

Economics School of Louvain - ESL
Economics School of Namur - ESN

How Can Conditional Foreign Aid Reduce Poverty? Evidence from the Millennium Challenge Corporation (MCC)

Author: PARAVICINI Sophia
Thesis Director: GOMES Joseph F.
Thesis Reader: MARIANI Fabio
Academic Year 2024-2025
Master in Economics – 120 credits – Focus: Professional

How Can Conditional Foreign Aid Reduce Poverty?

Evidence from the Millennium Challenge Corporation (MCC)

-

Paravicini Sophia

Master [120] in Economics, focus professional,

Université Catholique de Louvain

-

Supervisor: Pr. Gomes, Joseph F.

Reader: Mariani Fabio

-

2024-2025

Acknowledgements

I would like to take this moment to express my gratitude to everyone who has contributed to help me complete this master's thesis.

First, I would like to thank my Supervisor, Pr. Joseph, F. Gomes, for the help and support throughout the master.

I would also like to extend my thanks to the reader of this thesis, Pr. Mariani.

I can't forget the precious advice and recommendations from Dr. Jing-Rong Zeng, who helped me test different statistical methods for this analysis.

Finally, I would like to thank my friends and my family from the bottom of my heart. Their constant support throughout the writing process, their reassuring presence, and the joyful moments we shared together. I will never forget the curiosity, joy, laughter and happiness I experienced over the past five years at university.

To all those who have supported me from near and far: thank you.

Plagiat

« Je déclare sur l'honneur que ce mémoire a été écrit de ma plume, sans avoir sollicité d'aide extérieure illicite, qu'il n'est pas la reprise d'un travail présenté dans une autre institution pour évaluation, et qu'il n'a jamais été publié, en tout ou en partie. Toutes les informations (idées, phrases, graphes, cartes, tableaux, etc.) empruntées ou faisant référence à des sources primaires ou secondaires sont référencées adéquatement selon la méthode universitaire en vigueur. Je déclare avoir pris connaissance et adhérer au Code de déontologie pour les étudiants en matière d'emprunts, de citations et d'exploitation de sources diverses et savoir que le plagiat constitue une faute grave sanctionnée par l'Université catholique de Louvain ».

Statement regarding the use of artificial intelligence tools:

As a non-native English speaker, I used AI tools (Copilot, Deepl) in order to improve the writing of the text, improve the clarity of the language and refine the wording. These tools (Copilot, BlackBox) were also useful for solving specific technical issues related to coding. However, all the ideas, analyses, structures, results and interpretations presented in this thesis are the work of the author. The AI tools were not used to produce original scientific content.

Abstract.

This paper studies the impact of foreign aid on poverty reduction through the case of the Millennium Challenge Corporation (MCC). Historically, analyses of foreign aid effectiveness have often relied on income-based metrics such as GDP (Burnside & Dollar, 2000; 2004; Collier & Dollar, 2002; Doucouliagos & Paldam, 2006; Minoiu & Reddy, 2009; Galiani et al., 2016). This research goes beyond these traditional measures, proposing to analyse the MCC's impact using the Human Development Index (HDI) as a proxy for poverty reduction, a more precise indicator of well-being that includes health, education, and income. The MCC, a U.S. government initiative, allocates aid based on countries' performance in governance, economic freedom, and investment in human capital.

Using a difference-in-differences event study regression approach, specifically the normalised event study estimator developed by de Chaisemartin and D'Haultfœuille (2020), this study tests the causal effect of MCC aid on HDI in recipient countries.

Our findings indicate that MCC aid has statistically significant positive impact on reducing poverty indicators through the HDI variable. More specifically, the effects are positive and statistically significant in the third- and fifth years following programme signing, suggesting that conditional aid can lead to long-term development results when specific conditions are met. While the results of these effects are small, they represent meaningful progress. We acknowledge many issues such as a violation of the parallel trends assumption due to pre-treatment divergence, potentially reflecting an "MCC incentive effect" where countries improve policies in anticipation of aid. Despite these complexities and data limitations, the consistency of results across multiples estimation strategies reinforces the validity of the hypothesis that MCC assistance positively impacts HDI. This research contributes to the foreign aid literature by providing evidence on conditional foreign aid effectiveness using new statistical event study methods.

Content

1.	Introduction	1
2.	Literature review	3
2.1	Historical background	3
2.2	Sachs vs. Easterly and the Effectiveness Debate.....	6
2.3	Conditional Foreign Aid.....	9
2.4	Empirical Findings on Poverty	10
3.	The Millennium Challenge Corporation (MCC).....	14
3.1	History and Mission	14
3.2	Four Principles of MCC Aid.....	16
3.3	Types of grants (Compact, Threshold, Regional)	17
3.3	Eligibility and Scorecard System.....	18
3.4	Why MCC is a good case for causal analysis	23
4.	Conceptual Framework	23
5.	Data Analysis	24
5.1	Data Sources and Variables.....	24
5.2	Descriptive Statistics.....	27
6.	Empirical Strategy.....	29
6.1	Estimator Selection.....	31
7.	Main Results: Impact on HDI.....	33
7.1	Testing Parallel Trends and Pre-Treatment Dynamics	34
7.2	Control and Robustness Checks	36
7.3	Interpretation	37
7.4	Event-Study Estimates for HDI	38
8.	Further Results	38
9.	Robustness Checks	40
10.	Conclusion and Discussion.....	40
11.	Caveats.....	41
	Bibliography	43
	Appendixes	53

1. Introduction

In April 2025, the Millennium Challenge Corporation (MCC), a U.S. foreign aid agency known for its performance-based model, was shut down by the Department of Government Efficiency (DOGE). This decision followed a wave of budget cuts and institutional reforms that also affected other major aid programs such as USAID and the Power Africa Initiative. The DOGE, led until May 2025 by Elon Musk, implemented controversial measures, including the removal of public data and firing civil servants, raising a large debate about the future of US foreign aid.

The shutdown of the MCC, which had been praised for its transparency, strict conditions and rare bipartisan support, has reopened discussions about the effectiveness of foreign aid in reducing poverty. Unlike traditional foreign aid initiatives, the MCC only supported countries that met strict standards of governance and political stability. Its key principle was that aid should be earned, not given for free, with the aim of encouraging long-term, self-reliant development rather than dependency. Now that the programme has ended, a more urgent question arises: has MCC really kept its promises?

Since its creation by the U.S. Congress in 2004 under President George W. Bush, the MCC has represented a change in the way foreign aid is viewed and delivered. It was designed to be results-oriented, transparent and conditional on good governance, economic freedom and investment in human capital (education and health). Over the past two decades, MCC has delivered billions of dollars through three types of grants: compacts, threshold programmes and regional compacts, targeting infrastructure, education, health, and institutional reform. Some programmes have been prematurely terminated due to political instability in recipient countries, such as the 2022 military coup in Burkina Faso, the 2009 undemocratic transfer of power in Madagascar and the 2012 coup in Mali. These cases highlight the strength of conditional aid models.

The context of foreign aid is equally complex. Over the past 60 years, rich countries have provided more than \$3.5 trillion in development aid to poor countries (Qian, 2015). Yet many

of these countries still face persistent poverty, weak institutions and underdevelopment. This paradox has led researchers and policymakers to question the effectiveness of aid and explore alternative models. The MCC approach, which links aid to measurable improvements in governance and development indicators, has been seen by many as a promising solution.

The aim of this master thesis is to examine whether MCC aid has contributed to poverty reduction in recipient countries. More specifically, it asks the following question: “What is the impact of Conditional Foreign Aid on Poverty Reduction? Evidence from the Millennium Challenge Corporation (MCC).”

And to answer this question, we apply difference-in-differences models (event study), to analyse how the dynamic treatment effects evolve over time before and after the intervention in each MCC programme implementation across countries.

This study shows that MCC aid has had a statistically significant impact on reducing poverty indicators in recipient countries through HDI variable used as a proxy of poverty reduction. The effects are positive and statistically significant in the third- and fifth-years following program signature. These results support the idea that conditional aid can lead to long-term development results, as long as specific conditions such as governance, economic freedom and investing in human capital are met.

This master thesis and findings contribute to the literature. First, we add to the, already, well establish debate on foreign aid, by adding effectiveness with conditional foreign aid. Secondly, we use statistical event study methods not yet documented for analysing conditional foreign aid effectiveness.

Overall, we provide evidence that conditions for aid to be delivered can really make a difference in foreign aid effectiveness.

The paper is organised as follows. In Section 2, we overview the Literature review on foreign aid, the effectiveness debate, conditional foreign aid and empirical findings on poverty. Section 3 overviews the Millennium Challenge Corporation (MCC), to better understand the programme in itself, how the conditionality works and emphasises how MCC is a good case

for causal analysis. Section 3 describes the data, and Section 4 lays out the empirical strategy. We provide our main results in Section 5 with robustness checks, the parallel trend assumption and interpretation in Section 6. We conclude in Section 7 and provide our caveats in Section 8.

2. Literature review

2.1 Historical background

Foreign aid has, in a sense, always existed throughout human history, often taking the form of assistance between communities or countries. No official start date of foreign aid has been attributed to any particular event or date. As Keenleyside observed, “the history of international aid is as old as the history of interrelationship between organized human communities” (Ali & Zeb. 2016, p. 109). However, its modern institutionalization form, with more structured programmes and multilateral coordination, emerged in the post-World War II period, with the Marshall Plan. This U.S. initiative provided over \$13 billion in aid to help rebuild European economies and recover from the war, and gave birth to foreign aid in its modern form. This U.S. initiative was initially not only meant for economy recovery but also as a way to contain the spread of communism, reflecting some deep geopolitical motivations of the early Cold War era (OECD, 2008; Tarnoff (CRS), 2018).

Foreign aid was initially designed as a way to boost economic growth and help maintain global political stability. But over time, its goals expanded. Aid started to serve multiple purposes: from providing humanitarian relief and reducing poverty to advancing diplomatic interests and supporting institutional reform. The motivations behind giving aid also changed, moving from purely altruistic or religious motivations toward more strategic ones, including economic interests and geopolitical influence (Thorbecke, 2007).

2.1.1 Donor Motives

The academic literature on aid motivations from donor countries is quite rich. The paper by Qian (2015) offers a structured overview of the foreign aid literature. The paper focuses mostly on donor motivations as well as the debate on aid effectiveness.

Throughout the 1960s, foreign aid motivations focused mostly on development issues to meet basic human needs (Michalopoulos, 2017; Philips, 2013; Bandyopadhyay & Vermann, 2013). During the Cold War, foreign aid was largely influenced by security interests. In the period that followed, ideological considerations became the dominant factor (Qian, 2015).

But more recently, in the early 2000s, donor motivation and in particular the United States has increasingly reflected strategic considerations with the aim to reduce terrorism after the terrorist attacks on September 2001 (Bandyopadhyay & Vermann, 2013).

Currently, the main motivations for foreign aid to developing countries are mostly strategic, economic, or geopolitical (Michalopoulos, 2017; Moyo, 2009; Dreher et al., 2018; Alesina & Dollar, 2000). Purely altruistic motivations for foreign aid are relatively uncommon¹. Foreign aid often works as a tool to maintain the international status quo (Markovits et al, 2019). This tool primarily serves the interests of donor states rather than only addressing humanitarian needs of the recipient countries, even though the official statement is the latter. According to Markovits et al (2019), aid has been used by dominant powers to reinforce existing international hierarchies and thus serves to maintain the donor's geopolitical influence. A historical example is the aid given by France to francophone and militarised countries, often interpreted as a form of "cultural propagation" (Qian, 2015).

Although Professor John D. Montgomery's 1996 analysis of U.S. foreign aid is somewhat dated, its influence remains relevant. First, he identifies a 'diplomatic aid', used to create a visible American "presence" abroad, by symbolizing values such as humanitarianism and technological progress. This diplomatic foreign aid was responsible for most of the popular criticisms but represented only a small proportion of the total effort, estimated at "certainly less than 10 per cent by the mid-1960s" (Montgomery, 1996, p.322). Secondly, some aid falls

¹ Literature on purely altruistic intentions in foreign aid exist, especially for aid to non-allies. But we will not focus our study on this case. See Chong & Grastein (2006) for more.

in the category of 'compensatory aid'. This aid served as a bargaining chip in diplomatic negotiations, often used to secure military or political concessions. Finally, Montgomery considers the last type of motivation as 'strategic influence', an aid used to shape domestic policies in recipient countries marking a shift from traditional diplomacy to more interventionist strategies.

Montgomery argues that U.S. foreign aid evolved from a series of pragmatic responses to global challenges. Those motivations were both ideologic and strategic.

Barthel et al. (2014) demonstrate strong evidence that foreign aid from major donors, particularly in areas such as economic infrastructure and production, is often influenced by commercial interests and strategic competition for access to the export markets of recipient countries. This challenges the common assumption that aid is given mainly on the basis of country needs or development objectives. Although Barthel et al. found less evidence of these strategic motivations in sectors such as health and education, more recent studies suggest that these motivations may still play a role in all sectors. This shows that donor decisions are complex and that sector aid needs to be analysed carefully in detail.

Their analysis suggests that aid allocation decisions are often used as a tool to maintain or extend geopolitical and commercial influence.

In support of this view, Qian (2015) notes that the list of the top 10 Official Development Assistance (ODA) recipient countries change considerably from decade to decade, while the list of the top 10 donor countries remains relatively stable².

Furthermore, recent empirical studies expand on this analysis by examining how political and electoral factors within donor countries (Kim et al., 2022) and changing national interests following Brexit (Honeyman et al., 2025) influence aid allocation patterns.

Many previous studies have found that foreign aid has a positive correlation with trade interest, with donors favouring countries that are key export markets (Barthel et al., 2014; Hoeffler & Outram, 2011; Claessens et al., 2009; Berthélemy, 2006).

² We provide tables in the Annex (Figures A1 and A2) to show this claim. Those tables come directly from the paper by Qian (2015).

2.2 Sachs vs. Easterly and the Effectiveness Debate

One of the most well-known and polarized debates in development economics is about the effectiveness of foreign aid, illustrated by the opposed views of Jeffrey Sachs and William Easterly.

In his book *The End of Poverty* (2005), Sachs argues that extreme poverty can be ended if it is well-targeted. He estimates that global poverty could be eradicated by 2025 with approximately \$195 billion per year in aid investments over 20 years. This claim is based on the principle that aid can help countries escape the 'poverty trap', a situation in which low-income countries are unable to generate enough capital for their development without external assistance. Sachs advocates for an initial "big push" in investments (Sachs, 2005) to enable recipient countries to reach a threshold for self-sustaining growth, in order to escape persistent aid dependence. However, this methodology using macroeconomic models has been criticised for its lack of empirical validation at the microeconomic level by later scholars (Deaton, 2013; Ravallion, 2016). To illustrate this, Angus Deaton (2013), argues that aid can be harmful when local institutions are weak, pointing out that "when local conditions are hostile to development, aid is not useful, and it will do harm if it perpetuates those conditions" (as cited in Qian, 2015, p.279).

In contrast to Sachs, Easterly, in *The White Man's Burden* (2006), argues that foreign aid has generally failed to deliver sustainable development. He argues that, in many cases, foreign aid has worsened problems such as dependency, corruption, and inefficiency, especially when imposed by others in a paternalistic, top-down way (Easterly, 2006). He notes that more than \$568 billion in aid has been sent to Africa, and yet the average African country is no better off today than it was four decades ago (as stated in Qian, 2015, p. 279). Easterly advocates a principle of 'selectivity', arguing that aid should be directed to countries with good governance and political environments (Easterly & Pfitze, 2008). His approach is not totally anti-aid but critical of top-down interventions, preferring bottom-up, context-specific solutions (Easterly, 2006). Still, Easterly's methodology is not without flaws. His reliance on anecdotal evidence and historical case studies often lacks rigorous counterfactual analysis, making it difficult to isolate the causal impact of aid from other variables (Ravallion, 2016).

