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Does Aid Reduce Inequality? Evidence for Latin America

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Abstract:

Little attention has been paid to the role of aid on income distribution within receiving countries. In this paper, we analyse the role of aid in the evolution of income distribution over the last two decades for 18 Latin American countries. While Latin America is the most unequal region of the world, it includes some of the countries currently leading the reduction of inequality at the global level. The main findings of our work, once we have controlled for several relevant variables, is that there has been is a significant effect of international aid on reducing income inequality in Latin America.

Keywords: foreign aid; inequality; Latin America. JEL: C23; D31; F35; O54.

1. Introduction

Rich countries have repeatedly committed to the well-known 0.7 per cent of their GDP towards international aid (United Nations' 2001 Millennium Declaration; OECD-DAC 2011; Clemens and Moss 2007, among many others). However, only five countries have actually delivered international aid at levels close to or above that 0.7 per cent (Sweden, Norway, Luxembourg, Denmark, and the Netherlands). Moreover, since the beginning of the current great recession there has been a clear downward trend globally in the levels of international aid: -2.7per cent in real terms for DAC countries in 2011, but with large cuts such as -34per cent by Spain, -22per cent by Greece, or -14 and -13per cent by Austria and Belgium respectively; (OECD-DAC 2012).¹ Many donor countries, especially European ones, have adopted contractionary fiscal policies that have led to drastic cuts in international aid budgets.

In line with the trend described above, there has been a wide and intense debate during the last decades over the efficacy and efficiency of international aid.² The main focus of the debate has been the performance of beneficiary countries in terms of economic growth.³ Yet much less analysis has been done on the role of international Official Development Assistance (ODA) in income distribution in receiving countries, and across regions of the world, despite the fact that reducing inequality is an explicit aim of international aid, as we will show below.

For the purpose of our study, Latin America represents a very interesting case of analysis. As a traditionally receiving region, Latin American countries have seen their aid inflow levels significantly reduced over the last years, from 0.50per cent of GDP in 1991 to 0.32per cent in 2001 and 0.22per cent in 2010 (equivalent to constant 2010 USD 7,130 million in 2001 and 5,400 million in 2010) according to the World Bank. The European Commission, in particular, will decide to exclude all Latin American countries - except Haiti - from its Development Co-operation Instrument in 2014-2020. However, Latin America is still considered the most unequal

¹ ODA reached USD 128.7 billion in 2010, representing a historical maximum and an increase of 6.5 per cent over 2009 and 0.32per cent of DAC members' GNI. In 2011, ODA was constant USD 2010 125.5 billion and 0.31per cent of GNI.

² In this paper we use "aid" and "ODA" as synonyms.

³ Literature on aid and growth is still controversial (see McGillivray et al. 2006) even when meta-analysis techniques are used. Whereas the meta-analysis of Doucouliagos and Paldam (2011) does not find any significant effect of aid on growth, Mekasha and Tarp (2011) show positive results using meta-analysis as well. Some recent studies show a positive link using a variety of robust econometric techniques (Dovern and Nunnenkamp 2007; Nowak-Lehmann 2009; Minoui and Reddy 2010; Arndt et al. 2010, 2011; Juselius et al. 2011 and Tezanos et al. 2012 for the Latin American case). Other authors even suggest that aid might actually do more harm than benefit (i.e. Easterly 2006 and Moyo 2009), usually looking at the stagnation of several African countries despite large aid inflows, together with evident corruption and mismanagement of resources.

region in the world⁴ and persistent inequalities pose a major challenge to social and political improvements in the region (Korzeniewicz 2012). But, according to recent data, many Latin American countries are now among those leading inequality reductions in the world. In fact, in the 2002-2008 period inequalities decreased in 14 out of 17 continental Latin American countries, while the Gini coefficient dropped by 2.3 points on average (Lustig and Gasparini 2011).

Although some studies have analysed the determinants of the evolution of inequality in Latin America during recent decades, none - to the best of our knowledge - has focused on the possible role of foreign aid. As we will describe, the study of the relationship between aid and income distribution in developing countries has surprisingly received very little attention. The aim of this paper is to contribute to the study of the evolution of income inequality in Latin American countries during the last two decades. We use yearly data and pay special attention to assessing, theoretically and empirically, the role of international aid in this evolution. Our contribution is thus threefold: we focus on the potential equalizing effect of international aid in the most unequal region of the world; we analyse the relationship between aid and inequality using annual data for the Gini index in 18 Latin American countries; and we estimate the impact of aid using a variety of econometric techniques, specifications and aid measures. Our main finding was that aid has significantly contributed to the reduction in income inequality observed in Latin America during the past two decades: On average, an additional 1per cent of aid/GDP seems to have reduced the Gini coefficient by 0.2-0.4 percentage points.

The structure of the paper is as follows. In the next section we review the literature on the determinants of inequality, paying special attention to the Latin American case, to then justify the possible role of international aid (section 3). In section 4 we look at data to first describe the evolution of inequality and aid in the Latin American countries under study, and then perform econometric analysis. Section 5 contains our final remarks and conclusions.

2. Inequality in Latin America: literature review

Although some authors have hypothesized that Latin American inequality was born under their independence due to their extractive institutions (Acemoglu et al. 2002) and factor endowments

⁴ Gini indexes among Latin American countries show wide dispersion, but even the most equal Latin American country (Uruguay with a Gini of 0.42 measured under disposable income) is still more unequal than the most unequal European country (Portugal with a Gini of 0.38) according to Goñi et al. (2011). Since 2000 Latin America averages 0.50 in terms of Gini coefficient, while European countries average 0.31.

(Engerman and Sokolof 2002), recent evidence shows that this historical determinism might be a myth (Williamson 2009; Milanovic 2009; Prados de la Escosura 2007 a, b). In the same vein Fitzgerald (2009) has shown that income inequality worsened between 1880-1920, decreased in the 1920s, and deteriorated again from 1930 to 1970. Moreover, a new period of decreasing inequality took place between 1970 and 1982 and from 2002-03 to today. Latin American inequality has not always been high and differences among countries have been significant.

Looking at possible determinants of the evolution of inequality in Latin America, in particular the "rise and fall" of the last few decades (Lustig and Gasparini 2011), some recent literature has focused on the political reasons. McLeod and Lustig (2010); Birdsall et al. (2011) and Roberts (2012) have shown that, in contrast to the liberalization policies and conservative governments of the 1980s and 1990s, leftist governments have adopted some redistributive-oriented reforms since 2002-2003, with social democratic regimes (Brazil, Chile or Uruguay) achieving a higher success than the so-called left populist regimes (such as Argentina, Bolivia or Venezuela). In a more economic vein, economic liberalization during the 80s and 90s (Londoño and Székely 2000; Székely 2003), trade openness (Székely and Sámano 2012), a new fiscal pact and tax policy (Cubero and Vladkova-Hollar 2010; Lustig cord. 2011; Ocampo and Malagón 2012; and Cornia et al. 2012), and the expansion and more effective social spending through cash and in-kind transfers (in education and health) and, to lesser extent, progressive direct taxes (Lustig cord. 2012), have been identified as determinants of recent inequality reductions.

