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Income inequality and health status: role of institutions quality

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Abstract

This paper investigates the relationships between health indicators, institutional variables and income inequality. In the economic literature, the impact of income distribution on health status is largely studied. Theoretically, all the mechanisms developed in the literature highlight a negative impact of income inequality on health status. However, empirical studies find different results and the conclusions are far from a consensus. In this article, we partly propose an explanation to these discrepancies on the effect of income distribution on health by introducing institutions quality in the debate. More precisely, we assess whether the effect of income inequality on population's health is conditional to institutions quality. Our analysis shows that income inequality affects negatively population health and this negative effect is mitigated by good institutions. Another interesting result is that income inequality affects higher health status in developing countries as compare to others.

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1. Introduction

Population health is an important economic concern for many developing countries. It plays a crucial role in the development process, since it constitutes a component of investment in human capital and workforce is the most abundant production factor in these countries. It constitutes also a major preoccupation for the international community, especially when it is considered as a public good. The importance given to health status could be illustrated through its relatively high weight among the Millennium Development Goals (MDGs). In fact, three out of the eight MDGs concern health preoccupations. It is therefore important to know the factors that influence population health in order to undertake suitable economic policy.

Rodgers (1979) is one of the first economists to consider income distribution as a determinant of health outcomes. He shows that income inequality influences health status not only in developed countries, but also in developing countries, opening the debate about the association between income distribution and health. Wilkinson (1992) reopens the debate by showing through eleven industrialized countries that income inequality is an essential determinant of health status. All the theoretical mechanisms through which income distribution impacts health status developed in the literature show that an increase in inequality worsens population health. These mechanisms rely on the absolute and relative income hypothesis, psychosocial hypothesis and neo-materialism hypothesis as well. Even though the major part of the empirical studies on this topic confirm the negative effect of inequality on health, some authors reject this hypothesis and show that high inequality may be indifferent to health status or improve it (Pampel et Pellai 1986 ; Mellor et Mylio, 2001, Deaton, 2003). On the hand, some authors argue that this discrepancy could be partly explained by the income inequality indicator used, as Judge (1995) underlined. Through a sample of thirteen OECD countries from 1984 to 1987, he found different results according to the inequality indicator used. But, this argument is not plausible, because Kawachi and Kennedy (1997) showed with six different inequality measures that the negative effect does not depend on the choice of indicator, since all the indicators have negative effect. On the other hand, some scholars think that the negative effect observed is not due to income inequality, but to other variables correlated to it. For Jason (2004), the discrepancies are caused by statistical problems, such as small sample size, choice of control variables or presence of unobserved heterogeneity.

In this paper, we partly propose an explanation to this discrepancy on the effect of income distribution on health by introducing institutions quality in the debate. More precisely, we assess whether the effect of income inequality on population health is conditional to institutions quality. Previous studies have not explore this hypothesis despite the emergence of a large literature on institutions quality that consider them as important source of development, and the appearance of deep inequalities in poor countries.

Our econometric results show that income inequality worsens health status, and this impact is higher in developing countries as compare to others. Another interesting result is that, good institutions mitigate this effect of income distribution on population health.

The rest of this paper is organized in three sections. Section 2 reviews the literature on the association between income distribution, health status and institutions quality. In this section we explain why and how income inequality affects health before introducing the arguments that defend the mitigation role of institutions quality. In section 3, we investigate empirically the effects of income distribution on health conditional to institutions quality. The last section concludes.

2. Literature review

Income inequality and population health

The relationship between income inequality and population health has been investigated by many studies during the past 15 years. Scholars examine how and why income inequality affects health theoretically and empirically within and between nations. Theoretically, four mechanisms are underlined, through which income inequality can harm population health (Mayer & Sarin, 2005).

The first mechanism is the absolute income hypothesis. In fact, income may be an important determinant of population health, since it allows them to buy better nutrition or medical care or reduces their stress. If the relationship between an individual income level and its health status is linear, an extra unit of income will have the same effect on health regardless of whether it goes to the rich or to the poor. In this case taking a unit of income from the rich and giving it to the poor will lower health status among the rich and raise it among the poor by exactly equal amounts, leaving the global health unchanged. The reality is that standard economic models predict that the health gains from an extra unit of income should diminish as income rises (Preston, 1975; Laporte, 2002; Deaton, 2003; Backlund et al., 1996), in other words, health should be a concave function of income. That is, a transfer of a unit of income from the rich to the poor might improve aggregate population health status.

