



UNITED NATIONS
UNIVERSITY

UNU-MERIT

Working Paper Series

#2016-035

Millennium Development Goals (MDGs):

Did they change social reality?

**Janyl Moldaliev, Arip Muttaqien, Choolwe Muzyamba, Davina Osei, Eli
Stoykova and Nga Le Thi Quynh**

Maastricht Economic and social Research institute on Innovation and Technology (UNU-MERIT)

email: info@merit.unu.edu | website: <http://www.merit.unu.edu>

Maastricht Graduate School of Governance (MGSoG)

email: info-governance@maastrichtuniversity.nl | website: <http://www.maastrichtuniversity.nl/governance>

Boschstraat 24, 6211 AX Maastricht, The Netherlands

Tel: (31) (43) 388 44 00

UNU-MERIT Working Papers

ISSN 1871-9872

**Maastricht Economic and social Research Institute on Innovation and Technology
UNU-MERIT**

**Maastricht Graduate School of Governance
MGSoG**

UNU-MERIT Working Papers intend to disseminate preliminary results of research carried out at UNU-MERIT and MGSoG to stimulate discussion on the issues raised.



MILLENNIUM DEVELOPMENT GOALS: DID THEY CHANGE SOCIAL REALITY?

Abstract

The aim of the paper is to investigate whether the Millennium Development Goals (MDGs) changed social realities of people around the world or not. By answering this question, we contribute to the longstanding debate on whether social improvement in the lives of people is MDG-precipitated or it is incidental to the introduction of MDGs. We make use of interrupted time series analysis and show that although there has been improvement in social realities of people around the world between 1990 and 2013, the two dominant opposing views on the role of MDGs in this process are uncandid. Although the genesis of the improvement was in the early 1990s (before the introduction of MDGs), there is no way of stating without question that the improvement in social realities would have been sustained after 2001 in the absence of MDGs. We conclude that given the above, the question should not be “whether the MDGs have improved social realities or not”. Instead, we recommend that in order to effectively assess the usefulness of the MDGs, one needs to conduct a tedious and complex task of “tracing-the-change” by following through the chain of policy changes triggered by the MDGs.

Keywords: Millennium Development Goals, impact, social realities, Interrupted Time Series Analysis, Sub-Saharan Africa

JEL Classification: A13, I14, I24

Millennium Development Goals: Did They Change Social Reality?

TABLE OF CONTENTS

1. BACKGROUND	7
2. METHODOLOGY	10
2.1. SAMPLE SELECTION.....	10
2.2. DATA SELECTION	10
2.3. ESTIMATION TECHNIQUE	11
3. RESULTS.....	13
3.1. RESULTS ON POVERTY REDUCTION	15
3.2. RESULTS ON BASIC EDUCATION	16
3.3. RESULTS ON CHILD AND MATERNAL HEALTH.	18
4. DISCUSSION	19
5. CONCLUSION	21
APPENDIX	25

1. BACKGROUND

The recent United Nations Sustainable Development Summit in September 2015 marked the deadline set for achieving the Millennium Development Goals (MDGs). The central point in the summit's agenda was the adoption of new goals and targets for global development for the next fifteen years (i.e. the Sustainable Development Goals or SDGs), which brought to the fore an important question: *Did the MDGs improve the social standards of people around the world?*

Hulme (2007) defines the MDGs as a phenomenon in which “human development meets results-based management”. Put simply, the MDGs can be defined as a mechanism representing integrated efforts to achieve progress on a range of social and economic indicators around the world (Hulme, 2007). They are made up of a set of eight goals and corresponding indicators. The MDGs can therefore be seen as a set of indicators to measure progress on improvement in social and economic conditions of people globally (Sahn & Stifel, 2003).

However, while tracing their origin, Hulme (2009) contends that MDGs epitomise a western socially constructed norm of “poverty-reduction” which went on to become the “new international norm”. MDGs have come to embody what Hulme (2009) calls the “moral and ethical” duty for the international community to tackle poverty in all its forms. The MDGs can therefore be viewed from two angles: as an international norm to mobilise development aid and as a standard of measure for assessing progress towards ameliorating poverty in the world (Hulme, 2009). Although the history of the MDGs can be traced back to different political events, ideologies, UN conventions, the International Development Goals (IDGs), the “We the Peoples” report etc., they were however only officially launched in September of 2000 at the Millennium Summit and only managed to reach a consensus on resource mobilisation in 2002 (Hulme, 2007).

Researchers are divided on whether the MDGs have improved the social standards of people around the world or not (Fukuda-Parr et al., 2013). The disagreement is not least whether there has been or not been improvement in social conditions around the world; common consent exists among researchers that indeed social conditions such as health, education and poverty have on average been improving over the last 25 years (Melamed & Samman, 2013). The schism however is centred on whether this improvement in the social conditions between 1990 and 2015 can be attributed to the MDGs (Fukuda-Parr, 2010; Friedman, 2013).

Millennium Development Goals: Did They Change Social Reality?

Friedman (2013), one of the strongest sceptics of the “MDG-precipitated-success” narrative postulates that there is no basis for drawing a causal link between improved social conditions in the world and the MDGs. He argues that apart from the MDG indicator 8D on debt service, which showed significant improvement after 2001, all the other indicators were already on an improving trend long before the establishment of MDGs (Friedman, 2013). Empirical evidence elucidates the fact that improving social conditions of people around the world was antecedent to the establishment of the MDGs (Friedman, 2013). Therefore, the claim that MDGs have improved social conditions in the world is disingenuous as it is not consistent with empirical affirmation (Friedman, 2013). This argument is qualified by other studies which delineate that social indicators (such as life expectancy, infant mortality, education attainment etc.) have been on a consistent upward trend since the 19th century (McKeown, 1976). The upward trend has long been necessitated by improved technology, economic development, nutrition etc. (Preston, 1975). The negative fluctuations have mainly been due to shocks such as wars, economic crises and natural disasters, without which the trend is predicted to continue until it reaches optimum (Caldwell, 1986; Preston, 1975). This therefore makes it difficult to attribute periodically consistent trends to the newly established MDGs (McKeown, 1976).

