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Aid effectiveness: Human rights as a conditionality measure

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ABSTRACT

The 'aid conditionality' hypothesis as documented in the literature suggests that aid is effective in augmenting growth only in the presence of a sound policy environment. This hypothesis was so influential that its policy recommendation, to provide aid conditional upon recipient domestic policies, is currently the dominant ODA allocation criterion. However non-economic dimensions of development (political and institutional) are increasingly seen as fundamental. For this reason, this paper focuses on the linkage between aid and a non-economic factor like Human Rights (reflecting repression and corruption) as a measure of aid effectiveness, in explaining growth outcomes across 42 Least Developed economies. We find that countries with better protection of human rights experience positive growth from aid receipts, signifying the role of stronger institutions in enabling more effective use of aid. The paper thus concludes that the measurement and monitoring of human rights provision is a useful tool in gauging the likely effectiveness of foreign aid.

1. Introduction

Foreign aid to developing countries is an important part of OECD budgets, with a total of USD 153.5 billion in 2018 and a slightly lower total of USD 152 billion allocated in 2019, even though overall trends since the late 1990s have increased significantly from roughly USD 60 billion to over USD 150 billion currently. Aid as a share of gross national income (GNI) has risen from approximately 0.23 percent in 1996 to near 0.30 percent in 2019.[1] Six countries (Germany, Denmark, Luxembourg, Norway, Sweden and the UK) met the UN target of spending 0.7 percent of GNI, although a further 22 countries did not. In November 2020, for the first time since 2013, the UK reduced its aid budget to 0.5 percent of GNI.[2] When combined with economic contraction owing to the COVID-19 pandemic, this commitment to foreign aid from the UK government is a real terms decline of 50 percent.[3] The decline in the share of aid going to the poorest countries reflects, perhaps, a climate of skepticism in parts of the Western media over the effectiveness of aid: even publications such as *The Economist*, which made many supportive comments about aid,[4] have been emphasizing that while aid 'set South Korea and Taiwan on the road to riches, helped eliminate smallpox in the 1970s and has almost eliminated polio', it was likely to be 'snaffled by crooks' (*The Economist* cites Malawi as a prime example) and prop up dictators.[5] Indeed, research has yet to produce a consensus regarding whether or not aid provides any favorable effects at all. The view closest to the status of general consensus is currently the 'conditionality hypothesis', as first introduced by Dollar and Pritchett (1998) and Burnside and Dollar (2000); in general, where the policy environment meets certain conditions, aid has generally been seen as effective in producing economic growth.

In this context, we should start by noting that aid is not necessarily motivated in terms of boosting economic growth, but for rea-

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[1] https://www.oecd.org/dac/financing-sustainable-development/development-finance-data/ODA-2019-detailed-summary.pdf.

[2] https://commonslibrary.parliament.uk/spending-review-reducing-the-aid-commitment/.

[3] https://www.theguardian.com/politics/2021/mar/05/uk-foreign-office-discussing-aid-cuts-more-than-50-leak-reveals.

[4] The Economist, April 7, 2011; Retrieved on August 12, 2011, from The Economist.com: http://www.economist.com/node/18530173.

[5] The Economist, 11 June 2016.

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0305-750X/

sons of tractability and consistency with the literature, we focus primarily on the aid-growth conditionality issue from here onwards. To the extent that donors come to accept aid conditionality, the issue of choice of decision/assessment variables is central. The original (Burnside & Dollar, 2000) article used a policy variable composed of three policy dimensions: the government's budget surplus for fiscal policy, the inflation rate for monetary policy and the Sachs Warner index for openness or trade policy. Needless to say, the choice of policy variables may have a profound impact on the conclusions and, thereby a major impact on the world's poor. Our research in this paper accepts (with some reservations[6]) that the original conditionality variables are positively related to growth (Arndt, Jones, & Tarp, 2015). There is also evidence that the aid-growth nexus is supported in middle income countries, whereas the misallocation of official inflows, namely foreign aid, is more likely to exist in the low income countries, suggesting that aid effectiveness remains conditional on the domestic policy environment (Mallick & Moore, 2008).

However, drawing on research in political science, development studies, and human rights, we argue that there is a strong case for the use of more political and economic indicators as well (Szirmai, 2012). In political science, the focus has been on the degree to which foreign aid affects the protection of human rights (Barrat, 2004; Meyer, 1998; Meyer, 1999; Poe, 1990; Poe, 1992; Poe & Tate, 1994), or how the human rights performance of a country affects the allocation of aid (Landman, 2005). In development studies, the human rights-based approach to development focuses on how the principles, values, and rights derived from international human rights law shape the overall landscape of development (Broberg & Otto-Sano, 2018). We are interested in whether the variation of human rights protection affects the effectiveness of aid on economic growth. Human rights protection is a general reflection of the institutional context in which aid is used and is thus a mediating variable in the overall relationship between aid and economic growth. In particular, we argue that corruption and repression are intrinsically connected, and that the development of a range of institutional quality indices is potentially an important contributor towards developing better conditionality and targeting of aid. In this paper, we make extensive and novel use of international comparative indices of human rights (HR) provision, which are now available for almost all countries since 1980. As aid strengthens the bargaining power of oligarchs (i.e., more corruption), it could undermine the effectiveness of aid on growth, which is supported by our scatter plot that better HR provision is, indeed, closely linked to less corruption, but the data for the latter (from Transparency International) is still more partial in its coverage – and hence there is a strong case for focusing at present on the former.

To assess whether HR is, indeed, a good variable for assessing potential aid effectiveness, we follow Burnside and Dollar (2000), whose main analytical premise was to establish whether aid influenced per capita GDP growth.[7] In particular, we make use of an updated version of the Landman and Larizza HR index (Landman & Larizza, 2009). Adding the relevant literature and data analysis on the role of politico-economic variables, in particular HR provision indicators (reflecting corruption perception), our empirical analysis of the conditionality hypothesis shows that, although there may be exceptions, there is a positive influence of both human rights and of the policy environment on the impact of aid upon GDP per capita. We further show that the aid-human rights interaction term is still positive and highly significant, even after having considered the role of macroeconomic policy variables which can have differential impact on development (see, for example, Askarov & Doucouliagos (2015)).

We develop a theoretical model of corruption and repression, showing that unconditional aid can weaken the bargaining position of workers vis-a-vis the ruling oligarchy, undermining the contribution of aid to growth. The model should be seen as schematic only, but provides support to the empirical work. Based on the empirical analysis, a modified 'new conditionality' (Mosley, Hudson, & Verschoor, 2004) is proposed which suggests that aid efficiency can be improved not only by targeting recipient countries with a sound policy environment but also by targeting purpose-specific schemes – specifically those related to the establishment of a sound policy environment and the promotion of human rights. Although aid has a positive effect, the negative effect of corruption as reflected in poor human rights record weakens the effectiveness of aid. In other words, when corruption is high (weak human rights), oligarchs steal more aid funds, leaving less aid money available for productive government-led infrastructural investment. The direct effect of human rights being insignificant or negative suggests that the least developed countries in our sample with relatively better human rights do not always have higher per capita GDP growth on average. But we find a significant and stable positive coefficient for the interaction effect of HR provision and net ODA receipts, indicating that the impact of ODA receipts upon economic growth is consistently positive in countries where HR performance is better, even after considering several robustness checks including a matched sample, a broader group of low- and middle-income countries, and distributional outcome variables.

The structure of the rest of the paper is as follows. Section 2 provides a more extensive review of the literature, starting with Dollar and Pritchett (1998) and Burnside and Dollar (2000), while subSections 2.2 and 2.3 establish some key stylized facts, relating aid effectiveness, human rights and corruption. In Section 3, we develop an illustrative theoretical model, which is consistent with the stylized facts in the literature and Section 2, as well as the empirical findings of the later sections. Section 4 introduces our database: a multi-country panel of the UN-defined Least Developed Countries (LDCs) over the period from 1990 to 2012. Critically, in Section 5, we carry out our main econometric analysis. In Section 6 we specifically introduce policy variables following Burnside and Dollar (2000). We further address the issue of endogeneity by undertaking propensity score matching approach as an additional robustness check. Section 7 concludes the paper.

2. Background and literature

2.1. The importance of aid conditionality

The aid effectiveness literature is grounded in models of growth and development. Such models are typically of two types. First, there are conditional convergence models (Mankiw, Romer, & Weil, 1992), in which per capita GDP converges on relative levels. A potential criticism (Carlin & Soskice, 2005) of this model often implies that poorer countries should have higher growth rates. As an alternative, in the endogenous growth literature (Romer, 1986), countries converge on different relative growth rates. Burnside and Dollar (2000) base their analysis upon the Barro

[6] For example, the binary nature of the Sachs Warner index for openness is an inadequate simplification of the far more intricate trade system. Consequently this paper proposes the implementation of a more standard measure of trade openness: exports plus imports as a share of GDP.

[7] This is, of course, a relatively limited concept of development; nevertheless it is the most widely used indicator of development. Sen (2001), for example, proposed the 'Development As Freedom' hypothesis which suggests that various freedoms, such as civil liberties, are not only constituent parts of the concept of development, and as such possess intrinsic value, but they form central forces in the promotion of effective development. An advancement in education for example, is a non-income factor that has been shown to have considerable mid-to-long term effects on economic growth (Becker, Murphy, & Tamura, 1994; Barro, 2001).

(1990) model which is a modified version of the latter endogenous growth model that allows for the presence of government activity – i.e. $y = AK^{\alpha}G^{1-\alpha}$, where G is government expenditure. Barro (1990) model allows aid to subsidize government expenditure and to alter the budget constraint accordingly, and thus improve consumption and utility.[8]

Burnside and Dollar (2000) (henceforth 'BD2000') argue that the convergence result has been difficult to identify due to the persistence of subsistence consumption and subsequent low average propensity to save. This low propensity to save is the theoretical foundation for the role of aid, justified through the Barro (1990) government consumption mechanism. The presence of policy and institutional distortions in such a growth model would naturally reduce the productivity of capital, which in turn diminishes growth and hampers aid's effect on growth. Consequently, BD2000 base their growth model on this theory of economic growth whilst the main innovation consisted of the introduction of an aid-policy interaction term $(a_{it}p'_{it})$ to account for the above mentioned distortions. For their empirical analysis, BD2000 used a panel of 56 countries and six time periods of each four year averages from 1970–1973 until 1990–1993. Their specified model contained two equations in order to analyze both the effect of aid on growth and to model the allocation of aid. This was an attempt to account for the endogeneity of aid, the allocation of which was thought to be highly correlated with growth itself.

The primary finding of the BD2000 paper was that the coefficient on the aid-policy interaction term was positive and statistically significant across a number of alternative specifications whereas the coefficient of aid was not. This led to the policy recommendation that the efficiency of aid would be enhanced, if donor resources were allocated to countries with a sound policy environment: i.e. the conditionality hypothesis. The BD2000 paper was criticized, e.g. by Dalgaard and Hansen (2001), Dehn and Collier (2001) and Easterly, Levine, and Roodman (2004), who all suggested that the conditionality conclusion was highly sensitive to sample choice. Easterly et al. (2004) tested the robustness by expanding the BD2000 dataset from 275 observations across 56 countries to 356 observations in 62 countries.[9] Note that, in this paper, we take an alternative approach of focusing on LDCs only, as specifically defined by the UN.[10]

Dehn and Collier (2001) introduced export price variables and found that they were highly significant suggesting that the BD2000 model specification suffered from omitted variables bias, putting into question the reliability of their results. However, unlike Easterly et al. (2004), Dehn and Collier (2001) found that aid was still significant but that its effectiveness could be increased more by targeting countries suffering from shocks than by targeting those with sound policy environments. Additionally Dehn and Collier (2001) proposed that accounting for shocks made the BD regression robust to sample selection. Although BD2000 implemented a 2SLS estimation technique to account for possible endogeneity of aid, they assumed that aid was unable to affect policy. Mosley et al. (2004) found this assumption questionable and produced a model that analyzed the effect of aid on both poverty reduction and on the policy environment of the aid recipient, finding that policy areas such as corruption, inequality and the composition of public expenditure in particular have a high influence on pro-poor growth. In addition, Mosley et al. (2004) proposed a 'new conditionality', under which donors have improved flexibility in the punishment and rewarding of recipient country policy achievements (Mosley et al., 2004). This recommendation entails the targeting and development of government expenditure in particular, since supervision would arguably be relatively easy.

Hansen and Tarp (2001), criticized the BD2000 methodology for not correctly dealing with country specific fixed effects. Hansen and Tarp (2001) argued that the inclusion of initial real GDP per capita in the BD2000 regression causes significant correlation between the regressor and the error term; naturally this leads to inconsistent estimators. Consequently Hansen and Tarp (2001) differenced the data, implementing the within-difference fixed effects model, removing country specific effects, which allowed for consistent estimation through the generalized method of moments (GMM) estimator. Through this methodology they found that aid had a significant positive impact regardless of policy environment; however the fact that decreasing returns exist, support the necessity to adjust for possible non-linearities in the aid-growth relationship. Combes, Ouedraogo, and and Tapsoba (2016) show how aid inflows may cause structural shifts (shocks) in developing countries due to aid dependency. These aid shocks (Crivelli & Gupta, 2016) emphasize that aid conditionality can have implications in countries with strong governance and high aid dependency.

2.2. Aid effectiveness in practice

We start by plotting, in Fig. 1, below, the simple bivariate correlations for our sample of LDCs between (a) the growth rate of GDP per capita and Official Development Assistance (ODA) received in per capita terms, (b) ODA and HR provision (higher is better) and (c) growth in GDP per capita and HR provision.

These scatter plots are a preliminary indication of the results that can be expected from the regression analysis and informally suggest that there exists a clear relationship between ODA per capita and per capita GDP growth, as well as between these variables and the provision of HR. Broadly, there are three schools of thought on the role of aid: first, those suggesting aid is ineffective (Mosley, 1987; Boone, 1996; Easterly et al., 2004; Rajan & Subramanian, 2008; Doucouliagos & Paldam, 2009; Doucouliagos & Paldam, 2010), second, those that support a strong causal relationship between aid and growth (Hansen & Tarp, 2000; Hansen & Tarp, 2001 or Dalgaard, Hansen, & Tarp, 2004) and, third, those that promote a conditioned causal relationship of various shapes and forms (Dollar & Pritchett, 1998; Burnside & Dollar, 2000, and to a certain extent Dehn & Collier, 2001). Despite their disagreements and methodological differences, all the above mentioned studies and model specifications share a ubiquitous assumption that the purpose of aid is to promote economic growth.

