The correlates of declining income inequality among emerging and developing economies during the 2000s

Abstract

Since the early 2000s, trends in income inequality in emerging and developing economies have undergone a noticeable shift. While inequality tended to increase during the 1980s and 1990s, it has tended to fall since the early 2000s. In this paper we analyse the correlates of declining income inequality among emerging and developing economies during the 2000s. We estimate country-specific trends in market and disposable income inequality for a large sample of over 100 countries, and then use econometric analysis to examine the correlates of those trends. We find that the tendency toward declining inequality in the 2000s was stronger in countries with higher initial levels of inequality and larger increases in relative agricultural productivity, country-specific primary commodity prices, and remittance inflows. We also find a role for increases in educational attainments, tax revenues and government social spending, and trade liberalisation, but only in Latin America. The results suggest that the challenge now facing many emerging and developing countries is how to sustain the reductions in inequality achieved since the early 2000s, given the decline in commodity prices since 2015, and the social and economic repercussions of the COVID-19 pandemic.

1. Introduction

Since the early 2000s, trends in income inequality in emerging and developing economies (EMDEs) have undergone a noticeable shift. While inequality tended to increase during the 1980s and 1990s, it has tended to fall since the early 2000s. For example, Gini coefficients fell by at least 2.5 percent in around two-thirds of developing countries with comparable data during the 2000s, after rising by at least 2.5 percent in more than half of countries during the 1990s (Alvaredo and Gasparini 2015). This shift has been most noticeable in Latin America, where almost all countries saw large declines in the Gini coefficient during the 2000s (Lopez-Calva and Lustig 2010; Cornia 2012, 2014; Lustig et al. 2013a,b), but the share of countries with falling inequality in fact rose in all developing regions during the 2000s, as compared to the 1990s (Alvaredo and Gasparini 2015).

A large amount of evidence now exists on the adverse effects of high inequality.[i] From a welfare perspective therefore, the tendency toward falling inequality in EMDEs during the 2000s must be viewed as a favourable development. But what explains the shift? Answering this question is important for two reasons. First, it gives an indication as to whether the shift is likely to be long-term: does the decline reflect transitory factors, such as higher global commodity prices, or longer-term factors, such as improvements in governance or increases in education? In Latin America, there is already some concern that the decline in inequality has begun to stagnate, partly because declining commodity prices and slower economic growth have reduced the scope for redistributive government spending (Gasparini et al. 2016, Cord et al. 2017). Second, understanding the drivers of declining inequality may provide important lessons for policy, particularly in those countries where inequality has not fallen in recent years.

A number of studies have examined the drivers of declining inequality in Latin America during the 2000s. Cornia (2012) uses econometric analysis to assess a range of potential factors, and concludes that the largest role was played by changes in 'policy variables', e.g. higher government social spending, greater reliance on direct as opposed to indirect taxation, and large increases in school enrolment. By comparison, global factors, e.g. improvements in the terms of trade, and robust rates

of economic growth, played a more minor role. Evidence from decomposition analysis paints a similar picture, pointing toward two main drivers of falling income inequality in the region during the 2000s: a decline in labour income inequality, driven by a fall in the relative wages of skilled labour, and more progressive government transfers (e.g. Azevedo et al. 2013; Lustig et al. 2013a, 2013b; De la Torre et al. 2017).[ii]

In this paper, we add to our understanding of the drivers of declining inequality in EMDEs during the 2000s, by adopting a more global perspective. While the Latin American experience is to a large extent unique, in terms of the size and generalised nature of the decline, there is still evidence of a similar tendency – albeit less dramatic – in other regions, which is important to explain. Adopting a global perspective also allows us to ask why the experience of Latin America was so special in comparison with other regions. For example, was the strong performance of Latin America compared to other regions a reflection of its relatively high commodity dependence? In adopting a more global approach, our paper is related to Tsounta and Osueke (2014), who investigate the drivers of inequality trends in a sample of 44 EMDEs, testing for the effects of trends in GDP growth, public education spending, tax revenues, FDI, and the real exchange rate. However, we use a different dataset with a much larger sample of countries, test for a wider range of potential drivers, and use a different econometric approach.

One of the drawbacks of a global analysis of trends in inequality is the difficulty of constructing consistent series of inequality estimates over time (Atkinson and Brandolini 2001, 2009). The detailed examination of underlying data sources, which underpins empirical work at the country or regional level, is almost impossible when dealing with large samples of 100 countries or more. We address this problem by using the Standardised World Income Inequality Database (SWIID) (Solt 2019a), which arguably provides the best attempt yet to provide consistent and comparable income inequality estimates for large numbers of developed and developing countries from all regions of the world. Although the SWIID has its drawbacks, related to the extensive use of imputations (Jenkins 2015),

detailed documentation and guidance provided by Solt (2019b) makes it possible to take the added uncertainty arising from the imputed nature of the data into account when analysing the data.

We analyse trends in income inequality using a novel two-stage approach, in which we first estimate country-specific trends in income inequality during the 1990s and 2000s, and then use econometric analysis to examine the correlates of those trends. The advantage of this approach is that it centres our attention on longer-term trends in inequality – typically, periods of at least 10 years or more – as opposed to shorter-term changes, which may not adequately capture the significant time-lags between changes in economic conditions and changes in income distribution. For the econometric analysis, we apply a weighted least squares (WLS) estimator, in which we weight each estimated country-specific trend by its precision, measured by the inverse standard error of the trend. This draws on the literature on meta-regression analysis (e.g. Stanley and Doucouliagos 2012), where WLS is widely used to take account of differences in the precision of effect sizes obtained from primary studies, leading to more efficient estimates of the true underlying effect.

To give a brief flavour of the results, we confirm the strong performance of EMDEs in reducing income inequality during the 2000s. We show that this applies when comparing trends with AEs during the 2000s, and when comparing trends among EMDEs between the 1990s and 2000s. It was also not a purely Latin American phenomenon: inequality also tended to fall in other EMDEs during the 2000s, albeit by significantly less than in Latin America. In terms of the correlates, we find that the tendency toward declining inequality during the 2000s was stronger in countries with higher initial levels of inequality, and larger increases in relative agricultural productivity, country-specific primary commodity prices, and remittance inflows. We also find a role for increasing educational attainments, increasing tax revenues and government social spending, and trade liberalisation in Latin America, but not in other EMDEs. Overall, our regression model can explain between 25 and 50 per cent of the overall variation in inequality trends across countries and decades, depending on the precise specification and sample.

The remainder of the paper is structured as follows. Section 2 outlines our approach to estimating country-specific trends in income inequality, and discusses a range of summary statistics regarding the direction and magnitude of the estimated trends. Section 3 then presents the results of our econometric analysis of the correlates of inequality trends, while Section 4 concludes, summarising the key findings and discussing their implications for policy and for future research.

2. Trends in inequality

In this section we analyse recent trends in income inequality for a large sample of emerging and developing economies (EMDEs) and advanced economies (AEs) during the 1990s and 2000s. We adopt a broad definition of EMDEs, namely all non-OECD countries as of 1990; AEs are the 24 OECD countries as of 1990. We look at trends in two broad time periods: 1987-2001 (hereafter, 'the 1990s' for short) and 2002-2016 (hereafter, 'the 2000s').

There are a number of sources of inequality data, all of which have their advantages and disadvantages (Ferreira et al. 2015). In this paper we rely mainly on the Standardised World Income Inequality Database (SWIID), version 8.2 (Solt 2019a). The SWIID provides estimates of inequality in market and disposable income, measured in each case by the Gini coefficient, for 196 countries over the period 1960-2018.[iii] All estimates are standardised, and designed to be comparable with estimates from the Luxembourg Income Study, which is used as the benchmark. The main advantage of the SWIID is that it corrects for the breaks in consistency and continuity that can occur when using datasets composed of estimates drawn from different sources and calculated using different welfare measures, such as the UNU-WIDER World Income Inequality Database (Atkinson and Brandolini 2009; Solt 2015). Since a large number of estimates in the SWIID are imputed, coverage of EMDEs is also greater in the SWIID than in other datasets. Although the extensive use of imputations means that the estimates for EMDEs are often subject to wide margins of error, it is possible to take this uncertainty into account during empirical work, following guidelines provided by Solt (2019b).

