. In that case, even when the transferred technology is “neutral,” an increase in FDI from advanced to developed countries can increase the demand for skilled labor and contribute to increasing inequality in both advanced and developing countries (Feenstra and Hanson, 2003; Lee and Vivarelli, 2006). Further, there may be indirect disequalizing effects, even if FDI is mainly attracted by low skill-intensive countries and sectors; to attract FDI, countries may relax regulations in the field of employment protection or fiscal parameters, which otherwise would have an equalizing effect (Cornia, 2005).

Endogenous growth models such as those proposed by Aghion and Howitt (1998) or Aghion et al. (1999) assume two stages of development and inequality when new technologies are introduced: in the transition phase skilled labor demand and hence wage inequality increase before decreasing in a second stage. Such models can be adapted in terms of effects of FDI on the availability of new technologies. Figini and Görg (2006), for instance, view FDI as a vehicle for introducing new technologies. They expect that in a first step more FDI will lead to increased inequality between skilled and unskilled workers, with a reversed trend in the second step as domestic firms follow up imitating advance technologies.

19.5.2.3.1 Wage Dispersion Effects

Figini and Görg (2006) wrote one of two articles in our review that use FDI as the main explanatory factor for distributional changes. Their model specifies only the inward component of FDI. For the subsample of 22 OECD countries, they found that higher inward FDI is significantly (at the 5% level) related to lower earnings inequality in the manufacturing sector for the period 1980–2002. Further, this effect seems to be linear. This is in contrast to the results for non-OECD countries, where the inward FDI has a positive though nonlinear association with earnings inequality.

Similar findings are also suggested in the results of OECD (2011) for 23 OECD countries between 1980 and 2008. Although overall FDI turns out to be insignificant, inward FDI has a significant equalizing effect on wage distribution and outward FDI has a disequalizing effect, although the latter effect is rather modest (see the next section). Inward

FDI, however, seems to be correlated with trends in trade integration. Other indicators of financial openness were reported to be insignificant in this study; this concerns cross-border assets and liabilities, foreign portfolio investment, and a *de jure* measure of FDI restrictiveness, which was the preferred measure of financial openness in this study.³²

Among more country-specific studies, [Taylor and Driffield \(2005\)](#) found that inward FDI flow can explain, on average, 11% of the increase in wage inequality in United Kingdom between 1983 and 1992. [Bruno et al. \(2004\)](#) examined the effects of inward FDI on relative skilled labor demand and wage differentials in manufacturing in the Czech Republic, Hungary and Poland for the years 1993–2000. They found that FDI did not contribute to increasing wage dispersion in the three countries, although it did contribute to increasing the skill premium in the Czech Republic and in Hungary (but not in Poland). [Hijzen et al. \(2013\)](#) analyzed microeconomic (firm-level) data for three developed and two emerging economies and found that wage premium effects following foreign ownership are larger in developing countries, that the largest effect on wages comes from workers who move from domestic to foreign firms and that employment growth after foreign takeover is concentrated in high-skill jobs.

19.5.2.3.2 Income Distribution Effects

Most studies reviewed found only modest or no significant effects of overall FDI in OECD countries, but there are more significant results when inward and outward FDI are analyzed separately. Using time series data for the period 1960–1996, [Reuveny and Li \(2003\)](#) showed that inward FDI flow for 69 countries is significantly and positively associated with income inequality for both OECD and less developed countries, which were sampled separately. The [IMF \(2007\)](#) reached the same conclusion: for the subsample of advanced countries in the study of trends over 1980–2003, they identified both inward and, in particular, outward FDI as the elements of globalization that most increased income inequality, slightly more than outweighing the equalizing effect of increased trade. For a more recent period, 1997–2007, increased inward FDI was also found to be significantly positively related to income inequality for a sample of 24 OECD countries by [Faustino and Vali \(2012\)](#).³³ This seems to back up the observation that FDI occurs in more skill- and technology-intensive sectors.

The opposite was found by [Çelik and Basdas \(2010\)](#). Their article is the second of the two studies in our review that uses FDI as the main explanatory factor for distributional changes. For a subsample of five developed countries, their analysis suggests that both FDI inflows and FDI outflows are associated with *decreased* income inequality for the period of

³² This is because *de facto* volume-based measures of financial openness such as FDI or foreign portfolio investment are often endogenously determined by other factors included in the framework, for example, technology or trade, as has been shown above.

³³ The effect of FDI, however, becomes insignificant when the authors control for potential endogeneity by applying generalized methods of moments estimators.

the mid-1990s to mid-2000s. The working hypothesis is that this is attributable to greater redistribution permitted by higher tax revenues from increased employment in the case of FDI inflows and changes in the economic structure with low-skilled labor being pushed to up-skill in the case of FDI outflows. The small number of observations (5 countries for 11 time observations), however, casts some doubts on the robustness of the results.

On the other hand, the [ILO \(2008\)](#) estimates that the inward FDI share in GDP had no effect on income inequality in a sample of 16 OECD countries for the period 1978–2002, as long as the analysis controls for technology (information and communications technology [ICT] share)—otherwise FDI comes out as a significant predictor, suggesting that FDI could act as a proxy for that omitted factor and actually lead to greater demand for skilled labor.

Somewhat more clear-cut results were found for the region of Latin America. [Cornia \(2012\)](#) examined a subsample of 19 Latin American countries for the period from 1990 to 2009. Given the boom in capital inflow, Cornia expects deteriorating effects on income inequality via an appreciation of the real exchange rate and a dampened growth in the labor intensive noncommodity traded sector. Indeed, the FDI stock had a significant and strongly disequalizing effect in all specifications, and the effect is most pronounced among the group of Andean countries (where FDI is particularly important in the mining sector). That said, in this analysis FDI—such as other external economic and demographic variables considered—had a more limited average effect on income inequality than the policy variables.

A more disequalizing effect of FDI also often is found in studies with the broadest possible country coverage. Broadening the analysis to 42 advanced and developing countries, the [ILO \(2008\)](#) found inward FDI to be the only variable among eight economic controls to be robustly positively associated with increased income inequality. This positive association was confirmed by the [IMF \(2007\)](#) for 51 countries, although technology played an even stronger role in the latter study. Higher inward FDI benefits solely the top quintile, whereas income effects for the three bottom quintiles are significantly negative. For a panel for 111 countries from 1970 to 2000, [Te Velde and Xenogiani \(2007\)](#) showed that FDI positively affects skill formation not only within countries but also across countries, especially in countries that are relatively well endowed with skills to start with. On the other hand, in his analysis of 129 countries for three benchmark years (late 1980s, early 1990s, late 1990s), [Milanovic \(2005\)](#) found that FDI has no effect on the income distribution, whether alone or when interacting with income. However, results from analyses that pool developed and developing countries are difficult to interpret because this blurs the channels through which financial openness affects the distribution of incomes, especially when inward and outward FDI are netted out.

19.5.2.4 Outsourcing

Most of the evidence that relates increasing earnings or income inequality on increased trade openness focuses on trade in *final* goods. As shown earlier, a larger part of the

literature suggests that trade, measured in these terms, has not been the major driving factor (if at all) of increased inequalities in the OECD area. Such findings, however, neglect that the production of goods itself has become globalized, and outsourcing in terms of increasing trade in *intermediate* products may play a decisive role. It has been estimated that the potential of off-shoring of tasks concerns between 20% and 30% of all jobs in a number of OECD countries, including medium- and high-skilled jobs; however, tradability is determined not only by the technical feasibility of unbundling and digitization but also by transaction costs and the economies of scope of keeping tasks together (Lanz et al., 2011).

Among the first to put forward the outsourcing hypothesis, Feenstra and Hanson (1996) suggested that the rapid development of international production sharing³⁴ (from home companies to their foreign affiliates) may distort the wage distribution in home countries by moving some of domestic non-skill-intensive activities abroad. Such a move concerns potentially all firms (not only traded industries) as long as business owners find the fragmentation of production more cost-effective. Firms in advanced countries may “outsource” particular stages of production to less developed countries; these stages seem less skill-intensive in the advanced country but relatively skill-intensive in the receiving country. As a result, trade—the outsourcing aspect of it—may reduce the relative demand for unskilled workers and increase employment toward skilled work within industries in *both* countries. This also offers an explanation of why trade could lead to increased relative demand for skilled workers within industries, rather than across industries, as predicted by the traditional HOS theory. Chusseau et al. (2008) and Pavcnik (2011) provide a summary of recent approaches of theoretical outsourcing models.

Various studies have tested the outsourcing hypothesis for single countries. Feenstra and Hanson (1996) found that outsourcing can account for a sizeable share of the increase in the relative demand for skilled workers in manufacturing sectors and for a notable amount of the increase in the relative wage of nonproduction workers in the United States during the 1980s.³⁵ Using updated data for the United States and measuring outsourcing by intermediate inputs in total materials purchase, Feenstra and Hanson (2003) found that outsourcing can account for half or more of the observed skill upgrading; the other half is contributed by technological change. For the United Kingdom, Hijzen (2007) also found international outsourcing contributing to the increase in wage inequality during the 1990s, although not to the same extent as technological change. Kang and Yun (2008) identified deindustrialization and outsourcing to China as two of the factors of rapidly increasing wage inequality in Korea since the mid-1990s, in addition to human

³⁴ The definition of outsourcing as “imports of intermediate inputs by domestic firms” is broader than the pure subcontracted part of the production process usually associated with outsourcing (see Chusseau et al., 2008).

³⁵ Feenstra and Hanson (1999) estimate that outsourcing could explain between 15% and 40% of the increase in wage inequality, depending on the specification.

capital factors and technological change. On the other hand, [Slaughter \(2000\)](#) suggested that outsourcing activities of US multinational enterprises tend to have small, imprecisely estimated effects on US relative labor demand. Similarly, using industrial data for a group of OECD countries, the [OECD \(2007\)](#) also concluded that outsourcing in general has only a rather moderate effect on shifting relative demand away from low-skill workers within the same industry. [Lorentowicz et al. \(2005\)](#), on the other extreme, discovered that outsourcing actually lowered the skill premium in Austria, a skill-abundant country, whereas it increased the wage gap in Poland, a relatively labor-abundant country.³⁶

There are, however, few larger cross-country studies that explicitly test the outsourcing hypothesis. Taking outward FDI as a partial proxy for outsourcing, the [OECD \(2011\)](#) found this effect to be only modestly significant for explaining increased wage inequality in a sample of 23 OECD countries and distribution neutral in terms of overall earnings inequality (i.e., when employment effects are included).³⁷ This result is consistent with the fact that outsourcing activities to developing economies account for a small portion of total outward FDI stock in most OECD countries.³⁸ Analyzing 16 OECD countries over 1980–2000, [Mahler \(2004\)](#) also found that outward FDI is not significantly related to both household earnings and income inequality in either direction.

19.5.2.5 Technological Change

Next to trade and financial globalization, there are other equally plausible and competing explanations for income distributional changes. One that is often portrayed as an alternative to trade-related explanations is technological progress (e.g., [Autor et al., 1998](#); [Berman et al., 1998](#)). Technological change, often described as advances in information and communication technology, is considered skill-biased insofar as it increases the total relative demand for skills for given prices of skilled and unskilled labor. Whether factor- or sector-biased (or indirectly biased via other factors of production), skill-biased technological change (SBTC) tends to increase the wage premium and/or increase unemployment among low-skilled workers and is therefore expected to increase inequality.³⁹ The wage premium will not increase only if the increase in the relative

³⁶ Some country-specific studies analyze the outsourcing effects on wage dispersion at the firm level. Analyzing data for the United States from 1981 to 2006, [Ebenstein et al. \(2009\)](#) suggested that the location of off-shoring activities matter, and off-shoring to high-wage countries can increase wages (via proliferation of nonroutine tasks), whereas off-shoring to low-wage countries have a negative wage effect.

³⁷ The same study also tested whether outward FDI has different effects in countries with distinct institutional settings (notably EPL), and found that outsourcing plays a modest role in wage inequality trends regardless of the institutional setting of the country considered.

³⁸ Intra-OECD investment, in fact, accounts for >75% of total outward FDI stocks in more than half of OECD countries ([OECD, 2005](#)).

³⁹ For the specific subset of central and eastern European transition countries, [Vecernik \(2010\)](#) suggests that differences in wages between skilled and unskilled labor were one of the major determinants of inequality increase after the economic transition in 1989.

demand for skilled labor is offset by a corresponding increase in the endowment with skilled labor.

In most studies, skill bias is identified by looking at changes in the share of skilled workers in sectoral wage bills or employment, and an increase in these shares within selected and defined research and development (R&D) industries or firms often is interpreted as evidence for SBTC.⁴⁰ Research that uses direct measures for technological progress such as computer usage or total factor productivity also reaches similar conclusions, although there is still debate over whether it is sector bias or skill bias that determines changes in the wage distribution.⁴¹ The impact of technology seemed to be robust even when broader levels of aggregation were analyzed.

One reason why technological change often has been privileged over trade as the main explanation for increased inequality is the observation that employment shifts toward skilled work happening *within* rather than between sectors (although newer trade theories take this phenomenon into account in the frame of heterogeneity of firms models; see Section 19.5.2.1). Although this finding was confirmed for a sample of 12 OECD countries by the OECD (2011, p. 139), the analysis also highlights the growing wage inequality among workers with *similar* skills. Even after accounting for observable differences across workers, the dispersion of wages has risen, that is, there has been an increase in residual wage variation. The simple distinction between skilled and unskilled workers may not be detailed enough, and technological change, in particular ICT developments, can be accompanied by shifts away from routine and toward nonroutine labor (Autor et al., 2003; Michaels et al., 2010; Goos and Manning, 2007).

Many studies that have put technological change in the forefront of their explanation refer to one single country. Over the years, considerable evidence has been collected for the United Kingdom (e.g., Haskel and Slaughter, 1999; Hijzen, 2007) or for the United States (e.g., Blackburn and Bloom, 1987; Acemoglu, 1988; Card and DiNardo, 2002; Autor et al., 2003; Wheeler, 2005).

Larger cross-country studies including measures of technological progress (usually among the controls) became available more recently. Some studies identified this process as a key driver for inequality: the IMF (2007) finds that, overall (i.e., for the total sample of 51 countries), “technological progress has had a greater impact than globalization on (income) inequality within countries” (p. 31). Looking at the subsample of advanced countries, it turns out that globalization in terms of FDI contributed as much as, if not somewhat more than, technological change to increasing overall income inequality.

⁴⁰ Machin and Van Reenen (1998) and Autor et al. (1998) showed that such an indirect technology measure (i.e., the share of wage bills or employment) is highly correlated with direct measures of technological changes such as R&D intensity or computers.

⁴¹ Krueger (1993), for instance, measures technology by computer usage, whereas Hijzen (2007) uses total factor productivity growth for skill-biased technical change. For a discussion of sector versus factor bias, see Haskel and Slaughter (2001, 2002).

A higher share of ICT investment also is identified as being strongly and significantly associated with higher inequality in 16 advanced countries by the [ILO \(2008\)](#).

The [OECD \(2011\)](#) also shows a strong and positive effect of technological change (captured by R&D business sector expenditures) on both wage dispersion among workers and overall earnings inequality among the whole working-age population. The second effect arises because technological change had no significant effect on employment rates, and the overall effect was therefore driven by the increased wage dispersion effect. Technological change is further shown to affect mostly the upper part of the distribution ([OECD, 2011](#)).

It is, however, in practice extremely difficult to disentangle technological change from other aspects of globalization that increase skill premia.⁴² Advances in technology are, for instance, at the origin of the fragmentation of economic activities, outsourcing and off-shoring, or, as [Freeman \(2009\)](#) put it, “offshoring and digitalization go together.”

19.5.2.6 Trade-Induced Technological Change or Technology-Induced Trade?

In most studies, technological change is treated as an exogenous variable (e.g., [IMF, 2007](#); [ILO, 2008](#); [OECD, 2011](#)). However, developments of technology and trade are not independent. Increased trade openness has contributed to the spread of technology, whereas technological progress has helped widen trade integration. Therefore, the three studies mentioned above recognize that technological change can also be seen as an additional channel through which economic globalization operates.^{43,44}

[Chusseau et al. \(2008\)](#) reviewed four studies from the early 2000s, all of which found indications of trade-induced technological change in advanced countries. More recent studies confirm this picture. [Bloom et al. \(2011\)](#) showed that trade with low-wage countries (in particular China) had large effects on technical change in 20 European countries and the United States; it led to within-firm technology upgrading as well as between-firm reallocation of jobs towards more technology-intensive enterprises. Equally, [Goldberg and Pavcnik \(2007\)](#), [Verhoogen \(2008\)](#), and [van Reenen \(2011\)](#) emphasized in their studies that increased trade integration leads to faster technology upgrading.

Another approach to the interaction between globalization and technology has been called “defensive innovation” and goes back to [Wood \(1994\)](#). Firms that faced intensified import competition from developing countries have incentives to engage in more R&D efforts to develop new ways of production to remain competitive. While testing this

⁴² As [Wood \(1998\)](#) argues for the period between the mid-19670s and mid-1990s, “there is plenty of evidence that skill-biased technical change has raised the relative demand for skilled workers, but much less evidence of an *autonomous* acceleration in its pace over the past two decades” (p. 1478).

⁴³ As [Feenstra and Hanson \(2003\)](#) put it, “Distinguishing whether the change in wages is due to international trade, or technological change, is fundamentally an empirical rather than a theoretical question” (p. 148).

⁴⁴ Institutions-induced technological change also has been proposed (see [Chusseau and Dumont, 2012](#)).

hypothesis is complex because it requires the availability of innovation data at the firm level, there are some studies confirming such an effect.⁴⁵

The hypotheses of trade-induced skill-biased technological change SBTC and endogenous SBTC through capital deepening is also backed up by the OECD (2011), which suggested a positive correlation between SBTC, trade and capital flows, pointing to an interplay between globalization and technological change.

19.5.2.7 Education

Access to education and human capital accumulation are important factors that are expected to have an impact on income distribution. A higher average level of education is often expected *ceteris paribus* to reduce income inequality because it allows a greater share of the population to benefit from higher-skill activities (see, e.g., results from Sylwester, 2003 for OECD countries and an enlarged country sample for the period 1970–1990). However, while there is agreement on the existence of positive economic returns on education in terms of earnings levels, the theoretical predictions of the *inequality* effect of changes in education enrolment are not straightforward. Increases in education levels entail both a composition and a wage effect, which can move in different directions: the composition effect increases the share of higher education and initially tends to increase inequality before eventually decreasing it when higher education becomes the majority choice. The wage effect lowers the wage premium as the supply of more highly educated workers increases and thereby decreases inequality (for a discussion, see Bergh and Fink, 2008 or De Gregorio and Lee, 2002).

The important point to retain here is that the education–inequality relationship is neither monotonic nor linear, and the education effect can first be disequalizing and then equalizing, in analogy with the Kuznets process (see also Rehme, 2007). Further, there remains the issue of lagged reversed causality, with inequality levels at time t affecting education enrolment at time $t + 1$.

