Reverse Ricardian? The effect of development aid on sectoral exports*

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Abstract

In this paper we study heterogenous effects of foreign development aid on sectoral exports. We test whether the initial comparative advantage of a sector is linked to the efficacy of aid in promoting exports. We use a panel of low and lower middle income countries' exports over the 2001-2013 period. Our results using various fixed effects suggest that initially weak sectors gain while there is no effect for initially strong sectors. Endogeneity concerns are addressed using a control function approach with an instrument based on donors' budgets. We confirm the validity of the instrument using Placebo analysis. The results are highly robust, and do not seem to be driven by specific sectors or specific types of aid. We conjecture that aid may serve as a substitute for financial development. Using the theoretical framework by Manova (2013) we model aggregate demand as the decisive channel. Our results seem to be stronger for financially less developed countries suggesting that this may in fact be the channel at play.

Keywords: Development Aid, Gravity Model of Trade, Revealed Comparative Advantage, Structural Change

1 Introduction

In 2013 the total value of all development aid recorded by the OECD amounted to 167 billion USD. That is, the volume of aid is larger than the GDP of most countries in the world. Despite this magnitude the effectiveness of aid to advance macroeconomic goals is highly disputed among economists (e.g., Doucouliagos and Paldam (2015)).

Aside from the overarching goal of economic growth, trade promotion is often cited as an important intermediate outcome. In fact, the WTO in 2005 launched the Aid for Trade-initiative emphasing the necessity of capacity building and trade facilitation. This paper takes a more general stance and asks how aid inflows affect sectoral exports differently in recipient economies depending on the initial comparative advantage in the given sector. There are two main reasons motivating this endeavor. First,

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Hausmann et al. (2007) argue that "What you export matters" for growth prospects. For instance, some products may exhibit larger inherent productivity growth rates, or lead to stronger technological spillovers. Thus understanding what drives sectoral (export) performance may teach us something about growth performance in the economy in question. Second, we believe that the initial comparative advantage that a sector enjoys contains information about the extent it can benefit from foreign resource inflows such as aid. Sectors with an existing comparative advantage will typically comprise firms with better established trading networks, including trade finance, better access to infrastructure, and possibly better political networks. Thus, they may be in a better position to appropriate gains from aid inflows. On the other hand, disadvantaged sectors have more to gain. Infrastructure projects to more remote areas may allow previously disadvantaged firms to access trade infrastructure, increases in domestic demand may help lift financial constraints, and the presence of foreign aid workers may generate export opportunities lowering fixed costs for particular transactions.

In this study we aim to empirically explore what types of sectors benefit from foreign development aid in terms of their exports, and to see if initial comparative advantage may in fact be a relevant force. A complicating factor is that low and lower middle income countries, which we focus on here, have by and large comparative advantages in similar sectors. Many enjoy a comparative advantage in agriculture and related industries, few have a comparative advantage in basic manufacturing. Moreoever, as Manova (2013) has shown few developing countries have a comparative advantage in financially dependent sectors. We will show that our results are not driven by particular sectors.

We use a panel of sectoral export data for low and lower middle income countries from 2001 to 2013. In particular, we test whether the effect of aid on exports is different depending on the initial comparative advantage. In order to address endogeneity concerns we use a synthetic aid instrument based on donor budgets developed by Temple and Van de Sijpe (Forthcoming), in a control function setting. We document what we call a reverse Ricardian pattern: sectors with a comparative disadvantage gain while sectors with a strong comparative advantage see no - in few cases even negative - effects. A battery of robustness checks confirms this result. We use Placebo analysis, sector dummies to make sure it is not particular sectors driving our results, and we adjust the functional form. Finally, we conjecture that aid may serve as a substitute for credit to cover up-front export costs. We provide a simple extension to the model by Manova (2013) in which the channel for this effect is via aggregate demand. Since credit constraints should be less binding in more financially developed countries, we test whether the pattern is stronger in financially less developed countries. In fact, we find that the pattern is mainly driven by financially less developed countries providing suggestive evidence for our envisioned channel.

The remainder of the paper is structured as follows. In Section 2 we discuss the relevant literature. Section 3 provides some descriptive information about comparative advantage of low and lower middle income countries, the development aid they receive, and potential channels. Section 4 presents our data, and Section 5 explains our empirical approach, including the control function method. Our main results and robustness checks are presented in Section 6. Section 7 discusses an extension of Manova's (2013) theoretical framework that may be able to account for the pattern, and provides suggestive evidence in favor. Finally, Section 8 concludes.

2 Literature Review

The first strand of literature that this paper is related to is the aid effectiveness literature. This broad and controversial literature studies the effect of aid on growth among many other outcomes. Doucouliagos (2016) provide a literature survey concluding that results increasingly point to neglible effects. By and large, the debate in the aid effectiveness literature revolves around the question of how to achieve exogeneity, or more precisely what constitutes a good instrument. Rajan and Subramanian (2008) use a gravity-type model to predict bilateral aid flows, and ultimately total aid inflows. Using these predictions as an instrument they find no discernable effect of aid on growth. While the idea in their paper is that characteristics of the donor-recipient relationship are exogenous predictors of aid

flows, Clemens et al. (2012) argue that in fact the bulk of explanatory power derives from the included population varibales. Thus refuting the strength of the instrument they abandon IVs altogether. Using lags and a more narrow definition of effective aid and a bulk of fixed effects, they do in fact find positive effects of aid on growth. More recently, Galiani et al. (2017) use crossing the International Development Association's eligibility threshold as an instrument in what they call a "Quasi-experiment". In fact, they find positive and significant effects of aid on growth rates. This finding is consistent with results from Magesan (2016), who uses recipient's ratification of UN human rights treaties as an instrument for aid. On the contrary, Dreher and Langlotz (2015) use an interaction of donor government fractionalization, which is shown to be related to higher aid budgets, with the probability of receiving aid and find no or even negative effects of aid on growth.

As far as trade is concerned, there is a vast literature looking at the effect of aid on recipient imports starting with Nilsson (1997), and including Wagner (2003), Martínez-Zarzoso et al. (2009), and Silva and Nelson (2012), just to name a few. Most studies find a positive effect of bilateral aid on imports from the respective donor, while results for imports from third countries differ. Kruse and Martínez-Zarzoso (2016) find that third country aid has a stronger overall effect than bilateral aid. The literature on the effect of aid on exports provides less robust results. Pettersson and Johansson (2013) find a positive effect of aid in some sectors, whereas Nowak-Lehmann D. et al. (2013) show that this effect vanishes when using a fixed effects estimator. These studies look at the bilateral effect of aid. Calì and te Velde (2011) and Vijil and Wagner (2012) take particular interest in the effect of Aid for Trade (AfT) on aggregate exports. Both studies find that aid for infrastructure in fact facilitates trade and has an impact on overall exports. They also study the effect of aid dedicated to specific sectors of the economy on exports in these sectors, but do not find any effect.

Temple and Van de Sijpe (Forthcoming) provide a broader approach. Absent robust evidence of aid effectiveness regarding growth, they set out to study the effect of aid on GDP components, including imports. They use an instrument based on a similar idea as Dreher and Langlotz (2015) but differently implemented. They use historical shares of a recipient in a given donor's aid budget, and multiply this figure with current levels of the aid budget to calculate a "synthetic" value of aid. Using a correlated random effects approach they show that aid affects imports and consumption, but leaves the remaining GDP components unaffected.