2.3. Human rights as a facilitator of development: its relationship to corruption

While many studies have viewed improved human rights as a potential benefit of development (Poe & Tate, 1994; Acemoglu, Johnson, & Robinson, 2001; Landman, 2005; Landman, 2005; Fariss, 2018; Fariss, 2019), our study lies more strongly in the tradition of Sen (2001), who argues that development is a process of eradication of numerous 'unfreedoms', such as *inter alia*, tyranny, social deprivation, oppression and poor socio-economic opportunities.[11] Sen (2001) argues that beyond their intrinsic humanitarian

[8] The BD model is non-convergent in GDP levels because the power terms on the two production factors, K and G, sum to unity. For a lower sum of parameters, there will be eventual convergence in relative levels, even if the effects of a positive shock are magnified relative to the simple Solow model.

[9] A response to Easterly et al. (2004) by Burnside and Dollar (2004) argued that Easterly et al. (2004)'s results reflected the country specific characteristics and trends of eight added countries in the observed time periods.

[10] However, in SubSection 6.5 we examine an extension to middle income countries as a robustness check.

[11] Our approach is also in line with Collier (2008)'s view on 'traps' which impeded development.

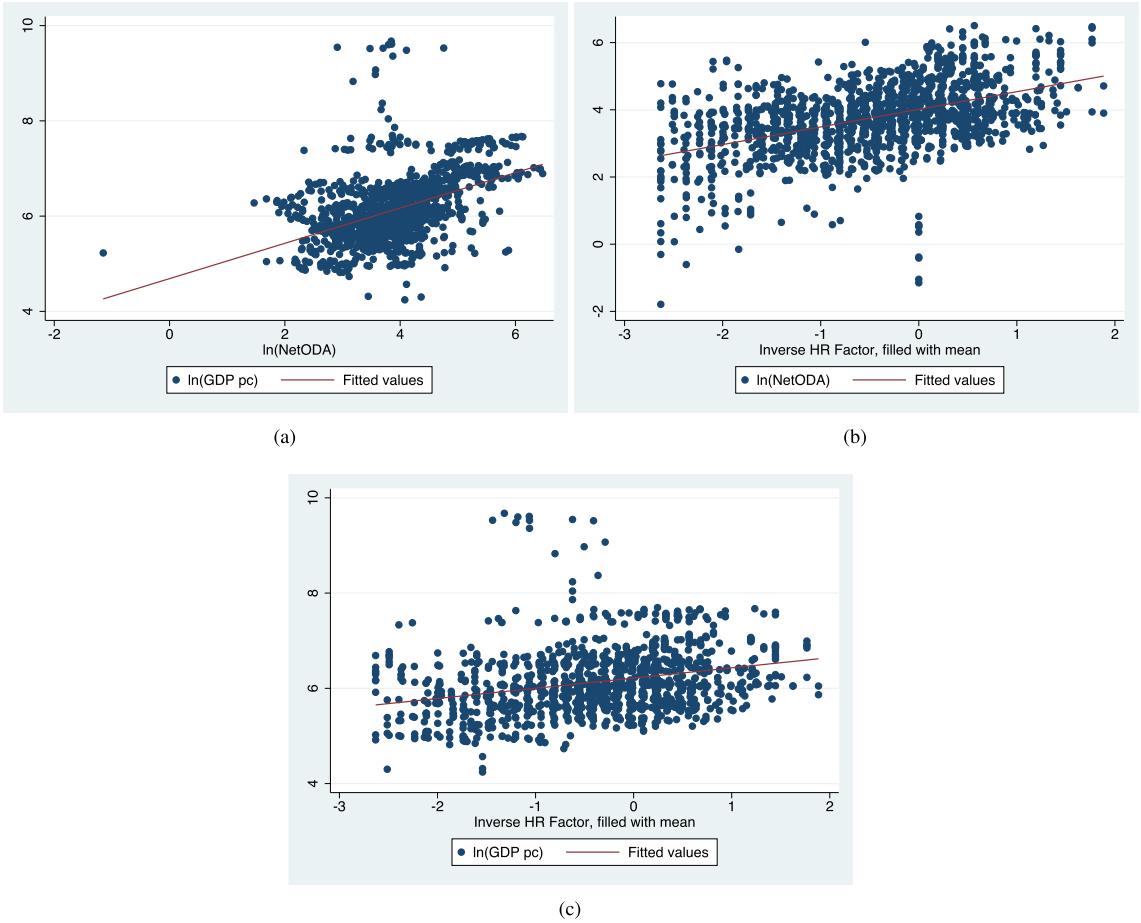
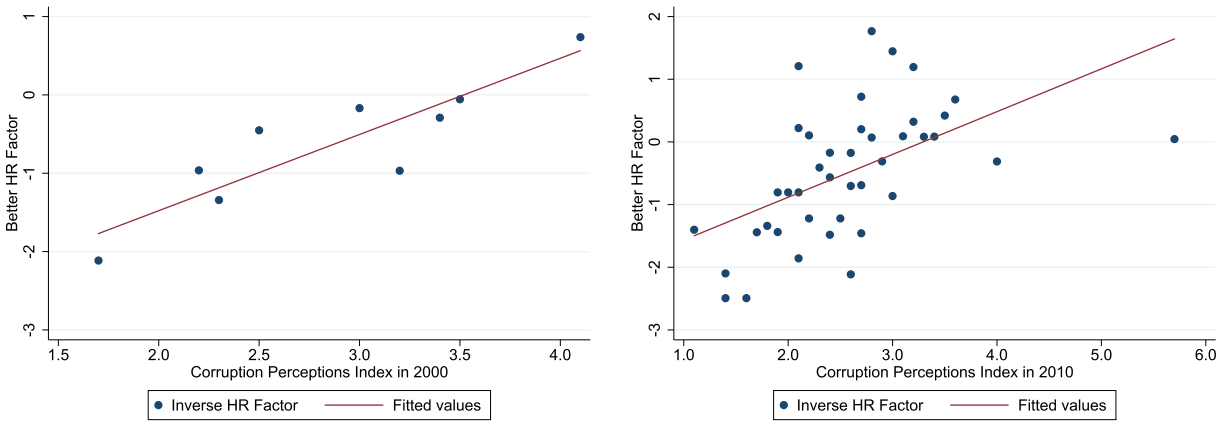


Fig. 1. Simple correlation between GDP per capita and official development assistance (ODA), and the relation of these to the human rights factor (higher value meaning better HR) among LDCs.

value, the provision of personal integrity rights and civil liberties themselves constitute individual and political incentives for economic security; Or rather that a violent and oppressive regime is unlikely to foster an innovative and competitive economic environment. Against this view, there is a critique that human rights constitute an imposition of 'Western values' (Cerna, 1994; Hopgood, 2013; Sikkink, 2017; Brysk, 2018; Ron, Shannon, Crow, & and Pandya, 1998), although other authors (Sen, 2001; Sikkink, 2017; Brysk, 2018; Ron et al., 1998) tend to dismiss this argument. One strong argument for the potential role of personal integrity and other human rights measures in fostering development is simply to observe the relationship with a known impediment to development: namely corruption. Fig. 2 plots our human rights indicator against Transparency International's corruption perception index for two years.

The correlation in Fig. 2 (a) is based on the very small number of LDCs for which corruption perception data are available in 2000. It can be seen that there is a clear positive correlation with our (inverse) HR factor: in other words, countries with less corruption tend to have better HR provision. Fig. 2 (b) reports a similar simple correlation for 2010 for which more data are available and for which we see a positive but not perfect correlation. Using a pooled cross-section time-series data set with 186 countries between 1980 and 2004, Landman and Schudel (2007) show that more corrupt countries have worse records at protecting human rights, even after controlling for other explanatory variables, such as the level of democracy, national income, population size, government consumption, and regional controls. It is thus fair to say that some LDCs tend to have a 'corrupt and repress' model, while others tend to be better on both counts. While both forms of data rely on perceptions and judgments about the level of corruption and human rights situation in any given country-year, the data for human rights are more complete and based on published source drawn from the annual reports of Amnesty International and the US State Department. The greater coverage and reliability of the human rights data lead us to focus on human rights as our main indicator for analyzing how domestic governance interacts with foreign aid. In the absence of continuous data on corruption, we use human rights data to reflect the institutional mechanisms in the sense that better human rights correspond to lower level of corruption, in making more effective use of aid.

Besides, human rights capture a more comprehensive indicator of human development namely educational, health care, social, political and personal freedoms, rather than focusing merely on income dimensions necessary for development. For example regarding human rights, or basic freedoms, Sen (2001) argues that beyond their intrinsic humanitarian value, the provision of personal integrity rights and civil liberties themselves constitute individual and political incentives for economic security. Or rather that a violent and oppressive regime in conflict-prone countries is unlikely to foster an innovative and competitive economic environment. This proposition is tested through the inclusion of our human rights index in the empirical analysis. The inclusion of this non-income dimension of development is motivated in the following theoretical model by showing problematic human rights performance as an outcome of corruption and thereby such a non-



(a) (b)

Fig. 2. Correlation between corruption perception index and human rights factor. (These figures represent a simple correlation between Corruption Perception Index (CPI) and human right factor. Note that higher value of HR factor means better human rights, while higher value of CPI means lower level of corruption.)

income outcome is integrated with the aid effectiveness literature in this paper.

3. A theoretical model to illustrate the growth effect of the linkage between aid and human rights

We model the effects of aid, in the context of a political economy model of economic growth that promotes corruption to suppress human rights. As such, we need to choose whether to use a convergent growth model (following Solow (1956) and Mankiw et al. (1992)) or an endogenous growth framework (Romer, 1986). In reality, however, the choice is not so stark; unlike the original Solow model, it is quite possible to incorporate increasing returns to scale in a convergent growth model, where they are not increasing so fast as to prevent eventual convergence. At the same time, convergence may actually be quite slow, so that a change in conditions can produce higher or lower growth for many years. In this context, we note that, in subSection 5.1 below, we find evidence for slow conditional convergence, and hence we follow this route in our modelling.

In this section, we set out such a conditional, but extended convergence model. The model is primarily illustrative, and is simplified in order to obtain tractable closed form solutions. Nevertheless, the main principles carry across to a range of models. The key feature is that, while private sector decisions (labor and capital investment) lead the economy to converge on a steady-state exogenous growth path, as in Solow (1956), provision of a public good (in Romer (1986)'s case, education) can lead to further growth. This has to be funded, of course, usually through taxation on capital and labor income, but if the balance of public good provision and taxation is sensible, investment in the public good will lead, over time, to a rise in private sector investment, in turn producing more tax revenues that can be reinvested in a virtuous circle. In the extreme case, as discussed by Romer (1986), the virtuous circle is unending, and classed as 'endogenous growth' since there is no convergence in levels: in a more plausible case there is eventually convergence on a new equilibrium, but with multiplier effects from the feedback process. Our analysis in subsequent sections supports conditionally convergent growth, with a long-run multiplier effect. For this reason, unlike BD2000 and others, we choose a model with convergent properties.

Critically, however, our modeling follows BD2000 in assuming that LDCs have a poverty trap, inhibiting (in this case public) investment, and hence providing a primary motivation for aid provision. Within this framework, we consider human rights to be one of a number of underlying institutional factors which determine the responses of growth to a boost in public goods provision. The model setup with a poverty trap is consistent with our focus on LDCs in Section 5, below, and indeed with our finding in Section 6.3 that the effects of human rights on aid effectiveness are indeed stronger in LDCs.

In particular, we start from Acemoglu et al. (2001)'s view that bad institutions, which have usually been inherited from centuries of history, are the primary cause of low economic growth. Repression (in the form of lack of human rights, political freedoms and the rule of law) can be seen in this light as shifting the bargaining balance between the main populace of a country (stereotyped in our model as 'workers') and an exploitative elite ('oligarchs'), by weakening the bargaining power of the former, leading to bad institutions. The latter not only leads to poor distribution of existing resources, but also to poor distribution at the margin, so that a country where the elite exploit existing tax and other resources and divert them for their own purposes is likely to see foreign aid resources exploited in a similar way.

To show this, we concentrate on an economy employing three factors: labor, L, private capital, K, which is assumed to be internationally mobile, with a return set to r, and a depreciation rate of δ, and a public good, G, in order to produce output. The model of the economy is to be seen as primarily illustrative. The labor force is assumed to be constant in size, in order to simplify the model (this can be altered without a great deal of difficulty). Likewise, we assume that the level of technology is constant: again, this can easily be replaced by a constant exogenous growth rate, but it would simply complicate the main results. Growth, in response to a shock (such as an increase in international aid) is therefore a medium-term phenomenon, as the economy moves from one steady-state level towards another.

Note that we are seeking a model which is consistent with a number of stylised facts. The relationship between human rights and corruption has already been noted in Section 2.3. This can be termed a 'corrupt and repress' model. We also expect higher levels of corruption to be associated with poorer GDP outcomes. Linked to this, worse human rights performance tends to be associated with greater inequality (Landman & Larizza, 2009). As regards the effectiveness of aid, the analysis in Section 5 below confirms that worse human rights lead not just to a lower absolute increase in GDP in response to aid, but also a lower proportionate increase. Our discussion below suggests that, while this effect does not occur

in the simplest model, there are possible mechanisms which might do this: for example, the introduction of a subsistence floor provides a constraint on the ability of oligarchs to increase their extraction of income from the poor. Interestingly, this hypothesised mechanism is consistent with our finding in Section 6.3, as well as by studies on poverty traps among poorer countries (Collier, 2008).

We choose parameters again in order to make the model tractable and illustrative. Hence, we assume output as:

$$Y_t = BL_t^{\frac{1}{2}}K_t^{\frac{1}{2}}G_t^{a}e^{gt}. \tag{1}$$

We set productivity parameter $B = 1$ without loss of generality, and also set $L = 1$.

Note that, in our model, the Cobb-Douglas share parameters for labor and capital sum to unity, so that the total national product is exhausted, with labor and capital each receiving $\frac{1}{2}$ of GDP, before tax. The public good is funded from a tax at rate T on profits. Looking at the parameters on the two reproduced factors, K and G, they sum to $a + \frac{1}{2}$: as long as $a < \frac{1}{2}$, this is not large enough to yield endogenous growth, but rather convergent growth with a multiplier relative to the exogenous rate of technical progress, g, of $\frac{3}{1-2a}$ (so, for example, the multiplier on growth, with $a = 0.1$, would be 3.75). When $a = \frac{1}{2}$, we have a variant of the Barro (1990) endogenous growth model, which is essentially similar to the model in Carter and Temple (2017) where neoclassical growth is amplified, except that the driver of amplified growth in our model is through taxation and investment in the public good, G.

