Policy Research Working Paper 8889

Better Policies from Policy-Selective Aid?

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WORLD BANK GROUP
Development Economics
Development Research Group
June 2019

Policy Research Working Paper 8889

Abstract

This paper shows that the increased policy-selectivity of aid allocations observed in recent years provides recipient countries an incentive to improve policies. The paper estimates that a change in the World Banks Country Policy and Institutional Assessment policy index from 1.5 to 2 for a recipient is associated with an increase of about 13 percent in aid. The analysis also finds a modest but statistically significant positive relationship between the share of policy-selective aid in the global aid budget and policy, suggesting that policy-selective aid improves policies. This effect is properly identified, as the share of policy-selective aid in the global aid budget is exogenous to recipient country policy choices. Furthermore, the paper provides a game theoretic model that establishes the link between the policy-selectivity of the global budget and better recipient country policies in equilibrium.

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Better Policies from Policy-Selective Aid?*

Kurt Annen† and Stephen Knack‡

*Sadly, Steve Knack passed away only few days after we finished writing this paper. Steve was a dedicated and inspiring scholar, colleague, and friend. Collaborating with him was an enriching experience. He will be greatly missed.

The paper benefited from helpful comments made by Simon Hug, Andreas Fuchs, Samantha Custer, Andrea Presbitero, Alexander Meek and participants of the workshop "Tracking International Aid and Investment from Developing and Emerging Economies" in Heidelberg, the seminar at the Political Science Department of the University of Geneva, and the annual conference of the European Public Choice Society in Jerusalem. Any remaining errors are our own, as are all the views expressed in this article, which do not necessarily represent those of the World Bank or World Bank policy.

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1 Introduction

Aid allocations of many multi- and bilateral donors became more policy-selective starting in the 1990s – that is, donors provided more aid to recipient countries with better policies. This fact, which we discuss in more detail below, raises two important questions that this paper seeks to answer: First, does increased policy-selectivity of donors provide recipients with an incentive to improve policies? Second, has the increased policy-selectivity of donors translated into improved policy levels in aid recipient countries? Clearly, the second question is relevant only when we answer the first one affirmatively.

We address these two questions theoretically and empirically. We develop a game-theoretic model that shows that policy-selective aid by a donor leads to a contest for aid among recipients in terms of policies, which increases policy levels in recipient countries in equilibrium. Comparative static results of the model show, however, that incentives to participate in that contest depend on the level of aid and other resource windfalls a recipient receives unconditionally of its policy choice. This result holds if the donor's aid allocation is both policy- and poverty-selective, as a poverty-selective donor, conditional on policies, balances out resources across recipients. A recipient receiving a sufficiently large amount of unconditional aid has no incentive to participate in the contest for aid. Because not all aid is given policy-selectively, including large financial flows by China and other emerging donors more recently, it is then an empirical question whether for a recipient government improving policy levels tends to lead to more aid as our model predicts.

We provide evidence for an economically and statistically strong and robust relationship between lagged policy and current aid conditional on lagged aid using recipient-year panel data. Thus, our estimates suggest that a positive change in policy is associated with an increase in aid money. We estimate that an increase in the World Bank's CPIA policy index from 1.5 to 2 for a recipient is associated with about a 13% increase in aid.

The second question – of whether policy-selective aid produces better policies – poses the challenge of empirically disentangling selection effects – i.e. donors are policy-selective – from incentive effects – i.e. selectivity leads to better policies. If we find a positive correlation between policy levels and policy-selective aid a recipient receives, that relationship would be consistent with both selection and incentive effects. We overcome this challenge by recognizing an important insight generated by our

theoretical model: it is the policy-selectivity of the *overall* or *global* aid budget that affects recipients' incentives to improve policies. Importantly, the policy-selectivity of the overall aid budget is exogenous to recipient country policies and to other recipient country factors that may affect its policies. The choices of any one recipient country are unlikely to affect the policy-selectivity of the global aid budget. We find economically modest but statistically significant positive incentive effects. We show that a 10 percent increase in the global share of aid that is given policy selectively increases policy for the average recipient country by about 1.34 percent. Furthermore, we present evidence that is consistent with comparative static results of our model, namely that a large resource influx by a donor that allocates aid unconditional of policies reduces the incentive effect. We show that the incentive effect disappears for recipient countries that received a large amount of investments from China.

The current paper relates to the growing literature that analyzes the policy selectivity of donors' aid allocations (Dollar and Levine, 2006; Knack, Rogers, and Eubank, 2011; Annen and Knack, 2018; World Bank, 2005; Annen and Moers, 2017). The policy-selectivity of aid allocations received more scrutiny after the publication of World Bank (1998) and a working paper version of Burnside and Dollar (2000), which both argue that aid is effective conditional on good policy. This message has been very influential among policy makers and development practitioners, as Easterly (2003) convincingly shows. Most of this literature, however, addresses policy-selectivity from a donor perspective. Here, we also consider the recipient perspective, as it is not clear whether policy-selectivity by donors translates into a better-policy-more-aid relationship for a typical recipient country that receives aid from many donors, of whom not all are policy-selective. In addition, we ask whether policy-selective aid leads to better policies, which may be expected when recipients are rewarded with more aid if they improve their policies.

Previous studies of this question relied on somewhat dubious identification strategies, and arrived at very mixed results, based on somewhat different methods, time periods, and policy measures. Burnside and Dollar (1997) report no relationship between aid and an index of macro policy distortions; Alesina and Weder (2002) similarly conclude aid has no effect on corruption. Knack (2001) finds aid impairs the quality of governance, measured by an index of bureaucratic quality, rule of law and corruption, but Tavares (2003) reports the contradictory finding that aid reduces corruption. Heckelman and Knack (2008) find aid reduces scores on a broader policy index of "economic freedom." These studies do not attempt to distinguish policy selective aid from other aid. Öhler, Nunnenkamp, and Dreher (2012), in

contrast, test for incentive effects associated with the introduction of the U.S. Millennium Challenge Account (MCA), which makes recipients eligible for its aid only if they are below a certain income threshold and above specified thresholds on a set of policy measures. Öhler, Nunnenkamp, and Dreher (2012) focus on one key measure – an index of corruption – and report improvements in scores for countries and periods in a plausible treatment group relative to a plausible control group. This finding is rather surprising, however, given the short period of time covered by their analysis and the small amounts of aid commitments and disbursements by the MCA. Here, we use the World Bank's "Country Policy and Institutional Assessment" (CPIA) index as our policy measure, which includes corruption as one sub-component. In addition, we show that policy-selectivity of aid started to increase quite substantially in the early 1990s, which corresponds to the end of the sample period used in Alesina and Weder (2002).

