

Foreign Aid and Internal Migration in Malawi

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Why it Matters/Relevance

Magnitude/Numbers

- Globally, 1 in 8 people are internal migrants (UNDP, 2009)
- Four times as many as international migrants

Aid as a Determinant of Internal Mobility:



In a context of high aid dependency and rapid (and mostly uncontrolled) “early” urbanization (Henderson and Turner 2020) such as Sub-Saharan Africa, this project

- ❖ *Investigates the (indirect) role of foreign assistance in driving internal mobility*
- ❖ *... and in doing so it explores whether aid might play a role in helping developing countries to better manage rapid urbanization - by creating more even development opportunities across districts.*

Theory and Hypothesis

- Private decisions to move or stay are driven by the *differentials in opportunities* across locations (Lucas 2015).

Opportunities mainly in the form of:

-  - Employment and Earnings (Harris and Todaro 1970)
-  - Availability and Quality of Amenities (Dustmann and Okatenko 2014)
- In extremely poor contexts/deprived areas the supply and the quality of amenities as well as income opportunities depend to a large extent by the provision of Foreign Aid (*Key!!*)

- **Hypothesis:** Especially in Aid Dependent Countries, Foreign Aid projects enhance the relative attractiveness of the areas in which they are located, which in turn shapes the incentives to migrate internally and drive population movements

This Paper in a nutshell: what we do

- This paper examines the role of Foreign Aid projects as ***Pull Factor*** for internal migration in Malawi.

We proceed in ***three Steps*** :

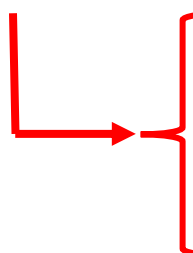
- Estimate the effect of aid projects (volumes of \$) located in a particular district on bilateral inflows of migrants.
- Also *Push Factor* and *Disaggregated Analysis: Aid Projects (Social vs Economic Infrastructures)* as well as types of Migrants (Gender)
- Explore the Mechanisms through which Foreign Aid projects can affect the decision to migrate.

How :

- ✓ We match IPUMS Census Data with Geo-Localized Aid Data and estimate a Gravity Model for Internal (district to district) Migration over the period 1998-2008.
- ✓ We provide a series of robustness tests, including an IV strategy a la Nunn and Qian (2014) and Langlotz et al (2019).
- ✓ We utilize the variability on *Nightlights* and *Quality of Services* using survey data (Afrobarometer) to explore the Mechanisms/Channels through which aid influences the decision to migrate.

This Paper in a nutshell: I

- ❖ **First**, our findings suggest not only that the effect of the number of projects on immigration at district level is statistically significant, but also that the estimated impact is numerically and economically relevant.

 *Moving from zero to positive aid inflows leads to 22 more migrants per dyad. This roughly corresponds to an additional 660 immigrants per district, which is about 8% of the average number of migrants per district in 2008.*

- ❖ **Second**, while the welfare enhancing effect of concluded aid projects in a given Malawian district (positively) influences its relative attractiveness as migrant destination, there's no evidence of a correspondent *push factor* effect of foreign assistance.

This Paper in a nutshell: II

- ❖ **Third**, our estimates reveal that the positive welfare effects manifest themselves not only through a rise in economic opportunities, but also in improved access to public services in recipient districts.
- ❖ **Fourth**, our results holds once the potential endogeneity is taken into account via a two-step IV strategy

How it Contributes to the Existing Literature

Aid as Determinant of Internal Migration in Developing Countries:

- Literature mostly focuses on the Impact of Aid as *Push Factor* in the form of *Cash Transfer* and *Credit Access* programs (e.g. Cai 2020, JDE, Ardington 2009, AEJ:AE, Bryan et. al 2014, ECTCA). Hence, it mostly refers to the effect of aid that operates through the *Liquidity Constraints Channel*.
 - ***This paper provides a broader perspective/more comprehensive analysis of the complex aid-migration relationship:***

Development Aid is not only about Cash Transfers (*Social Infrastructures!*)

- An issue often neglected in the aid-migration literature is that foreign assistance may also affect relevant non-monetary dimensions of well-being, such as the quality of public services

