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## **On the impact of inequality on growth, human development, and governance**

Ines A. Ferreira,<sup>1\*</sup> Rachel M. Gisselquist,<sup>2</sup> and Finn Tarp<sup>1,2</sup>

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**Abstract:** Countering recent rises in many countries of inequality in income and wealth is widely recognized as a major development challenge. This is so from an ethical perspective and because greater inequality is perceived to be detrimental to key development aims. Still, an informed debate on the effects of inequality requires clear evidence. This review contributes to the literature by taking stock and providing an overview of current knowledge of the impact of income inequality on three important outcomes: economic growth, health and education as two dimensions of human development, and governance, with a focus on democracy. Drawing on the insights from different disciplines and considering recent work, it reveals that existing evidence provides somewhat mixed results and argues for a need for further in-depth empirical work. It also points to explanations for the lack of consensus embedded in data quality and availability, measurement issues, and the shortcomings of the different methods employed. Finally, we point to promising future research avenues relying on experimental work for micro level analysis, more region- and country-specific studies, and reiterate the need for improvements in the availability and reliability of data.

**Key words:** inequality, growth, health, education, governance, review

**JEL classification:** O15, O40, P48

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On 9 April 2021, this working paper was modified to add a missing sub-heading. On 10 December 2021, the equation on page 11 was corrected.

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<sup>1</sup> University of Copenhagen, Copenhagen, Denmark; <sup>2</sup> UNU-WIDER; \* corresponding author: Ines A. Ferreira, [if@econ.ku.dk](mailto:if@econ.ku.dk)

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## 1 Introduction

Recent decades have witnessed sharp rises in inequality of income and wealth in many countries (though neither globally nor everywhere) as well as in the observed level of inequality of opportunities in access to basic services, such as health and education. The concern with these trends is reflected in Goal 10 of the Sustainable Development Goals approved by the United Nations General Assembly in 2015, which aims at ‘reducing inequality within and among countries’. As the impact of the COVID-19 pandemic in furthering existing inequalities became increasingly visible, this was set as goal of the month in May 2020, pointing to a moment of opportunity to invest in policies to tackle inequality (United Nations 2020).

Pursuing this goal can obviously be justified from an ethical perspective. Yet, even if we recognize the intrinsic value of reducing inequality, the seminal *World Development Report 2006* on ‘Equity and Development’ also drew attention to the implications of high levels of inequality for long-term development (World Bank 2006). Economists have long been concerned with the trade-offs between equity and efficiency,<sup>1</sup> and the old classical view even suggested that a contradiction exists between equality and development. Yet, it has subsequently been argued that there are many channels through which inequality can be harmful to economic growth. The potential negative effects of inequality have also been associated with other development outcomes, such as poverty, health and education, and social and political stability.

Informed policy debate requires clear evidence on these impacts. Surprisingly, the literature is quite ambiguous about how inequality affects different outcomes. This paper aims at bringing more clarity to the debate by taking stock of the current knowledge of the effects on three important outcomes: economic growth, health and education as two dimensions of human development, and governance, with a focus on democracy. We develop an overview of the core arguments and underlying mechanisms, as well as of the existing evidence, with a particular focus on cross-country insights. While building on previous work (e.g., Neves and Silva 2014; Voitchovsky 2011; O’Donnell et al. 2015), this review provides a more comprehensive perspective on the consequences of inequality,<sup>2</sup> drawing on strands of literature from different disciplines as well as collecting the insights from recently published work.

Overall, our review of an extensive body of work suggests that there is no consensus emerging from the empirical evidence and we argue that there is room for additional in-depth work in terms of uncovering the effects through specific mechanisms of transmission. We advance the underlying explanations for this state of affairs, related to the challenges inherent in data quality and availability, measurement issues, and shortcomings of the different estimation methods employed, and suggest some avenues for further research.

The remainder of this paper is organized as follows. In Section 2, we present an outline of the main theoretical predictions of the effects of inequality on socio-economic outcomes and on governance, presenting different channels of transmission. Section 3 follows the same structure

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<sup>1</sup> In this debate, equity refers to equality of opportunities to pursue a life of the person’s choosing and protection from extreme deprivation in outcomes (World Bank 2006), and efficiency refers to economic efficiency, which is needed for economic growth (Thorbecke 2016).

<sup>2</sup> Throughout this paper we refer to ‘income inequality’ and ‘inequality’ interchangeably. Although we recognize the multidimensionality of inequality, in this paper we focus on the literature considering income inequality, which is still a dominant measure (Stewart 2016).

and reviews existing empirical evidence. We reflect on the empirical challenges of estimating the effects of inequality in Section 4, before concluding in Section 5.

## 2 Theoretical predictions

Several theoretical explanations have been proposed across disciplines for the effects of inequality on different socio-economic and political outcomes. Before we describe in more detail these channels of influence and the resulting outcomes, we highlight a broader set of arguments, which act as a roadmap for the rest of the section. These are schematically represented in Figure 1.

Starting from the left- to the right-hand side, the diagram represents different channels of transmission of the effects of higher levels of inequality, their intermediate effects, and the resulting positive or negative impact on our three outcomes of interest: growth, human development, and democracy. These channels can be broadly divided according to their underlying drivers: the poor, the population at large or the average, and the wealthy. While this is a simplified schematic representation, there is also some consideration of the linkages between different effects, represented in dashed lines.

Overall, the diagram suggests that high inequality is expected to have predominantly harmful effects on our three outcomes of interest, according to theoretical explanations advanced in the literature. The dominant view then runs contra the expectations of classical theorists, that inequality would have positive impact on growth, via savings and investment (shown at the top of Figure 1). We highlight six main transmission channels:

- influence on policy making and consequent effects on property rights and the incentives for savings and investment;
- influence on investment in public goods, namely, health and education;
- relatedly, the under-investment on human capital resulting from credit constraints;
- high taxation demanded by a well-endowed median voter;
- the effects of a small middle class on the demand for manufactures and democracy; and
- polarization and social discontent and, consequently, increased probability of political violence.

Some of these channels affect all of the outcomes. For instance, the effect through investment in public goods has detrimental effects on human development, and on growth and democracy. Moreover, the resulting polarization and social discontent which increase the chances of political violence again negatively impacts the three outcomes. However, there is also some indication that, when it comes to growth, the effect might be ambiguous depending on the predominance of the effects of transmission mechanisms. The channel through savings (and investment) points to a potential positive effect, while the different effects through public investment, taxation, the structure of demand, imperfect credit markets, fertility, and social discontent suggest potential negative consequences for growth.



This section uncovers more details about these different theoretical predictions. It starts by introducing the main hypotheses advanced for the effects of inequality on growth. As suggested in Figure 1 and described in more detail below, some of these channels point to the impact of inequality on our remaining outcomes of interest, namely, education and health, or governance. We return to them in the remaining two subsections, where we expand to consider the insights from other strands of literature.

## 2.1 How inequality affects growth

An extensive literature examines the effects of inequality on growth, highlighting multiple channels of transmission.<sup>3</sup> The early studies, referred to as the classical approach, argued that there is a positive effect of inequality on growth, explained via savings or incentives. However, subsequent work questioned this view, challenging some of its assumptions and proposing different channels of influence. Most of this work has predicted a negative effect of inequality. We briefly outline these channels in the next paragraphs, and refer to Bourguignon (2015), Neves and Silva (2014), and Voitchovsky (2011) for detailed and comprehensive reviews.<sup>4</sup>

### 2.1.1 High inequality is growth enhancing

We start by drawing attention to the view of classical economists on income inequality, according to which there was a contradiction between equality and development (for a discussion of the trade-off between efficiency and equity, see Thorbecke 2016). Adam Smith defended that inequality had benefits based on arguments of (i) ‘trickle-down effects’—the increase in wealth will eventually benefit the poor, (ii) incentive effects—inequality is necessary to encourage competition and to provide incentives for innovation, and (iii) social stability—the different ranks in wealth distribution ensure peace and stability in society (in Walraevens 2020). The famous Kuznets curve (Kuznets 1955), shaped like an inverted U-relationship between growth and inequality (as per capita income increases), seemed to reinforce this view.<sup>5</sup>

Developed in the 1950s and 1960s, what became known as the ‘classical approach’ followed a similar line of thinking, based on arguments related to savings and incentives. The prominent work by Kaldor (1956) suggested a positive link between inequality and growth via saving rates, based on the assumption that the higher the level of income, the higher would be the marginal propensity to save (Aghion et al. 1999). This assumption that the rich have a higher marginal propensity to save relative to the poor can be explained by two hypotheses: (i) that consumption smoothing cannot occur unless the subsistence level of consumption is achieved, and therefore the poor cannot save; and (ii) that the possibility to save is conditioned by the previous generations, which leads to a concentration of savings in rich households (Thorbecke and Charumilind 2002).

