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RELATIONSHIP BETWEEN MILLENNIUM CHALLENGE AID AND CONTROL OF CORRUPTION IN ARMENIA
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List of Acronyms

BEEPS  Business Environment and Enterprise Performance Survey
CC  Control of Corruption
CPI  Corruption Perception Index
CRRC  Caucasian Research Resource Center
DAC  Development Assistance Committee
DID  Difference-in-Difference
EBRD  European Bank for Reconstruction and Development
GDP  Gross Domestic Product
GNI  Gross National Income
KK  Kaufmann and Kraay
LMIC Low-Middle Income Country
MAAC Mobilizing Action Against Corruption
MCA Millennium Challenge Account
MCC Millennium Challenge Corporation
OLS Ordinary Least Squares
TI Transparency International
US United States
USD United States Dollar
USAID United States Agency for International Development
URL Uniform Resource Locator
WGI World Governance Indicators
Introduction

Twenty years have passed since the collapse of the Soviet Union, yet pervasive corruption still evolves and thrives in Armenia, negatively affecting economic development and the reduction of poverty. Public officials in Armenia have been slow to adopt policy changes or regulatory measures to control levels of corruption. Due to the lack of reforms initiated, the existing matrix perpetuates this systemic problem.

In the absence of accountability standards, large sums of foreign aid, rather than facilitating development, create a ripe territory for corruption (Tavares 2003). Since its independence in 1991, Armenia has received more than four billion USD in official development assistance (ODA), according to World Bank data. On average, for the past twenty years, official aid made up eight percent of Armenia’s gross domestic product.

Official development assistance is designed to help developing countries compensate for financial scarcity and to support growth within those countries. However, critics of aid argue that six decades of contributions have not shown substantial improvements in recipient governments’ economic development (Bauer 1976; Hancock 1994; Easterly 2001). Proponents suggest that, if designed appropriately, aid can promote good governance and policy reforms in recipient countries (Cooksey 2002).

To address the problem of aid effectiveness and reward good performance, a new foreign aid initiative was developed by the United States Government in 2002—the Millennium Challenge Account (MCA), administered by Millennium Challenge Corporation (MCC). In contrast to other aid programs, MCA funds are rewarded based on more selective criteria, with an emphasis on accountability and past performance, among other factors. MCA regards control of corruption as crucial requisite for Millennium Challenge aid eligibility. The program creates incentives for developing countries to improve their governance indicators (Johnson and Zajonc 2006). MCC allocates a more significant amount of aid over five years, specifically for projects that have a potential to promote economic growth and reduce poverty. In 2006, Armenia signed a contract with MCC to become part of Millennium Challenge Compact. A new set of data can now provide analysis of the actual impact of MCC policies on governance in recipient countries, and, particularly, in Armenia.
The lack of research analyzing the impact of MCA on corruption, especially in Armenia, has motivated this research. This study aims to determine a possible relationship between MCA and control of corruption in recipient countries, with a focus on Armenia. By design, MCA focuses on the corruption controls of beneficiaries; hence, the focal point of this study on the interface between objectives and results is crucial to the sustainable efficacy of MCA in the developing world. The first chapter of this analysis examines various definitions and measures of corruption. The second chapter links foreign aid with corruption and presents Millennium Challenge aid, with an emphasis on MCA’s control of the corruption component. The third chapter determines a relationship between Millennium Challenge aid and the control of corruption in Armenia via difference-in-difference analysis and a regression model. Conclusions and policy implications are provided at the end.

1. Definition and Measurement of Corruption

1.1. Corruption Defined

In the past three decades, the need has emerged for a universal definition of corruption, inclusive of international, cultural, and religious borders (Brown 2006). Such a definition has not yet been found, nor has a consensus been reached (Duncan 2006; Langseth 2007). Corruption can adopt various forms and levels; it can have different meanings in different contexts (i.e. political and economic) and cultures (Bardhan 1997). Corruption is not by necessity an illegal action. Rose-Ackerman’s widely used definition of corruption, “an illegal payment to a public agent to obtain a benefit that may or may not be observed in the absence of payoffs” (Rose-Ackerman 2003), does not represent the fact that an action need not be constituted illegal in order to be considered corrupt. Furthermore, it disregards the fact that corruption can exist in both the private sector and the public sector (Brown 2006; Bardhan 1997). Langseth presents the twelve most frequently faced forms of corruption—big and small bribery, embezzlement, theft, fraud, nepotism, favoritism, extortion, abuse of discretion, creation of exploitation of conflict of interests, and improper political contributions—only one of which is exclusive to political entities (Langseth 2007). Several authors have studied the hierarchical and complex nature of corruption in the private and public sectors. Bardhan (1997) notes the differences between “immoral” and “corrupt” transactions.
Paying a blackmailer to avoid exposure of unwanted information is immoral, but not corrupt. Paying a police officer not to torture a suspect is corrupt, but moral. Therefore, Bardhan uses the definition of corruption as “use of public office for private gain,” an agency-specific problem.

Brown (2006) contends that this definition is too exclusive, defining only one type of corruption—bribery, or public office-centered corruption, to the exclusion of other variances, market-centered and public interest-centered corruption. Brown presents Transparency International’s Bogor (West Java) definition of corruption, “abuse of entrusted power,” as a more precise method of describing the essence of corruption. According to the author, this definition captures power in both public and private sectors, incorporating the factor of public interest. With regard to the question of benefits, Brown states that political gains can be considered within a continuum of other gains. In this definition, the essence of corruption has been proposed as “abuse of a power that has been entrusted in socially recognizable way” (Brown 2006).