We restrict our attention to countries in the SWIID with data spanning at least seven years in the 2000s. This gives a sample of 165 countries, including 141 EMDEs. The EMDEs in our sample cover around 95% of the total population of EMDEs, and over 80% of the total population in each main region (see Table 1). A further 123 countries, including 99 EMDEs, also have data for periods of at least seven years in the 1990s. The average period length across all countries with data is 13 years in the 1990s and 12 years in the 2000s.

[Table 1 about here]

We estimate trends in inequality using a spline regression model, with country-specific intercepts and country-specific trends for each of our two periods of interest. The model is given by:

$$G_{it} = \alpha_i D_i + \beta_i (D_i \cdot t) + \gamma_i (D_i \cdot t^*) + \epsilon_{it} \quad (1)$$

where G_{it} is the Gini coefficient of market or disposable income in country *i* in year *t*, D_i is a set of dummy variables for each country, α_i are country-specific intercepts, β_i and γ_i are country-specific slope terms, $t^* = t - 2002$ if $t >= 2002$ and 0 otherwise, and ϵ_{it} is an error term. Note that under this specification, the country-specific trends in inequality are given by β_i for the 1990s and $\beta_i + \gamma_i$ for the 2000s, and the overall trend for each country is constrained to be a single continuous line with a knot at 2002. We take into account the multiple-imputation nature of the data when estimating equation (1), using the *mi* command in STATA (see Solt 2019b).[iv]

Table 2 presents summary statistics of the estimated trends in market and disposable income inequality during the 1990s and 2000s. Slightly under two thirds of EMDEs saw declining trends in each measure of inequality during the 2000s, and in around half of these cases, the overall reduction in the Gini was fairly large: at least two percentage points.[v] By contrast, less than half of the AEs saw declining trends during the 2000s, and the overall reduction in the Gini exceeded two percentage points in just two cases. During the 1990s, around 60 percent of EMDEs saw rising trends in disposable income inequality, while two thirds saw rising trends in market income inequality; the size of the increase amounted to at least two percentage points in the majority of cases. When disaggregating by region,

similar to Alvaredo and Gasparini (2015) we find that the proportion of countries with falling inequality is higher in the 2000s than in the 1990s in all main regions, except in Sub-Saharan Africa, where it was about the same. The same finding also applies when restricting attention to large changes in the Gini.

[Table 2 about here]

Table 2 also shows the diversity in trends within and across regions. The declining tendency during the 2000s is particularly pronounced in Latin America, where 17 out of 20 countries witnessed a large reduction in disposable income inequality, consistent with previous findings.[vi] In Sub-Saharan Africa, and also in the Middle East and North Africa, twice as many countries witnessed declining as opposed to rising disposable income inequality in the 2000s, although the numbers with large reductions as opposed to large increases were more similar.[vii] By contrast, in South and East Asia, and also in Eastern Europe and Central Asia, there was a roughly even split between countries with rising and falling trends. In fact, the largest economies in Asia all experienced large rises in either market or disposable income inequality during the 2000s, including China, India, Indonesia, and South Korea.[viii] Despite this, outside Latin America there are still more than twice as many cases of large reductions in disposable income inequality as there are large rises, and more than half as many for market income inequality.

Figure 1 plots trends in disposable income inequality against those in market income inequality, for EMDEs during the 2000s. The correlation is very high, at 0.95, and in almost all cases where inequality in market income fell, inequality in disposable income also fell. Only six EMDEs did not see a falling trend for disposable income, despite a falling trend for market income, and the trends in each case were small in size. The slope of the regression line is not statistically different from unity, but the constant is slightly below zero, and significant at the 5 per cent level. This indicates that inequality in disposable income tended to fall by slightly less than inequality in market income, although the difference was small: about 0.014 percentage points in the Gini per year.

[Figure 1 about here]

Table 3 compares the average trends in inequality between periods and country groups. We calculate weighted averages, giving greater weight to trends estimated with more precision, as measured by the inverse standard error of the trend estimate.[ix] To facilitate comparisons, we also restrict the sample to the 123 countries with data for both the 1990s and the 2000s. Across all EMDEs, the average trend during the 2000s was a reduction of 0.17 percentage points per year in the disposable income Gini and 0.14 percentage points per year in the market income Gini, compared to increases of 0.04 and 0.10 points per year respectively in AEs; both differences are statistically significant at the 1% level. The average trend for EMDEs in the 1990s was an increase of 0.18 points per year in the disposable income Gini and 0.16 points per year in the market income Gini; the differences with the trends for EMDEs in the 2000s are again both significantly significant at the 1% level. There is also a statistically significant difference between trends for the 1990s and 2000s among AEs, but the size of the difference is much smaller than for EMDEs.

[Table 3 about here]

To see whether the strong performance of EMDEs during the 2000s is driven purely by the Latin American experience, we also compare the average trend for this region with that for other EMDEs. The results confirm that Latin America was the stand-out performer. The average trend in disposable income inequality in the region was a decline of 0.42 percentage points per year, compared with 0.07 points per year among other EMDEs. Nevertheless, the decline among other EMDEs in this period is still statistically significant, and there were statistically significant declines in inequality in both Eastern Europe and Central Asia and Sub-Saharan Africa. The relatively strong performance of EMDEs during the 2000s does not therefore appear to be a purely Latin American phenomenon. As a final check, we also separate out the trends for Eastern Europe and Central Asia, since the particularly large rise in inequality in that region during the 1990s could account for the difference in trends among EMDEs between the 1990s and 2000s. The results confirm the particularly large increase in that region, but there is still a statistically significant improvement in performance among EMDEs between the 1990s and 2000s, even when excluding both Latin America and Eastern Europe and Central Asia. This reflects

the improvement in performance in both Sub-Saharan Africa and South and East Asia during the 2000s: in the former, the emergence of a downward trend, following the relative stability of the 1990s, and in the latter, a levelling-off of the rise in inequality experienced during the 1990s.[x]

3. Explaining inequality trends during the 2000s

In this section we use econometric analysis to assess the correlates of trends in inequality during the 2000s. Our basic approach is to estimate cross-country regressions of the form:

$$g_i = \beta_0 + \sum_k \beta_k X_{ik} + \varepsilon_i \quad (2)$$

where g_i is the estimated trend in market or disposable income inequality in country i during the 2000s, as estimated in Section 2, and X_{ik} is a set of explanatory variables which may account for at least some of the variation in inequality trends. We consider a range of explanatory factors, grouped into five main categories: inequality convergence, economic growth, structural change, global factors, and other domestic factors. We estimate each regression using weighted least squares (WLS), with the inverse standard error ('precision') of each estimated trend as the weights. To shed further light on the particularly strong performance of Latin America in comparison with other EMDEs during the 2000s, we also estimate additional regressions in which we interact each explanatory variable with a dummy variable for this region. Since our approach does not on the whole control for possible reverse causation between inequality trends and our explanatory variables, our regression results are best interpreted as partial correlations rather than as causal effects. In addition, we focus only on the correlates of inequality trends during the 2000s: more specifically, periods spanning at least seven years between 2002 and 2016, although we also limit the analysis to periods spanning at least ten years during this period as a robustness test. We do not include the estimated inequality trends during the 1990s in our regressions, mainly to avoid our results being driven by factors specific to that decade, e.g. related to the transition from socialism in Eastern Europe.

A possible alternative to our approach would be to estimate the correlates of inequality more directly, using panel data analysis. In particular, we could regress levels of income inequality on a range of explanatory variables thought to affect levels of inequality, controlling for country and time fixed effects. Examples of recent studies using this approach include Cornia (2012), Goderis and Malone (2011), Acemoglu et al. (2015), Bumann and Lensink (2016), and Dorsch and Maarek (2019). There are however two main challenges with this approach. The first is time lags: many factors that influence inequality are unlikely to do so immediately, meaning that at least some of the explanatory variables must be lagged (e.g. Acemoglu et al. 2015). However, there is no obvious way of determining which variables should be lagged and by how long; moreover, adding several lags for each explanatory variable can lead to multi-collinearity. The second challenge is the fact that Gini coefficients tend to change only gradually over time. To take this persistence into account, a lagged dependent variable should be added to the regression, but in this case standard fixed effects estimation is likely to be biased (Nickell 1980). Instead, more advanced methods of dynamic panel data analysis are required, such as GMM (e.g. Acemoglu et al. 2015, Bumann and Lensink 2016, Dorsch and Maarek 2019) or co-integration (e.g. Goderis and Malone 2011), but the assumptions underpinning these methods are not always straightforward to assess.