Under this assumption, the redistribution of resources towards the rich would lead to higher savings, which, in turn, would improve growth via investment.<sup>6</sup> This link is particularly important

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<sup>3</sup> Kuznets (1955) argued that the early stages of the development process would be accompanied by rising inequality, which would then fall as the country reached a higher level of per capita income. This relationship, which became known as the ‘Kuznets curve’, and other work looking at this direction of causality are not covered here.

<sup>4</sup> See also a review of early studies in Bénabou (1996) and Aghion et al. (1999), and a more recent overview in Ehrhart (2009).

<sup>5</sup> See Sandmo (2015) for an overview of the history of theories of income distribution, from the time of Adam Smith until the 1970s.

<sup>6</sup> The formal model developed in Stiglitz (1969) was in line with this argument.

if one considers limited borrowing possibilities, initial set-up costs, and the large investments involved in risky and high-return opportunities (Voitchovsky 2011; Aghion et al. 1999). Big investment projects involve large sunk costs, and therefore investment relies on the concentration of wealth in individuals to be able to afford them.

A second argument drew on the role of incentives and on the trade-off between efficiency and social justice mentioned earlier (Aghion et al. 1999). At the micro level, in a simple moral hazard model, if output depends on unobserved effort, then setting a constant reward (in the form of wage) would discourage effort, whereas linking the reward to output can be inefficient due to agents' risk aversion. The same argument is maintained at the aggregate level, assuming identical agents and/or perfect capital markets. As explained by Aghion et al. (1999), redistribution will have a direct negative effect on growth, as well as a negative indirect effect through the reduction in the incentives to accumulate wealth (resulting from redistribution through income tax).

### *2.1.2. High inequality has a negative effect on growth*

#### *Credit market imperfections and fertility*

The effects of inequality on growth via credit market imperfections and via fertility can be linked by their focus on the circumstances of the poor and on human capital investment (Voitchovsky 2011). The first channel focused on the impact of credit imperfections on investment decisions. If one considers the high fixed costs associated with, for instance, education, limitations on the access to credit may lead to under-investment in human capital, which would have a negative impact on growth (Neves and Silva 2014). This was the argument resulting from Galor and Zeira's (1993) model. Assuming that credit markets are imperfect and that investment in human capital is indivisible, they argued that the distribution of wealth would have an impact on aggregate investment in human capital and therefore on growth, both in the short and in the long run.

The reasoning behind the link between inequality and growth through fertility was similar to this argument. Poor families might not have the resources to invest in their children's education and, thus, their income would depend on having bigger families; for richer families it might be optimal to invest more in education and, consequently, to have fewer children (Gründler and Scheuermeyer 2018). In this line of thinking, de la Croix and Doepke (2003) argued that a high fertility differential between the rich and the poor lowered average education. Thus, inequality would lead to lower levels of human capital accumulation via the increased fertility differential and, therefore, to lower growth.

#### *Government expenditure and taxation*

Seminal work by Alesina and Rodrik (1994) as well as Persson and Tabellini (1994) pointed to a negative link between inequality and growth through government expenditure and taxation, combining endogenous growth theory with political economy arguments. They proposed two different mechanisms that Perotti (1996) termed 'political' and 'economic', respectively. Alesina and Rodrik's (1994) model drew on the median voter theorem and considered tax revenues to be equally distributed among all individuals. Given that the tax rate was proportional to income, individuals with a lower share of capital income (relative to labour income) would prefer higher taxes. Thus, the more equitable the distribution in the economy, the better endowed would be the median voter, and the lower the equilibrium level of taxation. A lower rate of tax would correspond to a higher growth rate, which led them to conclude that there was an inverse relationship between inequality and subsequent economic growth.

Persson and Tabellini (1994) reached the same conclusion considering the role of incentives for productive accumulation and for growth. According to them, the incentives necessary for private savings and investment relied on individuals' ability to 'appropriate privately the fruits of their efforts' (Persson and Tabellini 1994: 600), which were in turn influenced by tax and regulatory policies. Inequality would give rise to policies that did not protect property rights or allow full appropriation of returns to investment, and was therefore associated with lower economic growth.

Still, this result was defied by Li and Zou (1998). They offered a more general framework than that proposed in Alesina and Rodrik (1994), considering that government spending could be directed not only to production services—which entered the production function—but also to consumption services—which entered the utility function. By adding this extension, they showed that a more equal distribution could lead to lower growth via higher taxation, and that the effect of income inequality on growth would therefore be ambiguous.

The view outlined in Alesina and Rodrik (1994) and in Persson and Tabellini (2014) was also challenged by an alternative perspective suggesting that redistributive policies might also have a positive effect on growth in the presence of imperfect credit and insurance markets, and that the popular support for these policies would decrease with inequality (Bénabou 2000). When combined, these two mechanisms could originate multiple steady states, while the correlation with growth would be dependent on the balance between incentive distortions and credit constraints (Neves and Silva 2014). Voitchovsky (2011: 556) lists the criticism towards the median voter argument and highlights how the channel through redistribution did not gather consensus.

#### *The structure of demand*

Zweimüller (2000) described the role of redistribution on growth through innovation. Building on the assumption of hierarchic preferences, the distribution of income would affect the structure of demand: poor people would spend mainly on basic needs whereas rich people would spend on luxurious goods. According to the author, inequality would impact growth through its effect on the time path faced by an innovator. When a new and expensive good was introduced in the market, only rich consumers could afford it, until the increasing demand drove the price–wage ratio down (due to economies of scale) and opened the market to mass consumers (Voitchovsky 2011). The optimal consumption levels of those affected by redistribution would dictate the overall effect of changes in income inequality on long-run growth (Zweimüller 2000). An earlier study by Murphy et al. (1989) had already highlighted the importance of the middle class to the consumption of domestic manufactures and therefore to industrialization.

#### *Socio-political instability and rent seeking*

Another group of studies suggested a link between inequality and growth through socio-political instability, drawing attention to the effects on property rights. According to Alesina and Perotti (1996), social unrest—resulting from social discontent caused by income inequality—can lead to an increasing probability of political violence as well as policy uncertainty and threats to property rights, which, in turn, have a negative impact on investment and thus on growth. Keefer and Knack (2002) claimed that income inequality led to instability in government policies, namely those related to security of property rights, which would affect the decisions of economic actors, and consequently slow the rate of growth.<sup>7</sup> Relatedly, Glaeser et al.'s (2003) model showed a

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<sup>7</sup> Note that neither Alesina and Perotti (1996) nor Keefer and Knack (2002) include a formal theoretical model.

detrimental effect of inequality on property rights through the subversion of political regulatory and legal institutions by the rich for their own benefit.