Oxford’s Advanced Dictionary describes corruption as “dishonest or illegal behavior, especially of people in authority”, and “act or effect making somebody change from moral to immoral standard of behavior” (Seldadyo and De Haan 2005). Brown (2006) also quotes corruption as defined by the Oxford English Dictionary, and both authors independently state that corruption is not only a problem of morality. It is also a relational issue, which is more than a mere description of its moral or behavioral attributes. Seldadyo and De Haan (2005) state that the definition needs to capture discretionary power, or authority that is associated with economic rents and rent-seeking activities. Moreover, even in the absence of morality, “combination of rent, power and a weak (or even failure of the) judicial system is enough for corruption to exist” (Seldadyo and De Haan 2005).

Subsequently, Brown contends that defining corruption as “abuse of entrusted power” addresses this issue in its wording of “entrusted power”, which extends the concept beyond elected officials. In both the public and private sectors, corruption is a direct corollary of the economic climate that must exist for it to occur, and the regulatory conditions and lack of oversight that allow for it to thrive.

1.2. Corruption Measures

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1 Rent-seeking activities are non-productive activities performed by economic agents who try to gain above average profit for themselves on the expense of someone else. These activities are called non-productive as they do not produce any service or product and hence, do not add to economic output. URL: http://social.jrank.org/pages/2808/rent-seeking-activities.html
Corruption itself does not easily allow for measurement, because the process usually is hidden from public view, and neither of the stakeholders has an incentive to reveal the secrecy of corrupt transactions (Galtung 2006; Urra 2007). However, several corruption assessment techniques have been developed to estimate degree of corruption (Sampford et al. 2006), including macro- and micro-level data. Micro-level data can be drawn from firm-level surveys or infrastructure projects. Macro-level data consists of two types (Seldadyo and De Haan 2005; Urra 2007): 
(1) General or target group perception-based data or subjective indicators that are based on polls and surveys, where respondents answer questions that tend to measure corruption, and 
(2) Occurrence of corrupt activities or objective indicators that are experience-based data, though such measures are rare in practice (Urra 2007).

Several authors have attempted to develop purely objective measurements of corruption (Golden and Picci 2005; Duncan 2006; Olken 2006). According Urra (2007), experience-based objective measures are not necessarily preferable to perception-based polls. Lambsdorff, (2006), states that elimination of the reliability of corrupt transactions may be a more helpful approach than implementation of penalties (i.e. “perceptions matter”). Another advantage of perception-based indicators is degrees of error in measurement to help its users with data interpretation. In contrast, experience-based indicators do not provide such standard errors, which offsets the validity of the results (Urra 2007).

In the 1990s, a new generation of corruption indicators was developed, the so called “aggregate indicators,” three of which are most commonly used among practitioners (Galtung 2006):

a) Corruption Perception Index (CPI) of Transparency International,

b) World Government Indicators (WGI) and its Control of Corruption component,

c) Business Environment and Enterprise Performance Survey (BEEPS), (Urra 2007);

The first two are macro-based corruption indices that use sophisticated approaches and aggregate polls of polls (secondary) data. Aggregate indicators were developed to respond to criticism of individual indicators, hence they capture a broad spectrum of countries, are published annually, and they average out and reduce measurement errors (Urra 2007; Kaufmann, Kraay, and Mastruzzi 2009).

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3All three indicators cover Armenia, though only WGI Control of Corruption index has long running data for Armenia.
The CPI index is compiled and published annually by Transparency International. Currently, CPI covers almost 200 countries, varying from year to year. The index is determined by expert assessments and opinion surveys\(^4\). CPI includes data from a minimum of three sources including World Economic Forum, PricewaterhouseCoopers, World Bank’s World Business Environment Survey, Freedom House, and The Economist Intelligence Unit (Lambsdorff 2006). All sources of CPI generally apply the definition of corruption as “misuse of public power for private benefit” (Lambsdorff 2006). CPI has faced considerable criticism with regard to biased samples, varying country coverage, unreliable sources, inconsistent methodology, vague and narrow definitions, and, most importantly, the allegation that CPI ranking does not reward genuine reformers and is “guilty” when being associated with aid conditionality\(^5\) (Galtung 2006).

World Government Indicators (WGI) employs six components, including a Control of Corruption (CC) indicator. The CC indicator is designed to measure misuse of public power for private gain, including small and large bribery, and the control of state functions by private and elite interests.\(^6\) This index, however, does not allow for year-to-year comparisons, as the index is equalized to a zero mean and reassessed on an annual basis. WGI has several sources of expert and survey data, including Business Enterprise Environment Survey, EBRD, Freedom House, TI Global Corruption Barometer, Political Risk Service International Country Risk Guide, and Global Integrity Index.

Business Environment and Enterprise Performance Survey (BEEPS) is a joint project of World Bank and the European Bank for Reconstruction and Development, launched in 1999. BEEPS is widely perceived as effectively measuring corruption from the private sector’s perspective on quality of governance. Analysis focuses on twenty countries in Eastern Europe and Central Asia. This initiative aims to fight corruption that inhibits business and investment flows (Urra 2007). BEEPS, in contrast to CPI and WGI, employs a common measurement technique (face-to-face interviews) for country comparisons, including questions on bribes and other like payments to public officials. In addition, BEEPS allows analysis for changes over time, and the examination of different types of corruption\(^7\): two facets that CPI and WGI lack. However, it is not published on yearly basis, and is primarily concerned with obstacles in the private sector.