Our theoretical model is closely related to Annen and Knack (2018), who analyze a 2-donor-2-recipient setup. Here, we look at a 1-donor-n-recipient setup to focus more on the incentive effects the number of recipients has on the competition for aid. Also, we extend the framework by introducing an incentive alignment parameter between the donor and recipients, to see how it affects the incentive effect of policy-selective aid.

The remainder of the paper is structured as follows: Section 2 documents the policy selectivity of donors since 1985 as the key fact our paper builds on. Section 3 introduces the theoretical model. Section 4 uses the insights generated by the model to empirically test the impact of policy-selectivity on policies. Section 5 concludes.

2 Policy Selectivity of Foreign Aid

The World Bank's CPIA assesses the quality of countries' present policies and institutions on a yearly basis for IDA and IBRD-eligible countries. Ratings for IDA but not IBRD countries are publicly available. The CPIA index comprises four broad dimensions or policy "clusters": 1) macroeconomic management including monetary, fiscal and debt policy, 2) structural policies such as trade and financial sector policies, and the regulatory environment for businesses, 3) policies for social inclusion and equity, including policies related to gender equality, education, health, social protection and labor, and the environment, and 4)

public sector management and institutions, including policies related to property rights, quality of public administration, and transparency. See Table 1 for a list of the 16 sub-dimensions. This table shows that there are statistically significant differences in the average of the 12 question scores across years. Trade with an average score of 3.96 has the highest score whereas the score on question 16, that deals with transparency, accountability and corruption in the public sector, with 3.05 has a score that is almost a full point lower. Both formally and in practice, the World Bank allocates more of its IDA aid to countries with higher CPIA ratings. The African and Asian Development Banks similarly allocate their aid using very similar policy indexes, and other donors take the CPIA (among other cross-country ratings) into account in allocating their aid. We therefore use the CPIA as our policy measure throughout the paper.

Table 1: Averages of CPIA components between 2004-2016

Q1: Monetary and Exchange Rate Policies	0.39***
	(0.03)
Q2: Fiscal Policy	0.06**
	(0.03)
Q3: Debt Policy and Management	0.25***
	(0.03)
Q4: Trade	0.54***
	(0.03)
Q5: Financial Sector	-0.12***
	(0.03)
Q7: Gender Equality	0.26***
	(0.03)
Q8: Equity of Public Resource Use	0.11***
	(0.03)
Q9: Building Human Resources	0.24***
	(0.03)
Q10: Social Protection and Labor	-0.12***
	(0.03)
Q11: Policies and Institutions for Environmental Sustainability	-0.01
	(0.03)
Q12: Property Rights and Rule-based Governance	-0.33***
	(0.03)
Q13: Quality of Budgetary and Financial Management	-0.01
	(0.03)
Q14: Efficiency of Revenue Mobilization	0.20***
	(0.03)
Q15: Quality of Public Administration	-0.27***
	(0.03)
Q16: Transparency, Accountability, and Corruption in the Public Sector	-0.36***
	(0.03)
Constant	3.41***
	(0.02)
N	26544
R-squared	0.10
F statistic	191.69

The omitted category among the 16 CPIA categories is "Q6: Business Regulatory Environment."

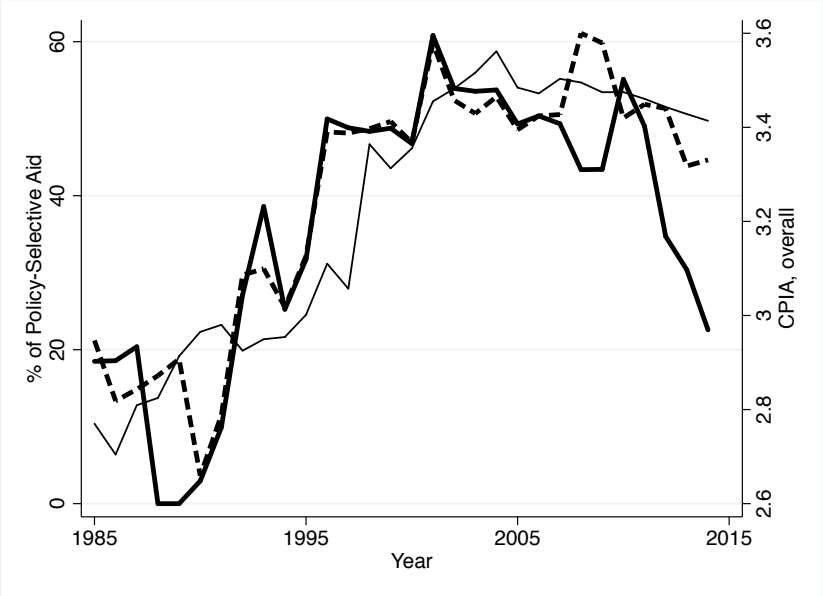
To determine the share of policy selective aid disbursed to recipients, we run recipient-year aid allocation regressions for each donor, using the lagged CPIA index as the key explanatory variable. In these regressions we control for GDP per capita and total population, both lagged. All covariates are expressed in logs.[1] If a donor has a positive and statistically significant (of at least 10%) CPIA coefficient in these regressions for at least four of the most recent 5 years, a donor is classified as being policy-selective in that year. The premise is that only donors known to disburse aid policy-selectively are likely to influence recipient policies. In order to assure that these donor-specific recipient-year aid allocation regressions are not influenced by outlier observations, we also estimate these regressions by removing observations that exhibit a DFBETA that is larger than $2/\sqrt{n}$ hereby following Belsley, Kuh, and Welsch (1980). The share of policy selective aid, our variable of interest, is then calculated as the sum of aid allocated by policy selective donors divided by the sum of aid allocated by all donors. Because policy-selectivity is measured based on two samples, the full sample and a sample where we remove outliers, we obtain two such measures for our analysis.