On the other hand, there are scholars who hypothesise that the recent social improvement in the world is MDG-precipitated (Fukuda-Parr, et al., 2013; Manning, 2009). Although they are cognisant of the fact that direct development impact of the MDGs is difficult to prove, they however posit that discounting their impact on social improvement in the world is at best unfair (Melamed & Samman, 2013). For example, Kenny and Sumner (2011) argue that MDGs have played a huge role in increasing the quantity of aid from US\$72 billion before the year 2000 to over US\$128 billion in 2009 (although when measured as a percentage of the donor-countries’ GDP there seems to be no significant change). This increase in Official Development Assistance (ODA) is central to the improvement in social indicators especially in Sub-Saharan African countries, which have been the largest beneficiaries of the ODA (Kenny & Sumner, 2011; Clemens, et al., 2004).

Further, Manning (2009) insinuates in his study that there is some evidence that shows faster progress towards improved quality of life, especially in the developing world after 2000; a fact which explicates the significant role played by the MDGs on improved

social indicators around the world. Melamed (2012), on the other hand, emphasises that the lack of a counterfactual to prove the impact of the MDGs is not a good-enough excuse to discount their impact on improved quality of life given that there is concrete evidence showing increased political and financial commitment towards social aspects of development after 2000. Fukunda-Parr (2010) also points out that there is no basis for discounting the role of MDGs on improved quality of life because the MDGs have been integrated and implemented selectively and differently in different countries; thereby giving rise to different channels of achieving positive social indicators. The findings of Fukunda-Parr (2010) and other scholars point to the fact that the lack of a counterfactual and the complex nature of the MDGs make it difficult to discount their impact on improved social indicators around the world. It is thus uncandid for anyone to concretely make a claim of whether the MDGs have had or have not had an impact on improved social indicators. Therefore, the burden of proof on the impact of MDGs or lack thereof does not only lie on the champions of MDGs, but also on the sceptics (who are yet to provide concrete evidence for their claims).

The foregoing two conflicting explanations on the role of MDGs on improved social realities in the world attest to the fact that there is still lack of consensus on whether the MDGs have improved social realities or not. We therefore aim to contribute to this extant literature which comes to a conflicting conclusion on the role of MDGs on improved social realities of people around the world. Specifically, in an attempt to shed light on the existing debate this study will utilise a quantitative methodology to analyse and compare the trends in development progress in two distinct periods - prior to and after the adoption of the MDGs.

2. METHODOLOGY

2.1. Sample Selection

In order to answer the question of whether the MDGs have changed the social realities of people around the world or not, Sub-Saharan Africa (SSA) was chosen as the representative region of the less developed economies.¹ In the 1990s, this region constituted the highest share of population living under extreme poverty (below \$1 a day) (Chen and Ravallion, 2004). Moreover, in 1990 Sub-Saharan Africa lagged behind in other socioeconomic indicators such as health and education. We therefore expect any significant impacts of social change to be observable in such a region that had been lagging behind in very crucial aspects of human development. Concomitantly, by choosing SSA, contributions of MDG to social change are likely to be captured more easily.

2.2. Data Selection

From a multidimensional perspective of poverty, basic needs such as food, clothing, shelter, health and education are essential for human development, without which, improvement in social realities is but an illusion. Guided by Sen's (1974) capability approach on poverty, we conceptualise "improvement in social realities" as improvement in the following categories: *poverty reduction, basic education, child and maternal health and gender equality*. The foregoing categories are succinctly captured by four of the millennium development goals: I. Eradicate Extreme Poverty and Hunger; II. Achieve Universal Primary Education by 2015; IV. Reduce Child Mortality; V. Improve Maternal Health. Corresponding to these goals, the indicators selected for the purposes of our analysis are thus the following: a) poverty headcount ratio, b) poverty gap ratio, c) net primary school enrolment ratio, d) persistence in primary education, e) under five mortality rate, and f) maternal mortality rate. By evaluating the impact of these four goals, we directly assess human development in varying yet crucial

¹ We do not include countries that are termed as "high income" according to World Bank classifications

dimensions of socio-economic development..(See Table A.1 in the appendix for detailed explanation on ensuing targets and indicators and how the indicators are calculated). All data used in our analysis were sourced from the World Bank Development Indicators Databank (WBDID).

2.3. Estimation Technique

Due to the fact that there exists no counterfactual, the task of assessing the impact of the MDGs on social realities in the world possesses a methodological challenge. The MDGs are a global program and as such, it is difficult to observe or construct a counterfactual. Owing to this major limitation, we concentrate on analysing the trends of selected indicators before and after the introduction of the MDGs. In order to estimate whether a positive change in social realities occurred after the introduction of the MDGs, we employ *interrupted time series analysis* and estimate behavioural changes in the selected MDG indicators after the introduction of MDGs. A dummy variable indicating the period after the introduction of the MDGs is generated to capture an interruption in the trend. Since the MDG framework was introduced in September 2001, we set the interruption point between 2001 and 2002.

A multi-stage analysis was conducted to identify the best-fit model. After testing several specifications by using the Bayesian Information Criterion² (BIC) as a measurement of goodness-of-fit, an ARIMAX model with interrupted time series was selected as the ultimate estimation model for this analysis.³

The final model takes the form:

$$D.y_t = \alpha_0 + mdg_t + t + t^*mdg_t + D.GDPpc_t + D.military_t + D.y_{t-1} + \epsilon_t + \epsilon_{t-1} \quad (1)$$

Where

- y_t is the selected MDG indicator at time t .
- mdg_t is a dummy variable marking the introduction of the MDG framework.
 $mdg_t = 1$ after the introduction of the MDGs (from 2002 to 2013);
 $mdg_t = 0$, from 1993 to 2001.

² See Wooldridge (2009) for explanation of model selection criteria.

³ For more information on the models tested, please see Table A.2 in the appendix.

Millennium Development Goals: Did They Change Social Reality?

t is a time variable taking the values in the interval [1, 24] in the corresponding time period [1990, 2013].

$t * mdg_i$ is an interaction term between the dummy variable mdg_i and the time variable. This variable allows us to see a change in the slope after the interrupted point in time.

$t * mdg_i = 0$ if year < 2002 (interrupted year).