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\(^4\)URL: http://www.transparency.org
\(^5\)A country score or rank can merely alternate because each year new countries enter and others drop out
\(^7\)URL:
There are also regional corruption measures that exist. In recent years, starting from 2008, the Caucasus Research Resource Center (CRRC) - Armenia, on behalf of USAID’s Mobilizing Action against Corruption (MAAC), has conducted household and enterprise surveys. The main technique is face-to-face interviews that involve questions in terms of respondents’ experience of corruption and their perception of corruption in Armenia (including judiciary, public officials, health care and education spheres). CRRC Corruption Perception surveys are relatively recent, which limits their effectiveness for analyzing historical data sets. The positive attribute of this approach is that it is primary source data, in contrast to the three aforementioned methods, which use secondary sources and other techniques to compile corruption measures.

2. Role of Aid in Combating Corruption

2.1. Brief Literature Review

A number of studies have recorded the negative impacts of corruption on economic growth (Abbott 1990; Shleifer and Vishny 1993; Bardhan 1997). Corruption redistributes resources from poor to rich, and distorts incentives in the society, encouraging public and private members to engage in rent-seeking rather than in productive activities (Abbott 1990; Shleifer and Vishny 1993). Conversely, some studies suggest that corruption may enhance efficiency when it is viewed as a Coasian bargaining game, where the highest bidder of bribes (generally a private company) receives a government contract and efficient allocation of resources is still maintained, because the bidder of largest bribe assumes to have the lowest costs. In addition, corruption in many developing countries also acts as some type of “speed money” to accelerate administrative procedures or avoid bureaucratic delays. In most cases of corruption, though, monetary resources are captured by individuals rather than directed to state budgets, as in case of taxation. Additionally, more resources are misused to keep corrupt activities in secrecy (Shleifer and Vishny 1993). In post-communist and transitioning economies, corruption is viewed as a major obstacle in forming democratic, open and free market economies (Shleifer 1997).

The goal of foreign aid is to fill in “financial gaps”, assist economic development, and positively impact economic growth (Easterly 2008). However, foreign aid is often misused by corrupt

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8 Foreign aid = Official development aid transfers, flows, grants and funds
governments for purposes of patronage and cronyism and individual rent-seeking (Cooksey 2002; Tavares 2003). Cooksey suggests that aid can combat corruption in recipient countries by supporting reforms toward good governance, the market economy, and civil society. Nevertheless, Cooksey also maintains, many aid agencies do not contribute to fighting corruption due to the lack of accountability and transparency in their anti-corruption policies. These same agencies exhibit an excessive degree of tolerance towards misuse of aid funds, which can be explained by the need for disbursing resources.

Multiple studies have been conducted to answer the question of whether more corrupt governments receive less aid (Alesina and Weder 1999; Dollar and Alesina 2000; Tavares 2003; De la Croix and Delavallade 2009). Alesina and Weder (1999) found no evidence that more corrupt governments receive less aid. Subsequently, Alesina and Dollar (2000) corroborated the theory that foreign aid flows do not directly depend on good government performance and, as evidence shows, aid-giving decisions are influenced by political and strategic motives rather than the quality of government performance in recipient countries. Tavares (2003) finds that foreign aid decreases corruption in two cases: first, when efficient and transparent institutions are a normal good (demand for it increases with higher income) and, second, there are no aid allocation biases (aid-giving for political and strategic purposes). This result does not necessarily indicate that more aid will result in lower corruption levels. Rather, it indicates the potential impact of aid when it’s allocated without any of the biases mentioned in Alesina and Dollar (2000) (Tavares, 2003).

De la Croix and Delavallade (2010) argue that donors allocate aid to countries with lowest productivity. According to the authors, higher corruption levels result in lower productivity. Hence, a positive correlation between corruption and aid is likely if the difference in productivity among developing countries is more important for aid allocation than the difference in quality of institutions, or level of corruption. In this case, giving more aid to corrupt governments can be optimal, as concluded in Croix and Delavallade (2010).

The following chapter introduces a new aid initiative that was developed to ensure accountability and transparency, support good governance, and control corruption. The primary goal is to promote economic development and poverty reduction in low-income and low-to-middle income countries.
2.2. New Foreign Aid Format: Millennium Challenge Account

There has been considerable criticism concerning foreign aid (Bauer 1976; Hancock 1994; Easterly 2001) since the outset of U.S. foreign aid in 1961, with John F. Kennedy’s proposal to create US Agency for International Development (Radelet 2003). Nevertheless, according to OECD Development Co-operation Directorate, in 2010, aid from countries of the Development Assistance Committee was at its highest level of 128 billion, an increase of 6.8% from 2009, 0.32% of the GNI. This percentage was higher than any other year since 1992, despite ongoing criticism towards aid and the recent financial crises in many developed economies.

Nonetheless, the practice of foreign aid as a lump sum of money – which accounts for more than 500 billion in international aid – continues to be criticized for its inability to reduce poverty and control corruption (Diamond 2008). Many studies have found that aid has no effect on growth, in some cases weakening it (Bauer 1976) by undermining incentives for savings and investment, enlarging the public sector, encouraging corruption, and perpetuating corrupt governance (Radelet and Levine 2008).

Proponents of foreign aid have argued that the criticism of foreign aid is exaggerated. A number of scholars find that foreign aid has actually helped poverty reduction and growth in certain countries (Stiglitz 2002; Stern 2002). Supporters of aid reason that shortcomings are tied more directly to donors than recipients, because aid is often allocated to achieve political objectives rather than solve development issues (Radelet and Levine 2008).

To address criticism on aid and to increase its effectiveness, a new foreign assistance program – Millennium Challenge Account – proposed by President George W. Bush in March 2002, was instituted by U.S. Government (Radelet and Levine 2008; Radelet 2003). The Millennium Challenge Account (MCA) is administered by a separate institution – Millennium Challenge Corporation – in order to reduce administrative costs and increase effectiveness (Radelet 2003).