Human capital can be seen as a complement to technology. Increases in human capital and in the supply of skills are necessary to decrease and eventually reverse the pressure to higher inequality that stems from technological change. The underlying logic is that technological change in the economy drives up the demand for higher-skilled workers, while the overall effect on inequality by and large depends on how elastic the higher education output is in relation to the increased demand. If the response is slow or inadequate, the skill premium of the more highly educated (the incumbent and the inflow as well)

⁴⁵ Thoenig and Verdier (2003) found support for defensive innovations by looking at the correlation between foreign competition and the share of skilled workers within the firm. Bloom et al. (2011) used technology data at the establishment/firm level for advanced countries and found that Chinese import competition has led to a considerable technological upgrading in European firms through both fast diffusion and innovation. They also showed that both Chinese imports and information technology intensity, in turn, are associated with an increase in the wage share of skilled workers.

increase, implying, by definition, an increase in inequality in a dimension (education) that plays a large role in explaining overall inequality (on this latter relationship see [Ballarino et al., 2014](#)). Such a view refers to the model of a “race between technology and education” going back to [Tinbergen \(1975\)](#).⁴⁶

In many of the studies reviewed here, some education variable (e.g., share of adults with secondary or higher education, average school years) is introduced, most often as a control variable to capture human capital development. None of these studies suggest a positive association with inequality, that is, a disequalizing effect of education on earnings or income inequality but in their majority rather an equalizing one. This is particularly the case when the country sample is restricted to the OECD/EU area, and significant coefficients are reported, for instance, by the [ILO \(2008\)](#), [OECD \(2011\)](#), [Afonso et al. \(2010\)](#) and [Cassette et al. \(2012\)](#), as well as [Cornia \(2012\)](#) for Latin American countries. In terms of magnitude, according to the [OECD \(2011\)](#), the growth in average educational attainment over the 1980–2008 period offset to a great extent the disequalizing effect brought on by other factors, in particular SBTC. [De Gregorio and Lee \(2002\)](#), in one of the studies that specify educational factors—attainment and distribution of education—as the main explanatory variable in their models, suggest that these explain some but by no means all of the variation in income inequality across countries and over time. Nonetheless, their analysis confirms a negative relationship between income inequality and higher educational attainment (and a positive one with educational inequality) for a larger sample of around 60 countries.

On the other hand, the [IMF \(2007\)](#) suggests that there is an insignificant association between education and income inequality for both the OECD and an enlarged country sample. [Carter \(2007\)](#) and [Bergh and Nilson \(2010\)](#) even report a positive association, but their studies pool a subset of OECD with a larger number of mostly low-income countries. The point that a more highly educated labor force can contribute to greater income inequality in developing and emerging economies is also made by [Carnoy \(2011\)](#). This is related to increasing returns to university relative to secondary and lower education; decreasing public spending differences between higher and lower education; and increasing differentiation of spending among higher education institutions, with declining spending towards mass universities relative to elite universities.⁴⁷

For the sample of OECD/EU countries, however, it is fair to say that most empirical evidence points to an equalizing effect of educational expansion. These results are also important for policy considerations drawn from cross-country studies of the multiple causes of inequality. If “up-skilling” of the population can indeed provide a most powerful

⁴⁶ A note of caution is warranted here. While appealing, such a model should not be applied mechanically because it does not take into account dynamics and ignores the interaction with the capital market ([Atkinson, 2008](#)).

⁴⁷ [Carnoy \(2011\)](#) underlines that some of these features also hold for the United States.

element for countering the trend towards increasing inequality, policy responses that focus on increased access to education will be more promising than those that concentrate on limiting economic globalization (and technological progress). They potentially have a double dividend by contributing to capturing benefits from increased economic integration and by keeping inequality levels lower or actually lowering them (see also Machin, 2009).

19.5.2.8 Going Beyond the Economic Notion of Globalization

Some authors have argued that the pure economic aspects of increased openness—trade, capital flows, foreign investment and so on—do not reflect the whole reality of globalization. Other more social, political and cultural aspects would also merit consideration (e.g., Dreher and Gaston, 2008; Zhou et al., 2011; Atif et al., 2012; Heshmati, 2004). These authors typically construct synthetic measures of globalization along the lines of the Kearney globalization indexes⁴⁸ and test their significance and that of their subcomponents for explaining earnings and income inequality.

Interestingly, some of these studies—in particular Heshmati (2004) and Zhou et al. (2011)—find overall globalization to have a *negative* relationship with income inequality.⁴⁹ In these cases, investigation of the subcomponents of globalization reveals that the economic aspects (such as trade) tend to have a significant positive relationship, which is, however, more than outweighed by factors such as increased personal contacts/travel and information/Internet use.

While the above two studies of the impact of “overall” globalization are based on a broad country sample of advanced and developing countries (60 and 62, respectively), the Dreher and Gaston (2008) study allows the OECD area to be separated out in their analysis of 100 countries. For the OECD sample, they found overall globalization to have a significant *positive* relationship with inequality, whereby this association is much larger for earnings than for income inequality.⁵⁰ Different than the studies mentioned above, the three subdimensions of globalization (economic, political, social) seem to have no systematic relationship with inequality except that none of them have a negative sign in any of the specifications. Bergh and Nilson (2010) are another example of an analysis of the effect of an overall indicator of globalization and its element on net income inequality trends over the past 35 years in around 80 countries. Their results reveal a

⁴⁸ The Kearney Globalization Index (KGI) (see Kearney, A.T., Inc. and the Carnegie Endowment for International Peace, 2004, 2007) is composed of four major component variables: economic integration, personal contact, technological connections and political engagement. Each of these four component variables is a weighted average of several determinant variables. In a similar vein, Dreher (2006) proposed a composite measure for 123 countries, the KOF index of globalization, which is based on 23 variables that relate to three globalization dimensions: economic integration, political engagement and social globalization (see <http://globalization.kof.ethz.ch/>).

⁴⁹ But see a critical review of their methods and results in Atif et al. (2012) and Tsai et al. (2012).

⁵⁰ They estimate that a one-point increase in the overall globalization index increases industrial wage inequality by 26% and household income inequality by 3%.

positive and strong association⁵¹ that is largely driven by the social dimension of globalization. Although the sign and size of the economic and the political dimensions of globalization are similar, their coefficient is not significant.

19.5.3 Changes in Institutions and Regulations

Until 30 years ago, the quest for identifying driving factors of income inequality focused on testing the Kuznet hypothesis (see Section 19.5.1). However, since the 1990s a range of other factors has increasingly been considered. In the context of OECD countries, globalization and technological change became prime candidates for research (many other variables show little variability in the OECD). It is, however, important to also consider the role of institutions, in particular labor market institutions, and changes in regulations (Checchi and Garcia-Penalosa, 2005; Piketty and Saez, 2006; Lemieux, 2008). The increase in wage inequality since the 1980s in several countries coincided with changes in labor market institutions, such as a decline in the importance of unions in setting wages. That labor market institutions and policies have lost redistributive potential in recent times also has been put forward; in particular, trade union density, collective bargaining coverage and centralized collective bargaining were estimated to have become less effective in reducing inequality (Baccaro, 2008). Chapter 18 provides a detailed discussion of the theory and literature that relates labor market institutions to the dispersion of wage earnings and proposes an empirical approach for analysis.

While it is widely recognized that institutions are an important factor for identifying the multiple causes of inequality (e.g., Acemoglu, 2003; Smeeding, 2002), the weight attached to this factor in econometric studies has long been limited. Some papers have argued that, given the relative stability of institutional patterns across countries, including country fixed effects in the analysis would capture a larger part of this factor, at least its time invariant components (e.g., Figini and Görg, 2006). This does not, however, fully reflect development over the past decades, during which some institutions such as union density and coverage or EPL considerably weakened in many countries.

In the earlier studies, the degree of unionization was the main factor used to measure labor market institutions (e.g., Freeman, 1993); union density (share of employees who are members of a trade union) or union coverage (share of employees covered by wage bargaining agreements) are probably more precise indicators. Union density and coverage often are expected to have an equalizing effect on the earnings distribution, not only because unions strive for wage standardization and seek to increase the earnings of their members⁵² but also through indirect effects, such as promotion of social expenditures that

⁵¹ Their results suggest that the maximum effect of overall globalization would be a 14% increase of the Gini coefficient of income inequality.

⁵² The existence of wage premia for union members tends to be equalising if low-wage earners were better organized than high-wage earners, but the opposite may hold if high-paid earners were better organized (Freeman, 1993). Blau and Kahn (2009) argue that the net effect of unions on wage inequality partly depends on which groups have higher labor demand and supply elasticities.

benefit low-income groups as a whole (Mahler, 2004), creation of an institutional environment in which workers care more about wage dispersion because of some shared norm of fairness (Golden and Wallerstein, 2011) or employers following certain pay norms where workers are paid a fraction of their productivity plus a uniform amount (for a discussion of this reputational approach see Atkinson, 2002).

Another factor increasingly analyzed is the impact of wage-setting centralization and coordination. Again, this factor may have both direct and indirect effects on the distribution of earnings: centralized bargaining improves the bargaining position of workers; it may help broaden norms of distributive justice; and it is expected to be economically more efficient, resulting in more resources to be distributed (Mahler, 2004; see also the discussion in sub-section below).

A third factor that is expected to have an important effect on wage dispersion is EPL. EPL is likely to affect employers' costs to hire/dismiss workers. Such policies would compress the wage differential if they are relatively more important for unskilled workers. There may, however, be considerable differences for the effects of changes in EPL for regular versus temporary workers.

Further, there are a number of regulative factors that affect the distribution of earnings, such as minimum wages, unemployment benefits and tax wedges. The working hypothesis here is that minimum wages compress the wage differential, and a decrease in minimum wages contributes to an increase in wage inequality. Higher unemployment benefit replacement rates would increase the reservation wage, with a possible equalizing effect on wage inequality. The distributive effect of tax wedges is a priori ambiguous. Finally, not only labor market institutions and regulations affect the earnings distribution; the observed trend of a large decline in product market regulation (PMR), which precedes the larger trends weakening labor market institutions, also is expected to have a major role (OECD, 2011).

Many of the above aspects of labor market institutions and regulations are, in general, expected to have a more or less equalizing effect on the distribution of wages. This is, however, not necessarily the case when it comes to household earnings or income inequality; the latter also is influenced by trends in employment and unemployment at the household level. Rising employment, for instance, may attenuate growing wage inequality, and the net effect of institutions on household income inequality also depends on their effect on employment. A vast body of empirical evidence points to a significant effect of both institutions and regulations on employment levels (for an overview, see OECD, 2006).⁵³ Theoretically, the overall impact of institutions and regulations remains ambiguous (Cecchi and Garcia-Penalosa, 2008).

⁵³ For evidence on unemployment benefits, see, for instance, Nickell (1998) and Nunziata (2002). For evidence on labor market bargaining models, see Layard et al. (1991) or Pissarides (1990). For evidence on product market regulation, see Blanchard and Giavazzi (2003), Spector (2004), Messina (2003), or Fiori et al. (2007).

The majority of studies reviewed (with the major exception of [ILO, 2008](#)) point to a negative association between various aspects of institutional and regulatory change and earnings as well as income inequality. Weakening of institutions has often been identified as a key driver of increasing inequalities.

19.5.3.1 Wage Dispersion Effects

Earlier studies of single OECD countries found that the decline in unionization increased wage inequality ([Card, 1996](#); [Machin, 1997](#)). Looking at trends in a cross-country setting up to 1995, [Rueda and Pontusson \(2000\)](#) suggested higher union density is associated with a more compressed wage dispersion independent of the policy “regime” of a country (social, liberal, mixed). For the same set of OECD countries, [Golden and Wallerstein \(2011\)](#) provide newer estimates but make a distinction between the 1980s and the 1990s: in the former decade, decreasing union density and centralization were identified as key factors of increasing wage dispersion, whereas these factors were no longer significant in the 1990s and were replaced by trade and social expenditures as explanatory factors. [Cassette et al. \(2012\)](#) found union density and union concentration to be significantly negatively associated with earnings inequality for a set of 10 countries for a period of 25 years (up to 2005). Such a finding is also reported by [Burniaux et al. \(2006\)](#), although it is limited to particular inequality indexes. On the other hand, [Mahler \(2004\)](#) finds no effect of union density but a significant and negative effect of wage coordination on earnings inequality for a set of 13 OECD countries over the two decades 1980–2000.

[Koeninger et al. \(2007\)](#) found changes in a set of labor market institutions explained as much as trade and technology: EPL, levels and duration of benefit replacement rates, union density and the minimum wage were shown to negatively affect the wage differential. [Checchi and Garcia-Penalosa \(2005\)](#) identified three types of labor market institutions as essential determinants of wage differentials: union density, the unemployment benefit and the minimum wage. Declining minimum wages also have been found to increase wage dispersion, mainly at the lower end of the distribution ([Dickens et al., 1999](#); [DiNardo et al., 1996](#); [Lee, 1999](#)).

The [OECD \(2011\)](#) considers a range of labor market institutions and regulations as possible explanatory factors for increased earnings inequality in 23 OECD countries up to 2008. The weakening in these institutions and regulations since the 1980s was shown to widen the wage dispersion among workers: (i) the effect of EPL is entirely driven by weakening EPL for temporary workers, whereas EPL for regular workers had no significant effect. Furthermore, EPL had more of an impact on the lower than the upper half of the earnings distribution; (ii) lower unemployment benefit replacement rates for low-wage workers (but not for average-wage workers); (iii) decreases in union coverage, which predominantly affected the upper half of the earnings distribution; and (iv) and lower taxation of earnings (tax wedge).

Effects of changes in product market regulation are generally not included in analyses of inequality but rather are considered in studies of employment effects (e.g., Nicoletti and Scarpetta 2005; Bassanini and Duval, 2006; Fiori et al., 2007). However, it can be expected that these regulations had a larger role in wage dispersion. The OECD (2011) showed that declining PMR contributed significantly to a wider wage dispersion, in particular at the lower half of it. This is consistent with the view that PMR tends to reduce market rents available for unions to capture through collective bargaining (Nicoletti et al., 2001); this leads to a decline in union power (or more decentralized bargaining), which in turn results in greater wage dispersion.

Combining the results of the effect of institutions on wage dispersion with additional ones on employment, the OECD (2011) estimated the overall effects on earnings distribution among the entire working-age population. It turns out that wage dispersion and employment effects often were off-setting and led to undetermined estimates of the effects of institutions and regulations on overall earnings inequality, with one exception: weaker employment protection among temporary workers, which is estimated to have an overall disequalizing effect.

19.5.3.2 Income Inequality Effects

Some studies provide estimates of the direct effect of institutions on (gross or net) income inequality, in particular Checchi and Garcia-Penalosa (2005, 2008) and the ILO (2008). All three studies cover a set of 16 OECD countries for a period up to the early 2000s. Checchi and Garcia-Penalosa (2005) identify union density, the tax wedge and unemployment benefits as major determinants of higher income inequality, whereas the effect of minimum wages is only marginally significant. The overall effect of stronger institutions is estimated to reduce income inequality, partly through wage compression and partly through a reduction in the rewards for capital. For a smaller sample of seven OECD countries, Weeks (2005) estimated decreasing union density as a strong predictor of increased gross income inequality.

Based on a different set of data that allows several income concepts to be investigated, Checchi and Garcia-Penalosa (2008) suggested only a weak role for institutions in determining factor income inequality. A stronger effect occurs when considering disposable income inequality, particularly for unemployment benefits and EPL (negative) as well as tax wedge (positive), whereas union density, wage coordination and minimum wage remain insignificant. The fact that the tax wedge is estimated to increase income inequality (including factor income inequality) runs counter to some of the evidence summarized earlier. Checchi and Garcia-Penalosa (2008) put forward that high-wage workers may be better able to pass tax increases onto their employers than low-wage workers and that a high tax wedge can increase unemployment.

Results reported by the ILO (2008), based on Baccaro (2008), show that trade unionism and collective bargaining are not significantly associated with within-country

inequality, except in the central and eastern European countries.⁵⁴ Rather, economic factors such as technology-induced shifts in the demand for skilled labor and increases in FDI shares seem better predictors of increasing inequality. This nonsignificance of institutional factors also holds for the enlarged sample of 51 countries going beyond the subsample of the 16 OECD countries. Evidence for 14 OECD countries, presented by Mahler (2004), is quite the opposite: union density and wage coordination were found to have the strongest negative relationship with disposable income inequality, whereas indicators of economic globalization (imports, outbound investment, financial openness) were found to be insignificant.

19.5.4 Political Processes

A great deal of the political science and of the policy literature is concerned with the effects of inequalities and how they can be mitigated in various societies. For this chapter, however, it is the other direction that is interesting: mechanisms of how various political arrangements (voting, electoral institutions and representation in political parties, interest reconciliation and employer–employee relationships) affect inequality. The core question is, therefore, How and to what extent can political factors account for the variability of inequalities across countries and over time? How much of the cross-country and over-time variance of inequality can be explained by political determinants (agency,⁵⁵ institutions or policies)?

The explanation of inequalities by political institutions has to start from the actual level and structure of inequality itself (initial or t_1 distribution). Then the degree of change achieved by institutions and policies—how they modify the social setting and transform it into a new system of inequality (end result or t_2 distribution)—is subject to study here. The assumption is that the objective position in the income distribution defines preferences over redistribution, which is aggregated in the political process, the end of which, in turn, is a change in income distribution. This is, no question, a loop in the line of reasoning, indicating a circularity in the arguments. This is a difficult issue for empirical research and, although recognized by many, few have offered convincing solutions to it.

We classify the channels of this transformation into three groups: (i) democratic representation and partisan politics, (ii) interest groups and lobby organizations and (iii) redistributive policies of the state (governments). From a different angle, we are concerned with the demand for and the supply of policies, mediated by the political process itself. Below we turn to these in detail.

⁵⁴ Bradley et al. (2003) also report the “absence of any significant effect of wage coordination on pre-tax and transfer inequality” (p. 216) for the 61 countries they investigated.

⁵⁵ There is no question that agency (political leadership) may exert influence on the shape of inequality, especially for shorter periods and especially in countries where the political system allows for a larger role of personalities. This happens in fully democratic states, less democratic states and nondemocratic environments, in “normal” democracies and in populist regimes. Nevertheless, dealing with the role of political personalities would stretch beyond the scope of this chapter.

19.5.4.1 Preference Formation and Partisanship

19.5.4.1.1 General Frame of Understanding

The most commonly used general frame for understanding the politics of redistribution in democratic societies is offered by [Meltzer and Richard \(1981\)](#), originating from a Downsian definition of political competition and democracy ([Downs, 1957](#); see also [Romer, 1975](#)). In this setting politics is about redistribution only, and the extent of redistribution is defined by electoral politics only. The aim of parties is to win elections. It is assumed that in majority voting systems (where the winner takes all) the party that is able to attract the vote of the median voter—the median being defined in terms of the dimension in which the political agenda stretches the political spectrum (incomes, political opinions, etc.)—wins. For voting on taxes and redistribution, the spectrum is, by definition, defined by the level of incomes/wealth. Voters, who by their material wealth/incomes occupy the full continuum of the income distribution, vote over the general tax rate, which provides resources (public funds) for redistribution. If the pivotal voter is the same as the person with a median income (which is not necessarily the case), on the assumption of self-interest he or she would prefer more redistribution (higher taxes) than a person with an income above the median. An increase in inequality can be gauged by the increased distance between the median and the average income. The demand for redistribution in period t_2 , therefore, is assumed to be linked to the extent of inequalities in period t_1 . Under the Meltzer and Richard (hereafter MR) paradigm, greater inequality leads to higher social spending and results in larger redistribution. This would imply a higher level of redistribution in countries with greater inequalities to start with. To put it differently, multiparty democracy, as described above, would produce an equalizing self-correction mechanism, leading to larger redistribution in those countries where inequalities are larger. The prediction, therefore, is that the variance of inequalities are, at least to some extent, dependent upon the essential features of democracy.

There have been many tests of this proposition, contrasting levels of inequality with levels of redistribution, with varying results. As an empirical test, for example, [Milanovic \(2000\)](#) found that there is a consistent association between gross household income inequality and more tax/transfer redistribution in a set of 24 democracies in the period of the mid-1970s to the mid-1990s. Also, [Mahler \(2008\)](#) found support for the MR propositions after refining definitions of original inequality and redistribution.⁵⁶ [Mahler \(2010\)](#) found a positive relationship between pregovernment inequality and government redistribution on the basis of observations of 13 OECD countries. [Mohl and Pamp \(2009\)](#) stated that there is a nonlinear relationship between the two. They concluded that at very high levels the positive relationship between inequality and redistribution is reversed. The argument for the reversal stresses the role of Director's law, that is, that redistribution

⁵⁶ When, however, it is not the status (democratic preference aggregation via representative democracy) but the process itself (say, transition from nondemocracy into democracy) that is observed, [Nel \(2005\)](#) did not find support for the median voter hypotheses (despite careful definitions of the variables used).

may go from the ends to the broadly defined middle class (ranging from the 20th to the 80th percentile).⁵⁷

Contrary to the above findings, and partly because of lack of appropriate data or improper specifications, many of the tests of the link between initial inequality and redistribution could not reach conclusive results. (For reviews of various aspects of the MR model and its propositions, see [Alesina and Giuliano, 2009](#); [Borck, 2007](#); [Guillaud, 2013](#); [Keely and Tan, 2008](#); [Kenworthy and McCall, 2007](#); [Lübker, 2007](#); [Lupu and Pontusson, 2011](#); [McCarty and Pontusson, 2009](#); [Mohl and Pamp, 2009](#); [Olivera, 2014](#); [Osberg et al., 2004](#); [Senik, 2009](#).)