$GDPpc_t$ is GDP per capita of the region (weighted) in time t .

$military_t$ is military expenditure of the region (weighted) in time t .

ε_t and ε_{t-1} are error terms in year t and year $t-1$.

$D.$ denotes differencing of the variable, i.e. the difference/change in the value between year t and year $t-1$:

$$D.y_t = y_t - y_{t-1}$$

$$D.GDPpc_t = GDPpc_t - GDPpc_{t-1}$$

$$D.military_t = military_t - military_{t-1}$$

Due to the non-stationary nature of the dependent variables, in the final model we use as dependent variables $D.y_t$ (the change in the rate from year $t-1$ to year t , called *differencing*) instead of y_t (the value in the particular year). The dependent variable denoted $D.poverty\ headcount$, for example, in year t takes the value of the difference between the poverty rate in year t and the poverty rate in year $t-1$.

Two control variables, *GDP per capita* and *military expenditure* are included in the final estimation.⁴ GDP per capita captures the effects of economic development on social outcomes and therefore serves as a good control variable. Additionally, military expenditure is a useful control for the SSA region where conflicts often disrupt developmental efforts. Military expenditure also captures the proportion of a country's income that is allocated to non-developmental projects and therefore gives a good indication of government priorities which are likely to influence the implementation of

⁴ Four control variables, *GDP per capita*, *military expenditure*, *ODI* and *FDI* were included in the initial estimations, based on data availability and the relevance of the variables to changes in social realities. However, following significance tests of the various controls in the different models (F-tests in this case) only GDP per capita and military expenditure were kept in the final regressions.

MDGs-oriented policies. These two controls are differenced once⁵ to account for the effect of non-stationarity.

The specified model then allows us to estimate whether there was a change in the social realities after the year of the introduction of the MDGs. However, it is important to note that this model cannot serve as a basis for attribution of any ensuing change following the adoption of the MDGs.

3. RESULTS

Table 1 below displays the results of the ARIMAX model applied to the six selected MDG indicators: *poverty headcount ratio*, *poverty gap ratio*, *net primary school enrolment ratio*, *persistence in primary education*, *under five mortality rate*, and *maternal mortality rate*. The dependent variables in models (1) to (6) are the annual changes in the rates of the indicators in percentage points (see above section for explanation of differencing). Our explanatory variables of interest are time (*time*), a dummy variable indicating the period after the MDGs introduction (*MDGs*), and the interaction between time and MDGs (*time*MDGs*). The effect of time indicates the development of the trend before the introduction of the MDGs, whereas the combined effect of time, MDGs and time*MDGs shows the development of the trend after 2001. Differencing of military expenditure (*D.military*) and differencing of GDP per capita (*D.GDPpc*) serve as control variables.

Given the general of improvement in most development indicators, we would expect the explanatory variables of interest (*time*, *MDGs* and *time*MDGs*) to have a negative sign when looking at poverty headcount, poverty gap, child mortality and maternal mortality as improvement in these areas would suggest reduction in the rates. Similarly, in the case of net enrolment rates and net persistency in education we would expect positive signs to signify an improvement. Table 1 shows that all variables of interest (*time*, *MDGs* and *time*MDGs*) are highly significant in all regressions with the exception of regression (4). The significance and negative sign of the time variable coefficients in regressions (1), (2), (5), and (6) and the positive and significant coefficient in regression (3) indicate that there is indeed a desirable acceleration of the trend until

⁵ The term of differencing, in this case term=1, is specified using graphic illustrations in stata13

2002. However, after the introduction of the MDGs, the combined effect of the MDGs dummy and the interaction term has the opposite sign; a fact which indicates a slow-down in progress. Regarding the control variables, *D.GDPpc* is negative and significant in regressions (1) and (2), which reflects a positive relationship between GDP growth and the acceleration in monetary poverty reduction. More detailed results follow immediately after table 1 below.

Table 1. Regression Results

Independent variables	Dependent Variables					
	(1) <i>D.poverty headcount</i>	(2) <i>D.poverty gap</i>	(3) <i>D.net enrolment</i>	(4) <i>D.net persistency</i>	(5) <i>D.under 5 mortality</i>	(6) <i>D.maternal mortality</i>
<i>time</i>	-0.1694** (0.0316)	-0.1026** (0.0264)	0.1143 (0.0816)	0.3581* (0.1586)	-0.3629** (0.0900)	-1.5111** (0.2553)
<i>MDGs</i>	-1.8620** (0.5670)	-1.2432* (0.5527)	5.4897** (1.6892)	-0.4112 (1.9422)	-0.7645** (1.1577)	-44.471** (4.6275)
<i>time * MDGs</i>	0.1772** (0.0349)	0.1212** (0.0313)	-0.3413** (0.1060)	-0.2435* (0.1188)	0.5300** (0.1154)	2.9367** (0.3093)
<i>D.military</i>	0.7352 (0.5519)	0.5625 (0.4640)	0.5539 (0.9588)	1.9321 (2.1220)	-0.1184 (0.3887)	-0.2182 (4.4871)
<i>D.GDPpc</i>	-0.0063** (0.0023)	-0.0043* (0.0021)	0.0014 (0.0056)	-0.0045 (0.0062)	-0.0010 (0.0037)	-0.00004 (0.0155)
<i>Constant</i>	1.2508** (0.2737)	0.7048** (0.2216)	-0.0041 (0.6992)	-1.6987 (1.2851)	-0.1506 (0.5260)	-6.3368** (2.3147)
<i>AR.(L1)</i>	0.1241 (0.4188)	0.2716 (0.4426)	0.1143 (0.3355)	0.0006 (0.2629)	0.3180 (0.5936)	0.1151 (0.3851)
<i>MA.(L1)</i>	-1.0000 (5882.7)	-1.0000	-1.0000	-1.0000	0.2664 (0.6925)	-1.0000

*Note: Estimated coefficient and standard error (bracket), ** significant at 1%, * significant at 5%, + significant at 10%.*

Detailed Results

3.1. Results on Poverty reduction

With respect to poverty reduction, we look at two indicators, namely poverty headcount ratio and poverty gap ratio; which are graphically represented below.