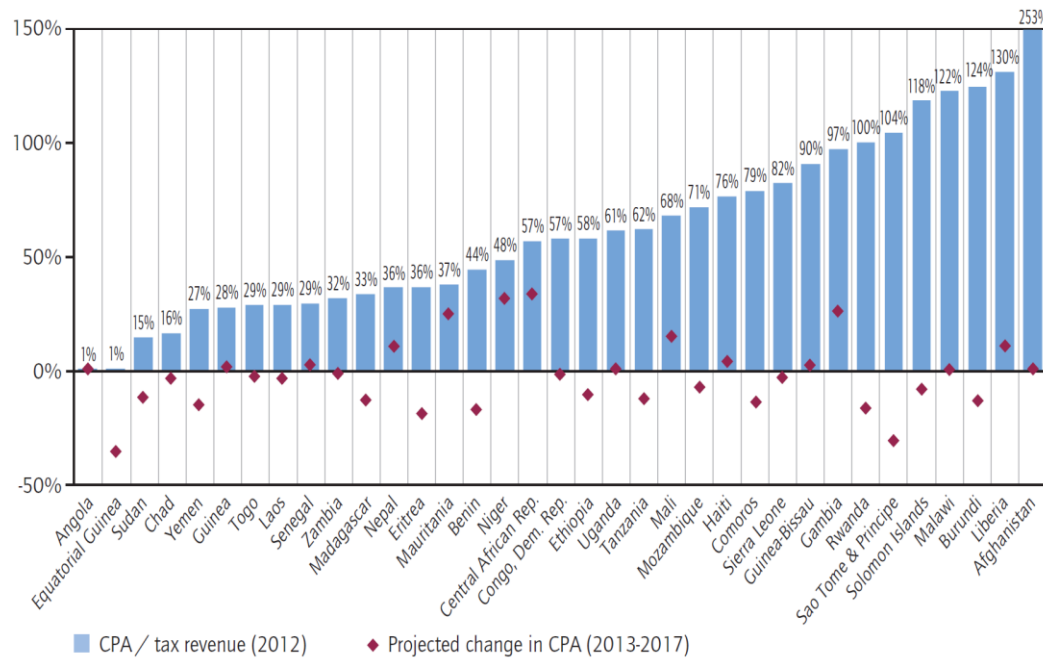
People are not only after Higher Wages (*Amenities!*)

- Harris and Todaro (1970) spatial gaps in earnings and the associated journey costs are only two of several factors affecting migration decisions. Dustmann and Okatenko (2014, JDE) emphasize the role of local amenities in shaping migration decisions, a channel that remains relatively understudied compared to the others (Lucas 2019).

Why Malawi?

Aid Dependency

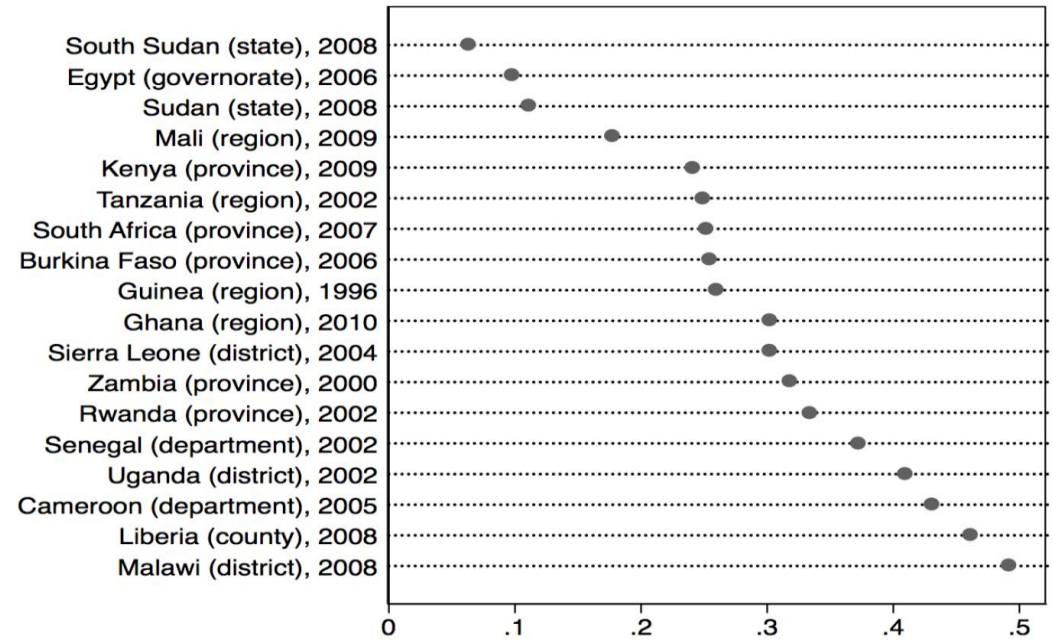
- Net ODA received accounts for 24.1% of GNI.
- Malawi receives more in aid than they can collect through taxes (122% in 2012, OECD, 2014).



Source: OECD 2014 – Global Outlook on Aid

High Internal Migration Rates

- In Sub-Saharan Africa, Malawi is the country exhibiting the highest Migration Rate.