The second mechanism developed in the literature is the relative income hypothesis. The effect of economic inequality is likely to depend to some extent on the geographic proximity of the rich to the poor (Mayer & Sarin, 2005). In fact, if people assess their income by comparing themselves to their neighbours, the income of others can affect their health. The chronic stress provoked by this comparison may lower resistance to some diseases and cause premature death. For Wilkinson (1997), if individuals evaluate their well-being by comparing themselves to others with more income than themselves, increases in economic inequality will engender low control, insecurity, and loss of self esteem.

The third way developed in the literature through which income inequality may worsen population health is psychosocial hypothesis. Inequality can impact health through social comparisons by reducing social capital, trust and efficacy (Kawachi & Kennedy, 1997; Marmot & Bobak, 2000). According to Wilkinson (1996), income inequality worsens health because ranking low in the social hierarchy produces negative emotions such as shame and distrust that lead to worse health via neuro-endocrine mechanisms and stress-induced behaviors such as smoking, excessive drinking, taking dangerous drugs, and other risky activities (Mayer & Sarin, 2005). Lynch et al. (2001) found weak associations between a variety of measures of the psychosocial environment, (distrust, belonging to organizations, volunteering, and efficacy), and infant mortality, but they found that economic inequality is strongly related to infant deaths.

Neo-materialism hypothesis is the fourth mechanism through which income inequality may harm health status. According to some authors defending this idea, income inequality affects health mainly through its effect on the level and the distribution of material resources (Coburn, 2000 and Lynch, 2000). This argument suggests that bad health could be the consequence of an increase in income inequality that reduces state spending on medical care, goods and services for the poor.

If theoretically, all the arguments found in the literature indicate a negative impact of income inequality on health status, empirical findings are far from a consensus. Lynch et al. (2004) review 98 aggregate and multilevel studies to examine the associations between income inequality and health. They conclude that overall, there seems to be little support for the idea that income inequality is a major, generalizable determinant of population health differences

within or between rich countries. Income inequality may, however, directly influence some health outcomes, such as homicide in some contexts. Mayer & Sarin (2005) review ten (10) studies that use cross-sectional data to estimates the association between economic inequality and infant mortality. Eight (8) of these ten use cross-national data and produce eleven (11) estimates. Nine (9) of these find that more unequal countries have higher infant mortality rates, and two (2) (Pampel & Pellai, 1986; Mellor& Milyo, 2001) find that more unequal countries have lower infant mortality rates than countries with less inequality. Wilkinson & Pickett (2006) compiled one hundred sixty eight (168) analyses in one hundred fifty five (155) papers reporting research findings on the association between income distribution and population health, and classified them according to how far their findings supported the hypothesis that greater income differences are associated with lower standards of population health. They find that for eighty seven (87) of these studies the coefficient of income inequality is always statistically significant with the correct sign. Forty four (44) present mixed results and thirty seven (37) no significant coefficient. They explain the divergence of empirical finding by the size of area, choice of control variables and don't find any explanation for some international studies.
In this paper we explore whether the effect of income inequality on population health is conditional to institutions quality. This hypothesis is supported by some theoretical arguments.

Role of institutions quality

Many studies investigate the links between institutions quality and social sectors (Baum et al. 2003), and they normally underline a positive contribution of good institutions quality to these sectors in general and particularly to health status. However, the role played by institutions in presence of income inequality remains unexplored to our knowledge. Three categories of theoretical arguments support the importance of institutions quality in the explanation of the effect of income distribution on health.