Figure 1. The Fitted Model (A) and Difference in Poverty Headcount (B)

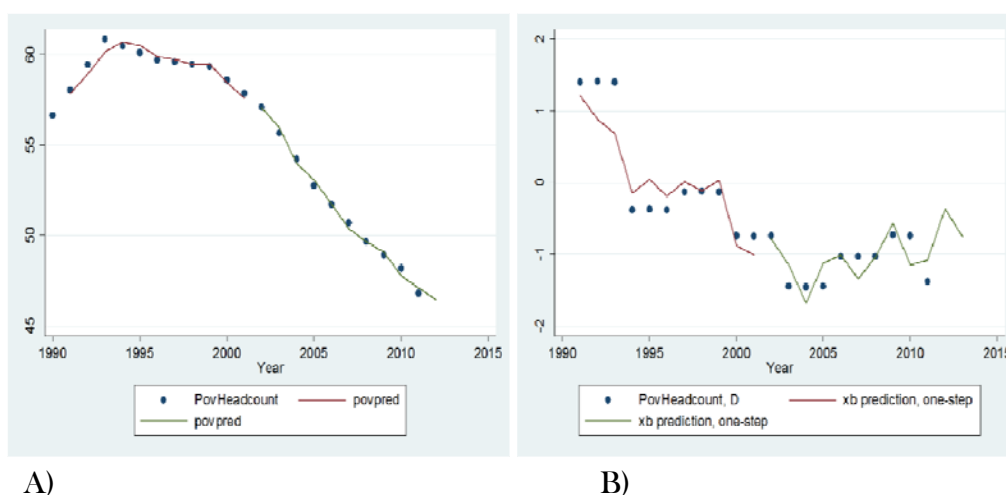
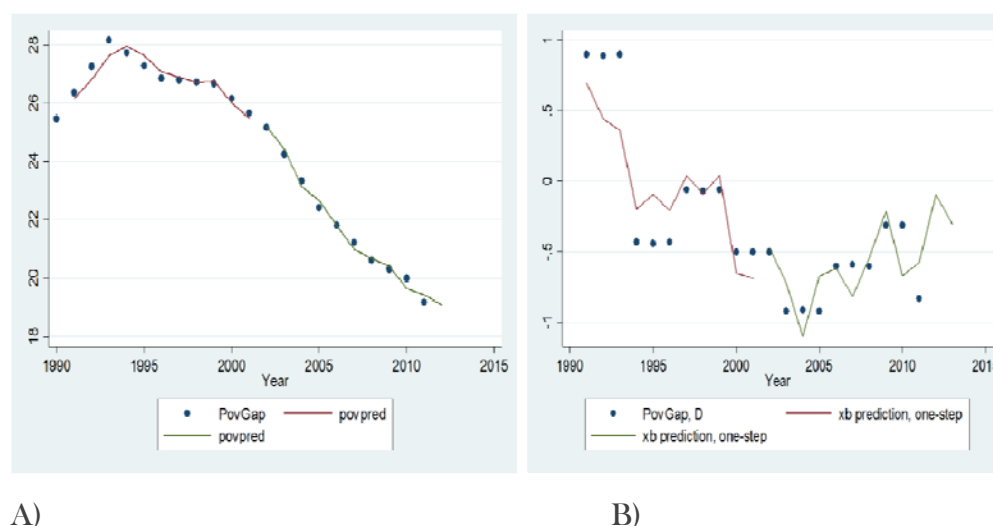


Figure 2. The Fitted Model (A) and Difference in Poverty Gap (B)



The model estimations for these two indicators are presented in regressions (1) and (2) in Table 1 above. For illustrative interpretation of these regressions, please see Figure 1 and Figure 2 above.

Figure 1.A demonstrates that although there was on average an improvement in poverty headcount ratio between 1990 and 2013, the improvement started around 1993, picking up at higher speed until around 2005 at which point the improvement in

Millennium Development Goals: Did They Change Social Reality?

poverty headcount ratio begins to decelerate. The trend is similar for the poverty gap which although improved on average between 1990 and 2013, the improvement is much faster and more significant after 2001.

All variables of interest, *time*, *MDGs*, and *time*MDGs*, are significant with respect to the change in poverty headcount and poverty gap (see Table 1, regression 1 and 2). The effect of time on the change in poverty is negative, which indicates that before the introduction of the MDGs, the reduction in poverty was accelerating (note, however, that there was an increase in poverty in the beginning of the period). By and large, the combined effect of the MDGs dummy (negative) and the interaction term *time*MDGs* (positive) is positive, pointing to a slow-down in poverty reduction after 2002. In sum, based on these trends, we can conclude that indeed there was improvement in poverty levels overall between 1990 and 2013. The improvement however starts around 1993 (before the MDGs) at high speed before decelerating (although still improving) after the introduction of MDGs.

3.2. Results on Basic Education

For Basic Education, we look at the following indicators: Net Enrolment Ratio and Persistence to Last Grade represented graphically below.

Figure 3. The Fitted Model (A) and Difference in Net Enrolment Ratio (B)