### *2.1.3. The effect depends*

Finally, we highlight some contributions suggesting that different mechanisms might be present at different points. Galor and Moav (2004) proposed a unified theory between the credit market imperfections and the saving rates channels described earlier. According to them, the positive effect of inequality on growth suggested by classical theories corresponded to early stages of industrialization when economic growth was primarily driven by physical capital accumulation. However, at later stages, human capital accumulation would become the main determinant of growth and credit constraints would be largely binding, which explained the negative link between inequality and growth through credit market imperfections. As credit constraints became less binding as a result of wage increases, the aggregate effect of income distribution on growth would be less significant.

A decade later, Halter et al. (2014) presented a parsimonious theoretical model that took into account both a short-term and a long-term effect of asset inequality. According to them, the short-term effect was positive and occurred through an economic channel, whereas the long-term effect was negative and stemmed from a political economy channel.

## **2.2 How inequality affects education and health**

### *2.2.1 Inequality can have both positive and negative effects on education*

While the literature examining the effects of education on inequality is extensive, the same is not true for studies looking at the other direction of causality. We distinguish between the argument on the effects of inequality through expenditure on education and through school enrolment and attainment.

The provision of education depends on the willingness of citizens to redistribute resources via taxation [in line with Alesina and Rodrik (1994) and Perotti (1996)]. According to this political economy mechanism, increasing inequality will lead to lower availability of resources, as the rich will prefer not to contribute to public education, favouring private schools (Mayer 2001).<sup>8</sup> Gutiérrez and Tanaka (2009) modelled the effect of inequality on school enrolment, and the preferred tax rate and expenditure per student focusing on parents' decisions in developing countries. According to the authors, beyond a certain level of inequality, there is no longer support for public education. The model shows that, when considering that parents can make a choice between sending their children to work, or to private or public schools, high inequality results in exiting public education, which has implications on the tax rate and expenditure per student.<sup>9</sup>

According to the credit market imperfections' channel discussed in Section 2.1, inequality creates obstacles in terms of access to education. In the presence of imperfect credit markets, the distribution of wealth affects the aggregate investment in human capital (Galor and Zeira 1993; García-Peñalosa 1995). The expected returns to the family from schooling will also affect the demand for education, as educated children are expected to have higher future income (Birdsall 1999). If inequality is induced in part by increased returns to schooling, then there will be an

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<sup>8</sup> For a summary of theoretical work on the choice between a public and a private education system, see García-Peñalosa (1995).

<sup>9</sup> Gutiérrez and Tanaka (2009) offer a review of previous theoretical models.

incentive for children to stay in school and one could expect a positive relationship between an increase in inequality and educational attainment (Mayer 2001; Thorbecke and Charumilind 2002; Dabla-Norris et al. 2015).<sup>10</sup>

Additionally, inequality can affect enrolment by determining the number of poor that are able to substitute the return of child labour for school attendance (Gutiérrez and Tanaka 2009: 56). Tanaka's (2003) model shows that in contexts of high inequality, there is low support for public provision of schooling, which, in equilibrium, leads to a higher level of child labour.

### *2.2.2 Inequality negatively affects health*

The interest in understanding how health is affected by income inequality has instigated a broad range of work both in economics and in the fields of public health and sociology<sup>11</sup> and has been explained by different hypotheses. Generally, they suggest that inequality negatively affects health. Following O'Donnell et al. (2015) and Leigh et al. (2011), we distinguish between hypotheses that imply that the health of all individuals is affected and those that do not require that the health of every individual in society is threatened.<sup>12</sup>

The first group of hypotheses proposes three different channels: public goods provision, social capital, and violent crime.<sup>13</sup> The effect through public goods provision can be negative or positive (Leigh et al. 2011). There will be a negative effect if inequality causes a reduction in the average value of publicly provided goods due to more heterogeneous preferences, or if it enables the rich to acquire more political influence and, consequently, to pressure for a reduction in public spending on health. However, it can also be positive, given that as inequality increases among voters, the median voter will tend to support spending on health.

The effect through social capital is based on the assumption that income inequality leads to decreased social cohesion and, therefore, affects health through social and psychosocial support, informal insurance mechanisms, and information diffusion (O'Donnell et al. 2015). Low trust can lead to disbelief about the improvements in health via public spending and it has been linked to higher mortality via smaller friendship networks as well (Leigh et al. 2011). Finally, even though only a small percentage of deaths in developed countries result from violent crime, Leigh et al.

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<sup>10</sup> Additional mechanisms relate to social comparison, and include relative deprivation and gratification in the context of neighbourhood and school effects, as well as economic segregation (Mayer 2001). The first refers to the fact that people compare themselves with those who are more disadvantaged, which in the case of children can lead to feeling less willing to study or stay in school and in the case of parents can cause stress and alienation. The second suggests that an increase in inequality is likely to lead to more geographic segregation as the rich and poor have less in common. We refer to Mayer (2001) for more details on this literature.

<sup>11</sup> We refer to Deaton (2003) and Lynch et al. (2004) for detailed descriptions of the emergence of the debate on the link between income inequality and health.

<sup>12</sup> In this review, we do not cover studies on the link between inequality and homicides and between inequality and life satisfaction and happiness.

<sup>13</sup> Lynch et al. (2004) refer to additional nuances for this hypothesis, related to the effects of inequality through psychosocial processes, and through the differential accumulation of exposures that derive from material sources rather than from perceptions of disadvantage. They mention also the weak and strong versions of this hypothesis proposed by Mellor and Milyo (2002).

(2011) highlight the potential of larger secondary effects via increased stress about experiencing crime in the future.<sup>14</sup>

In the second group of hypotheses, health depends on income at the individual level. Wagstaff and van Doorslaer's (2000) seminal review describes different interpretations. First, the absolute income hypothesis, which was also termed the 'income artefact' hypothesis, suggests that the observed correlation between inequality and health is a result of the concave relationship between income and health; that is, the health gains of an additional unit of income are diminishing in an individual's income level. The term artefact applies to the fact that a redistribution of income leads to an increase in average population health even though there is no effect on the health of any individual, given their income.

Second, the relative income hypothesis is built on the idea that health is affected by the psychosocial effects that result from individuals comparing their income with that of others' (the mean income of the population or the community). Third, the deprivation hypothesis is a variation of the relative income hypothesis that argues that the crucial aspect is the extent of deprivation measured by the income gap. Fourth, and related, the relative position hypothesis states that what is important is the position of the individual in the income distribution.

### **2.3 How inequality affects democratic governance**

In this section, we delve more deeply into the relationship between inequality and governance outcomes, democracy in particular, which have attracted considerable attention, especially within political economy and political science. We start by focusing on the effects on democratic stability and democratic transition, and then we zoom in on the effects on political participation.

First, we refer back to the link between inequality and growth through political instability and social conflict described in Section 2.1.2. As highlighted by Fukuyama (2011: 84), '[a] more likely reason why inequality is bad for growth is directly political: highly unequal countries are polarized between rich and poor, and the resulting social conflict destabilizes them, undermines democratic legitimacy, and reduces economic growth.' The summary in Thorbecke and Charumilind (2002) suggests two main mechanisms: the relative deprivation hypothesis and resource mobilization. According to the first, discontent resulting from the gap between individual expected and achieved well-being leads to collective political violence. Inequality might deepen the grievances of certain groups or reduce the opportunity cost of engaging in violent conflict (Dabla-Norris et al. 2015). Nevertheless, the second mechanism points to the ability of dissident groups to organize themselves as the key element.

The theoretical literature largely suggests negative effects of inequality on the likelihood of transition to and stability of democracy. It attributes an important role to democratic values and access to education, which are more likely to characterize citizens and the situation in equal societies, and to the middle class, which is more likely to promote tolerance and avoid extremist positions (Houle 2015).

Two of the most prominent arguments for the link between inequality and democracy were presented in Boix (2003) and Acemoglu and Robinson (2006).<sup>15</sup> The former argued that increasing levels of economic equality would lead to a higher probability of democracy through redistribution.

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<sup>14</sup> We refer to Thorbecke and Charumilind (2002) for an overview of the evidence and causal mechanisms linking inequality and crime.