MCA incorporates several key differences when compared to other international aid programs in terms of focused objectives, country selectivity, conditionality, a focus on good governance, greater recipient involvement, and lower bureaucratic costs (Radelet 2003; Radelet and Levine 2008). Also, MCA is designed to support only those objectives that directly relate to economic growth and poverty reduction, and it allocates funds only to low-income economies that “rule justly, invest in

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9http://www.oecd.org/document/35/0,3746,en_2649_34447_47515235_1_1_1_1,00.html
their people, and support economic freedom.” During the competitive selection process, eligible countries write proposals for activities, with only the most efficient and sustainable ideas receiving funding.

In terms of funds, MCA has accumulated five billion USD to be allocated among a small number of selected countries. To measure the “ruling justly” selection component, MCA uses World Governance Indicators (see Appendix) that includes six indicators, control of corruption (CC) being one of them. To be selected, countries must score above the median of the CC indicator within their respective group (Radelet 2003). Additionally, they must score above the median on several other indicators in order to be selected. Hence, the right allocation of funds, combined with effective monitoring and evaluation, will determine which beneficiaries are selected, and how capital is absorbed in recipient countries (Radelet 2003).

There are two types of MCA programs: Compact and threshold. Countries meeting selectivity requirements are chosen for a Compact program, a multi-year agreement between an eligible country and MCC. Threshold programs are executed in a shorter period to support policy and institutional reforms (within its three selectivity areas – ruling justly, investing in people, and economic freedom) in countries with potential Compact program eligibility.

As mentioned before, one of MCA’s primary activities and goals is fighting corruption, which is a key part of poverty reduction. In 2009, MCC came up with a “Policy for Preventing, Detecting and Remediating Fraud and Corruption in MCC Operations.” Countries adhere to MCC efforts by focusing on and strengthening anti-corruption laws, institutions, transparency in public policy-making, prosecution and investigation of corrupt practices, and risk assessment for corruption during project implementation.

Millennium Challenge Corporation also aims to create affirmative incentives for a change. MCA Compact is seen as “badge of honor,” sending positive signals to international community. Granting a second Compact to a country is contingent on the successful outcome of first Compact. If the first Compact resulted in continued good policy performance, and the potential exists for poverty

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10 More details can be found on [http://www.mcc.gov](http://www.mcc.gov)
11 In the list of numbers median separates higher half of observation numbers from its lower half. When arranging the numbers from lowest to highest, the median is the one in the middle. In case of an even amount of numbers, the two numbers in the middle are divided by two (Bulmer, 1967).
12 To learn more details on selection methodology, please, refer to [www.mca.gov](http://www.mca.gov) and Radelet (2003). Also see Appendix.
13 [http://www.mcc.gov/pages/program/type/threshold-program](http://www.mcc.gov/pages/program/type/threshold-program)
reduction and economic growth, then, considering availability of funds, a second Compact may be granted\textsuperscript{16}. To measure the progress of corruption controls in a recipient country, MCA uses the World Bank’s Control of Corruption (CC) index\textsuperscript{17}. MCC uses data from World Bank regarding GNI per capita and WGI indicators (including Control of Corruption) to generate country scorecards and form a basis for selectivity. One limitation of this methodology lies in the fact that World Bank data may not be current enough to adequately reflect the recent performance of a given country. For instance, the most recent data on a given country, as of 2011, dates from 2009. The scorecards that MCC develops for 2011 will reflect this same limitation, based on obsolete data sets. An additional issue lies in country data reporting dates. A country releases its data in the last month of the following year, the result being that countries, if judged by these indicators, will be assessed by performance measures from two years prior\textsuperscript{18}.

\textsuperscript{17}https://www.mcc.gov/pages/activities/activity/fighting-corruption
\textsuperscript{18}http://usoda.eads.usaidallnet.gov/data/detailed_data.html
2.2.1. Millennium Challenge Aid Incentive

Millennium Challenge Account initiative completes its first Compacts in the current year of 2011. The first tangible results and new data will be published by the end of the year. Hence, there is only limited number of research that studies MCA’s impact on country performance. A study carried out by Johnson and Zajonc (2006), in the initial phase of MCC funds disbursement, examines whether countries respond to MCC incentive (giving aid only to well-governed countries) by persuading sound polices in anticipation of MCC funds.

The authors estimate the MCC incentive effect by using difference-in-difference\(^{19}\) analysis before and after MCC was initiated. The study also discusses plausibility of MCC incentive and features a quote from the Armenian Foreign Minister, Vartan Oskanyan, that any lack of progress in governing democratically will have its cost, namely, $235 million (Johnson and Zajonc 2006). Data used in Johnson and Zajonc (2006) studies 102 countries (below lower-middle income level) on sixteen selection indicators of MCC in order to find whether there was a difference in reforms pre-MCC (2000-2002) and post-MCC (2002-2004) period. They use candidate countries as treatment group and non-candidate countries as control group, or comparison benchmark. The authors find that candidate countries pre-MCC have improved their indicators\(^{20}\) 25 percent more than non-candidate countries. However, post-MCC, according to their analysis (Johnson and Zajonc, 2006, Figure 3 in Appendix), a fraction of candidate countries improved their Control of Corruption indicator (in a two-year period), less than that of pre-MCC period. In conclusion, difference-in-difference estimates show improvement but are still negative (Johnson and Zajonc, 2006, Table 4 and 5 in Appendix).