Beyond this opposition lies the broader aid effectiveness debate, which can be divided into three camps. The first, represented by Sachs and others (e.g., Stiglitz, 2007; Arndt, Jones & Tarp, 2010, 2015), supports well-targeted, sustained foreign aid as a powerful tool to reduce poverty and foster development through financing essential services and infrastructure. Scholars here emphasize that strategic aid investments, if properly managed, support long-term growth.

The second camp consists of sceptics like Easterly (2006) and Moyo (2009), who argue that aid is largely ineffective or even harmful. Easterly, known for *The White Man's Burden*, has become one of the most influential critics of aid highlighting its failures to generate sustainable development (Duflo & Banerjee, 2011). Similarly, Moyo, in her book *Dead Aid* (2009), suggests that continuous aid creates dependency, fosters corruption, and market distortions that ultimately harm long-term development. She explains that since aid has been steady and predictable for many African governments, these countries view it as a permanent source of income, reducing their incentives to pursue sustainable policy reforms. This creates a “vicious circle of corruption, market distortion and future poverty- and thus the ‘need’ for more aid” (Moyo, 2009, p.16; Introduction).

Adding empirical support to this critique, Doucouliagos & Paldam (2006) analysed 43 studies and found no robust evidence that aid has a positive effect on economic growth. They emphasize that the effectiveness of aid depends critically on governance and policy contexts, recommending reforms that promote “more realism and a simplification of aid goals towards development” to improve outcomes (Doucouliagos & Paldam, 2006; V. Summary).

Beyond long-term development aid, unconditional humanitarian aid, such as food assistance, has also been examined in the literature. Nunn and Qian (2014) find that such aid can unintentionally fuel civil conflicts in recipient countries. This contrasts with targeted sector-specific aid and aid conditionality, which are increasingly recognised as critical factors for effective aid delivery.

A third, more nuanced perspective on foreign aid effectiveness acknowledges that its impact heavily depends on context, including governance quality, institutional capacity, sectoral targeting, and how aid is distributed (Burnside & Dollar, 2000, 2004; Collier & Dollar, 2001,

2002; Gomanee et al., 2005). Duflo and Banerjee (2011) further emphasise that well-designed, targeted interventions can indeed work.

To mediate the highly divided discussion, Ravallion (2016) offers a more balanced and nuanced perspective. He challenges Sachs' optimism, which relies on macroeconomic indicators to support his case for large-scale aid programmes, arguing that such measures often lack clarity and empirical rigor and tend to oversimplify the complex, multidimensional realities of poverty. At the same time, Ravallion (2016) criticises Easterly's tendency to reject aid based on generalisations from aid failures, warning against rejecting aid without taking into account context-specific successes.

Ravallion (2016) highlights that poverty and aid effectiveness vary a lot across contexts, with success depending on factors such as institutional strength, targeted interventions, and flexible, context-sensitive evaluation methods (Chapter 6, 10). His approach encourages moving beyond simplistic debates and recognising the nuanced realities of development.

In response to these complex challenges and ongoing debates, new types of aid have emerged, such as 'conditional aid'. Programmes like the Millennium Challenge Corporation (MCC) allocate aid based on democratic governance, economic freedom, and investment in human capital. These models attempt to combine the allocation of aid with key requirements of accountability and institutional reform, directly addressing the criticisms made by Easterly and other scholars regarding the effectiveness of aid.

In the end, the debate between Sachs and Easterly reflects deeper tensions within development economics: a cleavage between technology-solution optimism and institutional realism. Although he is not naive about institutional challenges, Sachs remains optimistic about the potential of aid to transform, while Easterly warns against unexpected negative consequences. It is important to note that Easterly agrees that aid can have positive effects when the conditions for good governance are in place. To reconcile these two views, development economics must move beyond dualistic thinking and embrace the complexity of development processes.

2.3 Conditional Foreign Aid

The foreign aid programme examined in this study is an example of conditional aid, implying that aid to a country is only provided if certain specific requirements or conditions are met. Although published research on this specific topic is limited, the comprehensive literature review conducted by Guillaumont et al. (2023) offers valuable insights into the evolution of aid conditionality over the past two decades, which will provide a better understanding of the context and implications of these programmes.

An initial distinction is made between instrument-based conditionality and results-based conditionality. For example, the European Commission often uses results-based conditionality, where aid is only disbursed if the recipient country achieved specific objectives that have been agreed in advance. This approach gives country more freedom to choose how they achieve these objectives, which can reinforce their sense of ownership of the reforms.

A second model, proposed by Kosh (2015), draws a distinction between ex-ante and ex-post conditionality, as well as between positive and negative forms.

Ex-ante conditionality requires countries to meet certain conditions before aid is granted. Whereas ex-post conditionality sets the conditions that must be met during the aid programme.

Finally, positive conditionality rewards countries that meet the conditions, while negative conditionality reduces or even withdraws aid if the conditions are not met (Guillaumont et al., 2023).

According to Kosh (2015), as cited by Guillaumont et al. (2023), ex-post conditionality can lead to more support if the country performs well. However, if it fails to meet expectations, cooperation may decrease and the recipient country may face public criticism or even censure from the donor.

The Millennium Challenge Corporation (MCC) follows an ex-ante conditionality model as well as a positive conditionality. Where countries must meet strict eligibility criteria, such as a good governance, economic freedom and investment in people, before they are eligible for funding. This ensures that the conditions for success are already in place before the programme starts.

At the same time, MCC also introduces a form of results-based conditionality. Countries that successfully implement their programmes are eligible for additional funding in the future. It is something that happened more than once and was actually something aimed to do. This combination of pre-conditions and results-based rewards makes MCC a unique example of how conditional aid can be structured to encourage long-term development and accountability.

2.4 Empirical Findings on Poverty

2.4.1 *Foreign aid on Poverty Reduction*

Foreign aid has been considered as a relevant and useful tool to reduce global poverty. Many studies have already analysed its effectiveness, with different conclusions depending on the context, the methodology, and indicators used. In the study by Tafana & Beceren (2022), they conducted an extensive literature review where they highlight the mixed results of foreign aid, suggesting that its success depends on governance quality and aid allocation. These findings follow the idea that aids can work if they are conditioned (Gomanee et al., 2005; Burnside & Dollar, 2004; Collier & Dollar, 2002; Collier & Dollar, 2001; Burnside & Dollar, 2000). Their research suggests for multidimensional poverty indicators, such as the HDI, to better capture aid outcomes. The term poverty is also quite difficult to define with many scholars who have already tried to define it in different perspectives to understand it better.

Owen's Barder's working paper, entitled "What is Poverty Reduction?" (2009), critically examines the dominant conception of *poverty reduction* within the development community and among donor countries. He argues that the definition of poverty is often too narrow and influences how the goal of foreign aid is achieved. This has significant negative consequences on its real effectiveness.

Barder (2009) highlights that although there is a healthy debate on 'how' to achieve poverty reduction, there is insufficient discussion about what the term actually means. Indeed, most donor countries, such as the UK, Germany, Denmark, Australia, and multilateral organisations like the World Bank, the African Development Bank, the Asian Development Bank, have

adopted '*poverty reduction*' as their main objective for foreign assistance (Barder, 2009). They associate poverty reduction with economic growth, believing that a sustainable increase in national income will eventually lift people out of poverty. This vision shapes the development of aid strategies, favouring macroeconomic reforms, infrastructure projects and business-friendly environments over programmes that provide immediate assistance or target vulnerable groups. To account for poverty reduction in recipient countries of foreign aid, many models measure the impact of aid on economic growth and translate it into GDP per capita or estimate the number of people lifted above the international poverty line (as discussed by Barder (2009), drawing on models developed by Burnside, Collier and Dollar).

2.4.2 *Multidimensional Nature of Poverty*

Traditionally, poverty was studied "as a lack of money with statistics on consumption or expenditure" (OPHI, Multidimensional Poverty and the AF method: what is multidimensional poverty?). However, more recent research started to take into account its multidimensional concept.

In their book *Poor Economics* (2011), Duplo and Banerjee introduce the idea that the way poverty is perceived is crucial for the debate. The reaction on how people perceive poverty is often seen as overwhelming and too difficult to find concrete solutions.

According to Nobel Prize Laureate Amartya Sen (1985), "poverty is the deprivation of capabilities" rather than merely a lack of income (Bao & Liao, 2021). In his work, Sen introduces the concept of 'capabilities' to describe the opportunities people have to achieve the kind of lives they value (Sen, 1987).

Understanding poverty is crucial in order to reduce it. Many scholars have tried to measure poverty, some with indexes (Alkire & Foster, MPI), others with the capability approach (Sen), or with monetary poverty lines (Ravallion, 1998).

Many foreign aids are either designed into humanitarian aid or for development aid. Foreign aid considered in this paper are development aid with the end goal being poverty reduction.

The term "Poverty reduction" is a multidimensional issue, and it can be challenging to identify a single, universally accepted measure to analyse it.

Initially, the Multidimensional Poverty Index (MPI), developed by the Oxford Poverty & Human Development Initiative (OPHI) and the Human Development Report Office of the United Nations Development Programme (UNDP), was considered as a potential variable for this analysis. The MPI includes ten indicators grouped into three key dimensions: health, education and standard of living, providing a broad perspective on poverty. However, the extensive data requirements for constructing an MPI for every country and every year was not available given resource constraints. As a result, despite its analytical value, the MPI was excluded from this study to use it for analysing poverty reduction.

Following this, various alternative indicators were examined to measure poverty reduction effectively in our analysis. Among them were poverty headcount ratio (based on the \$1.90 per day threshold), income levels and access to basic services, human development index (HDI), GDP per capita, Gini coefficient, and Employment rate, among others.

Initially, the poverty headcount ratio, which measures the share of people living below the global poverty line of \$1.90 per day, was seen as a strong candidate. However, two major issues emerged. The first was the uneven availability of poverty data across countries, which created gaps and prevented a full analysis. Secondly, measurement differences across nations introduced comparability issues. Specifically, many developed countries which have a high quality of life, and advanced technological infrastructure, lack extensive poverty related data. Institutions for many developed countries, such as Eurostat (for European countries) mostly show economic data based on GDP, GNP, and other macroeconomic indicators, while poverty and social data are missing. The same issue occurs for the World Bank database in offering limited poverty-related statistics for industrialized nations.

The Human Development Index (HDI) is a composite measure used to measure a country's overall level of human development. It combines three key dimensions: health (measured by life expectancy), education (measured by years of schooling), and standard of living (measured by gross national income per capita). Each dimension is then standardised to ensure comparability, and then the HDI is calculated. The final score ranges from 0 to 1, where 0 represents the lowest possible level of development and 1 the highest (UNDP, Human Development Reports, HDI)

2.4.2.1 Justification for using HDI

Given these challenges, the Human Development Index (HDI) developed by the United Nations Development Programme (UNDP), appeared as the most suitable measure of poverty reduction for this analysis. The HDI provides a multidimensional approach to assessing human well-being, health, education, and standard of living indicators. The ability to estimate poverty reduction across developed and developing countries was essential, reinforcing the HDI as the most reliable measure for this study. Moreover, its data availability for all countries was essential (UNDP, 2019. Data available until 2022 as on the day 2/05/2025)³.

A convincing reason for using the HDI as an indicator of poverty reduction is its adoption in recent studies as an indicator of poverty reduction globally (Andaish & Assadi, 2024; Aderemi et al, 2021; Fayyaz et al., 2019; Gohou and Soumare, 2012; Masud & Yontcheva, 2005; Sharma & Gani, 2004). Mohamed & Mzee (2017) found out that HDI as well as the three indicators (Income, Health and Education index) were generally significantly impacted by aid.

A recent study (2024) used HDI as a measure of individual well-being. They used a Vector Error Correction Model (VECM) and found that “for every one percent increase in ODA (Official Development Assistance), we have observed a 0.0007 percent improvement in HDI” using Afghanistan as a case study. They hypothesise the idea that foreign aid boosts but also draws economic growth (Andaish & Assadi, 2024).

2.4.2.2 Criticism for using HDI

The HDI has helped shift global attention from purely economic growth to broader human well-being. However, Martin Ravallion (2012; 2016) offers a nuanced critique that challenges the HDI’s conceptual and practical foundations. While acknowledging that composite indices such as the HDI have raised awareness of important development issues, he makes several important criticisms regarding their construction and implications. He first notes that the HDI’s construction relied on pre-assigned weights for health, education, and income, without clear theoretical justification. He refers this issue as the problem of “Mashup Indices” (Chapter 5.10), where too different elements are combined without a coherent

³ Some data relating to the Human Development Index (HDI) remain limited for certain countries. For instance, Kosovo, which benefited from a first Millennium Challenge Corporation aid programme in 2017, still lacks full data. Largely due to its relatively recent independence, achieved in 2008. We also face limitations in HDI data regarding some small countries or islands.

framework. This raises concerns about the possible subjectivity of the index and its manipulation or even misinterpretation. Ravallion also warns that such indices may distort policymaking. By emphasizing easily measurable proxies (e.g., life expectancy), governments might neglect deeper structural issues such as institutional quality or even inequalities. Where the sole pursuit could be to reach better scores and would overshadow meaningful progress in other areas.

Many of the criticisms raised by Ravallion (2012, 2016) regarding the HDI had already been addressed by scholars like Klugman et al. (2011) or Zambrano (2016). Although the paper by Klugman et al. predate Ravallion's formal critique, it responds to similar concerns about the HDI. Those scholars emphasise that the HDI is meant to be a capability index, rather than a utility function. With its main objective to raise awareness on human capabilities. They also argue that weights are explicit and transparent, allowing for public to analyse and debate. Thus, although imperfect with some criticisms, the HDI has been used by scholars in order to shed lights on poverty and human conditions.

3. The Millennium Challenge Corporation (MCC)

3.1 History and Mission

The Millennium Challenge Corporation (MCC) was established by the U.S. Congress in 2004 under President George W. Bush as a new model of foreign aid. Unlike traditional aid programmes, MCC main mission was to reduce poverty by encouraging potential recipient countries to invest and pursue better policies. MCC was created two years after President George W. Bush introduced the Millennium Challenge Account (MCA) as a new mechanism for directing U.S. foreign aid to developing countries.

Foreign aid has been criticised for effectiveness due to corruption and mismanagement, particularly in traditional aid programmes. Several cases highlight these concerns: the failure of the PlayPums initiative in Southern Africa, the limited impact of the HIV/AIDS education

programme in Kenya (Duflo et al., 2014) and the widespread mismanagement of the so called “phantom aid” in Afghanistan, illustrating the dangers of poorly executed aid.

MCC approach is unique with its emphasis on country ownership where recipient countries are expected to define their own development priorities and take responsibility for implementation. This approach aims to promote more sustainable and effective results by ensuring aid is aligned with local needs and capacities. With an annual budget of less than \$1 billion and a few hundred employees, MCC was considered as a relatively “small foreign aid” when compared to USAID (with \$40 billion annually aid disbursed and thousands of employees).

MCC aid can be delivered through three different types of grants: Compacts, Threshold Programmes, and Regional Compacts. These grants target sectors such as infrastructure, education, health, and institutional reform.

A paper by Johnson & Zajonc (2006), published not long after the launch of the MCC, examined whether foreign aid could act as an incentive for good governance. Using the newly created MCC as a case study, they identified what they called an “MCC incentive effect”. Their analysis revealed that countries eligible for MCC funding improved governance indicators by 25% after the programme’s creation compared with before, suggesting that the prospect of receiving aid encouraged better institutional performance. The official page of the MCC highlights this “MCC Effect” referring it to “the positive impact of MCC’s rigorous commitment to sound policies beyond MCC’s direct investments” (MCC, MCC Effect). Thus, it is the effect of countries encouraged by the selection criteria in order to be eligible that results in reforming policies, strengthening institutions or improve data quality. According to an independent survey conducted in 2012 with development specialists, 92% of participants states that the MCC eligibility criteria had influenced reform efforts in their countries (Parks & Rice, 2013. P.80).