Other factors have accompanied political reasons, such as a fall in the skilled labour premium: returns to education have fallen because of the increase in the average years of schooling (Lustig and López Calva 2012; Lustig et al. 2012; Acevedo and Cabrera 2012 for El Salvador) or due to a higher demand for unskilled workers compared to skilled, to work in the so-called *maquiladoras* (Campos et al. 2012 for Mexico; Gindling and Trejos 2013 for Central America except Costa Rica; Azevedo et al. 2013 for 15 Latin American countries). In fact, Cruces et al. (2012) have pointed out that a more pro-poor pattern of the educational improvements and a more stable or even increasing relative demand for unskilled labour significantly explain the egalitarian evolution of some Latin American countries in the 2000s, as the opposite was a remarkable factor of the increasing inequality of the 1980s (Psacharopoulos et al. 1995, 1997). In this line, Bashir and Luque (2012) have documented the effect tertiary education has on inequality in Central America. Institutional factors related to the labour market have also been identified as relevant. In particular, minimum wages have been found to have an egalitarian effect in the cases of Brazil

(Barros et al. 2010), Chile (Contreras and Ffrech-Davies 2012), Argentina (Gasparini and Cruces 2010) and Uruguay (Amarante et al. 2011). External flows might also affect income inequality. Foreign direct investment (FDI), for example, is expected to have an impact on wage differences. Herzer et al. (2011) have identified a positive co-integration between FDI and inequality in Bolivia, Chile, Colombia and Mexico. Similarly, remittances increase disposable income in receiving families versus families that have not received them (Acevedo and Cabrera 2012 for El Salvador; Klasen et al. (2012) for Honduras or Ponce and Vos 2012 for Ecuador). Cornia (2011) has shown these factors as examples of differences in policies and results in inequality between Latin America and European economies in transition.

None of the aforementioned studies on the evolution of inequality in Latin America has considered ODA flows as a factor determining income inequality. While Cornia (2014) has summarized five groups for redistributive effects to take place (macro-policies, taxation, trade policy, labour market policies and social assistance transfers) he only considers FDI and remittances as relevant external inflows. ODA, nevertheless, is another relevant external inflow that might finance some, or all, of these redistributive mechanisms. This might be especially true in Latin American countries as having been important recipients of ODA up to now. Our goal in this paper is precisely to discuss the role that aid can play in the evolution of inequality and test whether ODA flows have had a significant role in the recent fall of income inequality in Latin America.

3. Aid as a possible determinant of inequality

It is often assumed that aid has the potential of mitigating poverty. Poverty might be reduced not only through economic growth but also by counteracting inequality. Thus, aid might alleviate poverty either by increasing growth or by reducing inequality, and pro-poor aid should reach the poorest among income distribution. In fact, international summits and OECD-DAC High Level Fora have explicitly declared that inequality reduction is one of the goals behind aid effectiveness.⁵ However, despite these statements, very little theoretical and empirical knowledge

⁵ Among others, the United Nations Millennium Declaration in 2000 states that: "#2. We recognize that, in addition to our separate responsibilities to our individual societies, we have a collective responsibility to uphold the principles of human dignity, *equality* and equity at the global level"; and in "#6. We consider certain fundamental values to be essential to international relations in the twenty-first century. These include: *Equality*. No individual and no nation must be denied the opportunity to benefit from development. The equal rights and opportunities of women and men must be assured". The Paris Declaration (OECD 2005) says: "#2. At this High-Level Forum on Aid Effectiveness, we followed up on the Declaration adopted at the High-Level Forum on Harmonization in Rome (February 2003) and the core principles put forward at the Marrakech Roundtable on Managing for Development

on the aid-inequality relationship has been offered. Trying to close this gap, in this section we review the empirical evidence on the subject and discuss justifications for potential impacts of aid on inequality, considering some channels for those effects to take place.

Few works have empirically considered a possible relationship between aid and inequality, and those that do have contrasting results and do not focus especially on Latin America. Some studies have found that aid has a positive effect on income inequality (Bornschier et al. 1978, and more recently Layton and Nielson 2008, and Bjørnskov 2010).⁶ Herzer and Nunnenkamp (2012) have also identified a positive panel co-integration between aid and inequality for 1970-1995 in a sample of 21 countries (six of them were Latin American). Other studies either do not confirm these results (Dolan and Tomlin 1980, and more recently Chong et al. (2009) using cross-country regressions and dynamic panel data)⁷ or even find a negative relationship between aid and inequality (Cuesta et al. 2006 using an ordered probit with annual data for 1995-98).⁸ Finally, while Tezanos et al. (2013) have shown that ODA flows had a significant effect on Latin American growth per capita if the income of the highest decile is subtracted, their paper does not directly address the effect of aid on the Gini index.

According to Feeny (2003), aid might directly reduce inequality in three different ways: by focusing on the poorest zones of the recipient country; on the most vulnerable groups (offering them grants or microcredits); or on sectors of high social relevance such as water, sanitation, education and health. In this line, Gomanee et al. (2005) have shown that when aid is channelled through public expenditure and directed towards social sectors (education, health and sanitation),

Results (February 2004) because we believe they will increase the impact aid has in reducing poverty and *inequality*, increasing growth, building capacity and accelerating achievement of the MDGs". Finally, the Accra Agenda for Action (OECD 2008) states: "#3. We need to achieve much more if all countries are to meet the Millennium Development Goals (MDGs). Aid is only one part of the development picture. Democracy, economic growth, social progress, and care for the environment are the prime engines of development in all countries. Addressing *inequalities* of income and opportunity within countries and between states is essential to global progress".

⁶ Both studies identified a stronger regressive effect in democratic countries but did not in autocratic. The result is partially explained by rent-seeking activities and by the fact that aid is captured by local elites. Angeles and Neanidis (2010) and Holder and Raschy (2010) find similar results.

⁷ Dolan and Tomlin (1980) run cross-section regressions with data for 66 developing countries and for 1970-1973. They find positive effects of aid on the Gini index and negative on the 20per cent richest/40per cent poorest income ratio, both statistically insignificant. Chong et al. (2009) use panel data with 112 countries for 1972-2001. They use cross-section and GMM panel data techniques to study the impact of aid (measured as a percentage of GDP) on the Gini index, considering aid, its quadratic value, and an interactive term between aid and corruption. Most of their specifications yield non-significant results for aid.

⁸ The effect was very sensitive to sample countries and regions (in Latin America the effect found was the lowest, and the lower the initial inequality the lower the effect identified). The authors consider probit models due to the double censored characteristic of the Gini variable [0-100] and use contemporaneous, one lag and two lags for the aid's effect. Only 12 Latin American countries are considered and most of them received very low aid/GDP amounts in the years considered. Besides, the ordered probit technique implies fixing ratings that are to some extent arbitrary.

it is likely to have a positive impact on development indicators such as the human development index and infant mortality rates. But aid might also reduce income inequality through other channels. Firstly, we can consider ODA for better governance (17per cent of the aid to Latin America in 2011).⁹ ODA may strengthen trade unions activities, leading to better labour market institutions such as minimum wages or collective negotiation and salaries. Indeed, these factors have been identified as a cause for lower inequality in the cases of Argentina and Uruguay. Secondly, multilateral ODA may enhance macroeconomic stability through structural reforms and programmes. The programmes are expected to lower inflation rates and improve real exchange rates and terms of trade, which could help reduce income inequality. Improved economic stability and better investment environments can also attract more FDI. If incoming firms increase the demand for unskilled workers, unemployment can be lowered and income inequality reduced. Thirdly, ODA in terms of debt relief can also help improve income distribution. This is expected if debt relief frees up resources to be invested in pro-poor projects such as debt-for-education or debt-for-health swaps programmes. In the same line, as aid is fungible, more public resources - cash or in-kind transfers, for instance - may be channelled to the lowest income quintiles, improving income distribution. Fourthly, this aforementioned effect is even clearer if aid channelled through direct budget support is considered. ODA might feed the budgets for conditional cash transfer programmes. Their impact on inequality has been well documented in the literature (Lustig, coord. 2012). Finally, technical cooperation in fields such as fiscal reforms for a higher progressivity - on both taxes and transfers sides - can be financed by aid flows.¹⁰