<sup>15</sup> For a review of the theoretical arguments developed earlier, see Bollen and Jackman (1985).

According to the theoretical predictions, the pressure for redistribution from the poor would decrease with higher levels of equality, which would mean that a turn to democracy would be less costly for the holders of the most productive assets; that is, the payment of tax would be less costly than repression.

Acemoglu and Robinson's (2006) predictions indicated a nonlinear, inverted U-shaped relationship. On the one hand, greater inter-group inequality would increase the appeal of a revolution for citizens in order to increase their share in the income of the economy, thus, increasing the likelihood of democracy. On the other hand, higher inequality also meant higher aversion to democracy by elites as their tax burden would be greater, thus discouraging democratization. Accordingly, the authors suggested that, for high levels of equality, there was no incentive for citizens to challenge the system and the interests of the elites would be preserved. In societies with high levels of inequality, the citizens would try to rise up against the system, but this would be met by great repression from the elite, leading to a repressive non-democracy or a revolution, in certain cases. Therefore, the likelihood of democracy would be higher for middle levels of inequality.

However, Houle (2009) highlighted three problems with these theories. First, they do not apply to transitions that are driven from above (e.g., from intra-elite competition). Second, the net effect of inequality is ambiguous because it makes redistribution more costly for the elites but, at the same time, it increases the population's demand for regime change. Finally, they ignore collective action problems and the challenges of mobilizing the population. More recently, Ansell and Samuels (2010) departed from Boix (2003) and Acemoglu and Robinson (2006) and proposed a contractarian approach that placed the focus on the citizens' demand for protection against expropriation. According to these authors, democracy would emerge from land equality and income inequality.

We refer briefly to a related group of studies examining the link from inequality to institutional quality, and refer to Chong and Gradstein (2019) for more details. Chong and Gradstein (2007, 2019) argue that there is double causality: while inequality leads to subversion of institutions through the political power of the elite, poor institutional quality also causes a higher level of inequality. Furthermore, Kotschy and Sunde (2017) have proposed that inequality interacts with political institutions in shaping institutional quality.

Finally, a strand of studies in political science has argued that there is a link between inequality and political participation. As reviewed in Solt (2008), the theoretical predictions lead to different possible outcomes of economic inequality on political engagement: a negative effect, a positive effect, or an effect that depends on the level of income of the individual. The first outcome is a result of the concentration of power: societies that are more unequal have a higher concentration of power, which has implications for how the issues that separate the rich from the poor are dealt with in the political sphere. The rich will have a lower need to engage in the political process whereas the poor will feel removed from politics. The prediction of a positive effect results from the fact that the divergence in the views of the rich and the poor will be more apparent in societies with higher inequality, which should lead to higher participation in the political process. Finally, the last prediction hinges on the fact that political engagement entails the use of resources. Thus, with higher levels of inequality, one should expect greater engagement from the rich, who would have more resources available, and lower political engagement from the poor.<sup>16</sup>

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<sup>16</sup> This summary follows closely Solt (2008), to whom we refer for more details on this literature.

### 3 What the empirical evidence says

We now move on to discussing the main insights from empirical analyses. We follow the structure of the previous section and start with the results from the studies testing the causal effect of inequality on growth, before discussing the effects on education and health and on governance outcomes. Although we focus this review mainly on cross-country analysis, which makes up a significant part of the evidence on the inequality–growth link, we also refer to studies examining the inequality–growth link at the regional level, namely in the United States. The same is so for the reviews on education, health, and governance outcomes. In particular, our summary of the evidence on the impact of inequality on health considers aggregate level and multilevel studies as well as cross-country and within-country empirical analyses.

#### 3.1 Growth

##### 3.1.1 Direct link

Many of the studies testing the link between inequality and growth estimate reduced-form equations. The results of these studies are inconclusive, which can be partly explained by the application of different data specifications and estimation methods (Knowles 2005), to which we return later. Table 1 provides additional details of prominent studies in the literature as well as recent contributions. We make no claim of completeness (for a more comprehensive account, see Neves and Silva 2014). Initial studies that focused on cross-country analysis added inequality to a list of growth determinants in a Barro-style regression of the form:

$$g = \alpha_0 + \sum_{m=1}^M \alpha_m Z_m + \delta INEQ + u$$

where  $g$  is the average annual growth rate, frequently measured as the log difference of gross domestic product (GDP) per capita;  $INEQ$  is a measure of income inequality (usually the Gini coefficient);  $Z_m$  is a set of other variables commonly used in standard growth regressions; and  $u$  is the usual error term. This was then estimated frequently using basic ordinary least squares. To avoid reverse causation, inequality was measured at the beginning of the time span for growth, which would usually consider a period of 20–30 years, and in some cases instrumental variables were also employed to address endogeneity concerns.

Table 1: Summary of results from selected empirical work testing the link between inequality and growth

General finding	Reference	Data (no. countries; period)	Measure of inequality	Data source	Data structure; estimation method(s)
Negative effect	Alesina and Rodrik (1994)	$N=46/70$ ; 1960–85	Gini for land and income	Jain (1975); Fields (1989)	Cross-section; OLS, 2SLS
	Persson and Tabellini (1994)	$N=56$ ; 1960–85	Pre-tax income share accruing to the third quintile (note: measure of equality)	Paukert (1973)	Cross-section; OLS, 2SLS
	Clarke (1995)	$N=74/81$ ; 1970–78	Coefficient of variation; Theil's index; Gini; share of income of the poorest 40% to the share of income of the richest 20%	United Nations Indicator of Social Development; Jain (1975);	Cross-section; OLS, WLS, 2SLS

	Perotti (1996)	$N=67$ ; 1960–85	Combined share of the third and fourth quintiles	Lecaillon et al. (1984) Jain (1975); Lecaillon et al. (1984)	Cross-section; OLS, 2SLS
	Cingano (2014)	$N=31$ ; 1970–2010	Gini; bottom inequality; top inequality	OECD income distribution dataset	Panel; Sys-GMM
	Berg et al. (2018)	$N=153$ ; 1960–2009	Gini	SWIID	Panel; Sys-GMM
	Gründler and Scheuermeyer (2018)	$N=164$ ; 1965–2014	Gini	SWIID	Panel; two-step Sys-GMM
Positive effect	Li and Zou (1998)	$N=46$ ; 1960–90	Gini	Deiningering and Squire (1996)	Panel; FE, RE
	Forbes (2000)	$N=45$ ; 1966–95	Gini	Deiningering and Squire (1996)	Panel; FE, RE, Diff-GMM
	El-Shagi and Shao (2019)	$N=123$ ; 1960–2010	Gini	SWIID	Panel; LSDV
It depends					
Controls	Deiningering and Squire (1998)	$N=87/66$ ; 1960–92	Gini; land distribution	Deiningering and Squire (1996)	Cross-section; OLS
Level of income	Barro (2000)	$N=84$ ; 1965–95	Gini; quintile shares	Deiningering and Squire (1996)	Panel; 3SLS
	Castelló-Climent (2010)	$N=102/23$ ; 1960–2000	Gini; percentile ratios 90/10, 90/50, 80/20	WIID; Luxembourg Income Study	Panel; Sys-GMM
Non-linear effects	Banerjee and Duflo (2003)	$N=45$ ; 1965–95	Gini	Deiningering and Squire (1996)	Panel; RE, GMM, Kernel regression
Profile of inequality	Voitchovsky (2005)	$N=21$ ; 1975–2000	Gini; top-end inequality (90/75 ratio); bottom-end inequality (50/10 ratio)	Luxembourg Income Study	Panel; Sys-GMM
Time	Halter et al. (2014)	$N=106$ ; 1965–2005	Gini	Deiningering and Squire (1996); WIID	Panel; Diff-GMM, Sys-GMM

Note: studies in chronological and alphabetical order within each main category. WIID, World Income Inequality Database; SWIID, Standardized World Income Inequality Database; OLS, ordinary least squares; 2SLS, two-stage least squares; WLS, weighted least squares; ; 3SLS, three-stage least squares; LSDV, least squares dummy variable; FE, fixed effects; RE, random effects; GMM, generalized method of moments; Sys-GMM, system GMM; Diff-GMM, difference GMM.