However, they point out that the “MCC effect” varies across countries, time periods, and policy areas. Some governments respond more strongly to the MCA eligibility criteria than others. The survey concludes that the MCA eligibility assessment is an effective tool for encouraging policy and institutional reform in developing countries.

3.2 Four Principles of MCC Aid

To operationalise its missions, the Millennium Challenge Corporation (MCC) follows four main principles that shape its aid delivery model and distinguish it from foreign aid programmes. These principles follow some scholarly debates and practical lessons from decades of aid experience.

The first principle is that aid works best in well-governed countries. Because aid effectiveness is highly connected on the institutional and governance context of the recipient countries (Burnside & Dollar, 2000, 2004; Collier & Dollar, 2001, 2002; Gomanee et al., 2005). MCC carefully selects countries that meet strict governance criteria, such as rule of law, control of corruption, and democratic accountability. Without those criteria met, no fundings are disbursed and countries are not even selected.

Scholars have argued that aid is more likely to promote growth and poverty reduction when institutions are strong (Burnside & Dollar, 2000, 2004; Collier & Dollar, 2001, 2002; Gomanee et al., 2005). Thus, by selecting countries with good governance beforehand, MCC aims to avoid the backlash of aid dependency and mismanagement, ensuring that aid contributes to sustainable development rather than reinforcing weak institutions.

The second principle of MCC relies on the fact that projects should be data-driven and focused on results. MCC relies on rigorous monitoring and evaluations, using quantitative indicators to assess progress and determine eligibility. By following results-oriented approaches, MCC ensures that aid is not just well-intentioned but demonstrably effective. In practice, MCC uses scorecards and performance benchmarks to track outcomes in areas like education, health, and infrastructure. Success is measured by tangible improvements in human developments.

The third principle followed by MCC is country-led development ensures sustainability. Unlike top-down aid models (that Easterly heavily criticizes), MCC requires of recipient countries to design and implement their own development programs hand in hand with MCC Board of Directors. This ensures a long-term commitment and tries to limit the perceived “paternalistic” way foreign aid is often associated with. Theory follows and emphasizes the importance of local context and participatory development (Duflo & Banerjee, 2011).

Finally, the last principles of MCC are Transparency and Accountability. MCC is known for its commitment to transparency in aid allocation, projects implementation, and performance evaluation. This helps mitigate the risks of “phantom aid” and misallocation, which has been a big issue in many traditional aid programmes. By requiring public disclosure and independent audits, MCC reinforced democratic governance and civic oversight over such projects.

3.3 Types of grants (Compact, Threshold, Regional)

- i. Compacts are five-year agreements between the MCC and eligible countries. Compacts include the principle of country ownership, thus building a partnership between the U.S. and the country it partners with. The principle of country ownership is considered as vital for effective development. Since its creation, the MCC has signed 48 compacts agreements with 34 different countries for a total of more than \$16 billion in investments. Out of those agreements, 31 have reached successful completion by 2025 worth \$13.5 billion. While others remained signed but not implemented for around \$2.2 billion. Additionally, due to the shutdown of MCC in April 2025, 19 programmes only passed the signature deal but will unfortunately remain at this stage not receiving aid, for a rough total of \$6 billion.
- ii. Threshold Programmes are meant to assist promising candidate countries to become compact eligible. Created by the U.S. Congress, these programmes target countries that show a strong commitment to MCC’s eligibility criteria but have not yet fully met the requirements for compact assistance. They offer an opportunity for countries to implement targeted reforms, address specific governance or economic weakness, with the goal to improve their performance on MCC’s scorecard indicators and potentially qualify for a larger Compact grant in the future. Their aim is thus to demonstrate their commitment to the three main indicators that are governance, economic freedom, and investment in their people. The same level of rigorous and evidence-based approach used in compact programmes is used in these threshold programmes as well. Many countries which received a

threshold programme led to other future programmes, including compacts. To date, the MCC has signed Threshold agreements totalling more than \$700 million.

- iii. Regional Compacts were introduced in April 2018 “to promote cross-border economic integration, trade and collaboration” (MCC “Regional Compacts”). Four Regional Compacts were made, one signed in 2022 for Benin but terminated in June 2024 following a coup d’état in 2023, the three others are still in their development phase (Cabo Verde, Côte d’Ivoire, Senegal). These will likely not be continued because of the recent shutdown of the programme which announced that any current programme will be terminated, and stop being financed.

3.3 Eligibility and Scorecard System

Eligibility is determined by a scorecard of 22 indicators, including control of corruption, civil liberties, and investment in people. This conditionality makes MCC a unique case for studying the effectiveness of aid tied to institutional performance.

To be eligible for MCC aid, a country must follow some strict conditions. They must pass at least half of the indicators (at least 10 indicators out of 20 for the FY24 and 11 out of 22 for the FY25). They also must pass the Control of Corruption indicator, which is mandatory, with at least 50%. They also need to pass either the Political Rights (score above 17) or the Civil Liberties (score above 25) indicators. Without these criteria, countries will not be eligible to receive any aid programme from the MCC.

Some indicators have fixed threshold, such as inflation, that must be below 15%. While others are based on median performance within income groups.

3.3.1 Country Selection

The MCC selects eligible countries through a four-step process explained in the Millennium Challenge Act of 2003.

Step 1: Identify candidate countries

First, candidate countries must be classified as either low income or lower middle income by the World Bank (set annually in early July) and must not be subject to U.S. sanctions. An annual Candidate Country Report lists all nations meeting these criteria and is published annually. This report is then submitted to the Congress and made publicly available.

Step 2: Establish country selection criteria & methodology

Next, MCC defines specific criteria for selecting countries, such as the performance on scorecard indicators, poverty reduction and economic growth potential, and the availability of funds. For countries seeking a second compact, MCC also evaluates past programme implementation and commitment to reform to view evidence of improved scorecard policy performance. Public comments are solicited during 30 days after the publication before they are reviewed for a designated period before finalising decisions.

Step 3: Publish country scorecards

Once the criteria have been defined, country scorecards are published to show how each country is doing on the indicators. The MCC also publishes a Country Scorebook, which summarises the results of the scorecards for all candidate countries for each fiscal year (the most recent being fiscal year 2024). Figure 1 (p.22) shows an example of a country scorecard.

Step 4: Select countries

Finally, the selection of eligible countries happens annually, typically in December. The MCC Board of Directors reviews each country's policy performance and selects eligible countries. Once selected, countries then collaborate with the MCC to develop aid proposals and programmes. These can either be a Compact, or a Threshold Programme proposal.

This process ensures that aid is provided to nations with strong governance and economic potential for poverty reduction, as well as ensuring that the necessary funds are available before any decision is made.

The MCC is also assessing whether a country is approaching the revenue threshold that would make it ineligible for future aid. If so, the board will decide if it's worth continuing investing based on the country's ability to contribute to and sustain the results of the agreement.

3.3.2 Scorecards and indicators

The MCC uses scorecards to evaluate whether a county is eligible for U.S. development aid assistance. These scorecards (Figure 1) measure performance in three main domains: ruling justly, investing in people, and encouraging economic freedom. The first indicator, “Ruling justly”, focuses on governance, rights, and anti-corruption, and is evaluated using six indicators. The second indicator, “Investing in People”, considers health, education, and the environment, also measured using six indicators. The last section, “Encouraging Economic Freedom”, assesses trade, regulation, and fiscal policy, and includes eight indicators, although only six were used until fiscal year 2024, adding two new indicators this year.

Each category includes several indicators based on data from independent institutions like the World Bank, Freedom House, WHO, and UNESCO. The Scorecards are created based on the indicators in each category. After the scorecards are created, they are used to evaluate a country’s performance based on the eligibility criteria set by MCC’s legislation.

In Table 1, we provide a summary of the three indicators, their categories and the sources used by MCC to assess those results.

Table 1. Indicators and Category

Indicator	Category	Source
Ruling justly	Civil Liberties (-)	Freedom House
	Control of Corruption (+)	World Bank Institute
	Freedom of Information (+)	Multiple
	Government Effectiveness (+)	World Bank Institute
	Political Rights (-)	Freedom House
	Rule of Law (+)	World Bank Institute
Investing in People	Child Health (+)	Columbia/Yale
	Education Expenditures (+)	UNESCO
	Girls’ Primary Education Completion Rate (+)	UNESCO
	Girls’ Lower Secondary Education Completion Rate (+)	UNESCO
	Girls’ Upper Secondary Education Completion Rate (+)	UNESCO
	Health Expenditure (+)	World Health Organization
	Immunization Rates (+)	WHO/UNICEF
	Natural Resource Protection (+)	Yale/Columbia

Economic Freedom	Access to Credit (+)	International Monetary Fund and World Bank
	Employment Opportunity (+)	Multiple
	Fiscal Policy (+)	International Monetary Fund
	Inflation (-)	International Monetary Fund
	Land Rights and Access (+)	Multiple
	Regulatory Quality (+)	World Bank Institute
	Trade Policy (-)	The Heritage Foundation
	Women in the Economy (+)	World Bank and University of California

Note: FY2025 indicators. Signs in parentheses indicate the direction of change that is associated with an improvement.

Examples: Political rights: fewer restrictions on political rights (-) is considered as better. Civil Liberties: less infringements (-), so more freedom is better.

Source: MCC “Selection Indicators”

Figure 1 shows scorecards of two countries for the fiscal year of 2024 (FY24): The Gambia and Mali, both of which have received aid in the past. The scorecards visually present three eligibility criteria for aid: passing at least half of the indicators, achieving acceptable scores on “Control of Corruption” and “Democratic Rights”. These criteria are highlighted by green (pass) or red (fail) markers for better clarity.

The Gambia’s scorecard shows that it meets all three criteria. Passing more than half of the indicators and achieves acceptable scores for both “Control of Corruption” and “Democratic Rights”. As a result, The Gambia was selected by the MCC Board in December 2022 as eligible to develop an agreement. It remains eligible to this day, although no agreement has yet been signed.

On the other hand, Mali’s FY24 scorecard does not meet one of the main eligibility criteria for “Democratic Rights”. Despite meeting the other two conditions, this disqualifies Mali from selection for assistance under an FY24 agreement.

Figure 1 also provides a clear example of how these scorecards works and the importance of each eligibility criterion in the selection process.

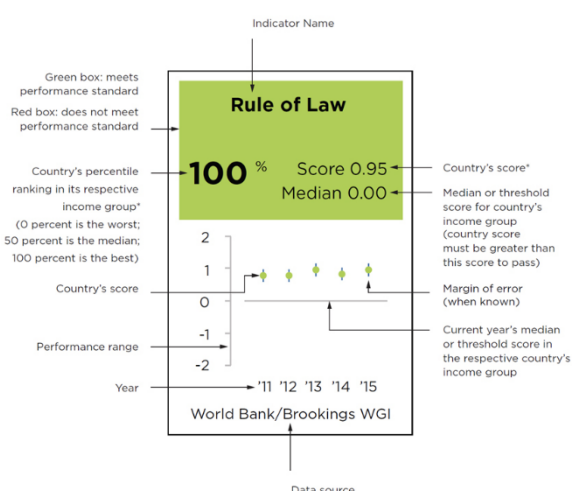
For the indicators ‘Political Rights’, ‘Civil Liberties’, ‘Inflation’, and ‘Immunization Rates’ (when the median immunization rate exceeds 90%), the score and percentile ranking are reversed. This adjustment to the score is necessary because these indicators are based on minimum or maximum-score systems, rather than a median-based system. ‘Political Rights’ and ‘Civil Liberties’ are measured by Freedom House using a 1-7 scale, where 1 signifies “most free”,

and 7 signifies “least free”. To understand how to interpret these indicators, please refer to the example provided for the Rule of Law indicator (see Figure 2).

Figure 1. Example of Scorecards (from FY24)



Figure 2. How to read the indicators:



3.4 Why MCC is a good case for causal analysis

The Millennium Challenge Corporation (MCC) presents a unique opportunity for an analysis by proposing a different institutional design and implementation model. With its conditionality aid programmes, they indirectly try to, make a difference by influencing countries to be eligible in order to receive their aid programmes. By working directly with the recipient country, MCC help with the implementation of the programme. Recipient countries often add amounts to accompany MCC programmes, proving their commitment. Unlike traditional forms of official development assistance (ODA), MCC aid is performance-based, and is only granted to countries that meet a set of rigorous eligibility criteria linked to governance, economic freedom, and investment in people.

The fact that MCC programmes are large-scale and limited in time to specific projects, with clearly defined start and end dates, makes MCC a good case for analysis. This timing precision allows us to implement event study designs, which can trace the dynamic effects of aid over time.

Finally, MCC's focus on data transparency and availability, including detailed project documentation, monitoring and evaluation reports and country scorecards, provides for a throughout analysis.

All things considered, the MCC is an ideal case for studying the impact of conditional foreign aid on poverty reduction.

4. Conceptual Framework

There is a lot of existing literature that has already examined the relationship between foreign aid and economic growth using GDP-based metrics (Burnside & Dollar, 2000, 2004; Collier & Dollar, 2002; Doucouliagos & Padam, 2006; Minoiu & Reddy, 2009; Galiani et al., 2016). However, relatively few studies have focused on conditional foreign aid programmes such as the MCC⁴. Moreover, existing but less recent research on foreign aid effectiveness

⁴ Several papers on Conditional aid effectiveness can be found on Google Scholar but we were not able to find one using a dynamic event study regression.

tends to prioritize economic indicators like GDP per capita, often overlooking multidimensional measures of development which is highly related to poverty.

This thesis addresses these gaps by applying a dynamic event study design to measure the impact of MCC aid on Human Development Index (HDI) outcomes as a proxy of poverty reduction. The HDI is a more precise indicator of well-being that includes health, education, and income. By using this dynamic event study, the study offers a more robust analysis of aid effectiveness in the case of conditional foreign aid.

We hypothesise that MCC aid leads to measurable improvements in HDI outcomes, with stronger effects in countries with better governance (Doucouliagos & Paldam, 2006; Gomanee et al., 2005; Burnside & Dollar, 2004; Collier & Dollar, 2002; Collier & Dollar, 2001; Burnside & Dollar, 2000).

5. Data Analysis

5.1 Data Sources and Variables

To assess the impact of MCC aid on poverty reduction, we constructed a panel data set covering MCC beneficiary and control countries from 1990 to 2022.

The control group is composed of all countries not treated by the programme, composed of 170 countries. And the treated group composed of 49 countries.

We initially considered restricting the control group to only OECD countries to avoid confounding effects from other aid programmes. However, this approach was abandoned because it might bias our results by leaving us with a control group of only OECD countries which is too different from the treated group.

We constructed a dataset that includes the *first* MCC programme for each recipient country, as well as the year of signing. We use the framework of Clarke & Schythe (2020) with recipient and control countries, as well as Leads 10 and Lags 10 from year 1990 to 2025.

We provide a simplified example of the setting in Table 2. Here, we consider only four groups forming balanced panel of years from 2000-2004 with leads and lags until 3. In this example, Group C is a control group, not receiving any investment.

