

Finn Tarp | Farewell lecture, Ministry of Foreign Affairs
Helsinki, Finland, 17 December 2018

Development aid and economic policy: getting the analytics and guiding principles right



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Part I: Introduction and motivation

Foreign aid is controversial

Introduction

- The effectiveness of aid contentious: not really surprising
 - Aid is given and received for many reasons
 - “Does aid work” has many interpretations
 - Even if we agree on purpose: “The how” remains open
- Analytical reasons for disagreement
 - Different perceptions of market structure and power (causal relationships)
 - Different levels of aggregation
 - Different time horizons

One key question of interest

- Does foreign aid boost economic growth on average in developing countries?
- Much debated in both the academic and popular literature
 - “The notion that aid can alleviate systemic poverty, and has done so, is a **myth**. Millions in Africa are poorer today **because** of aid; misery and poverty have not ended but have increased.”

(Dambisa Moyo, 2009)

- “A **reasonable estimate** is that over the last thirty years [aid] has added around **one percentage point** to the annual growth rate of the bottom billion.”

(Paul Collier, 2007)

Objections to pursuing the issue

- This isn't a relevant question
 - Economic growth is not the objective
 - Foreign aid is too heterogeneous
 - Averages are not interesting
- This is FUQed
 - A fundamentally unanswerable question (Angrist & Pischke)

Challenging methodological issues

Recognize upfront:

- Data quality an issue across the board (though getting better)
- Growth is a highly complex, non-linear process
- Long delays between receipt of aid and onset of economic growth (e.g., health, education)
- Endogenous allocation of aid
 - good performers graduate
 - poor performers remain or receive even more

= Humility is required

A common empirical challenge

- Card (2001) reviews literature on the causal impact of schooling on earnings
 - Many similarities with aid:
 - Selection bias
 - Heterogeneous treatment effects
 - Measurement error - both in terms of quality and quantity
 - Use of supply side innovations to identify causal impact
 - A truly voluminous literature
 - Large high quality data sets
- Difficulty establishing the direction of bias of OLS estimates

What is the challenge?

- How to measure the true impact of aid?
- Targets versus actual outcomes
- Before-and-after
- The need for a counterfactual
 - With-and-without
 - It is difficult and controversial! Economists use different (often statistical) methods to try to deal with this

So, many difficulties in pursuing the issue: but.....

- My view: Profound dangers involved if the economics profession and more broadly social sciences fenced off the question (would leave the field even more wide open to unhelpful rhetoric...)
- And existing macro-lessons and insights spanning >50 years do merit attention when one looks carefully at the accumulated evidence
- Alongside insights from micro- and meso-level studies [not in focus here – but generally positive]

Part II: The empirical literature before 2008

A tale of moving goal posts,
four generations of work and
many misinterpretations of the data

Part II (i): 1st and 2nd generation

What does “Does Aid Work?” mean?

An economist’s perspective

- High income per capita associated with good standards of living – a lot of variation around means, but
- How to get high income? One avenue is:
 - Savings -> Investment -> Growth
- “Does aid work” often means:
 - Does aid increase savings?
 - Does aid increase investment?
 - Does aid increase growth?

Micro-evidence (in passing)

- Traditional cost-benefit analysis
- Many projects showed respectable rates of private, economic and social return
- Different projects had different returns (and variation across countries and time), but overall it seemed aid works ...
- And to this can be added a large literature of randomized control trials (RCTs)

The early macro model: the Harrod-Domar macro model of saving, investment and growth

$$\text{Growth} = \text{Constant} * \text{Investment} / \text{GDP}$$

$$g = v \frac{I}{Y}$$

$$\text{Investment} \equiv \text{Gross Domestic Saving} + \text{Foreign Saving}$$

$$\frac{I}{Y} \equiv \frac{S}{Y} + \left(\frac{A}{Y} + \frac{F}{Y} \right)$$

- This simple (and optimistic) model leads to the “financing gap” model: Aid fills a gap to reach desired growth
- Aid => S one-to-one, so Aid => I one-to-one, and **Aid => Growth is predictable and sizeable** (Aid = 10% of GDP might give an additional 5% growth)

Aid and growth - 1970s and 1980s

- Early optimism – Gustav Papanek’s high-profile articles using **simple cross-country regressions** (early 1970s)
- But increasing disappointment with traditional (Harrod-Domar and two gap) models
- Aid may work at micro – but its impact is not only smaller than predicted (for many reasons) – it was also argued it somehow ‘evaporates’ on its way to the macro level (**micro-macro paradox**)
- Eventually widespread perception of failure – reported in influential summary overview studies...by Paul Mosley, Anne Krueger, Howard White etc
- But **what did the simple cross-country research actually show?** No impact??