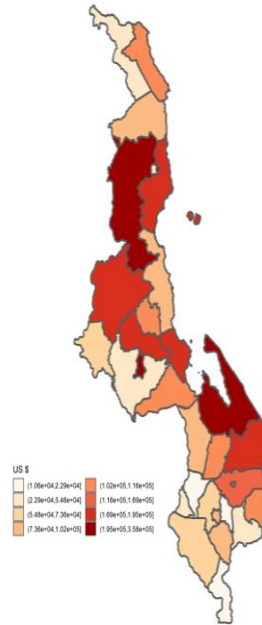
Source: Morten 2015

Location and Disbursement of Aid Projects

Panel a: Location of Aid Projects



Panel b: Disbursements for Concluded Projects



Notes: The graph includes only completed projects concluded in the period 1998-2008.
Source: Authors' elaboration on AidData.

- **Location of Aid Projects (1998-2008)**

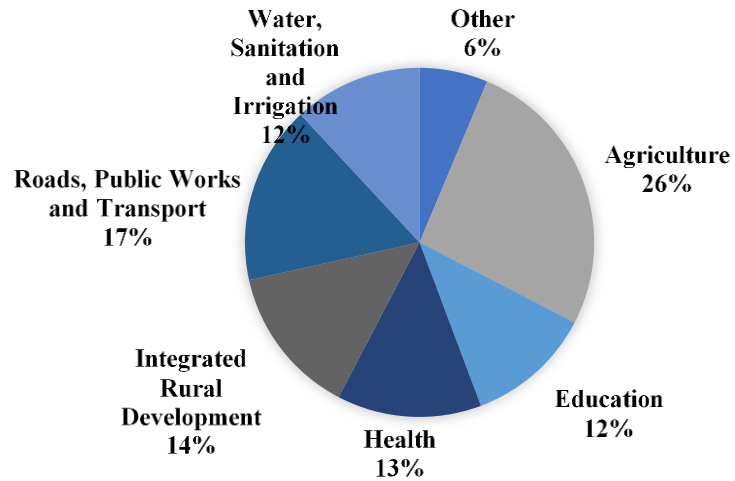
- ✓ The projects are (roughly) spread over all districts
- ✓ Slightly higher concentration in urban areas (Lilongwe, accounting for about 10% of the total), and Zomba (8.8%).

- **Disbursements(1998-2008)**

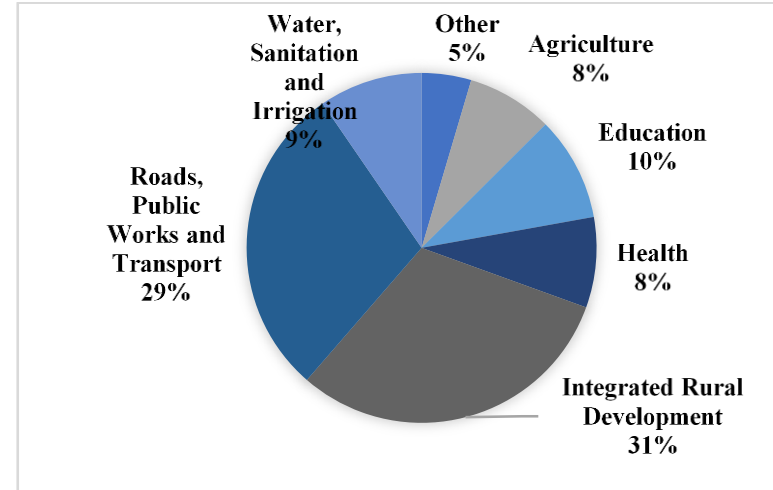
- ✓ Conversely, looking at the aid volumes, the larger ODA flows are concentrated in the districts of Karonga, Mangochi, and in Lilongwe district.

Sectoral Distribution of Aid Projects

Panel a: Number of Concluded Projects



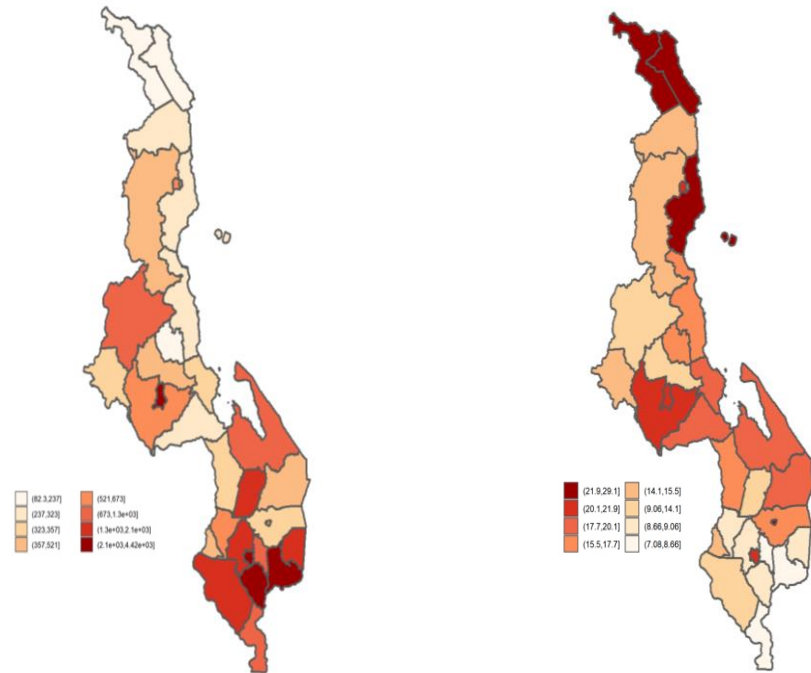
Panel b: Disbursements for Concluded Projects