Table 2. A Stylized Example of the setting

Group (g)	Year (t)	Event	Post Event	Time to Event	Lead 3	Lead 2	Lead 1	Lag 0	Lag 1	Lag 2	Lag 3
Group A	2000	2002	0	-2	0	1	0	0	0	0	0
Group A	2001	2002	0	-1	0	0	1	0	0	0	0
Group A	2002	2002	1	0	0	0	0	1	0	0	0
Group A	2003	2002	1	1	0	0	0	0	1	0	0
Group A	2004	2002	1	2	0	0	0	0	0	1	0
Group B	2000	2003	0	-3	1	0	0	0	0	0	1
Group B	2001	2003	0	-2	0	1	0	0	0	0	0
Group B	2002	2003	0	-1	0	0	1	0	0	0	0
Group B	2003	2003	1	0	0	0	0	1	0	0	0
Group B	2004	2003	1	1	0	0	0	0	1	0	0
Group C	2000	.	0	.	0	0	0	0	0	0	0
Group C	2001	.	0	.	0	0	0	0	0	0	0
Group C	2002	.	0	.	0	0	0	0	0	0	0
Group C	2003	.	0	.	0	0	0	0	0	0	0
Group C	2004	.	0	.	0	0	0	0	0	0	0
Group D	2000	2000	1	0	0	0	0	0	0	0	0
Group D	2001	2000	1	1	0	0	0	0	0	0	0
Group D	2002	2000	1	2	0	0	0	0	0	0	0
Group D	2003	2000	1	3	0	0	0	0	0	0	1
Group D	2004	2000	1	4	0	0	0	0	0	0	1

We first planned to use the year of implementation to better reflect when the aid was actually provided, for when projects began. Unfortunately, due to missing data, we had to keep the signing date as the official starting year for the programme in each country.

The dataset also contains details on the type of MCC programme (Compact, Threshold or Regional), its sector of intervention (governance, education, and or economy) and characteristics at the national level for the variables used in this analysis.

The variables used in this analyse, along with our justification for selecting them and their data sources are detailed in Table 3.

Due to time constraint we only provide results with HDI as a main variable but we would have liked to add more figures and tables with other variables. We provide some figures with other variables using the eventdd method (Clarke & Schythe, 2021) in the Annex.

Table 3. Choice of Variables

Category	Variable	Justification	Source
Main Outcome	HDI	Proxy variable for poverty reduction	UNDP
	Poverty Headcount (3.65 USD)	Standard Poverty Line	World Bank
	GDP (PPP)	Indicator of economic Strength	World Bank
	GDP per capita growth	Indicator of economic momentum	World Bank
Ruling Justly	Control of Corruption	MCC eligibility criteria for the 'Ruling Justly' indicator	World Bank
	Government Effectiveness	Measures government performance	World Bank
Investing in People	Maternal Mortality Ratio	Health indicator for MCC 'Investing in People' category	UNDP
	Infant Mortality	A way to account for the 'Investing in People' category eligibility MCC	UNDP
	Life Expectancy	A relevant variable for the Investing in People' indicator.	World Bank
	Expected years of Schooling	Education Access	UNDP
	Secondary Education Female	A relevant variable for the Investing in People' indicator.	UNDP
	Health Expenditure	Public health investment	World Bank
Economic Freedom	Employability to Population ratio	Employability opportunity	World Bank
	Access to Electricity	Investment in infrastructure	World Bank
	Net Official Aid	Look at the aid received	World Bank
	FDI net	Foreign Investment	World Bank

5.2 Descriptive Statistics

Our analysis sample contains (at most) 219 countries, through 1990-2025.

Summary statistics regarding variables can be found in Table 4.

We also provide a separate short table for the number of countries, time span for years, number of treated vs. control units in Table 5. In the Appendixes, we provide a table (Table A1) with all first programmes recipient countries treated by MCC, including signing date, entry in force (EIF), closure and sector information.

Table 4. Summary statistics for our main variables

Panel A: Full Sample					
	N	Mean	SD	Min	Max
HDI	5777	.672	0.166	.212	.967
Poverty Headcount 3.65	1857	7.029	42.762	0	816.91
GDP PPP	6600	4.184e+11	1.689e+12	14743616	3.466e+13
GDP per capita growth	6839	1.811	6.604	-64.424	140.491
Control Corruption	4963	-.03	1.000	-1.97	2.459
Government Effectiveness	4939	-.034	0.994	-2.44	2.47
Maternal Mortality Ratio (deaths per 100,000 live births)	5841	226.968	366.133	1.082	6591.344
Infant Mortality	6435	32.372	30.610	1.3	213.9
Life Expectancy	6860	69.059	9.461	14.098	85.533
Expected Years Schooling	5933	12.011	3.506	1.942	23.248
Secondary Education (female, % ages 25 and older)	5283	50.498	30.560	.42	100
Domestic general government health expenditure (% of GDP)	4323	3.298	2.377	.062	22.254
Employability to Population Ratio	6101	56.362	12.088	19.886	87.461
Access to Electricity	6251	81.444	29.257	.534	100
Net Official Aid	5120	5.982e+08	111416300	-1.007e+09	2.929e+10
			1.048		
FDI net	5512	-3.373e+08	2.049e+10	-3.454e+11	2.183e+11

Panel B: Treated Group					
	N	Mean	SD	Min	Max
HDI	1501	.55	0.128	.212	.816
Poverty Headcount 3.65	444	6.326	16.272	0	143.68
GDP PPP	1648	9.274e+10	3.191e+11	86999754	4.335e+12
GDP per capita growth	1644	1.805	6.959	-45.325	90.832
Control Corruption	1215	-.47	0.466	-1.537	1.155
Government Effectiveness	1197	-.54	0.418	-1.792	.791
Maternal Mortality Ratio (deaths per 100,000 live births)	1584	341.387	325.561	5.305	4105.524
Infant Mortality	1617	48.438	31.705	7	213.9
Life Expectancy	1617	63.123	8.554	14.098	79.524
Expected Years Schooling	1555	9.963	2.783	1.942	16.727
Secondary Education (female, %	1410	32.459	27.723	.942	98.238

ages 25 and older)					
Domestic general government health expenditure (% of GDP)	1101	2.34	1.631	.291	11.808
Employability to Population Ratio	1549	59.501	13.571	19.886	85.84
Access to Electricity	1359	57.611	33.584	.534	100
Net Official Aid	1592	6.797e+08	965198661.054	-6.593e+08	2.929e+10
FDI net	1452	-7.436e+08	1909155538.081	-2.053e+10	4.550e+09

Panel C: Control Group

	N	Mean	SD	Min	Max
HDI	4276	.715	0.157	.257	.967
Poverty Headcount 3.65	1413	7.25	48.170	0	816.91
GDP PPP	4952	5.267e+11	1.929e+12	14743616	3.466e+13
GDP per capita growth	5195	1.812	6.488	-64.424	140.491
Control Corruption	3748	.113	1.082	-1.97	2.459
Government Effectiveness	3742	.128	1.068	-2.44	2.47
Maternal Mortality Ratio (deaths per 100,000 live births)	4257	184.394	371.264	1.082	6591.344
Infant Mortality	4818	26.98	28.259	1.3	148.9
Life Expectancy	5243	70.889	8.963	18.385	85.533
Expected Years Schooling	4378	12.738	3.448	2.286	23.248
Secondary Education (female, % ages 25 and older)	3873	57.065	28.856	.42	100
Domestic general government health expenditure (% of GDP)	3222	3.625	2.501	.062	22.254
Employability to Population Ratio	4552	55.294	11.345	22.51	87.461
Access to Electricity	4892	88.064	24.062	.8	100
Net Official Aid	3528	5.614e+08	1173493133.332	-1.007e+09	2.743e+10
FDI net	4060	-1.920e+08	2.385e+10	-3.454e+11	2.183e+11

Table 5. short table for the context

Panel A: Full Sample

	N	Mean	SD	Min	Max
Country	7884	110	63.223	1	219
Year	7884	2007.5	10.389	1990	2025
Event implementation Year	1764	2010.429	6.126	2006	2025

Panel B: Treated Group

	N	Mean	SD	Min	Max
Country	1764	119.122	55.260	2	218
Year	1764	2007.5	10.391	1990	2025
Event implementation Year	1764	2010.429	6.126	2006	2025

Panel C: Control Group

	N	Mean	SD	Min	Max
Country	6120	107.371	65.106	1	219
Year	6120	2007.5	10.389	1990	2025
Event implementation Year	0	.	.	.	.

6. Empirical Strategy

The Millennium Challenge Corporation (MCC) allocates foreign aid conditionally, selecting recipient countries based on specific eligibility criteria related to governance, economic freedom, and investment in human capital. This conditionality induces non-random selection into treatment, as countries receiving MCC aid already show characteristics distinct from non-recipient even prior to receiving assistance. As a consequence, standard difference-in-differences (DiD) approaches may produce biased estimates if such selection and unobserved heterogeneity are not properly addressed.

The staggered nature of MCC aid, in which countries receive treatment at different times, makes causal inference difficult. Treatment effects may vary over time and across units, which violates the assumptions of traditional DiD models. To address this, we use the normalised event study estimator developed by de Chaisemartin and D'Haultfœuille (2020), which aligns time with each country's treatment year and allows for heterogeneous dynamic treatment effects. This method improves on previous event study approaches by providing unbiased estimates, even when treatment effects vary or when the parallel trends assumption is violated in its strict form.

We follow the empirical strategy of Bhalotra et al. (2023) as a basis plan for presenting our findings because of the similarity in our statistical analysis using new DiD models.

The equation we use is the full dynamic event-study specification proposed by de Chaisemartin and D'Haultfœuille (2020).

(1)

$$Y_{ct} = \alpha + \sum_{j=2}^5 \beta_j^{lead} Treated_c \times 1\{lead_t = j\} + \sum_{k=0}^5 \beta_k^{lag} Treated_c \times 1\{lead_t = k\} + \mu_t + \phi_c + \epsilon_{ct}.$$

Where the outcome variable Y_{ct} is measured at the country c and year t level, with our primary focus on the Human Development Index (HDI).

$Treated_c$ is our treatment indicator, equal to 1 for countries that received programme aid from the Millennium Challenge Corporation (MCC), these form our recipient group. And 0 for countries that never received MCC aid, which constitute our control group. This variable interact with a full set of leads and lags with respect to the year the programme was implemented. Leads are related to pre-treatment and Lags for post-treatment. More specifically, we include 5 leads and 5 lags, where the last lead and lag terms accumulates years beyond the 5-year threshold. The first lead is excluded to serve as the reference category, allowing us to interpret other coefficients relative to the pre-treatment baseline. Our small timeframe for the de Chaisemartin and D'Haultfœuille method is due to the specifications this method needs. Initially, we wanted to look at a 10-year window before and after treatment, but only the countries that had at least 10 years of data before and after their treatment could be included as “switchers”, which limited our sample too much excluding recipient countries with later interventions. This option ensures that the same set of treated unites, named the “switchers”, used to estimate each event-time effect works. This option helps us avoid bias from changing sample composition across event times, improves consistency in the treatment group, and enhances statistical precision by reducing statistical noise.

The parameters J and K are the number of leads and lags, respectively. We also present alternative specifications using shorter windows of 6 and 8 years for our eventdd study model (Clarke & Schythe, 2021). The model includes fixed effects for both country (ϕ_c) and year (μ_t), and standard errors are clustered at the country level, following the approach of Bertrand et al. (2004).

Regarding time-varying confounding factors, we considered including additional covariates such as governance indicators (e.g., control of corruption), GDP per capita growth, or health expenditure as control variables. However, many of these variables are either outcomes influenced by MCC aid or closely related to the mechanisms through which aid operates. Including them as control variables could lead to ‘over-control,’ which could potentially reduce estimated bias by absorbing part of the treatment effect. Given this and the limitations in data coverage and consistency, our main specification relies on fixed effects and does not include these variables as control variables.

When doing a difference-in-differences (DiD), it is essential to check for the parallel trends assumption. The principle is that the average result of the treated group would have been the same as the control group in the absence of treatment. In simpler words, we must make sure that the difference observed in the treated group is due to the treatment and not because of other confound factors.

Researchers who apply a DiD approach and similar techniques often face uncertainty about the validity of the parallel trends assumption. Rambachan and Roth (2020) introduced a method that improves the reliability of inference and allows for sensitivity analysis in cases where the parallel trends assumption may be violated. Their approach is implemented in STATA using the “honestdid” package and can be used as a robustness check. A synthetic diff-in-diff (SDID) can also be used as a robustness check by Arkhangelsky et al. (2021) and Clarke et al. (2023).

The setup by de Chaisemartin and D'Haultfœuille (2020) allows to give more accurate results by comparing countries that have received aid with those who did not. This can help us estimate what would have happened without the aid and is a way to check for parallel trends for staggered treatment. The setup also checks for changes before the aid was implemented to make sure the results are reliable.

We will then compare our results from the de Chaisemartin and D'Haultfœuille (2020) method with other methods, like event study ‘eventdd’ by Clarke and Schythe (2021).

Conditional foreign aid (MCC) creates non-random selection, based on specific conditions (see part 3.3 Eligibility and Scorecard). Therefore, we know there will be a bias in the selection of those countries. And thus, that the parallel trend assumption will not be respected.

6.1 Estimator Selection

To determine the causal effect of MCC aid on HDI over time, we explored several estimators adapted to dynamic treatment contexts. While this thesis focuses on the estimator proposed by de Chaisemartin & D'Haultfœuille (2020), we also applied a range of alternative methods to assess robustness. The results from these other estimators are provided in the appendix.

We initially applied a Two-Way Fixed Effects (TWFE) regression in order to detect dynamic treatment effects or anticipation effects. Unfortunately, this regression cannot estimate robustness with heterogeneous effects. The model is failing to capture key panel complexities.

However, the assumptions of this TWFE regression are not respected for our foreign aid programme. More specifically, we talk about the “No Anticipation” and “Homogeneity” assumptions. Because the conditionality of our programme, recipient countries change their behaviour in anticipation of future treatment to be eligible. The assumption of “Homogeneity” is also not respected, where the effect of the treatment is assumed to be the same across all units and over time. We provide results of this TWFE in our annex (Table A2).

We have then applied an event study using the eventdd estimator (Clarke & Schythe, 2021), which re-centres time around each country’s treatment onset. We use this approach as it allows us to visualise short- and long-term treatment effects while taking into account its staggered adoption. This method tried different timeframes; 10, 8, and 6. These figures and tables can be found in the Appendixes (Figure A3 to Figure A5 for the figures and Table A3 to Table A4 for the table results). However, this method assumes homogeneous effects across units, which is too restrictive given the diversity of recipient countries. We provide the figures and tables of this method in our Annex.

To respect the assumption of heterogeneity and thus incorporate variations specific to each unit, we have applied the estimator proposed by de Chaisemartin & D'Haultfœuille (2020). This method also normalises time around the treatment event and additionally handles better for heterogeneous effects and staggered adoption. The results estimates were clearer and more consistent, with modest positive effects on HDI emerging in year 3 and 5 following treatment. These findings are the core of our analysis. However, concerns remain regarding internal validity when testing the parallel trends assumption, as we obtained a by a p-value of 0.0012 and found significant placebo coefficients in the pre-treatment periods. This suggests that HDI evolved differently prior to aid, potentially affect causal inference.

To address these violations, we explored the synthetic difference-in-differences (SDiD) estimator of Arkhangelsky et al. (2021). This method improves robustness through a combination of matching and fixed effects. Unfortunately, SDiD requires a fully balanced panel but due to missing HDI data and the staggered treatment schedule, it was not feasible to apply this method across all treated years. The results of this attempt are discussed in the Appendix.

As an alternative, we apply `xtdidregress` command in STATA as a complementary estimator. While `xtdidregress` cannot fully model dynamic heterogeneous effects, it efficiently handles unbalanced panels with staggered adoption and provides consistent average treatment effect on the treated (ATET) estimates under weaker assumptions. Given real-world data constraints, such as missing observations and staggered treatment timing, `xtdidregress` serves as a practical compromise to support the robustness of our main findings.

From this specification, we observed a statistically significant improvement in HDI, with an ATET of +0.01396, a standard error of 0.0051, and a p-value of 0.007, indicating a reliable average effect across treated countries. These results are included in the Appendix (Table A6) to support the robustness of our findings.

Although the `xtdidregress` method does not fully resolve the issues related to temporal dynamics or parallel trend violations observed in previous models, it provides a practical and interpretable summary of the average treatment effects in real-world contexts.