In the end, Johnson and Zajonc (2006) found that countries do respond to MCC incentives by increasing the indicators measured by MCC. In regards to manipulation of indicators, the authors note that it is unlikely because of the methods used to measure the MCC indicators. In particular, for the five World Bank Governance Indicators, including control of corruption, Johnson and Zajonc (2006) mentioned that indicators are actually measuring perception rather than actual attributes. In order to corrupt data, a government must aim to change perceptions, or manipulate survey questions, rather than institute or enforce policy measures. The authors find this type of manipulation highly unlikely, because previous attempts of shifting perceptions among the populace have been

\(^{19}\) Difference-in-difference (DID) analysis measures a policy impact on treated object before and after its implementation.

\(^{20}\) These are the same indicators measured by MCC (see Appendix)
unsuccessful. Furthermore, the citizens of many developing countries demonstrate a tendency toward distrust of incumbent governments. Also, according to authors, it is difficult to manipulate survey designs, as indicators are compiled using weighted average of a number of surveys, each weighted survey being inversely proportional to estimate of its error variance. That is, without multilateral agreements to tamper with results, governments would find it “irritatingly frustrating” to manipulate weaknesses of surveys (Johnson and Zajonc 2006). Hence, the authors, with some caution, conclude that aid can create incentives for good governance when selection is contingent upon previous performance. However, due to time lag and lack of data, no evidence could be found that MCC had reduced poverty and increased growth in candidate countries.

The following chapter describes MCA Armenia Compact and provides historical data and information on relationship between Armenia and MCC.

### 2.2.2. Millennium Challenge Aid and Armenia

In 2006, Armenia became a MCA Compact country, signing a contract with MCC for five years. According to the agreement, MCC was to allocate 235 million USD to reduce rural poverty and increase economic performance of agricultural sector. At the time, Armenia was categorized as a low-income country and its Control of Corruption indicator was above the median among candidate countries. In general, to sustain flow of MCC funds each year, recipient countries must maintain a performance above the median on at least fifty percent of selected indicators, as well as for the Control of Corruption indicator. For each country a scorecard is issued each year, rating its performance relative to the median of the respective income group\(^\text{21}\).

MCC develops its scorecards on governance indicators, including, control of corruption, using WGI data, but it recalculates the figure by adjusting medians of the WGI Control of Corruption index to zero for low-income and lower-middle income countries (LMIC)\(^\text{22}\). Armenia began its Compact above the median Control of Corruption index of 0.31, calculated by MCC. In terms of WGI, Armenia’s Control of Corruption was \(-0.53\)\(^\text{23}\) at that time. Armenia’s per capita GNI nearly doubled from 2006 to 2008, though the CC index did not reflect any improvements during this period. Instead, in 2007 it decreased down to \(-0.66\) (WGI).


\(^{22}\) For details see [http://www.mcc.gov](http://www.mcc.gov) Fiscal year 2011 Data Notes PDF file

\(^{23}\) Best = 2.5 and worst = - 2.5, average mean set to 0
According to the latest record of 2009, it is currently -0.59 (WGI). Additionally, the plotted chart (Figure 1) shows that there is no explicit linear relationship between WGI Control of Corruption index and GNI per capita in Armenia\textsuperscript{24}. The relationship is polynomial, possibly with a number of independent variables influencing trends of control of corruption in Armenia.

According to MCC selection criteria, countries are classified as low-income if their GNI is less than or equal to $1,905, and as lower-middle income if their GNI is between $1,905 and $3,954. In 2005, before receiving MCC funds, Armenia’s GNI per capita was $1,470. In 2007, Armenia crossed the threshold and moved to lower-middle income category with GNI per capita of $2,580. However, according to the MCC website, in 2007, a year after receipt of an MCA Compact, Armenia was still classified as low-income country. For 2008, there was no scorecard for Armenia issued, and only in 2009, two years after the actual change, did MCC categorize Armenia as a lower-middle income country. A noteworthy fact to consider is that, when a country ascends to the lower-middle income category, the median for Control of Corruption index also tends to increase\textsuperscript{25}. In 2007, Armenia was competing with an incorrect designation of countries: the low-income group. There is the possibility that, if categorized as lower-middle income, Armenia might not have passed the median of Control of Corruption index among its peers (LMIC), which could have led to termination of the Compact. Moreover, in 2007, Armenia’s Control of Corruption index rate was the lowest since the commencement of MCC Compact at -0.66 (WGI). Hence, the very low Control of Corruption index and graduation to LMIC (which was not fixed in online scorecards) could have led to a different performance rating, perhaps an early or partial termination of aid to Armenia.

The problem that Armenia’s scorecard was not recorded in 2008 is most likely associated with the termination of MCC Armenia’s Compact, which was not linked to control of corruption, but due to a violation of democratic principles during the presidential election of 2008\textsuperscript{26}. As a result, in 2009, the MCC board decided to partially terminate Compact funding and not to resume the Road Rehabilitation project\textsuperscript{27}.

\textbf{Figure 1. WGI Control of Corruption and GNI per capita}

\textsuperscript{24}World Bank data
\textsuperscript{25}http://www.mcc.gov/pages/selection
\textsuperscript{26}http://1in.am/arm/armenia_politics_6181.html
\textsuperscript{27}http://www.mcc.gov/pages/countries/overview/armenia
According to the Program Officer of Millennium Challenge Compact Operations, Sonia Shahrigian: “Compact [in Armenia] total reflects funding for the Irrigated Agriculture Project ($152.7 million), Monitoring and Evaluation ($3.6 million), and Program Administration ($12.2 million), which total approximately $168.5 million, as well as approximately $8 million in Compact funds that paid for rural road designs/studies and 24.5 km of rehabilitation before the June 2009 MCC Board of Director’s meeting.” In sum it is $176.5 million, $47.03 million of which was transferred from 2007-2009, as is reported in the US Official Assistance Database. The initial Compact amount, $235 million, (about 4% of GDP in 2006) was intended to be transferred each year in portions. Due to partial termination of the Compact, only $8 million out of the planned $67.1 million was transferred for Rural Road rehabilitation project. As a result of poor democratic performance in 2008, Armenia gained a detrimental reputation among the international development community, and lost $59 million in funds designated to rehabilitate 175 km of rural roads. Currently, World Bank funds remain for 150km of the Rural Roads Rehabilitation project designed by MCC. In 2011, MCC will complete its Compact in September. MCC has not elected Armenia as eligible country to submit second Compact proposals. Judging from published scorecards, Armenia is below median on the Control of Corruption index among LMIC group, hence, according to MCC policy, a renewal of Compact is highly unlikely.