Figure 1 depicts the share of policy-selective aid in the global aid budget for the years between 1985 and 2014. The two lines in bold show that share, with the solid line showing the full sample results and the dashed line showing the outlier adjusted results. Figure 1 shows a substantial increase between 1990 and 2001 from zero to 60%, and then declines to just above 20% in 2014. Since 2011, the decline has been fairly steep. However, note that the decline has been not as pronounced when removing outlier-recipient observations from our donor aid allocation regressions using our mechanism explained earlier. The large discrepancy between the two lines, particularly from 2012 onward, is mainly driven by the US. In the full sample analysis, the US is classified as policy-selective only in the years 2010 and 2011, whereas in the analysis where we remove outliers the US is classified as being policy-selective from 2008 onward. Consistent outliers are for example Chile, Iraq and Zimbabwe, which all bias the CPIA estimate downward. Iraq and Zimbabwe because of too much aid and Chile because of too little aid given their CPIA. Note that from 2003 onward, Chile has been identified as an outlier for about 14 donors in average in our sample of 72 donors. We believe that these examples illustrate that our outlier adjusted policy-selectivity measure is probably the better measure for policy-selective aid as it seems hardly plausible to us to see recipient countries such as Chile and Iraq as serious participants in

[1] GDP and population data are obtained from the Penn World Tables (pwt90).

the "contest for aid."

The non-bold line in Figure 1 shows average policy – measured by the CPIA – across recipients for the same time period, and its dynamics over time exhibit a very similar pattern – particularly when considering the outlier adjusted measure. The change in the CPIA over the time period amounts to about one full point from 2.5 to 3.5. For example, on the trade policy sub-dimension, an increase from 2 to 3 implies a change from a "very discretionary and discriminatory trade regime" to a "somewhat discretionary and discriminatory trade regime," and "high" taxation of imports and exports to "moderate" taxation. On the transparency sub-dimension, an increase from 2 to 3 corresponds to a change from "boundaries between the public and private sectors are poorly defined, and conflicts of interest abound" to "boundaries between the public and private sectors are moderately well defined, but violations are frequent and often not investigated or sanctioned." Note that there is quite a bit of a variation in the policy level across aid recipient countries. For example, in Peru, Uganda, or St. Kitts and Nevis the CPIA index has improved by more than three points while in other countries such as Suriname or Iraq it hardly changed over this time period.



Bold lines shows the percentage of policy-selective aid in the global aid budget (GPS) between 1985 and 2014. Dashed bold line shows GPS without outliers. Solid line shows the average overall CPIA measure among recipient countries. The large jump between 1997 and 1998 reflects also the change from a 5- to a 6-point scale in the CPIA measurement.

Figure 1: Share of Policy-selective Aid and CPIA

3 The Model

Consider a situation between one donor and n recipient countries. Recipients maximize their utility u_i by choosing policy regarding the division of resources, from domestic sources and foreign aid, between a public good and a private good. The utility of a recipient is given by

$$u_i = G_i + \phi_i(1 - p_i)R_i, \tag{1}$$

where $R_i = r_i + a_i$, i.e. the total amount of resources, consisting of domestic resources r_i and foreign aid a_i, and G_i is the public good that is produced using technology

$$G_i = (p_i R_i)^\beta.$$

The parameter, ϕ_i, captures a recipient's valuation of the public good relative to the private good. The larger ϕ_i, the more a recipient values the private good relative to the public good. The fundamental assumption behind selectorate theory holds that national leaders aim to remain in power by distributing public and private goods to their supporters. One can also think of cultural or deep-rooted institutional factors affecting the relative valuation of private and public goods. Since ϕ_i relates to preferences, and we think of u_i as preferences of the government, ϕ_i may also capture to what extent a country is run by the elite having a relatively low valuation for public goods, as opposed to a democratically elected government that has a higher valuation for public goods (e.g. Acemoglu and Robinson, 2006).[2] .

We assume an altruistic donor with preferences given by

$$v = \sum_{i=1}^{n} G_i. \tag{2}$$

Note that given these preferences, the parameter ϕ_i measures the alignment of preferences between the donor and a recipient. If $\phi_i = 0$ the preferences are perfectly aligned. The larger ϕ_i, the smaller the alignment of the donor's and a recipient i's preferences.

[2]For example, this setup can be justified by the theory on the winning coalition in political science (e.g. Bueno de Mesquita, Smith, Siverson, and Morrow, 2003; Bormann, Eichenauer, and Hug, 2017), where it is argued that the mix between private and public goods depends on the relative size of the "selectorate" and the "winning coalition" (Bueno de Mesquita, Smith, Siverson, and Morrow, 2003, p. 42)

Our donor allocates its aid budget $b > 0$ among the n recipients after perfectly observing their policy choices p_i. This setup produces the following timing of the game: First, recipients simultaneously choose p_i. Second, the donor chooses an aid allocation $a = (a_1, \ldots, a_n)$, where $a_i \geq 0$ is the aid given to recipient i. We are solving the game by finding a Subgame Perfect Equilibrium $\{(a^*(p)), p^*\}$, where $a^*(p)$ is the donor's strategy specifying an aid allocation for every possible history of the game.

Consider, first, the donor's optimization problem in the last stage of the game. Given $p = (p_1, \ldots, p_n)$, the donor's optimization problem is

$$\max_{a_1,\ldots,a_n} \sum_{i=1}^{n} G_i, \quad \text{s.t.} \quad a_1 + \ldots + a_n \leq b.$$

The Kuhn-Tucker conditions equal

$$\beta p_i (p_i(r_i + a_i))^{\beta - 1} - \lambda \leq 0, \quad a_i \geq 0 \quad \text{w.c.s} \quad \forall i,$$

$$b - a_1 - \ldots - a_n \geq 0, \quad \lambda \geq 0 \quad \text{w.c.s.}$$

Recognizing that λ is identical across i and that the budget constraint must be binding yields the condition that in the optimum

$$R_i^* = \max[\min[\gamma_i(R + b), r_i + b], r_i], \tag{3}$$

where $R = r_1 + \ldots + r_n$ and

$$\gamma_i \equiv \frac{p_i^{\frac{\beta}{1-\beta}}}{p_1^{\frac{\beta}{1-\beta}} + \ldots + p_n^{\frac{\beta}{1-\beta}}}.$$

γ_i is recipient i's share of total resources. We observe that γ_i amounts to a standard Tullock contest in terms of policies. However, this contest is not a contest for aid only but a contest for all resources, including the recipient country's own resources r_i. This comes from the fact that the donor cares about the distribution of the public good overall, and both aid and country resources are used to produce the public good. Thus, the aid allocation depends not only on policy but also on the level of country

resources r_i. Our donor, thus, is both policy-selective *and* poverty-selective when allocating aid. Thus,

$$a^*(p) = (\max[\min[R_1^* - r_1, b], 0], \ldots, \max[\min[R_n^* - r_n, b], 0]),$$

where R_i^* is defined in (3). We can conclude that a higher policy level leads to more aid, and more country resources r_i lead to less aid.