The consistency of the results obtained from multiple estimation strategies reinforces the validity of our hypothesis: MCC assistance has a positive, although modest, impact on the HDI, even under imperfect assumptions and constraints related to actual data, such as missing data.

7. Main Results: Impact on HDI

Our main findings are based on the standardised event study estimator developed by de Chaisemartin and D'Haultfœuille (2020), which compares changes in the Human Development Index (HDI) between countries receiving MCC aid (treatment group) and those not receiving it (control group) over time. This method focuses the analysis on the year in

which MCC aid was implemented in each country. Figure 3 displays this event-study trajectory and the associated effects at different periods before and after aid is received. We use the time period of five years prior and after implementation to have a large-enough window of treated countries associated.

In the post-treatment period, we observe that the lag coefficients measuring the annual treatment effects on HDI are consistently positive across the five years following the introduction of MCC aid. More specifically, the estimated impact of MCC aid on HDI (Figure 3) gradually increases, reaching its maximum after five years. The effect recorded in year one after treatment represents an increase in HDI of approximately +0.00072 (standard error 0.00051), which rises to +0.00095 (standard error 0.00042) after five years. Only the third and fifth year after the aid signature are statistically significant at the 5% level. Without p-value, we follow the 'Confidence Interval' (CI) that cannot include zero to be statistically significant. The CI of year 5 ranges from [+0.00013 to +0.00177] thus show some significance.

These results, with only 2 years that are statistically significant suggest that MCC aid is associated with a small yet statistically significant improvement in multidimensional development as measured by the HDI. The estimator proposes to test whether all five post-treatment effects are jointly zero. With a p-value of 0.0984, we have a marginally significant at the 10% level, suggesting some evidence of a cumulative treatment effect.

We test now for the average cumulative effect per unit of treatment (Table 5), we find that MCC assistance results in an overall gain of +0.00269 (standard error 0.00125) at 95% CI = [0.00024; 0.00515], thus significant with an interval not including zero. Which means that the average cumulative effect is statistically significant. This means that, on average, MCC recipient countries experience an improvement in HDI of approximately 0.0027 compared to what would have occurred without aid, once the staggered implementation schedule and dynamic effects of the treatment are taken into account.

7.1 Testing Parallel Trends and Pre-Treatment Dynamics

A fundamental assumption behind any difference-in-differences (DiD) estimate is that the treatment and control groups should follow the Parallel trend assumption in the absence of treatment. To examine this, we analyse the offset coefficients representing the periods

prior to treatment in an event study. Our results (Table 5) reveal negative and statistically significant differences in HDI between future MCC recipients and control countries prior to aid implementation. Five years before treatment, the estimated placebo effects range from [-0.00158 to -0.00207], all of which are statistically significant, with a joint test on the pre-treatment periods showing a p-value of 0.0012. The results suggest that treated countries were already diverging from control countries in their HDI trajectories before receiving aid. This indicates a violation of the parallel trends assumption. This divergence may be due to selection bias or anticipatory reforms linked to MCC eligibility process. In particular, it could reflect what is known as the “MCC incentive effect”, where countries begin improving their institutions hoping to qualify for aid, leading to changes in HDI even before the treatment officially starts. This violation of parallel trends suggests that we should use the standardised event study estimator, which can produce valid causal estimates despite these pre-trends. It also warns us against overconfidence in the reliability of conventional DiD methods based on strict parallel trends assumptions. As a result, we planned to pursue alternative approaches to better estimate causal effects under such conditions.

The estimator developed by de Chaisemartin and D'Haultfœuille (2020) is specifically designed to produce valid causal estimates in contexts where treatment adoption is staggered, and effects are heterogeneous. It addresses biases presents in traditional TWFE models, particularly when the parallel trends assumption is violated due to pre-treatment divergence. This is especially relevant in our context, where the “MCC incentive effect” may lead countries to initiate institutional reforms in anticipation of aid, resulting in changes to HDI even before the official start of the treatment. We tested the parallel trends assumption using a joint significance test of pre-treatment coefficients (see Table 6). The robustness of the de Chaisemartin and D'Haultfœuille (2020) estimator makes it well-suited for our analysis, as it takes account of these complexities and produces more reliable causal estimates.

Due to the data limitations in several countries and MCC’s staggered implementation, we were unable to apply a synthetic DiD. As a practical solution, we used a Stata’s `xtidregress` (Annex Table A6), which supports unbalanced panels and staggered adoption. Which resulted in a statistically significant ATET of +0.01396 in HDI with a standard error of 0.0051 and p-value of 0.007, reinforcing the credibility of our findings under more flexible model assumptions.

To summarise, these findings provide strong evidence that the MCC's performance-based aid model is associated with small but consistent improvements in human development outcomes, and thus in reducing poverty. Although the magnitude of the effects is small in absolute terms, they are statistically significant and remain strong after controlling for pre-treatment differences. The timing of the significant positive effects, taking several years after aid implementation, is consistent with the assumption that development interventions require time to translate into measurable progress in health, education, and living standards.

7.2 Control and Robustness Checks

The Chaisemartin and D'Haultfoeulle (2020) estimator already incorporates controls through its design, allowing us to compare our results over time and across treated and control groups. As shown in Tables 4 and 5, we report both cumulative and period-specific treatment effects, allowing for robustness checks across different time horizons.

To further assess robustness, we have explored two methods called synthetic DiD, and honest DiD.

The Synthetic DiD is a method developed by Arkhangelsky et al. (2021) and can help build a better control group, especially if we have selection bias or anticipatory effects like we have with the “MCC incentive effect”. The honest DiD estimator by Rambachan and Roth (2023) is used when parallel trends assumption is uncertain. Constructing uniformly valid confidence intervals even when pre-treatment trends differ. This method can be used when we find significant pre-treatment effects, particularly suited to settings like ours.

Despite our best efforts, these methods proved technically too advanced for us. Our attempts at these methods can be found in the Appendix.

Table 4. MCC impacts: de Chaisemartin and D'Haultfœuille's Normalization estimation of treatment effects

Estimation of treatment effects: Event-study effects

	Estimate	SE	LB CI	UB CI	N	Switchers
Effect_1	.0007242	.0005147	-.0002846	.0017329	1294	41
Effect_2	.0009176	.0005167	-.0000952	.0019304	1294	41
Effect_3	.0009383	.000444	.0000681	.0018085	1294	41
Effect_4	.0008325	.0004383	-.0000265	.0016915	1294	41
Effect_5	.0009541	.0004187	.0001334	.0017748	1294	41

Test of joint nullity of the effects: p-value = .09836587

Table 5. MCC impacts: de Chaisemartin and D'Haultfœuille's Normalization average cumulative effect per treatment unit

Average cumulative (total) effect per treatment unit

	Estimate	SE	LB CI	UB CI	N	Switch x Periods
Av_tot_effect	.0026949	.0012509	.0002433	.0051466	2807	205

Average number of time periods over which a treatment's effect is accumulated = 3

Table 6. MCC impacts: de Chaisemartin and D'Haultfœuille's Normalization Parallel Trends and no anticipation assumptions

Testing the parallel trends and no anticipation assumptions

	Estimate	SE	LB CI	UB CI	N	Switchers
Placebo_1	-.001583	.0007401	-.0030336	-.0001323	1284	40
Placebo_2	-.0019808	.0005514	-.0030615	-.0009001	1243	40
Placebo_3	-.0019068	.0006387	-.0031586	-.0006549	1211	40
Placebo_4	-.0020676	.0006492	-.0033401	-.0007952	1191	40
Placebo_5	-.0018611	.0006783	-.0031906	-.0005316	1153	38

Test of joint nullity of the placebos: p-value = .00116186

7.3 Interpretation

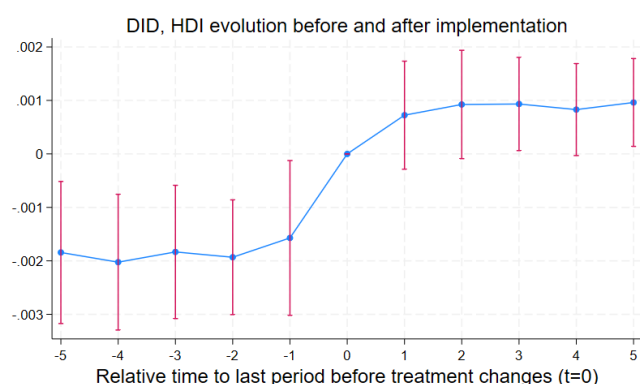
Following the treatment, we observe small but statistically significant increases in HDI starting approximately three years after MCC aid initiation, peaking around year five. These delayed effects are consistent with theoretical expectations, as investments in governance, infrastructure, health and education typically require time to translate into measurable human development improvements.

The magnitudes of these effects are relatively small; however, small changes in HDI can reflect meaningful progress given the complexity of multidimensional development. Furthermore, the persistence of effects over several years post-treatment indicates that MCC aid may generate durable benefits.

7.4 Event-Study Estimates for HDI

Figure 3 presents the normalised event-study coefficients for HDI over five years before and after MCC aid introduction, with year 0 marking the treatment year.

Figure 3. MCC impacts: de Chaisemartin and D'Haultfœuille's Normalization estimator and placebo



8. Further Results

In table 7 we provide a summary for the different methods used in this study to compare results and try to understand them better. Method A uses FE (fixed effect) estimators also known as TWFE (two-way fixed effect). Method B uses pooled event study referring to the eventdd by Clarke & Schythe (2021). They developed this estimator for panel event studies and is widely used to estimate dynamic treatment effects in staggered adoption settings. We explained in our estimator selection the issues this estimator faced. However, we will still use it to compare it with the de Chaisemartin & D'Haultfœuille (2020).

We provide in Table 7 a comparison of the three methods, mainly the two-way fixed effect regression (TWFE), the de Chaisemartin and D'Haultfœuille event study regression, and we add the pooled event studies also called event DD by Clarke and Schythe.

Table 7. MCC impacts: TWFE, de Chaisemartin and D'Haultfœuille, pooled event studies estimate

HDI	Lag0	Lag1	Lag2	Lag3	Lag4	Lag5	cons	Avg total eff
Method A: TWFE model	0.00915** (2.98)	0.00141 (0.34)	0.00173 (0.42)	0.000412 (0.10)	0.00106 (0.25)	0.00302 (0.94)	0.679*** (2123.03)	
Method B: DID_multi estimates		0.000724 (1.41)	0.000918 (1.78)	0.000938* (2.11)	0.000833 (1.90)	0.000954* (2.28)		0.00269* (2.15)
Method C: pooled event study	0.000711 (0.68)	0.00185 (1.26)	0.00341 (1.86)	0.00374 (1.77)	0.00483 (1.87)	0.00507 (1.74)	0.673*** (1102.28)	
HDI	Lag0	Lead1	Lead2	Lead3	Lead4	Lead5	cons	Avg total eff
Method A: TWFE model	0.00915** (2.98)	0.00141 (0.34)	0.00173 (0.42)	0.000412 (0.10)	0.00106 (0.25)	0.00302 (0.94)	0.679*** (2123.03)	
Method B: DID_multi estimates		-0.00158* (-2.14)	-0.00198*** (-3.59)	-0.00191** (-2.99)	-0.00207** (-3.18)	- 0.00186** (-2.74)		0.00269* (2.15)
Method C: pooled event study	0.000711 (0.68)		-0.00315* (-2.49)	-0.00563*** (-3.84)	-0.00695*** (-3.70)	- 0.00916** (-4.01)	0.673*** (1102.28)	

9. Robustness Checks

Recent literature has shown that standard TWFE estimator can be biased and inconsistent when treatment effects are heterogeneous in a staggered adoption design, which would apply to our study (Goodman-Bacon, 2021; de Chaisemartin and D'Haultfœuille (2020)). As MCC implement different programmes at different times, the TWFE estimator can make problematic comparisons. For instance, it could happen that this method compares units that have already been treated with units that have not been treated yet.

To make sure that TWFE is not biased, we need to produce different event study models and check if the results are similar. If they are, it would suggest that bias is probably small.

We tried to perform a Bacon-Goodman decomposition for DiD but were not able to succeed it. We also tried to perform synthetic DiD (SDiD) but our panel was unbalanced due to missing data and could not perform a reliable SDiD. Our methodology and attempt can be found in the Annex.

10. Conclusion and Discussion

The aim of our study was to examine the impact of the Millennium Challenge Corporation (MCC), a U.S. conditional foreign aid programme on poverty reduction. We used the Human Development Index (HDI) as a proxy for poverty reduction, as poverty is multidimensional and complex. We looked beyond traditional measures based on income and macroeconomic measures such as GDP per capita, which are usually used to account for poverty reduction.

We applied new statistical event-study methods, in particular the standard event-study estimator developed by de Chaisemartin and D'Haultfœuille (2020), to provide a robust causal analysis of the effectiveness of MCC's conditional assistance.

Our results show that MCC aid has a statistically significant positive impact on reducing poverty indicators through the HDI variable. More specifically, the effects are positive and statistically significant in the third and fifth years following the signing of the programme for a time window of 5 years before and after signature. The short-term timeframe is one of the

key constraints of our study. As we are not able to analyse the long-term effect of this programme after five years. However, extending this period to longer periods would reduce the number of countries treated and therefore reduce our sample. Our positive statistical and significant results suggest that conditional aid can lead to long-term development outcomes when specific conditions, such as good governance, economic freedom and investment in human capital, are met.

Although our results are small, they represent significant progress in multidimensional development. The average cumulative effect per unit of treatment was found to be statistically significant, indicating an approximate 0.0027 improvement in the HDI for MCC recipient countries compared with those that did not receive aid.

Our research contributes to the foreign aid literature by providing new evidence on the effectiveness of conditional foreign aid by using advanced statistical event study methods for this analysis. The results reinforce the idea that conditions of eligibility can effectively improve the effectiveness of foreign aid. The results observed in the fifth year of positive improvement are consistent with theoretical expectations that investments in governance, infrastructure, health and education need time to result in measurable improvements in human development.

11. Caveats

As our programme is based on conditionality, countries must meet specific criteria to be eligible for aid. We acknowledge several issues and limitations within this study. A key issue identified is the violation of the parallel trend assumption due to pre-treatment difference between treated and control groups. This reflects a potential “MCC incentive effect”, where countries improve policies in anticipation of receiving aid, leading to changes in HDI even before the aid is granted.

Another methodological issue relates to the choice of starting date for each programme. Ideally, we would have used the official entry into force (EIF) of each programme. However, due to limited data availability regarding the effective EIF dates, we opted to rely on more consistent available information as our starting point.

We had intended to compare the different types of programmes (compact, threshold, regional threshold) to assess their respective outcomes. However, due to time constraints, we focused only on evaluating the effectiveness of the first programme received by each recipient country. It is worth noting that several recipient countries received multiple programmes, some countries receiving two or even three different programmes. Nonetheless, this analysis is limited to the first programme only. Future research could explore how the number and size of programmes influence development outcomes.

We were unable to observe (very) long-term impacts beyond five years, as our chosen methodology based on the de Chaisemartin and D'Haultfœuille (2020) estimators, limits the time horizon of analysis. Our study also faces challenges in achieving perfect comparability between treated and control groups. Additionally, we were unable to implement a synthetic difference-in-differences approach, which could have strengthened our robustness checks.

Future research could examine the sectoral effects of MCC aid more closely, compare the effectiveness of compact versus threshold programmes, or apply synthetic DiD methods to improve panel balance. Investigating long-term impacts beyond five years would also deepen our understanding of aid effectiveness.

Bibliography

Ahmad, F., Draz, M. U., Su, L., Ozturk, I., Rauf, A., & Ali, S. (2019). Impact of FDI Inflows on Poverty Reduction in the ASEAN and SAARC Economies. *Sustainability*, 11(9), 25-65.