There are several types of ODA that could lead to aid having a significant influence on income inequality. Different donor agents (bilateral and multilateral agencies, besides common funds and NGOs) finance different recipient agents (central governments, non-central governments and non-state actors) through different instruments such as budget support, technical assistance for

⁹ In the OECD-DAC taxonomy, the "good governance and civil society" sector includes programmes such as strengthening public expenditure management, fiscal reforms, and tax-assessment procedures, among many others. ¹⁰ OECD-DAC defines "Technical cooperation" as "activities whose primary purpose is to augment the level of knowledge, skills, technical know-how or productive aptitudes of the population of developing countries". A remarkable example of this kind is the EUROsociAL. EUROsociAL is the European Union's regional technical cooperation programme to promote social cohesion in Latin America, to support national public policies aimed at improving levels of social cohesion and to strengthen the institutions that implement such policies, including fiscal and employment. The first phase of the Programme (2005-2010) was co-financed by the European Commission, Spain and France. EUROsociAL-II, totally financed by the European Commission, was awarded to a consortium led by a Spanish institution: the International and Ibero-American Foundation for Administration and Public Policies (FIIAPP). Moreover, the Spanish Development Agency (AECID) finances technical assistances such as the Ibero-American Programme for Specialized Technical Training (PIFTE). Since 1987, hundreds of Latin American civil servants have received courses on fiscal reform taught by the Spanish Institute for Fiscal Studies.

policy reforms, debt relief or implementation of specific projects and programmes, as we have described. These instruments may affect a variety of sectors (social and economic infrastructure, productive or cross-cutting and multi-sector programmes). Finally, aid may be disbursed in cash or in kind and may be captured by elites, the middle class, or the poorest population. Empirical evidence of the effect of aid on inequality is, nevertheless, still scarce in the literature, as we have seen. In the next section we provide some qualitative and quantitative details and analyses for Latin America.

4. Empirical evidence

We start by describing inequality and aid data and trends. We complement our analysis by looking at correlations and estimating cross-section and dynamic panel data models. In order to try to test whether aid has had a relevant role in the recent evolution of inequality in Latin America, our estimates consider a variety of specifications, control variables and aid measures.

4.1. Inequality in Latin America: data and trends

To measure income inequality we use Gini coefficients and follow the Martorano and Cornia (2011) database. These Gini coefficients are based on income, calculated on a mixture of net income and gross income. The database includes annual data available for 12 out of 18 countries.¹¹ For missing values 71 interpolations were made among 323 observations (see IDLA Appendix 2 for details). Table 1 shows the main descriptive statistics for our sample and by country.¹²

[Insert Table 1. Descriptive statistics for inequality]

Gini average reaches 52.39, with a maximum of 61.70 (Bolivia in 2000) and a minimum of 41.20 (Venezuela in 2008). Standard deviations show a wide dispersion (1.095-3.181), which means a strong heterogeneity among sample values. Additionally, all-time series show order 1 autocorrelation [Box-Pierce test, Q(1)], except for Honduras and Peru. In other words, inequality is highly persistent within countries and varies among them. Furthermore, when average Gini

¹¹ Countries with uncompleted data are (missing years in parenthesis): Bolivia (2008); Ecuador (1990-94); Guatemala (2007-08); Nicaragua (1990-91 and 2006-08); Paraguay (1990-94) and Peru (1990).

¹² Although we rely on Gini coefficients from Martorano and Cornia to have the maximum number of observations possible, the correlation with Gini coefficients reported by the World Development Indicators dataset is higher than 0.9. Furthermore, although we present all our results with these Gini coefficients, main results hold when we experiment with other indices as the Theil index and Atkinson indices, which also have a correlation higher than 0.9 with the Gini coefficients used.

coefficients by country are computed and ranked, it can be seen that - with some exception lower middle-income countries have higher inequality than upper-middle income countries, although some of the highest Gini belongs to upper-middle income countries such as Brazil and Colombia (Figure 1).

[Insert Figure 1. Average Gini coefficients by country]

When the time series are analysed some remarkable features are detected. As Figure 2 shows, 8 out of 18 countries had a higher Gini at the end of the period (2008) than at the beginning (1990) (blue bars in the figure). Among these, Colombia was the country with the highest difference between the beginning and the end of the period. All the remaining sample countries experienced reductions of inequality from 1990 to 2008 but of different magnitudes.¹³ In few words, inequality has recently decreased in Latin America, although not in all cases or to the same degree.

[Insert Figure 2. Changes in Gini indexes by country]

4.2 Aid to Latin America: data and trends

For ODA we rely on data from the OECD-DAC (2012b) database. In absolute terms, gross ODA disbursements¹⁴ (in current USD million) varied from a maximum of USD 2.500 million in Bolivia (2006) to a minimum of USD 25.39 in Uruguay (2000). Differences among the sample countries are shown in the Appendix, Table A.1. Thus, the first thing to bear in mind when considering aid's effect on inequality is that effect's heterogeneity.

¹³ The amount of the reduction varies from -8.6 Gini points (Ecuador) to -1.2 (Costa Rica). Brazil in particular has experienced an almost steady reduction in income inequality, although its Gini values are still above the median. By contrast, Honduras, Peru and the Dominican Republic have experienced very volatile movements in their Gini indexes. As regards to the year of the onset of the reduction in inequality, there is some concentration around 2003 (Paraguay, the Dominican Republic, Peru), but also in 2002 (Argentina), in 2001 (Panama and Costa Rica) or even before (1998 Ecuador and El Salvador and 1995 in Mexico). Guatemala and Honduras have experienced some reduction in 2002 and 2003 respectively, but inequality rose again afterwards. Finally, Mexico and Peru had their Gini over the median for some years (1995-2000 and, in the Peruvian case for 1998-1999 and 2003), but they managed to reduce it below the median later.

¹⁴ We use gross ODA to illustrate how many resources (loans and grants) arrive in each country for egalitarian purposes. Net ODA, on the contrary, takes into account the returns of ODA loans to the donor. Loans represented more than 20per cent of the net ODA in Argentina, the Dominican Republic, Panama, Brazil and Costa Rica.

Another interesting feature is aid's volatility. This is lower in Latin America - and for the 18 countries in the sample - than in other regions.¹⁵ The standard deviation of gross ODA is outstanding in the case of Bolivia, Honduras and Nicaragua (higher than 450 USD) and remarkable in Colombia, El Salvador, Guatemala and Peru. If volatility around the mean is considered, the coefficient of variation among our sample varies from 0.66 in Honduras to 0.16 in Ecuador. We will deal with this point in our empirical exercise considering 3-year average data in some of our analyses.¹⁶

As pointed out above, aid may improve income distribution *directly* when focused on specific social services. While an exhaustive analysis of sectoral allocation of aid is beyond the scope of this paper, we can take a glance at where aid has mostly been directed. The cross-country average for the whole period (1990-2008) of aid to social services was 50per cent, whereas 12per cent was allocated to economic services and 10per cent to production sectors.¹⁷ And among social services, those more significant for the poor received greater attention. An average of 10per cent of aid was allocated to education (more than 15per cent in Argentina, Chile and Uruguay), 5per cent to health (16per cent in Argentina), and 8per cent to water supply and sanitation (21per cent in the case of Mexico and 24per cent in Panama). Moreover, in aid and social public expenditure, we find positive correlations between aid to education with expenditure in education (0.31), and likewise with health (0.32) and housing (0.35).¹⁸

Among some of the channels that we have described above, aid for good governance and social society is very important for our purposes. In our sample 11per cent of ODA, on average, went to this sector, reaching 20per cent in Guatemala and 17per cent in Mexico.