Since the model is purely illustrative, we want to make it as simple as possible, and we choose to set $g = 0$. Hence our starting model is:

$$Y_t = K_t^{\frac{1}{2}}G_t^{a}. \tag{2}$$

Capital earnings are $(1-T)\frac{Y}{2}$, and in the steady-state equilibrium, this will equal $(r+\delta)K$. Hence, in steady state $K = (1-T)\frac{Y}{2(r+\delta)}$, and rearranging the equation, we relate Y to T and G,

$$Y = (1-T)\frac{G^{2a}}{2(r+\delta)}. \tag{3}$$

The public good is assumed to be provided by a government which is dominated by oligarchs. They receive a revenue of $T\frac{Y}{2}$. In addition, we incorporate a flat rate provision DY of foreign aid relative to GDP, which is directly invested in public goods provision.

However, the oligarchs choose to consume proportion γ of their income, while only reinvesting share $(1-\gamma)$.[12] It follows that investment in the public good will be $((1-\gamma)\frac{T}{2} + D)Y$, and in a steady-state, this will just cover depreciation and interest on the public good stock, so that, after manipulation,

$$G^{2a} = 4^{\frac{2a}{2a-1}}\left((1-\gamma)(T+2D)\frac{1-T}{(r+\delta)^2}\right)^{\frac{2a}{1-2a}}. \tag{4}$$

Substituting back into 3, we obtain the steady-state solution for income,

$$Y = 2^{\frac{2a+1}{2}1-1}(r+\delta)\left(\frac{(1-T)}{(r+\delta)^2}\right)^{\frac{1}{1-2a}}((1-\gamma)(T+2D))^{\frac{2a}{1-2a}}. \tag{5}$$

Workers' consumption, v, is half of GDP, or $\frac{Y}{2}$, while oligarchs' consumption, c, is proportion γ of tax revenue plus aid, in other words $\gamma(T+2D)\frac{Y}{2}$ or $\gamma(T+2D)v$.

Before analyzing the underlying political economy and the role of human rights, it is worth considering the effects of the 'taxation' rate, T (which may include bribes and other forms of appropriation of rent) and the oligarchs' rate of consumption out of rent, γ. The effects on workers' consumption, v, and oligarchs' consumption, c, are shown in Fig. 3, below, for the numerical case where $a = 0.25$, r = $\delta = 0.05$ and there is no aid, so $\theta = D = 0$, Note that these numbers have been chosen for tractability: it is the qualitative result that we wish to emphasize.

While there is a conflict of interests between workers and oligarchs, this is over a limited range of parameters. Workers are happy to pay some taxes, to fund the public good. Likewise, oligarchs are happy to invest up to a point in a public good, which raises the long-term taxpaying potential of the economy, as long as they are consuming some of that tax revenue. The disagreement is therefore between the two blisspoints v^*, with $\gamma = 0$ and $T = 0.333$, which maximize consumer incomes, and c^*, with $T = 0.5$ and $\gamma = 0.5$, which maximize oligarchs' consumption. Nevertheless, given the presence of a growth multiplier in the economy, the difference in workers' incomes between the two points is considerable.[13] The effect of the public good parameter on GDP, a, makes a significant difference in this: the lower a is, the more divergent are the interests of workers and oligarchs, while as a tends towards $\frac{1}{2}$ and the model tends to endogenous growth, the interests become more convergent.

To consider the optimization decision, we differentiate v and c with respect to T and γ, setting them equal to zero. We start considering the optimization of v, which is most easily done by noting that optimization can also be carried out in logs.

$$\frac{\partial ln\, v}{\partial T} = -\frac{1}{1-2a}(1-T)^{-1} + \frac{2a}{1-2a}(T+2D)^{-1}. \tag{6}$$

Hence, setting this equal to zero and rearranging, we find the optimum from the point-of-view of the workers:

$$T^*_{worker} = \frac{2(a-D)}{1+2a}. \tag{7}$$

Note that for workers, the optimal level of γ is trivially zero. Also note that, where $D > 0, \frac{\partial T^*}{\partial D} < 0$, so that, where aid is simply given as a fixed proportion of national income, impatient workers will choose to consume a higher proportion of their incomes rather than invest in the public good.

We find a very similar story when optimizing with respect to c. In this case, $lnc = ln\gamma + ln(T+2D) + ln\, v$, so that when we differentiate this with respect to $T, \frac{\partial lnc}{\partial T} = \frac{1}{T+2D} + \frac{\partial ln\, v}{\partial T}$. Setting this equal to zero yields the solution that

$$T^{**}_{oligarch} = \frac{2(a-D)}{1+2a}. \tag{8}$$

By similar means, we deduce that

$$\frac{\partial lnc}{\partial \gamma} = \frac{\partial ln\{c\}}{\partial \gamma} = \gamma^{-1} - \frac{2a}{1-2a}(1-\gamma)^{-1}.$$

In this case, the solution for γ is

$$\gamma^{**} = \gamma^{**} = 1 - 2a. \tag{9}$$

3.1. Effects of changing aid upon the outcome

Our first approach is to compare two polar opposite cases: an economy which is optimized for the workers, and the one which is optimized for the oligarchs.

[12] It is, of course, possible that the public good might be funded from borrowing, but in a longer-term model this will need to be paid for by tax.

[13] In our illustrative numerical case, a ratio of GDP of 2.4 to 1.

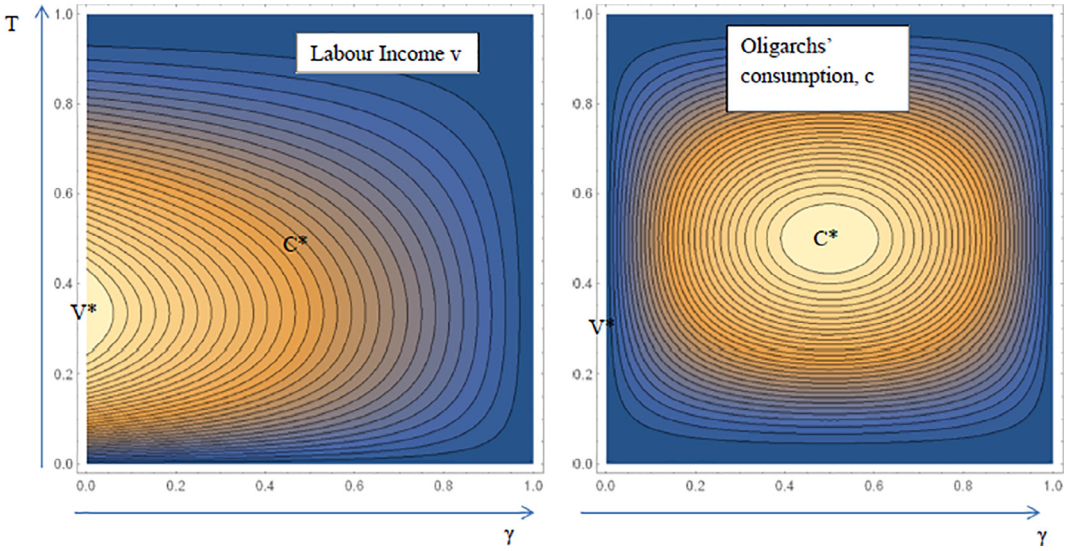


Fig. 3. Labor income and oligarchs' consumption as functions of the tax rate, T, and oligarchs' consumption rate, γ. r and δ both set to 0.05.

When workers' utility is maximised, $\gamma = 0;\ T = T^*_{workers} = \frac{2(a-D)}{1+2a};\ 1 - T^*_{workers} = \frac{1+2D}{1+2a}$.

This allows us to substitute in for $T^*_{workers}$ in Eq. 5, divide by 2 to obtain v, take logs and differentiate with respect to D.

Hence we find, after simplification, that

$$ln\,v^{**} = \frac{2a+1}{2a-1}ln(r+\delta) + \frac{1}{1-2a}ln\left\{\frac{1}{2}\frac{1+2D}{1+2a}\right\} + \frac{2a}{1-2a}ln\{1-\gamma\} + \frac{2a}{1-2a}ln\left\{\frac{1}{2}\left(\frac{2(a-D)}{1+2a}+2D\right)\right\},$$

and so

$$\frac{\partial ln\,v^{**}}{\partial D} = \frac{2+4a}{(1-2a)(1+2D)} > 0. \quad (10)$$

We now want to compare this with the situation **where oligarchs' consumption is maximised.** In this case, $\gamma = \gamma^{**} = 1-2a;\ T = T^{**} = \frac{1-2D}{2};\ 1-T^{**} = \frac{1+2D}{2}$; so that

$$ln\{c^{**}\} = 2^{\frac{2}{2(1-1)}}ln(2) + \frac{2a+1}{2a-1}ln(r+\delta) + \frac{2a}{1-2a}ln(2a) + \frac{1+2a}{1-2a}ln\left(\frac{1+2D}{2}\right),$$

and

$$\frac{\partial ln\,c^{**}}{\partial D} = \frac{2+4a}{(1-2a)(1+2D)} > 0. \quad (11)$$

This leads us to conclude that aid has the same proportional effect upon incomes in both the cases where oligarchs' consumption and where workers' consumption is maximised. The same would apply to any simple Nash bargaining game, where we choose to maximise a constant weighted index of oligarchs' and workers' consumption.

We now want to consider the bargaining setup in more detail. This is shown graphically in Fig. 4. The two contour plots from Fig. 3 have been superimposed, and the core – the line of points where the two sets of indifference curves are tangent, joining v^* and c^* – has been drawn in (in red) along with a Nash bargaining outcome, N^*, assuming constant bargaining weights. Note that, if workers' bargaining share ω is higher, T and γ will be relatively low, and the outcome will be close to v^*. Since v is proportional to Y, GDP will be higher near v^*. A lower workers' share parameter

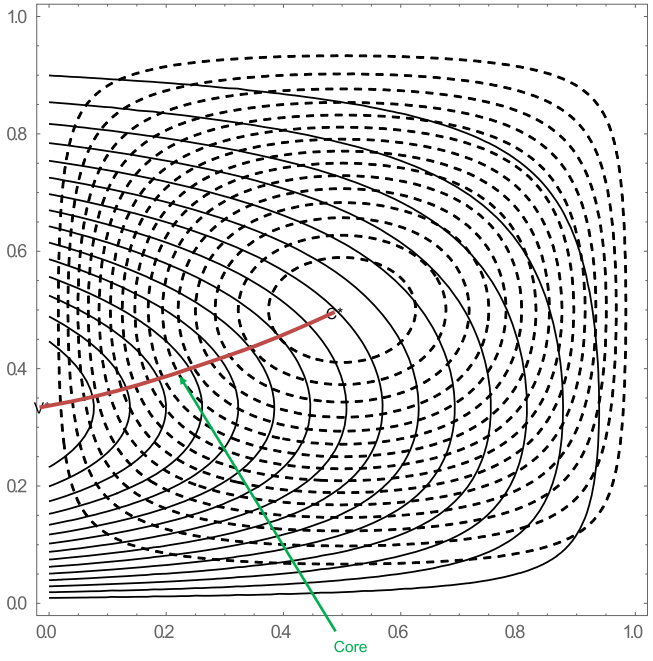


Fig. 4. The unconstrained bargaining problem. The core links v^*, and c^*.

will shift N^* towards c^*, and it is relatively trivial to show that Y will monotonically decline with respect to ω and hence with respect to H.

3.2. Oligarchs set income to avoid regime change

As an alternative to the Nash bargaining game which we discuss above, we choose to model an economy controlled more explicitly by oligarchs, but subject to the constraint that they will choose to pay workers sufficiently well to maintain power. Fig. 5.

We start the analysis here by considering the standpoint of the oligarchs. These are assumed to pay workers at least $\hat{v}$ in order to avoid unrest: in our relatively simple model, this corresponds to setting T and γ sufficient enough to achieve GDP of at least $\hat{Y}$. We will also restrict ourselves to the case where $a = \frac{1}{4}$, and

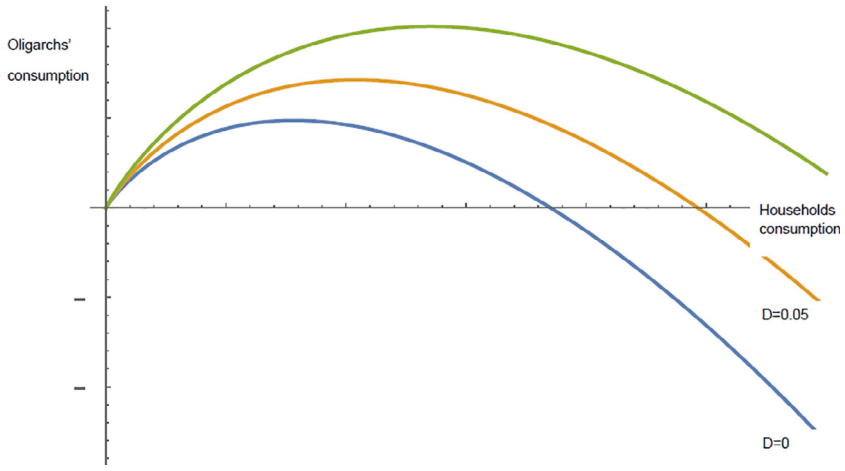


Fig. 5. The trade-off between workers' and oligarchs' incomes, and the effects of increasing aid.

$r = \delta = 0.05$, in order to make the model more tractable. This gives us a simplified version of Eq. 5 linking the various policy/behavioural variables: $\widehat{Y} = 125\left(1-\widehat{T}\right)^2(1-\hat{\gamma})\left(\widehat{T}+2D\right)$.

In these circumstances, the oligarchs will set constrained optimal values (from their own perspective) of $\widehat{T}$ and$\hat{\gamma}$. First we note that, differentiating with respect to γ and setting the outcome equal to zero, $\hat{\gamma} = 1 - \frac{\hat{y}}{125\left(1-\widehat{T}\right)^2\left(\widehat{T}+2D\right)}$. Substituting this back into oligarchs' consumption and differentiating with respect to T yields $\frac{\partial \hat{c}}{\partial \widehat{T}} = \frac{\hat{y}}{2} - \frac{\hat{y}^2}{125}\left(1-\widehat{T}\right)^{-3}$, so that

$$\widehat{T} = 1 - \frac{1}{5}2^{\frac{1}{3}}\hat{y}^{\frac{1}{3}};$$

and so

$$\hat{c} = \left(\frac{1}{2}+D\right)\widehat{Y} - \frac{3\widehat{Y}}{10x2^{\frac{2}{3}}}. \tag{12}$$

Note that if we rewrite $v = \frac{\widehat{Y}}{2}$, Eq. 12 identifies the consumption possibilities frontier between oligarchs and workers. We note that, for a given value of D, the frontier is quadratic in form, with consumption by both oligarchs and workers first increasing (as we move to oligarchs' blisspoint), but beyond the oligarchs' blisspoint, both decrease. The region, where there is a trade-off between oligarchs and workers, lies between the oligarchs' blisspoint, where $\hat{y}_{oligarch} = \frac{125}{16}(1+2D)^3$, and the workers' blisspoint, where $\hat{y}_{workers} = \frac{500}{27}(1+2D)^3$. It can be seen that a rise in aid shifts the frontier outwards. This is shown diagrammatically below:

Next, we consider this game from the workers' perspective. In this case, workers need to consider whether or not to instigate regime change. This is assumed to be costly, involving a loss of earnings for a period t. However, if a successful regime change is implemented, workers' earnings will rise to a higher level, assumed to be proportional to $\hat{y}_{workers}$.