<https://doi.org/10.3390/su11092565>

Alesina, A., & Dollar, D. (2000). Who Gives Foreign Aid to Whom and Why? *Journal of Economic Growth*, 5(1), 33-63. <https://doi.org/10.1023/A:1009874203400>

Ali, M, Khan, L., Sohail, A., & Puah, C. H. (2019) "The relationship between foreign aid and corruption: a case of selected Asian countries", *Journal of Finance Crime*, ISSN: 1359-0790.

Ali, M., & Zeb, A. (2016) "Foreign Aid: origin, evolution and its effectiveness in poverty alleviation", *Quarterly Research Journal*, 11(1)

Alkire, S., Foster, J. E., Seth, S., M. E., Roche, J. M., & Ballon, P. (2015) "Multidimensional Poverty Measurement and Analysis", *Oxford University Press*, ch.5. ISBN: 978-0-19-968949-1

Andaish, Q., & Assadi, S. (2024) "A study on the effectiveness of foreign aid on human development of Afghanistan", *Sustainable Technology and Entrepreneurship*, 3(1), January-April 2024, <https://doi.org/10.1016/j.stae.2023.100056>

Arkhangelsky, D., Athey, S., Hirshberg, D., A., Imbens, G., W., & Wager, S. (2021), "Synthetic Difference-in-Differences", *American Economic Review* 111 (12): 4088–4118. <https://doi.org/10.1257/aer.20190159>

Balasubramanian, P, Burchi, F., & Malerba, D. (2023) "Does economic growth reduce multidimensional poverty? Evidence from low- and middle-income countries", *World Development*, Volume 161, 2023, 106119, ISSN 0305-750X, <https://doi.org/10.1016/j.worlddev.2022.106119>.

Bao, Y. X., & Liao, T. X. (2021) "Capability Approach: Reconciling the Absolute Core and the Multidimensional Relative Poverty Measures", *MPRA, Munich Personal RePEc Archive*.

Barder, O. (2009) "What is Poverty Reduction?", *Center for Global Development Working Paper No. 170*

Barthel, F., Neumayer, E., Nunnenkamp, P., & Selaya, P. (2014) "Competition for Export Markets and the Allocation of Foreign Aid: The Role of Spatial Dependence among Donor Countries", *World Development*, 64, pp. 350-365.
<https://doi.org/10.1016/j.worlddev.2014.06.009>

Bauhr, M., Charron, N., & Nasiritousi, N. (2013). "Does Corruption Cause Aid Fatigue? Public Opinion and the Aid-Corruption Paradox", *International Studies Quarterly*, 57, 568-579.

Bernard, T. (2012) "Impact Analysis of Rural Electrification Projects in Sub-Saharan Africa", *The World Bank Research Observer*, 27(1), pp. 33-51

Berthélemy, J. C. (2006). "Bilateral Donors' Interest vs. Recipients' Development Motives in Aid Allocation: Do all Donors Behave the Same?", *Review of Development Economics*, 10(2), pp. 179–194.

Bhalotra, S., Clarke, D., Gomes, J., F., & Venkatarami, A. (2023) "Maternal Mortality and Women's Political Power", *Journal of the European Economic Association*, 21(5), Pages 2172-2208, <https://doi.org/10.1093/jeea/jvad012>

Burnside, C., & Dollar, D. (2000) "Aid, Policies, and Growth", *American Economic Review*, 90 (4), pp. 847-868. <https://doi.org/10.1257/aer.90.4.847>

Burnside, C., & Dollar, D. (2004) "Aid, policies, and growth: Revisiting the evidence", *World Bank Policy Research Working Paper No. 3251*. World Bank.

CFI Team (web) "Foreign aid: Overview, Purpose, Types and Examples", Corporate Finance Institute. <https://corporatefinanceinstitute.com/resources/economics/foreign-aid/> (consulted on 23/05/2025)

Chong, A. (2006) "Who's Afraid of Foreign Aid: The Donors' Perspective", *Research Department Working Paper 556*. Washington D.C., United States: Inter-American Development Bank

Civelli, A., Horowitz, A., & Teixeira, A. (2018) "Foreign aid and growth: A Sp P-VAR analysis using satellite sub-national data for Uganda", *Journal of Development Economics* 134 (2018) 50-67

Claessens, S. Cassimon, D., & Van Campenhout, B. (2009). "Evidence on Changes in Aid Allocation Criteria", *World Bank Economic Review*, 23(2), pp. 185–208.

Clarke, D., Pailanir, D., Athey, S., & Imbens, G. (2023) "On Synthetic Difference-in-Differences and Related Estimation Methods in Stata", *SSRN Electronic Journal*, <https://doi.org/10.2139/ssrn.4346540>

Collier, P., & Dollar, D. (2001) "Can the World Cut Poverty in Half? How Policy Reform and Effective Aid Can Meet International Development Goals", *World Development*, 29(11), pp. 1787-1802. [https://doi.org/10.1016/S0305-750X\(01\)00076-6](https://doi.org/10.1016/S0305-750X(01)00076-6)

Collier, P., & Dollar, D. (2002) "Aid allocation and poverty reduction", *European Economic Review*, 46(8), pp. 1475-1500. [https://doi.org/10.1016/S0014-2921\(01\)00187-8](https://doi.org/10.1016/S0014-2921(01)00187-8)

D'Attoma, I., & Matteucci, M. (2023) "Multidimensional poverty: an analysis of definitions, measurement tools, applications and their evolution over time through a systematic review of the literature up to 2019", *Qual Quant* 58, 3171-3213. <https://doi.org/10.1007/s11135-023-01792-8>

Daly, H. (2019) "Growthism: its ecological, economic and ethical limits", *Real-world economics review, issue no. 100*

De Chaisemartin, C., & D'Haultfoeuille, C. (2020) "Two-Way Fixed Estimators with Heterogeneous Treatment Effects", *American Economic Review*, 110(9), pp. 2964-2996.
<https://doi.org/10.1257/aer.20181169>

Dimoso, R. L. (2024) "Exploring the Relationship between GDP Per Capita, Government Expenditure, and Poverty Reduction in Tanzania", *NG-Journal of Social Development*.
<https://doi.org/10.4314/ngjsd.v13i2.8>

Dollar, D., Kleineberg, T., & Kraay, A. (2013) "Growth Still Is Good for the Poor", *European Economic Review*, 81. <https://doi.org/10.1016/j.euroecorev.2015.05.008>

Doucouliaagos, H., & Paldam, M. (2006) "Aid Effectiveness on Accumulation: A Meta Study", *Kyklos*, 59(2). <https://doi.org/10.1111/j.1467-6435.2006.00326.x>

Dreher, A., Eichenauer, V. Z., & Gehring, K. (2018). "Geopolitics, Aid, and Growth: The Impact of UN Security Council Membership on the Effectiveness of Aid". *The World Bank Economic Review*, 32(2), 268–286. <https://doi.org/10.1093/wber/lhw037>

Duflo, E., & Banerjee, A., V. (2011) "Poor economics: A radical rethinking of the way to fight global poverty". PublicAffairs

Duflo, E., Dupas, P., & Kremer, M. (2014) "Education, HIV, and early fertility: Experimental evidence from Kenya", *American Economic Review*, 105(9): 2757-97.
<https://doi.org/10.1257/aer.20121607>

Durbarry, R., Gemmel, N., & Greenaway, D. (1998) "New Evidence on the Impact of Foreign Aid on Economic Growth", *Centre for Research in Economic Development and International Trade (CREDIT) Research Paper*, University of Nottingham, No. 98/8.

Easterly, W. (2006) "The White Man's Burden", London, England: Oxford University Press

Easterly, W., & Pfutze T. (2008) "Where Does the Money Go? Best and Worst Practices in Foreign Aid", *American Economic Association, Journal of Economic Perspectives*, 22 (2), Spring, pp. 29-52

Edwards, S. (2015) "Economic Development and the Effectiveness of Foreign Aid: A Historical Perspective", *Kyklos*, 68 (3), pp. 277-316, <https://doi.org/10.1111/kykl.12084>

Finkel, S., & Perez-Linan, A. (2008) "Deepening Our Understanding of the Effects of US Foreign Assistance on Democracy Building Final Report", *GovInfo*

Galiani, S., Knack, S., Xu, L., C., & Zou, B. (2016) "The Effect of Aid on Growth: Evidence from a Quasi-Experiment", *NBER Working Paper Series*, Working Paper 22164, National Bureau of Economic Research

Gohou, G., & Soumare, I. (2012) "Does foreign direct investment reduce poverty in Africa and are there regional differences?", *World Development*, pp. 75-95. <https://doi.org/10.1016/j.worlddev.2011.05.014>

Gomanee, K., Morissey, O., Mosley, P., & Verschoor, A. (2005) "Aid, Government Expenditure, and Aggregate Welfare", *World Development*, 33(3), pp. 355-370. <https://doi.org/10.1016/j.worlddev.2004.09.005>

Gore, C. (2003) "Globalization, the International Poverty Trap and Chronic Poverty in the Least Developed Countries", *CPRC Working Paper No. 30*

Guillaumont P., Boussichas, M., & Dsouza, A. (2023) "The Evolution of Aid Conditionality: A Review of the Literature of the last Twenty Years", *Working paper September 2023, The Expert Group for Aid Studies (EBA)*

Henderson, J. V., Storeygard, A., & Weil, D. N. (2010) "Measuring Economic Growth from Outer Space", *American Economic Review*, 102(2), April 212 (pp. 994-1028)

Hoeffler, A., & Outram, V. (2011). "Need, Merit, or Self-Interest – What Determines the Allocation of Aid?" *Review of Development Economics*, 15(2), pp. 237–250

Honeyman, V., Szent-Ivanyi, B. & lightfoot, S. (2025) "Taking back control of foreign aid? National interest and the conservative reframings of UK development policy", *Springer Nature, Br Polit.* <https://doi.org/10.1057/s41293-025-00289-2>

IDB (2001) "Amartya Sen and the thousand faces of poverty", web stories. <https://www.iadb.org/en/news/amartya-sen-and-thousand-faces-poverty>. Consulted on 05/06/2025

Independent Evaluation Group (IEG) (2006) Annual Report on Operations Evaluation "The Welfare Impact of Rural Electrification: A Reassessment of the Costs and Benefits – An IEG Impact Evaluation", *The World Bank*, Public Disclosure Authorized

Johnson, D., & Zajonc, T., (2006) "Can Foreign Aid Create an Incentive for Good Governance? Evidence from the Millennium Challenge Corporation". <https://doi.org/10.2139/ssrn.896293>

Kassim, K., T., & Beceren, E. (2022) "The impact of foreign aid on poverty reduction: an international literature review", *Journal of Economics, Finance and Accounting (JEFA)*, 9(2), 130-144. <https://doi.org/10.17261/Pressacademia.2022.1621>.

Kim, Y., Han, K., & Han, S., M. (2022) "Political Leaders, Economic Hardship, and Foreign Aid Allocation", *Foreign Policy Analysis*, 18 (4), orac018, <https://doi.org/10.1093/fpa/orac018>

Klasen, S. (2018) "Human Development Indices and Indicators: A critical Evaluation", *UNDP Human Development Report Office, Background paper*.

Klugman, J., Rodriguez, F., & Choi, H-J. (2011) "The HDI 2010: new controversies, old critiques", *The Journal of Economic Inequality*, 9, pp. 249-288. <https://doi.org/10.1007/s10888-011-9178-z>

Kono, D., Y., & Montinola, G., R. (2012) "The Uses and Abuses of Foreign Aid: Development Aid and Military Spending", *Political Research Quarterly*, 66 (3), 2013, pp. 615–29. *JSTOR*

Kosh, S. (2015) "A Typology of Political Conditionality Beyond Aid: Conceptual Horizons Based on Lessons from the European Union", *World Development* 75, Pages 97-108, <https://doi.org/10.1016/j.worlddev.2015.01.006>

Kraay, A., & Raddatz, C. (2007) "Poverty traps, aid, and growth", *Journal of Development Economics* 82, 315-347. <https://doi.org/10.1016/j.jdeveco.2006.04.002>

Lebovic, J., H. (2014) "The Millenium Challenge Corporation: Organizational Constraints on US Foreign Aid, 2004-11", *World Development* 58, June 2014, Pages 116-129, <https://doi.org/10.1016/j.worlddev.2014.01.001>

Lundbord, P. (2003) "Foreign Aid and International Support as a Gift Exchange", *Economics and Politics*, Wiley Blackwell, 10(2), pages 127-142. <https://doi.org/10.1111/1468-0343.00041>

Magesan, A. (2016) "Foreign Aid and Economic Growth in Developing Countries: An Instrumental Variables Approach", *SSRN*. <https://doi.org/10.2139/ssrn.2584235>

Mahembe, E., & Odhiambo, N., M. (2019) "Foreign aid and poverty reduction: A review of international literature", *Cogent Social Sciences*, 5:1, 1625741, <https://doi.org/10.1080/23311886.2019.1625741>

Markovits, D., Strange, A., & Tingley, D. (2017) "Foreign Aid and the Status Quo: Evidence from Pre-Marshall Plan Aid", *The Chinese Journal of International Politics*, 12(4), 585-613. <https://www.jstor.org/stable/48616031>

Masud, N., & Yontcheva, B. (2005) "Does Foreign Aid Reduce Poverty? Empirical Evidence from Nongovernmental and Bilateral Aid", IMF Working Paper, IMF Institute.

Michalopoulos, C. (2017) "Growth Constraints, Aid Targets and Basic Needs", Aid, Trade and Development. Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-319-65861-2_2

Minoiu, C., & Reddy, S., G. (2009) "Development Aid and Economic Growth: A Positive Long-Run Relation", *IMF Working Paper, WP/09/118*.

Montgomery, J., D. (1966) "The Evolution of U.S. Foreign Aid", *Current history*, 50(298), 321-63, <http://www.jstor.org/stable/45311504>

Moyo, D. (2009) "Dead aid: Why Aid Is Not Working and How There Is a Better Way for Africa". New York: Farrar, Straus and Giroux. 188 pp.

Nunn, N., & Qian, N. (2014) "US Food Aid and Civil Conflict", *American Economic Review* 104 (6): 1630-66, <https://doi.org/10.1257/aer.104.6.1630>.

OECD (2008) "The Marshall Plan: Lessons Learned for the 21st Century", *OECD Publishing*, Paris, <https://doi.org/10.1787/9789264044258-en>

Okada, K., & Samreth, S. (2012). "The effect of foreign aid on corruption: A quantile regression approach", *Economic Letters*, 11: 240-243. <https://doi.org/10.1016/j.econlet.2011.12.051>

Parks, B. C., & Rice, Z. J. (2013). "Does the "MCC Effect" Exist? Result from the 2012 MCA Stakeholder Survey", *Center for Global Development*

Philips, K. (Web) (2013) "The history of foreign aid", ABC (Australian Broadcasting Corporation), News and Press Release (consulted on 16/07/2025)

Pronk, J., P. (2009) "Catalysing Development: A debate on Aid", *Wiley-Blackwell Publishing*

Qian, N. (2015) "Making progress on Foreign aid", *Annual Review of Economics*, vol. 7:277-308. 2015. <https://doi.org/10.1146/annurev-economics-080614-115553>

Rahnama, M., Fawaz, F., & Gittings, K. (2017) "The Effects if Foreign Aid on Economic Growth in Developing Countries", *The Journal of Developing Areas*, 51(3): 153-171. <https://doi.org/10.1353/jda.2017.0066>

Ravallion, M. (1998) "Poverty Lines in Theory and Practice", Living Standards Measurement Study (LSMS) Working Paper, N. 133, *The World Bank*, Washington, D.C.

Ravallion, M. (2012) "Troubling Tradeoffs in the Human Development Index", *Journal of Development Economics*, 99, 201, 09. <https://doi.org/10.1016/j.jdeveco.2012.01.003>

Ravallion, M. (2016) "The Economics of Poverty: History, measurement, and policy". *Oxford University Press*. <https://doi.org/10.1093/acprof:oso/9780190212766.001.0001>

Runde, D., F. (2020) "U.S. Foreign Assistance in the Age of Strategic Competition", CSIS <https://www.csis.org/analysis/us-foreign-assistance-age-strategic-competition>. Consulted on 20/06/2025

Sachs, J. D. (2005). *The end of poverty: Economic possibilities for our time*. Penguin Press.