28 Excerpt from a personal electronic mail communication with MCC staff member
29 http://usoda.eads.usaidallnet.gov/query/do?_program=/eads/dac/recipientAidMatrix
31 http://www.mcc.gov/pages/countries/program/armenia-Compact
The following chapter attempts to identify the relationship between MCC aid and control of corruption in Armenia using difference-in-difference (DID) and regression analysis.

3. Correlation between Control of Corruption and Millennium Challenge Aid in Armenia

3.1. Difference-in-Difference Analysis

To analyze the relationship between MCA aid and control of corruption in Armenia, difference-in-difference (DID) analysis is carried out, using WGI’s Control of Corruption indicator from 1996 to 2009. The time period is broken into two frames: pre-MCC Compact and post-MCC Compact granting. From 1996 to 2002, the WGI Control of Corruption indicator was published biennially. Since then, it has been published annually. As of 2011, only data until 2009 is available from the World Bank Database.

Azerbaijan is the benchmark country for analysis, because it is in close proximity to Armenia, in the South Caucasus region, and it did not receive MCC aid, neither in contract nor threshold form. Though considered as a candidate country in the low-income and later the lower-middle income group, Azerbaijan seemed to show insufficient indicators to be eligible for MCC.

The figure (2) below presents graphical interpretation of DID analysis with Armenia as a treatment country and Azerbaijan as a control country.

Cursory DID analysis reveals the possible impact of the MCC Compact on control of corruption levels in Armenia. However, when conducting this type of analysis, we must also assume that control of corruption trends in Armenia and Azerbaijan would have been similar in the absence of the MCC Compact (the parallel dotted line reflects this assumption).

Figure 2. Difference-in-Difference Graph

33 http://www.mcc.gov
Figure 2 displays DID analysis graphically. Lower black line (over red) represents control of corruption trend for Azerbaijan. Upper black line (over blue) represents control of corruption trend for Armenia. These trends cover pre-MCC (1996-2005) and post-MCC (2006-2009) periods. The graph shows that in 1996 the difference between two counties before disbursement of MCC funds (pre-MCC difference) was larger than the difference after disbursement of MCC funds to Armenia. However, to get the real impact of the MCC we have to assume that control of corruption trend for Armenia would have been similar to that of Azerbaijan in absence of MCC Compact. The dotted black line parallel to Azerbaijan trend line represents this assumption. Therefore, to show the impact on graph pre-MCC difference is subtracted from post-MCC difference, and the remainder represents the possible impact of MCC Compact. On graph, we can see that the impact is negative because Armenia’s trend line, instead of going up or parallel to Azerbaijan trend line, descended, indicating that it was actually lower than Azerbaijan performance in relative terms.

This negative result does not indicate that changes should be assigned singularly to MCC impact. As shown in Figure 1, control of corruption possibly depends on many other independent variables as well.

However, to confirm the outcome in the previous graph, numerical analysis is also performed for Armenia and Azerbaijan, which is presented in Figure 3. First, average of Control of Corruption indicator over 1996 and 2005 (pre-MCC) and 2006 and 2009 (post-MCC) is calculated for Armenia and Azerbaijan. Afterwards, difference between countries is calculated subtracting average of Armenia from average of Azerbaijan for each broken down period (pre-MCC and post-MCC). Then
period averages are calculated individually for each country. Thereafter, we achieve DID estimate by subtracting differences:

DID equal: \(0.444 - 0.376 = (-0.068)\) as well as \((-0.1) - (-0.0315) = (-0.068)\)

\[0.444 = (-0.604) - (1.049); \quad 0.376 = (-0.704) - (-1.081);\]
\[(-0.1) = (-0.604) - (-0.704); \quad (-0.31) = (-1.049) - (-1.081)\]

In result, we get DID estimate negative 0.068. To demonstrate empirical change, in comparing to the initial difference between countries in pre-MCC period, the difference had shrunk by 15 percent \([(-0.068)/0.444*100])\).

However, this may not represent a pure MCC impact due to the assumptions made and the possibility of unknown variables. In order to drop the assumption of parallelism, a regression analysis is required.

**Figure 3. Difference-in-Difference Calculation**

<table>
<thead>
<tr>
<th></th>
<th>Change in Control of Corruption</th>
<th>Difference between periods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Armenia</td>
<td>-0.604</td>
<td>-0.704</td>
</tr>
<tr>
<td>Azerbaijan</td>
<td>-1.049</td>
<td>-1.081</td>
</tr>
<tr>
<td>Difference</td>
<td>0.444</td>
<td>0.376</td>
</tr>
</tbody>
</table>
3.2. Regression Analysis

In the regression model designed below, control of corruption is the dependent variable and dummies\textsuperscript{35} for countries (Armenia and Azerbaijan) and periods are independent variables. That is, the null hypothesis in the model tests the impact of MCC incentive, time trends, and actual MCC Compact on control of corruption in Armenia. The regression model eliminates the assumption of parallelism and opts to identify any causality impact of MCC on control of corruption in Armenia. The regression equation is as follows:

\[ C_{1,t} = \alpha + \beta mca_i + \gamma \text{Period}_t + \delta mca_i \times \text{Period}_t + \varepsilon_{i,t}, \]

where

- \( C_{1,t} \) is Control of Corruption index in period t for country i
- \( mca_i \) is a dummy variable =1 if country received; MCA, \( = 0 \), if no MCA is received
- \( \text{Period}_t \) – is a dummy, if 1996-2005 \( =0 \), if 2006-2009 \( =1 \)
- \( mca_i \times \text{Period}_t \) - is the interaction term: product of two dummy variables \( =1 \), in period 2006-2009.