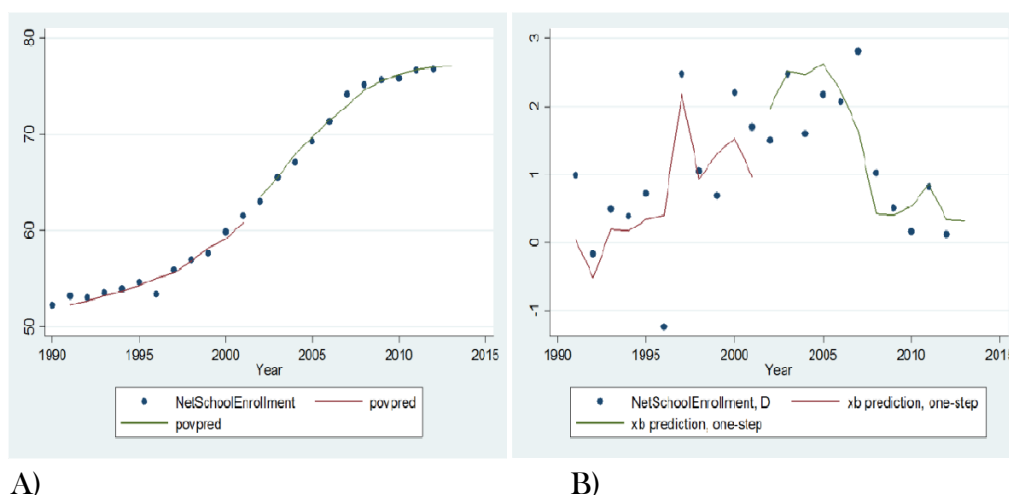
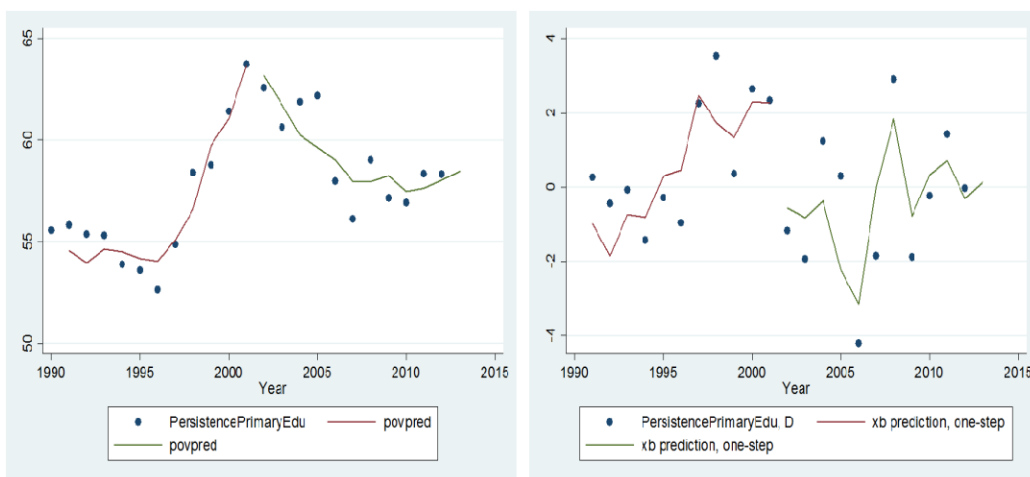


Figure 4. The Fitted Model (A) and Difference in Persistence to Last Grade (B)



A)

B)

Starting with **Net Enrolment** represented in the graph 3 above, we can see that Net Enrolment Ratio (NER) improved on average from 1990 to 2013. The positive change however starts after 1996 picking up at high speed until 2007 when the improvement starts to decelerate. (This means that positive annual changes are observed in all years except for 1992 and 1996)

On the hand, looking at graph 4 which shows **the last grade of primary education** (Figure 4) We observe that there is positive improvement starting from 1996 at high speed until 2001 when the improvement starts to decelerate after which we begin to observe negative improvement especially between 2009-2012.

3.3. Results on Child and maternal Health.

The two indicators we are interested in are **child mortality** and **maternal mortality** which are graphically represented below.

Figure 5. The Fitted Model (A) and Difference in Child Mortality (B)

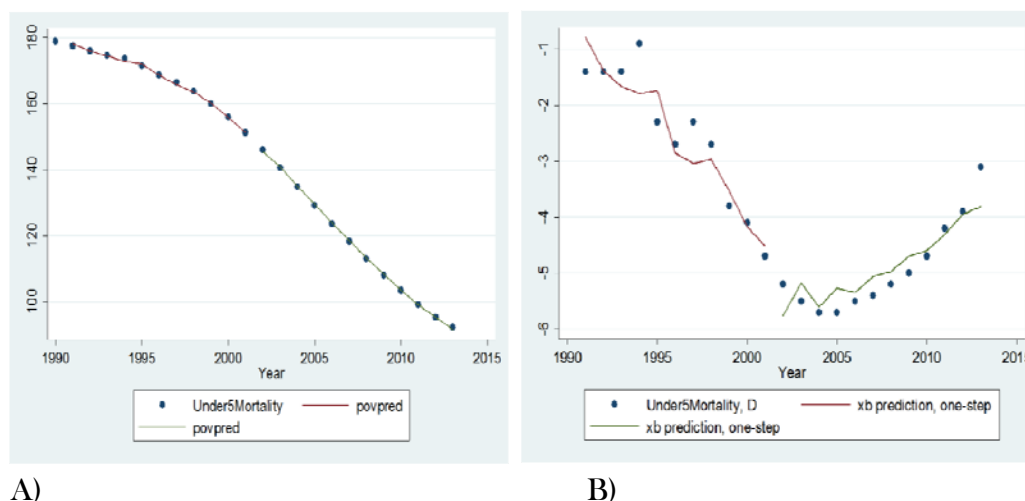


Figure 6. The Fitted Model (A) and Difference in Maternal Mortality (B)



Both the child mortality and maternal mortality rates have been decreasing throughout the observed period (1990-2013) (see graph A). Looking at the annual reduction in the rates, it is clear that the trend accelerated until 2004, but started slowing down afterwards. Despite this deceleration, the total reduction in mortality rates after the introduction of the MDGs is larger than the reduction achieved before 2001.

4. DISCUSSION

Our aim in this study was to investigate whether MDGs changed the social realities of people around the world or not. First and foremost, our study has revealed that this is an implicitly complex question to untangle. In order to make an uncontested claim of the effect of MDGs on social realities, one would need a counterfactual. However, in this case, there is lack of a counterfactual owing to having only a single planet where the MDGs were implemented. Concomitantly, the lack of a counterfactual constrains us to only statistically investigate through the lens of interrupted time series analysis whether a positive change in social conditions took place after the establishment of the MDGs.

Our results begin by confirming what other scholars have previously shown; which is that indeed on average there has been an improvement in social realities of people in the period 1990-2013. However, our results suggest that this improvement in social realities had already started prior to the introduction of MDGs. For example, indicators such as poverty headcount started improving around 1995 (long before the MDGs were introduced in 2001) and the trend of improvement continued after 2001 albeit at a reduced speed. This trend is also visible in other social indicators such as net enrolment rate in primary school, persistence to last grade ratio, child and maternal mortality rates which show that the genesis of improvement is in the early 1990s and advancement in social realities did not begin after 2001 when the MDGs were introduced. Although the improvement continues after 2001, the rate of improvement is slowing down.