If aid by and large finances consumption, this would be one explanation why aid rarely is found to be associated with higher growth. However, other studies have suggested different mechanisms that render aid ineffective that are more closely related to the sectoral focus of the present study. Rajan and Subramanian (2007) argue that aid could reduce the necessity for the government to provide good governance, and hence hurt sectors that particularly rely on good governance, such as manufacturing. In a later paper Rajan and Subramanian (2011) provide evidence that aid leads to dutch disease effects. I.e., aid leads to an appreciation of the currency and weakens the tradable industries vis-á-vis non-tradables.

We combine this literature with the literature on export sophistication and structural change, e.g., Hausmann et al. (2007). They argue that "what you exports matters" –as their paper title states–; in particular, how sophisticated the export portfolio is. The studies that are most similar to our paper in terms of the research hypothesis are Page (2012) and Kim (2013). The former argues that aid supports the incumbent sectors, but does not provide an empirical test. The latter examines the *direct* effect of aid on export sophistication using a GMM framework and finds no long-run effect.

3 Patterns of Revealed Comparative Advantage, and Aid

The notion of revealed comparative advantage was first introduced by Balassa (1965). The basic idea is that countries that have a comparative advantage in certain goods, should export relatively more of this good. In turn, the *revealed* comparative advantage (RCA) of a country in a given sector is defined

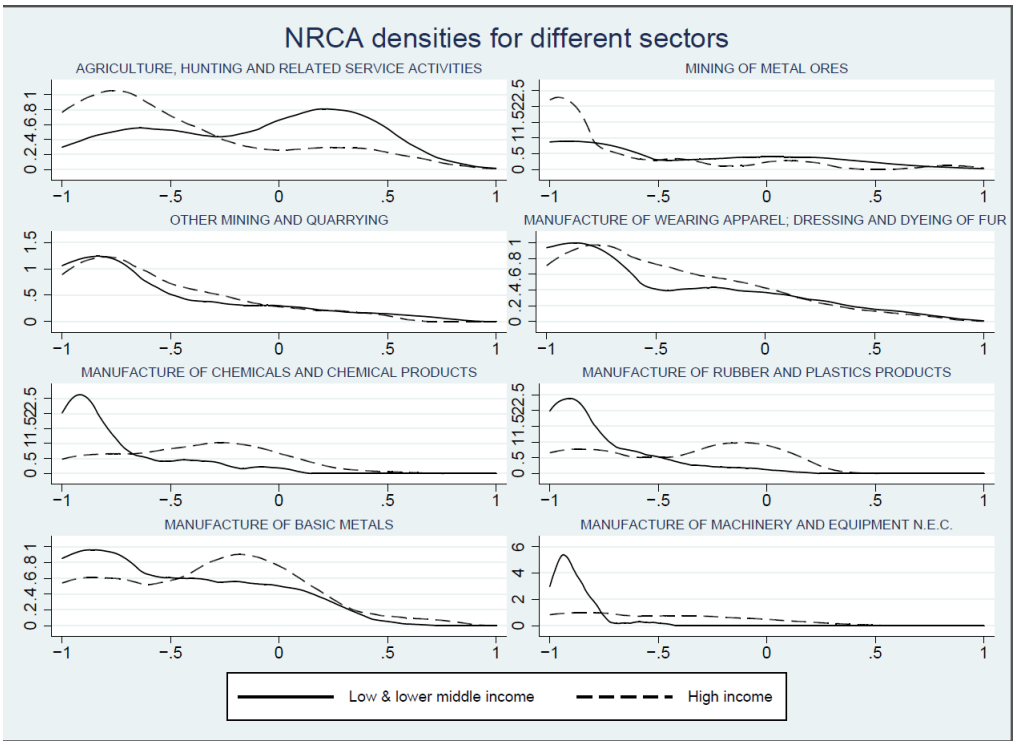

Figure 1: PDF for NRCA in selected sectors

Note: This graph depicts the probability density function of the NRCA in different sectors by different income groups.

as the ratio of the export share of the good in this country and the export share worldwide:

$$RCA_{ikt} = \frac{x_{ikt}/x_{it}}{\sum_i x_{kt}/x_t} \tag{1}$$

where x_{ikt} are country i exports of good k at time t. Left out indices indicate totals across the respective dimension. Figure 1 depicts the estimated distribution of the *normalized* revealed comparative advantage (NRCA) for low and middle income countries vs. high income countries.[1] The normalization applied is due to Laursen (2000) and limits the support of the index between -1 and 1: $NRCA = (RCA - 1)/(RCA + 1)$. For values larger than 0 a product has a higher share in the country's export portfolio than the world average. A value for NRCA of -1 corresponds to zero trade, while a value of 1 is reached in the limit only as exports approach infinity. Hence, by construction the density should go to 0 as NRCA approaches 1.

Unsurprisingly, the distribution suggests that developing countries are much more likely to have a comparative advantage in agricultural products than developed countries.[2] However, the distribution is quite dispersed with some countries not reporting any exports of agricultural goods. In many mining activities, too, developing countries seem to be on a par with developed countries. The greatest differences to the disadvantage of developing countries emerges in manufacturing sectors. In most cases there is a peak close to -1 —i.e., no reported exports—and then distributions quickly decay. Exceptions seem to be textile and apparel sectors, as well as manufacture of basic metals. Here, the distribution is more dispersed, more in line with developed countries, and a larger share of the distribution is above zero.[3]

[1] According to the World Bank's (2015) classification.
[2] McMillan et al. (2014) show that the extent of this difference has increased in recent years.
[3] This is in line with Rajan and Subramanian (2011).

Table 1: Comparative Advantage - Descriptive Statistics

				Export Shares (in%)		
NRCA	PRODY	Fin. Dep.	Herfindahl	Agri.	Textile	Oth. Man.
0	13721.03	0.26	0.28	0	4.24	25.45
1 - low RCA	19217.34	0.58	0.4	0.83	4.96	72.31
2	17562.99	0.36	0.34	0.44	8.81	77.09
3 - medium RCA	16433.63	0.31	0.34	1.78	9.78	68.00
4	13652.44	0.17	0.34	12.33	15.42	45.81
5 - high RCA	10384.5	0.10	0.32	25.12	16.11	20.85

Note: NRCA is a categorical variable ranging from 0 to 5, where 0 indicates no exports, numbers 1 to 5 represent different bins (separated by 4 quantiles) of the distribution where 1 indicates lowest RCA and 5 indicates highest RCA. PRODY denotes technological sophistication and is defined in accordance with Hausmann et al. (2007): $PRODY_k = \frac{1}{T}\sum_i \frac{RCA_{ikt}}{\sum_i RCA_{ikt}} y_{it}$; i.e., it is measured on an income scale. Fin. Dep. denotes financial dependency and is taken from Rajan and Zingales (1998). Herfindahl is the Herfindahl Index measuring the concentration of trading partners in the given sector. Agri. refers to the agricultural sectors; Textile denotes textile sectors, and Oth. Man. refers to manufacturing other than textile.