- ✓ The largest share of aid disbursements in our sample takes the form of grants (around 70%) and comes from a restricted group of multilateral agencies (African Development Bank, the European Commission, World Bank and FAO) and bilateral donors, namely the US, Norway and Germany: the top seven donors accounts for about 90% of the total number of projects.
- ✓ Aid-supported projects in Malawi display a relatively high concentration in the agricultural sector and are almost evenly distributed across the other groups.
- ✓ When looking at the size of these projects, however, aid disbursements in rural development and roads, public works and transport together make about 60% of the total volume of ODA.

Internal Migration

Panel a: Migration Intensity (Aggregate flow) Panel b: Internal Immigrants (Rate of Growth)



Notes: Shaded areas (from light to dark) denotes immigration intensity (left panel) and immigration growth (right) by district over the period 1998-2008. Source: Authors' Elaboration based on IPUMS data

- ✓ The southern districts represent the most attractive destinations for internal migrants

..but at the same time..

- ✓ While internal migrants moved – on average – predominantly to the south-central districts and to the capital city, the areas in the North exhibited the highest growth rate of migration inflows over the period 1998-2008

Empirical Setup

Gravity Model

$$\ln(N_{ijt}) = \alpha_{ji} + \alpha_{it} + \beta \ln(Aid_{j:t-1,t-3}) + e_{ijt}$$

α_{ji} : Absorbs all the district-pair specific & time invariant characteristics that may affect internal flows of migrants.

α_{it} : Absorbs all the district specific & time varying determinants (push factors) of internal migration.

Other Controls

- ✓ **Migrant Network Effects**, which we capture by the pre-determined (one-year lagged) stock of migrants from district i living in district j
- ✓ **Nightlights**: which proxies for economic opportunities and population (source: NOAA-DMSP)
- ✓ **Standardized Precipitation-Evotransporation Index**: Crop affecting natural disasters (Harari and La Ferrara, 2019)
- ✓ **Conflict**: a dummy which takes the value of 1 when there's an ongoing conflict in the district at destination, 0 otherwise (ACLED, 2018 and Harari and La Ferrara, 2019).

Data: I

Migration Data:

- 2008 Malawi Housing and Population Census (Malawi NSO – IPUMS)

Official Development Assistance data

- Malawi Aid Management Platform Geocoded Research Release (Malawi NSO and AidData Research Lab)
- Creditor Reporting System – CRS (OECD)

Main Controls

- Nightlight (NASA), SPEI (Harari and La Ferrara, 2019), Conflict (ACLED)

Other Data (Robustness and Consistency of Results)

- Afrobarometer, DHS,

Data: II

<i>Migration: Bilateral Flows and Stocks</i>					
	N	Mean	SD	Min	Max
Migrant Flows (od), t	10054	288.30	1658.03	0	65630
Network (od), t	10054	3954.55	27372.86	0	535300
<i>Aid (different definitions)</i>					
	N	mean	sd	min	max
Disbursement for Concluded Projects_{j,t}	10054	2026431	4822938	0	32133124
Number Concluded Projects_{j,t}	10054	1.761886	2.926194	0	17
Aid Disbursements_{j:t-1,t-3}	10054	1853393	3024883	0	16353139
Number of Aid Projects_{j:t-1,t-3}	10054	1.836301	2.534877	0	17
<i>Additional Control Variables</i>					
	N	mean	Sd	min	Max
Nightlights_{j,t}	10054	0.688222	1.173775	0.006179	4.975995
Conflict_{j,t}	10054	0.326733	0.381061	0	1
SPEI_{j,t}	10054	0.243752	0.708976	-1.34018	1.635544