This is the actual treatment variable (DID estimate).

\( \varepsilon_{i,t} \) - is the error term with variance \( \sigma^2 \)

\( \alpha, \beta, \gamma \) and \( \delta \) regression parameters to be estimated

The hypothesis tested is \( \beta=0, \gamma=0 \) and/or \( \delta=0 \). That is, there is no relationship between control of corruption and MCC, MCC Compact, and time trends in Armenia. To determine this, it is necessary to conduct regression with Ordinary Least Squares (OLS) and assume that random variables are homoscedastic (constant variance), which is a property of OLS\textsuperscript{36}.

When running OLS regression, the results appear to be same as in simple difference-in-difference analysis (Figure 4).

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\textsuperscript{35} In regression analysis and econometrics a dummy variable is made-up variable that takes the value unity when the phenomenon it denotes occurs and zero otherwise (Kennedy 2008).

\textsuperscript{36} Homoscedasticity can be checked with Breutsch-Pagan test, if necessary.
<table>
<thead>
<tr>
<th></th>
<th>Coefficients</th>
<th>Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
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<td>(0.026756)</td>
</tr>
<tr>
<td>MCA</td>
<td>0.444756325</td>
<td>(0.037839)</td>
</tr>
<tr>
<td>Per</td>
<td>-0.03152266</td>
<td>(0.044371)</td>
</tr>
<tr>
<td>MCA*Per</td>
<td>-0.068501734</td>
<td>(0.062749)</td>
</tr>
<tr>
<td>R Square</td>
<td>0.917068289</td>
<td></td>
</tr>
<tr>
<td>Adjusted R</td>
<td></td>
<td>0.903246337</td>
</tr>
<tr>
<td>Standard Error</td>
<td></td>
<td>0.070790831</td>
</tr>
<tr>
<td>Observations</td>
<td></td>
<td>22</td>
</tr>
</tbody>
</table>

That is, \( C_{i,t} = -1.04 + 0.44MCA_i - 0.03PER_i - 0.068MCA*PER_i \)

Significance of F test is less than 0.05 for a 95% significance level, hence we reject null hypothesis. That is, there seems to be a relationship between Control of Corruption and independent (dummy variables). In order to find out which variables have a significant effect on the control of corruption level, it is necessary to check the significance of each dummy variable independently. An examination of probability values (P-values) demonstrates that only the model for MCA is significant and it is positive. The other two dummies are negative and insignificant (see Appendix for Regression Output).

Therefore, the results are in coherence with the Johnson and Zajonc (2006) findings. That is, MCA-incentive has positive impact on improving control of corruption in eligible countries – positive and significant for the MCA dummy. However, during MCA Compact years the impact is not significant. Hence, in anticipation of MCC, Armenia seemed to improve its indicator, though, during the MCC Compact period, Armenia has actually relaxed its control of corruption.

Thus, either Armenia relaxed its corruption control measures during the MCC Compact, or there were changes implemented in measurement methods that happen to determine corruption more effectively. For further analysis, additional variables can be added to determine other factors that have reasonable impact on control of corruption in Armenia, which is the beyond scope of this paper.
Conclusions

More than four decades, developing countries have been receiving financial assistance to overcome poverty and experience economic growth. Nevertheless, countries receiving aid money remain poor and display no indicators of substantial economic growth. Financial aid flows seem not to meet their target and benefit recipients in many developing countries because of corruption issues. Many corrupt governments and non-governmental organizations misuse entrusted power. Instead of implementing poverty reduction and growth-promoting projects, and allocating aid resources in a transparent and just manner, they frequently misappropriate these resources.

This criticism does not relate only to recipient governments, but extends to aid distributors and international aid agencies. International scholarship criticizes the governing bodies of developed countries and international donor organizations, among others, for lack of accountability and performance-based measures in their decisions regarding aid distribution.

Corruption is a substantial obstacle for economic growth and poverty reduction. The problem of corruption becomes more detrimental when the impoverished are discriminated against through graft and systemic violation of democratic values by governing bodies. When a developing country finds itself the recipient of capital with no strings attached, it is a near certainty that corrupt government and institutions will misuse this money for private gain and exploit all possible opportunities for corruption. Aid money is a ripe territory for corruption when it is not based on selectivity, accountability, and performance-based measures.

Thus, in response to criticism of international aid, the United States State Department instituted the Millennium Challenge Aid account, administered by Millennium Challenge Corporation. The program, released in 2002, initiated its Compacts in 2006. Armenia was among the first eligible and selected countries to implement an MCC Compact. MCA seemed to address each missing point of productive aid disbursement such as: selectivity, accountability, and performance. MCC has developed its selectivity measures along the Control of Corruption index in recipient countries.