In Table 1 we report descriptive statistics for different values of RCA in 2000 for our sample of low and lower middle income countries. For that purpose (and the later analysis) we separate the values of RCA for each country into 6 categories. 0 indicates no exports in the respective year. Categories 1 to 5 are separated according to quantiles of the positive part of the distribution of RCA such that 1 indicates a low RCA and 5 indicates a high RCA. PRODY is a measure of technological sophistication taken from Hausmann et al. (2007). Unsurprisingly, recipient countries tend to have a comparative advantage in sectors with low technological sophistication. Moreover, in accordance with Manova (2013) low and lower middle income countries tend to have a comparative advantage in sectors with low financial dependency (Rajan and Zingales, 1998). Furthermore, the pattern of Herfindahl indices suggests that disadvantaged sectors in general seem to have a more concentrated set of partner countries, even though the pattern is less clear in the middle of the distribution. Note that for all the variables reported the 0-bin does not fit into the overall pattern. The reason is probably that some sectors in which there are usually exports did not report exports in 2000. Additionaly, Table 1 reports export shares of some sectors of broad economic activities in the respective bins. In accordance with the patterns for individual sectors presented above, we see that agricultural exports are most frequently in the highest bin of comparative advantage. The same, albeit less extreme, is true for the textile sector. Manufacturing sectors other than textile cover a larger share of exports in most bins than the other two broad categories reported –unsurprisingly so, as they simply include more sectors; but relatively infrequently do they fall into the highest bin of comparative advantage. For the lowest 3 bins manufacturing other than textile accounts for more than 65% of exports. Again, the 0-bin is an exception.

Table 2 allows a more nuanced look at how much RCA changed from the beginning until the end of our sample period. It reports the share of sectors in a given bin in the year 2000 that ended up in the respective other bin in 2013; in other words, transition probabilities. For instance the probability that a sector stays in the 0-bin from 2000 to 2013 is 54.52%, whereas there is a 23.67% chance that it moves up into the first bin. For every bin in every column the probability that a sector stays in the respective bin is always highest. For the 3-bin the probability to remain in the same bin is merely 39.26% but that is still the highest value in the column. However, the level of revealed comparative advantage seems by no means fix across time.

One way to target the performance of specific sectors is to explicitly dedicate aid to a specific sector. Figure 2 describes the sectoral distribution of ODA (Official Development Assistance) commitments in constant US$ in the 1988-2012 period. The first pie graph indicates that ODA targeted towards

Table 2: Transition probabilities (in %)

RCA bin in 2000	RCA bin in 2013 0	1	2	3	4	5
0	**54.52**	23.67	7.71	5.59	3.72	4.79
1	7.53	**57.66**	20.00	8.44	4.16	2.21
2	2.33	19.32	**41.92**	23.84	8.63	3.97
3	1.93	8.40	22.59	**39.26**	21.90	5.92
4	1.51	3.01	10.41	20.55	**46.71**	17.81
5	0.58	2.63	2.19	6.58	19.74	**68.27**

Note: Probability of staying in the same bin in bold on the diagonal.

specific sectors only constitutes a small share of total foreign commitments (circa 10%). However, looking at the distribution of these commitments across country groups reveals that the lion's share of commitments is targeted towards agricultural producers.[4] Industry and Mining benefit to a smaller extent. This is especially true for the low income countries, where two thirds of ODA are committed for the primary sector.

While there seems to be a correlation between comparative advantage and sectoral aid, this does not necessarily imply that aid deepens existing advantages. It might just reflect the different structure of the economies. Moreover, a common problem with aid is its fungibility. I.e., while foreign aid may be designated for a certain purpose this could free government resources to be used in other areas. Also, it is not necessarily specific parts of aid, that have an effect. In fact, the effect on aggregate demand may be what matters. For these reasons we will, in what follows, focus on aggregate aid.

4 Data

The underlying sectoral export data is obtained from the World Bank's World Integrated Trade Solution Database (WITS: COMTRADE). Exports to the rest of the world are taken as reported by the exporter. Exports are retrieved for 32 sectors using Revision 3 of the ISIC classification. Due to data availability we use 2000 as our initial period, and construct our NRCA variable based on this year. Since in many cases initial exports are zero, we use only 5 bins and an additional dummy for zero exports. This way we ensure that each quantile consists of more than one sectoral observations. Effectively applied tariff rates are also obtained from WITS. As a further main variable of interest, we obtain data on aid flows from the OECD's Development Assistance Committee (OECD, 2015). For this broad aid variable we construct a dataset covering the period 2001-2013.

Per capita GDP in constant (2011) US-Dollars –as required for the calculation of PRODY and EXPY— are from the World Bank's World Development Indicators (WDI). Total GDP in current US-Dollars as required for the aggregate trade equation is also obtained from WDI. Bilateral distance, used to calculate our market potential measure, is from CEPII. For robustness checks we use UNCTAD's data on FDI inflows, remittances flows from the World Bank (2017) and real effective exchange rates from Bruegel (Darvas, 2012). In our discussion of potential channels we use the WDI's measure of domestic credit provided by the financial sector as a percentage of GDP as an indicator of financial development.

[4]This is also supported by a positive correlation of the aid amount committed to each sector and its NRCA. This correlation is larger in low income economies, if sectors with no exports in the year 2000 are excluded.

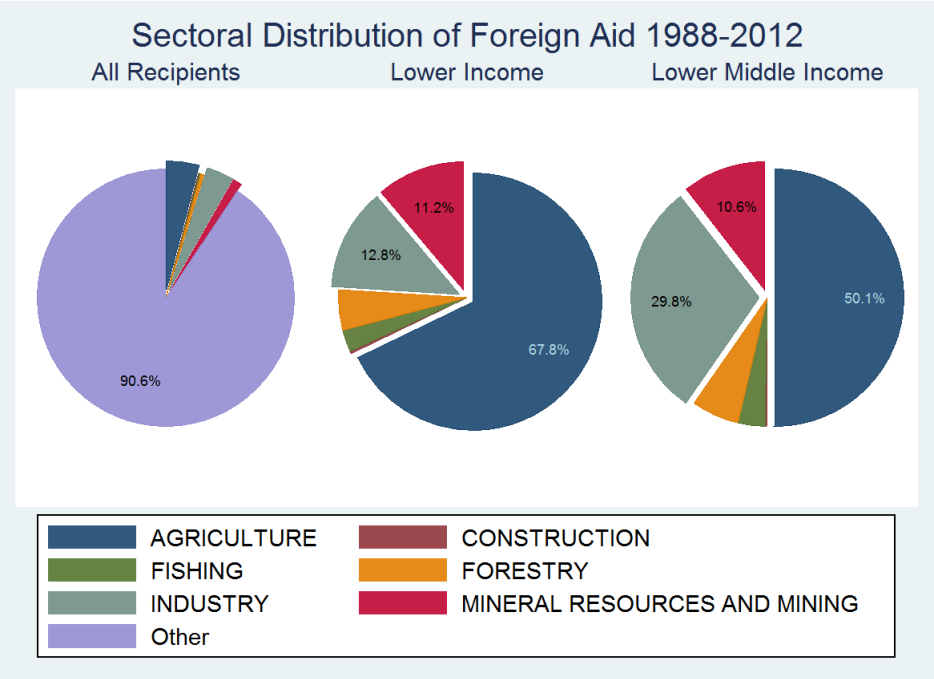

Figure 2: Sectoral distribution of commitments

5 Empirical Specification

The most popular model in empirical studies of trade is the gravity model of international trade (Tinbergen, 1962). Anderson and van Wincoop (2003) famously provided a theoretical foundation for the model that before had often been perceived as *ad hoc* (compare Deardorff 1984). Unfortunately, the bilateral gravity model does not lend itself easily to the study of total trade flows of a country. Calì and te Velde (2011) present a model based on very similar assumptions that leads to an expression for aggregate trade. However, they ignore general equilibrium effects in their model. Nevertheless, it seems like a reasonable starting point. In accordance with the previous gravity literature, their model aggregates trade flows as a function of productive capacity (GDP) and market potential (GDP of trading partners weighted by distance).