Baseline Estimates

	(1)	(2)	(3)	(4)
Estimator	PPML	PPML	PPML	PPML
Dep. Variable	<i>Migrant Flows</i>	<i>Migrant Flows</i>	<i>Migrant Flows</i>	<i>Migrant Flows</i>
Aid_{j:t-1,t-3}	0.008*** (0.002)	0.007*** (0.002)	0.006*** (0.002)	0.006*** (0.002)
Network _{ij, t-1}		0.360** (0.162)	0.323** (0.153)	0.323** (0.154)
Nightlights _{d,t}			0.074*** (0.021)	0.075*** (0.021)
Conflict _{d,t}				-0.004 (0.018)
SPEI _{d,t}				0.014 (0.039)
Observations	10,054	10,054	10,054	10,054
% Null	.22	.22	.22	.22
Adj. R2	.96	.96	.96	.96
Pair FE	Yes	Yes	Yes	Yes
Origin*Year FE	Yes	Yes	Yes	Yes

Notes: *** p<0.001, ** p<0.01, * p<0.05 Standard errors clustered by destination in parentheses. The Table reports the results of Equation (1) estimated with PPML with different sets of controls. The variable **Aid_{j:t-1,t-3}** refers to the 3-year average of total aid disbursements received by the destination district over the previous 3 years (expressed in constant US\$) in logs. The additional controls include the stock of migrants from district *i* to district *j* in the previous year (in logs) as a measure of migrants' network; and three measures capturing destination specific time varying factors, such as Average Nightlight intensity, presence of any form of Conflict, and a measure of adverse climatic conditions respectively. See Table A1 for a full description of the controls.

Quantification

- ❖ Our results reveal a positive impact of foreign aid as a *pull factor* for internal migration in Malawi. This effect is not only statistically significant, but also economically relevant.
- ❖ A [back-of-the-envelope](#) calculation shows that moving from zero to positive aid inflows (which corresponds to the 55th percentile of the aid distribution), leads to 22 more migrants per dyad. This roughly corresponds to an additional 660 immigrants per district, which is about 8% of the average number of migrants per district in 2008.
- ❖ In addition, the decreasing marginal return of the volume of aid in terms of additional migration suggests that migration decisions appear to be mostly influenced by the presence of aid-supported projects in recipient districts, rather than their size.

Robustness of the Baseline Estimates

<i>Type of Robustness Test</i>	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	<i>Alternative Estimators</i>		<i>Alternative Sets of Fixed Effects</i>				<i>Robustness to sample selection</i>			
	Pooled OLS	EK Tobit	Pair Only	Pair + T	Pair + O + T	O + T + D	No Top Destination	No Top Migr. Corridors	No Top Recipients	No Zero Aid Flows
Aid Disbursements_{Sj;t-1,t-3}	0.008**	0.007***	0.040***	0.009***	0.009***	0.009***	0.008***	0.007***	0.008***	0.011***
	(0.003)	(0.002)	(0.005)	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)	(0.004)
Observations	10,230	10,230	10,054	10,054	10,054	10,230	9,064	9,999	9,075	5,436
% Null	-	-	.22	.22	.22	.23	.23	.22	.23	.16
Adj. R2	.85	.85	0.94	0.95	0.95	.35	0.95	.96	.96	.96
Origin*Year FE	Yes	Yes	No	No	No	No	Yes	Yes	Yes	Yes
District Pair FE	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Year FE	No	No	No	Yes	Yes	Yes	No	No	No	No
Origin FE	No	No	No	No	Yes	Yes	No	No	No	No
Destination FE	No	No	No	No	No	Yes	No	No	No	No

Sectoral Analysis

	(1)	(2)	(3)	(4)
Estimator	PPML	PPML	PPML	PPML
Dep. Variable	<i>Migrant Flows</i>	<i>Migrant Flows</i>	<i>Migrant Flows</i>	<i>Migrant Flows</i>
Disbursement for Social Projects_{j:t-1,t-3}	0.003 (0.003)			0.001 (0.002)
Disbursement for Economic Projects_{j:t-1,t-3}		0.010** (0.003)		0.009** (0.003)
Disbursement for Miscellaneous Projects_{j:t-1,t-3}			0.003 (0.003)	0.000 (0.002)
Observations	10,054	10,054	10,054	10,054
% Null	.22	.22	.22	.22
Adj. R2	.96	.96	.96	.96
Pair f.e.	Yes	Yes	Yes	Yes
Origin * year f.e.	Yes	Yes	Yes	Yes