Aid Effectiveness Disputed

Hansen and Tarp
Journal of International Development
(2000)

Early literature - Hansen and Tarp (2000)

- 131 "early" (simple) **cross-country regression studies**...
 - Several studies showed aid associated with decreased savings BUT only one study (and one regression) (Gupta & Islam, 1983) shows impact is greater than the aid – so net savings effect positive
 - Aid increases investment! Not a single study contradicts
 - Only **one** study (and one regression) (Mosley, 1987) shows negative impact on growth
- Based on this literature, aid seemed to work – on average
- But then the goal posts moved -> 3rd generation

Part II (ii): 3rd generation

Aid and growth in the 1990s

Panel data cross-country regressions

- New panel data
- New growth theory (introducing economic policy and institutions directly) (plugging aid in as an explanatory variable)
- Taking account of the endogeneity of aid
- Taking non-linearity serious
- New econometric methods – **dynamic panels** (GMM)
- Boone (1994): **Aid down the rathole**
- But Boone soon started fading....

Aid and Growth: Burnside-Dollar (1997)

- Burnside-Dollar: aid works
 - **But only** in good policy countries
- Burnside-Dollar cut the *Gordian knot* introducing an **aid x policy** interaction term in the statistical analysis alongside aid itself (aid insignificant, interaction significant at 10%)
- Note underlying development **paradigm** and key policy implication: selectivity (provide background and discuss what this implied for the guiding principles in aid allocation and policy)
- Note also: you could **equally well** (based on the Burnside-Dollar analysis) have argued: policy works, but only in aid receiving countries

Back to basics

Conditional

$$\frac{\dot{y}_{i,t}}{y_{i,t}} = \alpha + \beta d_{i,t}^{net} + \gamma q_{i,t} + \delta (d_{i,t}^{net} \times q_{i,t}) + X_{i,t} \eta + \theta \ln y_{i,t} + \varepsilon_{i,t}$$

$$d_{i,t}^{net} = Z_{i,t} \zeta + v_{i,t}$$

Unconditional

$$\frac{\dot{y}_{i,t}}{y_{i,t}} = \alpha + \beta d_{i,t}^{net} + \lambda (d_{i,t}^{net})^2 + X_{i,t} \eta + \theta \ln y_{i,t} + \varepsilon_{i,t}$$

$$d_{i,t}^{net} = Z_{i,t} \zeta + v_{i,t}$$

Aid and Growth Regressions

Hansen and Tarp
Journal of Development Economics
(2001)

A more convincing story

- Hansen and Tarp (2001) – there is a more convincing story/better description of the data (with very different implications):
 - Aid works, but diminishing returns (and driven by a few “bad cases”)
 - The interaction term, aid x policy, loses out to aid squared!
 - Policy also works!
- But Burnside-Dollar continued influential (although gradually undermined in practice)

3rd generation: summing-up

- A substantial number of 3rd generation studies
- General consensus – aid does seem to work (disagreement about the particular circumstances)
- Robustness an issue, methodological choices matter + remember ‘iron law of econometrics’:
 - With ‘noisy’ data, a ‘dirty’ dependent variable, and weak proxies results biased towards zero
 - Weak instruments will give weak conclusions
- Don’t allocate aid selectively according to simple macro rules – but the aid x policy story has remained influential
- And then the goal posts moved again -> 4th generation

On The Empirics of Foreign Aid and Growth

Dalgaard, Hansen and Tarp
The Economic Journal (2004)

Aid and Development

Tarp

Swedish Economic Policy Review (2006)

Part II (iii): 4th generation

Pessimistic contributions 2000-08

- Leading example: Rajan and Subramanian 2008 (RS08)
 - Long-run cross-section averages rather than dynamic panel methods (responding to concerns about the validity of internal instruments in GMM)
 - RS08: no robust positive systematic effect of aid – seems to hold for: different types of aid and alternative time periods
 - The return of the micro-macro paradox!
- Anecdotal background – what drove the story (and a personal comment)

Part III: UNU-WIDER foreign aid research from 2009: 5th generation

ReCom – Research and Communication
on Foreign Aid (recom.wider.unu.edu)

Point of departure

- Aim of empirics is to falsify a prior – so what is our prior?
- First: prior from growth theory = **modest**
 - Rajan and Subramanian (2008): 10% Aid/GDP → 1% increase in per capita growth rate (but might be higher) (= Collier, but well below Harrod-Domar)
- Second: **time dimension** is important due to long run cumulative effects of aid
 - Education & health (Ashraf et al. 2008; Acemoglu & Johnson 2007)
 - Another reason to opt for long-run cross-section averages rather than dynamic panel methods

Aid, Growth, and Development: Have We Come Full Circle?