In our treatment of the aid variable, however, we will differ from Calì and te Velde (2011). Instead of including aid in logs in a log-linearized regression model, we use the aid expansion factor (Kruse and Martínez-Zarzoso, 2016; Hansen and Rand, 2014).[5] Kruse and Martínez-Zarzoso (2016) show that the choice of functional form can have severe implications for the parameter estimates obtained. The basic intuition is that aid is a nominal transfer and as such shifts the budget constraint. Hence, insofar as GDP can be considered the initial autark budget, aid should matter to the extent that it inflates GDP—i.e., $\left(1 + \frac{Aid}{GDP}\right)$.

Our research question is whether aid will have a different effect in different sectors, depending on whether or not the country has a comparative advantage in that very sector. Importantly, aid might even have a negative effect in weak sectors, but a positive in the strong sectors or the other way around. In order to be able to capture such patterns, we divide the empirical distribution of the NRCA of a country into bins, and allow heterogenous coefficients for each bin. The bins are separate by 4 quantiles. Contemporary NRCA, is highly endogenous in trade regression. Moreover, we are

[5]This is, in fact, closer to the model Calì and te Velde (2011) themselves derive. They do not estimate it this way, however.

interested in the long run effect. For both reasons we use the NRCA quantile of a given sector in the initial year. We also allow for a separate coefficient for sectors that have not exported in the initial period in order to capture—if partly—the extensive margin.

The estimation equation thus reads as follows:

$$\ln x_{ikt} = \beta_0 + \beta_{GDP}\mathbf{b}_{ik} \times \ln y_{it} + \beta_{Aid}\mathbf{b}_{ik} \times \ln\left(1 + \frac{Aid_{it}}{y_{it}}\right) + \beta_\tau \ln\left(\sum_{j \neq i} \frac{y_{jt}}{\tau_{ijkt}}\right) + \psi_i + \lambda_k + \theta_t \epsilon_{ijkt}, \tag{2}$$

where x_{ikt} are exports from country i in sector k at time t. y_i and y_j are importer and exporter GDP. $\mathbf{b}_{ik}$ is the incidence matrix for the bins of the distribution of NRCA. $\left(1 + \frac{Aid_i}{y_i}\right)$ is the aid expansion factor as defined above. ψ_i are exporter fixed effects, λ_k are sector fixed effects and θ_t are time fixed effects controlling for world market fluctuations. $\sum_{j \neq i} \frac{y_j}{\tau_{ijt}}$ is a measure for market potential, i.e., trading partners' GDP weighted by bilateral trade costs. In our baseline regressions, we will merely use bilateral distance and tariffs for τ.

We interact GDP with the different bins because larger countries are more likely to have a broader export portfolio. That means that they are more likely to also export goods where they have a relative disadvantage. Since the expansion factor has GDP in the denominator and GDP is correlated with aid, not including this interaction would bias results in favor of a Ricardian pattern.

5.1 Endogeneity

Estimating equation (2) raises the concern of endogeneity. In particular, a country that exports a lot, i.e., is more open to trade, could be rewarded by receiving a larger amount of aid. Such a reward channel may be stronger for certain sectors —e.g., resources— or directly depend on the level of comparative advantage of the sector in question.[6] The standard approach to endogeneity is to use an instrumental variable (IV) approach. The aid-growth literature has produced numerous such variables.

We will follow Temple and Van de Sijpe's (Forthcoming) approach, and construct a synthetic measure of aid based on the overall aid budget of the donor. Temple and Van de Sijpe (Forthcoming) then use average past values for the share of a given donor country's aid that has gone to a specific recipient in order to get counterfactual –synthetic– bilateral aid flows. These bilateral aid flows are then aggregated for each recipient, and the resulting aggregate is used as an instrument for actual aid flows. We use average bilateral shares for the period 1990-1999 to construct this variable. While recipient characteristics may be endogenous determinants of aid, in our setting donor characteristics can arguably be treated as exogenous. Moreover, the synthetic aid variable is also plausibly excludable because it represents merely a counterfactual aid flow.[7]

Instead of a standard IV-approach, we follow Wooldridge (2015) in using a control function approach. The control function rests on similar identifying assumption as the IV approach, namely excludability and exogeneity of the instrument. We estimate a first stage equation with development aid as our dependent variable:

[6] Thus, Bun and Harrison's (2014) result that interacting an endogenous with an exogenous regressor may yield an exogenous interaction cannot be invoked here. The reason is that even though the initial level of RCA is arguably exogenous, the way in which exports could reversely affect aid may depend on the level of RCA.

[7] We also considered potential alternative instrumental variables, which were recently suggested. Galiani et al. (2017) use crossing the International Development Association's gross national income eligibility threshold as an instrument. However, the local average treatment effect in this "Quasi-experiment", which is only experienced for countries on a growth trajectory is rather specific. This might be problematic for our specific research question as shifts in the export structure are suggested as growth determinants in the literature (Hausmann et al., 2005). Another alternative is Dreher and Langlotz's (2015) instrument, which is based on donor fractionalization and the probability to receive aid. As a large part of the statistical power of this IV is derived from the cold war period, which is not covered by our sample, this identification strategy is not applicable to our research.

$$\ln\left(1+\frac{Aid_{it}}{y_{it}}\right)=\alpha_0+\alpha_1 y_{it}+\ln\left(1+\frac{Aid_{it}^{syn}}{y_{it}}\right)+\phi_i+\zeta_t+v_{it} \tag{3}$$

where Aid_{it}^{syn} denotes our synthetic aid variable, and ϕ_i are country and ζ_t are year fixed effects. While in IV the predicted value from (3) would replace the endogenous regressor in (2), in a control function approach we use the predicted error term from (3) $\hat{v}_{it}$ as an *additional* regressor in (2) to properly control for the endogenous variation. Wooldridge (2015) and others have shown that in a linear model (without interactions) this yields the same point estimates as traditional IVs. One decisive advantage, however, is that the control function approach provides a simple Hausman-test of endogeneity that can be easily made robust to heteroskedasticity. In a control function approach one can simply use a robust t-test to test the null hypothesis of exogeneity of the variable of interest. If $\hat{v}_{it}$ is insignificant the null hypothesis can be accepted.

In a setting with interactions, however, the control function approach offers additional efficiency gains compared to IV. The difference, as Wooldridge (2015) points out, is that in an IV framework one has to treat every interaction as a single endogenous regressor. In the control function approach, on the other hand, it suffices to simply include $\hat{v}_{it}$, as in the linear case.