The foregoing therefore presents a challenge to both those who claim that the improvement in social realities was MDG-precipitated and those who claim that the improvement was incidental to the establishment of the MDGs, (i.e. that improvement in social realities would have been there irrespective of the MDGs). From our results, it is clear that progress was evident already before 2001, therefore, making it difficult for anyone to lay a claim that the improvement is MDG-precipitated. Likewise, it is difficult to argue that the improvement was incidental to the introduction of the MDGs because there is no way of determining indubitably whether the improvement after 2001 would have been sustained in the manner in which it has been without the MDGs. It is uncandid for anyone to posit without question that the continued improvement in social realities after 2001 is completely independent of the MDGs. We therefore argue that it is disingenuous for anyone to make a definite claim that the social improvement was

MDG-precipitated or that the improvement would have been realised irrespective of the MDGs.

In order to effectively assess the usefulness of the MDGs, one needs to conduct a tedious and complex task of “tracing-the-change” by following through the chain of changes triggered by the MDGs. This should start by investigating whether MDGs have translated into regional policy change, after which one has to examine whether this has also led to policy change at the country level. If a policy change has indeed ensued at country-level, one has to further follow through the chain of change within the country and assess what impact that particular policy change has had on the lives of the people in a context-specific manner. All this convoluted chain of inquiry only attests to the fact that arguing for and against the influence of MDGs on social realities by taking a specific position on the matter amounts to self-deception.

Despite the unsound effort by other researchers to take strong positions on either that the improvement in social realities is MDG-precipitated or incidental to the MDGs, we are not oblivious to the fact that the MDGs in themselves present useful opportunities. We posit however that the MDGs and their successors, the SDGs, present desirable ends, but should be viewed more as a conduit for political diffusion of the human development agenda, rather than as means to achieve the set goals. The question therefore should not be “whether the MDGs have improved social realities or not”. This is because an attempt to answer this question is a fool’s paradise and reduces the debate to the impossible task of “attribution” which in a way is in juxtaposition with the facts guiding the global development goals.

We thus contend that the usefulness of the MDGs should be assessed from ensuing domestic developmental policies and how these policies change local realities in a context-specific-way. Transformation on a country level comes with local ownership of processes, which results from political commitment manifested through policies. This implies that the potential for exploring any linkage between the MDGs and the change in social realities should lie in the path of observing the effect of the MDGs on country-level policies, where a more direct impact is expected.

5. CONCLUSION

From above, we have shown that although there has been improvement in social realities of people around the world between 1990 and 2013, the two dominant opposing views on the role of MDGs in this process are uncandid. There is no sound basis for championing either position. It is thus misleading for anyone to argue that the improvement was MDG-precipitated or indeed that the improvement was incidental to the introduction of MDGs. This is because either position is riddled with complex challenges. Those who argue for the MDG-precipitated narrative have to contend with the time-incompatibility fact of the genesis of the improvement which was in the early 1990s (before the introduction of MDGs) and at the same time, those who champion the position that the improvement was incidental to the introduction of the MDGs have to prove without question that the improvement would have been sustained after 2001 in the absence of the MDGs.

Given this difficulty, we argue that the question of the importance of global development goals should not be reduced to “whether the MDGs have improved social realities or not”. An attempt to answer this question is a fool’s paradise and limits the complex debate to the impossible task of “attribution” which is a race against the facts guiding the MDGs and their successors. Instead, we recommend that in order to effectively assess the usefulness of global development goals, one needs to conduct a tedious and complex task of “tracing-the-change” by following through the chain of policy changes triggered by the MDGs starting from a regional level to national level and then assessing the impact of these policies on the lives of people at country level in a context-specific way.

REFERENCES

- Bond, P., 2006. Global governance campaigning and MDGs: From top-down to bottom-up anti-poverty. *Third World Quarterly*, 27, 595-608.
- Caldwell, J. C., 1986. Routes to low mortality in poor countries. *Population and Development Review*, 12, 171-220.
- Chen, S. & Ravallion, M. (2004). How have the world's poorest fared since the early 1980s? *World Bank Research Observer*, 19, 141-169.
- Clemens, M., Kenny, C. & Moss, T. (2004). The trouble with MDGs: Confronting expectations of aid and development success. *Center for Global Development*. Working Paper.
- Davis, T. (2011). The MDGs and the incomplete relationship between development and foreign aid. *Journal of the Asia Pacific*, 16, 562-578.
- Easterly, W. (2009). How the Millennium Development Goals are unfair to Africa. *World Development*, 37, p. 26-35.
- Friedman, H. S. (2013). Causal inference and the Millennium Development Goals (MDGs): Assessing whether there was an acceleration in MDG development indicators following the MDG declaration
- Fukuda-Parr, S. (2010). Reducing inequality - The missing MDG: A content review of PRSPs and bilateral donor policy statements. *IDS Bulletin*, 41, 26-35.
- Fukuda-Parr, S., Greenstein, J. & Stewart, D. (2013). How should MDG success and failure be judged: Faster progress or achieving the targets? *World Development*, 41, 19-30.
- Hulme, D. (2007). The making of the Millennium Development Goals: Human development meets results-based management in an imperfect world. *BWPI Working paper*
- Jerven, M. (2013). *Poor numbers. How we are misled by African Development Statistics and What to do about it. Cornell Studies in Political Economy*. Ithaca: Cornell University Press.

Millennium Development Goals: Did They Change Social Reality?