By adopting our two-stage approach, in which we first estimate longer-term trends in inequality using equation (1), and then investigate the correlates of those trends using equation (2), our study avoids these challenges. In so doing, it is related to other empirical work focusing on longer-term changes in inequality. For example, Ravallion (2014) explores some of the factors influencing within-country changes in income inequality over periods beginning around 1989 and ending around 2008, while Rojas-Vallejo and Turnovsky (2017) estimate the long-run effects of within-country changes in tariffs on within-country changes in income inequality between 1992 and 2008. Similarly, Dollar et al. (2016) explore the correlates of average annual changes in the shares of the poorest 20 per cent and 40 per cent in national income during ‘spells’ of at least five years, although many spells are significantly longer.[xi]

The remainder of the section is organised as follows: Section 3.1 discusses the explanatory variables in more detail, while Section 3.2 outlines the sample used for estimation. Section 3.3 then sets out our main regression results, while Section 3.4 reports the results of a number of robustness tests. Finally, Section 3.5 presents the results of our decomposition analysis, in which we calculate the contribution of different sets of explanatory variables in equation (2) to explaining the differences in average inequality trends between country groups during the 2000s highlighted in Section 2.

3.1 Explanatory variables

Inequality convergence

A number of studies have found empirical support for inequality convergence: the tendency for cross-country differences in levels of inequality to decline over time (e.g. Ravallion 2003, Bleaney and Nishiyama 2003). Higher initial levels of inequality could therefore explain the strong inequality performance among EMDEs compared with AEs during the 2000s, as well as the strong performance in Latin America – the most unequal region – relative to other regions.[xii] To test for the role of convergence in explaining trends, we include the initial level of market or disposable inequality (*sgini*) in equation (2). Following the econometric literature, we use the last available estimate of inequality prior to period *t* as an instrument for the initial level of inequality in period *t*.[xiii]

Economic growth

Average rates of economic growth in EMDEs during the 2000s significantly exceeded the average for AEs (Abiad et al. 2015). Could this strong growth performance be related to the strong inequality performance? On the one hand, this might seem unlikely: there is little evidence of a strong correlation between changes in inequality and rates of economic growth in EMDEs in recent decades: growth has tended to be 'distribution-neutral' on average (Ravallion 2001, 2007; Ferreira and Ravallion 2011; Dollar et al. 2016). Nevertheless, Ravallion (2014) does find some evidence of a small negative relationship between growth in average incomes and changes in inequality, implying that growth has indeed been 'equality-enhancing' on average. This is consistent with recent studies finding evidence

of a Kuznets curve, but one in which most EMDEs are now beyond the turning point (e.g. Alvaredo and Gasparini 2015).[xiv]

To test for the role of economic growth in explaining inequality trends, we include the average rate of growth of per capita GDP (*gdp_d)* as our second explanatory variable. We also include the interaction between growth and the sum of the starting and end levels of GDP per capita (*gdp_i*). This allows for a non-linear 'inverse-U' shaped relationship between levels of income inequality and per capita GDP, as implied by the Kuznets hypothesis. The specific form of the interaction term is based on the assumption of a quadratic relationship between income inequality and per capita GDP of the form $G = a + bY + cY^2$. where *G* is a measure of inequality and *Y* is per capita GDP (in logs), and *a*, *b* and *c* are coefficients. If we take first differences of this equation, we obtain $\Delta G = b\Delta Y + c\Delta Y^2$, which can be re-written as $\Delta G = b\Delta Y + c(Y_1 + Y_2)\Delta Y$, where Y_1 and Y_2 are the start and end values of per capita GDP. Thus the change in inequality in a given period is a function of the rate of growth in that period (ΔY), and the rate of growth interacted with the sum of the start and end levels of per capita GDP ($Y_1 + Y_2$). The Kuznets hypothesis implies a positive value of *b*, the coefficient on the growth term, and a negative value of *c*, the coefficient on the interaction term; the implied turning point in the relationship between levels of income inequality and per capita GDP is given by $-b/2c$.

Structural change

Structural change can also have significant implications for inequality. Baymul and Sen (2019) find evidence of an inverted-U shaped relationship between income inequality and the share of agriculture in total employment, which is consistent with one common explanation for the Kuznets curve – namely, the gradual movement of labour from a traditional, low-productivity agricultural sector to a modern, high-productivity industrial sector, which first raises inequality but then subsequently reduces it. However, the authors also find that declining employment in agriculture is more likely to reduce inequality if labour reallocation is toward manufacturing, and less likely to do so if toward services. This may be the result of high levels of inequality within the service sector, due to the co-

existence of low productivity informal employment with high-productivity modern services (e.g. banking and finance).

Differences in productivity growth between sectors can also have implications for inequality. Andersson and Palacio (2017) argue that rapid productivity growth in agriculture in Latin America during the 2000s narrowed the income gap between the agricultural and non-agricultural sector, which in turn reduced overall inequality. More broadly, reductions in gaps in labour productivity between agriculture and the rest of the economy have been found in cross-country work to be positively associated with reductions in income inequality (e.g. Timmer 2004; Lee et al. 2007; Bogliaccini 2013).

To test for the relationship between structural change and inequality trends, we include the change in the agricultural share of employment (*agr_d*), entered separately and also interacted with the sum of the start and end values of the agricultural employment share (*agr_i*). The interaction term again allows for an inverted-U shaped relationship, in this case between levels of inequality and the agricultural employment share, as implied by a structural change interpretation of the Kuznets hypothesis. The specific form of the interaction term again assumes a quadratic relationship between levels of inequality and the agricultural employment share, which in turn implies that changes in inequality in any given period are a function of changes in the agricultural employment share and its interaction with the sum of the start and end levels of the agricultural employment share. We also include the change in the share of employment in services (*ser_d*), and the change in relative agricultural productivity (*rpa_d*), with relative productivity measured by dividing the share of agriculture in GDP by its share of total employment.[xv]

Global factors

Several authors have linked the decline in inequality in Latin America during the 2000s to the boom in global commodity prices (e.g. Andersson and Palacio 2017).[xvi] Goderis and Malone (2011) argue that a commodity boom causes a shift of resources to the non-traded sector, which is relatively intensive

in the use of unskilled labour. As a result, the relative demand for unskilled labour increases, leading to a fall in non-resource income inequality. However, the reduction in overall inequality is offset by the redistribution of natural resource rents, which is likely to be dis-equalising; the effect may also only be temporary, since in the longer term a commodity boom will increase productivity growth in the non-traded sector, which is likely to reduce the relative demand for unskilled labour. The authors find some econometric support for these predictions, finding that higher commodity prices tend to reduce income inequality, at least in the short run.

A commodity boom can also have spill-over effects on other countries. Higher commodity prices have encouraged large flows of relatively unskilled migrant labour to many resource-abundant countries (e.g. from South Asia to the Middle East). These flows have the potential to reduce inequality in sending countries, either by reducing the domestic supply of unskilled labour, driving up unskilled wages, or through the progressive impact of remittances. Inward remittances did grow very rapidly among EMDEs during the 2000s: an average of 14 per cent per year between 1999 and 2008, roughly double the average increase in the 1990s (World Bank 2019). Econometric evidence on the impacts of remittances on inequality remains mixed, but there is some evidence that remittances in Latin America have been equalising, even if the effect appears to be relatively small in size (Acosta et al. 2008).

To test for the role of these global factors in explaining inequality trends, we include the change in a country-specific commodity price index constructed by Gruss and Kebhaj (2019) (*cpi_d*), and the change in inward remittances received as a percentage of GDP (*rem_d*).