6 Results

Table 3 describes the main results, which are obtained in different fixed effects specification based on Equation 2. All regressions use the log of sectoral gross exports as the dependent variable. Exporter, sector and year fixed effects are included as explanatory variables in all regressions to account for country- and sector-level heterogeneity and changes in the world economy respectively. For brevity, we only depict the interactions of the extensive margin and the five NRCA quantiles with aid in the first to sixth row as well as the market potential indicator in the seventh row. Our baseline results in column (1) suggest that development aid primarily benefits sectors that are initially least succesful. We find significant positive effects in the bin of initially worst performing sectors with positive exports. Also the effect at the extensive margin (0-bin) is weakly significant. In fact, the pattern seems to suggest that the positive effect of aid is reduced as the degree of comparative advantage increases. Point estimates decrease the higher the bin, to the extent that the effect even turns negative and significant in the fourth. Only the fifth bin defies this pattern and shows a positive albeit insignificant effect. In Column (2) to allow for even more flexibility we add sector-year dummies, which capture the yearly dynamics of sectors to an even larger extent. Our results are robust to this modification.

In order to tackle the concern of endogeneity raised in section 5.1 in column (3) we present results from a control function approach as described above. The excluded instrument is the donor budget based synthetic aid measure due to Temple and Van de Sijpe (Forthcoming). As described above, we include the residual from the first stage $\hat{v}_2$ to control for endogeneity. However, $\hat{v}_2$ does not have a significant effect on the outcome. According to Wooldridge (2015), the significance test is tantamount to a heteroskedasticity-robust Hausman test of the null hypothesis that our variable of interest is exogenous. The test suggests that endogeneity is not a major problem. The strong similarity between columns (1) and (3) gives us further confidence that the issue can largely be set aside.

Temple and Van de Sijpe (Forthcoming) cite a potential cause of concern, which is that there may be confounding (global) factors affecting overall donor budgets and the outcome variable simultaneously. Their remedy is to employ a Common Correlated Effects (CCE) approach. However, due to the number of parameters that have to be estimated this approach is not feasible for us.[8] Instead, we resort to a Placebo test. We calculate the average expansion factor for all *other* recipients in our sample. The logarithm of this average replaces Aid_{t-1} in column (4). If in fact there are global confounding factors that increase donors' budgets we should see the same pattern when using other countries' expansion factors. The placebo treatment does not produce a pattern that is similar to the one in the previous

[8]Because of the necessity to retain GDP as a control, we do not have sufficient degrees of freedom.

Table 3: Fixed Effects Specifications

	(1) FE1	(2) FE2	(3) CF	(4) Placebo
$Aid_{t-1} \times 6$ bins of RCA_{2000}				
0 - Extensive Margin	5.506*	5.775*	5.445*	-18.66
	(2.235)	(2.259)	(2.223)	(11.05)
1 - low RCA	2.176***	2.128***	2.084***	-9.233
	(0.587)	(0.616)	(0.586)	(10.72)
2	0.478	0.282	0.393	-8.474
	(0.452)	(0.453)	(0.453)	(10.41)
3 - medium RCA	0.0422	-0.111	-0.0528	-9.855
	(0.454)	(0.461)	(0.456)	(10.48)
4	-0.958	-0.965*	-1.047*	-9.819
	(0.494)	(0.489)	(0.496)	(10.79)
5 - high RCA	0.207	0.490	0.112	-9.854
	(0.515)	(0.548)	(0.523)	(10.58)
Dist. + Tariff (MP)	0.377***	0.373***	0.381***	0.376***
	(0.0285)	(0.0285)	(0.0289)	(0.0286)
$\hat{v}_2$			0.523	
			(0.433)	
N	15925	15925	15925	15936
Year-Sector FE:	No	Yes	No	No
Control Function:	No	No	Yes	No

Note: Standard errors clustered at country-year level in parentheses. All regressions include Exporter, Sector and Year fixed effects. Further control variables (Bins and Interactions of Bins × GDP) are not depicted for brevity. Aid_{t-1} is to represent the expansion factor $\ln\left(1 + \frac{Aid_{it-1}}{y_{it-1}}\right)$. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

columns. In fact, the effect is insignificant for all bins. This suggests that global factors are not driving the results and, hence, that the instrument works.

6.1 Robustness Checks

In order to make sure that the relation we capture is not a spurious one, we run a number of further robustness checks. Table 4 presents results including a number of alternative channels that could be driving our results.

In Column 1 of Table 4 we include in addition to our aid expansion factor, an expansion factor for FDI inflow. This way, we try to examine whether aid possibly could crowd-in other types of funds that are the actual drivers of our pattern. For instance, Donaubauer et al. (2016) point to complementarities of ODA and foreign direct investment and show that specific aid types foster foreign investment. Again, different coefficients for the FDI expansion factor are calculated for each bin.[9] Evidently, including

[9]The FDI expansion factors are constructed in analogy to the aid expansion factors and are based on annual FDI

Table 4: Robustness - Other Financial Flows & REER

	(1) FDI	(2) Remittances	(3) REER
$Aid_{t-1} \times 6$ bins of RCA_{2000}			
0 - Extensive Margin	5.519*	3.912	8.117***
	(2.280)	(2.274)	(1.193)
1 - low RCA	2.194***	2.537***	2.430***
	(0.606)	(0.593)	(0.577)
2	0.518	0.717	0.447
	(0.464)	(0.471)	(0.444)
3 - medium RCA	0.101	0.0149	-0.0165
	(0.469)	(0.464)	(0.459)
4	-0.959	-1.378**	-0.744
	(0.506)	(0.499)	(0.523)
5 - high RCA	0.277	-0.333	0.368
	(0.533)	(0.493)	(0.515)
$Var_{t-1} \times 6$ bins of RCA_{2000}			
0 - Extensive Margin	-1.610	-4.682	-0.0657***
	(2.954)	(1.704)	(0.0178)
1 - low RCA	1.116	-1.349	-0.0969***
	(1.477)	(1.152)	(0.0184)
2	-0.941	0.248	-0.0967***
	(1.347)	(1.114)	(0.0185)
3 - medium RCA	1.507	-0.204	-0.0987***
	(1.080)	(1.066)	(0.0184)
4	-0.743	-0.968	-0.0881***
	(1.044)	(1.168)	(0.0187)
5 - high RCA	-0.211	-2.966	-0.0936***
	(1.372)	(1.270)	(0.0184)
N	15763	14911	15379

Note: Standard errors clustered at country-year level in parentheses. All regressions include Exporter, Sector and Year fixed effects. Further control variables (Bins and Interactions of Bins × GDP and a market potential indicator) are not depicted for brevity. Aid_{t-1} is to represent the expansion factor $\ln\left(1+\frac{Aid_{it-1}}{y_{it-1}}\right)$. Var_{t-1} is a placeholder for the respective variable mentioned in the column header. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

the FDI expansion factor has no noticable effect on the pattern we observe for aid. Moreover, FDI

inflows to the respective recipient economy.

does not seem to be positively associated with exports. However, aid may also be related to the amount of remittances a country receives (Minasyan and Nunnenkamp, 2016). We test this possibility by including an remittances expansion factor in Column 2 of Table 4. The remittances variable does not show a significant effect on exports, and does not affect the observed pattern. Finally, Rajan and Subramanian (2011) argued that aid could lead to dutch disease affects via an appreciation of the real exchange rate. Possibly, vulnerability to dutch disease effects could be different across sectors (for instance due to different use of imported inputs). In order to test whether appreciation is driving results, we estimate different coefficients for the real effective exchange rate (REER) for each bin. While the REER does seem to have a significantly negative effect on exports, this effect does not seem to differ across bins. Moreover, the pattern observed is largely unaffected by the inclusion of this additional variable.[10]

Next, we check if our pattern depends on the number of bins we chose.[11] We start with two bins and increase them gradually to eight. Results are reported in Table A.1 in the Appendix. Regardless of the number of bins we find that the effect of aid on exports decreases with the degree of initial comparative advantage. Only the highest sector defies this pattern for 5 and more bins. However, in all these cases it is only the highest bin that defies this pattern. We also used a less flexible specification where instead of bins we used a linear interaction, and a squared term for aid to account for non-linearities. Results for this exercise are reported in Table A.2 in the Appendix. While the parent term for the expansion factor is insignificant, in line with other studies finding no aggregate effect of aid (Nowak-Lehmann D. et al., 2013), the interaction has a negative and significant effect, albeit only weakly significant. The squared term, however, does not seem to exert a significant influence.