We also generalise workers' utility to include a subsistence minimum, $\underline{v}$. Hence, the cost to workers of foregoing wage v in order to instigate regime change is $tu\hat{v}$, where $u\hat{v} = \hat{v} - \underline{v}$. t is assumed to be an increasing function of human rights repression tH.

In the case that regime change is successful, the present discounted value of the long-run gain in utility is assumed to be $\phi(v_{work} - \hat{v})$,where ϕ is a constant incorporating both discounting and an adjustment for the expected gain in regime quality (from workers' perspective) compared to potential.

It follows that if oligarchs set $\hat{v}$ at a level where workers are just deterred from instituting regime change (given H, and hence t), we can derive $\hat{v} = \frac{\phi v_{work} + t\underline{v}}{\phi + t}$. Note that if $\hat{v}_{work} = \frac{250}{27}(1+2D)^3$;

$$\hat{v} = \frac{250\phi(1+2D)^3 + t\underline{v}}{27(\phi+t)}. \tag{13}$$

We can then take logs, and double differentiate with respect to t and D, revealing that

$$\frac{\partial^2 ln\hat{v}}{\partial t \partial D} = -\frac{1500\phi(1+2D)^3 27t}{\left(250\phi(1+2D)^3 + 27t\underline{v}\right)^2} < 0 \quad iff\ \underline{v} > 0. \tag{14}$$

Hence, in the case where there is a positive subsistence wage floor, aid has a greater proportional effect upon workers' earnings (which are proportional to GDP) when t is lower (and hence when human rights are better). Note that this effect is dependent upon a positive value for $\underline{v}$. If the subsistence minimum wage is zero, then $\frac{\partial ln\hat{v}}{\partial D} = \frac{1}{\hat{v}}\frac{\partial \hat{v}}{\partial D} = \frac{1500\phi(1+2D)^3}{250\phi(1+2D)^3}$,which is invariant with respect to t.

We should note that, if aid provision is not linked conditionally to human rights, repression may worsen in response to an increase in aid. The logic is that increased aid leads to increased demands for higher wages, unless repression is increased. The marginal return to oligarchs from increasing repression will consequently increase. It is not easy to obtain a closed form solution for this. The above theoretical analysis suggests that any improvement in human rights performance due to lower repression in a country will reflect relatively better quality of institutions in making more effective use of aid in order to enable higher per capita growth compared to a more repressed country, which we test in the empirical framework below.

4. Data: measures and dimensions

We focus on a specific group of countries, namely on Least Developed Countries (LDC) as defined and listed by the UN (UN-OHRLLS). Primarily this reduces the sample selection bias that Burnside and Dollar (2000) were heavily criticized for (Easterly et al., 2004), on the grounds that we are choosing a UN-defined list. Additionally non-aid recipients were removed in order to avoid any bias. As such, conclusions of this study will only be directly applicable to LDCs. Focus on LDCs also allows this study to specifically model those countries that have been

deemed to be most fragile and have been argued to posses different attributes to other developing countries (Collier, 2008). Although LDCs are not a subset of Collier's Bottom Billion countries, there is a degree of overlap and the suggestion to investigate Bottom Billion countries in their own right applies equally to LDCs. A list of countries in the sample is provided in an Appendix Table A.1. For all the variables used in this study, we report the summary statistics in Table 1.

4.1. Human rights data

Our human rights measure (HR Factor) draws on Landman and Larizza (2009) and operationalizes the protection of civil and personal integrity rights using four 'standards-based' (Jabine & Claude, 1992) human rights scales: (1) the Amnesty International version of the Political Terror Scale, (2) the U.S. State Department version of the Political Terror Scale, (3) the Cingranelli and Richards (1999) Index of Personal Integrity Rights (http://www.humanrightsdata.com), and (4) the Freedom House civil liberties scale (Landman & Larizza, 2009), suggesting that they may be measuring aspects of the same underlying dimension (see also Edwards, Kernohan, Landman, & Nessa, 2018). Given this degree of agreement among the different scales, we used principal components factor analysis to reduce the group of interrelated human rights variables into a single component with high factor loadings, which indicate a strong relationship between each variable and the common underlying dimension they all measure. Moreover, the component represents a set of human rights violations that are consistent with Cingranelli and Richards (1999) findings about the uni-dimensionality of their aggregate 'personal integrity rights scale'. Once extracted, the human rights factor score has been inverted to make its substantive meaning more intelligible, where low values of the factor score correspond to a low protection of human rights (high violations) and high values correspond to a high protection of human rights (low violations). This variable has a mean of 0, a minimum value is −2.7 and the maximum value is 1.97.

There is considerable discussion of the choice and construction of such indices in Landman and Larizza (2009): in particular, we update here their principal components measure. The principal component in this case accounts for about 0.6687 of the total variance of the four measures, and we can view it as a measure of the components of human rights provision around which these four diverse indices agree. Moreover, this method delivers a normally distributed variable around zero, with minimum value of −2.0037 and maximum of 2.6308. The HR variable is inverted (HR factor) so that higher is a more favorable state of human rights and is intuitively simpler to interpret. Fig. 6 reports the HR factor distribution across the globe. This clearly emphasizes the low level of human rights protection in some African countries as well as in Asia and Latin American countries with respect to Europe, Australia and North America.

The domestic conflict variable, the Global Conflict Risk Index (GCRI) measure of internal conflict, conflicts with neighbors and lack of democracy were adopted as control variables. The scale measurement of these variables captures the overall risk for civil war and includes the threat of a military coup, terrorism, political violence and aggregate levels of civil unrest. This time series approach provides a much more accurate depiction of the state of domestic characteristics as a dummy variable. Besides, we use two measures of trade openness: the standard measure, (exports + imports)/GDP, and the KOF globalization index. For aid and GDP per capita, data from the World Bank and OECD were compiled. The data span over the period 1989–2012.

5. Model specification and empirical results

We start our empirical strategy by using a standard Per-Capita GDP (y) equation:

$$ln(y_{it}) = ln(y_{it0}) + \Delta ln(y_{it}) \tag{15}$$

where $\Delta ln(y_{it})$ depends in equilibrium on the level of public investment, $ln(I_{it})$,[14] which in turn can positively depend on aid, better human rights, and economic globalization, while low human capital and inflation can negatively influence investment.

$$ln(y_{it}) = \beta_0 + \beta_1 ln(I_{it}) + \varepsilon_{it} \tag{16}$$

$$ln(I_{it}) = \beta_2 ln(NetODA_{it}) + \beta_3 HRfactor_{it} + \beta_4 ln(KOF)_{it} + \\ + \beta_5 GrossEnrol.RatioPrimary_{it} + \beta_6 Inflation_{it} + \epsilon_{it} \tag{17}$$

Substituting Eq. 17 and Eq. 16 in Eq. 15 and applying a partial adjustment growth model, as well as adding additional controls yields:

$$\begin{aligned} ln(GDPpc_{it}) - ln(GDPpc_{it-1}) = {} & \beta_0 ln(GDPpc_{it-1}) \\ & + \beta_1 ln(NetODA_{it}) \\ & + \beta_2 ln(NetODA_{it}) \cdot HRfactor_{it} \\ & + +\beta_3 HRfactor_{it} + \beta_4 ln(KOF)_{it} \\ & + \beta_5 ln(INEQ_{it}) \\ & + \beta_6 GrossEnrol.RatioPrimary_{it} \\ & + +\beta_7 Inflation_{it} + X'_{it}\beta_x + \gamma_t \\ & + \gamma_i + \varepsilon_{it} \end{aligned} \tag{18}$$

Here the dependent variable is the difference in log GDPpc between t and t-1 – i.e., the growth rate of GDPpc. Explanatory variables include aid per capita (NetODA), inverse of human rights $HRfactor_{it}$, economic globalization index (KOF_{it}), income inequality $(INEQ_{it})$, $Inflation_{it}$ and a human capital indicator – i.e., gross rate of enrollment (both genders considered) in primary school – for country i over time t. Additional control variables (X'_{it}) are included which include recent conflict, subnational ethnic diversity and child mortality rate. Furthermore, time and country fixed effects are accounted for. Instruments used are HR factor$_{it-1}$, $ln(KOF)_{it-1}$, ln(population)$_{it-1}$ and $ln(INEQ_{it-1})$,

Endogeneity is a significant hazard due to the possible simultaneity of the aid and GDP regressions (Burnside & Dollar, 2000; Mosley et al., 2004). Although the endogeneity of non-income dimensions has been discussed above, especially through new conditionality in Mosley et al. (2004) and conceptually through Sen (2001), the empirical rendition of all the endogenous variables in an n-equation simultaneous equation model is beyond the scope of this paper. Therefore the BD2000 approach to modeling aid endogeneity will be implemented, mentioning that the other dimensions of development, such as human rights, are also potentially endogenous. Thus, to address these issues, we use system GMM as an alternative estimation method to the 2SLS model, along with undertaking a 'like-for-like' comparison via a propensity score matching approach.

[14] This isoelastic formulation is broadly consistent with the model outlined in Section 3. Private investment is assumed to respond positively and endogenously to a boost in public good provision.

Table 1
Summary Statistics.

variable	N	mean	sd	min	max
ln(GDP pc)	1,178	6.138	0.709	4.242	9.675
ln(KOF)	1,178	3.433	0.283	2.424	3.989
ln(NetODA)	1,178	3.920	0.825	1.467	6.473
ln(NetODA) · HR factor	966	−0.964	3.111	−10.103	10.401
Child Mortality Rate	1,175	139.638	58.260	13.900	316.8
HR factor	1,178	−0.383	0.926	−2.631	1.885
Internal Conflict	895	2.154	3.518	0.000	10.000
Neighbors Conflict	895	5.932	4.118	0.000	10.000
Ethnic Diversity	895	4.293	2.066	1.000	10.000
Income Inequality	895	4.635	1.414	2.029	8.920
Lack of Democracy	895	5.081	2.685	0.500	10.000
Gross Enrollment Ratio Primary Sch.	983	84.606	30.829	20.064	207.234
Inflation	1,098	0.120	0.212	−0.316	1.900

Note: The Table presents summary statistics of the main variable used in the analysis.

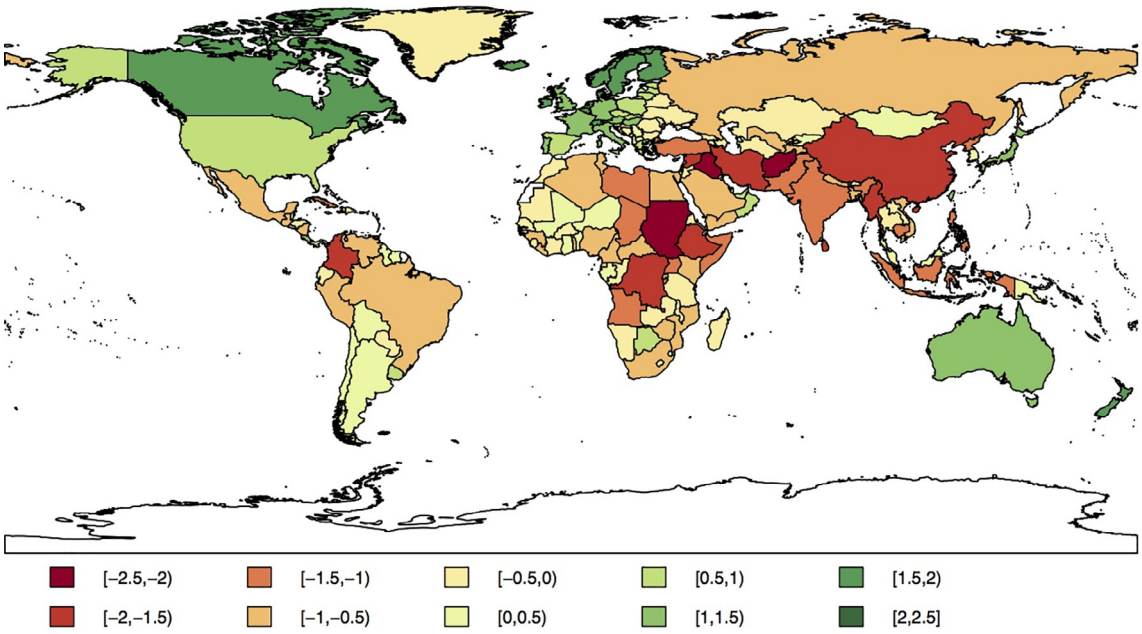


Fig. 6. Human Rights Distribution, this graph represents the average inverse human rights factor for all countries including Least Developed Countries (LDCs). Note, positive HR Factor indicates better human rights protection.

Table 2
The aid growth relationship without conditionality.

Variables	(1)	(2)	(3)	(4)
	LDCs			
	OLS	FE	2SLS	GMM
ln(NetODA)	0.000834	0.0102**	0.0155	0.0103**
	(0.0040)	(0.0050)	(0.0237)	(0.0044)
Lag ln(GDPpc)	0.0033	−0.0253	−0.0693**	
	(0.0088)	(0.0178)	(0.0271)	
Lag Change ln(GDPpc)				0.221**
				(0.110)
Constant	−0.0246	0.115		−0.0435**
	(0.0483)	(0.106)		(0.0213)
Hausman test			127.52***	
Arellano-Bond test for AR(2)				−0.33
				[0.738]
Observations	1,178	1,178	863	849
R-squared	0.065	0.085	0.137	
Country Dummy	–	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes
Number of id		42	39	39

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1; The Table reports the point estimates of the growth model by using alternative specifications. The results show a consistent positive effect of the interaction term between aid and HR factor.

5.1. The basic aid-growth equation

The results, in Table 2, provide estimation of a very basic aid-growth relationship, without convergence. We carry out estimation by an ordinary least squares method (OLS), fixed effect (FE) model[15] and by dynamic panel model[16] (GMM). The results are consistent with widespread skepticism about the effectiveness of aid. That is, while the point estimates from three of the four estimators suggest a positive relationship between aid and growth of GDP per capita, this is not statistically significant.