Consider now the recipient's decision given $a^*(p)$. If a recipient receives no aid, then recipient i maximizes u_i by choosing

$$p_i^* = \min[\frac{\left(\frac{\beta}{\phi_i}\right)^{\frac{1}{1-\beta}}}{r_i}, 1] \equiv p_i^0(r_i).$$

Indirect utility in this case equals $u_i^0 = \phi_i r_i + \left(\frac{\beta}{\phi_i}\right)^{\frac{1}{1-\beta}} \phi_i \left(\frac{1}{\beta} - 1\right)$. Comparative statics suggest that indirect utility increases in both r_i and ϕ_i, and a higher value for the private good ϕ_i leads to lower policy levels. More country resources similarly lead to lower policy levels. The latter result is a direct implication of the fact that a recipient's preferences are quasi-linear in the private good, which implies that once the public good reaches a certain level it does not increase any further with increasing resources. All additional resources are allocated to the private good. However, this logic breaks down when $a_i > 0$ in equilibrium. Now, the recipient is part of the contest for aid, and increasing policy has the additional benefit of increasing resources – resources that can be used for the production of the public *and* the private good.

For a recipient the benefit from participating in the contest for aid is that aid increases total resources R_i, which increases utility. The marginal benefit equals: $\text{MB}_i = \frac{\partial u_i}{\partial R_i} \frac{\partial R_i}{\partial p_i}$, where $\frac{\partial u_i}{\partial R_i} = p_i G_i' + \phi_i(1 - p_i)$ and

$$\frac{\partial R_i}{\partial p_i} = \gamma_i z(R + b),$$

where $z \equiv \frac{1}{(p_i^{\frac{\beta}{1-\beta}} + \sum_{-i} p_{-i}^{\frac{\beta}{1-\beta}})}$. The cost of participation in the contest for aid arises due to a "mis-allocation" of total resources between private goods and public goods. The marginal cost equals $\text{MC}_i = \frac{\partial u_i(p_i|R_i)}{\partial p_i} = \gamma_i(R + b)(\phi_i - G_i')$. The cost is zero at $p_i = p_i^0(R_i)$ and it is positive for any $p_i > p_i^0(R_i)$ and it is negative for any $p_i < p_i^0(R_i)$.

Notice that for each recipient i, the payoff function is continuous in p_i. Continuity and the fact that the set of choices is convex and closed implies that a Nash equilibrium in all subgames exists (Glicksberg,

1952). It is straightforward to characterize best-response functions:

- At $p_{-i} = 0$, $p_i = p_i^0 R > 0$ as in this case the marginal benefit equals zero (because $1 - \gamma_i = 0$) and MC equals zero at p_i^0 and all the aid will be allocated to recipient i.
- As p_{-i} increases $p_i(p_{-i})$ increases because MB_i strictly increases in p_{-i} and MC_i strictly decreases in p_{-i}.
- Monotonicity of best-response functions, a positive intercept, and the fact that policy choices have a ceiling at $p_i = 1$ implies that best-response functions must intersect.
- Each recipient faces a participation constraint as the utility of participating in the contest of aid must be at least as large as not participating:

$$u_i(R_i^*, p_i^*) \geq u_i^0 \tag{4}$$

  Notice whether this constraint is satisfied or not depends on the size of the aid budget b relative to the country resources r_i.

The model generates the following comparative statics results:

- An interesting comparative static result arises from changes in ϕ_i. First observe that if $\phi_i = \phi_j$ for two recipients and (4) is satisfied, then $p_i^* = p_j^*$ and $R_i^* = R_j^*$ in equilibrium. Second, MB_i and MC_i strictly increase in ϕ_i but costs grow faster than benefits, which implies that in equilibrium $p_i^* < p_j^*$ if $\phi_i > \phi_j$.[3] In addition, since $p_i(p_{-i})$ increases in p_{-i}, a decrease in ϕ_j lowers the equilibrium policy levels of *all* recipient countries that participate in the contest for aid. This is an interesting result of our model: Including a recipient with a high valuation of the private good in the contest for aid lowers the competitiveness of the overall contest resulting in lower equilibrium policy levels for *all* recipients that are competing for aid.
- A second comparative static result emerges due to changes in the aid budget b. Notice that by equating MC and MB, b only enters into the first-order condition through G_i', as the term $R + b$ is added multiplicatively on both sides so cancels out. G_i' decreases in b, which implies

[3] We have $\frac{\partial \text{MB}_i}{\partial \phi_i} = \gamma_i(1 - \gamma_i)$ and $\frac{\partial \text{MC}_i}{\partial \phi_i} = \gamma_i$.

that MB_i decreases and MC_i increases. Thus, the equilibrium policy level must decrease in b. We can conclude that equilibrium policy levels decrease in b. More aid can therefore make the competition for aid less competitive. However, an important caveat to this insight is discussed next.

- A third important comparative static result emerges due to changes in the number of participants in the aid contest. Adding one more aid contestant while keeping total resources $R+b$ constant strictly increases policy levels. When adding one more contestant j with $p_j > 0$, γ_j will decrease, increasing MB_j and reducing MC_j so that policy levels of incumbent contestants will increase. This, however, assumes that the participation constraint (4) is still met for all aid contestants. Thus, more aid contestants makes competing for aid more competitive. This insight qualifies the previous point, that increasing the aid budget can make the contest for aid more competitive by increasing the number of contestants. A higher budget relaxes the participation constraint for all contestants, which makes it more likely that this constraint is satisfied for a larger number of recipients.

Our third comparative static result highlights the importance of the number of recipient countries competing for aid. Whether a recipient participates depends on its participation constraint (4). Indirect utility at $p_i = p_i^0(r_i)$ equals

$$u_i^0(r_i) = \phi_i r_i + \left(\frac{\beta}{\phi_i}\right)^{\frac{1}{1-\beta}} \phi_i \left(\frac{1}{\beta} - 1\right).$$

We observe that the reservation utility increases in r_i and ϕ_i. In contrast, indirect utility from participating in the contest is constant in r_i (when holding total resources $R+b$ constant, but it increases in ϕ_i.

Another comparative static result of interest of the model is from increasing r_i but holding overall resources $R+b$ constant. This change will not affect the equilibrium policy level as long as the participation constraint (4) remains satisfied for all recipients participating in the contest. However, if the increase in resources leads recipient i to drop out of the contest, because its participation constraint is no longer met, then policy p_i drops to $p_i^0(r_i)$. Thus, a large influx of resources to country i can lead to substantially lower policy levels as participation in the contest for aid is no longer optimal. Furthermore,

the reduction of the number of contestants in equilibrium will lead to a reduction of policy levels in *all* recipient countries.