In Section 3 we showed that most developing countries share a similar pattern of comparative advantage. It is possible that our pattern is explained by those sectors, and is unrelated to comparative advantage. In order to rule out that possibility, in Table 5 we add an interaction between our aid expansion factor and several sectoral dummies that denote sectors in which developing countries typically might have a comparative advantage. In particular, we add an interaction with an agriculture dummy (column 1), a resource dummy (column 2), a dummy for manufacturing sectors (column 3), and a dummy for textile sectors (column 4). Finally, in column 5, we interact aid with Rajan and Zingales's (1998) measure for dependecy, since developing countries tend to have a comparative disadvantage in such sectors. In no case is the additional interaction significant or affects our general pattern.

Finally, we examine how the effects of aid play out over time. In Table A.3 in the Appendix we present results for a distributed lag model (DLM) including contemporay effects and lags up to the fifth year in the past. The rationale for this is twofold. First, as Clemens et al. (2012) argued development aid might need some time to show fruits. Second, we are interested whether we are capturing an effect that is persistent over time, or just contemporary. This can help narrow down the set of potential channels. Note that because of the use of many lags in the DLM, we lose a number of observations. The results suggest that the positive significant coefficients in the first bin stem mainly from contemporary aid as well as its first lag. Only at the extensive margin more long term effects materialize; seemingly arbitrary for the third and fifth lags.

[10] As a further robustness check, we considered different types of aid separately; e.g., aid for trade, financial development aid, infrastructure aid and aid designated to specific sectors. Note that since we are interested in the effect of the *composition* of aid on specific sectors, we are not linking specific aid components to specific sectors. Instead, we look at aid components as the country receives them, and obtain different slope parameters for different sectors. Results for these subtypes always turned out to be rather imprecise, even though a similar pattern than the one reported above was observed for instance for aid for trade. More importantly, for the rest of the aid inflow, i.e., all aid *not* part of the respective category, the pattern remained unaffected. This suggests that our results are not mainly driven by specific subtypes of aid, but rather by the total volume of aid received.

[11] The original number was chosen to ensure that every bin was non-empty for every country.

Table 5: Robustness - Sectors and Financial Dependency

	(1) Agriculture	(2) Resources	(3) Manufacturing	(4) Textiles	(5) Fin. Dep.
$Aid_{t-1} \times$ 6 bins of RCA_{2000}					
0 - Extensive Margin	5.507*	5.417*	6.491**	5.685*	3.613*
	(2.230)	(2.271)	(2.123)	(2.219)	(1.811)
1 - low RCA	2.175***	2.162***	3.419***	2.295***	1.991**
	(0.587)	(0.596)	(0.851)	(0.587)	(0.628)
2	0.484	0.462	1.642*	0.581	1.031*
	(0.452)	(0.453)	(0.752)	(0.452)	(0.470)
3 - medium RCA	0.0496	-0.0240	1.011	0.159	0.681
	(0.456)	(0.478)	(0.650)	(0.445)	(0.438)
4	-0.993*	-0.977	-0.255	-0.849	-0.552
	(0.503)	(0.499)	(0.561)	(0.483)	(0.524)
5 - high RCA	-0.332	0.145	0.271	0.380	-1.054
	(0.711)	(0.527)	(0.543)	(0.543)	(0.667)
$Aid_{t-1} \times$ Sector Dummy	1.095	0.398	-1.257	-1.162	-0.232
	(0.0361)	(0.971)	(0.649)	(0.630)	(0.772)
N	15925	15925	15925	15925	12575

Note: Standard errors clustered at country-year level in parentheses. All regressions include Exporter, Sector and Year fixed effects. Further control variables (Bins and Interactions of Bins × GDP and a market potential indicator) are not depicted for brevity. Aid_{t-1} is to represent the expansion factor $\ln\left(1+\frac{Aid_{it-1}}{y_{it-1}}\right)$. Sector Dummy is a placeholder for the respective dummy indicating the sector in the column header.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

7 Discussion and Potential Channels

One simple explanation for this pattern, as argued above, could be that sectors with a low initial comparative advantage face higher financing costs or are more likely to be credit constrained. In what follows, we will briefly discuss a potential framework to think about these ideas. The simple model borrows largely from Helpman et al. (2004) and Manova (2013). (The notation follows Helpman et al. (2004)).

Suppose in country i N_{ik} firms operate in sector $k = 1, \ldots, K$ sectors and each produce a distinct variety $\omega_k \in \Omega_k$. They produce using labour, where the wage – for simplicity – has been normalized to 1. Every firm draws a productivity coefficient a from a distribution $G(a)$, where a specifies how many units of labour the company needs to produce one unit of ouput. The firm can sell in the domestic market where it faces fixed costs f^D, and can additionally export the product abroad - or for notational purposes country j. In the latter case, it incurs additional fixed costs f^X and variable iceberg trade costs $\tau_{ijk} > 1$. Suppose we have preference that exhibit constant elasticity of substitution (CES) in any given sector k. Let $\epsilon_k \equiv 1/(1-\alpha_k) > 1$ denote the elasticity of substitution. The standard CES demand function implies: $q_{ik}(\omega_k) = p_{ik}(\omega_k)^{-\epsilon} E_{ik}/P_{ik}^{1-\epsilon}$, where q_{ik} denotes quantity, p_{ik} denotes the price of the variety, E_{ik} denotes expenditure, and P_{ik} the price index in sector k and country i. Expenditure and price index are taken as given. The same demand function holds for country j. CES preferences imply monopolistic competition, i.e., firms charge a markup above marginal costs. Hence,

$p_{ik}(\omega_k) = a/\alpha$ and $p_{jk}(\omega_k) = a\tau_{ijk}/\alpha$. As in Helpman et al. (2004) let $B^i = (1-\alpha)E_{ik}/(\alpha P_{ik})^{1-\epsilon}$ for brevity. Then profits from domestic sales and exports can be written as:

$$\pi^D = a^{1-\epsilon}B^i - f^D \tag{4}$$

$$\pi^X = (\tau_{ijk}a)^{1-\epsilon}B^j - f^X \tag{5}$$

Now, as in Manova (2013) assume that a fraction δ of fixed exporting costs have to be covered up front - i.e., cannot be covered by exporter revenue. However, unlike in Manova (2013) these upfront costs can either be covered by obtaining credit, which incurs a sector specific cost r_k, or by spending profits from domestic sales. Note that r_k can mean more things than just interest. For instance it may include travel that is necessary to obtain a credit. Importantly, since covering fixed cost using domestic profits is costless, only firms will take a credit for which $\pi^D < f^X$. Profits for such firms can be written as:

$$\pi^X = (\tau_{ijk}a)^{1-\epsilon}B^j - (1+\delta r_k)f^X + \delta r_k \pi^D \tag{6}$$

and after plugging in the domestic profit function (4), the sector specific zero profit cut-off productivity can be found at:

$$a_{ijk}^{1-\epsilon} = \frac{(1+\delta r_k)f^X + \delta r_k f^D}{\tau_{ijk}^{1-\epsilon}B^j + \delta r_k B^i} \tag{7}$$