Santos, M. E., Dabus, C, & Delbianco, F. (2017) "Growth and Poverty Revised from a Multidimensional Perspective", *The Journal of Development Studies*, 55(2), 260–277. <https://doi.org/10.1080/00220388.2017.1393520>

Sen, A. K. (1987) "The Standard of Living", *The Tanner Lectures on Human Values*, Cambridge, MA: Cambridge University Press.

Sen, A. K. (1985) "Commodities and Capabilities", Amsterdam: North-Holland

Sharma, B., & Gani, A. (2004) "The Effects of Foreign Direct Investment on Human Development", *Global Economy Journal*, 4(2). <https://doi.org/10.2202/1524-5861.1049>

Sturdy, J., Aquino, S., & Molyneaux, J. (2014) "Learning from evaluation at the Millennium Challenge Corporation", *Journal of Development Effectiveness*, 6(4), 436-450. <https://doi.org/10.1080/19439342.2014.975424>.

Tafana, K. & Beceren, E. (2022) "The Impact of Foreign Aid on Poverty Reduction: An International Literature Review", *Journal of Economics, Finance and Accounting (JEFA)*, PressAcademia, 9(2), pp. 130-144. <https://doi.org/10.17261/Pressacademia.2022.1621>

Tarnoff, C. (2018) "The Marshall Plan: Design, Accomplishments, and Significance", Congressional Research Service Reports, Library of Congress, Washington D.C., R45079.

Thorbecke, E. (2007) "The Evolution of the Development Doctrine and the Role of Foreign Aid, 1950-2000", *Advancing Development*. Studies in Development Economics and Policy. Palgrave Macmillan, London. https://doi.org/10.1057/9780230801462_1

Zambrano, E. (2016) "The 'Troubling Tradeoffs' Paradox and a Resolution", *Review of Income and Wealth*, 63(3), pp.520-541. <https://doi.org/10.1111/roiw.12235>

Appendixes

Table A1: Table summary of the recipient countries

Country	Signed	EIF	Closed	Type of Grant	Sector
Albania	April 2006	April 2006	November 2008	Threshold Programme	Gov, Eco
Armenia	March 2006	September 2006	September 2011	Compact	Eco, Educ&Health
Belize	September 2024	NY	/	Compact	Eco, Educ&Health
Benin	February 2006	October 2006	October 2011	Compact	Eco
Burkina Faso	July 2005	September 2005	September 2008	Threshold Programme	Educ&Health
Cabo Verde	July 2005	October 2005	October 2010	Compact	Eco
Côte d'Ivoire	November 2017	August 2019	/	Compact	Eco, Educ&Health
El Salvador	November 2006	September 2007	September 2012	Compact	Eco, Educ&Health
The Gambia	November 2021	June 2022	/	Threshold Programme	Eco, Educ&Health
Georgia	September 2005	April 2006	April 2011	Compact	Eco
Ghana	August 2006	February 2007	February 2012	Compact	Gov, Eco
Guatemala	April 2015	NA	October 2021	Threshold Programme	Gov, Eco
Guyana	August 2007	NA	February 2010	Threshold Programme	Gov
Honduras	June 2005	September 2005	September 2010	Compact	Eco
Indonesia	November 2006	NA	December 2010	Threshold Programme	Gov
Jordan	October 2006	NA	August 2009	Threshold Programme	Gov, Eco
Kenya	March 2007	NA	January 2011	Threshold Programme	Gov, Educ&Health
Kiribati	September 2024	NA	/	Threshold Programme	Educ&Health
Kosovo	September 2017	NA	September 2022	Threshold Programme	Gov, Eco
Kyrgyz Republic	March 2008	NA	July 2010	Threshold Programme	Gov

Lesotho	July 2007	September 2008	September 2013	Compact	Eco, Educ&Health
Liberia	July 2010	NA	December 2013	Threshold Programme	Eco
Madagascar	April 2005	NA	August 2009	Compact	Eco
Malawi	September 2005	NA	October 2008	Threshold Programme	Gov
Mali	November 2006	NA	September 2012	Compact	Eco
Mauritania	January 2025	NA	/	Threshold Programme	Gov, Eco
Moldova	December 2006	NA	March 2010	Threshold Programme	Eco
Mongolia	October 2007	September 2008	September 2013	Compact	Eco, Educ&Health
Morocco	August 2007	September 2008	September 2013	Compact	Eco, Educ&Health
Mozambique	July 2007	September 2008	September 2013	Compact	Eco, Educ&Health
Namibia	July 2008	September 2009	September 2014	Compact	Eco, Educ&Health
Nepal	September 2017	August 2023	/	Compact	Eco, Educ&Health
Nicaragua	July 2005	NA	July 2009	Compact	Eco
Niger	March 2008	NA	December 2015	Threshold Programme	Gov, Eco, Educ&Health
Paraguay	May 2006	NA	September 2009	Threshold Programme	Gov
Peru	June 2008	NA	September 2012	Threshold Programme	Gov, Educ&Health
Philippines	July 2006	NA	May 2009	Threshold Programme	Gov
Rwanda	September 2008	NA	December 2011	Threshold Programme	Gov
Sao Tomé and Principles	November 2007	NA	April 2011	Threshold Programme	Gov, Eco
Senegal	September 2009	September 2010	September 2015	Compact	Eco, Educ&Health
Sierra Leone	November 2015	NA	March 2021	Threshold Programme	Gov, Eco
Solomon Islands	January 2022	January 2022	/	Threshold Programme	Eco
Tanzania	May 2006	NA	December 2008	Threshold Programme	Gov
Timor-Leste	September 2010	NA	March 2014	Threshold Programme	Gov

Togo	February 2019	November 2020	/	Threshold Programme	Eco, Educ&Health
Uganda	March 2007	NA	January 2010	Threshold Programme	Gov
Ukraine	December 2006	NA	January 2010	Threshold Programme	Gov
Vanuatu	March 2006	April 2006	April 2011	Compact	Eco
Zambia	May 2006	NA	March 2009	Threshold Programme	Gov, Eco

Note: This table provides an overview of the 49 recipient countries, including the dates on which the MCC agreements were signed and closed. When available, we also include the dates of entry into force (EIF), although many of these are missing (NA). The table indicates the type of grant received by each country. Regional compacts are not shown, as the three countries that received this type of grant; Côte d'Ivoire, Cabo Verde, and Senegal, received it as part of their second or third aid programme, and not as part of their first aid. Finally, we indicate the main sector targeted by each grant, either governance (Gov), economic development and/or infrastructure (Eco), or education and health (Educ&Health). Determining the exact sector focus was complex, so this classification reflects the author's interpretation.

"NA" stands for "Not Available" information.

"/" stands for "No information yet". Either the programme has not started (EIF) yet or not closed yet.

Figure A1: Top donors by decade (from Qian, 2015, p.287)

Rank	Country	Avg. ODA	Country	Avg. ODA	Country	Avg. ODA
1960s			1970s		1980s	
1	United States	18,311	United States	13,191	United States	15,102
2	France	4,477	Saudi Arabia	5,903	Japan	9,197
3	United Kingdom	2,399	Germany	4,777	France	6,841
4	Germany	2,283	France	4,278	Germany	6,601
5	Saudi Arabia	1,548	Japan	3,789	Saudi Arabia	6,083
6	Japan	1,155	United Kingdom	3,054	United Kingdom	3,483
7	Canada	616	Canada	2,315	Netherlands	2,947
8	Australia	600	Netherlands	1,893	Italy	2,925
9	Italy	469	Kuwait (KFAED)	1,583	Canada	2,908
10	Belgium	467	Sweden	1,478	Sweden	1,962
1990s			2000s		2010–2013	
1	Japan	15,100	United States	22,308	United States	29,555
2	United States	13,083	Japan	11,219	United Kingdom	14,451
3	France	9,891	Germany	9,839	Germany	13,039
4	Germany	9,043	United Kingdom	9,415	France	11,559
5	United Kingdom	4,356	France	9,357	Japan	10,537
6	Netherlands	3,832	Netherlands	5,300	Netherlands	5,495
7	Italy	3,572	Spain	3,864	Sweden	5,290
8	Canada	2,941	Sweden	3,496	Canada	5,086
9	Sweden	2,559	Canada	3,429	Australia	4,835
10	Denmark	2,017	Italy	3,322	Norway	4,784

Average annual official development assistance (ODA) disbursement is reported in millions of 2009 USD. Data taken from OECD table DAC 1, flows by donor/QWIDS.

Figure A2: Top recipients of ODA by decade (from Qian, 2015, p.288)

Rank	Country	Avg. ODA	Country	Avg. ODA	Country	Avg. ODA
1960s			1970s		1980s	
1	India	5,240	Egypt	4,414	India	3,349
2	Pakistan	2,097	India	4,341	Egypt	2,838
3	Vietnam	1,662	Indonesia	4,117	Bangladesh	2,465
4	Korea	1,285	Syria	3,837	Israel	2,276
5	Algeria	1,270	Bangladesh	3,707	Indonesia	1,822
6	Brazil	1,145	Pakistan	3,614	Pakistan	1,743
7	Turkey	996	Vietnam	2,216	Syria	1,724
8	Indonesia	788	Israel	2,124	China	1,696
9	Egypt	666	Jordan	2,022	Jordan	1,526
10	Chile	566	Korea	2,019	Sudan	1,487
1990s			2000s		2010–2013	
1	Egypt	4,198	Iraq	6,382	Afghanistan	4,850
2	China	3,552	Afghanistan	2,908	DRC	2,887
3	India	2,541	Nigeria	2,576	Vietnam	2,575
4	Indonesia	2,117	Vietnam	2,229	Ethiopia	2,508
5	Israel	2,040	Ethiopia	2,168	Pakistan	2,043
6	Bangladesh	2,031	DRC	2,018	Tanzania	2,024
7	Pakistan	1,471	Tanzania	2,009	India	1,871
8	Mozambique	1,448	Pakistan	1,922	Turkey	1,752
9	Philippines	1,420	India	1,708	West Bank and Gaza Strip	1,693
10	Tanzania	1,381	China	1,663	Kenya	1,679

Average annual ODA disbursement is reported in millions of 2009 USD. Data taken from OECD table DAC 2, flows by recipient/QWIDS.

Table A2: MCC impacts: TWFE regression

	(1) hdi
Postevent	0.00915** (2.98)
Postevent_lag1	0.00147 (0.34)
Postevent_lag2	0.00516 (1.58)
Postevent_lag3	0.000412 (0.10)
Postevent_lag4	0.00106 (0.25)
Postevent_lag5	0.00302 (0.94)
_cons	0.679*** (2123.03)
<i>N</i>	5076

t statistics in parentheses

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

Figure A3: MCC impacts: Clarke & Schythe (2021) Eventdd method (-8;8)

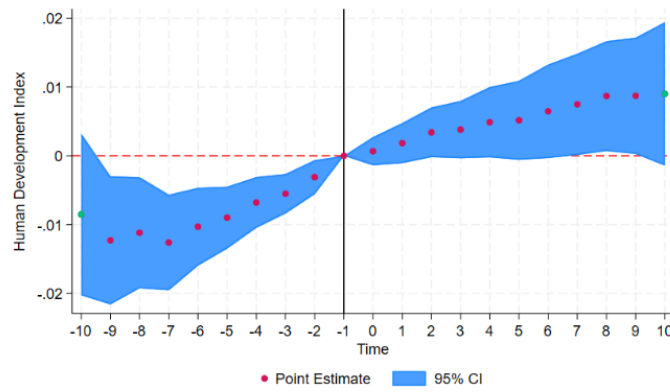


Figure A4: MCC impacts: Clarke & Schythe (2021) Eventdd method (-8;8)

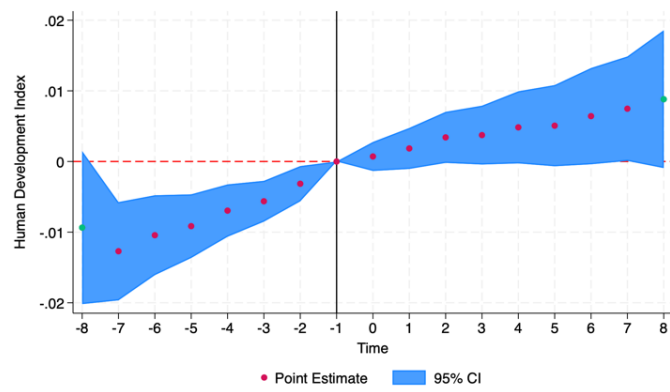


Figure A5: MCC impacts: Clarke & Schythe (2021) Eventdd method (-6;6)

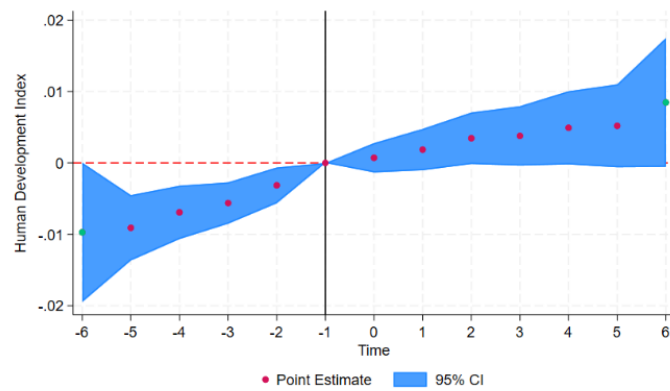


Table A3: MCC impacts: Clarke & Schythe (2021) Eventdd method (-10;10)

HDI	Coefficient	Robust se	t	P> t	[95% conf. interval]	
Lead10	-.0087292	.0059503	-1.47	0.144	-.0204659	.0030074
Lead9	-.01243	.0047185	-2.63	0.009	-.0217372	-.0031229
Lead8	-.0112876	.0040929	-2.76	0.006	-.193607	-.0032145
Lead7	-.0127799	.0035132	-3.64	0.000	-.197096	-.0058503
Lead6	-.0104615	.0028633	-3.65	0.000	-.0161093	-.0048137
Lead5	-.009158	.0022815	-4.01	0.000	-.0136583	-.0046578
Lead4	-.0069421	.0018765	-3.70	0.000	-.0106434	-.0032408
Lead3	-.0056076	.0014565	-3.85	0.000	-.0084804	-.0027348
Lead2	-.003133	.00121587	-2.49	0.014	-.0056158	-.0006503
Lag0	.0006904	.0010414	0.66	0.508	-.0013637	.0027445
Lag1	.001821	.0014691	1.24	0.217	-.0010769	.0047188
Lag2	.0033858	.0018289	1.85	0.066	-.0002217	.0069932
Lag3	.0037037	.0021088	1.76	0.081	-.0004559	.0078632
Lag4	.0047754	.0025839	1.85	0.066	-.0003213	.0098721
Lag5	.0050054	.0039097	1.72	0.087	-.000734	.0107447
Lag6	.0063475	.0034442	1.84	0.067	-.00446	.013141
Lag7	.0073882	.0037263	1.98	0.049	.0000382	.0147382
Lag8	.0085977	.0040427	2.13	0.35	.0006236	.0165719
Lag9	.0086212	.0042826	2.01	0.046	.000174	.0170685
Lag10	.0087839	.0052972	1.66	0.099	-.0016647	.0192325
cons	.6727768	.0006108	1101.48	0.000	.671572	.6739815

Table A4: MCC impacts: Clarke & Schythe (2021) Eventdd method (-8;8)