Note, also, that FE and 2SLS estimators show a significant negative relationship between lagged GDP per capita and growth. This should be seen as supporting growth convergence, rather than fully endogenous growth, and is an important reason why we chose to couch our theoretical model in Section 3 as convergent. The instrumental variable approach in column (3) is highly supported by a Hausman test, while the test of autocorrelation AR(2) using GMM in column (4) is rejected. This suggests that the latter methods are able to better capture causal effect and solve for potential endogeneity of the aid variable.

5.2. Estimation of conditionality hypothesis with human rights

While Table 2 finds only a weak and insignificant benefit of aid for growth, Table 3 extends the equations above, by considering whether aid might be effective conditionally when applied in an environment with good human rights. Hence, we introduce HR both in levels and, more importantly, as an interaction term with aid. The aid-HR interaction term was found to have a significant and positive impact on per capita growth rate, which is consistent across different methods, with FE, 2SLS and GMM all yielding very similar parameter estimates. The statistical significance of this interaction term and its positive sign is in clear support of Sen (2001)'s development as freedom hypothesis as introduced into the Burnside and Dollar (2000), which modified the endogenous growth framework. These results suggest that human rights do indeed have indirect productive effects, complementing their intrinsic value upon which much of the focus has previously rested.

Interestingly, these results also suggest that the aid variable, *ln*(*NetODA*), is positive across different models, while statistically significant in the FE and GMM methods. For example, in the GMM estimation, a 1 per cent increase in aid leads to a 1.4 per cent rise in the growth rate, before taking account of the interaction with aid. Hence, our model suggests that the LDCs that experience aid inflows are able to boost their GDP per capita growth. On the other hand, the aid-policy interaction term suggests a positive relationship with growth of GDPpc. That is, the FE, 2SLS and GMM models all emphasize a short-run gain of 0.02 percent in GDPpc for every 1% increase in aid, ln(NetODA), and an unit increase in HR factor. The first three models, which employ a convergent growth formulation imply that this effect increases in the long-run, while in the GMM method, there is a lasting increase in the growth rate.

Table 4 includes additional control variables, such as inflation, economic globalization, income inequality and child mortality rate. These variables control for potential macroeconomic shocks that those countries might experience; hence omitting them might bias the results of interest. However, the inclusion of these controls does not eliminate the significance of the main effect of aid and aid-HR interaction term, column(4), but the magnitude of aid-HR interaction has relatively declined both in 2SLS and GMM models, while OLS and FE models show an increase in this interaction term compared to the results of Table 3. Obviously, macroeconomic shocks that affect the economy, i.e., inflation or economic globalization, have important consequence on per capita GDP growth. Thus, failure to account for such shocks might result in overestimating the effect of aid-policy interaction term. Furthermore, the inclusion of these terms is well supported by the increase in the R-squared term.

While the human rights term on its own is negative (albeit of low significance), it is worth noting that, once we apply the mean level of ODA from the Summary Statistics table, the interaction term with aid suggests that the differential of per capita GDP with respect to HR is positive. The aid-HR interaction term suggests that developments in human rights have a positive impact on the ability of aid to boost economic growth. This is positive and statistically significant across all models. This suggests that governments implementing measures to increase freedom and human rights protection will see an extra beneficial effect in the growth of GDP per capita. As a result, one could tentatively suggest that countries seeking to get the most from inflow of aid should address measures that target improvement in economic development alongside enhancing factors in the non-income dimension. The point estimate from Table 4, column(4), suggests that, in the GMM case, every 1% increase in aid, ln(NetODA), leads to an increase of about 0.017 percent in the rate of per capita GDP growth, before including the interaction effect with human rights. Furthermore, the effect coming from non-income dimension, the interaction of aid-HR ln(NetODA)·HR Factor, adds an additional 0.018 percent and increases with improvement in human rights factor. This supports our conclusion that development in non-income dimension helps boost economic growth.

5.3. The effect of conflicts and other political variables

The conditionality hypothesis states that the effect of aid is conditional upon a sound policy environment. As a result, the effect of aid on per capita growth is amplified by the aid-HR interaction. However, we might expect that omitting from this analysis the effects of internal conflicts or conflicts in neighboring countries might result in an omitted variable bias, hence leading to an over identification of our point estimate for the aid-HR interaction. This is important because Landman and Larizza (2009) report a strong correlation between internal conflict within a country and problematic human rights performance. In addition, other factors such as ethnic diversity are important. Thus, Table 5 reports the results by accounting for a number of additional control variables – i.e., conflicts, enrollment in primary education and ethnic diversity. The inclusion of these additional controls does not however impact the significance of aid-HR interaction.

Table 5 reports a number of model specifications. Columns (3)-(4) differ from columns (5)-(6) because the latter accounts for the effect of the HR factor. The model confirms that internal conflicts have a negative effect upon economic growth, which is consistent and significant across all specifications. Indeed, a point increase in the internal conflict scale reduces the growth rate by about 0.7%. Interestingly, there is little significant effect from external conflicts.

Aid has a statistically positive effect on GDP growth as estimated by OLS, FE and GMM: i.e., the estimated elasticity for aid variable suggests that every 1% increase in aid, ln(NetODA), leads to about 0.0168 per cent in GDP growth in column(6). On the other hand, the aid-HR interaction term highlights a statistically significant and positive effect across all specifications. This emphasizes the importance of development of freedoms as a source of gain in economic growth. The estimated elasticity suggests that countries with better development of freedom or good institutions are

[15] Notice the Hausman test indicates a preference of this model as opposed to a random effect model.

[16] This model was initially developed by Arellano and Bond (1991) and subsequently developed by Arellano and Bover (1995); Blundell and Bond, 1998.

Table 3
Conditionality Hypothesis with Human Rights.

Variables	(1)	(2)	(3)	(4)
	LDCs			
	OLS	FE	2SLS	GMM
ln(NetODA)	0.0021	0.0203***	0.0125	0.0143**
	(0.0042)	(0.0069)	(0.0314)	(0.0063)
HR Factor	−0.0261**	−0.0507	−0.0504*	−0.0473*
	(0.0124)	(0.0346)	(0.0264)	(0.0263)
ln(NetODA)·HR Factor	0.0095**	0.0211*	0.0212***	0.0192**
	(0.0043)	(0.0111)	(0.0073)	(0.0081)
Lag ln(GDP pc)	−0.0022	−0.0882***	−0.170***	
	(0.0058)	(0.0160)	(0.0432)	
Lag Change ln(GDP pc)				0.128
				(0.128)
Constant	−0.0160	0.440***		−0.0746*
	(0.0322)	(0.103)		(0.0407)
Hausman test			180.03***	
Arellano-Bond test for AR(2)				.436
				[0.6627]
Observations	966	966	751	736
R-squared	0.098	0.201	0.273	
Country Dummy	–	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes
Number of id		40	39	39

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1; The Table reports the point estimates of the growth model by using alternative specifications. The results show a consistent positive effect of the interaction term between aid and HR factor.

Table 4
Aid Conditionality Hypothesis and Macroeconomic Controls.

Variables	(1)	(2)	(3)	(4)
	LDCs			
	OLS	FE	2SLS	GMM
ln(NetODA)	0.0066	0.0180**	−0.0224	0.0171***
	(0.0051)	(0.0075)	(0.0430)	(0.0066)
HR Factor	−0.0300*	−0.0572	−0.0310	−0.0476**
	(0.0158)	(0.0420)	(0.0297)	(0.0239)
ln(NetODA)·HR Factor	0.0106**	0.0220*	0.0159**	0.0181**
	(0.0052)	(0.0129)	(0.0073)	(0.0074)
ln(Econ. Globalization)	−0.0177	0.0604	0.0855	−0.0214
	(0.0137)	(0.0473)	(0.0573)	(0.0365)
ln(Income Inequality)	−0.0025	0.0062*	0.0068	0.0016
	(0.0021)	(0.0036)	(0.0043)	(0.0036)
ln(Child Mortality Rate)	−0.0001	−0.0004	−0.0005	−0.0004
	(0.00005)	(0.0003)	(0.00045)	(0.0002)
Inflation	0.0173	−0.0165	−0.0201	0.00756
	(0.0122)	(0.0168)	(0.0167)	(0.00948)
Lag ln(GDP pc)	−0.0009	−0.183***	−0.190***	
	(0.0074)	(0.0496)	(0.0479)	
Lag Change ln(GDP pc)				0.134
				(0.134)
Constant	0.0610	0.876***		0.0456
	(0.0403)	(0.291)		(0.144)
Hausman test			175.64***	
Arellano-Bond test for AR(2)				.33685
				[0.7362]
Observations	737	737	710	696
R-squared	0.121	0.313	0.269	
Country Dummy	–	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes
Number of id		38	38	38

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1; The Table reports the point estimates of the growth model by using alternative specifications. The results show a consistent positive effect of the interaction term between aid and HR factor, while we control for additional macroeconomic variables.

able to have an advantage in economic growth. Increased protection in human rights yields a better economic outcome, capturing its role in making more effective use of aid in increasing per capita GDP growth.

It is worth noting that both the 2SLS and GMM estimators imply a very similar short-run effect of the interaction of aid and HR upon growth, although in the former the growth rate is convergent, while in the latter case, there is a permanent rise in the growth rate. The point estimate of the HR factor is negative suggesting a negative impact on GDP per capita growth. However, this must be weighed against the positive effect of HR in terms of enhancing the growth effects of ODA.

On the whole, the significant estimated elasticity for the lag per capita GDP in the FE and 2SLS models suggests that growth prob-

Table 5
Conditionality Hypothesis with Control Variables.

Viariables	(1)	(2)	(3)	(4)
	LDCs			
	OLS	FE	2SLS	GMM
ln(NetODA)	0.0105*	0.0195**	−0.0338	0.0168**
	(0.0058)	(0.0074)	(0.0517)	(0.0073)
HR factor	−0.0627***	−0.0837*	−0.0568*	−0.0766***
	(0.0216)	(0.0440)	(0.0307)	(0.0297)
ln(NetODA) · HR factor	0.0181***	0.0265**	0.0201***	0.0232***
	(0.0061)	(0.0122)	(0.0076)	(0.0080)
ln(Econ. Globalization)	−0.0138	0.0554	0.0756	−0.0336
	(0.0143)	(0.0538)	(0.0568)	(0.0389)
ln(Income Inequality)	−0.0040	0.0036	0.0055	0.0006
	(0.0025)	(0.0042)	(0.0051)	(0.0039)
Child Mort. Rate	0.00004	−0.0003	−0.0003	−0.0002
	(0.0001)	(0.0004)	(0.0004)	(0.0003)
Internal Conflict	−0.0050***	−0.0064**	−0.0068***	−0.0067**
	(0.0016)	(0.0027)	(0.0017)	(0.0028)
Neighboring Conflict	0.0024**	0.0010	0.0013	0.0029
	(0.00098)	(0.0014)	(0.0013)	(0.0023)
Inflation	0.0150	−0.0091	−0.0089	0.0127
	(0.0161)	(0.0173)	(0.0175)	(0.0129)
Ethnic Diversity	−0.0018	−0.0029	−0.0027	−0.0017
	(0.0023)	(0.0044)	(0.0027)	(0.0023)
Lack of Democracy	0.0034***	0.0016	0.0003	0.0015
	(0.0011)	(0.0019)	(0.0019)	(0.0017)
Gross Enrol. Ratio Primary	0.0003**	0.0004	0.0004	0.0005
	(0.0002)	(0.0004)	(0.0003)	(0.0003)
Lag ln(GDP pc)	−0.0026	−0.181***	−0.184***	
	(0.0082)	(0.0454)	(0.0433)	
Lag Change ln(GDP pc)				0.113
				(0.106)
Constant	−0.0356	0.826***		0.0195
	(0.0578)	(0.286)		(0.175)
Hausman test			221.48***	
Arellano-Bond test for AR(2)				.16764
				[0.8669]
Observations	702	702	676	663
R-squared	0.186	0.367		0.305
Country Dummy	–	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes
Number of id		37	37	37

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1; The Table reports the point estimates of the growth model by using different specifications. The results show a consistent positive effect of the interaction term between aid and HR factor.

ably follows a convergent model, albeit the convergence may be extended, or magnified, compared to that in Solow, 1956 – hence supporting the convergence hypothesis documented by Roubini and Sala-i Martin (1995). Conflicts, aid and the interaction with human rights are clearly important in determining the precise relative levels upon which countries converge, although our estimators suggest, perhaps surprisingly, that, while other control variables such as economic globalization, child mortality rate, democracy and educational attainment are important factors that might lead to omitted variable bias, they turn out to be statistically insignificant (albeit, perhaps, important in their own right).

6. Robustness checks

6.1. Role of policy environment as in Burnside and Dollar (2000)

Burnside and Dollar (2000) ('BD2000') can be seen as the classic study supporting the 'aid conditionality' hypothesis. While our analysis in the previous sections follows strongly in that tradition, it is nevertheless sensible to test our results more directly against the approach in their equations. In particular, we note that BD2000 examine three main policy variables: inflation, openness and budget surplus/deficit. An initial regression is carried out using these variables as well as various other variables such as assassinations, ethnic fractionalization, M2/GDP and institutional quality. The coefficients from this regression for the first three policy indicators (inflation, openness and budget surplus) are then used to construct an aggregate 'policy' measure, which is then interacted with aid. Crucially, as in our analysis, the aid-policy interaction term is positive and significant, supporting the conditionality hypothesis.

We follow the same approach, with our more recent database for our sample of countries.[17] Since data on budget surplus (from the IMF) are not available for our entire sample, we carry out the exercise as follows: first, on our full sample excluding budget surplus, and second, on a sub-sample of countries, including budget surplus, and finally using Burnside & Dollar (2000) weights for the macro variables.

Results of our analysis are shown in Table 6 below, for the first policy index and the full set of countries. We utilize the estimated coefficients from the fixed effects regression in column (6) to construct our policy index:

$$Policy_1 = -0.0184 \cdot Inflation - 0.0004 \cdot Openness$$

Note that inflation has the expected signs in the fixed effects regression, but not openness. The last three columns then include the policy index in levels, and its interaction term with aid, alongside the human rights measure and its interaction with aid. Note that the first policy index does not perform particularly well, either

[17] Note, we use the KOF index relative to the Sachs-Warner index, as the latter shows very little variation across countries.

Table 6
Burnside and Dollar (2000) Test: Policy$_1$.