A potential reason for the inconclusiveness of the literature may be that, as [Robinson \(2009\)](#) put it, “The model does not predict a simple positive relationship between inequality and redistribution across countries since there are many differences between countries which may be correlated with either the demand or supply of redistribution at a particular level of inequality” (p. 28). Also, it can be expected that in high-inequality countries with badly performing institutions, any income that is taxed away is likely to be wasted by corruption or diverted by elites, and this will reduce the demand for redistribution. Also, in general, MR would mean that extension of the franchise will increase redistribution, that is, democratization of the political regimes brings about lower levels of inequalities. However, while the equalizing effects of democratization seem to be shown in many cases, they might not be automatic (see [Galbraith, 2012](#); [Nel, 2005](#); [Robinson, 2009](#)).⁵⁸

In what follows we go through some relevant assumptions and predictions and use the MR proposition to structure the line of reasoning here, acknowledging the fact that some alternative suggested theoretical papers (most notably [Iversen and Soskice, 2006](#) and to some extent [Moene and Wallerstein, 2001](#)) suggest different frames and sometimes diametrically different conclusions. We start from the micro (assumptions on the motivational base of voters) and move to the macro level (such as features of electoral systems).

⁵⁷ When referring to a “pregovernment” situation, one needs to keep in mind that the data relate to incomes before taxes and transfers in the presence of government. The “before redistribution” inequality is affected by the existence of the government, and it is quite possible that this is greater than the inequality that would be found if the government were not present.

⁵⁸ A more recent attempt to trace inequality paths among 30 developed societies points out that countries experiencing democratization in central and eastern Europe followed very different paths in terms of inequalities. While all belonged to the lower end of the inequality spectrum in the 1980s, they ended up at very different parts of the European “league table” in the late 2000s: Slovenia and the Czech and Slovak Republics at the bottom and the Baltic states on top, while the rest lie in between. The experiences of Spain, Portugal and Greece, where the ending of the dictatorships went hand in hand with inequality decreases, therefore, have to be balanced against the experiences of the central and eastern European countries in further comparative research ([Tóth, 2014](#)). However, a major difference between the Mediterranean and central and eastern European transitions was clearly that, in the latter group of countries, transition also implied marketization and liberalization, in contrast to countries in southern Europe where the role of the state changed albeit less in scope.

A simple presentation of the potential links between inequality, redistribution and intermediate processes is shown in Figure 19.2 (following Tóth et al., 2014). As indicated in Figure 19.2, there are potential mediating mechanisms on both the micro and the macro levels. On the one hand, personal attributes and perceptions might have an effect on individual redistributive preferences and, on the other, the institutional mechanisms that translate preferences to policy actions. Determinants of political participation shape the ratio and the composition of voters, and the activity of the civil society matters a lot in policy decisions. Finally, it is clear that the ways in which (and to what extent) attitudes of voters will, via the machinery of politics, shape policies depend to a large extent on various institutions (political and executive alike).

19.5.4.1.2 Motivations, Expectations and Values of Voters

To understand the mechanisms of the micro determinants of votes over redistribution is crucial and has to be linked more closely to the political science literature. However, a large number of empirical studies are already available and provide more understanding of the characteristics and *motivations* (from the redistribution perspective) of citizens belonging to various parts of the income distribution. Various studies show that although it exists, the correlation linking material position and attitudes regarding the welfare interventions of the state is far from perfect. Some attempts to identify reasons for the

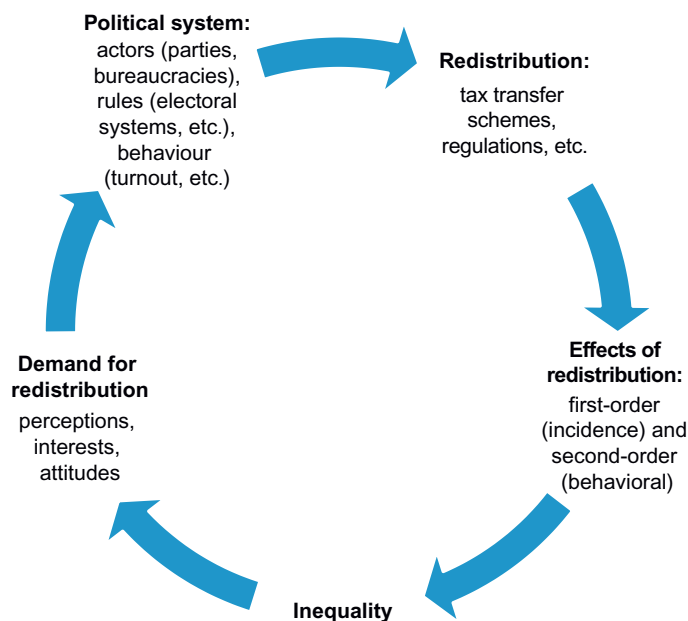


Figure 19.2 Theoretical links of the political processes involved in the determination of income distribution. Source: Tóth et al. (2014)

“deviations” (i.e., the observation that some of the relatively richer voters will be pro-redistribution while others with below-median incomes may not be supportive) stress that it is not only the current economic position but also the expectations concerning economic prospects that matter (see [Bénabou and Ok, 2001](#) and [Ravallion and Loskhin, 2000](#) for prospect for upward mobility; see [Alesina and Fuchs-Schündeln, 2005, 2005](#), [Piketty, 1995](#) or [Guillaud, 2013](#) for social mobility experiences and expectations based on these⁵⁹).

Others stress the role of socialization into general *value systems* either in the frame of the overall sociopolitical environment, such as a socialist past, or simply ideological systems or family traditions ([Kelley and Zagorski, 2004](#); [Corneo and Grüner, 2002](#); [Fong, 2001, 2006](#); [Alesina and Fuchs-Schündeln, 2005](#); [Gijssberts, 2002](#); [Suhrccke, 2001](#)). These are, in many cases, not temporary but long-lasting cultural differences, sometimes transmitted over generations ([Alesina and Fuchs-Schündeln, 2005](#); [Luttmer and Singhal, 2008](#)). Also, the beliefs about the fairness of the economic system and about the rules of the game of “getting ahead” in society seem to be important determinants of the acceptance the actual level of redistribution or a demand for more of it ([Fong, 2001, 2006](#); [Alesina and La Ferrara, 2005](#); [Alesina and Glaeser, 2006](#); [Osberg and Smeeding, 2006](#); for a recent review of the literature on inequality and justice perceptions see [Janmaat, 2013](#)).

Finally, it is not simply general views and attitudes but also personality traits that can matter. A hypothesis of how these attitudes come about is presented by [Tepe and Vanhuyse \(2014\)](#). They found that personality traits in some cases strongly determine welfare attitudes, even after controlling for class, sociodemographic variables and even socialization.⁶⁰ Moreover, they show that some traits such as conscientiousness, openness and extraversion are conditioned by communist regime socialization (when comparing the Eastern and Western Länder of Germany, similar to [Alesina and Fuchs-Schündeln, 2005](#)).

19.5.4.1.3 Reference Groups and Heterogeneity of Voters

Inequality is often measured by various indices reflecting the whole income distribution (most commonly by the Gini coefficient but also by various other variance-based measures). Putting these into the right-hand side of regressions is, however, problematic in political economy models. It cannot be reasonably assumed that voters have the same image of inequality that is provided by any of these rather complicated measures. It is a much more plausible assumption that voters think of social distances, define proximity to other voters, etc. The idea of social affinity (an acknowledgement of those groups who

⁵⁹ As for the measurement of and trends in actual income (and social) mobility, Chapter 10 of this book provides an exhaustive overview.

⁶⁰ As an example, the research of [Tepe and Vanhuyse \(2014\)](#) suggests a positive relationship between agreeableness and support for the state’s role when unemployed, a negative relationship between openness and support for governmental responsibility for the family and a positive association between conscientiousness and governmental responsibility for the elderly.

are the closest to the assumed decision makers) was raised by [Kristov et al. \(1992\)](#). For political economy models of redistribution the idea has been applied by [Osberg et al. \(2004\)](#), [Lupu and Pontusson \(2011\)](#), [Finseraas \(2008\)](#) and [Tóth and Keller \(2013\)](#). Empirical tests show that that the actual level of inequality (and, more importantly, the structure of inequality as measured by the distance between the middle classes and the poor) also drives attitudes towards redistribution. There seem to be convincing examples that the relative position of the middle—which might cover also the pivotal voter in elections— influences public spending priorities (and coalition formation). As [Lupu and Pontusson \(2011\)](#) showed, a greater dispersion in the lower half of the earnings distribution (as measured by the P50/P10 ratios) is consistently associated with less redistribution in a sample of 15 advanced democracies. A more prominent skew of the redistribution (meaning middle classes being positioned closer to the poor) would result in more redistribution in their sample. [Osberg et al. \(2004\)](#) also showed that the structure of redistribution matters, but in a different way: they found that inequality between the top and the middle of the distribution (measured by the 90/50 ratio) has a large and negative effect on social spending, implying that the top may have more room for opting out of public services in the case of larger inequalities.

19.5.4.2 The Issues at Stake: Different Forms of Redistribution

The assumption of the basic MR model is that there is only one type of redistribution (vertically transferring money from the rich to the poor). The original model is even more simplistic: it specifies a uniform tax rate levied on the above-average-income voters on the one hand and a lump sum amount handed over to the lower segments of the distribution. Actual redistribution programs are, however, more sophisticated. As [Moene and Wallerstein \(2001, 2003\)](#) pointed out, distinction between insurance-type programs (in which participants seek provisions against income losses at bad times) and redistribution programs involving taxes on the rich to benefit the poor has to be made. They suggest (and offer empirical evidence to support the suggestion) that while the demand for vertical redistribution is negatively correlated with income, the demand for insurance is positively correlated (and in some situations these two effects might even cancel out each other). This might indeed have a sizeable effect on the actual distributive outcomes.

In his review of the literature, [Borck \(2007\)](#) summarized various types of redistribution and classified the literature according to this differentiation. The first and most obvious direction is redistribution from the rich to the poor; models underlying social preferences, upward mobility and voter mobilization (see above) point to the direction of causation from increased inequality to increased vertical redistribution. There are, however, other types of redistributive mechanisms, such as spending programs, that entail transfers from the poor to the rich. This might be the case when there is public provision of private goods, education or insurance. In these cases the state/public budgets may effectively be subsidized by the poorer income groups. Finally, the public provision of private goods or the

operations of public pension schemes might represent a case for the so-called Director's law: when the tails of the distribution are expropriated by the middle (for other reviews, see [Mohl and Pamp, 2009](#); [Mahler, 2010](#); [Alesina and Giuliano, 2009](#)).

Another issue regarding the definition of redistribution relates to the income concepts used for measurement. Obviously, simply associating Gini coefficients after taxes and benefits with the size of the public social budgets is erroneous because it conflates the right- and the left-hand sides of the equation. Based on LIS data, [Kenworthy and Pontusson \(2005\)](#) refined the definition of redistribution. They proxy redistribution by a difference between the Gini of disposable household incomes (after taxes and benefits) and the Gini for market incomes (before taxes and benefits). This helps them show (on both cross section and on country time series data) that an increase in market income inequality correlates with an increase in redistribution (see similar results from [Immervoll and Richardson, 2011](#)).⁶¹ This finding about the over-time, within-country variation of redistribution as a response to inequality is in broad agreement with what is suggested by the MR proposition. What makes a difference between countries, however, is the elasticity with which the welfare states react during the period they observe (varying spells in the 1980s and 1990s) an inequality increase.⁶²

An additional empirical characteristic of electoral politics is that sometimes parties do not simply play the cards of (vertical or insurance-type) redistribution in elections. They often try to make political space multidimensional, sometimes introducing issues that create divisions orthogonal to the vertical income differentiation. Campaigns often are about complex packages, and "issue bundling" might easily place the median voter at a part of the income distribution different from the median income ([Roemer, 1998](#)). This might, in concrete circumstances, be a strategy to target parties on the Right of the political spectrum (because they are interested in diverting the electorate away from issues that motivate the lower-income groups), but issue bundling may sometimes also be in the interest of Left parties.⁶³

19.5.4.3 Political Inequality: Unequal Participation in Elections

The prediction of higher redistribution in the case of higher inequality also assumes full (or at least uniform across income groups) participation in elections. This, however,

⁶¹ A special note is needed here. Increased redistributive effects of given welfare state measures may be detected induring periods of increasing market income inequality, even in the absence of any changes in redistribution instruments such as taxes and transfers. We turn back to this in [Section 19.5.5.1](#). Also, see [Immervoll and Richardson \(2011\)](#).

⁶² Also the choice of the country universe in this case can clearly make a difference in results. OECD comparisons (see, e.g., [OECD, 2011](#)) tend to show a great deal of sensitivity of the results to the inclusion of lower-income OECD countries (such as Mexico or Chile).

⁶³ A further analysis of issue bundling would reveal how politics and policies that are not directly aiming inequalities could have important effects on actual developments in income distribution. This way of taking account of secondary effects, by-products and unintended consequences of party politics would, however, go beyond the scope of this chapter.

generally does not hold empirically.⁶⁴ Therefore, differential voter participation might alter aggregate redistributive preferences. If the middle classes participate more than the poor, then parties may seek to represent the interests of relatively higher-income voters. In another dimension, greater participation of older voters can induce more party promises for pension expenditures compared with family-related expenditures. Therefore, empirics of the actual redistribution might differ from predictions based on uniform participation. (See more on participation in [Kenworthy and Pontusson, 2005](#); [Larcinese, 2007](#); [Pontusson and Rueda, 2010](#).)

An important note by [Kenworthy and Pontusson \(2005\)](#) and, especially, by [Pontusson and Rueda \(2010\)](#) is that the mobilization of voters is a crucial issue in how inequality translates into politics of redistribution. Political inequality (at least in terms of participation in elections) may play a major role in policy formation. Because the low-income voters who might be motivated in larger redistribution may not be sufficiently activated during elections, redistribution might be lower than predicted by “objective” inequality. [Pontusson and Rueda \(2010\)](#) also point out that there is a need to differentiate between core constituencies of the Left (and Right) parties, in addition to the positions of the median voters who, in proportional representative (PR) systems at least, can be considered swing voters. Their major finding is that the extent to which Left parties take up the issue of redistribution also depends on the general mobilization of low-income citizens. To put it differently: if the “demand” for redistribution is represented by a larger appearance of the low-income segments in the polls, the Left will react to it by offering more redistributive policies. This, of course, cannot fully be treated as exogenous; therefore, party politics for differential mobilization of their core constituencies (especially on the Left) might have an important effect on redistribution. This issue is discussed further in the next section ([Section 19.5.4.4](#)) on political institutions.

[Mahler \(2008\)](#) introduces two factors into the analysis: the level of electoral turnout and the degree to which turnout is skewed by income. When these factors are taken into account, the predictive power of the MR model is significantly improved. He found the link to be especially strong for the lower and the middle parts of the income distribution and when social transfer policies are at stake as opposed to tax policies. In a later and more refined formulation, [Mahler and Jesuit \(2013\)](#) showed that political participation (most notably union density) is positively related to redistribution, especially when the share gains of the lower middle classes are considered.

⁶⁴ Full participation should not even be assumed theoretically. Following [Downs \(1957\)](#) and [Olson \(1965\)](#), it is shown and accepted in mainstream political economy thinking that voters are perfectly rational not to participate in elections, while it is also rational for rich voters/small interest groups to lobby and fund parties (see [Olson, 1965](#)). For an overview of what political economy reasons can be found behind insufficient performance MR-type and other “economistic” approaches to politics that work via “the market for votes” analogies, see [Vanhuysse \(2002\)](#).

19.5.4.4 *Political Regimes and Partisanship*

For a broader understanding of the effect of political dynamics on income distributions, it is worth starting with a consideration of the effect of general political regimes—most notably democracy—on inequality. As stated by Galbraith (2012) in a review of many propositions, it is difficult to establish clear conclusions. Classifying political regimes into democracies and nondemocracies does not help much. Some nondemocratic (communist or Islamic) regimes can have more egalitarian distributions than others. Of course, long-serving, established social democratic regimes of the twentieth century are associated with lower-level inequality, but causality may run in either direction. Finally, there are numerous examples when the transition to a more democratic regime is paralleled by an increase rather than a decrease of inequality (consider the case of central and eastern European countries experiencing post-communist transitions) (Galbraith, 2012; Tóth and Medgyesi, 2011; Tóth, 2014).

Second (and more generally), because various “welfare regimes” (the term coined by Esping-Andersen, 1990 in classifying the overall characteristics of the European welfare systems into three types of welfare regimes à la Esping-Andersen) are so embedded in general socioeconomic and sociopolitical settings, partisanship (normally meaning parties staying in an executive position for one or two election terms) cannot really achieve fundamental changes in the operation of an overarching institutional setting. Both of these considerations lead us to an analysis of not only the general frames of the political regimes, such as representative democracy, but also to elements of these (such as partisanship, ideologies, corporatist institutional settings).

A large tradition of the political science literature associates redistribution to the relative strength of the parties representing the working class in elections. Social democratic parties have long governed some democracies with large public spending, although their socioeconomic foundations have declined with the large sectoral shifts in economies following the two consecutive crises in the 1970s. However, the power resources theory (PRT) is an influential paradigm in explaining redistribution, arguing that the extension of the welfare state largely depends on the ability of the parties representing labor to mobilise lower-income voters (Korpi, 2006; Korpi and Palme, 2003).

Bradley et al. (2003), using a panel of 19 OECD countries, attempt to explain what determines “initial” income distribution and what are the results of redistribution and provide support for the central hypotheses of the PRT. They stress that high unemployment, low union density and a large proportion of households led by women are associated with high inequality before taxes and transfer. For the reduction of inequality (i.e., the effectiveness of the welfare state redistribution) they identify the existence of Leftist government (either directly or indirectly via other variables related to partisan politics) as statistically significant (and strong). As they conclude, “leftist government very strongly drives the redistributive process directly by shaping the redistributive contours of taxes and transfers and indirectly by increasing the proportion of GDP devoted to taxes and transfers.”

Iversen and Soskice (2006) allow for heterogeneity of parties (assuming separate, exclusive representatives of high-, the middle- and the low-income voters). They also allow coalitions between the representative parties, and they differentiate between PR and simple majoritarian electoral systems. Their proposition is that majoritarian systems tend to redistribute less because they tend to favor centre-Right governments (as a result of the interplay of the coalition game under constraints of the potential taxability of the three major income groups). Note, however, that Iversen and Soskice (2006) do not build on assumptions about the relationships of the mean and the median incomes (i.e., about the level of inequalities in the society), nor about the position of the median voter in the income distribution (i.e., about the effect of political mobilization on political coverage of the full income spectrum). Their assumed parties are, however, class parties representing the various income groups. The core element of the argument is the nontaxability of high-income groups and the uncertainty about the potential to enforce pre-election party commitments after a coalition is formed.