Source: authors' elaboration, inspired from Cingano (2014) and Neves and Silva (2014).

The aim was to estimate the coefficient of the income inequality variable,  $\delta$ , and most of these studies found a negative effect of inequality on growth. Persson and Tabellini (1994) obtained evidence for this effect using historical panel data and post-war cross-sectional analysis. Both the studies by Alesina and Rodrik (1994) and Clarke (1995) confirm this relationship using data from, among others, Jain (1975) and Lecaillon et al. (1984). Clarke (1995) showed that this was robust to different measures and empirical specifications.

Given the challenges imposed by scarce data, some authors turned to an analysis between states in the United States. Partridge (1997) tested the robustness of Persson and Tabellini's (1994) findings and the results suggested a positive link between inequality and subsequent growth when

considering either the Gini coefficient or the share of income of the middle quintile.<sup>17</sup> Using tax data at the state-level for the period 1940–80, Panizza (2002) warned that both the data and methodology used led to significant differences in the estimated coefficients for the effect of inequality on growth.

While the quality and reliability of the data were important challenges pertaining to early studies (Knowles 2005), the introduction of an improved and expanded dataset by Deininger and Squire (1996) led to a surge in new studies using panel estimators. In contrast with previous work, these studies found a positive link between inequality and growth. Li and Zou (1998) showed that the coefficient for lagged Gini had a positive sign and was significant in most growth regressions. Forbes (2000) confirmed this result using similar data and generalized method of moments (GMM) estimators.<sup>18</sup> Still, using the same dataset, Deininger and Squire (1998) found a negative effect of initial income inequality on growth, although the coefficient lost significance once regional dummies were added to the specification.

Offering a starting point to reconcile the differing views, some studies argued that the relationship between inequality and growth was dependent on other factors. According to Barro (2000), the effect of inequality on growth depended on the level of income of the country: panel evidence suggested growth-enhancing effects of inequality in richer countries (GDP per capita: above \$2,000, 1985 US dollars) and negative effects in poorer countries (below \$2,000). Soon after, Banerjee and Duflo (2003) raised concerns about the functional form used in the literature, arguing against using a linear specification for the relationship between inequality and growth. Their empirical work suggested an inverted U-shaped function between changes in inequality and lower future growth rates. Using a small sample of 21 industrialized countries, Voitchovsky (2005) showed empirical support for the hypothesis that the profile of inequality influenced its relationship with growth: top-end inequality seemed to have a positive effect and bottom-end inequality a negative effect.

The debate has continued in the literature ever since. Cingano (2014) lends support for a negative effect of inequality on growth using data from the OECD income distribution dataset. Additionally, the author suggests that reducing inequality by focusing on income disparities at the bottom of the income distribution has a greater positive effect on growth than by focusing on the top of the distribution. Castelló-Climent's (2010) results concur with this when considering the full sample of countries, but the results also find support for the argument of a differentiated effect according to the level of development. Halter et al. (2014) argue that there is a time dimension to the link between inequality and growth by showing a positive coefficient for the current Gini coefficient and a negative coefficient for lagged Gini.

Some studies have used data from an additional dataset proposed by Solt (2009), the Standardized World Income Inequality Database (SWIID). Yet, the results continue to mirror the lack of consensus of the earlier work. Applying system GMM, work from the International Monetary

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<sup>17</sup> Among the studies in the 1990s, there was also a focus on determining whether there was a differential effect of inequality on growth in democracies and non-democracies (Persson and Tabellini 1994; Alesina and Rodrik 1994; Perotti 1996; Clarke 1995; Deininger and Squire 1998). We discuss this in more detail in Section 3.3.

<sup>18</sup> Two recent studies build on Forbes' (2000) empirical model and attempt to overcome some of the remaining estimation challenges. Aiyar and Ebeke (2019) draw attention to the importance of considering equality of opportunity, and find empirical support for their hypothesis that the negative effect of income inequality is greater in countries with low levels of equality of opportunity (measured by intergenerational mobility). Scholl and Klasen (2019) are able to replicate Forbes' (2000) finding, but show that it disappears once they control for the experience of transition countries.

Fund finds a robust negative effect of inequality on growth (Ostry et al. 2014; Berg et al. 2018). While Gründler and Scheuermeyer (2018) concur with this result, Jäntti et al. (2020) raise concerns about the results in Berg et al. (2018), resulting from the use of the SWIID. El-Shagi and Shao (2019) criticize previous studies using system GMM and argue for the advantages of using a least squares dummy variable estimation instead. In contrast, their results show a positive effect of inequality on growth over the medium-term, which is primarily driven by market-based inequality.

Barro's (2000) view that the effect depends on the level of development in the country, confirmed in a later analysis by the same author using the World Income Inequality Database (WIID) dataset (Barro 2008), has also been verified in some recent work. Gründler and Scheuermeyer (2018) see a negative and significant marginal effect of net inequality on growth in poor economies, which is, however, non-significant in high-income countries.<sup>19</sup>

### 3.1.2 Channels of transmission

As discussed in Section 2.1, the theory proposes different channels through which inequality may affect growth. Although these specific mechanisms have received less attention in empirical work, we highlight the main findings, which are also summarized in Table 2.

Starting with the savings channel, while there was evidence of a positive link between inequality and personal savings when using household micro-data, studies based on cross-country aggregate data found mixed results (see references in Thorbecke and Charumilind 2002). Barro (2000) found that the investment ratio does not depend significantly on inequality. The channel via market imperfections and borrowing constraints found support in Deininger and Squire (1998), who added that the effect through the investment in human capital seemed more important than that via physical capital, as well as to some extent in Perotti (1996).<sup>20</sup> This channel also suggested that asset inequality mattered for growth (Ravallion 2001), which was shown in both Birdsall and Londoño (1997) and Deininger and Olinto (2000).

Table 2: Summary of empirical evidence on the different channels linking inequality and growth

Hypothesis	Channel	Empirical evidence
High inequality is growth enhancing	Savings	Some evidence using household micro-data, but mixed results using cross-country aggregate data (Thorbecke and Charumilind 2002). Barro (2000) rejects this hypothesis.
High inequality has a negative effect on growth	Credit market imperfections	Support in Deininger and Squire (1998), to some extent in Perotti (1996) and in Gründler and Scheuermeyer (2018).
	Fertility	Confirmed by de la Croix and Doepke (2003), Perotti (1996), Berg et al. (2018), as well as Gründler and Scheuermeyer (2018).
	Government expenditure and taxation	The fiscal policy channel received less support by Perotti (1996) and it was rejected by Persson and Tabellini (1994). Sylwester (2000) showed support for this hypothesis in the short run but not in the long run.
	Structure of demand	No specific empirical evidence on this channel.
	Socio-political instability and rent seeking	Support in Perotti (1996), Alesina and Perotti (1996), as well as Keefer and Knack (2002).

Source: authors' elaboration.

<sup>19</sup> In related work, Islam and McGillivray (2020) highlight the increasing interest in wealth inequality and investigate its effect on growth using wealth data from Forbes Magazine and Credit Suisse for 45 countries over the period 2000–12. The estimated results suggest a negative effect.

<sup>20</sup> Perotti (1996) empirically tested the different channels of transmission by estimating different structural models: first, using each of these channels in a growth model; then, estimating the effects of inequality on each of the channels.

There was also support for the channels related to socio-political instability (Perotti 1996). Using data from a sample of 71 countries over the period 1960–85, Alesina and Perotti (1996) found that a wealthy middle class was associated with lower levels of political instability, which was conducive to higher investment. Keefer and Knack (2002) showed evidence of a negative effect of inequality on growth and suggested that property rights were an important channel for this relationship.