Different Types of Migration

Estimator	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dep. Variable	PPML <i>Migration</i> (Men)	PPML <i>Migration</i> (Women)	PPML <i>Migration</i> (Youth)	PPML <i>Migration</i> (Work.)	PPML <i>Migration</i> (Old)	PPML <i>Migration</i> (Urban)	PPML <i>Migration</i> (Rural)
Aid Disbursements_{j:t-1,t-3}	0.010*** (0.002)	0.006*** (0.002)	0.008*** (0.002)	0.007*** (0.002)	0.007 (0.002)	0.006* (0.003)	0.005 (0.003)
Observations	9,966	9,790	9,647	10,032	4,750	1,320	8,734
% Null	.22	.2	.37	.27	.74	.09	.24
Adj. R2	.94	.94	.97	.87	.4	.97	.96
Pair f.e.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Origin * year f.e.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Wald Test Chi2 (p-val)	12.389324 (0.00)		0.16 (0.69)		3.97 (0.04)		

Mechanism

<i>Mechanism</i>	(1)	(2)	(3)	(6)
<i>Dep. Variable</i>	<i>Growth</i>	<i>School</i>	<i>Clinic</i>	<i>Electricity</i>
Aid Disbursements_{j:t-1,t-3}	0.001** (0.001)	0.027*** (0.006)	0.016* (0.007)	0.021** (0.007)
Observations	186	2,209	2,209	2,209
R-squared	0.89	0.895	0.457	0.521
Controls	Yes	Yes	Yes	Yes
District f.e.	Yes	Yes	Yes	Yes
Year f.e	Yes	Yes	Yes	Yes

Additional estimates: Aid as Push Factor

Estimator	(1)	(2)
Dep. Variable	<i>Net-Migration</i>	Int.nal Emigrants
Aid Disbursements_{j:t-1,t-3}	0.007* (0.004)	-0.007* (0.004)
Observations	10,054	321
% Null	.22	-
Adj. R2	.96	0.90
Pair f.e.	Yes	No
Dest * Year f.e.	Yes	No
Origin * Year f.e.	No	Yes
Kleibergen-Paap F-Stat	-	-

Endogeneity Concerns I

Potential Endogeneity of Geo-Localized Aid Projects, which might stem from different sources:

❖ Measurement Error AidData dataset does not encompass the totality of aid projects implemented in district j at time t : The main sources of omission lies in imprecise geo-localization and misreporting of aid volumes in presence of multi-location projects

❖ Reverse Causality Massive immigration might trigger international support in the most affected areas

❖ Omission of Variables that are simultaneously related to the error term (and thus immigration flows) and the included covariates for which we have data

This issue might be *particularly compelling* in our analysis as - given the constraints in terms of data availability in Malawi - we are able to include only a very limited number of district specific controls.

Endogeneity Concerns II

We implement a **Two-Step Strategy** along the lines of Eaton and Kortum (2002), Head Ries (2008), Docquier et al. (2021)

- We utilize an instrument a la Dreher et al (2019) and Nunn and Qian (2014), which is plausibly related to the number of concluded projects and unrelated to the total inflows of immigrants in given district of destination. The **first stage** then becomes:

$$Aid_{j:t-1,t-3} = \gamma_1 \sum_k \left(ODA_{k:t-1,t-3}^{(j)} * p_{j,k} \right) + \alpha_j + \alpha_t + \epsilon_{jt}$$

- ✓ Where γ_1 denotes the correlation of our instrument with the endogenous variable.

- The **second stage** reduces to:

$$\widehat{\alpha}_{jt} = \beta \ln(Aid_{jt-1,t-3}) + \omega_{jt} + \alpha_j + \alpha_t + \epsilon_{jt}$$

- ✓ where $\widehat{\alpha}_{jt}$ is the estimated destination-year fixed effects (in logs), from a fully specified structural gravity model.

Endogeneity of our variable of interest can now be addressed using an instrument with a district-time (jt) dimension

The Instrument

We construct our instrument by interacting a dyadic specific time invariant variable - the probability of receiving aid from a particular donor k , $\overline{p}_{j,k}$ – with a time varying district specific variable – the sum of the total volume of **aid commitment** allocated by donors to all recipients but Malawi, and that are present with at least one project in district j at time t , $ODA_{k,t}^{(j)}$.

- The volume refers to the total aid committed by donors to all recipients with the exclusion of Malawi.
- We define the probability of receiving aid from donor k as $\overline{p}_{j,k} = \frac{1}{11} \sum_{t=1}^{11} p_{j,k,t}$ where $p_{j,k,t}$ is a binary indicator variable that is one when district j hosts at least one aid project from donor k at time t .
- We multiply these two terms and then aggregate over all donors k ; the aggregated term is eventually utilized as an IV at district time level for Aid_{jt}