Some empirical accounts of the political dynamics and its effects on inequality challenge the usefulness of the traditional notions of Left-Right differentiation, and they also add to a more balanced understanding of the meaning of various “regimes.” As Rueda (2008), for example, stresses in his study of 16 OECD countries, in regimes where the underlying socioeconomic structure is characterized by corporatism (a broad, concentrated, institutionalized and informal system of bargaining and interest reconciliation between social partners, state bureaucracies and political parties), a small part of the discretion over, for instance, wage policies remains in the hands of partisan politics—hence the nonsignificance of the partisanship variables in explaining income distribution. In addition (as also put forward by Rueda, 2008), Left parties may (contrary to their general image) not always represent the full “labor side” of the economy. Rather, they may be more concerned with “insiders” (the employed, in this case) of the labor market rather than the “outsiders,” who may wish to enter the labor market but are not (yet) there. With outsiders’ interests being overlooked, inequality of overall incomes may increase even in periods of Left governments.

Rueda and Pontusson (2000) analyze four relevant political-institutional variables to explain (wage) distribution in a set of advanced countries⁶⁵: in addition to the partisan composition of government, they measure unionization rates, centralization of wage bargaining and the size of the public sector. They observe the effect of these variables in two different broad institutional contexts: social market economies (SMEs) and in liberal market economies (LMEs), as defined by Hall and Soskice (2001). The former setting is characterized by comprehensive, publicly funded welfare systems, heavily regulated labor markets and institutionalized wage bargaining systems. They find that these two distinctive general settings do have an effect on wage formation and distribution. Except for

⁶⁵ To account for broader socioeconomic variables, they control for participation of women in the labor force and unemployment rates.

unionization, for which the above broader institutional settings are not significant (higher unionization has an equalizing effect in both regimes), the effect of the other observed institutional variables differs in the various variations of capitalism (i.e., between SMEs and LMEs). The finding that the effect of a partisan composition of government varies among sociopolitical regimes (it matters in LMEs but not in SMEs) is also important in understanding the working of the median voter theorem, as specified in the previous section.

In a subsequent study [Pontusson et al. \(2002\)](#) also found that higher levels of unionization and wage bargaining and larger shares of public sector employment reach their equalizing effects primarily by improving the relative position of unskilled workers (who constitute the lower tail of the distribution), but partisanship (most notably the participation of the Left in government) has an equalizing effect on the upper end of the distribution by constraining the wage growth of the highly skilled. In centralized wage bargaining systems the Left governments seem to be successful in controlling changes at both the upper (taxation, etc.) and the lower (minimum wages, etc.) tails of the wage distribution.

Reflecting the fact that parties traditionally considered “Left-wing” became increasingly heterogeneous in their ideological beliefs and policies throughout the last decades, [Tepe and Vanhuysse \(2013\)](#) reclassify them by reweighting their nominal positions with their ideological stances/declarations in their party manifestos (data taken from the Comparative Manifesto Project). Also, the same authors aimed to identify strategies of Leftist parties and of trade unions with regard to their effect on EPL (assumed to favor insiders) and active labor market policies (ALMP; assumed to favor outsiders). Analyzing data from a sample of 20 OECD countries between 1986 and 2005, they found (in line with [Rueda, 2008](#)) that the Left party power variable has no effect on outsider-favoring ALMP spending in general and a negative effect on job creation programs (which contradicts what PRT theorists suggest). However, as they emphasize, larger and more strike-prone unions tend to increase ALMP spending overall, specifically in those dimensions that help their members: employment assistance and labor market training ([Tepe and Vanhuysse, 2013](#)).

19.5.5 Redistribution Via Taxes and Transfers: Technical and Efficiency Aspects

The question of why and in what direction redistribution changes the pre-tax and pre-transfer income distribution depends largely on the interplay of various political forces that are able to influence the political process. The question of how and with what effectiveness it happens is more of a technical nature. This section describes some aspects of effectiveness, many of which are not straightforward right from the outset.

The identification and measurement of redistribution presupposes a counterfactual that exists before the redistributive action of transferring money from taxpayers to benefit recipients takes effect. However, the pretransfer distribution already is influenced by regulatory acts (relating to interhousehold transfers such as alimony and others such

payments, to employer–employee relationships such as regulations of wages or working conditions, to supply and demand in various markets such as rent control in housing markets, etc.), the operation of which contributes to the shape taking place before conventionally defined income distribution starts to be measured.⁶⁶ Further, the features of “pre-redistribution” are embedded into a broader context such as informal norms of responsibility over the welfare of others (younger or older family or local community members, the poor or the handicapped, etc.); the actual role of such forms of informal solidarity varies across countries. These caveats need to be mentioned at the outset, although no extensive coverage can be given to them in what follows.

Broad forms of redistribution (and of welfare states) can be classified into two categories: the “piggy banks” and the “Robin Hoods” (Barr, 2001). The piggy bank approach puts the focus on smoothing consumption and on insurance against risks prevalent in various stages of the life cycle. In its ideal form it has an effect on life cycle distribution of incomes but does not lead to interpersonal redistribution. The other type (the Robin Hood approach) focuses is on redistribution between various social strata (most commonly from the rich to the poor).

Our image (and, even more, our evaluation) of the extent of redistribution is greatly affected by the perspective from which we see incomes and benefits. Consider the largest item—pensions—as an example. In actuarially fair pension insurance systems there is no interpersonal redistribution involved. Under given parametric regimes of accrual rates, retirement ages, compensation rates, etc., people save for income security during their old age. But putting this income transfer into a cross-sectional frame produces a false impression of the extent of redistribution between richer and poorer segments of the society at a given point in time. In the same vein, the perspective has to be clear when evaluating the redistributive role of sickness insurance, education finance (especially at a higher level), and many other fields.

Furthermore, for cross-country comparisons of income distribution, it should be made clear that countries differ in the mix of the characteristics described above (systems such as the Danish tax-financed welfare states are more the Robin Hood type, whereas Bismarckian systems and to a lesser extent the Beveridgean systems are more piggy bank types), although no really ideal types exist. However, changing the perspective also changes our images of the redistributive effects of the various welfare state arrangements. (See Whiteford, 2008 for more on this.) The extent to which welfare states focus on redistribution among versus between people in a lifetime perspective varies considerably (roughly half in Australia but two-thirds in the United Kingdom and four-fifths in Sweden, taken from a lifetime perspective; see Hills, 2004; Ståhlberg, 2007). This also hints to what extent we can expect welfare states to modify income distribution in a long-term perspective.

⁶⁶ This “counterfactual problem” in welfare state research has been discussed by Bergh (2005) and Esping-Andersen and Myles (2009). See also Lambert et al. (2010) and Förster and Mira d’Ercole (2012).

For explaining the distribution of current incomes (our focus in this chapter) it is mostly the Robin Hood–type welfare state activity that matters.⁶⁷ Among the many related issues (mostly treated in [Chapters 23](#) and [24](#) on antipoverty policies and micro-simulation, respectively), our focus remains on the effect of redistribution on incomes. We focus on the following questions.

- What overall first-order effect does redistribution have on (initial, cross-sectional, “virgin”) income distribution?
- What feedback/secondary effects of redistribution can be identified?

To measure redistribution, setting up a proper income accounting framework is crucial. The commonly used framework (see [OECD, 2008](#), for example, but earlier in [Atkinson, 1975](#)) starts from (1) factor incomes (i.e., gross wages, salaries, self-employment and property incomes, adding private occupational pensions to arrive at (2) market incomes, which are supplemented by social benefits, private transfers and miscellaneous cash incomes, resulting in (3) gross income, from which the deduction of various taxes (on wages and/or incomes, by employees and/or employers) results in (4) disposable cash incomes (see [Förster and Whiteford, 2009](#) for more on this framework). Attempts to measure redistribution compare various elements of the above to assess the immediate (direct, first-order) effects of redistribution.⁶⁸

19.5.5.1 Overall, First-Order Effects of Redistribution

After comparing pre-redistribution (market income) inequality to post-redistribution (net disposable income) inequality, [Whiteford \(2008\)](#) concluded that redistribution reduces inequality by roughly one-third of the “original” inequality (ranging between 45% in Denmark, Sweden and Belgium and some 8% in Korea [[Whiteford, 2008](#)]). These results refer to the entire population and thus include the effect of public pension transfers, which, as argued earlier, blurs the picture. The [OECD \(2011, 2013\)](#) showed that the redistributive effect of public transfers and taxes for the working-age population—thereby excluding public pensions to a large extent—amounted to, on average, little over a quarter across OECD countries in the late 2000s, reaching close to 40% in some Nordic and continental European countries.

[Immervoll and Richardson \(2011\)](#) showed that redistribution (as measured by the difference between Gini coefficients before and after redistributive measures, whichever is appropriate) increased between the 1980s and the mid-2000s in general across the OECD. However, the pace of increase of market income inequality to a large extent

⁶⁷ Mostly, but not exclusively. Life cycle income smoothing mechanisms also have cross-sectional income distribution effects. Consider the immediate effect of pensions on the relative position of the elderly. However, social insurance instruments are better judged by their own standards: their ability to smooth consumption over the life cycle.

⁶⁸ Most empirical studies are, however, confined to the effect of cash transfers and direct income taxes. Publicly provided services (in-kind transfers) also play an important redistributive role. While the inequality reducing effect in general is lower than that of cash benefits, it is still sizeable and amounts, for instance, to on average 20% of OECD countries in the 2000s (see, e.g., [OECD, 2011](#); [Förster and Verbist, 2012](#)).

exceeded the increase of redistribution during the period. Especially during the periods between the mid-1990s and mid-2000s, the redistributive strength of tax benefit systems decreased in many countries (in the latter period the weakening redistribution contributing to inequality increased more than market income inequality increased in itself).

Regarding the redistributive effectiveness of the two sides (taxes on the one hand and expenditures on the other), the [OECD \(2008\)](#) and [Whiteford \(2008\)](#) found redistribution achieved by public cash transfers was twice as large as redistribution achieved by income taxes (except, among the whole OECD country range, the case of the United States, where taxes play a greater role). [Immervoll and Richardson \(2011\)](#) found that the effect of benefits on inequality was much stronger than social contributions or income taxes,⁶⁹ despite the fact that taxes and contributions were larger compared with household incomes.⁷⁰ Partly relating to this, the overall effect of the tax/benefit system on the various parts of the income distribution was found to be more prevalent in the bottom tail than in the top of the income distribution ([Immervoll and Richardson, 2011](#)).

Nevertheless, [Fuest et al. \(2009\)](#) highlighted that the differential effect of taxes and transfers on redistributive outcomes is sensitive to the methods applied. In their study of 25 EU countries on the basis of the 2007 wave of the EU-SILC survey, their analysis, following the traditional redistribution accounting framework (see [Förster and Whiteford, 2009](#)), confirms that benefits are the most important inequality-reducing factors. However, when applying factor decompositions described by [Shorrocks \(1982\)](#) (i.e., when determining what roles various factor components play in determining overall inequality), they concluded that benefits play a minor role (if any) in redistribution. This later procedure results in a much larger role for taxes and contributions in inequality reduction in almost all countries ([Fuest et al., 2009](#)). Among the explanations, they argue that while in a traditional accounting framework an equally distributed social transfer tends to have a positive effect on final inequality, to achieve a redistributive effect in a decomposition framework requires a definite negative correlation of transfers with incomes. There has, however, been criticism with regard to policy interpretation of results based on the decomposition framework, which estimates the contribution of equally distributed income sources to overall inequality, by definition, as zero. This is regarded as not being intuitive because a flat-rate benefit that is “added” to unequally distributed pre-transfer income would normally be expected to decrease inequality.⁷¹

⁶⁹ Similarly, [Mahler \(2010\)](#) also found a much smaller redistributive effect for taxes than for social transfers.

⁷⁰ The corresponding effective tax rate is measured by dividing all taxes paid by all pretax income (of households, for both items). The analysis by [Immervoll and Richardson \(2011\)](#) takes into account the country-specific interactions of taxes with benefits and legal differences in sequencing, for example, the fact that some benefits are taxable while others are not.

⁷¹ Another point is that the results by [Fuest et al. \(2009\)](#) are based on the coefficient of variation, which is highly sensitive to outliers at the top, and this mere fact can lead to somewhat misleading interpretations. In addition, the fact that in certain countries the EU-SILC is based on registers that better capture top incomes, the direct cross-country comparison of redistributive effects of benefits estimated by effects on a tail-sensitive measure can be another reason for caution.

Based on LIS data comparisons, [Lambert et al. \(2010\)](#) suggested at the outset that empirical literature on the relationship between income inequality and redistribution is inconclusive. Given the fact that pre-redistribution (i.e., pre-tax and pre-transfer) income inequality can, by definition, be counterfactual only, they suggest a method called “transplant and compare” for measuring the “true” effect of redistribution, independent of the starting level of inequality of the observed countries. When income tax systems are evaluated according to their own pre-tax/-transfer inequality baseline, redistributive effects of personal income taxes seem to be stronger in more unequal countries for most of the measures they applied. When harmonizing the baselines across countries, they found a weaker relationship.

Based on an analysis of an unbalanced panel of 43 upper-middle- and high- income countries for the period 1972–2006, [Muinelo et al. \(2011\)](#) put the issue of redistribution and inequality into a broader context. After estimating structural equations to model the role of fiscal policies in economic growth and inequality, they found that increasing the size of the public sector (defined as direct taxes and expenditures), while decreasing inequality, harms growth. However, the effect of indirect taxes on both growth and inequality was found to be insignificant. Public investment of general government as a share of GDP, however, is shown to have an equalizing effect without harming economic growth. For a more restricted data set (an unbalanced panel of 21 high-income OECD countries for the period 1972–2006) and with a different variables structure for fiscal policies, [Muinelo et al. \(2013\)](#) found a positive correlation between lower levels of inequality and the size of the public sector (defined in terms of expenditures and taxes per the GDP). They also found that an increase of distributive expenditures (public spending on social protection, health, housing and education) to reduce income inequality in high-income welfare states had no a clear harmful effect on growth. At the same time, they found that an increase in nondistributive expenditure (general public services, defence, public order, economic services) decreases economic growth while increasing income inequality, irrespective of the financing sources (direct or indirect taxes) of expenditures.

[Afonso et al. \(2010\)](#) attempted to estimate how effectiveness (success in achieving program objectives) and efficiency (the degree to which the use of available resources maximize their objectives) of public spending programs is achieved in various countries. According to their propositions, higher social spending is associated with a more equal distribution of incomes across the OECD countries. Southern countries are shown to perform less well in terms of efficiency than Nordic countries. For the Anglo-Saxon countries, output efficiency (the degree to which outputs can be maximized with given inputs) tends to be low, whereas input efficiency (the degree to which a given output can be maintained with decreasing inputs) tends to be high.

On the basis of an analysis of 25 OECD countries, [Goudswaard and Caminada \(2010\)](#) found that total public social expenditures have a strong positive effect on redistribution (and inequality reduction). At the same time, countries with higher private social

expenditures have lower levels of redistribution. When excluding services (health expenditures in their analysis), social expenditures (public and private) were shown to make a somewhat smaller contribution to inequality reduction. However, the effect of spending on services did not seem to have a strong effect on their results. The various elements of social expenditures have different contributions; public pensions have larger effects and unemployment benefits and labor market programs have smaller but still positive effects. The sign for private pensions was shown to be positive, implying an inequality-increasing effect.

19.5.5.2 Back to Politics: The Paradox of Redistribution

With regard to the effect of welfare spending on poverty and income distribution, an influential article by [Korpi and Palme \(1998\)](#) pointed out an apparent paradox: they found that targeted benefit systems may have achieved less redistribution than more universal ones, based on available data for the 1980s. [Kenworthy \(2011\)](#) confirmed this finding for the original 10 OECD countries Korpi and Palme analyzed for the 1985–1990 time span. However, Kenworthy showed that that this inverse relationship between targeting and redistribution has weakened by the mid-1990s and then disappeared by 2000–2005. With refinements of the measures, extensions of the country coverage and robust checks of sensitivity to alternative income definitions, [Marx et al. \(2013\)](#) argued that the claimed empirical relationship as such no longer holds. On the methodological side they indicated that the outcomes are not only sensitive to operationalization (i.e., definitions of the counterfactual) and data sources (such as differences between LIS and EU-SILC data) but also to the country selection (inclusion of southern and eastern European countries reveals patterns that are different from each other and also from the previously involved country groupings). On the policy side, they argued that the nature and effects of targeted programs also substantially changed as the decades elapsed (with more emphasis on incentives and changed focus targeting in-work groups started to enjoy more support from middle class electorates as well). With better data, more refined analytics and broader coverage, Marx et al. argued that it is the differential efficiency of various targeted programs and of different country experiences that has to be explained in future research.

Identifying and measuring inequality-reducing effects of redistribution may become prohibitively difficult in the frame of understanding of welfare regimes ([Esping-Andersen and Myles, 2009](#)). A full analysis should involve an analysis of taxes and transfer schemes and services, all analyzed simultaneously in a complex setting where state activities are embedded into general societal functioning, producing welfare outcomes jointly with the market and the family. Under these circumstances, the same egalitarian commitments of two different states may produce different results ([Esping-Andersen and Myles, 2009](#)). This makes systematic accounts very difficult, calling rather for analysis in a case study

fashion. It is therefore important to understand the nature and operation of welfare state interventions at a program level before generalizing to the level of welfare regimes.

19.5.5.3 Second-Order Effects of Redistribution: Labor Market Responses

The above findings may, however, misguide us in the understanding of redistribution if we do not pay attention to the fact that there are second-order effects that also have to be specified and analyzed. The immediate effects (as above) are “overnight” hypothetical gains to recipients (say, of social assistance) and costs to contributors (say, taxpayers). Groups on both sides may vary (according to what type of redistribution is at stake). However, redistribution can also induce second-order effects as actors when noticing changes in costs and benefits their actions will adopt (rich people may change the way they receive their incomes to lower their effective tax rates, whereas poor people might change their labor supply, etc.). Regarding second-order effects, there are many assumptions and fewer tests (except, perhaps, tests of the Laffer curve, assuming high elasticity of labor supply to changes in marginal tax rates).

When modelling second-order effects, [Doerrenberg and Peichl \(2012\)](#) found no significance for the progressivity of income taxes, concluding that, for tax variables, the second-order (behavioral) effects might be larger than they are for expenditures. [Niehues \(2010\)](#) concluded that increased specific targeting of low-income groups is not associated with lower postgovernment levels of inequality. From this, her indirect conclusion is that there might be second-order (potential disincentive) effects in the case of means-tested benefits. However, her analysis of the overall effect of social transfers shows strong equalizing effects that largely outweigh second-order effects.

[Blundell \(1995; and Blundell et al., 2011\)](#) examined potential effects of income taxation on labor supply (extensive margin [decisions to enter labor market from the outside] and intensive margin [work effort decisions of those already in the labor market]). They found that labor supply elasticities for women at both margins are larger than elasticities for men. The overview by [Blundell \(1995\)](#) lists a number of factors why individual labor supply responses to changes in marginal tax rates is very complex (fixed costs of work, life cycles aspects of savings, demographics and wealth accumulation, on-the-job human capital and seniority, the role of unions and collective bargaining, as well as benefit usage and effective tax rates). All these elements characterize the actual operation of the redistribution, making generalized judgements of the secondary effects of redistribution almost impossible. It is even more difficult to draw any further conclusions with respect to inequality effects, given the large number of corresponding assumptions in addition to the above (the interplay of behaviors/demographics and of the labor market effects and income effects, etc.).

Starting from the assumptions that labor supply elasticity is higher at the bottom than at the top and that higher redistribution may shift employers away from social responsibility, [Doerrenberg and Peichl \(2012\)](#) expect negative second-round effects of redistribution on inequality, that is, increasing inequality. However, in an unspecified panel of

OECD countries for the period of 1981–2005, they found that redistributive policies’ first-order effects (we might call it “overnight incidence”) remain dominant when taking into account the offsetting second-order effects (i.e., behavioral repercussions). They concluded that a 1% increase in public social spending reduces inequality in the order of 0.3% in magnitude overall. Care must be taken when interpreting the magnitude of second-order effects when they are attempted to be put into a conventional redistribution framework. Consider for example the case when market income inequality is contrasted with disposable income inequalities. The differences of the Gini coefficients calculated for these two elements may already entail behavioral reactions from the past and they may also provoke reactions in the future. Therefore, introducing the time dimension is important, especially for the understanding of the second-order effects.