Individual income and investment in public goods:
The negative effect of income inequality on health can be reduced in presence of good institutions through redistributive policies. In fact, in all society there are individuals with heterogeneous preferences and the best way to take suitable decisions is through law. In a democracy, with decisions taken from a majority voting system, the political arena will set the social policy at the level that captures the majority's support to its economic plan. According to the median voter theorem, the policy chosen is that of the median voter (Persson and Tabellini 1992, 1994; Alesina and Rodrik 1994; and Chang 1998). In a society with high income inequality, the median voter belongs to the poorest population with bad health status. Therefore, he will choose a redistributive policy more interesting for the poor than the rich. In addition, a large amount of the transfer will be used as investment in social infrastructures, such as hospital and schooling, important for population health.
In societies with bad institutions, the policy chosen will reflect the preferences of the dictator or a small group of leaders or a group of lobbying (Meltzer and Richard 1981, and Roberts 1977) and will not take into account the preoccupations of the poor. Such policy will worsen poor living conditions and their health status.

The channel of the socio-political unrest:
Income inequality is negative for population health partly because it constitutes a potential factor of dissatisfactions and frustrations in presence of bad institutions. And this could provoke socio-political unrest, civil war, revolution and more generally a climate of

uncertainty. It is the case for some developing countries. This socio-political unrest is costly in terms of human capital, namely education, malnutrition, health, etc. Alesina and Perotti (1996) show empirically through a study of 71 countries from 1960 to 1985 that in presence of bad political institutions, income inequality constitutes a major source of socio-political unrest.

The fear of the rich and the short term behaviour of the poor:
Increasing income inequality in presence of bad institutions constitutes a source of fear for the population in general and the rich in particular against the behaviour of the poor (Piven and Cloward 1993; Gurr 1970). This is partly due to the cohabitation of rich who obtained their wealth from corruption with poor without any hope for the future. This fear could provoke stress and worsen population health.
In addition to this fear, the young without any hope for the future will expose themselves to some risky and bad behaviour such as tobacco, drug and alcohol consumption and risky sexual behaviour (Lorentzen, McMillan and Wacziarg, 2005). These behaviours are bad for their health in the long term and could be avoid with good institutions.

3. Empirical analysis

Data and variables

The data used in this paper cover the period 1975-2000 subdivided into 5 periods of 5 years and we retain for the basic regression 91 developed and developing countries (according to the availability). As health variables we use the logit of infant mortality rate and the logit of under five mortality rate. The mortality indicators are limited asymptotically, and an increase in these indicators do not represent the same performance when their initial levels are weak or high, the best functional form to examine is that where the variable are expressed as a logit, as Grigoriou (2005) underlined.

$\log it\ \text{Mortality} = \ln\left(\frac{mortality}{1-mortality}\right)$. We take the data from the World Health Organization (WHO) and the United Nations Children's Emergency Fund (UNICEF).
Income inequality is measured by the gini coefficient taken from the database created by Galbraith and associates and known as the University of Texas Inequality Project (UTIP) database. It contains two different types of data on inequality: the UTIP-UNIDO and the EHII indexes. The EHII (that we use here) is an index (ranging from 0 to 1) of Estimated Household Income Inequality and is built combining the information in the Deninger and Squire (D&S) data with the information in the UTIP-UNIDO data.
We also use for the robustness of our results, gini coefficients from the World Institute for Development Economics Research of the United Nations University (UNU-WIDER) and Milanovic (GINIALL). These data are available at the World Bank web site.
Three indicators are used to represent institutions variable. The first, investment profile, is taken from International Country Risk Guide (ICRG) and the two others (political liberties and civil rights) are taken from Freedom House dataset. Investment profile is an assessment of factors affecting the risk to investment. The risk rating assigned is the sum of three subcomponents, each with a maximum score of four points and a minimum score of 0 points. A score of 4 points equates to Very Low Risk and a score of 0 points to Very High Risk. The subcomponents are Contract Viability and Expropriation, Profits Repatriation and Payment Delays.

Freedom House has since 1973 published the Comparative Survey of Freedom, which rates the level of democracy or freedom in all independent states and some disputed and dependent territories. The survey measures freedom according to two broad categories: political rights and civil liberties. The methodology of the survey is grounded in basic standards of political rights and civil liberties, derived in large measure from relevant portions of the Universal Declaration of Human Rights. These standards apply to all countries and territories, irrespective of geographical location, ethnic or religious composition, or level of economic development. The survey operates from the assumption that freedom for all peoples is best achieved in liberal democratic societies. The ratings process is based on a checklist of 10 political rights questions and 15 civil liberties questions. The political rights questions are grouped into three subcategories: Electoral Process (3 questions), Political Pluralism and Participation (4), and Functioning of Government (3). The civil liberties questions are grouped into four subcategories: Freedom of Expression and Belief (4 questions), Associational and Organizational Rights (3), Rule of Law (4), and Personal Autonomy and Individual Rights (4).