VARIABLES	(1) OLS	(2) OLS	(3) FE	(4) 2SLS	(5) OLS	(6) FE	(7) 2SLS	(8) OLS	(9) FE	(10) 2SLS
Lag ln(GDP pc)	−0.0018	−0.0031	−0.147**	−0.0175	−0.0061	−0.173***	0.317	−0.0077	−0.154***	−0.170***
	(0.0071)	(0.0073)	(0.0549)	(0.143)	(0.0076)	(0.0605)	(0.727)	(0.0073)	(0.0538)	(0.0496)
ln(NetODA)	0.0021	0.0019	0.0026	0.943	0.0004	0.00391	3.468	0.00961	0.0464***	0.807***
	(0.0049)	(0.0048)	(0.0071)	(0.901)	(0.0047)	(0.0082)	(5.236)	(0.0107)	(0.0156)	(0.212)
Policy$_1$								−1.654	−3.204*	−61.59***
								(1.457)	(1.727)	(16.24)
ln(NetODA) · Policy$_1$								0.284	0.984***	15.99***
								(0.312)	(0.359)	(4.279)
HR factor					−0.0064	−0.0153	−2.599	−0.0139	−0.0297*	−0.438***
					(0.0124)	(0.0136)	(3.895)	(0.0142)	(0.0153)	(0.120)
ln(NetODA) · HR factor					0.0057	0.0117**	0.664	0.00770	0.0151***	0.124***
					(0.0045)	(0.0044)	(0.987)	(0.0048)	(0.0050)	(0.0337)
ln(Econ. Globalization)		−0.0225	0.0938	−0.721	−0.0205	0.146**	−2.239			
		(0.0141)	(0.0620)	(0.755)	(0.0156)	(0.0682)	(3.531)			
Inflation	0.0090	0.0103	−0.0141	0.150	0.0107	−0.0184	0.680			
	(0.0120)	(0.0118)	(0.0179)	(0.170)	(0.0121)	(0.0183)	(1.077)			
Ethnic Diversity	0.0037	0.00416*	0.00113	−0.0636	0.0062**	0.0059	−0.0619	0.0063**	0.0023	−0.0241**
	(0.0024)	(0.0025)	(0.0037)	(0.0650)	(0.0028)	(0.0041)	(0.117)	(0.0029)	(0.0039)	(0.0107)
Assassination	0.0023	0.0049	0.0046	−0.169	0.0006	0.0036	0.147	−0.0009	−0.0020	−0.0276
	(0.0078)	(0.0079)	(0.0071)	(0.174)	(0.009)	(0.0079)	(0.284)	(0.0088)	(0.0083)	(0.0248)
Ethnic Diversity · Assassination	−0.0015	−0.0019	−0.0003	0.0297	−0.0029	−0.00268	−0.0014	−0.0024	−0.0012	0.0121*
	(0.0016)	(0.0017)	(0.0015)	(0.0300)	(0.0021)	(0.0019)	(0.0412)	(0.0021)	(0.0018)	(0.0062)
M2/GDP	−0.0002	−0.0002	−9.06e-05	−0.0066	−0.0003	−0.0003	−0.0304	−0.0003*	−0.0003	−0.00167*
	(0.0002)	(0.0002)	(0.0005)	(0.0066)	(0.0002)	(0.0004)	(0.0467)	(0.0002)	(0.0004)	(0.0009)
Institutional Quality		0.0021**	−0.0010	0.0266	0.0038***	0.0025	0.0756	0.0042***	0.0018	0.0003
(Lack of Democracy)		(0.0008)	(0.0016)	(0.0283)	(0.0009)	(0.0016)	(0.119)	(0.0009)	(0.0016)	(0.0039)
Openness	0.0002	0.0002*	−0.0002	−0.0037	0.0002	−0.0003	−0.0122			
	(0.0001)	(0.0001)	(0.0004)	(0.0036)	(0.0001)	(0.0004)	(0.0187)			
Constant	−0.0023	0.0550	0.599**		0.0634	0.551**		−0.0322	0.815**	
	(0.0411)	(0.0540)	(0.240)		(0.0550)	(0.234)		(0.0492)	(0.344)	
Test for exogeneity of Aid χ^2				1.49 [0.4756]			3.64 [0.1622]			3.32 [0.1899]
Observations	708	707	707	707	679	679	679	679	679	679
R-squared	0.090	0.107	0.189	–	0.122	0.248	–	0.119	0.231	–
Country Dummy	–	–	Yes	Yes	–	Yes	Yes	–	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of id			38	38		38	38		38	38

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1; The Table reports the point estimates of the growth model by using alternative specifications. In, particular here we use Burnside and Dollar (2000)'s definition of policy variable (without budget surplus variable due to missing values) as well as HR factor. Inflation is dropped in the last 3 columns due to multicollinearity with policy variable.

in terms of level or in terms of the interaction with aid. The interaction of aid with human rights continues to be significant in columns (9) (FE) and (10) (2SLS), but not in the OLS case column (8), although it retains the expected sign.

We therefore proceed in Table 7 to investigate the smaller sample of countries, with the policy index constructed from three policy variables in column (5), including budget surplus:

$$Policy_2 = -0.0928 \cdot Inflation + 0.0003 \cdot Openness + 0.0007 BudgetSurplus$$

Looking at the last three columns of Table 7, the results are quite revealing. First, the full policy index has a positive effect upon economic growth, which is strongly significant at least in the 2SLS case. This confirms the role of good economic management in promoting growth. However, the interaction term with aid is either insignificant or wrongly termed. By contrast, the interaction of human rights with aid is positive and strongly significant. This confirms our view of human rights as a good indicator of potential aid effectiveness.[18] Hence, our analysis suggests that the economic policy indicators have a positive effect on growth, but human rights are a better indicator than economic policy in terms of predicting aid effectiveness.

[18] Note that, while human rights in levels, on their own, carry a negative sign, at mean levels of ln(NetODA) the differential of growth with respect to human rights is also positive.

Finally we use Burnside and Dollar (2000)'s definition of policy variable as well as applying the same weight to the macroeconomic variables.

$$Policy_3 = 1.28 - 1.4 \cdot Inflation + 2.16 \cdot Openness + 6.85 BudgetSurplus$$

The results of this are reported in Table 8. Also in this specification, the policy index has positive effect on growth, and the interaction of aid with policy remains negative.

6.2. Marginal effects

As a final exploration of the economic (as opposed to just statistical) significance of our results, we follow Cooray, Dutta, and Mallick (2017) in plotting the marginal effects of aid, as a function of level of human rights provision. To do this, we use the estimates based upon column 8 of Table 7.

Table 9 and Fig. 7 analyse the marginal effects of aid (based on the coefficient of aid and its interaction with human rights) across the distribution of countries by percentile on the human rights distribution. Again, the graph gives a clear indication: aid has a strongly positive effect at the higher end of the human rights distribution, as the marginal effect is insignificant at the lower end of the HR distribution. This supports the idea that aid could be getting misallocated (i.e., for humanitarian/consumption purposes rather than being used directly in productive investment) in most repressive and corrupt countries with problematic human rights perfor-

Table 7
Burnside and Dollar (2000) Test: Policy$_2$.

VARIABLES	(1) OLS	(2) OLS	(3) FE	(4) 2SLS	(5) OLS	(6) FE	(7) 2SLS	(8) OLS	(9) FE	(10) 2SLS
Lag ln(GDP pc)	−0.0024	−0.0042	0.0025	−0.0290	−0.0065	−0.0242	−0.0990	−0.0069	−0.0538	−0.0824
	(0.0041)	(0.0045)	(0.0330)	(0.102)	(0.0050)	(0.0495)	(0.139)	(0.0044)	(0.0427)	(0.0507)
ln(NetODA)	0.0107**	0.0094**	0.0004	0.259	0.0159***	0.0081	0.393*	0.0208***	0.0248	0.177***
	(0.0042)	(0.0043)	(0.0054)	(0.516)	(0.0059)	(0.0074)	(0.216)	(0.0078)	(0.0159)	(0.0514)
Policy$_2$								1.212	1.953	11.92***
								(1.128)	(1.475)	(3.573)
ln(NetODA) · Policy$_2$								−0.234	−0.295	−2.714***
								(0.250)	(0.365)	(0.835)
HR factor					−0.0397*	−0.0518*	−0.408*	−0.0463*	−0.0671*	−0.207***
					(0.0227)	(0.0292)	(0.225)	(0.0237)	(0.0363)	(0.0607)
ln(NetODA) · HR factor					0.0122**	0.0168**	0.117*	0.0140**	0.0209*	0.0655***
					(0.0058)	(0.0080)	(0.0637)	(0.0063)	(0.0103)	(0.0179)
ln(Econ. Globalization)		0.0028	0.151**	−0.389	0.0062	0.179**	−0.474			
		(0.0146)	(0.0725)	(1.119)	(0.0151)	(0.0727)	(0.429)			
Inflation	−0.0308	−0.0213	−0.0904	−0.124	−0.0223	−0.0928	−0.128			
	(0.0458)	(0.0442)	(0.0668)	(0.130)	(0.0465)	(0.0695)	(0.151)			
Ethnic Diversity	0.0068	0.0076	0.0031	−0.0437	0.0132**	0.0088	−0.0180	0.0126**	0.0066	−0.0142
	(0.0051)	(0.0051)	(0.0055)	(0.0945)	(0.0063)	(0.0054)	(0.0198)	(0.0064)	(0.0062)	(0.0102)
Assassination	0.0172	0.0260	0.0214	−0.103	0.0487*	0.0398**	−0.0106	0.0469*	0.0346	−0.0389
	(0.0197)	(0.0202)	(0.0273)	(0.257)	(0.0266)	(0.0186)	(0.0873)	(0.0266)	(0.0241)	(0.0487)
Ethnic Diversity · Assassination	−0.0044	−0.0058	−0.0040	0.0230	−0.0107**	−0.0078**	0.0082	−0.0104*	−0.0067	0.0089
	(0.0041)	(0.0042)	(0.0052)	(0.0557)	(0.0054)	(0.0036)	(0.0187)	(0.0054)	(0.0048)	(0.0101)
Budget Surplus	0.0008*	0.0005	0.0006	−0.0043	0.0004	0.0007	−0.0072			
	(0.0004)	(0.0004)	(0.0006)	(0.0104)	(0.0005)	(0.0008)	(0.0053)			
M2/GDP	0.0006***	0.0005**	−0.0015*	−0.0053	0.0001	−0.0015	−0.0093*	0.0002	−0.0012	−0.0026**
	(0.0002)	(0.0002)	(0.0008)	(0.0074)	(0.0003)	(0.0011)	(0.0050)	(0.0003)	(0.0010)	(0.0012)
Institutional Quality (Lack of Democracy)		0.0035***	0.0018	−0.0025	0.0052***	0.0038	0.0055	0.0049***	0.0029	0.0049
		(0.0012)	(0.0020)	(0.0103)	(0.0015)	(0.0025)	(0.0095)	(0.0013)	(0.0026)	(0.0033)
Openness	0.0007	0.0008	0.0003	0.0007	0.0004	0.0009	−0.0009			
	(0.0007)	(0.0007)	(0.0002)	(0.0008)	(0.0009)	(0.0003)	(0.0015)			
Constant	−0.0962**	−0.114**	−0.529		−0.166**	−0.546		−0.161**	0.233	
	(0.0422)	(0.0562)	(0.335)		(0.0831)	(0.407)		(0.0631)	(0.263)	
Test for exogeneity of Aid χ^2				0.37			4.05			3.35
				[0.8328]			[0.1317]			[0.1877]
Observations	216	215	215	213	195	195	193	195	195	193
R-squared	0.247	0.302	0.316	–	0.332	0.372	–	0.335	0.340	–
Country Dummy	–	–	Yes	Yes	–	Yes	Yes	–	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of id			25	23		24	22		24	22

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1; The Table reports the point estimates of the growth model by using alternative specifications. In particular, here we use Burnside and Dollar (2000)'s definition of policy variable as well as HR factor.

mance. Also the marginal effects of Table 8 reported in Table 10 and Fig. 8 show a similar pattern.

6.3. Potential endogeneity of Aid

In this section we investigate the potential endogeneity problem of our aid variable by employing alternative approaches. In particular, one may be sceptical about the results of Arellano & Bond results due to their potential sensitivity. To this end, we perform another robustness using the propensity score matching (PSM) algorithm.

The PSM specification follows Caliendo and Kopeinig (2008): the sample is split into treated and untreated sub-samples, and individual observations within the control samples are then matched, where a sufficiently close match is available. We start by assuming that the treatment is that a country receives above the median aid proportional to its GDP, so that the average treatment effect τ_{ATT}:

$$\tau_{ATT} = E_{p(X)|Aid=1}[E(Y)|Aid = 1, p(X) - E(Y|Aid = 0, p(X))] \quad (19)$$

where Y is the log GDP per capita growth, whereas Aid is equal to one if a country is above the median in the aid distribution and zero otherwise. Eq. (19) estimates the difference in growth between the treated group (top aid recipients) and the control group (low aid recipients), while holding constant the probability that an observation with a particular set of characteristics is treated (Caliendo & Kopeinig, 2008).

We also estimate the following equation to test whether top aid recipients and top HR-performing countries gain more in terms of better growth performance in making an effective use of aid.

$$\tau_{ATT} = E_{p(X)|Aid\times HR=1}[E(Y)|Aid \times HR = 1, p(X) - E(Y)|Aid \times HR = 0, p(X)] \quad (20)$$

where $Aid \times HR$ represents the interaction terms, dummies, between top aid recipients and top HR performers.[19]

The results are reported in Table 11. As reported in Fig. 9 the majority of observations is on support (i.e. matches have been found), and in particular virtually all treated observations are on support, which shows, importantly, that the quality of the matching is high. Although some imbalances might still exist, the extremely low Pseudo-R^2, reported in Panel C, and the rejection of likelihood ratio also support the high quality of the matching. Furthermore, Panel B reports sensitivity analysis of the matching exercise where we include our confounding variables. This shows that overall there is low bias between the treated and control groups.

[19] Here we consider top recipients or top HR performers as those above the median value.

Table 8
Burnside and Dollar (2000) Test: Policy$_3$.

VARIABLES	(1) OLS	(2) FE	(3) 2SLS
Lag ln(GDP pc)	−0.0077	−0.0492	−0.0743
	(0.0049)	(0.0440)	(0.0461)
ln(NetODA)	0.0251***	0.0386*	0.229***
	(0.0091)	(0.0189)	(0.0622)
Policy$_3$	0.0002	0.0005	0.0027***
	(0.0002)	(0.0004)	(0.0007)
ln(NetODA) · Policy$_3$	−5.06e-05	−9.01e-05	−0.0006***
	(3.46e-05)	(6.43e-05)	(0.0001)
HR factor	−0.0490**	−0.0757**	−0.221***
	(0.0236)	(0.0358)	(0.0577)
ln(NetODA) · HR factor	0.0148**	0.0235**	0.0700***
	(0.0062)	(0.0096)	(0.0171)
Ethnic Diversity	0.0133**	0.0074	−0.0106
	(0.0062)	(0.0063)	(0.0100)
Assassination	0.0501*	0.0364	−0.0293
	(0.0272)	(0.0240)	(0.0519)
Ethnic Diversity · Assassination	−0.0111**	−0.0070	0.0067
	(0.0054)	(0.0048)	(0.0107)
M2/GDP	0.0002	−0.0010	−0.0024**
	(0.0003)	(0.0010)	(0.0012)
Institutional Quality	0.0048***	0.0023	0.0003
(Lack of Democracy)	(0.0013)	(0.0020)	(0.0032)
Constant	−0.180***	0.124	
	(0.0681)	(0.297)	
Observations	195	195	193
R-squared	0.337	0.338	–
Country Dummy	–	Yes	Yes
Year Dummy	Yes	Yes	Yes
Number of id		24	22

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1; The Table reports the point estimates of the growth model by using alternative specifications. In, particular here we use Burnside and Dollar (2000)'s definition of policy variable as well as HR factor.