Other domestic factors

A range of other domestic factors could also account for the strong inequality performance of EMDEs during the 2000s. The first is the slower pace of trade and capital account liberalisation. EMDEs saw significant trade and capital account liberalisation during the 1980s and 1990s, and there is substantial evidence suggesting that this contributed to rising income inequality.[xvii] But while liberalisation has continued in the 2000s, it has typically done so at a slower pace, generating less upward pressure on

inequality.[xviii] This possibility was noted by Alvaredo and Gasparini (2015: 749), who argued that the tendency towards declining inequality among EMDEs might at least be partly linked to the "petering out" of the dis-equalising impacts of liberalising reforms carried out in the 1990s.

A second possible explanation is the convergence of educational attainments between EMDEs and AEs (Barro and Lee 2015). The expansion of education is generally considered to reduce income inequality, either by reducing the relative wages of more skilled labour, or by limiting the ability of a rich minority to skew resources and income generating opportunities in their favour (Li et al. 1998). In Latin America, a decline in the skill premium is widely considered to have made an important contribution to the reduction of income inequality in the 2000s, with an increase in the relative supply of skilled labour one important driver (Gasparini et al. 2011, Lustig et al. 2013b). The recent expansion of education in EMDEs has also typically been associated with a fall in education inequality, which can reinforce the equity-enhancing effect (Coady and Dizioli 2017).

More redistributive fiscal policy is also considered to have been a key driver of declining inequality in Latin America (López-Calva and Lustig 2010, Lustig et al. 2013a, Azevedo et al. 2013). Historically, the redistributive effect of fiscal policy in the region, as well as in EMDEs more generally, has been limited by low tax revenues (Goni et al. 2011). However, many developing economies saw significant increases in tax-GDP ratios during the 2000s; the median change was around 3 percent of GDP in Asia and Pacific and Latin America, and around 2 percent in sub-Saharan Africa (Bastagli et al. 2015). Cornia (2012) also points to large increases in tax-GDP ratios in many Latin American countries during the 2000s, typically accompanied by increases in government social spending.

A final potential explanation is improvements in governance. The control of corruption is widely perceived to reduce inequality, either because the benefits from corruption go to higher-income groups, or because corruption reduces the effectiveness of social programs that benefit the poor. Evidence in support of a positive relationship between corruption and income inequality has been found (e.g. Gupta et al. 2002, Gyimah-Brempong and de Camacho 2006). According to the Bayesian

Corruption Index (BCI) constructed by Standaert (2015), levels of corruption did decline on average in EMDEs during the 2000s, after rising somewhat in the 1990s, although the difference is not large, and corruption fell by similar amounts in AEs.

To test for the role of these other domestic factors in explaining inequality trends, we include in our regressions the reduction in average tariffs (*tradelib*), the change in the Chinn-Ito index of capital account openness (*caplib*) (Chinn and Ito 2006), the change in average years of schooling (*sch_d*), the change in the BCI index (*corrupt_d*), the change in the ratio of tax revenue to GDP (*tax_d*), and the change in government social spending as a share of GDP (*gsoc_d*), measured by the sum of spending on social benefits and subsidies from the IMF Economic Classification of Expenditure.

3.2 Data

A summary of the dependent and explanatory variables included in the analysis is shown in Table 4; descriptive statistics are shown in Table 5. Data availability is a problem for some variables, such that entering all variables in a single regression limits the size of the sample significantly. We therefore proceed in two stages. First, we estimate 'baseline' regressions with all explanatory variables except the other domestic factors. This gives a sample of 113 countries, including 90 EMDEs and 23 AEs. We then estimate a series of additional regressions, each adding one or two of the other domestic factors to the baseline regression; the sample sizes in these cases vary between 81 and 113 countries.

[Tables 4 and 5 about here]

3.3 Main results

The results for market income inequality are shown in Table 6. Turning first to the baseline results (column 1), we see strong evidence of inequality convergence: the initial level of inequality has a negative and statistically significant relationship with inequality trends. The size of the coefficient is similar to existing estimates in the literature, and indicates that a difference of 10 points in the Gini between two countries would decline on average by 0.14 points per year, *ceteris paribus*.

[Table 6 about here]

We find no evidence of a relationship between trends in inequality and rates of economic growth, but we do find evidence of a relationship with changes in the agricultural employment share. In particular, there is evidence of an inverse-U shaped relationship between inequality and the agricultural employment share, consistent with a 'structural change' interpretation of the Kuznets hypothesis, and the results of Baymul and Sen (2019). The estimated turning point in this relationship is an agricultural employment share of 67%, which is between the 75th and 90th percentile in our sample of EMDEs at the start of the 2000s. We also find a positive coefficient on the services employment share, again consistent with Baymul and Sen (2019). This indicates that, for countries beyond the turning point, the negative association between changes in income inequality and changes in agricultural employment is either offset or negated altogether, if the fall is accompanied by an increase in the employment share of services rather than industry. This is shown in Figure 2.

[Figure 2 about here]

We also find evidence that rising relative productivity in agriculture, rising commodity prices, and increases in inward remittances have all been associated with declining inequality: the coefficients on *rpa_d*, *cpi_d* and *rem_d* are all negative and statistically significant at the 10% level or below. This is consistent with Andersson and Palacio (2017) for relative agricultural productivity, and Goderis and Malone (2011) for commodity prices. The size of the coefficient on *rpa_d* suggests that a country with a rise in relative agricultural productivity of 15 percentage points over a 10 year period (about the 90th percentile in our sample) would expect to see the market income Gini fall by 1.6 points more than a country with a reduction in relative agricultural productivity of 20 percentage points (about the 10th percentile in our sample). Equivalent figures for *cpi_d* and *rem_d* are declines of 1.8 and 0.5 points in the Gini, again comparing the 90th and 10th percentile values of these explanatory variables.

Columns (2)-(5) of Table 6 show the results when including the other domestic factors. There is no evidence that these factors have been associated with inequality trends; the results are not

statistically significant in each case. Including the other domestic factors also typically makes little difference to the baseline results. The only exceptions are in column (4), when the results for remittances (*rem_d*) and the agricultural employment interaction term (*agr_i*) are no longer statistically significant – although this could be a reflection of the smaller sample for this regression. The overall explanatory power of the model (measured by the R-squared) is between 0.39 and 0.44, indicating that between 39 and 44 percent of the variation in trends in market inequality across countries during the 2000s can be explained by the baseline variables.

Table 7 shows equivalent results for disposable income inequality. In this case, the relationships between trends in inequality and changes in services employment and remittances are no longer statistically significant. However, the associations with changes in agricultural employment, relative agricultural productivity growth and changes in commodity prices remain of the same sign and statistically significant at the 10% level or below, albeit slightly smaller in terms of magnitude compared to Table 6. Furthermore, there is again little evidence that the other domestic factors have been associated with inequality trends – apart from trade liberalisation, which has a positive relationship, consistent with previous evidence – and their inclusion typically makes little difference to the baseline results. The overall explanatory power of the regression is also similar, at between 0.39 and 0.44.

[Table 7 about here]

Table 8 shows the results from additional regressions in which we interact selected explanatory variables from Tables 6-7 with a dummy for Latin America. These regressions also include interaction terms with a dummy for AEs, so the base category is all EMDEs except Latin America.[xix] For changes in relative agricultural productivity, commodity prices and remittances, the results suggest that the negative relationship with trends in inequality is no different in Latin America than in other EMDEs. For changes in corruption, the results indicate no significant relationship with trends in inequality, in neither Latin America nor other EMDEs. However, there is evidence that increases in educational

attainments, tax revenues and government social spending were associated with declining inequality in Latin America – consistent with previous research on the region (e.g. Cornia 2012) – but not in other EMDEs. The same also applies to trade liberalisation, which is associated with declining inequality in Latin America during the 2000s, but not in other EMDEs. These differences may in turn at least partly account for the particularly strong inequality performance of Latin America compared to EMDEs, a point we return to further below.[xx]

[Table 8 about here]