Perotti (1996) confirmed the link between inequality and growth via fertility. Testing the same hypothesis, de la Croix and Doepke (2003) used Deininger and Squire's (1996) improved dataset and showed that the negative and significant effect of initial inequality on subsequent growth did not survive the inclusion of differential fertility variable, which was negative and significant. They interpreted this as meaning that the differential fertility was an important factor explaining the link between inequality and growth.

The fiscal policy channel received less support by Perotti (1996) while Persson and Tabellini (1994) had also obtained coefficients with the expected sign but statistically insignificant for the links from inequality to redistributive policies and from redistribution to growth. Sylwester (2000) showed results from cross-country analysis that indicated that higher inequality was associated with higher subsequent expenditures for public education relative to GDP, which in turn had a negative effect on current growth but a long-term positive impact.

Recent studies have shown evidence that corroborates the theoretical effects via human capital accumulation (Berg et al. 2018), credit market imperfections (Gründler and Scheuermeyer 2018), and fertility (Berg et al. 2018; Gründler and Scheuermeyer 2018) as channels through which inequality affects growth. Using data from 21 OECD countries over the period 1870–2011, Madsen et al. (2018) find support for the hypothesis that income inequality affects growth through different channels, namely, savings, investment, education, and ideas production. Additionally, they concur with the arguments on differentiated effects. Although the negative impacts are significant in financially underdeveloped countries, there is little effect of inequality on the four outcomes in countries with highly developed financial markets.

### **3.2 Education and health**

In a recent paper, Castells-Quintana et al. (2019) estimated the effects of the Gini coefficient on the human development index and found a negative effect in the long run, whereas in the short run the results changed for different components of the index: positive effect on income and a negative effect on educational outcomes. Moreover, they concurred with the aforementioned studies that found distinct effects depending on the level of development. We are not aware of any other studies pursuing a similar analysis for the human development index, but in the remainder of this section, we discuss the empirical results on the link between inequality and education and health. The main conclusions are summarized in Table 3.

Table 3: Summary of empirical evidence on the different hypotheses on the effects of inequality on education and health

Outcome	Effect	Empirical evidence
Education	Inequality affects expenditure on education	In contrast with theory, Sylwester (2000) suggests that a high level of inequality is correlated with higher spending for public education.
	Inequality affects education enrolment and attainment	Several studies find a negative link between inequality and secondary school enrolment (Flug et al., 1998; Checchi 2003; Easterly 2007; Esposito and Villaseñor 2018; Madsen et al. 2018; Berg et al. 2018). A study from the United States links an increase in inequality with an increase in the gap in the educational attainment between rich and poor (Mayer 2001).
Health	Inequality affects the health of all individuals	There is strong support from Wilkinson and Pickett in different studies (Wilkinson and Pickett 2006; Pickett and Wilkinson 2015) and weak support in Lynch et al. (2004). Concerns have been raised in reviews by Subramanian and Kawachi (2004), Nolan and Valenzuela (2019), Deaton (2003) and Leigh et al. (2011).
	Inequality affects the population health, but not necessarily of all individuals	Strong support exists for the absolute income hypothesis, resulting from the concave relationship between average income and average health (Wagstaff and van Doorslaer 2000). No evidence exists for the relative income hypothesis; that is, that there is an effect on health resulting from individuals comparing their income with that of others (Wagstaff and van Doorslaer 2000). The hypothesis that what matters is the relative position of the individual in the income distribution has not been tested (Wagstaff and van Doorslaer 2000).

Source: authors' elaboration.

### 3.2.1 Education

Although there is an extensive body of empirical literature examining education as a determinant of income inequality, the evidence on the link from income inequality to educational outcomes is scarcer (Thorbecke and Charumilind 2002; Gutiérrez and Tanaka 2009). However, there is evidence that income inequality is reproduced in inequality in education, both in terms of achievements in primary and secondary school and in terms of access to tertiary education (see Buchmann and Hannum 2001; and references in Stewart 2016).

Regarding the links proposed in the theoretical work reviewed in the previous section, Sylwester (2000) reported a positive link between inequality and public expenditures on education. Considering the demand side, some studies have found a negative link between inequality and secondary school enrolment [Flug et al. (1998) and Easterly (2007) used cross-country analysis; and Esposito and Villaseñor (2018) used data from the 2010 Mexican Census]. The study by Madsen et al. (2018) showed a negative impact of inequality on the combined primary, secondary, and tertiary school enrolment rate in financially underdeveloped countries (using a sample from OECD). Concurring with these findings, Berg et al. (2018) show a negative correlation between inequality and human capital, measured as the average years of primary and secondary schooling. Checchi (2003) provided support for the link between inequality and growth via borrowing constraints and showed evidence of a negative effect of inequality on access to secondary education.<sup>21</sup> Finally, using data from the United States for the period 1970–90, Mayer (2001) found

<sup>21</sup> In terms of the measures of inequality used in these studies, with the exception of Flug et al. (1998), they all employed the Gini coefficient as one of the measures. Flug et al. (1998) used the ratio of the income shares of the top quintile to the bottom two quintiles of the population, and the shares of income accruing to the top quintile and lowest quintile were used, respectively, by Easterly (2007) and Checchi (2003). In their robustness checks, Esposito and Villaseñor (2018) used the Atkinson and Theil indices.

that the increase in inequality aggravated the gap in educational attainment between rich and poor children.

### 3.2.2 Health

Given that the literature is extensive and stems from different fields of literature (namely, public health), we summarize the main conclusions from different reviews, which distinguish between aggregate level and multilevel studies as well as cross-country and within-country empirical analyses.<sup>22</sup> Wagstaff and van Doorslaer (2000) highlighted that studies at the population level are limited in what they can reveal about the effects on individual health and that data at the individual level would be required to disentangle the effects of the different hypotheses described in Section 2.2.2. Still, existing evidence on these different channels remains inconclusive:

... the evidence emerging from the studies that can, in principle, shed light on these effects is rather negative—there is strong support for the AIH [absolute income hypothesis], no evidence for the RIH [relative income hypothesis], no evidence for the RPH [relative position hypothesis] (because it has not been tested), and evidence relating to the IIH [income inequality hypothesis] that suggests that, in the relatively few cases where income inequality appears to be associated with health at the individual level, this hypothesis may well not be picking up the psychosocial effects associated with social capital and social cohesion. This is not to say this is definitely the case—rather that the evidence is far from compelling. (Wagstaff and van Doorslaer 2000: 565.)

Lynch et al. (2004) found weak support for a direct effect of income inequality on health, although they suggested some indirect links. Additionally, they added that, in some cases, namely, homicide, income inequality contributed to some negative health outcomes. Subramanian and Kawachi (2004) also highlighted the lack of consensus in the results and the need for further work. Still, from a systematic review of 155 published peer review studies, Wilkinson and Pickett (2006) concluded that there was a link between greater income inequality and poorer health. Almost 10 years later, the authors provided further support to the existence of a causal link between income inequality and health, and reinforced their argument of the size of status and social class differences as an important mechanism (Pickett and Wilkinson 2015).

The conclusions from the economics literature have pointed to no evidence of a causal relationship (Nolan and Valenzuela 2019). From a detailed review of the literature, Deaton (2003: 150) argued that ‘the stories about income inequality affecting health are stronger than the evidence’ and that there was no robust evidence showing that income inequality in itself was an important determinant of population health, although it had effects through poverty. The review in Leigh et al. (2011) concurred. However, they warned that given the data challenges and the limitations of the methods used to test the link between inequality and health, one should not jump to draw definite conclusions. Focusing on morbidity and mortality, the comprehensive review of empirical literature by O’Donnell et al. (2015) concluded that even though population health is negatively associated with income inequality, there is little evidence to support the hypothesis of a negative impact of income inequality on health.