¹⁵ Measured by the coefficient of variation (or volatility around the mean), the value for Latin America between 1990-2010 was 0.12, whereas it was 0.31 for Europe, 0.28 for Asia, 0.26 for Oceania, 0.24 for Africa and 0.21 among all recipient countries. The coefficient of variation fitted 0.10 for South America and 0.19 for North and Central America.

¹⁶ Most of the aid flows to Latin American countries came from bilateral donors (from a minimum of 48per cent in Honduras or 55per cent in Dominican Republic, to 90-93per cent in Colombia, Panama, Brazil or Mexico in 2010). Spain, the United States, Japan and Germany have played a major role as bilateral donors. Multilateral institutions also play an important role financing macro stability programs. The European Union institutions are the biggest multilateral donors (in fact these institutions were the first donor in the Dominican Republic in 2009-10). EU ranks in the top ten donors in the 18 countries. Other important multilateral donors are the IDB Spanish Fund and the Global Education Fund - except in Andean and Central American countries. IDA has been another important donor in Bolivia, Honduras and Nicaragua.

¹⁷ The remaining percentage mainly belongs to multi-sector activities, humanitarian aid and debt relief.

¹⁸ The regression of aid for education on social expenditure for education was statistically significant at 99per cent of confidence. As suggested, aid may enhance domestic public investment in education and this might in turn be a channel for lower inequality.

We have also pointed out that the detracted resources by debt relief might enhance goods and services for the poorest and better their access to public goods, in cash or in kind. On average, 6per cent of ODA went to this sector, with very high percentages in the cases of Nicaragua (24per cent or a stock of USD 2.650 million), Bolivia (22per cent or USD 2.666 million) and Honduras (17per cent or USD 1.436 million). Spain approved a debt-for-education swap programme in El Salvador in 2006 for a total amount of USD 10 million.¹⁹ Similar programmes have been carried out in Peru and Honduras for expenditures in education, the environment and energy.²⁰

Aid channelled through direct budget support reached 5per cent in Nicaragua (USD 522 million) and 3per cent in Honduras (USD 297 million). For instance, the Inter-American Development Bank financed a conditional cash transfer programme (*Red de Protección Social*) in Nicaragua for 1998-2005 and 2007-2009. The total amount of the programme was USD 11 million, equivalent to 0.2per cent of Nicaragua's GDP (Moore 2009:4).

Finally, aid as technical cooperation has also been important in the region. On average, Venezuela, Colombia and Mexico have received more than 50per cent of their gross aid under this type. Honduras and Nicaragua received the lowest proportion: 15per cent and 17per cent respectively.

Due to the remarkable differences in terms of GDP and population among Latin American countries, it is interesting to look at aid data in relative terms (as we will use these ratios for our econometric analysis). ODA is a more important flow in Nicaragua, with an average of 24per cent in terms of GDP, (USD 138 per capita and an amazing 113per cent relative to central government expense), than for "the big four", Argentina, Brazil, Mexico and Venezuela, where ODA/GNI is smaller than 0.1per cent. In 2010, only Nicaragua (10per cent), Honduras (3.9per cent), Bolivia (3.6per cent), El Salvador (1.4per cent) and Guatemala (1.0per cent) received more than 1per cent aid/GDP. Table 2 shows main descriptive statistics for *aid*, our measure of ODA in terms of GDP, for the whole sample and by country, while Figure 3 shows the evolution and

¹⁹ The programme has allowed the rehabilitation and construction of libraries in 770 schools, better infrastructures in 31 educational centers, better equipment in 90 schools and better capabilities for 1,497 teachers. See Cassimon et al. (2009) for an independent evaluation and UNESCO (2006) or Salles Almeida (n.d.) for a review. The total amount of debt swaps reached USD 773.99 million for 1992-2007. Italy, Germany, Spain, France, the United States, Finland, Canada and Switzerland were the donors involved. We only use the inputs as a potential impact on inequality. We have not found an evaluation that shows a causal and direct impact of debt swaps on inequality in Latin America.

²⁰ See <u>http://www.fondohondurasespana.org/</u>

differences among sample countries. We will also consider net aid in per capita terms for sensibility analyses - see Table A.3 in the Appendix for statistics.

[Insert Table 2. Descriptive statistics for aid]

[Insert Figure 3. Net ODA evolution]

4.3. Correlation analysis:

Bi-variate correlation by country among Gini indexes and ODA per capita was positive for eight sample countries (Argentina, Brazil, Costa Rica, the Dominican Republic, Guatemala, Nicaragua, Uruguay and Venezuela), negative for five countries (Chile, Colombia, El Salvador, Mexico and Panama) and near zero for Bolivia, Ecuador, Honduras and Paraguay. However, analysed by year, the correlations between Gini and ODA per capita were positive for all years of the period, although their R^2 varies from 0.2243 in 2006 to 0.0040 in 1990. Figure 4 shows the pooled cross-section relationship between the Gini and the ODA/GNI ratio. Although Nicaragua is a clear outlier, the relationship does not change if this country is excluded.

[Insert Figure 4. ODA and inequality in Latin America: 1990-2008]

However, a positive relationship between aid and Gini coefficients is not enough to establish a causal effect of aid on inequality. Many more factors, as already discussed, are very likely to have an influence on the evolution of inequality in Latin American countries.

4.4. Cross-country evidence:

To econometrically assess the relationship between aid and inequality capturing each specific impact of aid, we would have to evaluate each specific instrument through which aid has an effect on income distribution. As most of the existing evaluations do not focus on distributive effects of aid, this is difficult to do. We have instead decided to look at the aggregate effect of aid relying on a reduced-form specification. We start with a simplistic approach and run crosssection regressions where we take into account possible relevant factors associated with inequality. We estimate inequality following specification (1):

$$G_i = \alpha + X_i \gamma + \beta_1 (aid_i) + \varepsilon_i \tag{1}$$

where G_i is country's *i* Gini coefficient averaged for the period 1990-2008, X_i are control variables, and *aid* our key variable of interest, defined as ODA as a percentage of GDP for each country, or alternatively in per capita terms for robustness purposes. As discussed in section 3, aid is expected to reduce inequality, at least as it is by principle oriented to reduce poverty and inequality.

We depart from Chong et al. (2009) and our literature review to identify and select initial control variables.²¹ The main economic controls of Chong et al. (2009) were inflation, liquid liabilities, literacy rate, GDP per capita, and the value added in agriculture and in industry (these last two also as a percentage of GDP). However, given our focus on Latin America, and to take into account other determinants of inequality detected as relevant for the region in previous literature - such as Cornia (2011, 2012) and Robinson (2009, 2010), we expand our analysis considering further controls. In particular, we organize our explanatory variables around four vectors: i) domestic redistributive policies, ii) labour institutions, iii) trade openness and external flows - aside aid, and iv) political context.