19.5.6 Structural Societal Changes

There are a number of reasons why changes in social structure have direct (via changing composition and the changing relative sizes of various societal subgroups) or indirect (via changing behaviors) effects on income distribution. Below is a list of examples of both direct and indirect effects, in the order of the demographic groups in question.

In ageing societies, depending on the concrete institutional arrangements of the pension systems, the growth of the elderly population may contribute to lower aggregate income inequality, given the fact that in most pension systems the inequality between pensioners is smaller than inequality among the active-age population, but it may also contribute to higher inequality because pensioners, on average, have lower relative incomes. Also, the growing imbalance between social insurance recipients and social insurance contributors (or taxpayers) induces shifts in retirement ages—a fact that also has a direct consequence on pensions-to-wages ratios and, through this, on income distribution. Furthermore, the shifting of the age balance of the electorate affects the political power of the elderly who, in elections, may have a stronger voice on public expenditure preferences; this points towards the direction of the relatively better situation of the elderly compared with the income situation of the younger generations.

Another example is that changes in family structures can also have direct and indirect effects. The long-term trend of the breakup process of traditional large families results in a larger number of societal units with a smaller average size. The unit of analysis for income inequality (as opposed to wage inequality) is the household. The changing household structure in a country (decline in household size, breakup of traditional family forms such as the breadwinner model, etc.) affects the unit of measurement, and this may have an immediate effect on household inequality, even if there is no change at all in wage distribution. The same holds for changes in household composition by labor market attachment; for example, an expansion of female participation in the labor force, depending on the distribution of it, will itself alter distribution. In addition, and parallel to the breakup

of larger units, an additional strain on the welfare state may arise, given the duties of modern states in taking care of vulnerable citizens (should the breakup take the form of the increase of single-parent families and/or the share of elderly single households).

Further, a general education expansion (which was massive in the past 50 years in the OECD area) not only changes the structure of subgroups with higher and lower skills but also contributes to deeper societal trends: more educated voters might become more interested in politics, with stronger opinions on economic or social policies, etc. Related to this, the emergence of a broader or shrinking middle class not only has a measurement consequence but the middle class change might also induce behavioral and attitudinal consequences.

Finally, the change of the composition of the population by origin of birth as a result of international migration can lead to income distribution changes, depending, of course, on which parts of the income distribution of the recipient country the migrants enter. Also, changes in the attitudes or ethnic composition of societies might urge politicians to reflect these attitudes in changes in their policies.

While there are a large number of studies of some particular aspects of these trends, relatively few systematic accounts of the effects of social structures in income distributions are available. When assessing the role of population structure changes on summary measures of inequality, the [OECD \(2008\)](#) emphasizes that income inequality exists between and within demographic groups (of various ages or by sex, for example). That study presented simulation results, considering population demography as “frozen” at the start of the observation period (mid-1980s or mid-1990s, depending on the country) to show the independent effect of changing population composition on income inequality. This highlights that changes in demography (ageing and household structure change combined) contributed to higher income inequality in most countries. It also showed that the effect of the change of household structure seems to be larger than the effects of ageing. Changes in population structure were driven by the increase of single-parent households, a key trend in determining the overall demographic effects.

The effect of demographic trends on income inequality has been studied by a number of papers in the past two decades (see [Burtless, 2009](#) and [OECD, 2011](#) for an overview), but the number of systematic cross-national accounts is small. It has been shown for the United States (see [Karoly and Burtless, 1995](#); [Burtless, 1999](#)) that the increase in the share of single households was an important contributor to the increase of inequality. Similar trends were shown for Germany ([Peichl et al., 2010](#)) and Canada ([Lu et al., 2011](#)), although the latter was not confirmed by another study of five OECD countries (including Canada) by [Jantti \(1997\)](#).

Marital sorting or “assortative mating,” that is, the growing tendency that people are married to spouses with similar earning levels, can also contribute to higher inequality, which has been documented in a number of country-specific studies. [Schwartz \(2010\)](#), for instance, found that, for the United States, assortative mating contributed one-quarter

to one-third to higher earnings inequality among married couples, with the main contribution occurring at the top of the distribution. A review of some other country-specific articles by the [OECD \(2011\)](#) lists a number of studies showing that an increased similarity of spouses' earnings in households contributes to widened inequality ([OECD, 2011](#)) Cross-country evidence, however, is rare. The role of assortative mating can be illustrated by counterfactual simulations ([Burtless, 2009](#); [Chen et al., 2013b](#)). As these simulations show, assortative mating may have nontrivial effects on inequality. The [OECD \(2011\)](#) provides an overview of the literature, which indicates that a number of studies show that increased resemblance of spouses' earnings had an inequality-increasing effect, although there is a wide range of estimates as to the relative weight of this effect.

[OECD \(2011, chapter 5\)](#) looks into this issue from a broader perspective, analyzing the transmission of earnings inequality from individuals to households in 23 countries. Results drawn from primary-order decompositions show that labor market factors outweigh demographic factors for determining increased household earnings inequality by far; the major driver behind household earnings inequality is the increase of male wage dispersion (this contributes one-third to one-half to the overall increase of household earnings inequality). A second major factor, but one that works in the opposite direction, is the increase in women's employment in most of the countries under scrutiny. This had an off-setting, that is, equalizing, effect everywhere. Finally, demographic factors also are shown to contribute to inequality. Both the effects of the more widespread assortative mating and the change of household structure played a role, directing towards a larger inequality, though this effect was assessed ([OECD, 2011](#)) to be much more modest than labor market-related changes.⁷²

In their recent article, [Greenwood et al. \(2014\)](#) concluded that assortative mating increased between 1960 and 2005 in the United States, with an increasing effect on inequality; comparing inequality figures based on assortative mating with inequality figures based on random matching, the estimated difference increased considerably, implying that part of the inequality increase in the United States can be accounted for by increased marital sorting.

In his LIS-based analysis of 18 rich (mostly OECD) countries, [Brady \(2006\)](#) tested the effect of various structural factors on the lower tail of the income distribution. He found that an increase in employment in general, and female employment in particular, reduces income poverty. After controlling for institutional factors (welfare state variables) and economic factors, this was found to be the largest single item with the largest poverty-reducing impact. On the other hand, the growth in the share of the elderly population and the increase in the share of children in single-mother families had an effect on increasing the poverty headcount. When concluding, however, he stressed that the welfare state has a larger effect than structural factors.

⁷² The effects of assortative mating and other household structure changes taken together are estimated to count roughly half as much as the effect of increased male wage dispersion alone.

The equalizing effect of women's participation in employment also is documented in other recent cross-country studies. On the basis of a counterfactual analysis of 20 OECD countries, [Chen et al. \(2014\)](#) found that if female labor force participation had not increased in the past 20 years, household income inequality would have increased by 1 point more on average than it actually did.

[Esping-Andersen \(2009\)](#) pointed to the importance of demographic shifts in society, sometimes even counterbalancing the effects of large trends such as globalization and technology. The changing role of women in terms of increased labor market participation, domestic work, marriage and education has a large role in the formation of inequalities. As he argues, the process, characterized by women's commitment to longer work careers and to their increased participation in (higher) education, via more equal division of domestic work between spouses and a greater degree of assortative mating, leads to a lower level of inequality within the family (i.e., among men and women), but it also leads to higher level of overall inequality in the society. The latter trend is induced primarily by the fact that it is the higher-educated and higher-income women among whom the process runs first, leading to widening inequalities between women with higher and lower social status. From this it follows that observed cross-country differentials in income inequality also reflect the state of what he terms the "incomplete revolution" of changing gender roles ([Esping-Andersen, 2009](#)). A next step in this reasoning could be that because societies differ according to their dominant family patterns (the two extremes being the male breadwinner model/nuclear family on the one hand and a model characterized by dual earner models and shared domestic work on the other), so too do their inequality patterns differ. This conclusion remains to be proven by further empirical comparisons.

The effect of demographic and household formation changes in households have, in turn, different consequences for inequality and income dynamics, depending on the differential institutional structures in various countries. As [DiPrete and McManus \(2000\)](#) concluded in their US-Germany comparisons, the chances of individuals and households responding to "trigger events" (such as partner losses, unemployment, etc.) are different in institutional settings relying more on the market than in countries having more elaborate welfare arrangements. The effect of shifts in income and material well-being, triggered by household employment and household composition changes, is mediated by tax/transfer schemes as well as by private responses to these events. As DiPrete and McManus highlight, the relative role of labor market events, family change and welfare state policies in income dynamics also depends on gender.

The effect of migration on inequality in donor and in recipient countries depends on the skill composition of migrants and native populations, on the process and speed of integration of migrants into the host labor markets, on differential household composition of migrants and of natives, among other factors. Also, the balance of inward and outward migration and the institutional structure is of major importance. Not only the share but also the skill composition of migrants varies substantially across countries. This makes drawing general conclusions on the effect of migration on income distribution very

difficult (if not impossible). The effect—if it exists—is thus very much country and context dependent. The vast empirical migration analysis literature focuses on these elements on various target variables such as labor market outcomes, poverty and tax/benefit systems, but they very rarely have the ambition of modelling the full impact of migration on overall income inequality (Chen, 2013).

A few models, however, are formulated to reach some broad general conclusions. Kahanec and Zimmermann (2009) introduced a model with heterogeneous labor markets. Their prediction is that highly skilled immigration can contribute to a decrease in inequality in the receiving countries. The argument (although with many caveats about complementarities between skilled and unskilled labor and about institutional and social histories of the various country contexts) stresses that, in OECD countries where skilled labor is abundant, the degree of the labor market assimilation of immigrants into the host country is key in determining the true long-term effect of migration on inequality. There is a much less general conclusion that can be offered for unskilled migration. Kahanec and Zimmermann (2009) concluded that the effects can be expected to be ambiguous.

As a conclusion of a thorough literature review, Chen (2013) identified a number of challenges for the assessment of the effect of migration on inequality. As he concludes, most assessments are partial (focus on relative wages rather than on the full distribution) and mostly cross sectional (and, as such, overlook the earnings potential and lifetime earnings of migrants). The review suggests building integrated micro-/macrosimulation models to assess the full effects of migration on income inequality.

19.6. CONCLUSIONS: MAJOR FINDINGS FROM THE LITERATURE SURVEY AND IMPLICATIONS FOR FURTHER RESEARCH

19.6.1 A Summary of Findings and Propositions from the Overview of Studies Providing Multicausal Explanations

This section summarizes the main findings presented above from the most important recent studies that provide multicausal explanations and provides a combined analysis of the relative weights of the various arguments set out in Section 19.5. For the purpose of the summary, we differentiate between three levels of explanatory factors. On the first, broadest level (represented by the diamonds in Figure 19.1), there are six different groups of factors:

1. structural macroeconomic sectoral changes
2. globalization and technology change
3. labor market and other relevant institutions
4. politics and political processes
5. tax/transfer schemes
6. demographic and other microstructural changes

As indicated in [Section 19.1](#), we may think of the above factors as “underlying” causes of inequality change. On the second level, there are elements within each of the six broad groups (such as FDI, technology, trade, etc., for globalization or such as unionization, unemployment benefits, employment protection legislation, etc., for labor market institutions). This second group could be included under the umbrella of “proximate causes” of inequality or “hints” at causes.⁷³ Finally, there is a third level, on which the various authors operationalize their models, that is, where they chose the appropriate variables for their models, which are, in most cases, necessarily second-best proxies of the second-level factors. In what follows, we summarize the results of the level of abstraction represented by the first level. While doing that, we also report findings for the interactions between the effects of the various variable groupings as far as they are available.

As for the major hypothesis of structural macroeconomic sectoral changes (i.e., sector bias and sector dualism, as proposed by Kuznets), the evidence is inconclusive. A large part of the literature (half of 30 studies reviewed by [Atkinson and Brandolini, 2009](#) and 19 studies in [Hellier and Lambrecht, 2012](#)) tests the Kuznets hypothesis, but sector dualism does not seem to find support.⁷⁴ Alternative explanations of the great U-turn therefore have been investigated in various articles in the past 15 years. The most influential hypotheses of these alternatives related the reversal of inequality trends to developments of globalization and of trends in skill-biased technology change to changes of (labor market) regulations and institutions.

As for the debate on globalization versus technology, there has been a move away from trade-focused explanations to technology explanations during the 1990s. In the 2000s, several authors changed track from their earlier views that the effect of trade on inequality was modest at best ([Krugman, 2007](#); [Scheve and Slaughter, 2007](#)). They now suggest that trade-induced phenomena such as outsourcing may have had a more significant effect on income distribution than formerly assumed. That said, while under the pure aspect of trade costs, off-shoring all tasks that are technically off-shorable may indeed be possible, this will not always make sense from a business point of view, especially when transaction costs and economies of scope are taken into account; the assumed effect of a surge in off-shoring may therefore be exaggerated, as argued by [Lanz et al. \(2011\)](#).

At the same time, technological change now is more often understood as endogenous and interacting with trade. More generally, the key issue today is no longer identifying which trade or technological change was the main culprit in increasing inequality, but rather to identify the channels through which these two operate and interact in their effect on inequality (see [Chusseau et al., 2008](#)).

⁷³ These notations follow [Cornia \(2012\)](#).

⁷⁴ However, [Nollmann \(2006\)](#) and [Rohrbach \(2009\)](#) propose a focus on knowledge sector dualism and bias.

The effect of *education*—human capital accumulation—on inequality is not linear and, because of different composition and wage premium effects at different times, can first be disequalizing and then equalizing, analogous with the Kuznets process. That said, none of the studies covering the set of OECD/EU countries suggest a disequalizing role for the growth in average educational attainment over the past three decades; on the contrary, in their majority they propose a rather equalizing role. Human capital can be seen as a complement to technology. Increases in human capital and in the supply of skills are necessary to decrease and eventually reverse the pressure to higher inequality that stems from technological change.⁷⁵

While it is widely recognized that institutions matter, the weight attached to this factor in econometric studies has long been limited. A majority of (but not all) studies finds significant negative associations, in particular with wage inequality, through direct or indirect effects of union density/coverage, wage coordination/centralization and EPL. [Checchi and Garcia-Penalosa \(2005\)](#) and the [OECD \(2011\)](#) found the weakening of employment protection and the decline in unionization increased wage dispersion, mostly having effects at the lower ends of the distribution of wages. It has, however, also been emphasized that when observed in a broader context (i.e., concentrating on combined employment and dispersion effects of institutional changes), the results were inconclusive because employment and inequality effects of institutional change tended to net each other out ([OECD, 2011](#)). Also, [Checchi and Garcia-Penalosa \(2008\)](#) suggested that the combined effects of institutions on factor income inequality are weak, whereas the income distribution effects of high tax wedges (which could be expected to serve larger redistribution to favor lower segments of the labor markets) also has controversial effects (high-wage workers are able to pass on tax burden to their employers, while the overall tax wedge effects can contain considerable unemployment increases).

All in all, it is shown that for inequality trends, developments in political processes are of key importance. How preferences of the electorate are recognized, processed and translated into policies (which, in turn, shape labor market and welfare state institutions) do play an important role in redistributive institutions and, ultimately, in inequalities. Indirect proof of this is found in the fact that many tests trying to find a direct relationship between initial and post-redistribution inequalities have been shown to be inconclusive. While some of these failures can be explained by problems of specification, of identification of the various factors or of data, there are a number of substantive elements of the political system that may have a special role in defining inequalities. Among these, the

⁷⁵ It can be suspected, however, that this is conditional on the stage of the “race between education and technology” change ([Tinbergen, 1975](#)). Most of the studies reviewed here refer to the OECD area for the 1980–2008 period, a rather fortunate period and set of countries where higher education expansion was to a great extent capable of keeping pace with the upwards pressure of the technology revolution. In different countries and in different periods, the results of this race may be less positive for inequality outcomes.

differential mobilization of voters from various parts of the income scale seems to be of a crucial importance (Pontusson and Rueda, 2010; Mahler, 2008). Also, how the actors of the political arena perceive their core constituencies is important. If the parties from the political Left perceive the mobilization of the poor on the ballots worth going for, they may put the issue of redistribution to the poor at the center of their political agenda.

The identification of the Left and the Right may easily turn out to be problematic, especially when representation of the various labor market segments is taken into account (Rueda, 2008). Given the fact that parties sometimes pick up interests of insiders (such as active earners) as opposed to the interests of outsiders (such as the inactive earners and the unemployed), redistributive outcomes might come about as results of sometimes contradicting tendencies of redistribution from the rich to the poor and of legislation to support the interest of the insiders of the labor markets.

When analyzing actual redistribution processes, the definitions of the pre- and post-redistribution inequality (in other words, the accounting framework in which the redistribution processes are understood and interpreted) has been identified as crucial to the measurement of the effects of redistribution (Whiteford, 2008; Immervoll and Richardson, 2011; Kenworthy and Pontusson, 2005). It also has been emphasized that redistribution might have a number of second-order effects. The results of redistribution analyzes have shown that redistribution reduces inequality overall in all OECD countries, although to a varying extent, depending on concrete institutional settings. It was found that “original” inequality (if it exists at all) is reduced by an order of magnitude of some one-third by redistribution (ranging between 45% in some northern and continental European countries to ~8% in Korea; see Whiteford, 2008; OECD, 2011).

The redistributive effectiveness of the two sides (taxes and benefits) has been shown to be different: cash transfers (in all countries but the United States) are estimated to have much larger first-order effects on inequality than taxes (Whiteford, 2008; Immervoll and Richardson, 2011).⁷⁶ Among public social transfers, public pension programmes achieve the largest redistribution; however, the interpretation and evaluation of these differs and is dependent on the chosen perspective of Robin Hood or piggy bank welfare states.

There are second-order effects of redistribution, such as those resulting from behavioral adjustment on the contributor side (taxpayers) or the recipient side (social assistance beneficiaries). Some studies are able to show the existence of second-order responses, the magnitude of which, however, seems to be relatively small (Doerrenberg and Peichl, 2012). The measured effects of taxation on labor supply (which is clearly an important area of potential behavioral repercussions) imply that social embeddedness of institutions is noticeable. Studies by Blundell et al. (2011)

⁷⁶ This is also confirmed by other studies (Mahler, 2010; Goudswaard and Caminada, 2010). The latter study also shows that countries relying mostly on public social expenditures achieve higher levels of redistribution than countries relying more on private social transfers.

highlighted that behavioral elasticities for women are larger with regard to both decisions about entering the labor markets (extensive margin) and changing work efforts on the labor markets (intensive margins).

An important aspect in redistribution research is how the change in size and techniques of tax transfer schemes have contributed to changes in overall inequality. As highlighted by the [OECD \(2011\)](#), changes in redistribution can be seen as causal factors for increasing inequality during the period before the breakout of the economic recession in 2008. The redistributive power of the welfare state was weakened in the period between the mid-1990s to mid-2000s. While in the period between mid-1980s and mid-1990s the share of increased market income inequality offset by taxes and transfers was measured at a level of almost 60%, this share declined to around 20% by the mid-2000s ([OECD, 2011](#)).

The social context can also be captured by the effects of changing demographic composition (by age, household types, etc.) and of changing demographic behavior (household formation, assortative mating, etc.) on inequality. While the (composition) effects of ageing and of household composition are estimated to have an inequality-increasing effect (Lu et al., 2011; [OECD, 2011](#); [Peichl et al., 2010](#)), the results of some of the discussed behavioral trends (assortative mating) are less clear-cut, but in general also are shown to have an effect on inequality change, mostly as disequalizing effects. Some scholars present the results of the “incomplete revolution” of women’s changing role in labor markets and in families as equalizing *within* the households (because of more equal divisions of domestic labor) but disequalizing *among* households (because of differential behavioral reactions of women with higher and lower status [[Esping-Andersen, 2009](#)]). Taken together, when modelling the inequality effects of changes in demographic composition and behavior on the one hand and labor market related changes on the other, the [OECD \(2011\)](#) concludes that the former seems to explain much less of the increase in inequality than the latter.