The other explanatory variables used are gross domestic product per capita (GDPCAP), population density (POPDENS), fertility rate (FERTILITY), physicians for 1000 habitants (PHYSICIAN), all taken from WDI 2007 and unschooled population (UNSCHOOL) from Barro and Lee (2000).
Appendix 1 summarizes the characteristics of the important variables. This table shows the mean, the minimum, the maximum, the standard deviation and the coefficient of variation of each variable.

Estimations

The purpose of this article is to investigate whether the effect of income inequality on health depends on the quality of institutions. To achieve this objective, we first examine the impact of income inequality on health through the following equation:

$$Health_{it} = \lambda_i + \beta_{it} EHII + \delta_{kit} X_k + \varepsilon_{it} \qquad \textbf{(3.1)}$$

Where *health* and *EHII* represent respectively the logit of health indicator and income inequality measure. X_k is the matrix of the control variables. The country fixed effects are represented by λ_i and ε_{it} is the error term.
Then, we add the interactive term of income inequality and development level variable to assess whether the effect is different from developing to developed countries and we obtain:

$$Health_{it} = \eta_i + \gamma_{it} EHII_{it} + \kappa_{it} (EHII_{it}) \times (dev\_level_i) + \theta_{kit} X_{it} + \omega_{it} \qquad \textbf{(3.2)}$$

Where *dev_level* is the development level dummy. η_i represents the country fixed effects and ω_{it} is the error term. In this equation the marginal effect of income inequality is: $(\partial Health_{it})/(\partial EHII_{it}) = \gamma_{it} + \kappa_{it}$ for developing countries and $(\partial Health_{it})/(\partial EHII_{it}) = \gamma_{it}$ for others.
Finally, we add the interactive term of income inequality and institutions quality variable to evaluate whether the effect of income distribution is conditional to the quality of the institutions and we have:

$$Health_{it} = \phi_i + \psi_{it} EHII + \rho_{it}(EHII_{it}) \times (institution_{it}) + \sigma_{kit} X_{it} + \tau_{it} \quad \textbf{(3.3)}$$

Institution represents the institutions quality variables. ϕ_i represents the country fixed effects and τ_{it} is the error term. The marginal effect of income inequality becomes: $(\partial Health_{it})/(\partial EHII_{it}) = \psi_{it} + \rho_{it}(institution_{it})$

These equations could be estimated by the Ordinary Least Squares (OLS), but it is very likely that population health affects income inequality through productivity, education and other factors. This potential simultaneity can be a source of endogeneity. To solve for this problem, we estimate them with the Generalized Method of Moments (GMM system) since we have not any external instrumental variable for income inequality indicator. We use the System-GMM estimator which combines equation in level and equation in difference and then exploits additional moment conditions (Blundell and Bond, 1998). Predetermined and endogenous variables are instrumented by both their lagged values in level and lagged values in difference.[1] Two specification tests check the validity of the instruments. The first is the standard Sargan/Hansen test of over-identifying restrictions. The second test examines the hypothesis that there is no second-order serial correlation in the first-difference residuals.

Results

The results obtained from equation (3.1) are presented in table 1 column (1) when the logit of infant mortality rate is used as dependent variable and investment profile as institutions quality. This column shows that income inequality worsens population health, since its coefficient is positive and highly significant. All the other explanatory variables have the corrected signs. GDP per capita, the number of physicians, the population density, the immunization rate and the institutions quality reduce infant mortality rate, while the unschooled population and the fertility increase it.

In the second column of this table are summarized the results from equation (3.2). This equation adds the interaction term between income inequality and development level as additional variable to equation (3.1). This interaction term presents a positive and highly significant coefficient, showing that the effect of income inequality on health is higher in developing countries. This is important for our analysis, since these countries are characterized by their bad institutions quality.