The discussion can be summarized by the following predictions:

1. A recipient is less likely to participate in the contest for aid if the valuation for the private good ϕ_i is high. A higher valuation increases the participation constraint. If ϕ captures the level of democracy in a recipient country, then the participation in the contest for a highly non-democratic government may be too costly. We will test this prediction in our empirical part.

2. A recipient is less likely to participate in the contest for aid if country resources r_i are large. More country resources increase the participation constraint, and countries therefore are less likely to participate even when they are aid-eligible. Given the poverty-selectivity of the donor, they will not receive a sufficient amount of aid to make participation worthwhile. Again, we will test this prediction in our empirical part.

3. An increase in the aid budget b of the donor may increase the competitiveness of the contest as it relaxes the participation constraint for all contestants, which makes if more likely that this constraint is satisfied for a larger number of recipients. This is an important prediction of the model and it plays a crucial role for our strategy to identify the incentive effects of the policy selectivity of aid.

In the following empirical section of the paper we make use of these insights.

4 Empirical Evidence

In Section 2 we discussed the evidence related to the policy-selectivity of foreign aid showing that between 1990 and 2014 a considerable share of the global aid budget has been allocated by policy-selective donors. Related to this policy-selectivity, this section investigates the following two questions empirically: First, from a recipient perspective does improving policy result in more aid? This is not obvious as there has always been a substantial fraction of aid that is not policy-selective. Second, does policy-selective aid improve policies?

Figure 1 exhibits substantial variation over time in the share of aid disbursed by policy-selective donors, mainly driven by the fact that starting in the 1990s many more donor became policy-selective in their aid allocation. However, from a recipient's perspective the question then arises whether improving policies "pays off" in terms of receiving more aid. Table 2 runs such a test from the recipient perspective. Despite the presence of policy selective donors, improving policies may not pay off because of the presence of non-policy selective donors.

Table 2: Policy Selectivity (1990–2016)

Dependent Variable:	Log of Total Aid					
	OLS			FE		
	(1)	(2)	(3)	(4)	(5)	(6)
Lagged CPIA	0.12***	0.40***	0.40***	0.24***	0.56***	0.56***
	(0.04)	(0.13)	(0.13)	(0.07)	(0.19)	(0.19)
Lagged CPIA, squared		-0.15**	-0.15**		-0.19*	-0.19*
		(0.07)	(0.07)		(0.10)	(0.10)
Lagged Total Aid	0.89***	0.89***	0.89***	0.64***	0.64***	0.63***
	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)
Lagged GDP per capita	-0.06***	-0.05***	-0.05***	-0.07	-0.07	-0.07
	(0.01)	(0.01)	(0.01)	(0.05)	(0.05)	(0.05)
Lagged Population	0.06***	0.06***	0.06***	0.29**	0.24*	0.22*
	(0.01)	(0.01)	(0.01)	(0.13)	(0.13)	(0.13)
Lagged Democracy (ANRR)			0.01			0.06**
			(0.01)			(0.03)
Constant	0.07	-0.11	-0.11	-2.14	-1.56	-1.33
	(0.09)	(0.12)	(0.12)	(2.27)	(2.25)	(2.25)
N	3195	3195	3195	3195	3195	3195
R-squared	0.94	0.94	0.94	0.49	0.49	0.50
F statistic	2459.33	2470.87	2546.14	59.40	61.08	59.48

Dependent variable is the log of total aid disbursements measured in constant USD excluding emergency aid, food aid, and debt relief (OECD Table 2a). All covariates are in logs, except for democracy. Democracy measure taken from Acemoglu, Naidu, Restrepo, and Robinson (forthcoming) and updated in accordance with their methodology. GDP and population data is taken from the WDI database. All regressions use recipient-year observations and include a constant term and period dummy variables, which are not reported. Recipient level cluster-robust standard error reported in parenthesis. Significance levels : $*$: 10 percent $**$: 5 percent $***$: 1 percent

Table 2 shows that there is a strong relationship between the lagged CPIA measure and current aid after controlling for the lagged aid level, population, and income per capita.[4] The table shows OLS

[4]Our aid data are from the OECD, Table 2a, that provides aid data in the donor-recipient-year dimensions. We adjust our aid measure and focus on development aid ignoring emergency and food aid and debt forgiveness by following the procedure described in Annen and Kosempel (2009).

results in Columns 1 – 3, and results with recipient fixed effects in Columns 4 – 7. All regressions include year fixed effects. A causal interpretation of this result suggests that a policy improvement leads to additional aid. It is important to emphasize that all the regressions control for a one-year lag in the aid level, which means that our coefficient on policy captures *additional* aid that a recipient receives from a policy improvement. Some regressions include a squared term, which is also statistically significant, implying a non-linear inverted U-shape relationship. The FE results estimate a turning point at a CPIA of 4.4. Only a very few countries in our sample have a CPIA measure that is larger than 4.4. The CPIA at the 95th percentile equals 4.38. Notice also that our fixed effect regression suggests that democratization is associated with more aid. Our democracy measure is taken from Acemoglu, Naidu, Restrepo, and Robinson (forthcoming) and updated in accordance with their methodology. Table 2 repeats the analysis for the years 1985 to 2014 using data from the PennWorld Tables for GDP and population, which cover a longer time-span. We obtain a very similar result.

We consider the results presented in Tables 2 and 3 as evidence that the "contest for aid" works. A recipient improving policies attracts a larger amount of aid. Figure 2 shows the partial point estimate for the CPIA conditional on the level of the CPIA. This figure reveals that there is a statistically significant relationship between the CPIA and the amount of aid given to a recipient for countries that have a CPIA rating below 2.7. Thus, incentives seem to work particularly for countries with low policy levels. Quantitatively, the estimates suggest that a CPIA measure change from 1.5 to 2 for a recipient is associated with about a 13% increase in aid.

With these findings, the question arises whether the "contest for aid" improves policies in recipient countries as our model suggests. Clearly, if improving policies is associated with more aid and if recipients are interested in attracting more aid, then this contest for aid should provide recipients with an incentive to improve policies. The incentive effect of policy-selective aid is a challenging notion to investigate empirically, however, as the relationship between policy-selective aid and policy includes both selection effects – as seen in Tables 2 and 3 – and incentive effects.