As shown in Temple and Van de Sijpe (Forthcoming) aid affects domestic demand. Via this channel aid affects the cut-off productivity level, in a way that depends on r_k:

$$\frac{\partial a_{ijk}^{1-\epsilon}}{\partial B^i} = -\frac{(1+\delta r_k)f^X + \delta r_k f^D}{\left(\tau_{ijk}^{1-\epsilon}B^j + \delta r_k B^i\right)^2}\delta r_k \tag{8}$$

Let $E_{ik} \equiv s_{ik}Y_i\left(1+\frac{A_i}{Y_i}\right)^{\gamma}$, i.e., consumers spend a share s_{ik} of their income in sector k. And the income consists of GDP (Y_i) and an aid transfer (A_i). γ measures the extent to which aid enters the country's budget.[12] If $\gamma = 1$ this implies full pass through. Then:[13]

$$\frac{\partial a_{ijk}^{1-\epsilon}}{\partial B^i}\frac{\partial B^i}{\partial\left(1+\frac{A_i}{Y_i}\right)} = -\frac{(1+\delta r_k)f^X + \delta r_k f^D}{\left(\tau_{ijk}^{1-\epsilon}B^j + \delta r_k B^i\right)^2}\delta r_k \gamma B^i\left(1+\frac{A_i}{Y_i}\right)^{-1} \tag{9}$$

Whether or not this expression is positively related to r_k is not clear a priori. Since $\partial B^i/\partial\left(1+A_i/Y_i\right)$ does not depend on r_k it is sufficient to focus on (8). The cross derivative is:

$$\frac{\partial^2 a_{ijk}^{1-\epsilon}}{\partial B^i \partial r_k} = -\delta f^X \frac{\tau_{ijk}^{1-\epsilon}B^j\left(1+2\delta r_k\frac{f^X+f^D}{f^X}\right) - \delta r_k B^i}{\left(\tau_{ijk}^{1-\epsilon}B^j + \delta r_k B^i\right)^3} \tag{10}$$

A sufficient but not necessary condition for $\frac{\partial^2 a_{ijk}^{1-\epsilon}}{\partial B^i \partial r_k} < 0$ is that $r < 1$ and $\frac{\tau_{ijk}^{1-\epsilon}B^J}{B^i} > \delta$, i.e. the ratio of profit before fixed costs is larger than the share of fixed costs payed upfront. Then, if r_k depends on the NRCA with $r_k = f(NRCA_k)$ and $f'(NRCA_k) \leq 0$, we get that the worse the NRCA the larger the reduction in the cut-off productivity level as long as the latter inequality holds strictly. However, if r_k and τ_{ijk} are too high and it could happen that $\frac{\partial^2 a_{ijk}^{1-\epsilon}}{\partial B^i \partial r_k} > 0$. [14] Moreover, how a shift in the

[12] A part of aid is spending on refugees from a country. This part of aid, for example, does not lift the budget constraint.

[13] Note that if $\gamma = 1$ this expression does not depend on A_i. Only under incomplete pass-through is there a declining effect of aid on the budget. (Compare Kruse and Martínez-Zarzoso 2016.)

[14] There are a number of possible extensions that would strengthen the ability of this model to explain the pattern obtained above. First, in our model there are no costs to covering fixed costs with domestic profits. One could endogenize the decision to use credit rather than domestic profits - for instance in a dynamic model using discount rates. In such

productivity cut-off would translate into changes in exports would depend on the probability mass around the cut-off productivity level in each sector. In order to obtain the pattern seen above the sectoral cut-off productivity levels should be in a realm where the density is sufficiently flat.[15]

Moreover, this explanation squares nicely with a number of findings from the literature. It is consistant with Temple and Van de Sijpe (Forthcoming) in that we only need increases in domestic demand, and it is perfectly compatible if aid mainly affects consumption, as they find in their paper. Moreover, it is consistant with the finding that lagged values hardly have any influence, except at the extensive margin. Unless aid improves financial development the effect described here cannot be sustained.

The most important reason why $f'(NRCA_k) \leq 0$ could hold is access to financial infrastructure. First, sectors with a low comparative advantage could be more likely located in areas that are physically remote from banks or other funding institution. Another –perhaps more convincing– reason is information asymmetries about credit worthiness and market profitability. Cadot et al. (2013) stress the importance of information for credit availability. If that is indeed the channel the pattern should be less pronounced in financially more developed countries. In more technical terms, we would expect that $r_k = f(NRCA_k, FinDev)$, where $FinDev$ is short for Financial Development, and the cross derivative $\frac{\partial^2 r_k}{\partial NRCA_k \partial FinDev} > 0$. The reason is that financially more developed countries are probably more likely to collect and process the information necessarily more quickly and efficiently.

Table 6 provides suggestive evidence regarding this channel. We split the sample into two groups. Countries with financial development below the sample median are in the lower financial development category ("Lower FinDev") for which results are reported in column (1). Only countries which showed financial development above the median, i.e., that had higher financial development ("Higher FinDev") were used in column (2).

For the group of countries below median financial development in column (1) we get a very similar pattern than before. The coefficient in the third bin is a little higher than in the second, but the difference is not statistically significant. Moreover, the coefficient on the extensive margin is now insignificant albeit similar in size to what we obtained above. For the group of observations above the median, however, we obtain a pattern that looks more U-shaped. While there is a strong positive effect at the extensive margin, there is no significant effect for the lower bins (1 and 2). Unlike before, however, we do find positive effects for sectors that already perform well in bins 4 and 5. These results confirm that by and large our results are driven by countries with a lower degree of financial development. However, while we expected the pattern to be less strong for countries with a higher degree of financial development, the positive effects obtained for the high bins do not easily fit into the framework outlined above. A possible explanation could be that financially more developed countries tend to have better institutions such that in turn for instance infrastructure projects are more likely to succeed.[16] Nonetheless, the disparity between the two groups provides suggestive evidence that an up-front fixed cost channel could be driving our results.

8 Conclusion

In this paper we study heterogenous effects of aid on sectoral exports of developing countries. We show that sectors with an initially low comparative advantage or no exports seem to gain, while incumbent sectors see insignificant gains or even losses. We use a control function approach using an instrument

a model, companies facing a low cost of credit would always choose credit to cover their upfront costs, and domestic sales would only be relevant for firms that face prohibitive credit costs. Second, preference are homothetic in our model. Including non-homotheticity may strengthen our case. If the weak sectors face a high income elasticity they would benefit particularily from an increase in demand. We leave this for further research.

[15] Strictly speaking, this is only true for distributions with monotonically decreasing probability mass functions like the Pareto distribution. In other cases, like with the Frechet distribution (Eaton and Kortum, 2002) it could also be that some cut-offs are left and others right of the mode.