The third column of this table presents the results when we adds the interaction term between income inequality and institutions quality variable as additional variable to equation (3.1), namely equation (3.3). The income distribution variable remains positive while the coefficient associated to the interaction term is negative and highly significant. This demonstrates that income inequality is bad for health, but good institutions mitigate its effect. The introduction of this interaction term changes the sign of institutions quality variable's coefficient. This does not mean that good institutions are bad for health, since this bad effect is compensated by the negative coefficient of the interaction term between income inequality and institutions quality variable.

The other columns of this table (columns 4, 5, 6 and 7) show the results when political liberties and civil rights are used as institutions quality variables. The results remain unchanged as compare to columns (1 and 3), namely, increases income inequality increase infant death, but this effect is reduced by good institutions.

[1] The paper uses the two-step System-GMM estimator with the Windmeijer (2005) correction for finite sample bias.

To verify the robustness of our result, we first replace infant mortality rate by under five mortality rate. The results obtained are presented in appendix 3. These results remain unchanged as compare to previous results. Then, we use inequality variable from other data source, WIDER and Milanovic. The results are summarized in appendix 4 and appendix 5. They remain similar to those already obtained.

Table 1: Conditional effect of income inequality on infant mortality rate

	GMM SYSTEM ESTIMATIONS (dependent variable: logit of infant mortality rate)						
	INSTITUTIONS QUALITY VARIABLES						
	ICRG Investment profil			Political		Civil	
Independent variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
LGDPCAP	-0.598***	-0.312***	-0.745***	-0.558***	-0.529***	-0.559***	-0.551***
	(-8.934)	(-3.846)	(-5.856)	(-7.537)	(-7.233)	(-7.629)	(-7.695)
PHYSICIAN	-0.0991**	-0.0830**	-0.113	-0.164***	-0.150***	-0.161***	-0.149***
	(-2.254)	(-2.286)	(-1.358)	(-3.175)	(-2.993)	(-3.196)	(-3.007)
POPDENS	-0.0651**	-0.0476***	-0.0894	-0.101***	-0.107***	-0.104***	-0.106***
	(-2.457)	(-3.013)	(-1.009)	(-3.264)	(-3.552)	(-3.303)	(-3.445)
IMMUNIZATION	-0.506***	-0.542***	-0.338*	-0.432***	-0.429***	-0.438***	-0.413***
	(-3.357)	(-3.928)	(-1.699)	(-3.252)	(-3.345)	(-3.285)	(-3.188)
UNSCHOOLING	0.803***	1.117***	0.648	0.619**	0.768***	0.625**	0.749***
	(3.085)	(4.325)	(1.038)	(2.184)	(2.739)	(2.210)	(2.635)
FERTILITY	0.00267	0.0331	-0.0588	0.0288	0.0252	0.0241	0.0250
	(0.0714)	(0.962)	(-0.696)	(0.734)	(0.660)	(0.616)	(0.655)
EHII	1.565***	0.824	11.89**	1.029*	3.153***	0.991*	2.938**
	(3.067)	(1.314)	(2.149)	(1.773)	(2.927)	(1.706)	(2.376)
(DEV_LEVEL)x(EHII)		1.344***					
		(5.023)					
(INSTITUTION)x(EHII)			-1.508**		-0.697***		-0.639**
			(-2.008)		(-2.807)		(-2.141)
INSTITUTION	-0.0312*	-0.0226	0.594*	0.00339	0.300***	0.0109	0.270**
	(-1.907)	(-1.475)	(1.935)	(0.190)	(2.818)	(0.475)	(2.211)
CONSTANT	1.643**	-1.243	-1.169	1.451*	0.314	1.478*	0.601
	(2.323)	(-1.505)	(-0.416)	(1.853)	(0.343)	(1.903)	(0.651)
Observations	265	265	265	328	328	328	328
NB. Countries	81	81	81	91	91	91	91
Hansen OID (p. value)	0.21	0.20	0.76	0.23	0.26	0.19	0.20
AR(2)	0.64	0.40	0.41	0.43	0.42	0.34	0.33

***significant at 1%, **significant at 5%, *significant at 10%. t-statistics enter parenthesis.

4. Conclusion

The object of this article was to assess the impact of income distribution on population and evaluate whether this effect depends on institutions quality. Theoretically, we show that income inequality worsens population health through many mechanisms found in the literature. We also argue how good institutions could reduce this health degradation.