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<sup>22</sup> In doing so, we do not offer a comprehensive overview of the measures used in the literature. However, according to the review in Lynch et al. (2004), the majority of the studies employ the Gini coefficient or different shares of income. In the list of studies reviewed by these authors, we counted 69 out of 98 using the Gini as (one of) the measure(s) of inequality.

### 3.3 Governance

We start this section by noting that the focus on voting of the political economy mechanism linking inequality and growth suggests that the effects should be observed in democracies (Houle 2015). Thus, some of the early empirical literature on the relationship between inequality and growth also tested whether this effect was dependent on the regime type (e.g., see Persson and Tabellini 1994; Alesina and Rodrik 1994; Perotti 1996; Clarke 1995; Deininger and Squire 1998).

The results were mixed. Persson and Tabellini (1994) suggested that the negative link between inequality and growth was only present in democracies and that the transmission channel through government redistributive policies should be further investigated. However, Perotti (1996) counter-argued that, although the data showed a stronger relationship between equality and growth in democracies, the effect of the democracy variable did not appear to be robust. Further criticism was advanced by Knack and Keefer (1997), who, after some regime reclassification and deletion of doubtful observations, concluded that there was no evidence of a differential effect of inequality on growth in democracies and non-democracies. Stewart (2016) argued that there is compelling evidence for the link between horizontal inequality (i.e. inequality among groups) and civil war as well as other forms of group violence. However, more recent reviews suggest that the evidence on the link between inequality and political violence is mixed (Lengfelder 2019).

We now turn to what the empirical evidence on the government outcomes described in Section 2.3 shows. The main conclusions are summarized in Table 4. Muller (1988) found a strong negative link between inequality and regime stability for a sample of 33 democracies, controlling only for the level of economic development. Using data from two panels on the periods 1950–90 and 1850–1980, Boix (2003) showed empirical evidence for a positive link between equality (proxied by an adjusted Gini coefficient) and democratization and, particularly, democratic consolidation. In an extension of this analysis, Boix and Stokes (2003) concluded that economic equality, proxied by farm ownership (distribution of agricultural property) and literacy rates (quality of human capital), had a positive effect on both the probability of a democratic transition and the stability of democracy.

Table 4: Summary of empirical evidence on the effects of inequality on different governance outcomes

Outcome	Empirical evidence
Democracy	Mixed results are found for the effect through redistributive policies. While some studies find support for a negative link between inequality and democratization (Boix 2003) and democratic consolidation (Boix and Stokes 2003), others have challenged the robustness of the effect of inequality on democracy (e.g., Barro 1999; Houle 2009) and suggested that this effect is conditional on certain factors, such as financial integration (Freeman and Quinn 2012), the income level (Houle 2016), and the state of the macroeconomy (Dorsch and Maarek 2020).
Institutional quality	There is some evidence of a negative link between inequality and institutional quality (Chong and Gradstein 2007; Kotschy and Sunde 2017), but there is a need for further research (Savoia et al. 2010).
Political participation	Recent evidence from developed economies suggests a negative effect of inequality on political participation (Solt 2008; Lengfelder 2019; Schäfer and Schwander 2019).

Source: authors' elaboration.

Others found low support for a significant link between the two (e.g., Bollen and Jackman 1985).<sup>23</sup> Barro (1999) showed a negative, but only marginally significant coefficient for the effect of

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<sup>23</sup> The review of the initial studies in Bollen and Jackman (1985) argued that problems of specification, measurement, and sample composition had led to inconclusive results in the existing empirical analyses.

inequality on democracy, proxied as electoral rights and civil liberties, for the period 1972–95. However, when entered alongside the share of income accruing to the middle class, the coefficient was non-significant. The empirical analysis in Houle (2009) went against previous results on the negative link between inequality and democracy, and showed a weak positive and non-significant relationship. Using the capital share of the value added in the industrial sector as a measure of inequality to overcome the data limitations in previous studies, the author also did not find support for Acemoglu and Robinson's (2006) argument for an inverted U-shaped relationship, but rather for a weakly U-shaped one.

More recently, Haggard and Kaufman (2012) used causal process observation to examine the association between inequality and transitions to and from democratic rule and found limited evidence supporting the link between inequality and democratic transitions via the distributive conflict between elites and masses. Additionally, the evidence in Scheve and Stasavage (2017) does not support the hypothesis of a link between wealth inequality and democracy.

Houle (2016) argues that the effect of inequality on democratization is dependent on the level of income and shows empirical support for this hypothesis, whereas a previous study by Freeman and Quinn (2012) suggested that the effect was conditional on financial integration. Dorsch and Maarek (2020) offer an explanation for the abundance of null results found for the link between inequality and democratization by showing that higher levels of inequality are associated with higher probabilities of democratic improvements following economic downturns ('windows of opportunity'). However, following growth periods, the effect of inequality is null or small and negative.

Considering a broader approach to governance, we briefly refer to the literature linking inequality and institutional quality. Chong and Gradstein (2007) established a double causal relationship between these variables using data from 1960 to 2000 and system GMM methods, and considering different measures of institutional quality, including civil liberties, political rights, government stability, corruption, and an aggregate measure of governance. Additionally, the results from vector autoregression analysis lent support to a dominating effect of the effect of inequality on institutions. Savoia et al. (2010) reviewed the arguments linking inequality to institutional quality directly and via democracy. The authors highlight the challenges underlying empirical analyses, related to data availability and endogeneity problems (given that the direction of causality between inequality and institutions is hard to determine), and argue that the limited existing work suggests a negative link between inequality and institutions, noting there is a need for further research. More recently, Kotschy and Sunde (2017) showed evidence of the importance of equality as a determinant of the effect of democratic institutions on institutional quality, measured by an index of economic freedom and an indicator of civil liberties.<sup>24</sup>

Finally, there is evidence from advanced industrial democracies of a negative link between inequality and political participation (Lengfelder 2019). Solt (2008) showed a negative effect of economic inequality on political engagement, namely, political interest, the frequency of political discussion, and participation in elections among all citizens except the richest, using data from advanced industrial countries. Using cross-sectional data from OECD countries and within-country data for Germany and a range of methods, the recent study by Schäfer and Schwander (2019) finds support for the negative link between economic inequality and political participation.

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<sup>24</sup> When considering the role of governance (using different indicators), the estimates in Islam and McGillivray (2020) give some indication that improved governance may contribute to reduced wealth inequality and higher growth.

## 4 Criticism of the empirics

The lack of consensus in the literature, especially when considering the effect of inequality on growth, raises questions about what explains this divergence as well as what can be done to contribute in a meaningful way to the existing knowledge. In this section, we summarize different empirical challenges in terms of estimating the effects of inequality. We have broadly divided them into data quality and availability, conceptual and measurement issues, and the methodological difficulties of dealing with confounding variables and endogeneity. We address these in turn.

### 4.1 Data quality and availability

Early studies drew on secondary datasets provided, for example, by the World Bank (Jain 1975) or the International Labour Office (Lecaillon et al. 1984). As mentioned earlier, the expanded dataset proposed by Deininger and Squire (1996) was crucial in opening possibilities for panel methods. Additionally, the databases offering secondary data compilations on income inequality provided by United Nations University World Institute for Development Economics Research—WIID, based on household surveys and SWIID, developed by Solt (2020) and resulting from multiple imputations of the WIID data—have been frequently used in empirical studies. The World Inequality Database (*WID.world* 2017) has emerged as an additional database providing data on income shares captured by top income groups.