3.4 Robustness tests

In this section we explore the robustness of our main regression results. First, we use an alternative set of weights, namely the squared inverse standard error, or 'precision squared', as well as standard (unweighted) ordinary least squares (OLS) estimation. Second, we repeat the regressions using a more restricted sample, requiring that the trends cover periods of at least ten rather than seven years; this reduces the baseline sample by nine observations. Third, we drop the use of IV estimation; although not strictly justified on econometric grounds, this does increase the sample (by 13 countries), thus providing some sense of how robust the results are to a larger sample. Fifth, we restrict the sample to EMDEs in the 2000s, to assess to what extent the explanatory variables can account for the variation in inequality trends specifically among this country group. Finally, we repeat the regressions using a range of other explanatory variables that have been identified in previous studies to be associated with income inequality.[xxi]

Tables 9 and 10 show the results. We show the baseline regressions only, since the other domestic factors are largely insignificant, with the exception of the interaction terms between the schooling, fiscal policy and trade liberalisation variables and the dummy for Latin America, which we report in the lower part of each table. For market income inequality (Table 9), the coefficients for initial inequality, structural change, relative agricultural productivity, commodity prices, and remittances, as well as the interaction terms for schooling, fiscal policy and trade liberalisation, all remain statistically

significant at the 10% level or below, in all but one or two cases. The main exception is structural change (*agr_d* and *agr_i*), where the results are of the same sign and similar magnitude, but no longer statistically significant when limiting the sample to EMDEs (column 5). For disposable income inequality (Table 10), the coefficients for initial inequality, relative agricultural productivity and commodity prices are similar in size to Table 7 and remain statistically significant at the 5% level or below. In each case, the overall explanatory power of the model is lower for the unweighted OLS results, at slightly below 0.3, and also for the results specifically for EMDEs in 2000, but it remains similar in the other cases.

Finally, the other explanatory variables were almost always insignificant, with just one or two exceptions, and did not substantially affect the results for the baseline variables. However, we did find that reductions in educational inequality and increases in share of direct taxes in total tax revenue have also been associated with declining inequality trends in Latin America, but not in other EMDEs, similar to the results in Table 8. We also found similar evidence for increases in urbanisation and reductions in dependency ratios.

[Tables 9 and 10 about here]

3.5 Decomposition analysis

In this section we calculate the percentage contribution of different sets of explanatory variables to explaining the differences in average inequality trends during the 2000s highlighted in Section 2. We do this by calculating, for each variable *k* in our baseline regressions, the ratio:

$$\frac{\beta_k\left(\bar{X}_{ik} - \bar{X}_{jk}\right)}{\bar{g}_i - \bar{g}_j} \tag{3}$$

where $\bar{g}$ indicates the average trend in inequality during the 2000s and $\bar{X}_k$ indicates the average value of explanatory variable *k*, in each case for a given country group *i* or *j*. (The values of $\bar{g}$ and $\bar{X}_k$ for each country group are reported in the Appendix, Table A2.) For the comparisons between Latin America

and other EMDEs, we also calculate the contributions of the schooling, tax and social spending, and trade liberalisation variables, according to the ratio:

$$\frac{\beta_k\left(\bar{X}_{ik} - \bar{X}_{jk}\right) + \beta_k^{INT}\bar{X}_{ik}}{\bar{g}_i - \bar{g}_j} \tag{4}$$

where β_k^{INT} indicates the coefficients on the interaction terms between these variables and the dummy for Latin America (as reported in Table 8), with subscripts *i* and *j* in this case indicating average values of each variable for Latin America and other EMDEs respectively. This takes into account the contribution of the different effects of schooling, tax and social spending, and trade liberalisation in the region, as indicated by the results in Table 8.

The results are shown in Table 11. We find that higher initial levels of inequality can account for 81 percent of the trend difference in disposable income inequality between EMDEs and AEs (column 1); stronger growth in commodity prices can account for a further 26 percent. By contrast, almost none of the trend difference in market income inequality can be explained by convergence, since average levels of market income inequality among EMDEs and the AEs were in fact very similar at the start of the 2000s.[xxii] Instead, around half of the trend difference in market inequality between EMDEs and AEs in the 2000s can be explained by a combination of faster structural change on the one hand, and stronger growth in commodity price indices on the other.

[Table 11 about here]

For the comparison between Latin America and other EMDEs in the 2000s (column 2), we find that convergence can explain 31 and 40 per cent of the trend differences in market and disposable inequality respectively, reflecting the higher initial levels of inequality in Latin America than in most other EMDE regions. The combination of structural change and faster growth in commodity prices can explain a further 23 and 15 percent of the trend differences, but the contributions of the other baseline variables are either small or negative. Instead, the remaining differences can be explained by the other domestic factors: in particular, rising educational attainments, tax revenues, government

social spending, and trade liberalisation, which were found to be associated with declining inequality in Latin America but not in other EMDEs. The results are similar when we compare Latin America with other specific EMDE regions (columns 3-5), the main exception being that convergence can explain relatively more of the trend difference with Eastern Europe and Central Asia, where levels of inequality were on average much lower at the start of the period, and relatively less of the trend difference with Sub-Saharan Africa, where levels of inequality were on average only slightly lower than in Latin America. Note however that the results for the other domestic factors in Table 11 must be treated with caution, since the contributions of these variables are obtained from regressions in which (due to limitations of sample size discussed in Section 3.2) each of the other domestic factors is entered separately, rather than together in a single regression. There may as a result be some overlap between the contribution of each of the other domestic factors shown in Table 11.

4. Conclusion

Since the early 2000s, there has been an important and notable shift in EMDEs: namely, a tendency toward declining income inequality, following the tendency toward rising inequality in the 1980s and 1990s. While the nature and drivers of this shift have been extensively studied in Latin America, we contribute to the literature by providing a more global perspective, documenting and analysing the correlates of recent trends in inequality for a large sample of over 100 countries, using data from the SWIID (Solt 2019a). In so doing, we aim to broaden our understanding of the factors associated with falling inequality among EMDEs during the 2000s, as well as place the Latin American experience in a comparative context.

Our main findings may be summarised as follows. First, we confirm the strong performance of EMDEs in reducing income inequality during the 2000s. We show that this applies in comparison with both AEs during the 2000s, and EMDEs during the 1990s; it also applies to inequality in both market and disposable income. We also show that the strong performance of EMDEs during the 2000s was not just a Latin American phenomenon: inequality also fell on average in other EMDEs, albeit by

significantly less than in Latin America. The improvement in performance among EMDEs between the 1990s and 2000s is also only partly explained by the particularly large increase in inequality in Eastern Europe and Central Asia during the 1990s.

Second, we find that the tendency toward declining inequality in both market and disposable income during the 2000s was stronger in countries with higher initial levels of inequality, and larger increases in relative agricultural productivity and country-specific primary commodity price indices. For inequality in market inequality, the tendency was also stronger in countries with larger increases in inward remittances. By contrast, structural change – understood as the movement of labour out of agriculture – had a conditional relationship with changes in inequality, depending on the initial level of agricultural employment, as implied by the Kuznets hypothesis, but also depending on whether the movement of labour was toward industry or services, with a tendency to reduce inequality in the former case but raise it in the latter. We also find a role for increasing educational attainments, tax revenues, government social spending and trade liberalisation, but only in Latin America, and not in other EMDEs.

Finally, we find that inequality convergence can account for around 80 percent of the difference in trends in disposable income inequality between EMDEs and AEs in the 2000s, but none of the difference in trends in market income inequality. The latter is instead explained mainly by structural change, combined with stronger growth in commodity prices. Convergence can also account for around 40 percent of the difference in trends between Latin America and other EMDEs in the 2000s, for both market and disposable income inequality. The remainder can be explained by the stronger association between reductions in inequality and increases in educational attainment, tax revenues and government social spending, and also trade liberalisation, in Latin America compared to other EMDE regions.

The results in this paper provide further support for several existing findings in the literature. These include the important role of inequality convergence (e.g. Ravallion 2003, Dhongde and Miao 2013),

the conditional relationship with structural change (e.g. Baymul and Sen 2019), and the significant negative associations between trends in inequality and changes in agricultural productivity (e.g. Bogliaccini 2013, Andersson and Palacio 2017), primary commodity prices (e.g. Goderis and Malone 2011), and remittance inflows (e.g. Acosta et al. 2008). We also find evidence that increases in educational attainments, tax revenues and government social spending were associated with falling inequality in Latin America, consistent with Cornia (2012), but more surprisingly, not in other EMDEs – suggesting the need for further analysis to understand why fiscal policy appears to have been more effective in this respect in Latin America than in other EMDE regions. In contrast to previous findings (e.g. Goldberg and Pavcnik 2007, Furceri and Loungani 2018), we also find relatively little evidence that trade and capital market liberalisation have affected inequality trends. This may be due to our focus on longer-term trends: Rojas-Vallejos and Turnovsky (2017) for example find that the effect of tariff reductions on inequality is much greater in the short-run than in the long-run.