Empirically, we show through an econometric analysis that income inequality affects negatively population health. This negative effect of income inequality on health status is mitigated by good institutions. Another interesting result is that income inequality affects higher health status in developing countries as compare to others.

This confirms the important role institutions quality to achieve MDGs. These results are robust to the choice of health, institutions and income inequality variables.

As policy implication, our results mean that income inequality is bad for health, and countries with high income inequality may implement distributive policy in order to avoid its negative impact on health. These countries may also improve their institutions quality to reduce this negative effect.

Next studies could extend our finding by taking it again at individual level (microeconomics).

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Appendices

Appendix 1: descriptive statistics

VARIABLES	MEAN	MINIMUM	MAXIMUM	Coef. Var.	NB. Obs.
IMR	46.768	3.48	191	0.868	536
U5MR	69.072	4.18	303.64	0.974	536
EHII	0.4124	0.21	0.6424	0.170	558
GINI WIDER	0.3822	0.16	0.6366	0.260	240
GINI MILANOVIC	0.3852	0.16	0.6318	0.255	332
INVEST. PROFIL	6.3398	1.86	10.833	0.284	372
POLITICAL	3.4998	1	7	0.599	519
CIVIL	3.6259	1	7	0.504	519
GDPCAP	8851.1	492.3	42129	0.926	505
PHYSICIAN	1.2932	0.017	4.341	0.861	480
POPDENS	310.06	1.296	15326.4	4.318	550
IMMUNIZATION	0.7181	0.012	0.99	0.350	484
UNSCHOOLING	0.2762	0	0.925	0.919	417
FERTILITY	3.6288	1.036	8.4944	0.528	553

Appendix 2: data characteristics and sources

VARIABLES	CHARACTERISTICS	SOURCES
IMR	Infant Mortality Rate	UNICEF - WHO
U5MR	Under Five Mortality Rate	UNICEF - WHO
EHII	Estimated Household Income Inequality	University of Texas Inequality Project (UTIP) database
GINI WIDER	Gini coefficient Wider	WORLD BANK
GINI MILANOVIC	gini coefficient Milanovic	WORLD BANK
INVEST. PROFIL	Investment profil institution	ICRG
POLITICAL	Political Rights institution	Freedom House
CIVIL	Civil Liberties institution	Freedom House
GDPCAP	GDP per capita	WDI 2007
PHYSICIAN	physicians per 1000 habitants	WDI 2007
POPDENS	population density	WDI 2007
IMMUNIZATION	Immunization from DPT	WDI 2007
UNSCHOOLING	Unschooling population	WDI 2007
FERTILITY	Fertility rate	WDI 2007

Appendix 3: Conditional effect of income inequality on under five mortality rate

	GMM SYSTEM ESTIMATIONS (dependent variable: logit of under five mortality rate)				
	INSTITUTIONS QUALITY VARIABLES				
	ICRG Investment profil			Political	Civil
Independent variables	(1)	(2)	(3)	(4)	(5)
LGDPCAP	-0.667***	-0.497***	-0.848***	-0.584***	-0.606***
	(-8.585)	(-4.958)	(-6.542)	(-8.174)	(-8.675)
PHYSICIAN	-0.103**	-0.0601	-0.0964	-0.137***	-0.136***
	(-1.999)	(-1.510)	(-1.131)	(-2.794)	(-2.832)
POPDENS	-0.0976***	-0.0567***	-0.117	-0.107***	-0.103***
	(-3.175)	(-3.422)	(-1.298)	(-3.635)	(-3.435)
IMMUNIZATION	-0.484***	-0.540***	-0.391*	-0.458***	-0.439***
	(-3.132)	(-3.750)	(-1.926)	(-3.666)	(-3.483)
UNSCHOOLING	1.053***	1.128***	0.572	0.896***	0.889***
	(3.571)	(3.846)	(0.898)	(3.274)	(3.209)
FERTILITY	0.0222	0.0593	-0.0206	0.0805**	0.0813**
	(0.543)	(1.542)	(-0.239)	(2.164)	(2.187)
EHII	1.073*	0.499	12.10**	2.259**	2.043*
	(1.873)	(0.683)	(2.145)	(2.149)	(1.695)
(DEV_LEVEL)x(EHII)		0.978***			
		(3.237)			
(INSTITUTION)x(EHII)			-1.587**	-0.552**	-0.490*
			(-2.072)	(-2.276)	(-1.685)
INSTITUTION	-0.0303*	-0.0241	0.631**	0.231**	0.195
	(-1.831)	(-1.530)	(2.017)	(2.218)	(1.635)
CONSTANT	2.736***	0.836	-0.0680	1.259	1.542*
	(3.395)	(0.820)	(-0.0237)	(1.405)	(1.714)
Observations	265	265	265	328	328
NB. Countries	81	81	81	91	91
Hansen OID (p. value)	0.25	0.14	0.70	0.12	0.13
AR(2)	0.56	0.37	0.37	0.32	0.32