This paper analyzed the correlation between Millennium Challenge aid and control of corruption in Armenia, and which aspects of MCA have more influence in controlling corruption in Armenia. Application of difference-in-difference analysis and regression analysis show that there is a significant relationship between MCC and control of corruption in Armenia. However, this
relationship seems to relate only to MCC incentive, rather than to the MCC Compact in Armenia. That is, confirming results of Johnson and Zajonc (2006), the expectation of receiving a MCA funds (MCC incentive) positively influenced control of corruption in Armenia, but MCC Compact itself had no significant impact on control of corruption in Armenia.

One possible weakness of this paper could be attributed to WGI index of Control of Corruption used in the analysis, properties of which do not allow for year-to-year comparison and reevaluation. The sources and measurement techniques that are used to compile CC index might change from year to year. However, an alternative index does not seem to be available at the moment, one that covers long periods, including for Armenia, and allows for annual reassessment. In future, when such suitable measure develops, a similar analysis can be carried out again. Also, for more comprehensive insight, further research can be conducted to include additional independent variables in the regression model, such as democracy, freedom of speech and press, readiness towards reforms, and cultural values.

**Policy Suggestions**

Results of the regression analysis show that MCC incentive (anticipation of funds) has more impact on control of corruption than the actual receipt of funds. In order to ensure a recipient country’s commitment in controlling corruption pre- and post-MCC, it is important to administer and control the MCC incentive at all the times. For instance, the MCC Compact period could be reduced in duration from five years to one year, with an annual renewal clause. Additionally, an annual reevaluation of projects could be conducted, accounting for improvements in a country’s control of corruption performance. If a recipient country’s control of corruption indicator falls below its previous level, punitive measures could be implemented, including MCC suspension or termination of funds. Thus, existing recipient countries could be evaluated on stricter reassessment basis. Rather than measuring the control of corruption indicator against the designated income group, it could be assessed relative to its previous performance.

Other foreign aid programs can likewise improve their aid-giving policies by establishing more stringent prerequisites for beneficiaries. Recipient countries could be encouraged to compete for aid disbursement and annual renewal of grant funds, if it is determined that they have reached a certain threshold of required indicators, sustained it, and improved those indicators over time. Prerequisites could relate to progress in corruption controls, freedom of speech, political liberty, fiscal policy,
economic freedom, investment in health, education, and infrastructure, among other benchmarks. Ensuring accountability, competition, and transparency is critical for such aid disbursement policies. To monitor these factors, donor organizations could establish committees, independent of the organization itself, to assess a country’s actual performance on required criteria and approve further aid disbursement. Additionally, each contract could include an exit plan, developed before disbursement of funds, to gradually reduce funding every year, allowing the recipient country to become independent from aid and continue its growth without foreign aid funds.
## Appendix

Table 1. Summary Output of Regression Analysis

### SUMMARY OUTPUT

<table>
<thead>
<tr>
<th>Regression Statistics</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Multiple R</td>
<td>0.957636825</td>
</tr>
<tr>
<td>R Square</td>
<td>0.917068289</td>
</tr>
<tr>
<td>Adjusted R Square</td>
<td>0.903246337</td>
</tr>
<tr>
<td>Standard Error</td>
<td>0.070790831</td>
</tr>
<tr>
<td>Observations</td>
<td>22</td>
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</tbody>
</table>

### ANOVA

<table>
<thead>
<tr>
<th></th>
<th>Df</th>
<th>SS</th>
<th>MS</th>
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<th>Significance</th>
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<tr>
<td>Regression</td>
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<tr>
<td>Residual</td>
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<td>Total</td>
<td>21</td>
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### Coefficients

<table>
<thead>
<tr>
<th></th>
<th>Coefficients</th>
<th>Standard Error</th>
<th>t Stat</th>
<th>P-value</th>
<th>Lower 95%</th>
<th>Upper 95%</th>
<th>Lower 95.0%</th>
<th>Upper 95.0%</th>
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<tbody>
<tr>
<td>Intercept</td>
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<td>MCA</td>
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<tr>
<td>Per</td>
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<td>MCA*Per</td>
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<td>-0.2003333</td>
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<td>-0.200333258</td>
<td>0.06332979</td>
</tr>
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</table>
Table 2. Selectivity Indicators of Millennium Challenge Account

MCA selects eligible countries based on the following indicators:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Control of Corruption</td>
<td>Inflation</td>
<td>Public Expenditure on Health</td>
</tr>
<tr>
<td>Political Rights</td>
<td>Fiscal policy</td>
<td>Public Expenditure on Primary Education</td>
</tr>
<tr>
<td>Voice and Accountability</td>
<td>Business start-up</td>
<td>Immunization Rates</td>
</tr>
<tr>
<td>Government Effectiveness</td>
<td>Trade Policy</td>
<td>Girls’ Primary Education Completion</td>
</tr>
<tr>
<td>Civil Liberties</td>
<td>Regulatory Quality</td>
<td>Natural Resource Management</td>
</tr>
<tr>
<td>Rule of Law</td>
<td>Land Rights and Access</td>
<td></td>
</tr>
</tbody>
</table>


According to World Bank Governance Indicators publication on methodology of WGI, “control of corruption captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as ‘capture’ of the state by elites and private interests.” Refer to the following URL for sources of corruption and measured concepts: http://info.worldbank.org/governance/wgi/pdf/cc.pdf
Table 3. Calculation of Net ODA as percentage of GDP

<table>
<thead>
<tr>
<th>Year</th>
<th>Net official development assistance and official aid received (current US$)</th>
<th>GDP (current US$)</th>
<th>Net ODA as % of GDP</th>
<th>Average Net ODA/GDP, %, per year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>2256838858</td>
<td>8.4039269</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1991</td>
<td>2720000</td>
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<td>22460000</td>
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</table>

8.4 = Sum of Net ODA as % of GDP (3rd column) / num

Number of years (1st column)
Bibliography