Panel A, reports the main results of interest. In particular, the first part reports the average treatment effect (ATT) between the treated and control group, where we include LDCs, as well as all other countries which are aid recipients. We do this first without taking into account the HR Factor. This shows that top aid recipients experience, on average, 0.85% higher growth compared to low recipients, and that this is statistically significant (t-stat = 2.17). Furthermore, once we also control for the HR Factor, we see that the gain in growth is greater: about 1.4% for top aid recipients.

We repeat this analysis, focusing only on LDCs. The results indicate that being a top aid recipient leads to substantial gain in GDPpc growth among LDCs, of about 3.1% compared to other aid recipients. This result is highly significant with a t-stat of 4.22.

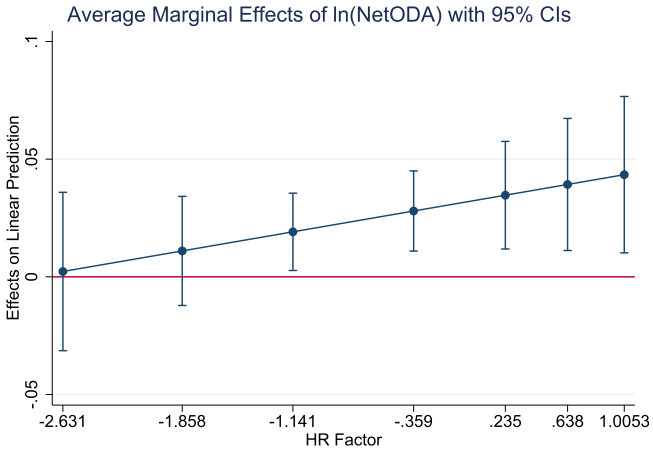


Fig. 7. This figure reports the marginal effects of Net Official Development Assistance variable (NetODA) at different levels of HR Factor as for Table 7.

The resulting estimates strongly support our hypothesis of human rights and aid effectiveness, along with the theoretical analysis in Section 3 that these effects are likely to be more marked in poorer ('poverty trap') countries.

As an alternative, we look at a treatment which depends on the combination of being both a top aid recipient and a top HR performer. In this case, when we look at the full sample, we find little statistical difference between the treated and control groups. However, if we restrict the sample to LDCs, the effect is much stronger and statistically different from zero. Indeed, for LDCs there is a gain of at least 2.19% in GDPpc growth, and this is statistically significant. The finding that HR factor has more effect on aid effectiveness in LDCs than in other countries is consistent with our suggested model in Section 3, where an income floor means the gains to oligarchs from repression and corruption are lower, in the absence of aid.

Furthermore, we relax our treatment variable of top aid recipients to comprise those above the 25^{th} percentile rather than those above the median (mean). The results reported in Table 12 remain consistent and statistically significant. LDCs with better institutional quality and being top aid recipients outperform with a GDP growth of about 2.6% compared to low recipients of aid flows.

6.4. Bootstrapping of standard errors and large country pool

Another potential concern that may arise is the low number of countries. In Table 5 we used about 37 countries, since we wished to focus primarily upon LDCs, as defined by the UN. However, to address the issue of sample size, we investigate whether bootstrapping standard errors by country would affect our results.

Table 9
Marginal effects of Net ODA at different levels of HR Factor: Policy$_2$.

			Delta-method					
Value of HR Factor	Percentile $\widehat{HRFactor}$	Example 2011	Margin	Std. Err.	z	P<z	[95% Conf.	Interval]
−2.631	1%	Myanmar	0.0023	0.0172	0.13	0.895	−0.0314	0.0359
−1.858	10%	Bangladesh	0.0110	0.0118	0.93	0.352	−0.0121	0.0342
−1.141	25%	Nepal	0.0191	0.0083	2.28	0.023	0.0027	0.0355
−0.359	50%	Mozambique	0.0279	0.0086	3.22	0.001	0.0109	0.0449
0.235	75%	Lesotho	0.0346	0.0116	2.97	0.003	0.0118	0.0575
0.638	90%	Vanuatu	0.0392	0.0143	2.74	0.006	0.0112	0.0673
1.0053	95%	Kiribati	0.0434	0.0169	2.56	0.01	0.0102	0.0766

Note: This table reports the marginal effects of log Net Official Development Assistance variable (NetODA) at different levels of HR factor. These results are based on the estimates of Table 7 column 9.

Table 10
Marginal effects of Net ODA at different levels of HR Factor: Policy$_3$.

			Delta-method					
Value of HR Factor	Percentile $\widehat{HRFactor}$	Example 2011	Margin	Std. Err.	z	P>z	[95% Conf.	Interval]
−2.631	1%	Myanmar	−0.0063	0.0091	−0.69	0.487	−0.0242	0.0115
−1.858	10%	Bangladesh	0.0043	0.0062	0.69	0.49	−0.0078	0.0164
−1.141	25%	Nepal	0.0141	0.0057	2.47	0.013	0.0029	0.0253
−0.359	50%	Mozambique	0.0248	0.0080	3.08	0.002	0.0090	0.0406
0.235	75%	Lesotho	0.0330	0.0108	3.05	0.002	0.0118	0.0542
0.638	90%	Vanuatu	0.0385	0.0128	3	0.003	0.0133	0.0637
1.0053	95%	Kiribati	0.0436	0.0148	2.95	0.003	0.0146	0.0726

Note: This table reports the marginal effects of log Net Official Development Assistance variable (NetODA) at different levels of HR factor. These results are based on the estimates of Table 8 column 2.

Furthermore, limiting our analysis to a small number of countries – i.e., LDCs – may be seen as a shortcoming. Thus, we replicate our analysis of Table 5 by both clustering and bootstrapping standard errors as well as including all aid recipient countries. The results in Table 13 highlight a consistent estimation of the conditionality hypothesis both for LDCs as well as when we increase the sample size. Despite this, we note that the interaction term of aid with the HR indicator is much stronger when only poor countries are considered: however, this reiterates our theoretical prediction in Section 3 that poor countries in particular will have higher gains from aid if they improve their human rights performance. In fact, the gain in GDPpc growth is 2.32% for LDCs compared to 1.05% overall.

6.5. Testing Aid-Conditionality Hypothesis in middle-income countries

We investigate whether the conditionality Hypothesis might hold in the case of middle income countries, since the literature suggests increasing concentration of poverty among middle-income countries (Sumner, 2016; Tezanos & Sumner, 2013; Edward & Sumner, 2014).[20] The poverty rates that arise in these countries are mainly driven by increasing inequality, economic growth patterns and development rather than access to resources (Sumner, 2016). To address this, we run our exercise by focusing only on middle-income countries. To this end we report in Table 14 the impact of aid conditionally on the environment with good human rights protection. We present the results by distinguishing between lower- and upper-middle income countries and a combined set of countries. The results for lower middle-income countries suggest that aid has a direct effect (column 2), indeed a 1% increase in log aid leads to about 0.007 percent increase in growth. This effect is also amplified for higher HR factor scores, which suggest that countries with higher levels of human rights protection are better able to realise the efficacy of aid to boost growth up to 0.005 percent. This effect is slightly lower than that reported for LDCs, although it is statistically significant. In other words, at the mean of log aid and the HR factor score, reported in Table 1, there is a 0.023 percent increase in growth for every 1% increase in log aid. Similarly, the results in columns (3)-(4) report the overall effect for upper middle-income countries, suggesting no direct effect of aid, column (4), although the interaction term is positive and statistically significant. The combination of these two groups of countries in the next columns, (5)-(6) shows a similar pattern. This suggests that even in middle-income countries, aid does play a role in boosting economic growth, and it is more so in countries with solid improvements in human rights. These results thus potentially support the conclusions made by Sumner (2016) that any poverty increase in middle-income countries can be mitigated via better human rights improving the effectiveness of aid flows.

[20] We use World Bank classification as of 2021.

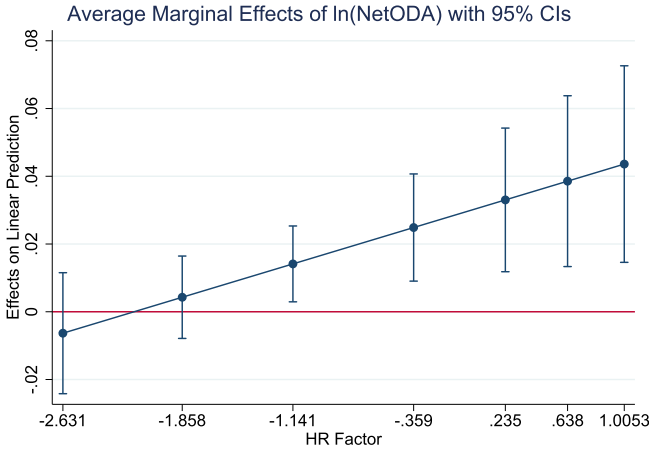


Fig. 8. This figure reports the marginal effects of Net Official Development Assistance variable (NetODA) at different levels of HR Factor as for Table 8.

6.6. Testing Aid-Conditionality Hypothesis for distributional outcomes

We consider as an additional exercise for the possibility that other distributional outcomes such as inequality might reflect the impact of aid-human rights interaction for least developing economies. We investigate whether aid effectiveness in terms of better income distribution (and other non-monetary measures of development) reflects improvement in human rights across countries. We report in Table 15 the point estimates. In particular, we consider two different dependent variables: the GINI index and child mortality rate, which capture the level of inequalities in a given country. What emerges from this, as expected, is that the interaction term between aid and human rights is negative. This suggests that countries with better human rights provisions experience lower inequalities. However, these results are not statistically significant – except being marginally significant for child mortality – which is due to small number of observations on inequality measures. This requires further investigation with better data on different distributional outcomes that we would pursue in a future study. However, our main finding survives that better human rights performance plays a crucial role in making the effectiveness of aid flows in improving per capita income growth and lowering inequalities across these low-income countries.

7. Concluding remarks

This paper has re-assessed the 'aid conditionality' arguments in investigating whether development aid is more effective in countries that are more respectful with human rights protection than in countries where this is not the case. By including the potential conditionality upon non-economic indicators, human rights provi-

Table 11
Propensity Score on Aid Variable: Top recipients above the median.

Panel A

Variable	Sample	Treated	Controls	Difference	S.E.	T-stat
All available countries with Aid: large sample size						
GDP pc growth	Unmatched	0.02325	0.0174	0.0057	0.0030	1.91
	ATT	0.0227	0.0142	0.0085	0.0039	2.17
Including HR Factor						
GDP pc growth	Unmatched	0.0232	0.0174	0.0057	0.0030	1.91
	ATT	0.0233	0.0096	0.0137	0.0047	2.91
Treatment:Top HR performer × Top Aid Recipient						
GDP pc growth	Unmatched	.0210	.0203	.0007	.0035	0.21
	ATT	0.0209	.0177	.0032	.0043	0.74
Least Developed Countries						
Including HR Factor						
GDP pc growth	Unmatched	0.0208	0.0088	0.012	0.0058	2.08
	ATT	0.0208	−0.0101	0.0309	0.0073	4.22
Treatment:Top HR performer × Top Aid Recipient						
GDP pc growth	Unmatched	0.0194	0.0167	0.0027	0.0058	0.46
	ATT	0.0201	−0.0018	0.0219	0.0084	2.60

Panel B

Variable	Mean Treated	Control	t-test %bias	t	p<t
ln(Econ. Globalization)	3.6861	3.6479	13	2.87	0.004
Income Inequality	4.7163	4.4917	15.4	3.72	0
Child Mort. Rate	94.336	95.698	−2.4	−0.54	0.588
Internal Conflict	1.0914	1.281	−5.9	−1.74	0.082
Neighboring Conflict	4.7395	4.5	5.8	1.37	0.17
Inflation	0.2011	0.32321	−2.9	−1.71	0.088
Ethnic Diversity	3.854	3.7903	3	0.75	0.45
Institutional Quality	4.2458	4.3729	−4.1	−1.02	0.309

Panel C

Ps R2	LR chi2	p<chi2	MeanBias	MedBias	B	R
0.011	35.35	0.000	6.6	5	24.4	1.11

Note: This table reports the propensity score matching results on different sample sizes. The treatment here is that a country is above the median of Aid recipient and zero otherwise. First we report in Panel A the results on a large sample size with all aid recipient countries available included, and then we restrict the sample only on LDC. Panel B reports an example of the sensitivity test of the confounding variables between the treated and control. Finally Panel C highlights the quality of this match.

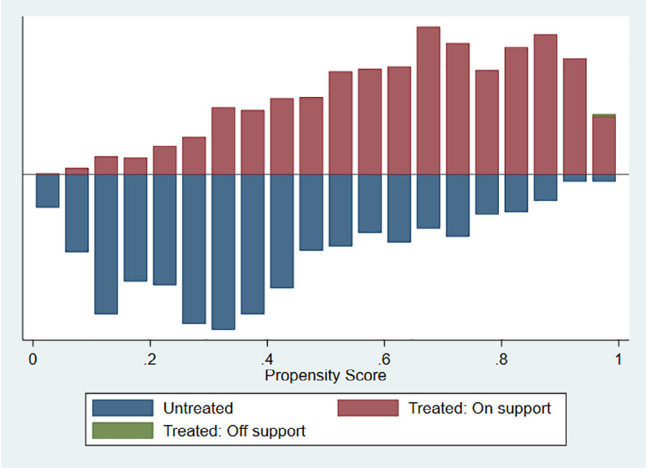


Fig. 9. Propensity score: matching on support. (This figure reports the propensity score matching distribution between treated and control on support.)

sion can be seen as underpinning better institutional structures in lowering repression and corruption. This paper used human rights data for the first time to integrate a non-monetary dimension as a conditionality measure into aid allocations, in the absence of comparable continuous time series data on repression and corruption.