- Kenny, C. & Sumner, A. (2011). More money or more development: What have the MDGs achieved? *Center for Global Development*, 278, PAGE INFO needed here
- Manning, R. (2009). *Using indicators to encourage development: Lessons from the Millennium Development Goals*. Copenhagen: Danish Institute for International.
- McDowall D. (2003) *Interrupted Time Series Analysis*. Sage Publications, USA
- Mckeown, T. (1976). *The Modern rise of population*. London: Edward Arnold Publishers.
- Millennium Development Goals (2010). *Reduce the under-five child mortality*. R
- Melamed, C. & Samman, E. (2013). *Equity, inequality and human development in a post- 2015 framework*. New York: United Nations Development Programme.
- Preston, S. (1975). The changing relation between mortality and level of economic development. *Population Studies*, 29, 231-248.
- Ronsmans, C. & Graham, W. (2006). Maternal mortality: Who, when, where, and why. *Global Health*, 368, 1189-1200
- Sahn, D. & Stifel, D. (2003). Progress toward the Millennium Development Goals in Africa. *World Development*, 23, pp. 31-1.
- Sen, A. (1999). *Development as freedom*. Oxford University Press, Oxford.
- United Nations Development Programme. (2006). *Human Development Report 2006 - beyond scarcity: Power, poverty and the global water crisis*. UNDP: New York.
- United Nations (2009). *The Millennium Development Goals Report 2009*. New York: The United Nations.
- United Nations (2010). Education for all. UN Briefing Papers. Retrieved from <http://www.un.org/en/globalissues/briefingpapers/efa/>
- Vandemoortele, J. (2011). A fresh look at the MDGs. *Journal of the Asia Pacific*, 16, 520-528.

Millennium Development Goals: Did They Change Social Reality?

Wooldridge, J. (2009). *Introductory econometrics: A modern approach*. Cengage Learning (is this a publisher?) PLACE OF PUBLICATION (then) needed

World Bank (2009). *Global Monitoring Report 2009: A development emergency*. Washington, DC: The World Bank.

APPENDIX

Table A.1 Selected MDGs Targets and Indicators

MDG		Target	Indicator	WDI
1	Eradicate Extreme Poverty and Hunger	1.A. Halve, between 1990-2015, the proportion of people whose income is less than one dollar a day	Proportion of population below \$1.25 (PPP) per day.	Poverty Head Count
			Poverty gap ratio: poverty gap as a proportion of the poverty line of \$1.25 (PPP) per day.	Poverty Gap ratio
2	Achieve Universal Primary Education by 2015	Ensure that all boys and girls complete a full course of primary schooling	Net enrolment ratio in primary education	Net school enrolment ratio
			Proportion of pupils starting grade 1 who reach last grade of primary	Persistence to last grade of primary education
4	Reduce Child Mortality	Reduce by two-thirds, between 1990-2015, the under-five mortality rate	Under-five mortality rate	Under five mortality rate
5	Improve Maternal Health	Reduce by three-quarters, between 1990-2015, the maternal	Maternal mortality ratio	Maternal mortality rate

		mortality ratio		
--	--	-----------------	--	--

Poverty Reduction

The first indicator used which is **the proportion of population living on less than \$1.25 per day** serves as a basic indication of material well-being. Living below this extreme poverty threshold means not being able to fulfil basic human needs such as food, clothing and shelter among others. It also shows the limited ability of an individual to cope with risks and shocks.

The poverty gap being the second indicator, displays the severity of deprivation. In addition to the poverty rate, it illustrates the depth of the material deprivation. The trends of these two indicators provide fundamental information on the general progress of development and captures the availability of material resources needed to attain capabilities and freedoms.

Basic Education

Net Enrolment ratio in primary education is the third indicator used and it is defined as the proportion of children within the school-going age who enrol in school. **Persistence to last grade** is also used as the fourth indicator to capture the proportion of enrolled students who actually complete their basic education. As the United Nations rightly put it in their *Education for All* report in 2010, “Education is not only a right but a passport to human development. It opens doors and expands opportunities and freedoms” (UN 2010: 1). A well- educated citizenry is needed for all types of social development; health, poverty reduction, demand for basic human rights, fostering peace and democracy among other. The starting point however is basic education which is captured by these two indicators.

Health, Children and Gender Equality

The most fundamental human right is the right to life and health (MDG, 2010). This makes health and that of children specifically of utmost importance. **Under-five mortality rate per 1,000 live births** therefore serves as a good indicator of quality of life. It however not only captures health and children’s rights. It also captures the economic resources and education of parents, the efficacy of health services, access to safe drinking water, and proper sanitation among others. **Maternal mortality ratio per**

100,000 live births also not only captures provision and access to health services and quality of health care in a given society but it also adds a gender dimension to human development. It therefore serves as one of the key indicators of development as it captures health before, during and after childbirth while reflecting the relative value a given society concedes to women (Ronsmans & Graham 2006).

Table A. 2 **Multi-stage analysis**

<i>Model</i>	<i>Independent Variables</i>	<i>Justification for the model</i>	<i>BIC (poverty headcount ratio)</i>
<i>1. Simple time series</i>	Dummy MDGs	To see the correlation between MDGs dummy on MDG indicators	105.38
<i>2. Time series analysis with time</i>	Time, dummy MDGs	Add time to model 1 to take into account the trending issue in time series data	101.04
<i>3. Time series analysis with time and age of MDGs</i>	Time, dummy MDGs, 'age' of MDGs	How far away from the MDGs introduction might have an impact on the improvement of social realities. 'age of MDGs' is added into model 2	69.05
<i>4. Time series analysis with time and interaction time-MDGs</i>	Time, dummy MDGs, and interaction between time and MDGs	Because 'time' and 'age of MDGs' are highly correlated, we experiment with the interaction as an alternative for model 3	69.05

Millennium Development Goals: Did They Change Social Reality?

5. Time series with control variables	Time, dummy MDGs, interaction between time and dummy MDGs, two control variables: GDP per capita and military expenditure	2 controls are added into model 4 to control for the effect of GDP per capita and military expenditure on social reality improvement. These two controls are clearly not associated with MDG introduction; they are however significantly correlated with MDG indicators.	40.97
6. Model with ARIMAX *	Model 6 employed ARIMAX process in model 5. In which dependant variable (MDG indicators), and two controls (GDP per capita, military expenditure) are differenced once. The autoregressive term and the moving average term are both specified as one-year lags.	Augmented Dickey-Fuller test, Breusch-Godfrey test and Durbin-Watson test were conducted to respectively detect non-stationary issue, Serial correlation (which is often manifested as autoregressive and moving average processes) and autoregressive issue. All the tests suggested that the issues are evident and that a more advanced model is required to remove the biases. Therefore ARIMAX was used to take those issues into account. Graphical illustrations: autocorrelations with confidence intervals and partial autocorrelations with confidence intervals were drawn to specify the number of lags needed for tackling autoregressive process and moving average process. Differencing is employed to all non-stationary variables. The dependent	34.92

variables and the two controls were differenced.