***significant at 1%, **significant at 5%, *significant at 10%. t-statistics enter parenthesis.

Appendix 4: Conditional effect of income inequality on infant health with gini from WIDER dataset:

	GMM SYSTEM ESTIMATIONS: DEPENDENT VARIABLES							
	UNDER FIVE MORTALITY RATE				INFANT MORTALITY RATE			
dependent variables	Investment profil		Political	civil	ICRG Investment profil		Political	civil
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
LGDPCAP	-0.441***	-0.428***	-0.409***	-0.184	-0.397***	-0.316***	-0.314***	0.0949
	(-5.568)	(-6.447)	(-5.927)	(-0.470)	(-4.533)	(-2.723)	(-4.207)	(0.209)
PHYSICIAN	-0.154**	-0.171**	-0.155**	0.308	-0.173**	-0.131	-0.180***	0.232
	(-2.258)	(-2.288)	(-2.603)	(1.153)	(-2.297)	(-1.343)	(-2.793)	(0.806)
POPDENS	-0.0001***	-0.0001***	-0.0001***	-0.0002**	-0.0001***	-0.0002***	-0.0002***	-0.0002***
	(-3.568)	(-6.474)	(-4.357)	(-2.548)	(-3.620)	(-3.509)	(-4.555)	(-2.993)
IMMUNIZATION	-0.512***	-0.501***	-0.298*	-1.233	-0.632***	-0.929**	-0.442**	-1.718
	(-2.739)	(-2.785)	(-1.717)	(-0.836)	(-3.060)	(-2.484)	(-2.349)	(-1.112)
UNSCHOOLING	0.948***	1.022***	0.888***	3.256*	1.040***	1.679***	0.909***	3.461*
	(3.211)	(3.465)	(3.628)	(1.778)	(3.188)	(3.343)	(3.433)	(1.783)
FERTILITY	0.119***	0.111**	0.153***	0.0831	0.0256	0.00593	0.0880**	-0.0115
	(2.887)	(2.108)	(4.176)	(0.376)	(0.564)	(0.0962)	(2.224)	(-0.0480)
GINI WIDER	0.854*	3.043**	2.081***	13.68**	0.921*	3.244	2.291***	14.69*
	(1.960)	(2.219)	(3.145)	(2.066)	(1.913)	(1.323)	(3.199)	(1.944)
(INSTITUTION) x(GINI WIDER)		-0.350*	-0.322*	-2.625*		-0.326	-0.412**	-2.897*
		(-1.769)	(-1.945)	(-1.755)		(-0.890)	(-2.294)	(-1.688)
INSTITUTION	-0.0587***	0.0715	0.143**	0.977	-0.0613**	0.0699	0.199***	1.148
	(-2.739)	(0.940)	(2.105)	(1.581)	(-2.590)	(0.496)	(2.705)	(1.637)
CONSTANT	0.503	-0.427	-0.912	-7.359	0.203	-1.366	-1.821**	-9.936
	(0.715)	(-0.533)	(-1.258)	(-1.274)	(0.262)	(-0.888)	(-2.321)	(-1.495)
Observations	146	146	180	180	146	146	180	180
NB. Countries	69	69	75	75	69	69	75	75
Hansen OID (p.value)	0.28	0.98	0.33	0.47	0.73	0.92	0.60	0.82
AR(2)	0.96	0.81	0.42	0.42	0.99	0.72	0.76	0.77

***significant at 1%, **significant at 5%, *significant at 10%. t-statistics enter parenthesis.

Appendix 5: Conditional effect of income inequality on infant health with gini from Milanovic dataset.