[16] For instance, Burnside and Dollar (2000) suggest that the quality that the quality of institutions in recipient countries matter for the efficacy of aid.

Table 6: Financial Development

	(1) Lower FinDev	(2) Higher FinDev
$Aid_{t-1} \times 6$ bins of RCA_{2000}		
0 - Extensive Margin	3.656	11.54***
	(1.994)	(1.987)
1 - low RCA	2.906***	1.513
	(0.700)	(1.789)
2	1.479**	0.233
	(0.549)	(1.297)
3 - medium RCA	1.515**	-1.688
	(0.558)	(1.168)
4	-0.755	2.491*
	(0.573)	(1.026)
5 - high RCA	-0.602	5.509***
	(0.585)	(1.112)
N	7407	8129

Note: Standard errors clustered at country-year level in parentheses. All regressions include Exporter, Sector and Year fixed effects. Further control variables (Bins and Interactions of Bins × GDP and a market potential indicator) are not depicted for brevity. Aid_{t-1} is to represent the expansion factor $\ln\left(1+\frac{Aid_{it-1}}{y_{it-1}}\right)$. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

based on a donor budgets (Temple and Van de Sijpe, Forthcoming) to control for endogeneity. A Placebo test confirms the validity of our instrument. We document that developing countries tend to have comparative advantages in similar sectors. Using sector specific dummies, we show that the patterns observed are not driven by any particular of these sectors. Moreover, the results do not seem to be sensible to the choice of functional form. The effects we find, however, seem to be short lived. Only at the extensive margin do we find significant effects of aid that date back farther than two time periods. In our discussion, we conjecture that aid by increasing aggregate demand may serve as a substitute for credit in some sectors and provide a theoretical framework based on Manova (2013). Results indeed seem to suggest that financially less developed countries seem to be driving our results.

In our view these results are relevant for current development policy in a number of ways. First, however, note that we do not think that the patterns we document are a necessary outcome of a mechanistic relationship. There are a number of conditions including the specificities of aid that affect outcomes. However, it is important to understand how aid in fact worked and works in order to improve its efficacy. (Unless of course one is inclined to think that no improvements are feasible.) We contribute to the understanding of how aid is linked to structural change. Our results seem to suggest that while aid is beneficial for sectors with a weak performance in terms of comparative advantage this effect is hardly sustainable. Thus, in the current form aid does not seem to promote structural change in a sustainable manner. If our conjectured channel is true, however, it can alleviate financial constraints –but, the downside as usual would be that in this way it may also alleviate reform pressures. In order to have a lasting affect on the structure of the economy aid should rather focus on providing a better environment for firms to flourish.

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Appendix

Table A.1: Robustness - Different # of Bins

	(1) 2 Bins	(2) 3 Bins	(3) 4 Bins	(4) 5 Bins	(5) 6 Bins	(6) 7 Bins	(7) 8 Bins
$Aid_{t-1} \times$ bins of RCA_{2000}							
0 - Extensive Margin	6.032**	5.652*	5.598*	5.506*	5.504*	5.666*	5.550*
	(2.262)	(2.247)	(2.229)	(2.235)	(2.212)	(2.204)	(2.214)
1	1.100**	1.372**	1.831***	2.176***	2.433***	2.531***	2.704***
	(0.410)	(0.464)	(0.503)	(0.587)	(0.631)	(0.664)	(0.692)
2	-0.420	0.240	0.286	0.478	0.363	0.685	0.962
	(0.388)	(0.542)	(0.445)	(0.452)	(0.518)	(0.552)	(0.553)
3		-0.458	-0.383	0.0422	0.258	0.669	0.572
		(0.467)	(0.455)	(0.454)	(0.513)	(0.489)	(0.525)
4			-0.215	-0.958	-0.0847	-0.846	-0.194
			(0.497)	(0.494)	(0.488)	(0.578)	(0.635)
5				0.207	-1.236*	-0.0401	-0.129
				(0.515)	(0.608)	(0.562)	(0.526)
6					0.695	-1.448*	-0.711
					(0.491)	(0.654)	(0.609)
7						1.226*	-1.392*
						(0.586)	(0.652)
8							1.467*
							(0.591)
N	15925	15925	15925	15925	15925	15925	15925

Note: Standard errors clustered at country-year level in parentheses. All regressions include Exporter, Sector and Year fixed effects. Further control variables (Bins and Interactions of Bins $\times$ GDP and a market potential indicator) are not depicted for brevity. Aid_{t-1} is to represent the expansion factor $\ln\left(1+\frac{Aid_{it-1}}{y_{it-1}}\right)$. * $p<0.05$, ** $p<0.01$, *** $p<0.001$.

Table A.2: Functional Form

	(1) Linear Form	(2) Quadratic Form
$NRCA_{2000}$	7.582***	7.839***
	(0.497)	(0.560)
Aid_{t-1}	0.467	0.913
	(0.353)	(0.696)
$Aid_{t-1} \times NRCA_{2000}$	-0.711*	-1.365
	(0.361)	(0.697)
Aid_{t-1}^2		-0.513
		(0.836)
$Aid_{t-1}^2 \times NRCA_{2000}$		1.215
		(0.873)
N	15925	15925

Note: Standard errors clustered at country-year level in parentheses. All regressions include Exporter, Sector and Year fixed effects. Further control variables (Bins and Interactions of Bins $\times$ GDP and a market potential indicator) are not depicted for brevity. Aid_{t-1} is to represent the expansion factor $\ln\left(1 + \frac{Aid_{it-1}}{y_{it-1}}\right)$. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table A.3: Lags

	(1) Aid_t	(2) Aid_{t-1}	(3) Aid_{t-2}	(4) Aid_{t-3}	(5) Aid_{t-4}	(6) Aid_{t-5}
$Aid \times$ bins of RCA_{2000}						
0 - Extensive Margin	1.314	2.293	0.136	2.295**	0.708	2.746*
	(1.571)	(2.066)	(1.236)	(0.802)	(0.874)	(1.015)
1 - low RCA	1.554*	1.070*	-0.218	0.0665	0.244	0.261
	(0.777)	(0.617)	(0.911)	(0.690)	(0.724)	(0.720)
2	-0.698	0.845	-0.191	-0.785	-1.073*	-0.347
	(0.597)	(0.503)	(0.631)	(0.714)	(0.469)	(0.624)
3 - medium RCA	-0.454	-0.110	0.00459	-0.402	-0.370	0.0849
	(0.640)	(0.525)	(0.563)	(0.611)	(0.595)	(0.590)
4	-0.281	-0.322	-0.168	-1.233	-0.381	-0.282
	(0.641)	(0.611)	(0.653)	(0.718)	(0.589)	(0.530)
5 - high RCA	-0.426	-0.0000144	0.213	-0.0651	-0.452	-0.615
	(0.610)	(0.587)	(0.539)	(0.683)	(0.502)	(0.598)
N						10919

Note: This table is based on one regression, which contains multiple lags. Standard errors clustered at country-year level in parentheses. All regressions include Exporter, Sector and Year fixed effects. Further control variables (Bins and Interactions of Bins × GDP and a market potential indicator) are not depicted for brevity. Aid_{t-1} is to represent the expansion factor $\ln\left(1+\frac{Aid_{it-1}}{y_{it-1}}\right)$.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.