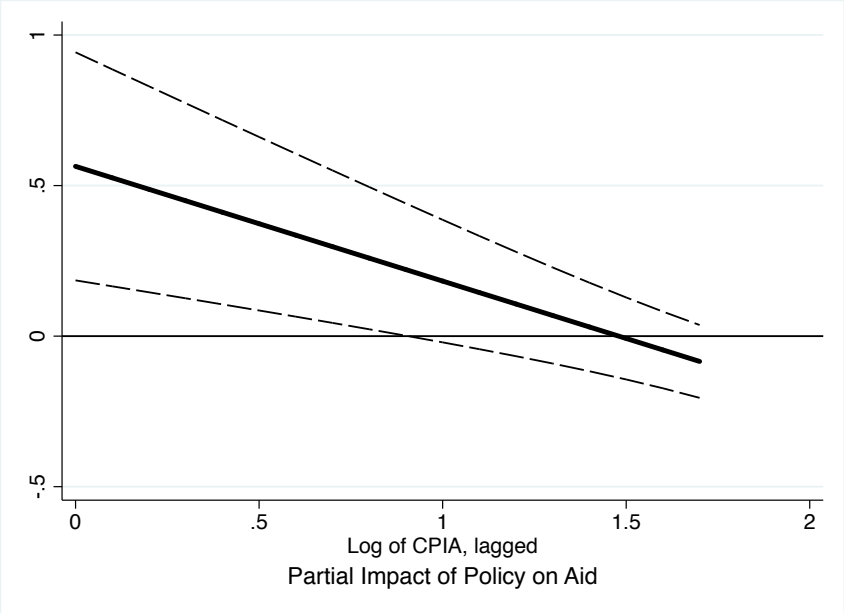
To identify the incentive effects we make use of our game theoretic model that suggests it is the policy-selectivity of the global aid budget that affects incentives and not the aid budget received by a given recipient. The model shows that if the budget of the policy-selective donor increases, then incentives to improve policies strengthen to the extent that a larger budget makes it individually rational

Table 3: Policy Selectivity (1985–2014)

Dependent Variable:	Log of Total Aid					
	OLS			FE		
	(1)	(2)	(3)	(4)	(5)	(6)
Lagged CPIA	0.12***	0.35**	0.36**	0.20***	0.49***	0.50***
	(0.04)	(0.15)	(0.15)	(0.07)	(0.19)	(0.19)
Lagged CPIA, squared		-0.12	-0.13*		-0.18*	-0.18*
		(0.07)	(0.07)		(0.10)	(0.10)
Lagged Total Aid	0.88***	0.88***	0.88***	0.63***	0.63***	0.62***
	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.03)
Lagged GDP per capita	-0.06***	-0.05***	-0.05***	-0.04	-0.04	-0.04
	(0.01)	(0.01)	(0.01)	(0.05)	(0.05)	(0.05)
Lagged Population	0.06***	0.06***	0.06***	0.36***	0.31**	0.29**
	(0.01)	(0.01)	(0.01)	(0.14)	(0.13)	(0.13)
Lagged Democracy (ANRR)			0.01			0.07**
			(0.01)			(0.03)
Constant	0.08	-0.05	-0.06	-3.51	-2.78	-2.49
	(0.10)	(0.13)	(0.13)	(2.36)	(2.25)	(2.25)
N	2905	2905	2905	2905	2905	2905
R-squared	0.93	0.93	0.93	0.48	0.48	0.48
F statistic	2053.37	2034.66	2177.25	62.67	64.26	61.91

Dependent variable is the log of total aid disbursements measured in constant USD excluding emergency aid, food aid, and debt relief (OECD Table 2a). All covariates are in logs, except for democracy. Democracy measure taken from Acemoglu, Naidu, Restrepo, and Robinson (forthcoming) and updated in accordance with their methodology. All regressions use recipient-year observations and include a constant term and period dummy variables, which are not reported. Recipient level cluster-robust standard errors reported in parenthesis. Significance levels : $*$: 10 percent $**$: 5 percent $***$: 1 percent

for more recipients to compete for the aid. The larger the pool of competitors, the higher the policy levels we observe in equilibrium. From an empirical perspective, the global aid budget that is policy-selective is exogenous to a given recipient's policy measure and other recipient-specific factors, which allows us to identify the incentive effect of the policy-selectivity of aid. This is certainly the case for our second measure of policy-selective aid that removes influential observations for the aid selectivity regressions as discussed earlier. Note that in our empirical analysis we use the share of policy-selective aid in contrast to the total aid budget as it was used in our model. Our model describes the one-donor case but in practice the total aid budget is provided for by many donors. For that reason, the share provides in our view a better measure of the scarcity of policy selective aid.



Solid line shows the point estimate for CPIA from regression (6) in Table 2 for different log levels of the CPIA. The dashed lines indicate the 5% interval estimate.

Figure 2: Interval estimate for CPIA

Accordingly, we estimate regressions of the form:

$$CPIA_{it} = \beta_0 + \beta_1 GPS_{t-1} + \epsilon_{it} \tag{5}$$

using OLS. The subscript i indexes an aid recipient country and t indexes time. The variable GPS is the global share of aid that is given by policy-selective donors. We argue that GPS is *exogenous* in (5), as the CPIA of a given recipient country does not affect the global share of policy-selective aid, nor does any other recipient-specific variable such as GDP per capita, population, etc. However, one may be concerned that there is some other unobserved global factor that simultaneously affects recipient-specific CPIA values and the global share. To test for this possibility we add region dummy and year-region dummy variables as additional controls in some of our regressions. By using year-region dummy variables we capture some time fixed effects as we cannot directly control for year fixed effects given that our main variable, GPS, shows only variation across years but not recipient countries.