For <u>domestic redistributive policies</u> we first consider pub_exp - government's overall final consumption expenditure, expressed as a percentage of GDP. The effect on inequality of government's overall final consumption expenditure will depend on the role of the government in the economy. We therefore further consider *soc_exp* - social public expenditure (also as a percentage of GDP), as a more direct means for redistribution of income. For labour institutions and education, aside from the already considered literacy rate, we consider *mw_shareformal* capturing minimum wages and the share of the formal sector - and *un* - the unemployment rate. Unemployment is expected to have a positive relation to inequality, especially if subsidies or insurances are not taken for granted due to informality, and minimum wages are expected to have a negative impact on inequality, because they increase the earnings of the lowest skilled workers and, therefore, the lowest deciles of income distribution.²² For external redistributive

²¹ We based our work on the Chong et al. (2009) analysis of the impact of aid on inequality, since it is the closest paper we could find in what refers to our empirical objective, and to have a benchmark for our results. However, while Chong et al. perform an analysis for a world sample, we focus specifically on Latin America. Our focus allows us to derive context-specific policy implications of major relevance for the region today. Additionally, our focus extends Chong et al. by using a longer time span, as well as considering other variables relevant for the analysis in Latin America.

²² However, minimum wages in the formal sector may increase inequality if higher minimum wages create a greater divide between formal and informal sectors, especially relevant in Latin American countries, where large informal sectors are prevalent. Additionally, higher minimum wages might favour top percentiles of the wage distribution when wages are indexed based on minimum wages. (Arango and Pachon, 2004, in fact find regressive effects of minimum wages in Latin American countries like Colombia.)

flows we first consider international terms of trade (*tot*). Terms of trade can represent a countercyclical policy and might have a negative impact on the Gini index. To reinforce our results for aid, we further consider net foreign direct investment (*fdi*) and workers' remittances receipts (*rem*) (both expressed as a percentage of GDP). FDI has been high, and increasing significantly, in many Latin American countries (Argentina, Brazil, Chile and Colombia, for example) and its effect on income inequality could be mixed. On the one hand, FDI might expand the profits and revenues of highest income quintiles, and, on the other , if international firms employ unskilled workers they may reduce inequality through higher formal employment. Remittances have been found to be a critical factor in reducing inequality because they increase the income of lower-income households (although not that of the lowest, because the poorest cannot migrate). Finally, for the overall political context, we consider *polity2*, as an index of the quality of democratic institutions.²³ Better democratic institutions are expected to lead to lower inequality. Appendix A details the variables used, their definitions and sources and Table 3 the correlation matrix.

[Insert Table 3. Correlation matrix]

Table 4 presents our cross-section results. In line with Chong et al. (2009), aid appears nonsignificant in the basic specification where we consider their same controls (column 1). However, not considering potentially relevant factors can bias our results for aid. In particular, looking at the correlations between our key variables and the aforementioned control variables, we find a positive and high correlation between *pub_exp* and inequality. As we control for public expenditure, the coefficient for aid becomes negative and significantly associated with inequality (column 2). The result holds when we consider other variables for our four vectors of explanatory variables:²⁴ In column 3 we drop the controls for liquid liabilities and the share of agriculture and industry (all non-significant in columns 1 and 2) and replace them with our controls for minimum wages in the formal sector, social expenditure and the political context (*polity2*) - this last variable yielding a negative and highly significant coefficient, as expected. In

²³ The polity score ranges from +10 (strongly democratic) to -10 (strongly autocratic). Democracy is conceived as three essential, interdependent elements: i) the presence of institutions and procedures through which citizens can express effective preferences about alternative policies and leaders; ii) the existence of institutionalized constraints on the exercise of power by the executive; iii) the guarantee of civil liberties to all citizens in their daily lives and in acts of political participation. Autocracy is defined as a distinctive set of political characteristics as: restriction or suppression of competitive political participation; chief executives chosen through a regularized process of selection within the political elite, and once in office they exercise power with few institutional constraints, etc.

²⁴ We report different combinations of up to seven control variables. Introducing more explanatory variables would dramatically reduce our degrees of freedom as we only have 18 observations for our cross-section (this does not affect our key result for aid however).

columns 4, 5 and 6 we introduce our controls for external redistributive flows, *tot*, *fdi* and *rem*. In all our estimates results do not change significantly when we consider Gini coefficients in 2008 as a dependent variable, rather than 1990-2008 averages, or aid in per capita terms, rather than as a percentage of GDP.

[Insert Table 4. Cross-section estimates]

4.4. Panel data:

As we only have 18 countries in our sample, the time dimension of our data can allow us to expand our number of observations. Moreover, we are interested not only in cross-country differences, but also in the evolution of inequality within countries. First we estimated a pooled OLS of equation (1). As in Chong et al. (2009), we used triennial data as inequality data moves slowly and to -partially- control for aid's volatility. As in our cross-section, our panel analysis starts with a basic specification to then consider further controls. Table 5 presents the results. The coefficient for aid is again negative but non-significant in the basic specification (column 1). As in our cross-section results, when we consider further relevant control variables for the evolution of inequality in Latin America, i.e. public expenditure, the coefficient for aid becomes significant (columns 2, 3 and 4).²⁵

[Insert Table 5. Pooled OLS estimates]

Our cross-section and panel results confirm a negative relationship between aid and inequality in Latin America when properly controlling for relevant variables explaining the evolution of inequality in the region. Our previous findings, however, only point to partial associations between our key variables and they can suffer from problems of simultaneity and reverse causation. As we have seen, poorer countries have higher levels of inequality in general and are, therefore, subject to higher external aid flows.²⁶ Panel data techniques can help resolve the causal effect of aid on inequality.²⁷ Additionally, as inequality data is highly persistent, a dynamic panel

²⁵ Given that we have significantly more observations than in the cross-section, in our pooled estimations we can introduce more control variables simultaneously. Main results for aid hold if we lag one period right-hand side variables, and use annual data or a 3-year moving average. As in the cross-section results, using aid per capita, instead of aid as a percentage of GDP does not change main results.

²⁶ If this were the case our coefficient for aid would be biased towards a positive sign. Hence, a negative coefficient in our OLS estimations would represent upper bounds of an unbiased result, which actually supports our hypothesis of a negative effect of aid on inequality.

²⁷ Random Effects (RE) estimations allow us to control for unobserved country-specific characteristics retaining cross-sectional differences. However, if the country-specific characteristics are correlated with the regressors - what is highly likely - RE is inconsistent and Fixed Effects (FE) estimations should be preferred. FE also controls for

specification to equation (1) seems more adequate for our purpose. GMM approaches (Arellano and Bover 1995), and in particular System-GMM estimates (Blundell and Bond 1998), appear as the most suitable estimation method for our specific panel data conditions: i) small number of temporal observations and ii) heteroscedasticity and autocorrelation (see Q test (1)) between observations from the same country (not between different countries). Moreover, the difficulties finding appropriate external instrumental variables to inequality reinforce the methodological choice of System-GMM estimates. Hence, in line with Chong et al. (2009) and Cornia (2012), we estimate a dynamic specification by System-GMM.²⁸

System-GMM estimates rely on two equations: one of first differences instrumented on lagged levels - as in traditional GMM estimators - and one of levels instrumented on lagged first differences, thus also retaining information in the equation in levels. For System-GMM to yield consistent estimates we need to ensure that lagged first differences of the endogenous variables are valid instruments for the untransformed equation in levels, which depends on the instrumented variables to be mean stationary after controlling for time trends. We also need to ensure conventional conditions used in traditional GMM estimates: that the lagged levels of the endogenous variables are valid instruments for the first-differenced equation, which depends on the absence of a serial correlation of the residuals. Both things together build in some insurance against weak specification, because if the series are persistent and lagged levels are weak instruments for first differences, it may still be the case that lagged first differences have some explanatory power for levels (Durlauf et al. 2005).²⁹

Table 6 presents results for our System-GMM estimates. Our basic specification now yields a negative and significant coefficient for aid (column 1). This result for aid holds to different specifications; for instance, when we control for public expenditure as before (column 2) as

time-invariant country-specific effects but does not solve reverse causality. Furthermore, FE only considers variations within countries. As our variables are highly persistent over time FE is expected to even worsen dynamic bias concerns (see for instance Ostry et al. 2014).