Arndt, Jones and Tarp (AJT)
Journal of Globalization and
Development (2010)

Aid in the aggregate

Start from RS08 (same data and instrument), i.e. we retain focus on long-run cross-section averages – but then:

- Improve the **instrumentation** strategy
- Strengthen the **growth equation specification**
- Introduce a new **treatment/control estimator**

Quick review of results:

- Cannot reject the theoretical prior of an aid-growth parameter = 0.1 (only in simple OLS is the result insignificant)
- If null hypothesis is no impact (parameter = 0) then in fact it appears 10% aid gives 1.3% additional growth (significant at 1%). We can reject a “no impact” hypothesis
- **No micro-macro paradox!**

(1a) New instrument

- Accept RS08 supply side strategy
- Address **specific concerns**:
 - Independent correlation from recipient GDP levels to RHS variables
 - Exclusion restriction doubtful with regard to specific colonial relations (French vs British legal system)
 - Donor fixed effects absent

(1b) New instrument

- Data problem: how to treat non-reported aid flow values?
 - Set to missing in RS08
 - But better set to zero according to OECD (in most cases represent unreported null)
- Treatment of non-reported aid flow values:
 - Re-collect bilateral aid flows from DAC
 - Non-reported values coded as zero
 - Apply Heckman selection model (aid allocation)

(2) New specification

- Improvements to the specification
- **Remove redundant vars. and bad controls:**
 - for general equilibrium effects of aid we should not control for contemporaneous outcomes (e.g., institutional quality)
- **Add more extensive initial conditions:**
 - Why? likely to affect growth response and rate of convergence (e.g., primary schooling)
- **Fuller set of regional fixed effects**

(3) New estimator

- We **dichotomize** the aid instrument into “high” and “low” predicted aid groups
 - ☑ (robustness verified)
- To focus on the most informative observations, we **weight** by the inverse propensity to receive aid (based on the binary instrument)
 - ☑ new **doubly robust estimator** for the IV context (IV-IPWLS)

(1) Results [1970-2000] ($H_0=0$)

Instrument	Specification	Estimator	
		RS08	AJT
RS08	RS08	0.10	0.15*
	AJT		
AJT	RS08		
	AJT		

(2) Results [1970-2000]

If $H_0=0.1$ then only original RS08 insignificant

Instrument	Specification	Estimator	
		RS08	AJT
RS08	RS08	0.10	0.15*
	AJT	0.10	0.10**
AJT	RS08		
	AJT		

(3) Results [1970-2000]

Instrument	Specification	Estimator	
		RS08	AJT
RS08	RS08		
	AJT		
AJT	RS08	0.22*	0.21*
	AJT	0.25**	0.13**

Summary results [1970-2000]

Instrument	Specification	Estimator	
		RS08	AJT
RS08	RS08	0.10	0.15*
	AJT	0.10	0.10**
AJT	RS08	0.22*	0.21*
	AJT	0.25**	0.13***

If $H_0=0.1$ then only original RS08 insignificant

The Long Run Impact of Aid on Macro-variables in Africa

Juselius, Møller and Tarp
Oxford Bulletin of Economics and
Statistics (2014)

**The Real Exchange Rate, Foreign Aid
and Macroeconomic Transmission
Mechanisms in Tanzania and Ghana**

Juselius, Reshid and Tarp

Journal of Development Studies (2017)

Our purpose and method

- To offer an **econometrically coherent** and transparent picture of aid impact in 36 countries in Sub-Saharan Africa
- To address the widespread misuse of **'statistical insignificance'** as an argument for aid ineffectiveness
- We comprehensively analyse the long-run effect of foreign aid (ODA) on key macroeconomic variables (mid-1960s to 2007), using a well-specified cointegrated VAR model as statistical benchmark

Findings

- Aid has a **positive** long-run effect on key macro-variables (GDP, investment, consumption) for the vast majority of countries
- In only **3 out of 36** countries is there a negative effect of aid on GDP or investment (this has since been studied and clarified)
- The transmission of aid to the macro economy quite **heterogeneous**

Assessing Foreign Aid's Long-Run Contribution to Growth and Development

Arndt, Jones and Tarp
World Development (2015)

Motivation: disaggregating the impact

- Many studies ask: does aid increase growth?
 - Addresses the question: **should we give aid?**
- BUT many possible paths linking aid to growth
 - Which ones matter?
 - **What should we give aid for?**
- We rely on the Structural Causal Model (SCM) approach to analyzing causality due to Pearl (2009) – and **open the 'black box'**
 - Identify key drivers linking aid to growth
 - Non-growth outcomes important per se
 - e.g., poverty reduction, human capital etc. (MDGs, SDGs)