Tables 4 and 5 show the regression results for the time frames 1991–2015 and 1998–2015 respectively. We find a positive and statistically significant effect of the global share of policy-selective aid on policy

Table 4: Global Policy Selectivity and CPIA (1991–2015)

Dependent Variable: CPIA, log				
	(1)	(2)	(3)	(4)
Lagged GPS	0.032***	0.043***	0.045***	0.067***
	(0.008)	(0.008)	(0.011)	(0.015)
=1 if year before 1998	-0.140***	-0.066***	-0.129***	-0.046**
	(0.012)	(0.016)	(0.014)	(0.019)
Region-Year FE	No	Yes	No	Yes
GPS without outliers	No	No	Yes	Yes
N	3064	3064	3064	3064
R-squared	0.084	0.201	0.084	0.201

Dependent variable is the log of the overall CPIA in recipient countries. GPS is the log of the share of policy-selective aid disbursed globally. A dummy variable that is equal to one for all years before 1998 is included to capture the scale change in the CPIA measure. All regressions use recipient-year observations and include a constant term that is not reported. Regressions (2) and (3) include region and region-year fixed effects that are not reported. Year level cluster-robust standard errors in (1) and (3) and region-year level cluster-robust standard errors in (2) and (4) reported in parenthesis. Significance levels : $*$: 10 percent $**$: 5 percent $***$: 1 percent

Table 5: Global Policy Selectivity and CPIA (1998–2015)

Dependent Variable: CPIA, log				
	(1)	(2)	(3)	(4)
Lagged GPS	0.042***	0.037***	0.119***	0.134***
	(0.013)	(0.013)	(0.038)	(0.041)
Region-Year FE	No	Yes	No	Yes
GPS without outliers	No	No	Yes	Yes
N	2323	2323	2323	2323
R-squared	0.002	0.145	0.003	0.146

Dependent variable is the log of the overall CPIA in recipient countries. GPS is the log of the share of policy-selective aid disbursed globally. All regressions use recipient-year observations and include a constant term that is not reported. Regressions (2) and (3) include region and region-year fixed effects that are not reported. Year level cluster-robust standard errors in (1) and (3) and region-year level cluster-robust standard errors in (2) and (4) reported in parenthesis. Significance levels : $*$: 10 percent $**$: 5 percent $***$: 1 percent

levels in recipient countries. The effect is small, however. The coefficient reported in (4) in Table 4 implies that a 10 percent increase in the share of policy selective aid is associated with a 0.67 percent increase in the CPIA index. In this specification we control for region-year fixed effects and we use our GPS measure without outliers. We notice that this effect doubles when we use the 1998-2015 time

frame for our estimation. This may have to do with the fact that many donors declared more openly around the year 2000 that their aid allocations will become more policy selective as described in Easterly (2003). Note that the difference in the time frame between Tables 4 and 5 is due to the fact that during the 1998-2015 period the CPIA was measured on a six-point scale, whereas during the 1991-1997 period the CPIA was measured on a five-point scale.

Table 6: Global Policy Selectivity, Democracy, and Resources (1998–2015)

Dependent Variable: CPIA, log						
	(1)	(2)	(3)	(4)	(5)	(6)
Lagged GPS	0.067*	0.061*	0.016	0.003	0.045***	0.040**
	(0.036)	(0.031)	(0.014)	(0.035)	(0.008)	(0.017)
Lagged IDA recipient	0.154	0.143				
	(0.139)	(0.169)				
Lagged GPS* IDA recipient	-0.052	-0.039				
	(0.036)	(0.044)				
Lagged Democracy (ANRR)			-0.043	-0.091		
			(0.051)	(0.235)		
Lagged GPS*Democracy			0.050***	0.057		
			(0.014)	(0.061)		
Rich in Natural Resources					0.045	-0.026
					(0.071)	(0.129)
Lagged GPS* Rich					-0.047**	-0.014
					(0.019)	(0.034)
Region-Year FE	No	Yes	No	Yes	No	Yes
GPS without outliers	No	No	No	No	No	No
N	2323	2323	2319	2319	2323	2323
R-squared	0.015	0.146	0.137	0.225	0.102	0.169

Dependent variable is the log of the overall CPIA in recipient countries. GPS is the log of the share of policy-selective aid disbursed globally, where GPS is determined without removing outlier observations. IDA recipient is a recipient that is IDA eligible. Democracy measure taken from Acemoglu, Naidu, Restrepo, and Robinson (forthcoming) and updated in accordance with their methodology. A recipient is rich in natural resources if the initial value of total natural resources rent as a percent of GDP is above the 75th percentile. All regressions use recipient-year observations and include a constant term that is not reported. Regressions (2), (4), and (6) include region and region-year fixed effects that are not reported. Year level cluster-robust standard errors in (1), (3), and (5) and region-year level cluster-robust standard errors in (2), (4), and (6) reported in parenthesis. Significance levels : $*$: 10 percent $**$: 5 percent $***$: 1 percent

Tables 6 and 7 show results for regressions with interaction terms. The difference between the two tables is that Table 6 uses the GPS measure derived from the full sample and Table 7 uses the GPS measure derived from the sample without outliers. Here, we are investigating some additional insights

Table 7: Global Policy Selectivity, Democracy, and Resources (1998–2015)

Dependent Variable: CPIA, log						
	(1)	(2)	(3)	(4)	(5)	(6)
Lagged GPS	0.114**	0.152***	0.083**	0.102*	0.116***	0.136***
	(0.043)	(0.050)	(0.035)	(0.054)	(0.039)	(0.044)
Lagged IDA recipient	-0.029	0.086				
	(0.057)	(0.141)				
Lagged GPS* IDA recipient	-0.004	-0.024				
	(0.015)	(0.037)				
Lagged Democracy (ANRR)			-0.047	-0.070		
			(0.053)	(0.187)		
Lagged GPS*Democracy			0.051***	0.052		
			(0.013)	(0.049)		
Rich in Natural Resources					-0.052	-0.044
					(0.100)	(0.121)
Lagged GPS* Rich					-0.022	-0.009
					(0.027)	(0.032)
Region-Year FE	No	Yes	No	Yes	No	Yes
GPS without outliers	Yes	Yes	Yes	Yes	Yes	Yes
N	2323	2323	2319	2319	2323	2323
R-squared	0.016	0.146	0.138	0.225	0.103	0.169

Dependent variable is the log of the overall CPIA in recipient countries. GPS is the log of the share of policy-selective aid disbursed globally, where GPS is determined with removing outlier observations. IDA recipient is a recipient that is IDA eligible. Democracy measure taken from Acemoglu, Naidu, Restrepo, and Robinson (forthcoming) and updated in accordance with their methodology. A recipient is rich in natural resources if the initial value of total natural resources rent as a percent of GDP is above the 75th percentile. All regressions use recipient-year observations and include a constant term that is not reported. Regressions (2), (4), and (6) include region and region-year fixed effects that are not reported. Year level cluster-robust standard errors in (1), (3), and (5) and region-year level cluster-robust standard errors in (2), (4), and (6) reported in parenthesis. Significance levels : $*$: 10 percent $**$: 5 percent $***$: 1 percent

generated by our theoretical model. Columns (1) and (2) investigate whether the incentive effect of the global share of policy-selective aid applies differently for recipient countries that received aid from IDA or not. The World Bank has a formal process that allocates more of its IDA aid to countries with higher CPIA ratings. We therefore would expect that IDA-eligible countries – simply by being eligible – are more likely to play the contest for aid. However, we do not find any evidence of a differential effect for IDA-eligible and non-eligible recipients for both our GPS measures no matter whether we control for region-year fixed effects or not.