Atkinson and Brandolini (2001, 2009) offered comprehensive analyses on secondary datasets on income distribution, drawing attention to issues of data quality and consistency. First, there may be lack of consistency in the data for income distribution over time for single countries or data might be drawn from different sources or definitions. Second, there may also be variation in the quality of sources and methods used across countries. These issues arise because of differences in the definitions used, the sources of data, and the processing used to obtain ‘ready-made’ income distribution statistics.<sup>25</sup>

Atkinson and Brandolini (2001) focused mainly on the Deininger and Squire dataset and on data for OECD member countries. Jenkins (2015) follows a similar line of reasoning and compares the WIID and the SWIID. According to this review, the issues raised by Atkinson and Brandolini (2001, 2009) were applicable to the WIID database, and in the case of SWIID one should additionally consider issues relating to the quality of imputations. Jenkins (2015) recommends the WIID over the SWIID, and Jäntti et al. (2020) stress that in the case of most developing countries given that actual redistribution is only rarely measured, the figures in the SWIID reflect questionable imputations. This leads to doubts about some of the observations resulting from the imputations and has implications for some of the results obtained using these data.

As demonstrated in Atkinson and Brandolini (2001, 2009) and in Jenkins (2015), the issues of non-comparability have consequences for econometric analysis and for trends over time. Voitchovsky (2011) warns that data scarcity and the limitations in terms of data availability may lead to, respectively, a trade-off between sources of bias and precision in inequality studies. Ravallion (2001: 1809) notes, however, that measurement errors, including those resulting from comparability problems, will have a greater impact on analyses that allow for country fixed-effects rather than on standard growth regressions given that the signal-to-noise ratio is likely to be low for changes in measured inequality.

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<sup>25</sup> See also discussions of these shortcomings in Deaton (2003), Voitchovsky (2011), and Houle (2015).

The challenges are even more striking for tests that require data at the individual level, namely, those related to the relative hypotheses linking inequality to health. These hypotheses also lead to questions about the appropriate reference groups—how they are defined and formed—as well as in terms of endogeneity, as the position of the individual in relation to the reference may be affected by group membership (O'Donnell et al. 2015: 1505).

## 4.2 Concept and measurement of inequality

As mentioned in the previous subsection, definitional issues are important for the ways of thinking about inequality. Atkinson and Brandolini (2001) list eight parameters that need to be chosen when defining income distribution, among which are the unit of observation, the concept of resource (e.g., income versus expenditure), and the tax treatment of income. These are also closely linked to the choices in terms of measurement. Different mechanisms require a specific concept of inequality and this should be reflected in the measure of inequality used in the empirical analysis (Voitchovsky 2011). Additionally, different parts of the distribution are given emphasis depending on the inequality measure used, and even the concept of income is open to measurement issues (Deaton 2003).

These concerns are illustrated in Knowles' (2005) account of the relationship between inequality and growth. The author warned that the results in previous studies should be regarded with some degree of caution given that they had failed to measure inequality in a consistent manner, mixing measures of the distributions of income before and after tax and the distribution of expenditure. Additionally, even though some had transformed the data to make them more comparable (e.g., Perotti, 1996), Knowles (2005) raised questions about the validity of these transformations. Using a smaller sample of consistently measured data, the author found that, while the coefficients for the effect of inequality on growth were reasonably robust, they were not statistically significant. Considering six different measures of inequality (three Gini coefficients and three top 10 income shares), a recent study by Blotevogel et al. (2020) showed that the choice of the inequality indicator has important implications for the results obtained in empirical analysis, namely, when considering different transmission channels between inequality and growth. In the case of the link between inequality and governance, there is a concern that frequently used measures do not capture interclass inequality, which precludes the testing of the theoretical hypothesis on the effects on democracy that refer to inequality between classes (Houle 2015).

Criticism has also been directed at specific measures, namely, the widely used Gini coefficient. First, in light of the observations above, Gini coefficients will provide different information depending on how they are calculated, for example, if based on net income or on gross income (Houle 2016). Second, Gini coefficients consider the overall level of inequality in a society, thus disguising inequality between classes (Houle 2016). Finally, some have argued that the use of absolute rather than relative measures might better capture perceptions of inequality on the ground (e.g., Niño-Zarazúa et al. 2017; Bosmans et al. 2014; Atkinson and Brandolini 2004).

## 4.3 Estimation methods

The review of empirical studies on the inequality–growth link highlighted the contrasting findings between the early cross-country studies and those that employed panel estimation techniques, after Deininger and Squire's (1998) dataset became available. Some explanations have been advanced for this divergence.

Measurement error may affect the estimation results in cross-country estimation (country- or regional-specific measurement error), and also in panel data estimation, given that inequality tends to be persistent over time; thus, this method relies on more limited time-series variation in the

data. The coefficients in cross-country studies may be biased due to time-invariant omitted variables (Voitchovsky 2011), while if we consider that inequality is related to underlying determinants of development that are persistent, then fixed-effects estimates may be biased upwards when considering long-run effects (Castells-Quintana et al. 2019).

Additional explanations included the argument for the misspecification of the linearity in the effect of inequality and growth (Banerjee and Duflo 2003) and the suggestion that the two methods capture different time effects, given the short- and long-term lag structures in panel and cross-country analyses, respectively (Voitchovsky 2011).

Finally, several concerns have been raised regarding the use of different instruments to tackle the reverse causality in the relationship between inequality and growth (see Easterly 2007), but also for other outcomes, namely, health (O'Donnell et al. 2015; Castells-Quintana et al. 2019) and democracy (Houle 2015). While different attempts have been made using instrumental variable approaches, the quest for finding a valid instrument for inequality is certainly not straightforward. Furthermore, even if GMM has often been used to try to tackle these issues, Roodman (2009) warns about the risk of instrument proliferation and the possibility for generating false-positive results. As an illustration of his point, the author re-examined the analysis in Forbes (2000) and raised some concerns over the positive effect of inequality on growth found in the original paper.

## 5 Conclusion

This review has highlighted the mixed results from empirical evidence on the impact of inequality on different development outcomes. We summarize the main conclusions as follows. First, in line with previous findings, the debate on whether there is a positive or negative effect on growth remains open, with recent studies mirroring the disagreement in decades of empirical work testing this relationship. With the exception of the classical approach, most of the transmission channels between inequality and growth point to a negative effect of inequality. However, the evidence from reduced-form equations is not consensual and the channels of transmission have received less attention in empirical work.

Second, while there seems to be some consensus from the evidence that there is a negative link between inequality and secondary school enrolment, there is a need for further research in terms of other education outcomes. Even though the theory generally points at the negative effect of inequality on health, existing evidence does not provide clear support to this relationship, in the economic literature in particular, and there is still a lot to be uncovered in terms of the mechanisms of transmission at the individual level. Third, the theoretical predictions and the empirical evidence show mixed results for the effects of inequality on democracy and political participation.

We then gathered some explanations for the diversity and divergence in the results found related to the empirical challenges of establishing the links. The problems with data quality and availability are well known in the literature, as are the issues related to the concept and measures of inequality, and the shortcomings of different estimation methods.

Suggestions for potential avenues for future contributions include first a methodological category. While advances in econometric analysis will shed light on the analysis across countries, this could be complemented with the use of experimental work to understand specific channels in particular contexts. While not a substitute for empirical cross-country analysis, experiments can be employed to understand behaviour at the micro level. The controlled nature of this work avoids biases in econometric studies and mitigates issues of endogeneity and measurement errors.

The second avenue is related to the focus of the analysis. While this review has concentrated mainly on cross-country analysis, there is indication that disaggregating the level of analysis might provide useful insights in terms of channels of transmission and underlying cases. For instance, it might be the case that in Africa, ethnic tensions or natural resources are the main driver of inequality and in turn slower growth, while in Latin America, inequality may be the main driver for political instability. Furthering regional analysis or even country-specific analysis might help explain these effects.

Finally, despite existing efforts to compile new—and improve on existing—secondary datasets, we referred extensively to the problems that persist with available data. Thus, in light of the importance of data availability and reliability for the analysis of the trends and effects of inequality, we stress that earlier calls for more and better data continue to be both relevant and important for progress in our search for better understanding of the impact of inequality on developmental outcomes.

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