In a nutshell, this is what we found at the first level of factors identified at the beginning of this section (and in the diamonds of [Figure 19.1](#)). To give a brief summary assessment of the results found in the studies published over the past 10–15 years, [Figure 19.3](#) provides an idea of the direction of causal factors of inequality that were identified. This summary remains qualitative and cannot be based on quantitative assessment because the multitude of studies use various and different methodologies, estimation methods and data, as well as varying country coverage. Further, it is in part our own subjective assessment. As a convention, positive/negative association means disequalizing/equalizing. “Significance” has to be understood here (and elsewhere in the text) as a statistically significant association, notwithstanding the relative size of a coefficient. “Inconclusive” means that roughly as many studies report (significantly) positive as negative effects. Further, this assessment is based as much as possible on studies covering the restricted sample of OECD/EU countries.

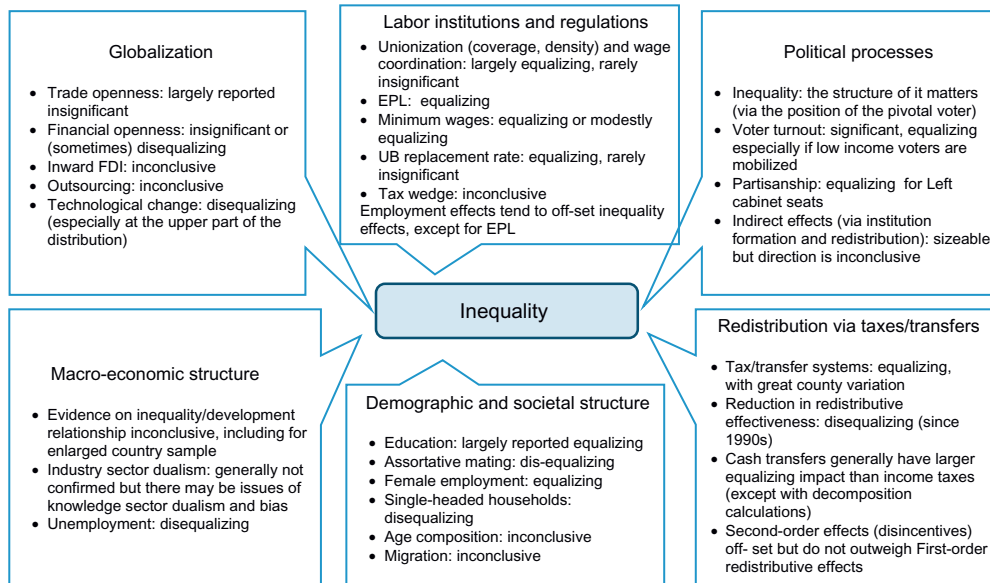


Figure 19.3 Drivers of inequality: a qualitative summary of results for OECD countries reported in recent studies. EPL, employment protection legislation; FDI, foreign direct investment; UB, unemployment benefit.

A first glance at [Figure 19.3](#) reveals that inconclusiveness prevails for many possible drivers of inequality, that is, the large number of recent empirical, cross-country studies report contradicting results, which can often but not always be traced back to different country samples, time periods, data and methodological specifications. In particular, for those factors for which there are more complete and fairly direct measures at hand (such as measures of trade openness or financial openness), there is little clear effect reported, whereas for factors where more proxy-type measures need to be used (such as technology), there seem to be more significant findings. One is tempted to detect some sort of Heisenberg principle: the sharper we can measure a variable, the less effect will be found.

As mentioned above, the summary assessment in [Figure 19.3](#) refers to findings on the different level-one factors separately. To show and interpret the relative strength of the various findings, one would need to refer to studies with a true multivariate design, that is, those covering not only a multitude of countries but also a sufficient number of variables representing *each* of the first-level factors in the models. Because of the complexity of methodological and data requirements, none of the studies attempts to cover all of the first-level factors simultaneously, but a few studies in our literature review were able to cover a multitude of the factors mentioned above.

One of the few examples is [OECD \(2011\)](#), which makes an attempt to study the interactions between four groups of factors: (i) globalization (captured both by trade and financial openness); (ii) SBTC; (iii) institutional and regulatory reforms; and (iv) changes in employment patterns.⁷⁷ When explaining the relative weights of these factors within a common analytical framework,⁷⁸ the authors conclude that globalization (trade, FDI, financial liberalization) had little effect on wage inequality trends per se once institutional factors are accounted for. However, globalization processes put pressure on policies and institutional reforms to deregularize labor and product markets. Such institutional and regulatory reforms were primarily aimed at promoting growth and productivity, and while they had a positive effect on employment, at the same time they have been associated with increased wage inequality in many countries. What concerns the role of technology development in the period is that it was mostly beneficial for the highly skilled workers, a trend that resulted in larger wage disparities. However, increases in human capital (via mostly large-scale expansion of higher education in most OECD countries) offset much of the drive towards rising inequality.

Another example is [Cornia \(2012\)](#), who examined the explanatory factors of the declining inequality trends in Latin American countries. Among “proximate” causes of inequality, he investigated changes in both factorial and personal distributions of income caused by endowments of unskilled labor, human capital, physical capital, land and nonrenewable assets; their rates of returns also were taken into account. State intervention was measured by taxes and transfers received by households. Household-level income components enter the equation (similar to GIRE), together with macro-level variables such as dependency rates and activity rates. Overall inequality (measured by Gini coefficients) was decomposed into a weighted average of six factors (six different types of income). Results then were put into a broader framework, and changes in proximate causes are interpreted within the frame of changes in underlying causes (these include external conditions such as exports or capital flows, macrovariables related to the balance of payments, nonpolicy endogenous factors such as fertility and activity trends, dependency ratios, etc.), educational achievements and policy factors (related to taxes and transfers policies, wages, labor markets, economic and social policies, etc.). The major conclusion of the paper is that the decline in inequality in Latin America was most importantly due to the reversal of the skill premium (resulting from a massive increase of secondary enrolment), a decrease in the supply of unskilled labor, a return to

⁷⁷ In a second step, when moving from explaining individual earnings inequality to explaining household earnings and income inequality, the study adds two additional factors to the framework: (v) changes in family formation and household structures; and (vi) changes in tax and benefit systems. These have been identified as two of the key drivers of the increase in inequality up to the Great Recession, as the redistributive effectiveness tended to decline, mostly starting in the mid-1990s.

⁷⁸ For applying a joint framework for capturing the distribution effects on both wages and employment, the study uses a methodological approach proposed by [Atkinson and Brandolini \(2006b\)](#).

collective bargaining and an increase in minimum wages. Other factors such as the improvements in external economic conditions or the endogenous changes in dependency and activity rates played only a minor role in inequality reversal.

A third noticeable example for an attempt to create a broad based modelling of inequality change is [Mahler \(2010\)](#), who sought to explain the determinants and effects of government redistribution on inequality, mostly focusing on the role of taxes and transfers and on the distributive effect of wage bargaining institutions and minimum wages. He tested five alternative explanations from the literature: the median voter argument, the PRT, the political institutional approach, the labor unions approach and the globalization approach. Government redistribution was found to be positively related to pregovernment inequality (as the MR argument predicts), to the level of electoral turnout, to unionization rate and to the presence of proportional electoral systems. Further, a relatively egalitarian distribution of earnings was found to be positively associated with the degree of coordination of wage bargaining. On the other hand, no significant relationship has been found for the measures of globalization in his models.⁷⁹ The study also does not find support for the government partisanship hypothesis (share of cabinet positions held by Left parties).

These three examples are quoted here in more detail because they help show how far the various multivariate analyses can take us in understanding the relative weights of the various drivers of inequality. However, for a more encompassing GIRE-type specification and a proper test of it, still better data and larger country coverage are awaited.

19.6.2 Lessons on Methods and Models

We started this chapter with the aim to provide a thorough survey of what international (i.e., cross-country) studies can tell us about the drivers and underlying causes of income inequality with regard to levels and, in particular, trends. In the sections above, we were able to demonstrate how much progress has been made in terms of data availability and use for the countries in the joint set of the EU and the OECD (despite all remaining deficiencies of secondary data sets). A rich literature of studies of various drivers of inequality and their results have been discussed in the chapter. Yet, for the answers to some of the most important questions formulated at the outset, the jury is still out. These relate to

- the influence of the time coverage and geographical coverage of inequality data
- a more precise identification of the relative weights of factors (drivers) of inequality
- the comparability and accuracy of model estimates

⁷⁹ “Although the prospect that globalization will bid down social transfers and constrain earnings of low income groups looms large in the popular consciousness, it does not appear that a country’s integration into the world economy seriously undermines government redistribution in the developed world” ([Mahler, 2010](#), p. 529).

Below we discuss these three aspects in turn.

The articles reviewed in this chapter reveal that there have been quite spectacular developments in data infrastructures for the research on earnings and income inequality. Elements of this development can be summarized as follows:

- First and foremost, some new, large, comparative data collection exercises began. The most prominent one is the EU-SILC, produced annually for all of the member states of the EU and some non-EU countries. This data exercise encompasses a combination of ex ante and ex post harmonized data collection activities (Atkinson and Marlier, 2010).
- The collection of inequality variables in secondary data sets (most recently, the OECD Income Distribution Database, for example) has been accelerated and standardized and moved to annual reporting. In addition, some new secondary data sets have been built (of which the GINI project has most recently provided a rich data set for 30 countries and 30 years; Tóth, 2014).
- For some of the countries, a historical data collection exercise started, which contributes to a much better understanding of long-term trends in inequality (see, e.g., Atkinson and Morelli, 2014 or the long-run data series of the World Top Incomes Database developed by Alvaredo et al.)

In sum, the data situation improved greatly in the past few decades and even since the publication of Volume 1 of the *Handbook of Income Distribution* (Atkinson and Bourguignon, 2000). Simon Kuznets could now perhaps count on a situation where not 5% but maybe 50% of the analysis comes from data and only the other half (rather than 95% in 1955) of the analysis has to rely on speculation. Nevertheless, there are still deficiencies in the data front that impose serious limits on analysis and on a better understanding of the dynamics of inequality from a cross-country perspective.

While there are some data sets covering a large number of countries, there are a few truly longitudinal data sets covering long periods but only a few countries. However, researchers wishing to analyze inequality developments using comparable long-term series of country data will have to make serious compromises.⁸⁰ These types of compromises regard coverage (N), the number of data points (t) per country and their combinations as well.

The vast majority of studies reviewed is based on unbalanced panels because they cover different time periods for each country. That means that t has a variance across the cases. If this variance is nonrandom, the estimates may be biased. When missing years correlate in a systematic way with the dependent variable, estimates risk being biased. In addition, for income inequality estimates, annual time series are not available for most

⁸⁰ As an illustration, in the GINI project, involving hundreds of country experts and producing case studies for 30 countries (27 from the EU as of 2010) over 30 years between 1980 and 2010, only some two-thirds of all the possible cells of the 30×30 matrix could be filled with reasonably well-comparable Gini coefficients (Tóth, 2014).

countries and in general not in secondary data sets. Most of the studies summarized in [Annex Table A19.1](#) look at a time period of about 20–30 years, but the number of observations per country differs greatly, from around 3 up to 20.

How serious the issue of unbalanced panels is also depends on the nature of the research question: for some tests of questions, a large N may compensate for a small t , for example, when testing the effect of institutional change (in which case the over-time variance in short periods will be negligible). In other cases, for example, when looking at the effect of macroeconomic changes (where year-to-year fluctuations may be not negligible), it may not.⁸¹

As we have shown in [Sections 19.5.1–19.5.6](#) (roughly corresponding to the six major “diamonds” in [Figure 19.1](#) representing six different groups of potential drivers of inequalities), studies of inequality identified significant effects of globalization and technical change, of political structures, of redistributive expenditures and some demographic composition changes. However, most models following the structure of Equation (19.3) (GIRE) are partial in the sense that they ask how variable group X affects inequality when controlled for variable groups Z or Q variables. This sometimes can misguide readers when interpreting the relevance of the results. All in all, in the literature there are rare attempts to provide weights to various significant factors; many leave complementary variable sets among the group of omitted variables or assume them to be absorbed by fixed effects.

As an example, studies analyzing the effects of globalization on inequality typically control for sectoral composition of the economy or sometimes for institutional variables (such as unionization or employment protection) but still leave out a great number of variables that could help control for demographic or education structure, for political processes or for redistribution. Similarly, analyses focusing on, for example, politics do account for party structures, electoral systems, voter turnout patterns and the like, sometimes controlling for demographic composition of societies, and so on. However, they also remain “rough,” omitting too many variables (related to globalization, sectoral divisions, etc.) and thereby keeping a large part of the unexplained variance in the dark (or gray).

However, when trying to enrich the variable sets on the right-hand side of the GIRE, we run into problems similar to those of growth regressions. This does not come as a surprise because the structure of inequality regressions and those of growth regressions is similar, with just different left-hand variables. As indicated in the literature on economic growth regressions (see [Mankiw, 1995](#); [Temple, 2000](#); [Eberhardt and Teal, 2009](#)), part of the problem of inconclusiveness of results stems from a very simple fact: too small a number of countries, too many competing explanations and too short a time series with not many comparable definitions. [Mankiw \(1995\)](#) lists three of these

⁸¹ For instance, the U -shaped inequality development in France between 1985 and 2010 (with the lowest point reached in 1998) requires more frequent year observations to perform meaningful econometric analysis.

problems: the problem of simultaneity, the problem of multicollinearity and the problem of degrees of freedom. For inequality regressions, each of these holds equally.

Simultaneity refers to the fact that right-hand variables are, in many cases, not exogenous but products of the same third (sometimes unobserved) factor, which determines inequality, and the chosen right-hand-side variable as well. This problem can also be called the endogeneity problem or reverse causality. Should we find that inefficient redistribution in a country fails to produce the expected inequality reduction, it might easily be that both government inefficiency and the large market income inequality are a product of a third factor, such as bad governance and or distrust in the given country (also on this issue see Robinson, 2009).

Multicollinearity has a similar origin. In many of the models the right-hand variables are correlated. A high level of taxes, for instance, will correlate with high levels of expenditures, especially in countries with higher levels of state employment (which in itself may have a lower level of inequality within this sector). Also, a higher share of more educated people may correlate with higher employment in education, where wage bargaining is more centralized. Inequality regressions need to face these multicollinearities, and researchers need to be innovative in trying to find proper ways to decrease the level of multicollinearity problems.

The third aspect is related to the potential number of explanatory variables. The trade-off here can be summarized as follows. For partial regressions, there may be too much unexplained variance left for the omitted variables. For more comprehensive regressions, the small number of observations limits the options. Given the fact that cross-country comparisons usually cover only a limited number of countries, the increase in the number of independent variables also is constrained. As Mankiw (1995) puts it, “there are too few degrees of freedom to answer all the questions being asked” (p. 306). For a better understanding of how inequalities evolve in a cross section of countries, more data points are needed—but for this we cannot have more countries, only time observations.

Furthermore, with the current amount of information at hand, not all of the complex mechanisms and channels that affect the distribution of earnings and incomes will show up in aggregate inequality regressions. Therefore, attempts to better specify the GIRE need to be complemented with more analysis of the constituent parts of these channels.

A final but important lesson relates to the disciplinary composition of inequality researchers. In our review we covered literature from economics, sociology and political science. Our most important lesson from this was that these disciplines have something to tell and to learn from each other. To share knowledge and discuss results, a common language is needed. As we have seen from scrolling through the literature, it is starting to exist.

As Atkinson and Brandolini (2009) put it, “valuable lessons can be learned but that we require: an integrated approach to theory and estimation; a proper specification of the data employed; and techniques to address the deficiencies of the underlying data” (p. 442). This will help decrease the level of speculation in inequality research—what Kuznets estimated to be 95% and we estimate now to be around 50% because of the fast development of inequality research in the past few decades.

Annex Table A19.1 Summary of multivariate analyses of determinants of cross-country differentials of within-country income distributions

Author, date	Geographical coverage, period and number of inequality observations	Data source for inequality measure	Dependent variable (inequality measure)	Explanatory variables and regressors	Estimation method	Findings with regard to causal factors of inequality	Other main findings
Globalization							
Spilimbergo et al. (1999)	34 Countries (21 OECD countries), 1965–1992, 320 observations	Deininger and Squire (1996 version)	Gini coefficient of personal income distribution	<ul style="list-style-type: none"> – Endowments: arable land per capita; capital per worker; skill intensity – GDP per capita in PPPs (and squared) – Endowment-corrected measure of trade openness 	OLS	<ul style="list-style-type: none"> – Land- and capital-abundant countries: significant positive – Skill-abundant countries: significant negative – Trade openness (keeping constant factor endowments): significant positive – Trade openness (interacted with factor endowments): significant positive in skill-abundant countries but significant negative in capital-abundant countries 	For the subsample of developing countries, coefficient of openness measure itself is negative but not significant
Heshmati (2004)	60 Countries (29 OECD countries); years between 1995 and 2000	WIID1	Gini coefficient of income (concept not specified) for most recent year and average across all available years	<ul style="list-style-type: none"> – Kearney composite index of globalization (covering economic integration, personal contact, technology and political engagement) – Regional dummies 	Cross-sectional OLS	<p><i>Overall globalization index:</i></p> <ul style="list-style-type: none"> – Significant negative <p><i>Subcomponents of globalization:</i></p> <ul style="list-style-type: none"> – Personal contacts and technology (internet use): significant negative (especially personal contacts) – Economic integration: significant positive (but insignificant when average Ginis are used) – Political engagement: insignificant 	Economic integration does not systematically lead to increased income inequality. Overall, globalization explains little of cross-country variations of inequality. Regional heterogeneity captures most of the variation

Mahler (2004)	14 OECD countries, 59 observations, 1980–2000	LIS	Gini coefficient of households, earnings	<ul style="list-style-type: none"> – Economic globalization: LDC trade (share in GDP of imports from LDCs), outbound investment flow as percentage of GDP, financial openness (14-point scale) – Domestic factors: ideological balance (5-point scale), electoral turnout, union density, wage coordination (5-point scale), unemployment rate, female participation rate 	OLS, fixed effects	<ul style="list-style-type: none"> – Concerning earnings inequality: financial openness (+), electoral turnout (–), wage coordination (–). – Concerning fiscal redistribution: wage coordination (–) – Concerning disposable income inequality: union density (–), wage coordination (–) 	–
Milanovic (2005)	129 Countries, 3 benchmark years (1988, 1993, 1998), 321 observations	WYD	Mean-normalised per capita household income deciles	<ul style="list-style-type: none"> – Trade openness (exports + imports)/GDP – FDI/GDP <p><i>Controls:</i></p> <ul style="list-style-type: none"> – Financial depth (M2/GDP) – Democracy indicator <p><i>Extended version:</i> interest rate and government expenditure/GDP</p>	Pooled cross-sectional OLS for each income decile; GMM instrumental variable estimation	<ul style="list-style-type: none"> – Increased trade openness: pro-rich in lower-income countries but pro-poor and middle incomes in higher-income countries (from around \$8,000 PPP per capita) – FDI: no effect – Financial depth: increases low- and middle-income shares – Higher democracy index: increases middle-income shares – Higher government expenditures: pro-poor – Higher interest rates: pro-rich 	Introducing regional dummy variables increases significance of results

Continued

Annex Table A19.1 Summary of multivariate analyses of determinants of cross-country differentials of within-country income distributions—cont'd