Columns (3) and (4) in both tables investigate the role of democracy. The democracy measure

proxies for the parameter ϕ in our theoretical model, and we observe that a higher ϕ lowers a recipient country's incentive to improve policies in equilibrium. Also, a higher ϕ makes it less likely for a recipient country to participate in the contest. Our data support that prediction, but results are somewhat different for different specifications and measures. Across all regressions we find a positive and significant GPS coefficient for democracies. With the outlier adjusted GPS measure we also find a positive and significant but smaller coefficient for non-democracies. The difference between democracies and non-democracies is significant only in Column (3) for both our GPS measures.

Columns (5) and (6) test for an interaction with natural resource wealth. We classify a recipient as rich in natural resources if its initial value of total natural resources rents, as reported in the World Development Indicators, is above the 75th percentile. In our data, that threshold is reached when a country has natural resource rents of above 6% of GDP. The evidence related to natural resource wealth is mixed. In Table 6 we find a statistically significant positive relationship between GPS and CPIA for non-resource rich countries and a non-significant coefficient for countries that are rich in natural resources. This finding is consistent with the model's predictions, which suggest that countries with large amounts of domestic resources have weaker incentives to participate in the contest for aid. However, the difference in the GPS coefficient between the two types of countries is statistically significant only in Column (5) that does not control for region-year fixed effects. In Table 7 the relationship between GPS and CPIA is statistically significant for both, resource and non-resource rich countries. The GPS coefficient is larger for non-resource rich countries than for resource rich countries as predicted by our theory, however, that difference is not statistically significant.

Finally, Table 8 investigates interaction effects related to financial flows from China, using data obtained from AidData (Dreher, Fuchs, Parks, Strange, and Tierney, 2017).[5] China's aid and investment policies follow a principle of non-interference in the politics and policy choices of recipient countries (Dreher, Fuchs, Parks, Strange, and Tierney, 2016). Furthermore, flows from China to aid-recipient countries have become very sizeable in recent years. Comparing its aid amounts with those of other bilateral and multilateral donors, China has been among the top 10 donors in most years. A notewor-

[5]China does not provide reliable data on its financial investments in developing countries. The methodology used for the data we use here relies on identifying aid projects through a media database, followed by targeted online searches to gather more detailed information. For a full description of the methodology see Strange, Parks, Perla, and Desai (2015) and Custer, Rice, Masaki, Latourell, and Parks (2015).

Table 8: Global Policy Selectivity and Chinese Investments (2000–2014)

Dependent Variable:	CPIA, log					
	(1)	(2)	(3)	(4)	(5)	(6)
Lagged GPS	0.060***	0.054**	0.091*	0.029**	0.017	0.064
	(0.011)	(0.024)	(0.046)	(0.012)	(0.019)	(0.039)
Large Chinese Investments	0.391***	0.461	0.433			
	(0.072)	(0.278)	(0.268)			
Lagged GPS* Chinese Investments	-0.117***	-0.134*	-0.127*			
	(0.019)	(0.072)	(0.069)			
Large IDA Aid Amounts				-0.034	-0.004	-0.005
				(0.086)	(0.075)	(0.074)
Lagged GPS*Large IDA Aid Amounts				0.011	0.016	0.017
				(0.022)	(0.019)	(0.019)
Region-Year FE	No	Yes	Yes	No	Yes	Yes
GPS without outliers	No	No	Yes	No	No	Yes
N	1954	1954	1954	1954	1954	1954
R-squared	0.023	0.158	0.158	0.002	0.159	0.159

Dependent variable is the log of the overall CPIA in recipient countries. GPS is the log of the share of policy-selective aid disbursed globally. A recipient received large Chinese or IDA investments if total investments over the entire time period are above the 75th percentile. All regressions use recipient-year observations and include a constant term that is not reported. Year level cluster-robust standard errors reported in parenthesis. Significance levels : $*$: 10 percent $**$: 5 percent $***$: 1 percent

thy difference is that compared to other donors, particularly bilateral donors, the number of recipient countries – with 52 on average in a given year – is very low.

For our estimation, we generate a Chinese investment dummy variable that equals one for a recipient if total investments over the entire time period exceed the 75th percentile, which corresponds to investments of about 2.4 billion USD. We include all investments recorded by AidData, which include ODA- and OOF-like flows. Because that dataset covers the period from 2000 to 2014, we use that time span in the regressions. Columns (1) to (3) in Table 8 present the results. As expected, we find a large negative and statistically significant coefficient on the interaction term in all three regression, implying that the incentive effect of policy-selective aid is not present in recipients of large Chinese investments. This result is robust to the inclusion of region-year fixed effect and holds for both our GPS measures, outlier adjusted or not. In Columns (4) to (6) in this table we report results where we apply the same methodology used for China for aid allocated by IDA.[6] We do not find an interaction effect for

[6]Note, however, the difference that for IDA the financial flows are all ODA, whereas for China they include

large IDA aid amounts. Aid allocations by China and IDA are different in that the latter allocates aid policy-selectively. IDA is a donor that is considered policy-selective for most of the years in our sample period.

5 Conclusions

Empirical evidence provided in this paper supports a major premise of policy-selective aid strategies pursued by many donor agencies. Namely, the incentive mechanism of offering more aid to countries with better policies appears to work as intended. Because aid levels are obviously endogenous to policy quality, our tests rely on year-to-year changes in the global share of policy-selective aid to identify this effect. This share is plausibly exogenous to the policy choices of any particular recipient country. Further tests show that these incentive effects are weak or absent for recipient countries with access to large financial flows from China - a large emerging donor that does not follow policy-selectivity - or to large natural resource rents. If flows from China and other new non-policy selective donors continue to increase, the incentive effects of IDA and other policy-selective donors are likely to be further undermined, as more recipient countries can afford to opt out of the contest for aid.

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ODA- and OOF-like flows. Also, note since financial flows by China are more concentrated, flows at the 75th percentile amount to about 2.4 billion whereas for IDA the 75th percentile amounts to a little bit over half a billion. The results, however, remain unchanged when we use the 2.4 billion USD threshold for IDA as well.

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