²⁸ Under these specific conditions, System-GMM estimates are expected to be more efficient than any other dynamic GMM estimators. Previous estimations have been carried out under a similar theoretical framework with static, autoregressive dynamic and simulated maximum likelihood techniques, finding an egalitarian effect of aid in lower-middle income Latin American countries (González and Larrú 2012). In this paper we apply the System-GMM approach to deal with endogeneity, using internal instruments, in order to improve the causal effects of the independent variables, and considering a wider set of ODA measures.

²⁹ Serial correlation tests, along with test for overidentifying restrictions, are standard to check the validity of instruments. For instruments to be valid, first-order serial correlation, but not second-order, is expected. We report ar1, ar2 and Hansen tests in the results tables.

when we control for each of the above-discussed additional controls.³⁰ In order to have more observations, in columns 3, 4 and 5 we use annual data.³¹ Inequality remains negative and significant and robust to different specifications. It also does when we control for redistributive policies (column 4), as well as when we control for different redistributive external flows (column 5).³² As expected, in all our System-GMM estimates the ar1 test rejects the null hypothesis of no autocorrelation, while the ar2 test fails to. Likewise, according to the Hansen test our set of instruments is valid.

Finally, most control variables have the expected sign. We confirm the high persistency of inequality in Latin America.³³ Regarding internal redistributive policies, government expenditure shows a positive coefficient while total social expenditure shows a negative one (although these coefficients are not always significant).³⁴ In line with the literature, the expansion and increased effectiveness of social expenditure, not the mere expansion of public expenditure, has most likely been a relevant determinant for income inequality reduction in Latin America in recent decades. Inflation shows a non-statistically significant coefficient (but highly significant in the pool estimates). Other foreign redistributive flows, aside aid, also seem to play a significant role; terms of trade and remittances show negative coefficients (always significant for remittances but with a lower coefficient than aid), while foreign direct investment shows a positive and significant effect.³⁵

[Insert Table 6. System-GMM estimates]

Our empirical results suggest, in line with the arguments described in section 3, aid had played a significant role in redistributing income in Latin America in recent years. After controlling for a wide variety of factors relevant for the evolution of inequality in Latin American countries, and also when addressing endogeneity concerns, international aid seems to have had a progressive

³⁰ The coefficients for aid are slightly larger than in our pooled estimations, confirming our intuition about the bias towards a positive sign (see footnote 24). Aid remains negative and significant if we control for minimum wages, unemployment rates, terms of trade, or political context (*polity2*). We cannot control for all of them simultaneously in our system-GMM estimations if we want to keep a reasonable fit between the number of instruments and the number of observations. Results are available upon demand.

³¹ For annual data we replace the literacy rate with the educational Gini variable due to data availability.

³² We find similar results when we measure aid as ODA in per capita terms, rather than as a percentage of GDP. Aid loses significance, however, if we exclude debt cancellation, suggesting a relevant role of this mechanism (as discussed in section 3). Results are available upon request.

³³ The coefficient for lagged Gini in our benchmark estimation (column 1) is 0.66, between Cornia (2012), 0.63, and Chong et al. (2009), 0.78.

³⁴ We also considered the ratio of indirect over direct taxes, finding non-significant results.

 $^{^{35}}$ Our coefficient for *fdi* in column 5 of table 6 (0.034) is in fact very close to the one obtained by Cornia (2012), 0.035.

effect on income distribution in the region. On average, an additional 1per cent of aid/GDP reduced the Gini coefficient by 0.2-0.4 percentage points.³⁶

5. Conclusions

Whereas the relationship between aid and growth has been thoroughly investigated, this is not the case for aid and inequality; although income distribution and poverty are the main stated goals of foreign aid, and economic growth is not. Latin America is the most unequal region in the world, but it has recently experienced remarkable reductions in poverty and inequality, especially since 2002-2003. Knowing whether aid has played an active role in this fact is important, mainly because the region has experienced a reduction in ODA flows and some donors are leaving it, based mainly on the fact that these countries are now becoming middleincome economies. In this line, our main interest in this paper has been to analyse - theoretically as well as empirically - the role that aid might have had on the recent evolution of income distribution in Latin American countries. Present and future decisions on the allocation, or withdrawal, of ODA flows should acknowledge possible income distribution effects of such decisions.

From the literature we have organised drivers of inequality around several vectors: domestic redistributive and productive policies; human capital and labour market institutions; the political context; and trade and external financial flows. In this line, we have studied the evolution of inequality in Latin America, based on panel data for 18 countries for 1990-2008 and using System-GMM estimates. We found that international aid has a significant effect on reducing income inequality once we have controlled for several variables that capture the vectors just described.

Some policy lessons could be derived from our findings. Firstly and most importantly, if ODA flows have had an egalitarian impact on Latin America, the cuts to the amounts of ODA or some donors leaving the continent should be revised if improving income distribution is still an explicit aim of the aid (and given that, despite significant improvements, Latin American countries continue to be highly unequal). Secondly, while aid might have conflicting effects on economic growth, as some authors suggest, it might still be a relevant tool to enhance much needed income redistribution in Latin America. In any case, aid should not replace domestic

 $^{^{36}}$ In the unique statistically significant specification for aid in Chong et al. (2009), the coefficient for aid/GDP was 0.634 (s.e. = 0.336) and for square aid was 0.022 (s.e. = 0.011). However, this result is not strictly comparable with ours due to differences in sample, aid and liquid liabilities indicators.

redistribution policies that have proven to be effective, but reinforce them. In this line, and as an interesting topic for further research, it remains to be studied how the effectiveness of ODA flows could be enhanced. One strategy may consist of aid given hand in hand with cash transfers, with donors allocating a substantial portion of their ODA in cash transfers funds. This would imply higher ownership, use of local procedures and systems, and higher alignment, and could increase mutual accountability. In contrast, donors could lose political influence, but Paris-Accra-Busan principles for aid effectiveness would be enhanced. Lastly, our results should never be an excuse for not continuing with the fiscal reforms that are much needed in Latin American countries.