Pearl-Structural Causal Model (SCM)

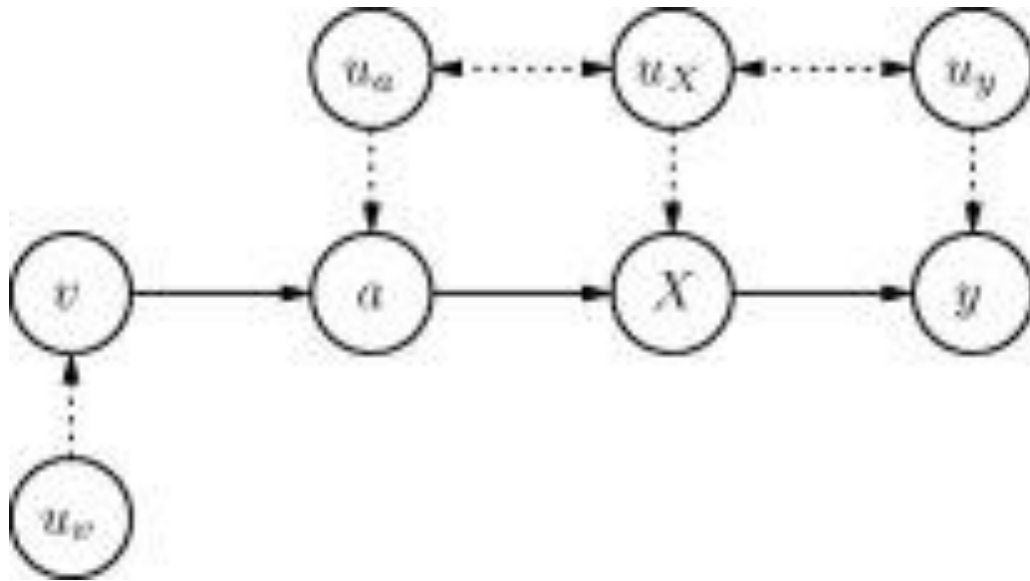


Figure 1. General causal diagram summarizing the linkages between aid and final outcomes.

Notes: This figure is a simplified causal directed acyclic graph (DAG) of the relationship between aid (a) and aggregate outcomes (y), via intermediate outcomes (X); v is a single exogenous determinant of aid; u terms are unobserved, possibly errors; solid lines represent directed relationships between observed variables; broken lines represent directed relations due to unobserved variables (errors).

Results: impact of aid

Outcome	Baseline	+\$25 p.c./year
GDP per capita growth	1.7	2.2
Poverty headcount at \$1.25 / day	21.7	18.2
Agriculture (% GDP)	20.7	13.2
Investment (% GDP)	17.2	18.7
Av. years total schooling, 15+	4.9	5.3
Life expectancy at birth (years)	61.0	62.3

Note: baseline is the observed median of the outcome variables

Aid and Growth: What Meta-Analysis Reveals

Mekasha and Tarp
Journal of Development Studies (2013)

Background

- Back to the goal posts story
- A database of 68 aid-growth empirical studies identified by Doucouliagos and Paldam (2008) henceforth DP08...
- DP08, using a meta-analysis of the 68 aid-growth studies (done until 2004/05) reach a pessimistic conclusion...

Meta-analysis

- Meta-analysis a commonly applied approach in medical science research (contested in social sciences)
- Main idea: to quantitatively combine empirical results from a range of independent studies & get a single effect estimate
- One can either **allow for** or **ignore** heterogeneity (differences) among studies

Meta-analysis (cont)

- **Ignoring** heterogeneity (fixed effect model)
 - All studies estimate the same “one” single true effect (of aid on growth)
 - Any variation = due to chance/sampling error only
- **Allowing** for heterogeneity (random effect model)
 - Each paper tries to estimate a true effect – but this effect will vary
 - Variation = chance + true variation in effect size

Our findings

- DP08 ignore heterogeneity – problematic for theoretical reasons
 - They simply mis-measure the partial effect of aid for those papers which include an interaction term with the aim of capturing the non-linearity in the aid-growth relation
- We checked, and the assumption of heterogeneity in the true effect of aid on growth across studies is confirmed
 - Statistical tests + graphical tools
- Controlling for heterogeneity, the weighted average effect of aid on growth is found to be positive & statistically significant
- Note: see WIDER working paper 44/2018 by Mekasha and Tarp (for up-to-date evidence)

What is the Aggregate Economic Rate of Return to Foreign Aid?