Certain caveats to our results must be pointed out. First, we have relied on the SWIID for data on inequality, and many of the figures for EMDEs in this source are imputed; in addition, the SWIID contains only one measure of inequality (the Gini coefficient), and does not distinguish between alternative sources of income (e.g. labour vs. non-labour income). Although we have taken the imputed nature of the data into account during estimation, one possible task for further research would be to repeat the analysis using an alternative data source, such as the WIID, which avoids the use of imputation and which also provides other measures of inequality (e.g. decile or quintile shares). However, considerable care would be required in this case, to construct comparable series of inequality estimates over time and avoid the breaks in continuity and consistency highlighted by Atkinson and Brandolini (2001, 2009). Second, our regression results are best interpreted as partial associations rather than causal effects, since we have not controlled for possible reverse causation between inequality trends and our explanatory variables: for example, if declining inequality is a cause as well as a consequence of faster economic growth. In addition, due to the relatively limited sample size, we have not been able to test for differences in the relationships between inequality trends and

our explanatory variables across all EMDE regions. Finally, our regression model can at best explain only one half of the overall variation in inequality trends across countries and over time, meaning that at least one half remains unexplained. Further cross-country work may be able to uncover more sources of variation, although we have repeated the regressions with a wide range of other potential explanatory variables that have been identified in previous research as being associated with inequality, with relatively little difference to our baseline results. More country-specific analysis may also be needed therefore to better understand the "unexplained 50%" of the correlates of inequality trends.

In terms of the policy implications, the results suggest that the challenge now facing many EMDEs is how to sustain the reductions in inequality achieved since the early 2000s, in the face of a more challenging external environment. The IMF all-commodity price index fell by 6 percent per year during 2014-19, after rising 10 percent per year during 2002-14 (IMF 2020); remittance inflows to EMDEs have also grown more slowly since the Global Financial Crisis, despite a recent upturn in 2018 and 2019 (World Bank 2019). According to our results, the combination of these factors is likely to put upward pressure on inequality, particularly in countries which are relatively dependent on primary commodity exports. This is likely to be compounded by weaker domestic factors: in particular, a natural slowdown of the pace of structural change, which according to our results has tended to be equity-enhancing in recent decades, and also in the role of inequality convergence, as cross-country gaps in levels of inequality come down in size. To this should be added the considerable potential impacts of COVID-19. At the time of writing, only preliminary evidence is available, but the initial indications are that the pandemic and its economic consequences are having a significantly more adverse impact on the relatively less well-off (e.g. Deaton 2020; Sen 2020). This could be for various reasons: first, a greater likelihood of contracting the disease, due for example to crowded living or working conditions, or worse pre-existing health outcomes; second, a greater likelihood of losing out from government-enforced lockdowns, due for example to greater levels of employment in informal, service sector activities which cannot be carried out online, or which miss out on official wage support

schemes; and third, the adverse long-term impacts on the education and human capital of children and young adults in lower-income households, due for example to a reduced ability to do schoolwork from home.

While challenging, the results also point to ways in which these inequality 'headwinds' might be overcome. First, there appears to be scope in many EMDEs for redistributive fiscal policy to further reduce levels of disposable income inequality, particularly given the evidence that redistribution, by itself, does not adversely affect growth (Berg et al. 2018). By the mid-2010s, the difference between levels of market and disposable income inequality – a crude measure of fiscal redistribution – remained at around 6 percentage points among the EMDEs in our sample, compared to over 17 percentage points among the AEs. As noted above however, while we find that increases in tax revenues and social spending have been associated with declining inequality in Latin America, we do not find a similar relationship for other EMDEs, suggesting the need for further research in this area. Second, a further contribution can be made by economic growth strategies aimed at narrowing gaps in productivity between agriculture and the rest of the economy, and which avoid the neglect of agriculture and the problem of sector dualism. Finally, there is scope to manage the volatility of commodity prices more effectively, in particular by avoiding the sorts of 'pro-cyclical' fiscal policy responses which may help reduce inequality in boom years but have the opposite effects during downturns. Some positive steps in this direction have been achieved by many EMDEs in recent years, in part due to strengthening of fiscal institutions (Frankel et al. 2013, Cespedes and Velasco 2014); these may in turn help sustain the progress made in reducing inequality.

References

Abiad, A., Bluedorn, J., Guajardo, J. and Topalova, P. (2015). The rising resilience of emerging market and developing economies. *World Development* 72: 1-26.

Acemoglu, D., Naidu, S., Restrepo, P. and Robinson, J. (2015). Democracy, redistribution and inequality. In Atkinson, A. and Bourguignon, F. (Eds.), *Handbook of Income Distribution* (Volume 2B). Elsevier.

Acosta, P., Calderon, C., Fajnzylber, P. and Lopez, H. (2008). What is the impact of international remittances on poverty and inequality in Latin America? *World Development* 36 (1): 89–114.

Alesina, A. and Rodrik, D. (1994). Distributive politics and economic growth. *Quarterly Journal of Economics* 109: 465-90.

Alvaredo, F. and Gasparini, L. (2015). Recent trends in Inequality and Poverty in Developing Countries. In Atkinson, A. and Bourguignon, F. (Eds.), *Handbook of Income Distribution* (Volume 2A). Elsevier.

Anderson, E. (2005) Openness and inequality in developing countries: a review of theory and evidence. *World Development* 33(7): 1045-1063.

Andersson, M. and Palacio, A. (2017). Structural change and the fall of income inequality in Latin America: agricultural development, inter-sectoral duality, and the Kuznets curve. In Bertola, L. and Williamson, J. (Eds.), *Has Latin American Inequality Changed Direction? Looking Over the Long Run*. Springer.

Atkinson, A. and Brandolini, A. (2001). Promise and pitfalls in the use of 'secondary' data-sets: income inequality in OECD countries as a case study. *Journal of Economic Literature* 39 (September 2001), 771-799.

Atkinson, A. and Brandolini, A. (2009). On data: a case study of the evolution of income inequality across time and across countries. *Cambridge Journal of Economics* 33: 381-404.

Azevedo, J., Inchaust, G. and Sanfelice, V. (2013). Decomposing the recent inequality decline in Latin America. Policy Research Working Paper 6715, World Bank, Washington D.C.

Barro, R. and Lee, J-W. (2015). *Education Matters: Global Schooling Gains from the 19th to the 21st Century*. New York: Oxford University Press.

Bastagli, F., Coady, D. and Gupta, S. (2015). Fiscal redistribution in developing countries: overview of policy options and issues. In Clements, B., de Mooij, R., Gupta, S. and Keen, M. (Eds.), *Inequality and Fiscal Policy*. International Monetary Fund.

Baymul, C. and Sen, K. (2019). Kuznets revisited: what do we know about the relationship between structural transformation and inequality? *Asian Development Review* 36(1): 136-167.

Berg, A. and Ostry, J. (2012). What makes growth sustained? *Journal of Development Economics* 98 (2): 149-166.

Berg, A., Ostry, J., Tsangarides, C. and Yakhshilikov (2018). Redistribution, inequality and growth: new evidence. *Journal of Economic Growth* 23: 259-305.

Beegle, K., Christiansen, L., Dabalen, A. and Gaddis, I. (2016). *Africa Poverty Report: Poverty in a Rising Africa*. World Bank.

Bleaney, M. and Nishiyama, A. (2003). Convergence in income inequality: differences between advanced and developing countries. *Economics Bulletin* 4 (22): 1-10.

Bogliaccini, J. (2013). Trade liberalization, deindustrialization, and inequality: evidence from middle-income Latin American countries. *Latin American Research Review* 48**:** 79-105.