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Tables:

Country	Obs.	Min.	Mean	Max.	Std. Dev.	Q(1) test
Argentina	19	44.432	48.358	53.264	2.572	13.958
Bolivia	18	49.400	56.359	61.703	3.181	12.06
Brazil	19	54.214	58.269	60.379	1.786	13.948
Chile	19	51.822	54.289	55.451	1.201	15.336
Colombia	19	51.320	55.657	58.900	2.100	12.224
Costa Rica	19	43.956	46.711	49.884	1.925	10.459
Dom. Rep.	19	47.208	49.895	51.998	1.363	6.358
Ecuador	14	50.157	55.360	58.822	2.399	7.469
El Salvador	19	46.102	50.547	53.446	2.128	10.403
Guatemala	17	53.227	56.056	58.221	1.420	6.793
Honduras	19	52.765	55.249	58.252	1.491	2.456
Mexico	19	49.760	52.604	54.717	1.680	17.057
Nicaragua	14	50.220	53.237	56.331	2.141	12.731
Panama	19	52.093	55.235	56.653	1.095	6.27
Paraguay	14	52.139	55.797	58.377	1.763	5.33
Peru	18	46.400	50.604	55.538	3.022	1.695
Uruguay	19	42.114	43.947	47.056	1.541	14.418
Venezuela	19	41.200	44.882	47.633	2.196	8.171
LATAM-18	323	41.200	52.251	61.703	4.643	

Table 1. Descriptive statistics for Gini coefficients

Table 2. Descriptive statistics for net ODA (as a percentage of GDP)

Country	Obs.	Min.	Mean	Max.	Std. Dev.
Argentina	19	0.019	0.065	0.149	0.036
Bolivia	19	3.775	8.731	12.229	2.599
Brazil	19	-0.067	0.028	0.047	0.025
Chile	19	-0.011	0.172	0.378	0.118
Colombia	19	0.093	0.353	0.906	0.200
Costa Rica	19	-0.110	0.542	3.174	0.926
Dom. Rep.	19	-0.015	0.504	1.504	0.329
Ecuador	19	0.434	1.049	2.321	0.561
El Salvador	19	0.445	2.714	7.234	2.108
Guatemala	19	0.919	1.501	2.687	0.425
Honduras	19	3.865	8.578	16.035	3.466
Mexico	19	-0.010	0.045	0.141	0.044
Nicaragua	19	11.938	24.650	72.060	14.743
Panama	19	-0.730	0.548	2.499	0.778
Paraguay	19	0.329	1.132	2.365	0.475
Peru	19	0.263	0.883	1.890	0.424
Uruguay	19	0.073	0.250	0.758	0.206
Venezuela	19	0.011	0.055	0.165	0.033
LATAM-18	342	-0.730	2.878	72.060	6.892

	gini	aid	inflation	m2	GDP p.c.	agr	ind	pub_exp	mw	un	tot
gini	1.000										
aid	0.149	1.000									
inflation	0.076	-0.057	1.000								
m2	0.348	0.053	-0.114	1.000							
GDP p.c.	-0.338	-0.777	0.005	-0.046	1.000						
agr.	0.227	0.688	-0.060	-0.044	-0.821	1.000					
ind.	-0.347	-0.089	0.148	-0.343	0.208	-0.280	1.000				
pub_exp	0.403	-0.047	0.052	0.322	0.052	-0.091	-0.150	1.000			
mw	-0.337	-0.297	-0.094	0.207	0.571	-0.406	0.212	0.083	1.000		
un	-0.130	-0.094	-0.094	0.007	0.077	-0.182	0.018	0.048	0.037	1.000	
tot	0.015	-0.061	-0.133	0.081	0.003	-0.018	-0.052	0.015	0.065	0.011	1.000
polity2	-0.183	0.016	-0.007	0.293	0.154	0.026	0.001	0.185	0.286	0.044	0.113
literacy	-0.332	-0.794	0.010	0.069	0.765	-0.731	0.174	0.138	0.343	0.110	0.073

Table 3. Correlation matrix

Note: Annual data for the 18 countries in the sample. 258 observations. 52 observations for literacy.

Dependent variable: gini						
	1	2	3	4	5	6
Variable	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.
aid	-0.1804	-0.4156**	-0.5509***	-0.5316***	-0.5717***	-0.5927***
	0.194	0.180	0.087	0.133	0.091	0.079
inflation rate	-0.0007	-0.0009**	-0.0003**	-0.0004*	-0.0003*	-0.0004**
	0.001	0.000	0.000	0.000	0.000	0.000
liquid liabilities	-0.1723	-0.1965				
-	0.136	0.133				
literacy rate	-0.0859	-0.1547	-0.1623*	-0.1881**	-0.1792**	-0.2574***
	0.132	0.095	0.077	0.070	0.072	0.062
GDP per capita	-6.459*	-7.4851*	-6.7534**	-6.5213**	-7.0129**	-7.6249***
	3.005	3.491	2.163	2.612	2.176	2.258
agriculture, v.a.	-0.1117	-0.0746				
	0.167	0.128				
industry, v.a.	-0.1124	-0.1262				
	0.121	0.078				
pub_exp		0.8334***	1.0429***	0.9810***	0.9780***	0.8450***
		0.162	0.135	0.107	0.089	0.150
mw_shareformal			-0.0469***	0.0516**	-0.0500**	-0.0572***
			0.012	0.017	0.017	0.017
polity2			-0.8515***	-0.9287***	-0.9022***	-0.8361***
			0.209	0.192	0.193	0.201
soc_exp			-0.1006			
-			0.085			
tot				-0.0378		
				0.089		
fdi					0.0070	
					0.053	
rem						-0.3366*
						0.180
Constant	124.924***	130.795***	121.891***	118.604***	125.628***	140.123***
Obs.	18	18	18	18	18	18
R-Square	0.395	0.692	0.886	0.883	0.881	0.905
Estimation by OLS						
Robust standard errors in	i cursive. ***p·	<0.01, **p<0.0)5, *p<0.1			

Table 4. Cross-section estimates

Table 5. Pool estimates Dependent variable: gini

	1	2	3	4
Variable	Coeff.	Coeff.	Coeff.	Coeff.
aid	-0.1272	-0.2558***	-0.1461**	-0.2461***
	0.099	0.089	0.057	0.074
inflation rate	0.0083***	0.0039***	0.0056***	0.0073***
	0.001	0.002	0.002	0.002
liquid liabilities	0.0559**	-0.0252	0.0507*	0.1009***
1	0.027	0.028	0.027	0.022
literacy rate	-0.0504	-0.1314**	-0.0164	-0.1096**
,	0.050	0.053	0.046	0.054
GDP per capita	-4.5693***	-4.3487***	-1.8572	-1.4684
1 1	1.535	1.484	1.417	1.556
agriculture, v.a.	-0.0491	-0.016	0.197	0.029
<i>o</i> ,	0.123	0.120	0.117	0.129
industry, v.a.	-0.1768***	-0.1587***	-0.1266**	-0.2730***
57	0.052	0.053	0.056	0.043
pub_exp		0.4811***	0.7357***	0.7338***
1 – 1		0.094	0.126	0.144
mw shareformal			-0.0052	0.008
_			0.018	0.017
un			-0.1466	0.0561
			0.070	0.072
polity2			-0.3705*	-0.3177*
1 5			0.205	0.182
soc exp			-0.3637***	-0.5125***
- 1			0.079	0.093
tot				-0.0034
				0.015
fdi				0.1172***
				0.018
rem				-0.3151***
				0.081
Time dummies	YES	YES	YES	YES
Constant	99.567***	100.227***	69.298***	77.393***
Obs.	108	108	108	108
R-Square	0.403	0 484	0.614	0.723