IV Estimates: I

Specification	(1) <i>Reduced Form</i>	(2) <i>Baseline 1st Stage</i>	(3) <i>2nd Stage No IV</i>	(4) <i>Baseline 2nd Stage</i>	(5) <i>Sector: Economic</i>	(6) <i>Sector: Social</i>	(7) <i>Sector: Else</i>	(8) <i>Mechanisms: School</i>	(9) <i>Mechanisms: Clinics</i>	(10) <i>Mechanisms: Electricity</i>	(11) <i>Mechanisms: Growth</i>
<i>Dependent Variable</i>	<i>Mig. Flows</i>	<i>Aid</i>	<i>Dest * Year f.e. (in logs)</i>								
<i>IV</i>	5.291*** (1.354)	70.917*** (20.675)									
<i>Aid Disbursements</i> _{j;t-1,t-3}			0.009*** (0.003)	0.075*** (0.023)	0.055*** (0.012)	0.183 (0.177)	0.065*** (0.024)	0.084*** (0.024)	0.090*** (0.021)	0.036*** (0.021)	0.011*** (0.007)
Observations	341	341	341	341	341	341	341	341	341	341	341
Destination * Year f.e.	Yes	No	No	No	No	No	No	No	No	No	No
Pair f.e.	Yes	No	No	No	No	No	No	No	No	No	No
Destination f.e.	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year f.e.	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Kleibergen Paap F-Stat	No	11.766	No	11.766	18.659	1.342	18.170	537.396	537.396	537.396	19.261

IV Estimates: II

Specification	(1) <i>Gender: Men</i>	(2) <i>Gender: Women</i>	(3) <i>Age: Youth</i>	(4) <i>Age: Working</i>	(5) <i>Age: Old</i>	(6) <i>Area: Urban</i>	(7) <i>Area: Rural</i>	(8) <i>Push Factor: Net Flows</i>
<i>Dependent Variable</i>	<i>Dest * Year f.e. (in logs)</i>							
Aid Disbursements_{j:t-1,t-3}	0.082*** 0.024	0.067*** (0.024)	0.102*** 0.033	0.066*** (0.024)	0.085* (0.045)	0.024 (0.177)	0.056** (0.023)	0.074* (0.023)
Observations	341	341	341	341	320	70	341	341
Destination * Year f.e.	Yes	No	No	No	No	No	No	No
Pair f.e.	Yes	No	No	No	No	No	No	No
Destination f.e.	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year f.e.	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Kleibergen Paap F-Stat	11.766	11.766	11.766	11.766	9.991	1.342	11.703	12.291

Endogeneity Concerns: III

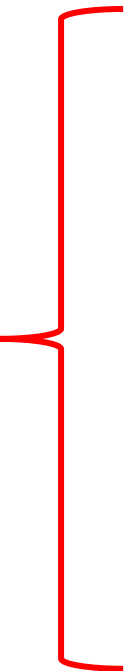
The relevance of the instrument is also robust to the inclusion of an additional instrument. We use both the probability of political switching of a district's administration to the president's party and the share of presidents co-ethnicity (from Khomba and Trew, forthcoming 2021)

<i>Mechanism</i>	(1)	(2)	(1)	(2)
	<i>1st Stage</i>	<i>2nd Stage</i>	<i>1st Stage</i>	<i>2nd Stage</i>
<i>IV2</i>	<i>President's Co-ethnicity</i>		<i>Political Switching</i>	
<i>Dep. Variable</i>	<i>Aid Disbursement</i>	<i>Migration Flows</i>	<i>Aid Disbursement</i>	<i>Migration Flows</i>
Aid Disbursements_{j:t-1,t-3}		0.077*** (0.024)		0.098*** (0.031)
IV 1	69.416*** (22.617)		69.527*** (20.887)	
IV 2	-0.372 (2.573)		0.066 (0.952)	
Observations	341	341	270	270
Destination * Year f.e.	No	No	No	No
Pair f.e.	No	No	No	No
Destination f.e.	Yes	Yes	Yes	Yes
Year f.e.	Yes	Yes	Yes	Yes
Kleibergen Paap F-Stat	11.766		6.684	
Hansen's J	1.167		0.81	

Conclusions & Policy Implications

- ❖ *Our findings suggest not only that the effect of aid on immigration at district level is statistically significant, but also that the estimated impact is numerically and economically relevant.*
- ❖ *While the welfare enhancing effect of aid-supported projects in a given Malawian district (positively) influences its relative attractiveness as migrant destination, there's no evidence of a correspondent push factor effect of foreign assistance.*
- ❖ *Our estimates reveal that the positive welfare effects of foreign assistance manifest themselves either through an increase in economic opportunities, as well as via an improved quality of local public services in recipient districts.*