Bown, C. and Cowley, M. (2016). The empirical landscape of trade policy. In Bagwell, K. and Staiger, R. (Eds.), *Handbook of Commercial Policy* (Volume 1A). North Holland.

Bumann, S. and Lensink, R. (2016). Capital account liberalisation and income inequality. *Journal of International Money and Finance* 61: 143-162.

Cespedes, L. and Velasco, A. (2014). Was this time different? Fiscal policy in commodity republics. *Journal of Development Economics* 106: 92-106.

Chinn, M. and Ito, H. (2006). What matters for financial development? Capital controls, institutions and interactions. *Journal of Development Economics* 81(1): 163-192.

Clark, A.E., Frijters, P. and Shields, M.A. (2008). Relative income, happiness, and utility: an explanation for the Easterlin paradox and other puzzles. *Journal of Economic Literature* 46: 95-144.

Coady, D. and Dizioli, A. (2017). Income inequality and education revisited: persistence, endogeneity and heterogeneity. Working Paper 126, International Monetary Fund, Washington D.C..

Cord, L., Barriga-Cabanillas, O., Lucchetti, L., Rodriguez-Castelan, C., Sousa, L. and Valderrama, D. (2017). Inequality stagnation in Latin America in the aftermath of the global financial crisis. *Review of Development Economics* 21 (1): 157-181.

Cornia, G. A. (2012). Inequality trends and their determinants: Latin America over 1990-2010. Working Paper 2012/09, UNU-WIDER, Helsinki.

Cornia, G. A. (2014) (Ed). *Falling inequality in Latin America: Policy Changes and Lessons*. Oxford University Press.

Cornia, G. A. (2017). Inequality levels, trends and determinants in sub-Saharan Africa: An overview of main changes since the early 1990s. In Odusola, A., Cornia, G.A., Bhorat, H. and Conceição, P. (Eds.), *Income Inequality Trends in Sub-Saharan Africa: Divergence, Determinants and Consequences*. United Nations Development Programme.

Deaton, A. (2020). Health and wealth inequality in America: how COVID-19 makes clear the need for change. Congressional Testimony to the House Budget Committee, June 23rd 2020.

Dollar, D., Kleineberg, T. and Kraay, A. (2016). Growth is still good for the poor. *European Economic Review* 81: 68-85.

Dorsch, M. and Maarek, P. (2019). Democratization and the conditional dynamics of income distribution. *American Political Science Review* 113 (2): 385-404.

Ferreira, F. and Ravallion, M. (2011). Poverty and inequality: the global context. In Nolan, B., Salverda, W. and Smeeding, T. (Eds.), *The Oxford Handbook of Economic Inequality*. Oxford University Press.

Ferreira, F., Lustig, N. and Teles, D. (2015). Appraising cross-national income inequality databases: an introduction. *Journal of Economic Inequality* 13: 497-526.

Fosu, A. (2015). Growth, Inequality and Poverty in Sub-Saharan Africa: Recent Progress in a Global Context. *Oxford Development Studies* 43 (1): 44-59.

Frankel, J., Vegh, C. and Vuletin, G. (2013). On graduation from fiscal procyclicality. *Journal of Development Economics* 100 (1): 32-47.

Furceri, D. and Loungani, P. (2018). The distributional effects of capital account liberalisation. *Journal of Development Economics* 130: 127-144.

Gasparini, L., Galiani, S., Cruces, G., & Acosta, P. (2011). Educational upgrading and returns to skills in Latin America. Evidence from a supply and demand framework, 1990–2010. World Bank Policy Research Paper 5921, World Bank, Washington D.C.

Gasparini, L., Cruces, G. and Tornarolli, L. (2016). Chronicle of a deceleration foretold: income inequality in Latin America in the 2010s. Working Paper 198, Centro de Estudios Distributivos, Laborales y Sociales (CEDLAS), Universidad Nacional de la Plata.

Goderis, B. and Malone, S. (2011). Natural resource booms and inequality: theory and evidence. *The Scandanavian Journal of Economics* 113 (2): 388-417.

Goldberg, P. and Pavcnik, N. (2007). Distributional effects of globalisation in developing countries. *Journal of Economic Literature* 45 (1): 39-82.

Goni, E., Lopez, J. and Serven, L. (2011). Fiscal Redistribution and Income Inequality in Latin America. *World Development* 39 (9): 1558–1569.

Gruss, B. and Kebhaj, S. (2019). Commodity terms of trade: a new database. Working Paper 19/21, International Monetary Fund, Washington D.C.

Gupta, S., Davoodi, H. and Alonso-Terme, R. (2002). Does corruption affect income distribution? *Economics of Governance* 3 (1): 23-45.

Gyimah-Brempong, K. and de Camacho, S. (2006). Corruption, growth and income distribution: are there regional differences? *Economics of Governance* 7: 245-269.

IMF (2020). data available at https://www.imf.org/en/Research/commodity-prices

Jaumotte, F., Lall, S. & Papageorgiou, C. 2013. Rising Income Inequality: Technology, or Trade and Financial Globalization? *IMF Economic Review* 61: 271-309.

Jenkins, S. (2015). World income inequality databases: an assessment of WIID and SWIID. *Journal of Economic Inequality* 13: 629-671.

Lee, C., Nielsen, F. and Alderson, A. (2007). Income inequality, global economy and the state. *Social Forces* 86: 77-111.

Li, H., Squire, L. and Zou, H. (1998). Explaining international and intertemporal variations in income inequality. *The Economic Journal* 108 (January): 26-43.

Lind, J. and Mehlum, H. (2010). With or without U? The appropriate test for a U-shaped relationship. *Oxford Bulletin of Economics and Statistics* 72 (1): 109-118.

Lopez-Calva, L. F. and Lustig, N. (Eds.) (2010). *Declining inequality in Latin America: A decade of progress?* Brookings Institution and UNDP.

Lustig, N., Lopez-Calva, L. and Ortiz-Juarez, O. (2013a). Deconstructing the decline in inequality in Latin America. Policy Research Working Paper 6552, World Bank, Washington D.C.

Lustig, N., Lopez-Calva, L. and Ortiz-Juarez, O. (2013b). Declining inequality in Latin America in the 2000s: the cases of Argentina, Brazil and Mexico. *World Development* 44: 129-141.

Ravallion, M. (1997). Can high-inequality developing countries escape absolute poverty? *Economics Letters,* 56, 51-57.

Ravallion, M. (2001). Growth, inequality and poverty: looking beyond averages. *World Development* 29 (11): 1803-1815.

Ravallion, M. (2003). Inequality convergence. *Economics Letters* 80: 351-356.

Ravallion, M., 2007. Inequality is bad for the poor. In: Jenkins, S. and Micklewright, J. (Eds.), *Inequality and Poverty Re-Examined*. Oxford University Press.

Ravallion, M. (2014). Income inequality in the developing world. *Science* 344 (6186): 851-855.

Rojas-Vallejos, J. and Turnovsky, S. (2017). Tariff reduction and income inequality: some empirical evidence. *Open Economies Review* 28: 603-631.

Sen, K. (2020). Five ways coronavirus is deepening global inequality. *The Conversation*, August 18th 2020.

Solt, F. (2015). On the assessment and use of cross-national income inequality datasets. *Journal of Economic Inequality* 13: 683-691.

Solt, F. (2019a). Measuring Income Inequality Across Countries and Over Time: The Standardized World Income Inequality Database. SWIID Version 8.2.

Solt (2019b). Using the SWIID in STATA. Mimeograph. Available at: https://fsolt.org/swiid/.

Standaert, S. (2015). Divining the Level of Corruption: a Bayesian State Space Approach", *Journal of Comparative Economics*, 43(3): 782-803.

Stanley, T.D. & Doucouliagos, H., 2012. *Meta-regression Analysis in Economics and Business*, Routledge, Abingdon.

Timmer, C.P. (2004). The road to pro-poor growth: the Indonesian experience in regional perspective. *Bulletin of Indonesian Economic Studies* 40 (2): 177-207.

Tsounta, E. and Osueke, A. (2014). What is behind Latin America's declining income inequality? IMF Working Paper 14/124, IMF, Washington D.C.