HDI	Coefficient	Robust se	t	P> t	[95% conf. interval]	
Lead8	-.009358	.0054917	-1.70	0.090	-.0201901	.0014741
Lead7	-.0127038	.0035265	-3.60	0.000	-.0196597	-.0057479
Lead6	-.0104354	.0028633	-3.64	0.000	-.01609	-.0047809
Lead5	-.009158	.0022815	-4.01	0.000	-.0136583	-.0046578
Lead4	-.0069542	.0018795	-3.70	0.000	-.0106615	-.0032469
Lead3	-.0056293	.0014644	-3.84	0.000	-.0085178	-.0027408
Lead2	-.0031479	.0012658	-2.49	0.014	-.0056446	-.0006511
Lag0	.0007111	.001042	0.68	0.496	-.0013443	.0027665
Lag1	.0018474	.0014706	1.26	0.211	-.0010532	.0047481
Lag2	.0034122	.0018307	1.86	0.064	-.0001988	.0070232
Lag3	.0037355	.0021102	1.77	0.078	-.0004268	.0078978
Lag4	.0048337	.002586	1.87	0.063	-.000267	.0099344
Lag5	.0050707	.0029149	1.74	0.084	-.0006789	.0108203
Lag6	.0064209	.0034536	1.86	0.065	-.0003912	.013233
Lag7	.0074742	.0037487	1.99	0.048	.00008	.0148683
Lag8	.0088204	.0049466	1.78	0.076	-.0009366	.0185774
cons	.672779	.0006104	1102.28	0.000	.6715751	.6739829

Table A5: MCC impacts: Clarke & Schythe (2021) Eventdd method (-6;6)

HDI	Coefficient	Robust se	t	P> t	[95% conf. interval]	
Lead6	-.0097243	.0049501	-1.96	0.051	-.0194881	.0000395
Lead5	-.0090897	.0023187	-3.92	0.000	-.0136632	-.0045162
Lead4	-.0069262	.0018919	-3.66	0.000	-.010658	-.0031945
Lead3	-.0056157	.001468	-3.83	0.000	-.0085114	-.0027201
Lead2	-.0031417	.0012686	-2.48	0.014	-.005644	-.0006393
Lag0	.0007192	.0010417	0.69	0.491	-.0013356	.0027739
Lag1	.0018691	.001468	1.27	0.205	-.0010276	.0047657
Lag2	.0034549	.0018264	1.89	0.060	-.0001475	-.0001475
Lag3	.0037868	.0021088	1.80	0.074	-.0003726	.0079463
Lag4	.0049215	.0025956	1.90	0.059	-.0001981	.0100412
Lag5	.0051988	.002945	1.77	0.079	-.0006101	.0110078
Lag6	.0084701	.0045753	1.85	0.066	-.0005546	.0174947
cons	.6727782	.0006104	1105.60	0.000	.671578	.6739785

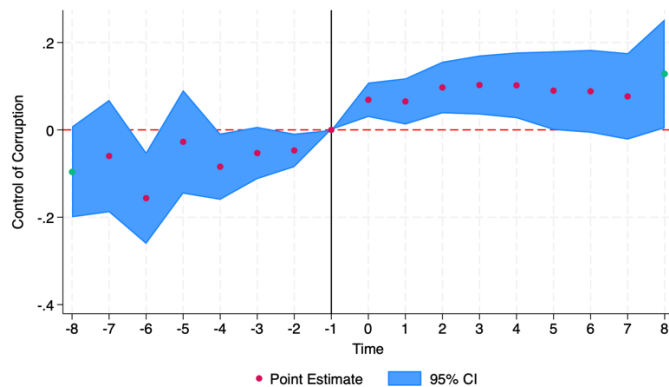
Figure A6: MCC impacts: Clarke & Schythe (2021) Eventdd method (-8;8) on Control of corruption variable

Figure A7: MCC impacts: Clarke & Schythe (2021) Eventdd method (-8;8) on GDP per capita growth variable

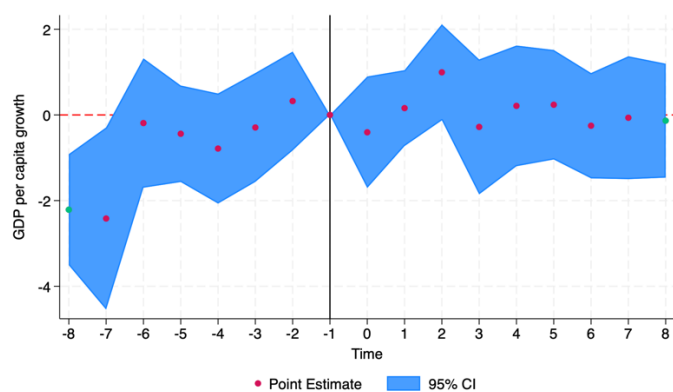


Figure A8: MCC impacts: Clarke & Schythe (2021) Eventdd method (-8;8) on GDP per capita PPP variable

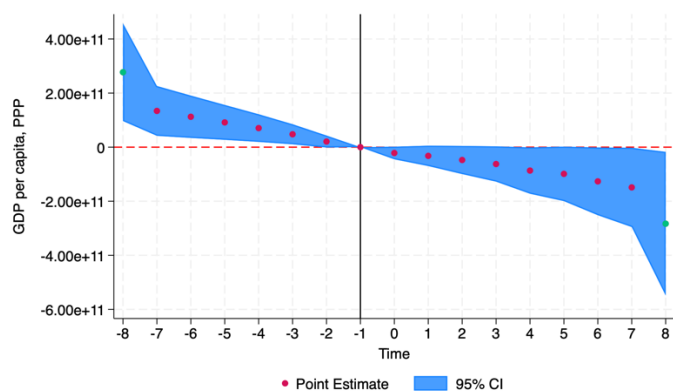


Table A6: Stata's xtdidregress

	(1)
	hdi
ATET	
r1vs0.Postevent	0.0140**
	(2.74)
Controls	
1990.year	0
	(.)
1991.year	0.00263***
	(4.99)
1992.year	0.00505***
	(4.50)
1993.year	0.00876***
	(5.40)

1994.year	0.0136*** (6.79)
1995.year	0.0165*** (7.09)
1996.year	0.0220*** (8.76)
1997.year	0.0272*** (10.16)
1998.year	0.0323*** (11.63)
1999.year	0.0377*** (12.49)
2000.year	0.0432*** (13.48)
2001.year	0.0497*** (15.12)
2002.year	0.0556*** (16.52)
2003.year	0.0610*** (17.73)
2004.year	0.0674*** (19.38)
2005.year	0.0730*** (20.71)
2006.year	0.0785*** (21.97)
2007.year	0.0845*** (23.23)
2008.year	0.0901*** (24.41)
2009.year	0.0939***

	(25.17)
2010.year	0.0991*** (26.09)
2011.year	0.105*** (27.45)
2012.year	0.109*** (28.87)
2013.year	0.114*** (28.81)
2014.year	0.118*** (29.23)
2015.year	0.121*** (29.50)
2016.year	0.125*** (29.70)
2017.year	0.129*** (30.03)
2018.year	0.132*** (30.58)
2019.year	0.136*** (30.22)
2020.year	0.131*** (28.22)
2021.year	0.130*** (27.89)
2022.year	0.134*** (28.59)
_cons	0.592*** (193.94)
N	5777

t statistics in parentheses

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

sdid and honest DiD attempts

Synthetic DiD attempt with red mark for the error message.

```

use "FINAL.dta", replace
.
end of do-file
. do "/var/folders/91/n4l8v8v55f1d_1_lhfsrqzvw0000gn/T//SD00391.000000"
. forvalues i = 2007(1)2007 {
2.   display `i'
3.
.   keep if Eventsigningyear == `i' | Eventsigningyear == . // keep only one time of
> adoption, control group is never-treated
4.
.   sdid hdi Country_num year Postevent, vce(noinference)
5.
.   local j = `i' - 1990
6.
.   matrix lambda = e(lambda)[1..`j', 1] // save lambda weight
7.   matrix yco = e(series)[1..`j', 2] // control baseline
8.   matrix ytr = e(series)[1..`j', 3] // treated baseline
9.   matrix aux = lambda*(ytr - yco) // calculate the pre-treatment mean
10.  scalar meanpre_o = aux[1, 1]
11.
.   matrix difference = e(difference)[1..33, 1..2] // Store Ytr-Yco
12.
.   svmat difference
13.  ren (difference1 difference2) (time d)
14.  replace d = d - meanpre_o // Calculate vector in (8)
15.
.   local b = 1
16.  local B = 3 // change later
17.
.   while `b' <= `B' {
18.
.   preserve

```

```

19.
.      bsample, cluster(Country_num) idcluster(c2)
20.
.      duplicates report Country_num year
21.      duplicates drop Country_num year, force
22.
.      count if Postevent == 0
23.      local r1 = r(N)
24.      count if Postevent != 0
25.      local r2 = r(N)
26.
.      if(`r1' != 0 & `r2' != 0) {
27.          sdid hdi Country_num year Postevent, vce(noinference)
28.
.          matrix lambda_b = e(lambda)[1..`j', 1] // save lambda weight
29.          matrix yco_b = e(series)[1..`j', 2] // control baseline
30.          matrix ytr_b = e(series)[1..`j', 3] // treated baseline
31.          matrix aux_b = lambda_b*(ytr_b - yco_b) // calculate the pre-treatmen
> t mean
32.          matrix meanpre_b = J(33, 1, aux_b[1, 1])
33.          matrix d`b' = e(difference)[1..33, 2] - meanpre_b
34.
.          local ++b
35.      }
36.      restore
37.  }
38.
.      preserve
39.
.      keep time d
40.      keep if time != .
41.      forval b=1/^B' {

```

```

42.     svmat d`b' // import each bootstrap replicate of difference between trends
43. }
44.
.     egen rsd = rowstd(d11 - d`B'1) // calculate standard deviation of this difference
45.     gen LCI = d + invnormal(0.025)*rsd // lower bounds on bootstrap CIs
46.     gen UCI = d + invnormal(0.975)*rsd // upper bounds on bootstrap CIs
47.
.     save "sdid_event_`i'.dta", replace

48.
.     * generate plot
.     tw rarea UCI LCI time, color(gray%40) || scatter d time, yscale(range(-0.1 0.1))
> ylabel(-0.1(0.05)0.1) ///
> color(blue) m(d) xtitle("") ytitle("HDI") xlab(1990(2)2022, angle(45)) ///
> legend(order(2 "PointEstimate" 1 "95%CI") pos(12) col(2)) ///
> xline(`i', lc(black) lp(solid)) yline(0, lc(red) lp(shortdash)) scheme(sj)
49.
.     graph export "sdid_eventplot_`i'.pdf", replace
50.     restore
51. }
2007
(1,440 observations deleted)
Missing values found in dependent variable. A balanced panel without missing observations is required.
> r(416);

end of do-file

```

Because we needed a balanced panel without missing observations we tried to delete all the missing values but still got an unbalanced panel:

```
.
*****
*****
> *** ** SDiD (Clarke et al., 2023; Arkhangelsky et al., 2021) **
*****
> *****
. use "FINAL.dta", replace
.
. *installing packs
. ssc install drdid, replace
checking drdid consistency and verifying not already installed...
all files already exist and are up to date.
. ssc install csdid, replace
checking csdid consistency and verifying not already installed...
all files already exist and are up to date.
. ssc install sdid, replace
checking sdid consistency and verifying not already installed...
all files already exist and are up to date.
.
.
. *** Rajout
. count if missing(hdi)
2,071
. *list Country_num year hdi if missing(hdi)
. drop if missing(hdi)
(2,071 observations deleted)
. *by Country_num year: gen count = _N
. *list Country_num year count if count < 1
. *by Country_num: count
.
. *****
. xtset Country_num year

Panel variable: Country_num (unbalanced)
Time variable: year, 1990 to 2022
Delta: 1 unit
.
. * Any units treated the entire panel should not be included in the synthetic DID proc
> edure
. by Country_num: drop if Postevent == 1 & year == 1990
(0 observations deleted)
```

```
. tab year if Timetoevent == 0
```

Year	Freq.	Percent	Cum.
2005	7	15.56	15.56
2006	14	31.11	46.67
2007	9	20.00	66.67
2008	5	11.11	77.78
2009	1	2.22	80.00
2010	2	4.44	84.44
2015	2	4.44	88.89
2017	1	2.22	91.11
2019	2	4.44	95.56
2021	1	2.22	97.78
2022	1	2.22	100.00
Total	45	100.00	

```
. forvalues i = 2007(1)2007 {
```

```
2. display `i'
```

```
3.
```

```
. keep if Eventsigningyear == `i' | Eventsigningyear == . // keep only one time of  
> adoption, control group is never-treated
```

```
4.
```

```
. sdid hdi Country_num year Postevent, vce(noinference)
```

```
5.
```

```
. local j = `i' - 1990
```

```
6.
```

```
. matrix lambda = e(lambda)[1..`j', 1] // save lambda weight
```

```
7. matrix yco = e(series)[1..`j', 2] // control baseline
```

```
8. matrix ytr = e(series)[1..`j', 3] // treated baseline
```

```
9. matrix aux = lambda'*(ytr - yco) // calculate the pre-treatment mean
```

```
10. scalar meanpre_o = aux[1, 1]
```

```
11.
```

```
. matrix difference = e(difference)[1..33, 1..2] // Store Ytr-Yco
```

```
12.
```

```
. svmat difference
```

```
13. ren (difference1 difference2) (time d)
```

```
14. replace d = d - meanpre_o // Calculate vector in (8)
```

```
15.
```

```
. local b = 1
```

```
16. local B = 3 // change later
```

```
17.
```

```
. while `b' <= `B' {
```

```
18.
```

```
. preserve
```

```
19.
```

```
. bsample, cluster(Country_num) idcluster(c2)
```

```
20.
```

```

.      duplicates report Country_num year
21.      duplicates drop Country_num year, force
22.
.      count if Postevent == 0
23.      local r1 = r(N)
24.      count if Postevent != 0
25.      local r2 = r(N)
26.
.      if(`r1' != 0 & `r2' != 0) {
27.          sdid hdi Country_num year Postevent, vce(noinference)
28.
.          matrix lambda_b = e(lambda)[1..`j', 1] // save lambda weight
29.          matrix yco_b = e(series)[1..`j', 2] // control baseline
30.          matrix ytr_b = e(series)[1..`j', 3] // treated baseline
31.          matrix aux_b = lambda_b*(ytr_b - yco_b) // calculate the pre-treatmen
> t mean
32.          matrix meanpre_b = J(33, 1, aux_b[1, 1])
33.          matrix d`b' = e(difference)[1..33, 2] - meanpre_b
34.
.          local ++b
35.      }
36.      restore
37.  }
38.
.      preserve
39.
.      keep time d
40.      keep if time != .
41.      forval b=1/`B' {
42.          svmat d`b' // import each bootstrap replicate of difference between trends
43.      }
44.
.      egen rsd = rowstd(d11 - d`B'1) // calculate standard deviation of this difference
45.      gen LCI = d + invnormal(0.025)*rsd // lower bounds on bootstrap CIs
46.      gen UCI = d + invnormal(0.975)*rsd // upper bounds on bootstrap CIs
47.
.      save "sdid_event_`i'.dta", replace
48.
.      * generate plot
.      tw rarea UCI LCI time, color(gray%40) || scatter d time, yscale(range(-0.1 0.1))
> ylabel(-0.1(0.05)0.1) ///
> color(blue) m(d) xtitle("") ytitle("HDI") xlab(1990(2)2022, angle(45)) ///
> legend(order(2 "PointEstimate" 1 "95%CI") pos(12) col(2)) ///
> xline(`i', lc(black) lp(solid)) yline(0, lc(red) lp(shortdash)) scheme(sj)
49.
.      graph export "sdid_eventplot_`i'.pdf", replace
50.      restore
51.  }
2007
(1,204 observations deleted)

```

Panel is unbalanced.

For the honest DiD, we did not understand how to implement it for our case. Therefore, we do not provide our attempt.