Dependent variable:	Dependent variable: gini									
-r	1	2	3	4	5					
Variable	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.					
L.gini	0.6614***	0.705***	0.523***	0.802***	0.549***					
	0.181	0.179	0.122	0.215	0.130					
aid	-0.1876***	-0.196***	-0.313***	-0.300*	-0.406***					
	0.061	0.057	0.104	0.171	0.130					
inflation rate	0.0017	0.0002	0.001*	0.0007	0.0007					
	0.002	0.002	0.001	0.001	0.001					
liquid liabilities	0.0128	0.0055	0.0260	-0.0050	0.044**					
	0.023	0.025	0.027	0.038	0.020					
literacy rate	-0.0138	-0.0386								
	0.052	0.048								
gini_edu			9.5122	-3.1683	12.701**					
			6.545	7.967	4.978					
GDP per capita	-2.8402**	-2.3134*	-4.4439***	-1.3734	-5.3450***					
	1.250	1.259	1.358	2.902	1.643					
agriculture, v.a.	-0.0812	-0.0626	-0.1405	0.0419	-0.1990*					
0	0.071	0.064	0.085	0.138	0.110					
industry, v.a.	-0.0687	-0.0518	-0.0709	0.0059	-0.0991*					
, , , , , , , , , , , , , , , , , , ,	0.042	0.040	0.043	0.063	0.057					
pub exp		0.1461		0.5004*						
rt		0.088		0.275						
SOC EXD				-0.4330						
oo o_o np				0.307						
tot				0.907	-0.0043					
101					0.0015					
fdi					0.0341***					
iui					0.0511					
rem					0.1644**					
ICIII					0.060					
					0.000					
Time dummies	YES	YES	NO	NO	NO					
Constant	45.640**	38.768*	63.262***	22.529	70.233***					
Obs	90	90	188	182	184					
ar1 p-value	0.091	0.079	0.026	0.023	0.026					
ar2 p-value	0.974	0.991	0.899	0.604	0.287					
Hansen I n-value	0.519	0.511	0.725	0.279	0.722					
Estimation by System	m GMM. Lag	s 2 and 3 as	instruments fo	or endogen	ous variables					
(gini, aid and soc_exp)	-0			0						

Table 6. Dynamic model estimates

Robust standard errors in cursive. ***p<0.01, **p<0.05, *p<0.1 Columns 3, 4 and 5 are estimated with annual, rather than triennial, data.

Figures:



Figure 1. Average Gini coefficients by country

Note: Lower middle-income countries in yellow and upper middle-income countries in blue. Source: Author's calculation based on the IDLA dataset.



Figure 2. Changes in Gini indices

Note: Blue bars are the net change between Gini in the first year with data and the last one. Pink bars are the difference between the maximum Gini for the period and the last observation. Source: Author's calculation based on the IDLA dataset (Martorano and Cornia 2011).





Source: Authors' elaboration based on the World Bank, World Development Indicators. OECD-DAC. G4 stands for Argentina, Brazil, Chile and Mexico.





Source: Authors' elaboration with data from the IDLA dataset (Martorano and Cornia 2011).

Appendix:

Variables considered

Variable	Description	Source
gini	Gini coefficient on income. Calculated on a mixture of net income and gross income concepts.	IDLA dataset. Martorano & Cornia (2011)
aid	Net ODA received (per cent of GDP).	World Development Indicators
aidpc	Net ODA per capita.	World Development Indicators
inflation rate	Inflation measured by the average consumer price index. Data for inflation are averages for the year, not end-of-period data (annual per cent change)	WEO
liquid liabilities	Money and quasi money (M2) as a per cent of GDP.	World Development Indicators
literacy rate	Literacy rate of population aged 15 years and over (in per cent).	Built from the IDLA dataset. Martorano & Cornia (2011)
GDP per capita	PPP converted GDP per capita (Chain Series), at 2005 constant prices.	Penn World Tables 7.1
agriculture, v.a.	Value added in agriculture as a per cent of GDP.	World Development Indicators
industry, v.a.	Value added in industry as a per cent of GDP.	World Development Indicators
pub_exp	Government's overall final consumption expenditure (per cent of GDP).	World Development Indicators
soc_exp	Social public expenditure as a per cent of GDP.	CEPALSTAT
mw_shareformal	Index of nominal minimum wages deflated by countries' CPI (2000=100). The indicator corresponds to the formal sector.	CEPALSTAT
un	Unemployment, total (per cent of total labour force).	World Development Indicators
tot	International terms of trade, fob (2000=100).	CEPALSTAT
fdi	Net foreign direct investment stocks measured as a percentage of GDP.	UNCTAD
rem	Worker's remittances receipts as a per cent of GDP.	USAID, UNCTAD, WDI
polity2	The polity2 score ranges from +10 (strongly democratic) to -10 (strongly autocratic).	Polity IV Project

Current USD Gross Disb.	Obs.	Min.	Mean	Max.	Std. Dev.	CV
Argentina	19	112.51	192.56	317.87	61.40	0.32
Bolivia	19	578.25	949.89	2.507.47	481.20	0.51
Brazil	19	258.93	421.14	626.09	77.41	0.18
Chile	19	82.32	154.49	348.98	64.77	0.42
Colombia	19	161.00	474.48	1.063.99	295.08	0.62
Costa Rica	19	55.65	111.35	246.56	51.74	0.40
Dominican Rep.	19	85.50	165.17	254.27	49.74	0.30
Ecuador	19	185.29	264.23	350.05	42.61	0.10
El Salvador	19	213.38	325.21	1.035.30	179.89	0.55
Guatemala	19	202.84	314.49	589.54	117.13	0.37
Honduras	19	320.10	691.40	1.882.31	457.31	0.60
Mexico	19	136.71	284.17	518.97	114.03	0.40
Nicaragua	19	329.56	890.90	2.041.41	481.97	0.54
Panama	19	43.31	73.30	220.37	42.26	0.58
Paraguay	19	95.35	136.77	201.22	33.71	0.25
Peru	19	403.44	591.45	787.38	111.39	0.19
Uruguay	19	25.39	51.43	150.52	28.74	0.50
Venezuela	19	32.86	56.84	89.41	16.95	0.30
LATAM18	342	25.39	341.63	2507.47	343.92	1.0
	1				1	

Table A.1. Descriptive statistics for aid (gross disbursements in current USD)

					Std.	
nODApc	Obs.	Min.	Mean	Max.	Dev.	cv
Argentina	19	1.419	3.748	8.304	1.967	0.525
Bolivia	19	50.055	81.201	108.171	15.069	0.186
Brazil	19	-1.669	1.168	2.398	0.804	0.688
Chile	19	-0.465	7.198	13.352	3.513	0.488
Colombia	19	2.077	9.238	23.001	6.722	0.728
Costa Rica	19	-3.597	14.852	55.155	21.345	1.437
Dominican Rep.	19	-0.238	10.637	21.823	4.828	0.454
Ecuador	19	11.865	16.618	22.588	3.570	0.215
El Salvador	19	14.422	43.235	73.492	15.840	0.360
Guatemala	19	17.514	24.024	39.166	6.098	0.254
Honduras	19	50.678	75.873	133.658	21.319	0.281
Mexico	19	-0.590	2.007	4.782	1.551	0.773
Nicaragua	19	70.729	138.723	230.253	41.706	0.301
Panama	19	-40.382	14.148	62.116	20.353	1.439
Paraguay	19	3.874	16.947	33.344	7.750	0.457
Peru	19	9.116	17.292	27.479	3.874	0.224
Uruguay	19	4.147	12.092	35.298	8.191	0.677
Venezuela	19	0.389	2.049	3.159	0.780	0.381
LATAM18	342	-40.382	27.281	230.253	38.039	1.394

Table A2. Descriptive statistics for net AID per capita.