UNCTAD (2016). *Trade and Development Report 2016: Structural Transformation for Sustained and Inclusive Growth*. United Nations.

Wilkinson, R. and Pickett, K. (2009). *The Spirit Level: Why More Equal Societies Almost Always Do Better*. Allen Lane.

World Bank (2019). Migration and remittances: recent developments and outlook. Migration and Development Brief 31, World Bank, Washington D.C.

[i] See for example Alesina and Rodrik (1994), Ravallion (1997), Clark et al. (2008), Wilkinson and Pickett (2009), Berg and Ostry (2012), and Berg et al. (2018). High levels of income inequality also conflict with notions of equity and social justice – as for example when life chances differ significantly by gender, inherited wealth, or ethnicity (World Bank 2005).

[ii] Lopez-Calva and Lustig (2010), Gasparini et al. (2011) and Azevedo et al. (2013) all argue that the most important factors behind the decline in the relative wages of skilled workers in Latin America during the 2000s were 'supply-side': in particular, an increase in the relative supply of workers with completed secondary and tertiary education. This in turn reflected the significant educational upgrading that took place in the region. Nevertheless, demand-side factors have also played a role, not least since the pace of educational expansion in the region was as great (if not greater) during the 1990s, when inequality tended to rise, than it was during the 2000s, when inequality tended to fall (De La Torre et al. 2017).

[iii] Market income is defined as the amount of money coming into the household, excluding any government cash or near-cash benefits; disposable income is equal to market income plus government transfer payments, minus direct taxes (Solt 2019a).

[iv] Our regression model is similar to that estimated by Li et al. (1998), except that this study only included a single country-specific trend. This study also included dummy variables for different types of inequality estimates, which are not necessary in our case, due to the standardisation already built into the SWIID data.

[v] The overall change in the Gini coefficient for each country and period is calculated by multiplying the country-specific trend by the length of period in years. Note that of the EMDEs with *rising* trends in the Gini during the 2000s, only between one fifth (for disposable income) and one third (for market income) of the trends are large in size.

[vi] These countries are (size of the overall reduction in disposable and market Gini coefficients in brackets): Bolivia (12.4, 9.2), Argentina (10.2, 7.6), Ecuador (9.1, 6.7), Peru (8.7, 10.0), El Salvador (8.6, 6.2), Brazil (7.2, 6.4), Venezuela (6.7, 5.3), Paraguay (6.5, 6.2), Guatemala (5.8, 5.6), Panama (5.4, 4.5), Dominican Republic (5.2, 4.2), Nicaragua (5, 4.1), Uruguay (4.8, 5.7), Colombia (4.1, 4), Chile (4, 1.9), Honduras (3.4, 1.9), Mexico (2.3, 1.5). The three countries in the region to buck the trend were Haiti, Puerto Rico and Costa Rica, which all saw rising

inequality in both market and disposable income, although the rise was large in size only for market income inequality in Costa Rica.

[vii] The countries in Sub-Saharan Africa experiencing large reductions in inequality during the 2000s according to our estimates were Burkina Faso (6.7, 7.2), Guinea (4.5, 5.0), Mauritania (4.8, 4.8), Niger (4.2, 4.1), Sierra Leone (4.2, 4.0), Gambia (3.3, 3.8), Malawi (3.2, 3.6), Namibia (2.6, 2.2), Comoros (2.2, 2.2) and Angola (2.1, 2.0); the countries experiencing large increases were Mozambique (3.1, 2.9), Zambia (4.0, 3.3), Benin (3.5, 4.4), Guinea-Bissau (4.0, 4.4). The results for Sub-Saharan Africa are broadly consistent with Cornia (2017), who finds that inequality fell in more than half of countries with data (17 out of 29), although other studies have found a more even split (e.g. Fosu 2015, Beegle et al. 2016).

[viii] The size of these rises was as follows: China (1.4, 5.5), India (5.1, 4.0), Indonesia (4.5, 1.9), South Korea (2.6, 2.4). With the exception of Indonesia, these countries also experienced large rises in inequality during the 1990s. The countries in South and East Asia experiencing large reductions in inequality during the 2000s were Thailand (5.6, 5.5), Malaysia (3.1, 3.9) and Timor-Leste (2.5, 2.9).

[ix] Results are very similar when using unweighted rather than weighted averages (details available on request).

[x] Note that in these cases the improvement in performance is statistically significant at the 10% level only for disposable income inequality in South and East Asia. In the other cases however, the improvement is only marginally insignificant ($0.10 < p < 0.15$).

[xi] In the study by Dollar et al. (2016), spells can be of quite different length, and there may be relatively little overlap between the spells in one country compared to others. By contrast, the periods of time on which we focus are more consistent across countries, thus facilitating the comparison of trends across country groups and decades. In contrast to previous work, we also take into account the precision of estimated inequality trends, using WLS estimation.

[xii] As is well known, levels of inequality vary significantly across countries, even after adjusting for differences in types of inequality estimates (Li et al. 1999, Alvaredo and Gasparini 2015). In 2010, Latin America still had the highest median Gini coefficient in the developing world, closely followed by Sub-Saharan Africa (45 and 42 respectively); equivalent figures in other EMDE regions were between 34 and 37 (Alvaredo and Gasparini 2015). On the higher levels of inequality in AEs compared to EMDEs, see Ferreira and Ravallion (2011).

[xiii] The use of instrumental variables (IV) estimation is designed to correct for measurement error in the initial level of inequality (see for example Ravallion 2003). In our case, it reduces the sample somewhat, since not all

countries with data for the 2000s have data for the 1990s. Durbin-Wu-Hausman tests supported the use of IV estimation, for both market and disposable income inequality.

[xiv] For other recent evidence on the Kuznets hypothesis, see Lind and Mehlum (2010).

[xv] We also experimented using the change in 'sector dualism', also referred to as the 'sectoral Gini coefficient', measured as the difference between the share of agriculture value added in GDP and its share of total employment. The results were similar to those using the change in relative agricultural productivity.

[xvi] The IMF all commodity price index rose by 10.3 percent per year between 2002 and 2014, after falling by 0.3 percent per year between 1992 and 2002 (IMF 2020).

[xvii] See for example Anderson (2005), Goldberg and Pavcnik (2007), Jaumotte et al (2013), Bumann and Lensink (2016), Rojas-Vallejo and Turnovsky (2017), and Furceri and Loungani (2018).

[xviii] On the slower fall in import tariffs among EMDEs in the 2000s, see UNCTAD (2016). Bown and Cowley (2016) look at applied MFN tariffs over the period 1993-2013 in 26 large EMDEs, and find that while average MFN tariffs declined from 26% in 1993 to 14% in 2003, they fell much more gradually to 11% in 2013.

[xix] The interaction terms for AEs were typically not statistically significant, the one main exception being trade liberalisation, where the results indicate a positive association with trends in inequality among advanced economies, consistent with previous evidence (details available on request). We did experiment with including interaction terms for all EMDE regions but the results were also not statistically significant in most cases. This may be a reflection of the limited sample size, which makes it difficult to estimate region-specific effects for each explanatory variable.

[xx] The coefficients for schooling in Table 8 indicate that a country in Latin America with an increase in average years of schooling by 1 year over a 10-year period (close to the EMDE average for the 2000s) would expect to see the Gini coefficient fall by 1.2-1.6 percentage points more than in other EMDEs. Equivalent figures for tax revenues and social spending, based on an increase in each variable of 1 percent of GDP, are 0.4-0.5 percentage points.

[xxi] These variables are: educational inequality, the share of direct taxes in total tax revenue, an alternative measure of government social spending based on the IMF functional classification – namely spending on health, education and social welfare, inflation, two measures of financial depth, the labour share of income, the labour force participation rate, urbanisation, dependency ratios, foreign direct investment, and the real effective exchange rate. In these cases, we proceed in the same manner as the other domestic factors, i.e. entering each

additional variable sequentially to the baseline regression model, rather than entering all variables simultaneously.

[xxii] See Appendix Table A2. This is consistent with Goni et al. (2011), who find relatively minor differences in market income inequality between Latin America and Western Europe at the start of the 2000s, in contrast to very large differences in disposable income inequality.