As part of this analysis, we have set up a theoretical model of repression and corruption, where resources – including aid resources – are diverted to oligarchs' consumption in the presence of worse level of human rights performance. Following this, we argued that, in low income countries with a poverty trap, the marginal diversion of aid is particularly likely to be high where repression is present. This is particularly significant as the literature emphasizes that the main potential role for aid in promoting growth is precisely in those countries which are experiencing a poverty trap. To account for this non-income dimension of aid effectiveness, our empirical investigation of the effect of aid on per capita GDP growth was carried out for least developed countries, introducing an aid-human rights interaction to capture the beneficial effect.

The results have strongly supported Sen (2001)'s development as freedom hypothesis, as well as providing a strong, modified variant on Burnside and Dollar (2000)'s aid conditionality finding. While initial regressions tended to indicate limited benefit from aid in terms of GDP growth, the interaction with measures of human rights makes our results more meaningful and significant, with remarkably consistent results across regressions, as other socioeconomic variables and even when conflict variables are introduced. Indeed, several robustness checks in Section 6 have confirmed that, while macroeconomic policy variables are important predictors of aid effectiveness, human rights also emerge as a better predictor of aid effectiveness in LDCs and even for a broader group including middle-income countries.

Table 12
Propensity Score on Aid Variable: Top recipients above $25^{th}p$.

All available countries with Aid: large sample size						
GDP pc growth	Unmatched	0.0202	0.0213	−0.0011	0.0034	−0.32
	ATT	0.0204	0.0041	0.0162	0.0073	2.21
Least Developed Countries						
GDP pc growth	Unmatched	0.0177	0.0120	0.0057	0.0110	0.52
	ATT	0.018922	−0.0076	0.0265	0.0134	1.97

Note: This table reports the propensity score matching results on different sample sizes. The treatment here is that a country is above the 25^{th} percentile of Aid recipient and zero otherwise. First we report the results on a large sample size with all aid recipient countries included, and then we restrict the sample only on LDCs.

Table 13
Conditionality Hypothesis clustered errors terms.

	LDCs				All available countries	
VARIABLES	(1) OLS	(2) FE	(3) 2SLS	(4) GMM	(5) FE	(6) GMM
ln(NetODA)	0.0105	0.0195**	−0.0346	0.0164**	0.0128***	0.0132**
	(0.0103)	(0.0083)	(0.0569)	(0.0074)	(0.0039)	(0.0061)
ln(NetODA) · HR factor	0.0181	0.0265**	0.0201*	0.0232***	0.0101**	0.0105***
	(0.0117)	(0.0120)	(0.0112)	(0.0080)	(0.0042)	(0.0040)
HR factor	−0.0627	−0.0837**	−0.0569	−0.0774***	−0.0256*	−0.0277**
	(0.0412)	(0.0423)	(0.0394)	(0.0299)	(0.0139)	(0.0137)
ln(Econ. Globalization)	−0.0138	0.0554	0.0763	−0.0361	0.0340	−0.000707
	(0.0380)	(0.0586)	(0.0760)	(0.0391)	(0.0301)	(0.0384)
ln(Income Inequality)	−0.0040	0.0036	0.0052	0.0002	0.0015	0.0009
	(0.0042)	(0.0047)	(0.0060)	(0.0039)	(0.0039)	(0.0036)
Child Mort. Rate	0.0004	−0.0003	−0.0003	−0.0002	−0.0002	−0.0004
	(0.0002)	(0.0004)	(0.0004)	(0.0002)	(0.0003)	(0.0004)
Internal Conflict	−0.0050*	−0.0064***	−0.0067**	−0.0066**	−0.0040***	−0.0058***
	(0.0027)	(0.0024)	(0.0028)	(0.0027)	(0.0012)	(0.0022)
Neighboring Conflict	0.0024	0.0010	0.0014	0.0029	0.001	0.0018
	(0.0018)	(0.0014)	(0.0014)	(0.0023)	(0.0008)	(0.0012)
Inflation	0.0150	−0.0091	−0.0089	0.0127	−0.0023	−0.0021*
	(0.0162)	(0.0213)	(0.0245)	(0.0129)	(0.0023)	(0.0011)
Ethnic Diversity	−0.0017	−0.0029	−0.0027	−0.0017	−0.0022	0.0002
	(0.00347)	(0.0050)	(0.0059)	(0.0022)	(0.0035)	(0.0049)
Lack of Democracy	0.0033*	0.0016	0.0003	0.0014	0.0004	0.0027
	(0.0017)	(0.0021)	(0.0024)	(0.0017)	(0.0013)	(0.0018)
Gross Enrol. Ratio Primary	0.0003	0.0004	0.0004	0.0005	−0.0002	−1.36e-05
	(0.0002)	(0.0004)	(0.0005)	(0.0003)	(0.0002)	(0.0004)
Lag ln(GDP pc)	−0.00261	−0.181***	−0.183***		−0.171***	
	(0.0211)	(0.0485)	(0.0560)		(0.0300)	
Lag Change ln(GDP pc)				0.113		0.0604
				(0.106)		(0.146)
Constant	−0.0356	0.826**		0.0195	1.044***	−0.0199
	(0.0971)	(0.323)		(0.175)	(0.256)	(0.181)
Observations	702	702	676	663	1,933	1,809
R-squared	0.186	0.367	0.305		0.279	
Country Dummy	–	Yes	Yes	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Number of id		37	37	37	108	107

Note: Bootstrapped clustered standard errors in parentheses by country. *** p<0.01, ** p<0.05, * p<0.1; The Table reports the point estimates of the growth model by using different alternative specifications. The results show a consistent positive effect of the interaction term between aid and HR factor.

From our evidence on human rights and corruption correlation, we have shown that the indicators of institutional governance tend to be positively correlated with our human rights index, making it a better indicator of institutional quality. The paper thus concludes that human rights protection is a valid institutional measure, given both its intrinsic value and the availability of such data, to be used as a conditionality variable in allocating aid.

Aside from the growth outcome, we have also considered other distributional outcomes like income inequality and infant mortality as a non-monetary measure of development. Despite the small sample size in using income inequality, our main findings have remained consistent, that aid effectiveness due to better human rights produces not only higher income growth but also lower income inequality and infant mortality as distributional outcomes.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Table 14
Aid Conditionality-Hypothesis in middle income countries.

	(1)	(2)	(3)	(4)	(5)	(6)
	Lower middle income		Upper middle income		All middle income	
VARIABLES	2SLS	GMM	2SLS	GMM	2SLS	GMM
ln(Net ODA)	−0.0331	0.00668**	0.0972**	0.00474	0.0942**	0.00257
	(0.0338)	(0.00282)	(0.0434)	(0.0110)	(0.0475)	(0.00893)
ln(NetODA) · HR factor	−0.00647	0.00487**	0.0397***	0.0159**	0.0302**	0.0104**
	(0.00902)	(0.00223)	(0.0150)	(0.00743)	(0.0142)	(0.00514)
HR factor	0.0251	−0.0145**	−0.0812**	−0.0167	−0.0815*	−0.0199
	(0.0291)	(0.00620)	(0.0392)	(0.0157)	(0.0420)	(0.0140)
ln(Econ. Globalization)	0.0326	0.0216	0.0377	−0.0430	0.0631	−0.0258
	(0.0277)	(0.0187)	(0.0594)	(0.0512)	(0.0399)	(0.0555)
Inflation	−0.0303***	−0.0220***	−0.00157***	−0.00293***	−0.00164***	−0.00263***
	(0.00803)	(0.00336)	(0.000508)	(0.000771)	(0.000465)	(0.000963)
ln(Income Inequality)	−0.00374	−0.00457	0.00108	−0.00322	0.000194	−0.00447
	(0.00358)	(0.00288)	(0.0104)	(0.0107)	(0.00462)	(0.00707)
Child Mort. Rate	−0.000376*	8.31e-05	0.00183**	0.00202*	0.000191	0.000639
	(0.000225)	(0.000117)	(0.000792)	(0.00110)	(0.000271)	(0.000450)
Lag Change ln(GDP pc)		0.149*		−0.0847		−0.0270
		(0.0801)		(0.177)		(0.181)
Lag ln(GDP pc)	−0.0637***		−0.219***		−0.185***	
	(0.0188)		(0.0458)		(0.0320)	
Constant		−0.0665		0.0379		0.0470
		(0.0736)		(0.165)		(0.170)
Arellano-Bond test for AR(2)		.72776		−1.270		-.9895
		[0.467]		[0.204]		[0.322]
Observations	731	718	638	614	1,369	1,332
Number of id	39	39	37	37	76	76
Country Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1; The Table reports the point estimates of the growth model by using alternative specifications. The results show a consistent positive effect of the interaction term between aid and HR factor, while we control for additional macroeconomic variables.

Table 15
Aid Conditionality Hypothesis, Inequality and Child Mortality.

	(1)	(2)	(3)	(4)
VARIABLES	GINI index		Child Mort. Rate	
Lag ln(GDP pc)	0.120	−0.470	−7.618*	3.738
	(3.234)	(1.334)	(4.270)	(0)
ln(Net ODA)	−14.02*	0.265	−0.654	0.300
	(7.233)	(0.249)	(9.748)	(0)
HR factor	9.068	0.206	8.704	2.019
	(6.032)	(0.576)	(6.790)	(0)
ln(NetODA) · HR factor	−2.314	−0.125	−2.977*	−0.193
	(1.629)	(0.172)	(1.723)	(0)
ln(Econ. Globalization)	26.40**	−0.176	−18.58*	−17.27
	(10.41)	(1.731)	(10.29)	(0)
Inflation	−1.745	−1.441***	−6.184**	0.0431
	(1.949)	(0.550)	(3.053)	(0)
Internal Conflict	−0.0325	−0.00550	0.647**	0.377
	(0.129)	(0.0215)	(0.305)	(0)
Ethnic Diversity	−0.146	−0.0276	1.989***	0.320
	(0.332)	(0.0913)	(0.654)	(0)
Lack of Democracy	−0.0798	0.0695	0.523	0.774
	(0.216)	(0.0767)	(0.509)	(0)
Constant		3.907		45.83
		(4.955)		(0)
Observations	463	422	709	738
Number of id	31	31	38	41
Country Dummy	Yes	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes
Method	2SLS	GMM	2SLS	GMM

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1; The Table reports the point estimates of the inequality model by using alternative specifications - i.e., GINI index and child mortality rate as dependent variables. The results show a consistent negative effect of the interaction term between aid and HR factor (although not statistically significant), while we control for additional macroeconomic variables.

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Appendix A. Growth effects of aid, in a bargaining model in the presence of a minimum workers' income constraint

We start with Eq. (13), denoting $\frac{v}{v-\bar{v}} = V$.

$$\frac{\partial N'}{\partial \gamma} = \frac{\partial ln\, v}{\partial \gamma}(V+H) + \frac{H}{\gamma} = 0.$$

Now note that $\frac{\partial ln v}{\partial \gamma} = -\frac{2a}{1-2a}\frac{1}{1-\gamma}$; so that substituting in for this

$$\frac{\partial N'}{\partial \gamma} = -\frac{2a}{1-2a}\frac{1}{1-\gamma}(V+H) + \frac{H}{\gamma} = 0. \tag{21}$$

Hence, after further simplification, the Nash bargaining outcome is

$$\hat{\gamma} = \frac{H-2aH}{H+2aV}. \tag{22}$$

Similarly for T, starting with Eq. (14)

$$\frac{\partial N'}{\partial T} = \frac{\partial ln\, v}{\partial T}(V+H) + \frac{H}{T} = 0.$$

And since

$$\frac{\partial ln\, v}{\partial T} = \frac{1}{2a-1}\left[\frac{1}{1-T} - \frac{2a}{T}\right],$$

then

$$T = \frac{H+2aV}{2H+V+2aV}. \tag{23}$$

We are interested in the effects upon log of GDPpc of changing aid subsidy on investment, θ.

We start with Eq. (5).

Taking logs, and using Ω to consolidate constants and without changing parameters, we derive

$$lnY = \Omega - \frac{2a}{1-2a}ln(1-\theta) + \frac{1}{1-2a}ln(1-T) + \frac{2a}{1-2a}lnT + \frac{2a}{1-2a}ln(1-\gamma). \tag{24}$$

Totally differentiating this, we obtain

$$\partial lnY = \frac{2a}{1-2a}\frac{\partial \theta}{(1-\theta)} - \frac{\frac{1}{1-T} + \left(\frac{2a}{T}\right)}{1-2a}\partial T - \frac{2a}{1-2a}\frac{1}{1-\gamma}\partial\gamma. \tag{25}$$

Note that when T and γ are exogenous (which is the case where V is constant, i.e., where the minimum income constraint is not binding),

$$\left(\frac{\partial lnY}{\partial \theta}\right)^{unconstrained} = \frac{2a}{1-2a}\frac{1}{(1-\theta)} > 0. \tag{26}$$

Hence Y and v are increasing with respect to the aid share, with the elasticity increasing with respect to the share of aid in the budget. Moreover, this is unaffected by H.

Now consider the indirect (feedback) channels. A rise in aid leads to a rise in Y (and an equiproportionate rise in v), but this leads to a rise in T and γ, both of which offset the GDP increase.

First consider

$$\hat{\gamma} = \frac{H-2aH}{H+2aV} \Rightarrow \frac{\partial \hat{\gamma}}{\partial V} = -\frac{2a(1-2a)H}{(H+2aV)^2} < 0. \tag{27}$$

This is increasing with respect to H as long as $H > 2aV$. In the case of T,

$$T = \frac{H+2aV}{2H+V+2aV} \Rightarrow \frac{\partial \widehat{T}}{\partial V} = \frac{V-(1-2a)H}{(2H+V+2aV)^2}. \tag{28}$$

We note that this latter term is likely to be negative if $V < (1-2a)H$. In this case, which is more likely with v being small relative to $\bar{v}$ and with poor human rights (high H), we can definitely say that both T and γ will be increasing with respect to V, which will dampen the rise in lnY.

Table A.1
List of Least Developed Countries.

Country Name			
Afghanistan	Djibouti	Liberia	Sierra Leone
Bangladesh	Equatorial Guinea	Madagascar	Solomon Islands
Benin	Eritrea	Malawi	Sudan
Bhutan	Ethiopia	Mali	Tanzania
Burkina Faso	Gambia, The	Mauritania	Togo
Burundi	Guinea	Mozambique	Uganda
Cambodia	Guinea-Bissau	Nepal	Vanuatu
Central African Republic	Haiti	Niger	Yemen, Rep.
Chad	Kiribati	Rwanda	Zambia
Comoros	Lao PDR	Sao Tome and Principe	
Congo, Rep.	Lesotho	Senegal	

Note: This table reports the list of LDCs used in our analysis.

Appendix B. List of Least Developed Countries

See Table A.1.

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