Conclusions and Policy Implications

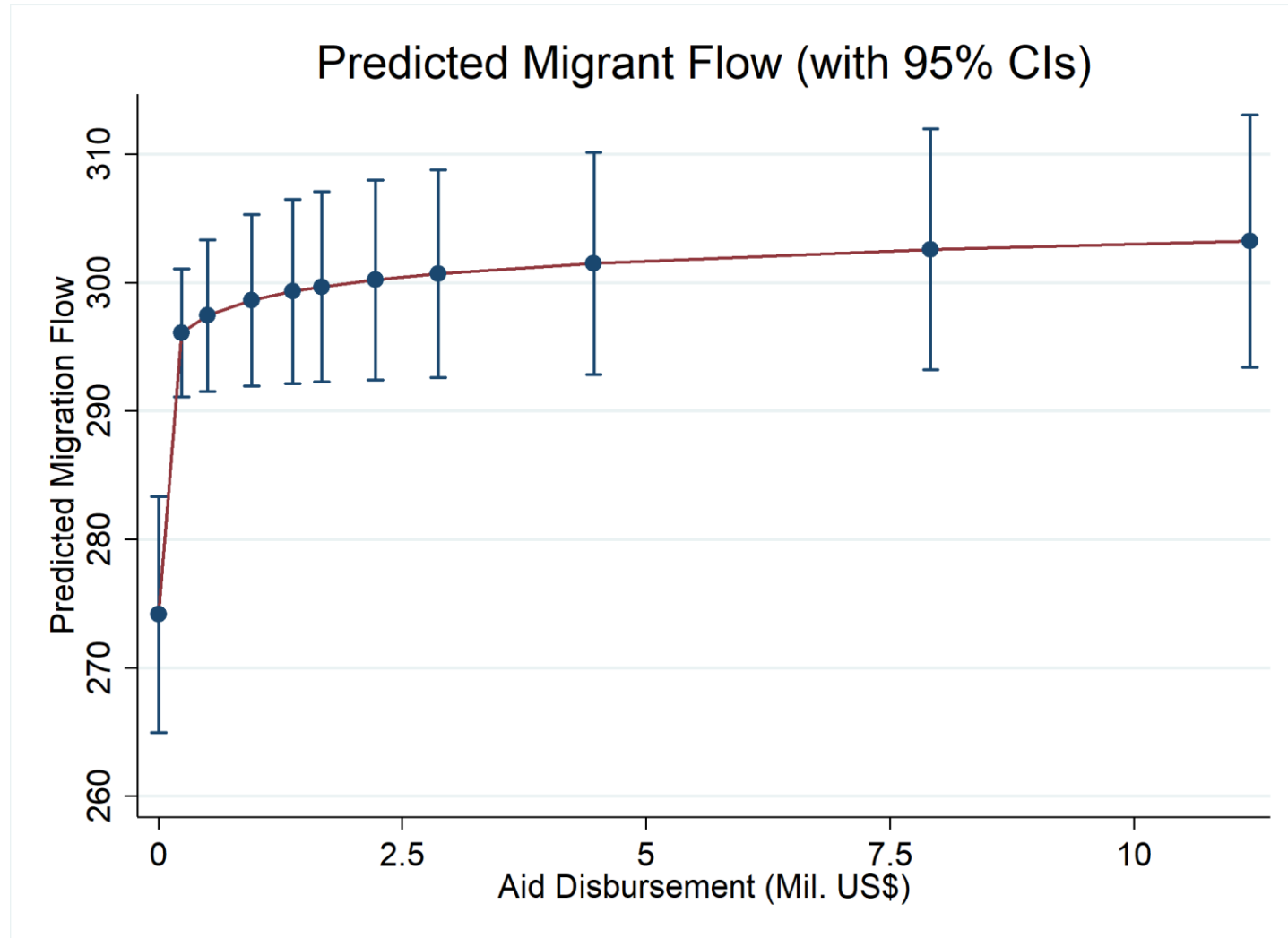
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- ❖ *From a policy point of view this paper highlights a so far unexplored dimension of foreign aid i.e. its capacity to drive within-country migration by affecting the distribution of economic and income opportunities across internal areas.*
 - ❖ *A potential concern is that aid-supported projects – as we show in our analysis - mostly drives internal migration towards easily-targeted urban areas. This poses important challenges in donors' aid allocation decisions.*

Thank you for your attention.

Extra Slides

Appendix

Quantification: II



Aid Volatility

Figure A1: Volatility of Aid Disbursements by District



Notes: Time series of the yearly volume of concluded aid projects in each district (in constant US\$).

Two-Step Strategy I

- ✓ Results of the 2-Step PPML+IV OLS (Column 1) essentially confirm the findings of our baseline estimates.
- ✓ Once endogeneity is accounted for (Column 2), the aid coefficient significantly increases – denoting potential sources of bias in the data and suggesting that the baseline results should be interpreted as a lower bound of the “true” effect of foreign assistance.
- ✓ While the IV estimates reinforce the evidence on the role of aid-supported projects as a pull factor for internal migration in Malawi, we still refrain from making strong causal claims regarding the link between aid and internal mobility.