Author, date	Geographical coverage, period and number of inequality observations	Data source for inequality measure	Dependent variable (inequality measure)	Explanatory variables and regressors	Estimation method	Findings with regard to causal factors of inequality	Other main findings
Figini and Görg (2006)	107 Countries (22 OECD countries), 1980–2002, 664 (200) observations	UNIDO	Gini coefficient and Theil index of pay dispersion in the manufacturing sector	<ul style="list-style-type: none"> – Inward FDI stock/ GDP, squared, and lagged <i>Controls:</i> – GDP per capita, secondary education enrolment, trade openness 	<ul style="list-style-type: none"> – OLS fixed effects – GMM 	<p><i>OECD countries:</i></p> <ul style="list-style-type: none"> – Inward FDI: significant negative – Education, trade: insignificant 	<ul style="list-style-type: none"> – Nonlinearity of FDI effects is rejected when using lagged FDI and with GMM
IMF (2007)	51 Countries (19 OECD countries), 1981–2003, 271–288 observations	PovCal, supplemented by WIID2b (2007 version)	Gini coefficient and quintile shares of per capita income (not defined)	<ul style="list-style-type: none"> – Nonoil exports/GDP – Tariff liberalization (100-tariff rate) – Inward FDI-stock/ GDP <i>Controls:</i> – ICT share in capital stock; credit to private sector/GDP; education (attainment and average years); agricultural and industry employment share 	OLS, fixed effects	<p><i>Full sample:</i></p> <ul style="list-style-type: none"> – Technological progress: significant positive (largest contribution to increasing income inequality) – Globalization: small disequalizing effect, (equalizing) effect of trade offset by (disequalizing) effect of inward FDI – Financial depth (credit to private sector): significant positive <p><i>Subset of advanced countries:</i></p> <ul style="list-style-type: none"> – Technological progress: significant positive – Globalization: disequalizing (contributed somewhat more than technology); imports from DCs and inward debt significant negative but inward and especially outward FDI significant positive 	Using quintile shares as dependent variables confirms findings, but estimates are less precise for tariff liberalization and technological progress

Milanovic and Squire (2007)	<ul style="list-style-type: none"> ~70 countries, 1983–1999, ~170 observations (OWW) ~90 countries, 1975–1999, ~170 observations (UTIP) 	<ul style="list-style-type: none"> (i) Occupational wages around the world (OWW) (ii) UTIP/UNIDO 	<ul style="list-style-type: none"> Gini coefficient of interoccupation wage inequality Theil index of inequality for interindustry wages 	<ul style="list-style-type: none"> Unweighted average tariff rate Import-weighted indicator of presence of trade reforms in country's most important trading partners GDP per capita Union density Coverage of collective agreements Social expenditures/GDP 	OLS, dependent and regressors in first differences	<p><i>Interoccupational inequality:</i></p> <ul style="list-style-type: none"> Decrease in tariff rate: significant positive in poorer countries, but significant negative in richer countries Labor market conditions: insignificant <p><i>Interindustrial wage inequality:</i></p> <ul style="list-style-type: none"> Decrease in tariffs rate significant positive in poorer countries, particularly in countries with a high density of trade unions; but negative in richer countries Social expenditures: insignificant Trade openness: significant positive Financial development: significant positive Government spending: significant negative (estimated by fixed effect regressions) 	The net effect of tariffs on both interoccupational and interindustry inequality reverses at around the world median level of income (\$4000 in 1995 PPPs)
Bertola (2008)	51 countries (14 OECD countries); 1970–2000; 467 observations	WIID1 (2007 version)	Gini coefficient of household income (generally net income; observations for gross income are controlled by dummy variables)	<ul style="list-style-type: none"> Trade openness (exports + imports)/GDP Share of government in GDP Ratio of private credit to GDP With and without controls for GDP per capita 	OLS (fixed effects)	<ul style="list-style-type: none"> Globalization (overall index): significantly positive on earnings and income inequality in OECD countries (GMM: only income inequality) No systematic evidence for three subdimensions of globalization Lagged dependent: highly significant positive 	Government spending is less effective (i.e., less significant negative effect on inequality) if openness is high
Dreher and Gaston (2008)	<ul style="list-style-type: none"> 100 countries (27 OECD countries) and 411 (129) observations for earnings 100 countries (26 OECD countries) and 340 (110) observations for income 1970–2000, averages of 5 years 	UTIP/UNIDO	<ul style="list-style-type: none"> Theil index of individual earnings Gini coefficient of gross household income (estimated from earnings inequality above) 	<ul style="list-style-type: none"> Synthetic globalization index (KOF) and separately for economic, political and social globalization Lagged dependent inequality variable <p><i>Controls:</i></p> <ul style="list-style-type: none"> GDP per capita and its square Democracy index 	OLS fixed effects and GMM	<ul style="list-style-type: none"> Greater democracy has not decreased earnings or income inequality Results robust when including additional variables: demography (dependency ration, population growth) and size of government (government consumption expenditure) Replacing time dummies with a time trend in all models leads to more poorly fitting models 	<ul style="list-style-type: none"> Greater democracy has not decreased earnings or income inequality Results robust when including additional variables: demography (dependency ration, population growth) and size of government (government consumption expenditure) Replacing time dummies with a time trend in all models leads to more poorly fitting models

Annex Table A19.1 Summary of multivariate analyses of determinants of cross-country differentials of within-country income distributions—cont'd

Author, date	Geographical coverage, period and number of inequality observations	Data source for inequality measure	Dependent variable (inequality measure)	Explanatory variables and regressors	Estimation method	Findings with regard to causal factors of inequality	Other main findings
Gourdon et al. (2008)	Dataset 1: 61 countries (22 OECD countries); 1980–2000; 198 observations Dataset 2: 55 countries (20 OECD countries); 1988–1998; 146 observations	Dataset 1: WIID1 (2005 version) Dataset 2: WYD	Gini coefficient of income (generally net household income; observations for gross income, personal income and expenditure are controlled by dummy variables)	<ul style="list-style-type: none"> – Trade openness: lagged ratio of tariff revenues to imports – Relative factor endowments <p><i>Controls:</i></p> <ul style="list-style-type: none"> – Log GDP per capita in PPPs (if no interaction with factor endowment) – Other controls (inflation, education, ethnicity) 	OLS (fixed effects)	<ul style="list-style-type: none"> – Trade openness (changes in tariffs): significant positive <p><i>When interacted with factor endowments:</i></p> <ul style="list-style-type: none"> – Trade openness: significant positive in capital-abundant and highly skill-abundant countries – Macro stability (reduction in inflation): significant negative 	<ul style="list-style-type: none"> – Analyzing more detailed data (decile data from WYD) but over a shorter time periods shows similar results but estimates often lack precision. – All studies should control for the source of inequality data via dummies and for omitted variable bias via FE.
ILO (2008)	16 OECD countries, 1978–2002, 175 observations	WIID2b, supplemented by LIS, PovCal, SEDLAC and TransMONEE	Gini coefficient of income (not specified but probably both net and gross)	<ul style="list-style-type: none"> – Globalization: inward FDI, tariff liberalisation, capital account openness – Institutions: union density, collective bargaining coordination – Other controls: ICT share, education years, credit to private sector, public social expenditures 	OLS or FGLS (not specified), fixed effects	<ul style="list-style-type: none"> – Institutions: insignificant – Social expenditures: significant negative – Technology (ICT share): significant positive – Capital openness: significant positive – Education: significant negative 	<ul style="list-style-type: none"> – FDI significant positive only when technology variable is not taken into account – PCA analysis suggests that from 1990s institutions forfeited capacity to reduce market inequality directly and retained indirect influence by virtue of the size of welfare state
Çelik and Basdas (2010)	Five developed countries 1995–2007 (FR, GE, NL, UK, US); 5 developing countries 1995–2006 (AG, BZ, CZ, HU, PL); 6 miracle countries 1990/1995–2005 (CH, IN, KO, MA, SI, TH) → 8 OECD countries	UNU-WIDER (WIID2), US Census Bureau (USA), EUROSTAT and other statistical departments	Gini index (household, income)	FDI inflows, FDI outflows and trade openness	OLS	<ul style="list-style-type: none"> – Developed countries: FDI inflows, outflows significant negative, trade openness positive – Developing countries: FDI inflows negative, trade openness positive – Miracle countries: FDI inflows positive, trade openness negative 	Results cannot be generalized.

OECD
(2011), Part I

22 OECD
countries,
1979–2008, 333
observations

- OECD earnings database
- LIS (for overall earnings distribution among working-age population)

- Interdecile ratios of full-time earnings: D9/D1, D9/D5, D5/D1
- Employment rate

- Trade exposure and subcomponents
 - FDI restrictiveness, inward and outward FDI, FPI, cross-border assets, private credits
 - Business sector expenditure on R&D
 - Institutional variables: union coverage, EPL (regular and temporary), tax wedge, UI replacement rate of low-wage workers, minimum wage, PMR
- Controls:*
- Education, sectorial employment share, female employment rate, output gap

OLS fixed effects

- Earnings inequality among workers:*
- Globalization (trade and financial integration): insignificant
 - Technology: significant positive
 - Institutions/regulations: significant negative
 - Education, female employment: significant negative
- Overall earnings inequality among working-age population:*
- Globalization (trade and financial integration): insignificant
 - Technology: positive
 - Education: negative
 - EPL (temporary): negative
 - Other institutions/regulations: undetermined, sign depends on assumption of reservation wage

- Earnings inequality among workers, effects of subaggregates:*
- Imports from low-income DCs: positive in low-EPL countries and negative in high-EPL countries
 - Inward FDI: negative, outward FDI: positive
 - Distributional effect of EPL is entirely driven by EPL for temporary contracts
 - Minimum wage (smaller sample): significant negative

- D9/D5 and D5/D1 effects:*
- FDI deregulation: reduces dispersion at bottom half and widens it at top
 - Technology: positive for D9/D5 only
 - PMR and EPL: positive for D5/D1 only
 - Union coverage: negative for D9/D5 only
 - Education and female employment: negative for both D5/D1 and D9/D5

Continued

Annex Table A19.1 Summary of multivariate analyses of determinants of cross-country differentials of within-country income distributions—cont'd

Author, date	Geographical coverage, period and number of inequality observations	Data source for inequality measure	Dependent variable (inequality measure)	Explanatory variables and regressors	Estimation method	Findings with regard to causal factors of inequality	Other main findings
Zhou et al. (2011)	62 countries (24 OECD countries), benchmark year 2000	WIID2b (2004 version)	Gini coefficient of net income (observations on expenditures were increased by 5 points, on gross income decreased by 7.5 points)	<ul style="list-style-type: none"> – Globalization: equally weighted Kearney index and principal component index – Education level (HDR education index) – Urbanization level 	Cross-sectional OLS	<ul style="list-style-type: none"> – Both overall globalization indices: significant negative – Education: significant negative – Results of globalization are robust to inclusion of education and urbanization 	<i>Subcomponents of globalization:</i> <ul style="list-style-type: none"> – International travel and Internet user: significant negative – Trade: significant positive – FDI: insignificant
Cassette et al. (2012)	10 OECD countries (AS, DK, FI, FR, GE, JP, NE, SW, UK, US), balanced panel; 1980–2005; 220–240 observations	OECD earnings database	Interdecile ratios of individual earnings: D9/D1, D9/D5, D5/D1	<ul style="list-style-type: none"> – Trade openness: total, goods and “other” services <i>Controls:</i> <ul style="list-style-type: none"> – FDI stock – Education (average years of schooling) – GDP per capita – Inflation – Technology (ICT capital/total capital stock) – Institutions (union density and concentration, bargaining level) 	Error correction model regression	<i>Long-run effects:</i> <ul style="list-style-type: none"> – Trade in goods: significant positive on D9/D1 and D5/D1 – Trade in services: significant positive on D9/D1, D9/D5 and D5/D1 – FDI, GDP/capita: significant positive <i>Short-run effects:</i> <ul style="list-style-type: none"> – Trade in goods: significant positive on D9/D1 and D5/D1 – Trade in services: insignificant – FDI, GDP: insignificant 	Education has a negative effect on inequality (but coefficient not always significant) Union density and union concentration: significant and negative
Faustino and Vali (2012)	24 OECD countries; 1997–2007; 230 observations	WIID2 (2008 version) (missing values imputed)	Gini coefficient of income	<ul style="list-style-type: none"> – Trade openness: (exports + imports)/GDP – FDI (net inflows/GDP) <i>Controls:</i> <ul style="list-style-type: none"> – GDP/capita, unemployment, LTU, inflation, number of companies 	<ul style="list-style-type: none"> – OLS fixed effects – GMM 	<i>OLS:</i> <ul style="list-style-type: none"> – Inward FDI significant positive – Trade openness significant negative <i>GMM:</i> <ul style="list-style-type: none"> – Inward FDI insignificant – Trade openness significant negative 	<i>OLS:</i> <ul style="list-style-type: none"> – GDP/capita, unemployment and inflation significant positive, other controls insignificant <i>GMM:</i> <ul style="list-style-type: none"> – GDP/capita significant positive, other controls insignificant

Institutions

De Gregorio and Lee (2002)	22 countries (1965), 49 countries (1990) (18 OECD)	IMF Government Finance Statistics Yearbook	Gini coefficient and quintile shares (household, income)	Educational inequality, educational attainment, log of GDP/capita, square of log of GDP per capita, social expenditure/GDP, regional dummies	OLS	Nonlinear relationship between educational attainment and educational inequality (inverted U-shape)	–
Beck et al. (2004)	For changes in the distribution of income: 52 developing and developed economies with data averaged over the period 1960 to 1999; For changes in poverty: 58 developing countries with data over the period 1980 to 2000	World Development Indicators, Dollar and Kray (2002), PovCal Net	Changes in 4 separate dependent variables: (i) changes in poverty (change in income of each economy's poorest 20%); (ii) changes in income distribution (Gini coefficient); (iii) growth rate of the percentage of population living under 1\$ a day (and 2\$ in robustness tests); (iv) growth rate of the Poverty Gap (=weighing by distance from the 1\$ level)	GDP % of private credit by financial intermediaries to private firms + GDP growth; Instrumental variables: legal origin of the country, latitude of the capital city, natural resource endowments; plus for inequality models: initial (1960) avg schooling, inflation, trade openness; plus for poverty models: initial poverty level	OLS, 2SLS	<ol style="list-style-type: none"> 1. Financial development alleviates poverty and reduces income inequality 2. Countries with better-developed financial intermediaries experience faster declines both in poverty and income inequality 	–
Cecchi and Garcia-Penalosa (2005)	16 OECD countries, 1960–1996, 210 observations	Deininger and Squire (1998 version) Brandolini (2003)	Gini coefficient of personal incomes	<ul style="list-style-type: none"> – Labor share – Wage dispersion – Unemployment rate – Unemployment benefit 	OLS and IV, fixed effects SLS regressions	<ul style="list-style-type: none"> – Labor share: significant negative – P9/P1 ratio: significant positive – Unemployment rate: significant positive (insignificant in OLS) – UB benefit: significant negative (indirectly through labor share in SLS) <p><i>Reduced form equation:</i> capital/labor ratio and education have strongest correlation with inequality, followed by union density, tax wedge and UB; minimum wage marginally significant</p>	Labor market institutions (union density, minimum wage, unemployment benefit) are essential determinants of labor market outcomes: labor share, wage differentials, unemployment rates

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Annex Table A19.1 Summary of multivariate analyses of determinants of cross-country differentials of within-country income distributions—cont'd

Author, date	Geographical coverage, period and number of inequality observations	Data source for inequality measure	Dependent variable (inequality measure)	Explanatory variables and regressors	Estimation method	Findings with regard to causal factors of inequality	Other main findings
Weeks (2005)	7 OECD countries (AS, CN, GE, JP, SW, UK, US); 1980–1998; 61 observations	WIID1	Gini coefficient of gross personal income	<ul style="list-style-type: none"> – Current public expenditure share in GDP – Unemployment rate – Union density rate 	OLS (fixed country effects)	<ul style="list-style-type: none"> – Union density: significant negative – Public expenditure: significant negative – Unemployment: significant positive 	Applying the model to two countries with annual time series (UK, US) yield the same strong significance for union density but unemployment and government expenditure (UK only) become insignificant
Carter (2007)	39 countries (20 OECD), 104 observations at all levels of economic development	WIID2b	Gini coefficient	<ul style="list-style-type: none"> – Economic freedom – Per capita income – Political rights – Civil liberties <p><i>Controls:</i></p> <ul style="list-style-type: none"> – Years of education; percentages of population under 15; over 64; urban; employed in industry; employed in services – Quadratic specification also included 	OLS with robust standard errors	<p>Economic freedom lowers equality by reducing income distribution towards the poor</p> <ul style="list-style-type: none"> – However, if controls and fixed effects are omitted, the estimated trade-off between inequality and economic freedom disappears 	–
Checchi and Garcia-Penalosa (2008)	16 OECD countries, 1969–2004, 82 observations	LIS	Gini coefficient of 3 equivalized income definitions for the working-age population: factor income, gross income, disposable income	<ul style="list-style-type: none"> – Institutions: union density, unemployment benefit, EPL, wage coordination, minimum wage, tax wedge <p><i>Controls:</i></p> <ul style="list-style-type: none"> – Demography: age of head of household, age of spouse – Tertiary education – Other controls: female employment, investment, openness 	OLS, fixed effects	<p><i>Factor income inequality:</i></p> <ul style="list-style-type: none"> – Institutions insignificant, except tax wedge (significant positive) <p><i>Gross and disposable income inequality:</i></p> <ul style="list-style-type: none"> – Unemployment benefit, EPL: significant negative – Tax wedge: significant positive 	<ul style="list-style-type: none"> – Trade-off of unemployment benefit and EPL: both lower inequality but increase unemployment (EPL only without fixed effects) – Weaker effect of institutions on factor income than on disposable income inequality

Beramendi and Cusack (2009)	13 countries (all OECD), 41 observations, 1978–2002 (LIS 5-year time periods)	LIS	Gini coefficient for market income inequality, wage inequality and disposable income inequality	<ul style="list-style-type: none"> – First model (wage inequality): number of manufacturing workers, imports from the Third World (percentage of GDP), female labor force participation rate, proportion of at least college education, union density, government partisanship, economic coordination, interaction of the last two – Second model (market income inequality): wage inequality, stock market capitalization, percentage of population in retirement age – Third model (disposable income inequality): union density, economic coordination, government partisanship 	OLS (robust standard errors and panel-estimated standard errors)	<p>First model (effects on wage inequality): female participation (+), percentage of college education (+), union density (–), economic coordination (–), interaction of economic coordination and partisanship (–)</p> <p>Second model (market-based income inequality): stock market capitalization (+), pension-age population (+)</p> <p>Third model (disposable income inequality): market income inequality (+), union density (–), economic coordination (–)</p> <p>Left government inheritance (–)</p>	–
Carnoy (2011)	20 countries (3 OCED); 1960–2003	WDI	Gini coefficient of household, income, highest 20%, lowest 20%	Trends of inequality, distribution of education, private and social returns to education, ratio of public spending	Trend analysis (no regression)	Higher education: greater inequality	Logical chain: higher education + → differentiation + → better (and richer) students to better universities → returns of education differentiate → greater inequality
Golden and Wallerstein (2011)	16 OECD countries (AS, AT, BE, CN, DK, FI, FR, GE, IT, JP, NE, NO, SW, CH, UK, US);	OECD earnings database	Interdecile ratio of individual earnings: D9/D1	<p><i>First differences over 5-year periods:</i></p> <ul style="list-style-type: none"> – Deindustrialization: share of industrial employment 	Weighted OLS; separate regression models for 1980s and 1990s; IV (independent variables); extreme	1980s: – Union density and centralisation: negative and highly significant	Determinants of earnings inequality are different in 1980s (institutions) and 1990s (trade with LDCs and social

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Annex Table A19.1 Summary of multivariate analyses of determinants of cross-country differentials of within-country income distributions—cont'd

Author, date	Geographical coverage, period and number of inequality observations	Data source for inequality measure	Dependent variable (inequality measure)	Explanatory variables and regressors	Estimation method	Findings with regard to causal factors of inequality	Other main findings
Muinelo-Gallo and Roca-Sagalés (2011)	1980–2000; around 220 observations Unbalanced panel of 43 upper-middle- and high-income countries for 1972–2006	WIID2b (Gini coefficients)	(Log of) Gini coefficient (5-year averages) of income	<ul style="list-style-type: none"> – Globalization: total trade; trade with LDCs – Institutions: union density; centralization <i>Controls:</i> – Migrants share in population; Right parties share in parliament; social insurance expenditures/GDP; unemployment rate; female labor force participation – Civil liberties – Education inequality – Growth – Public investment – Current public expense – Direct taxes – Indirect taxes – Disposable income (dummy) <i>Control:</i> – Dummy for various data sources 	<ul style="list-style-type: none"> – bounds analysis to test robustness – OLS (pooled, one-way random effects models with temporal dummies) 	<ul style="list-style-type: none"> – Trade, deindustrialization: positive but insignificant – Other controls: insignificant 1990s: – Trade with LDCs: positive and significant – Social insurance expenditures: negative and significant – All other regressors and controls: insignificant – Increase in civil liberties index reduce income inequality – Increase in educational inequality increase inequality – Current public expenditure has significant and sizeable negative effect on inequality – The direct effect of public investment is not significant (though indirect effects are shown) – Direct taxes have negative and significant (though small) effect – economic growth has a significant negative effect on inequality 	<ul style="list-style-type: none"> – expenditures), but in neither period is deindustrialisation significant – Data source dummy is significant on Gini – Public current expenditures and direct taxation robust in sensitivity estimates

Political Processes

Rueda and Jonas Pontusson (2000)	16 OECD countries (1973–1995)	OECD earnings database	Interdecile ratio of individual earnings: D9/D1	Union density, centralization of wage bargaining, the public sector's share of employment, partisan composition of government, social vs. liberal market economy, social spending/GDP, collective bargaining coverage and employment protection	OLS fixed effects	Union density, centralization of wage bargaining, the public sector's share of employment, and government partisanship: significant equalizing effect	The effect of institutional variables differs between the various variations of capitalism (liberal market economies [LMEs] and social market economies [SMEs]).
Bradley et al. (2003)	61 observations from 19 OECD countries, 1967–1997	LIS	Pre-tax, pre-transfer income distribution and proportional reduction in inequality from pre- to post-taxes and transfer inequality (based on household, income Gini coefficients)	Welfare generosity; Leftist party and Christian democratic party share of government; veto points; union membership; bargaining centralization/ corporatism + globalization (4 measures); economic development (GDP per capita and agricultural employment); deindustrialization (industrial employment); secondary school enrolment, vocational education; percentage of the unemployed, of female labor force participation, of female- headed households and of population under the age of 15	OLS	Unemployment (+), female-headed family (+) and union density (–); secondary education not significant	Effects on governmental redistribution: taxes, transfers, Leftist government The hypothesis that the magnitude of taxes and transfers has a strong effect on the reduction of inequality is confirmed.
Kenworthy and Pontusson (2005)	11 countries (1979–2000) (all OECD)	LIS	Gini coefficient (household income)	–	Trend analysis	–	Redistribution increased, but the effects were hidden by the even more increasing market inequality. Voter turnout can explain the redistribution paradox (the more inequality the less redistribution).