* *ARIMAX: Autoregressive Integrated Moving Average with Explanatory Variable.*

As a simple explanation of ARIMAX, the model can be viewed as a multiple regression model with one or more autoregressive (AR) terms and/or one or more moving average (MA) terms. In ARIMAX, non-stationary variables are transformed into stationary by the use of differencing technique. Autoregressive terms for a dependent variable are lagged values of that dependent variable which has a statistically significant correlation with its most recent values. The terms are employed to remove biases caused by autoregressive process. Moving average terms are lagged residuals resulting from previously error estimates, and they are specified in the model 6 to remove biases from that source. The core difference between ARIMAX and multiple regression modelling lies in the underlying assumptions of the ARIMAX model (see McDowall 2003).

The UNU-MERIT Working Paper Series

- 2016-01 *Mexican manufacturing and its integration into global value chains* by Juan Carlos Castillo and Adam Szirmai
- 2016-02 *New variables for vocational secondary schooling: Patterns around the world from 1950-2010* by Alison Cathles
- 2016-03 *Institutional factors and people's preferences in social protection* by Franziska Gassmann, Pierre Mohnen & Vincenzo Vinci
- 2016-04 *A semi-endogenous growth model for developing countries with public factors, imported capital goods, and limited export demand* by Jan Simon Hallonsten and Thomas Ziesemer
- 2016-05 *Critical raw material strategies in different world regions* by Eva Barteková and René Kemp
- 2016-06 *On the value of foreign PhDs in the developing world: Training versus selection effects* by Helena Barnard, Robin Cowan and Moritz Müller
- 2016-07 *Rejected Afghan asylum seekers in the Netherlands: Migration experiences, current situations and future aspirations*
- 2016-08 *Determinants of innovation in Croatian SMEs: Comparison of service and manufacturing firms* by Ljiljana Bozic and Pierre Mohnen
- 2016-09 *Aid, institutions and economic growth: Heterogeneous parameters and heterogeneous donors* by Hassen Abda Wakoy
- 2016-10 *On the optimum timing of the global carbon-transition under conditions of extreme weather-related damages: further green paradoxical results* by Adriaan van Zon
- 2016-11 *Inclusive labour market: A role for a job guarantee scheme* by Saskia Klosse and Joan Muysken
- 2016-12 *Management standard certification and firm productivity: micro-evidence from Africa* by Micheline Goedhuys and Pierre Mohnen
- 2016-13 *The role of technological trajectories in catching-up-based development: An application to energy efficiency technologies* by Sheng Zhong and Bart Verspagen
- 2016-14 *The dynamics of vehicle energy efficiency: Evidence from the Massachusetts Vehicle Census* by Sheng Zhong
- 2016-15 *Structural decompositions of energy consumption, energy intensity, emissions and emission intensity - A sectoral perspective: empirical evidence from WIOD over 1995 to 2009* by Sheng Zhong
- 2016-16 *Structural transformation in Brazil, Russia, India, China and South Africa (BRICS)* by Wim Naudé, Adam Szirmai and Nobuya Haraguchi
- 2016-17 *Technological Innovation Systems and the wider context: A framework for developing countries* by Hans-Erik Edsand
- 2016-18 *Migration, occupation and education: Evidence from Ghana* by Clotilde Mahé and Wim Naudé
- 2016-19 *The impact of ex-ante subsidies to researchers on researcher's productivity: Evidence from a developing country* by Diego Aboal and Ezequiel Tacsir
- 2016-20 *Multinational enterprises and economic development in host countries: What we know and what we don't know* by Rajneesh Narula and André Pineli
- 2016-21 *International standards certification, institutional voids and exports from developing country firms* by Micheline Goedhuys and Leo Sleuwaegen

- 2016-22 *Public policy and mental health: What we can learn from the HIV movement* by David Scheerer, Zina Nimeh and Stefan Weinmann
- 2016-23 *A new indicator for innovation clusters* by George Christopoulos and Rene Wintjes
- 2016-24 *Including excluded groups: The slow racial transformation of the South African university system* by Helena Barnard, Robin Cowan, Alan Kirman and Moritz Müller
- 2016-25 *Fading hope and the rise in inequality in the United States* by Jo Ritzen and Klaus F. Zimmermann
- 2016-26 *Globalisation, technology and the labour market: A microeconomic analysis for Turkey* by Elena Meschi, Erol Taymaz and Marco Vivarelli
- 2016-27 *The affordability of the Sustainable Development Goals: A myth or reality?* By Patima Chongcharoentanawat, Kaleab Kebede Haile, Bart Kleine Deters, Tamara Antoinette Kool and Victor Osei Kwadwo
- 2016-28 *Mimetic behaviour and institutional persistence: a two-armed bandit experiment* by Stefania Innocenti and Robin Cowan
- 2016-29 *Determinants of citation impact: A comparative analysis of the Global South versus the Global North* by Hugo Confraria, Manuel Mira Godinho and Lili Wang
- 2016-30 *The effect of means-tested social transfers on labour supply: heads versus spouses - An empirical analysis of work disincentives in the Kyrgyz Republic* by Franziska Gassmann and Lorena Zardo Trindade
- 2016-31 *The determinants of industrialisation in developing countries, 1960-2005* by Francesca Guadagno
- 2016-32 *The effects of productivity and benefits on unemployment: Breaking the link* by Alessio J. G. Brown, Britta Kohlbrecher, Christian Merkl and Dennis J. Snower
- 2016-33 *Social welfare benefits and their impacts on labour market participation among men and women in Mongolia* by Franziska Gassmann, Daphne François and Lorena Zardo Trindade
- 2016-34 *The role of innovation and management practices in determining firm productivity in developing economies* by Wiebke Bartz, Pierre Mohnen and Helena Schweiger
- 2016-35 *Millennium Development Goals (MDGs): Did they change social reality?* by Janyl Moldaliev, Arip Muttaqien, Choolwe Muzyamba, Davina Osei, Eli Stoykova and Nga Le Thi Quynh