Arndt, Jones and Tarp

World Bank Economic Review (2016)

Approach

- [ReCom position paper on aid, growth and employment](#)
- In recent years, academic studies have been converging towards the view that foreign aid promotes aggregate economic growth
- We employ a **simulation approach** to: (i) validate the coherence of empirical aid-growth studies published since 2008; and (ii) calculate plausible ranges for the rate of return to aid

TABLE 1

Point estimates of the marginal effect of aid on growth from recent studies
(i.e. since 2008)

Study \a	Reference	Period	Specific. \b	Beta	Std. Error	= Prob.
RS08	Table 4, col. 1	1960-2000	Linear	0.06	0.06	0.30
RS08	Table 4, col. 2	1970-2000	Linear	0.10	0.07	0.17
MR10	Table 4, col. 1	1960-2000	Linear	0.08	0.03	0.01
AJT10	Table 6, col. 2	1960-2000	Linear	0.09	0.04	0.02
AJT10	Table 4, col. 4	1970-2000	Linear	0.13	0.05	0.01
CRBB12	Table 7, col. 6	1970-2005	Non-linear	0.15	0.06	0.01
CRBB12	Table 7, col. 10	1970-2005	Non-linear	0.31	0.17	0.07
CRBB12	Table 9, col. 9	1971-2005	Non-linear	0.27	0.13	0.04
CRBB12	Table 9, col. 9	1971-2005	Non-linear	0.42	0.20	0.04
KSV12	Table 2, col. 5	1970-2000	Linear	0.05	0.05	0.32
LM12	Table 3, col. 4	1960-2001	Linear \c	0.85	0.43	0.05
NDHKM12	Table 1, col. 4	1960-2006	Linear	-0.02	0.01	0.14
B13	Table 3, col. 1	1960-2000	Linear	0.12	0.04	0.00
B13	Table 3, col. 1	1970-2000	Linear	0.18	0.07	0.01
HM13	Table 2, row 2	1971-2003	Linear \d	-0.01	0.00	0.00
AJT14	Table 1, col. 2	1970-2007	Linear \e	0.30	0.18	0.09
Mean	Unweighted			0.19	0.05	0.00
	Weighted			0.12	0.02	0.00

Two footnotes

- Re NDKHM12 (see [Aid and Income: Another Time-series Perspective](#) in World Development 2015 - by Lof, Mekasha and Tarp)
- Re HM13: this estimate controls for investment and is derived as an average from country-specific regressions (impact via investment is “blocked”)

Findings

- Our results highlight:
 - The long run nature of aid-financed investments
 - The importance of channels other than accumulation of physical capital
- We find:
 - The return to aid lies in ranges commonly accepted for public investments (IRR approximately 15%)
 - There is little to justify the view that aid has had a significant detrimental effect on productivity

Does Foreign Aid Harm Political Institutions?

Jones and Tarp
Journal of Development Economics
(2016)

Institutions

- The notion that foreign aid harms the institutions of recipient governments remains prevalent (Deaton)
- We combine **new disaggregated** aid data and various metrics of political institutions to re-examine this relationship (long run cross-section and alternative dynamic panel estimators show a **small positive** net effect of total aid on political institutions)
- Distinguishing between types of aid according to their frequency domain and stated objectives, we find that this aggregate net effect is driven primarily by the positive contribution of more stable inflows of **'governance aid'**
- We conclude that the data do not support the view that aid has had a systematic negative effect on political institutions

Part IV: Conclusions

Why so long?

- Both aid volumes and their associated impacts are not so large as to be easily identifiable in macroeconomic data
- Our studies underscore that long time frames are required to detect a growth impact, reflecting lags in the realization of benefits and the relatively moderate contribution of aid to the overall growth rate
- In reality, detecting the contribution of aid is further complicated by large fluctuations in growth that have been an inherent part of the experience of nearly all developing countries
- On top of this, observations of both the flow of aid funds to developing countries and their growth rates are known to be imperfect
- Not really surprising that the economics profession has only recently converged on a more consistent range of estimates
- BUT: why statistically insignificant results have been used so extensively in the literature as proof of **absence of impact** instead of as **absence of evidence** is a mystery

The Macroeconomics of Aid: Overview

Addison, Morrissey and Tarp
Journal of Development Studies (2017)

Getting policy-making right

Aid in a Post-2015 World

- A ReCom Summary

The “Stockholm” Statement

- 13 leading development economists’ attempt at formulating a new consensus on the principles of policy-making for the contemporary world



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See also: econ.ku.dk/ftarp/