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Annex Table A19.1 Summary of multivariate analyses of determinants of cross-country differentials of within-country income distributions—cont'd

Author, date	Geographical coverage, period and number of inequality observations	Data source for inequality measure	Dependent variable (inequality measure)	Explanatory variables and regressors	Estimation method	Findings with regard to causal factors of inequality	Other main findings
Iversen and Soskice (2006)	14 countries, 61 observations, 1967–1997 (all OECD)	LIS	Gini coefficient (household, income) before and after tax	Government partisanship, electoral system, pre-tax and tax inequality, constitutional veto points, unionization, voter turnout, unemployment, real per capita income, female labor force participation	OLS	<i>Effects on redistribution:</i> Right government (–), veto points (–), unionization (+), female labor force (–), GDP (–), unemployment (+), voter turnout (+)	–
Rueda (2008)	16 OECD countries (1973–1995)	OECD Economic Outlook	Gini coefficient (earnings, individuals)	Cabinet partisanship, unemployment, LDC trade, female labor force participation, private service employment + international and financial openness, government debt, unemployment, GDP growth	OLS fixed effects	<i>In case of low corporatism:</i> Left governments increase government employment and minimum wages, but reduce welfare state generosity, with following effects on inequality: employment (significant negative); minimum wages (significant negative); generosity (positive, not significant) <i>In case of high corporatism:</i> Left governments reduce government employment, minimum wages and welfare state generosity, which have the following effect on inequality, respectively: – (significant), + (not significant), – (not significant). <i>In general:</i> Left governments do not have a significant effect on inequality.	–
Iversen and Soskice (2009)	16 OECD countries, 1880–1990	LIS, Cuzack (2003), Cusack and Fuchs (2002)	Gini coefficient (individual, earnings) before and after tax	Electoral system, degree of nonmarket economic coordination + size of the electorate, size of the elderly population, GDP per capita; interactions of electoral system with decade dummies	OLS (fixed effects)	Electoral system and partisanship: significant effects on redistribution	Proportional representative electoral systems: positive effect on social spending shocks

Mahler (2010)	59 observations in 13 countries (all OECD), 1979–2000	LIS	Gini coefficient and percentiles (upper/lower, upper/middle and middle/lower percentile ratios)	Dependent variable: government redistribution Regressors: electoral turnout, skewness of turnout by income, distribution of pre-government income + share of the population over 65, ideological balance of the governing cabinet, share of imports from less developed countries in GDP, share of outbound FDI in GDP, and a measure of the openness of a country's economy to global financial flows, electoral disproportionality, competitiveness of elections, voter registration	OLS	Voter turnout is positively correlated to government redistribution even after controlling for pregovernment inequality	–
Pontusson and Rueda (2010)	10 OECD countries, 1966–2002	Atkinson (2007)	Share of total income accounted for by the top 1% of income earners (individual)	Voter turnout, effective number of parties, dummy for the existence of Left-wing competitors, median voter, union density	OLS	Left party position reduces inequality, if median voter mobility is high	–

Redistribution

Fuest et al. (2009)	26 EU countries (except Malta), 2007	EU-SILC	Squared coefficient of variation, GE(2)	–	Measurement of the contributions of social policy instruments to redistribution with two methods (standard and decomposition), cluster analysis	– Findings from the standard approach: benefits are the most important source of redistribution – Findings from decomposition approach: taxes are the most important ones (differences can be understood through focusing on the main goal of both approaches)	According to cluster analysis, new EU member countries do not form a distinct group, central eastern European countries tend to show similarities with continental welfare states, whereas the Baltic countries with the Mediterranean ones
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Annex Table A19.1 Summary of multivariate analyses of determinants of cross-country differentials of within-country income distributions—cont'd

Author, date	Geographical coverage, period and number of inequality observations	Data source for inequality measure	Dependent variable (inequality measure)	Explanatory variables and regressors	Estimation method	Findings with regard to causal factors of inequality	Other main findings
Mohl and Pamp (2009)	23 OECD countries, 1971–2005	LIS	5-Year averages of cumulative share-gains of the first, the first to second and the first to fifth deciles and share-gain of second to eighth deciles	<ul style="list-style-type: none"> – Overall government expenditures – Government social expenditures – Social transfers ratio (average transfers per total disposable income) – Unemployment expenditures – Health expenditures – Gini – Percentiles ratios (P90/P50, P50/P10, median-to-mean ratio) – Left government – Disproportionality of the electoral system – Voter turnout <p><i>Controls:</i></p> <ul style="list-style-type: none"> – GDP growth – Unemployment rate – Population 65 + 	Panel regressions ($t = 7, N = 23$) with various robustness checks, two-step system GMM	<ul style="list-style-type: none"> – At very high levels of inequality the positive relationship between inequality and redistribution is reversed (nonlinear relationship) – Redistribution is driven by the P90/P50 ratio and targeted at the middle class (Director's law) 	–
Afonso et al. (2010)	26 OECD countries; year around 2000 and average for period 1995–2000	WIID, supplemented by OECD and LIS	<ul style="list-style-type: none"> – Gini coefficient of household disposable income – Income share of bottom 40% – Per capita income of bottom 20% in PPPs 	<ul style="list-style-type: none"> – Redistributive social spending (transfers, subsidies) – PIT – Education achievement (PISA) – Education spending – Unemployment – GDP per capita in PPPs 	<ul style="list-style-type: none"> – Cross-sectional OLS – DEA for assessing efficiency of public spending – Tobit regressions to capture exogenous nondiscretionary factors in explaining spending efficiency 	<ul style="list-style-type: none"> – Redistributive social spending: highly significant equalizing the distribution (all three inequality indicators) – Education achievement (in particular maths): significantly equalizing – Education spending and PIT: not significant – Only high social spending coupled with good education reduces inequality (Gini) 	<ul style="list-style-type: none"> – DEA suggests low efficiency of public spending with regard to inequality in some southern and continental European and high efficiency in some Nordic countries – Tobit analysis suggests strong indirect role of institutions on distribution, being significantly correlated with spending efficiency

Goudswaard and Caminada (2010)	25 OECD countries (as in OECD 2008)	OECD (2008) data on income inequality	Redistribution (reduction of Gini coefficient of market income to Gini of disposable household income)	<ul style="list-style-type: none"> – Public social transfers (and elements such as pensions, active labor market benefits, unemployment benefits) – Spending on public services (health) – Private (pension) social expenditures 	OLS	<ul style="list-style-type: none"> – Higher social spending, higher per capita GDP and lower unemployment: associated with higher income of bottom quintile – Total public expenditure on redistribution: positive – The effect of total social expenditure (public and private) on redistribution: weaker but positive – At program level, pensions have larger effect than unemployment and labor market programs – Excluding health expenditure does not significantly affect the above – Private pensions expenditure on redistribution: negative 	
Jesuit and Mahler (2010)	12 OECD countries, 52 observations, 1979–2004	LIS	Gini coefficient of household income	–	Estimating net redistribution (difference between pregovernment and postgovernment Ginis) with three different methods: standard, only pre-pension society, life-cycle based	Intra-individual redistribution arises mostly from government taxes and transfers, but its rate is quite different depending on pension systems and other social policies	Using the alternative method described in the article results in lower values for redistribution than based on the conventional measure
Niehues (2010)	24 EU countries (21 OECD), 183 observations, 1993–2006	European Community Household Panel (1993–2000), EUROMOD (2001), EU-SILC (after 2003)	Gini coefficient of equivalised disposable income	Social spending + lagged dependent variable, macroeconomic factors (GDP per capita, and GDP per capita squared), socioeconomic factors (dependency ratio, percentage of the	Nonparametric analysis, stochastic kernel on dimensional graph + GMM	<ul style="list-style-type: none"> – Social spending: negative (especially social benefits, unemployment benefits and old age survivor benefits, and not health benefits), – GDP (inverse U-shaped), 	–

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Annex Table A19.1 Summary of multivariate analyses of determinants of cross-country differentials of within-country income distributions—cont'd

Author, date	Geographical coverage, period and number of inequality observations	Data source for inequality measure	Dependent variable (inequality measure)	Explanatory variables and regressors	Estimation method	Findings with regard to causal factors of inequality	Other main findings
Immervoll and Richardson (2011)	14 OECD countries, mid-1980s to mid-2000s	LIS	Gini (disposable, market income)	population aged 25–64 with at least secondary education), union density, dummy for post-communist countries Redistribution as instrument to reduce inequality	Trend analysis, decomposition	post-socialism: negative Second-order effects are found to be nonsignificant –	– Tax-benefit systems are less effective than they were in the 1980s (despite the fact that they became more redistributive over the whole period). – In general, benefits decreased in real terms, although they were still the major drivers of redistribution. – Taxes contributed less to redistribution. – Redistribution strategies based on government transfers have to be complemented by employment policy
Doerrenberg and Peichl (2012)	Panel of OECD countries (unspecified)	– LIS – WIID – University of Texas Inequality Project (UTIP) – Penn U tables – World Tax Indicators (Sabirianove-Peter et al., 2010) – OECD statistics – WB WDI database	– Gini coefficient of household incomes – Regression estimates of household income inequality from wage inequality data	<i>Dependent variables (lagged 1 year):</i> – Government spending (Penn) – Public total social expenditure (OECD Soc exp) – Degree of tax progressivity (WTA) <i>Controls (lagged 1 year):</i> – GDP per capita – Squared GDP per capita – Trade openness – Inflation rate	– OLS with country and year fixed effects – 2SLS for instrumental variables	– 1% Increase in government spending decreases inequality by 0,3% – Tax progressivity is insignificant – Social expenditures are more efficient in inequality reduction than taxes – There are indications of second-order effects	– No significance of GDP (as a control variable) for the results – Inflation: slight negative effect – Union density: strong effect on inequality

- Unemployment rate
- Union density
- Higher education levels
- Index of globalization
- Instrumental variable:*
- 1981 level of policy variables (government spending, government social experiments, progressivity) extrapolated

Structural and Macro

<p>Alderson and Nielsen (2002)</p>	<p>16 OECD countries, 1967–1992, 192 observations</p>	<p>Deininger and Squire (1996 version)</p>	<p>Gini coefficient of gross income</p>	<ul style="list-style-type: none"> - GDP per capita (and squared) - Sector dualism (shift of employment out of agriculture) - Sector bias (share of labor force in agriculture) - Natural rate of population increase - Secondary school enrolment - 3 Globalization variables: DI outflow/labor force, southern import penetration/GDP; net migration rate - 3 Institutional variables: union density, wage setting coordination, decommodification - Female labor force participation - Period indicators (1970s and 1980s) 	<p>Random effects</p>	<ul style="list-style-type: none"> - Sector bias: significant positive - All 3 globalization indicators: significant positive - All 3 institutional indicators: significant negative - Female labor force participation: significant positive - Secondary school enrolment: significant negative - Other controls: insignificant 	<ul style="list-style-type: none"> - Only modest evidence for inequality trend being inherently linked to postindustrial development - When calculating relative contributions of factors, sector bias has the strongest effect (positive), followed by union density and decommodification (negative), southern import penetration and DI outflow (positive) - When estimating the maximum longitudinal effect (within single countries), sector bias is still dominant, but followed by southern import penetration and FI outflow
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Annex Table A19.1 Summary of multivariate analyses of determinants of cross-country differentials of within-country income distributions—cont'd

Author, date	Geographical coverage, period and number of inequality observations	Data source for inequality measure	Dependent variable (inequality measure)	Explanatory variables and regressors	Estimation method	Findings with regard to causal factors of inequality	Other main findings
Rohrbach (2009)	19 OECD countries, 1970–1999, 225 observations	UTIP/UNIDO (EHII data set)	Gini coefficient of gross income (estimated from pay data)	<ul style="list-style-type: none"> – Sector dualism (knowledge sector wage differential) – Sector bias (employment share in knowledge sector) <p><i>Controls:</i></p> <ul style="list-style-type: none"> – Average years of schooling – Natural rate of population growth – Union density – Trade openness (trade/GDP constant prices) 	Error Correction Model regression	<ul style="list-style-type: none"> – Sector bias (income differential in knowledge sector): significant positive – Sector dualism (differential between knowledge sector and other sectors): insignificant 	<ul style="list-style-type: none"> – Average years of schooling lower inequality, in all specifications – No significant effects of demographic change and trade openness – Union density increases inequality

Social Structure

Brady (2006)	18 Developed countries (mostly OECD)	LIS	Poverty head count Poverty intensity	<ul style="list-style-type: none"> – Manufacturing employment – Agricultural employment – Female labor force participation, the Elderly population – Children in single-mother families <p><i>Control variables:</i></p> <ul style="list-style-type: none"> – Economic development, welfare state 	Random effects models and counterfactual simulations	<ul style="list-style-type: none"> – Manufacturing employment and female labor force participation significantly reduces poverty headcount – Share of elderly population and share of children in single mother families increases poverty headcount – Agricultural employment has no effect on headcount. – None of the explanatory variables are significant for poverty intensity 	Welfare state has, in general, larger effect on poverty reduction than any of the structural explanatory variables. Economic development is mostly insignificant for (relative) poverty.
OECD (2011), chapter 5	23 OECD countries, mid-1980s to end of 2000s	LIS	Gini coefficient and D9/D1 ratio (of disposable income in 12 countries and of gross incomes in 11 countries)	<ul style="list-style-type: none"> – Dispersion of male earnings, male employment rates – Female employment rates – Assortative mating (earnings correlation of spouses) 	Conditional reweighting and decomposition (see Chen et al., 2013b for methods)	<ul style="list-style-type: none"> – Main contributor to household earnings inequality: men's earnings dispersion – Increase in female employment has an equalizing effect in all countries – Change in men's employment has little 	<ul style="list-style-type: none"> – Assortative mating has increased in OECD countries – There is a considerable heterogeneity in the size of unexplained increase in inequality

				– Household composition (five household types)		effect on household earnings inequality in all but three countries	
						– Assortative mating and household structure changes has inequality increasing effects, but are less sizeable than employment effects	

General

Li et al. (1998)	49 developed and developing countries between 1947 and 1994, 573 observations	Deininger and Squire (1996) data set	Gini coefficients (for inequality determinants models: averaged over 5-year periods)	<p><i>Dependents for testing cross-country variance:</i></p> <ul style="list-style-type: none"> – Country and years to measure cross-country and over-time variance <p><i>Dependents for determinants of inequality:</i></p> <ul style="list-style-type: none"> – Political economy variables (political freedom and initial secondary schooling) – Credit market imperfections (measured by land distribution and financial market development index) <p><i>Controls:</i></p> <ul style="list-style-type: none"> – Various definitions of Gini (income/ consumption, etc.) 	<ul style="list-style-type: none"> – Analysis of variance – OLS with dummies – OLS with instrumental variables 	<ul style="list-style-type: none"> – 90% of total variance of Ginis is explained by variations across countries as opposed to intertemporal variation – 7 of 49 countries show significant decline, 10 show (small) increase in Gini – 65% of the sample of countries show no clear time trend – Financial market imperfection has larger effect on inequality than the political economy variables – Both effects are stronger for the lower 80% than for the top 20% – A more egalitarian distribution of land decreases inequality (benefits the poor more) – Expansion of political liberty, of secondary education and of financial market improvements benefits all and contributes to inequality decrease 	–
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Annex Table A19.1 Summary of multivariate analyses of determinants of cross-country differentials of within-country income distributions—cont'd

Author, date	Geographical coverage, period and number of inequality observations	Data source for inequality measure	Dependent variable (inequality measure)	Explanatory variables and regressors	Estimation method	Findings with regard to causal factors of inequality	Other main findings
Cornia (2012)	14 Countries in Latin America, 1990–2009 (2 OECD)	IDLA database	Gini coefficient (household, income)	<ul style="list-style-type: none"> – External conditions (international terms of trade, migrant remittances, and FDI); – The rate of growth of GDP per capita; – Changes in exogenous factors (the dependency rate and the activity rate); – The distribution of human capital among workers (the ratio of changes over time in the number of adults with secondary and tertiary education divided by changes over time in the number of those with primary or no education); – Fiscal policies (the ratio of direct to indirect taxes, and public expenditure on social security/GDP); – Labor market policies (the minimum wage interacted with the share of formal sector workers); – Macroeconomic policy (the real effective exchange rate and its square); (viii) political variables (the dummies “social democratic” and “radical-populist” and the Polity2 index, which measures the quality of democracy) 	OLS, 3SLS, GMM	<p><i>Impact on Gini:</i></p> <p>Terms of trade (–), remittances (not significant), FDI (+), GDP/c growth rate (–/not significant), dependency ratio (not significant), labor force participation (not significant), education (–), taxes (–), public expenditure (–), exchange rate (–), exchange rate squared (+), minimum wage (–), political variables (–), lagged Gini (++)</p>	–

ACKNOWLEDGMENTS

The authors are grateful to Tony Atkinson, François Bourguignon and Andrea Brandolini for their useful comments and suggestions on earlier drafts of this chapter. The authors also thank Wen-Hao Chen, Tim Goedemé, Alexander Hijzen, Márton Medgyesi and Pieter Vanhuyse for comments and advice on the literature. Numerous comments at the Paris author's conference organized in preparation of this book in April 2013 are much appreciated. The authors also thank Anna B. Kis and Eszter Rékasi for their research assistance. They have no responsibility for any remaining errors. The views expressed are not necessarily those of the institutions with which the authors are affiliated.

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