	GMM SYSTEM ESTIMATIONS: DEPENDENT VARIABLES							
	UNDER FIVE MORTALITY RATE				INFANT MORTALITY RATE			
Independent variables	ICRG	Investment profil	Political	civil	ICRG	Investment profil	Political	civil
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
LGDPCAP	-0.439***	-0.275	-0.403***	-0.550	-0.487***	-0.557***	-0.504***	-1.024***
	(-5.411)	(-1.489)	(-5.936)	(-1.109)	(-6.898)	(-5.966)	(-8.331)	(-2.766)
PHYSICIAN	-0.115**	-0.0967	-0.116***	-0.0257	-0.105**	-0.0263	-0.0976**	0.104
	(-2.404)	(-1.219)	(-2.693)	(-0.167)	(-2.513)	(-0.491)	(-2.548)	(0.734)
POPDENS	-0.0001***	-0.0002***	-0.0002***	-0.0001*	-0.0001***	-0.0001***	-0.0001***	-8.17e-05
	(-4.306)	(-3.270)	(-5.178)	(-1.864)	(-4.489)	(-3.382)	(-4.948)	(-0.971)
IMMUNIZATION	-0.594***	-0.527**	-0.477***	-0.434***	-0.428***	-0.416	-0.324**	-0.348*
	(-3.159)	(-2.274)	(-2.693)	(-2.887)	(-2.615)	(-1.200)	(-2.050)	(-1.798)
UNSCHOOLING	1.090***	2.234**	0.949***	0.903	1.088***	1.206***	0.938***	-0.109
	(3.404)	(2.226)	(3.833)	(0.567)	(3.911)	(2.633)	(4.246)	(-0.0729)
FERTILITY	0.0385	-0.0181	0.0762**	0.00913	0.123***	0.141***	0.145***	0.0476
	(0.888)	(-0.224)	(2.033)	(0.0685)	(3.257)	(2.760)	(4.340)	(0.313)
GINI WIDER	1.287***	10.58**	2.544***	7.907**	1.066***	5.447**	2.038***	9.336**
	(3.050)	(2.368)	(4.100)	(2.328)	(2.907)	(2.560)	(3.683)	(2.293)
(INSTITUTION) x(GINI WIDER)		-1.246**	-0.440***	-1.768**		-0.604**	-0.287*	-2.118**
		(-2.075)	(-2.604)	(-2.099)		(-2.036)	(-1.907)	(-2.154)
INSTITUTION	-0.0397**	0.452*	0.203***	0.709**	-0.0407**	0.210*	0.120*	0.791*
	(-2.153)	(1.904)	(2.849)	(2.051)	(-2.545)	(1.766)	(1.883)	(1.950)
CONSTANT	0.130	-5.198*	-1.171	-1.844	0.524	-0.901	-0.101	2.049
	(0.164)	(-1.800)	(-1.539)	(-0.376)	(0.764)	(-0.662)	(-0.148)	(0.504)
Observations	222	222	257	257	222	222	257	257
NB. Countries	77	77	83	83	77	77	83	83
Hansen OID (p. value)	0.86	0.88	0.84	0.89	0.13	0.30	0.17	0.71
AR(2)	0.71	0.71	0.42	0.27	0.71	0.71	0.23	0.21

***significant at 1%, **significant at 5%, *significant at 10%. t-statistics enter parenthesis.

Appendix 6: Country list

country	country	country	country
Algeria	Egypt, Arab Rep.	Kenya	Rwanda
Argentina	El Salvador	Korea, Rep.	Senegal
Australia	Fiji	Kuwait	Singapore
Austria	Finland	Lesotho	South Africa
Bahrain	France	Malawi	Spain
Bangladesh	Gambia, The	Malaysia	Sri Lanka
Belgium	Germany	Malta	Swaziland
Benin	Ghana	Mauritius	Sweden
Bolivia	Greece	Mexico	Syrian Arab Republic
Botswana	Guatemala	Mozambique	Thailand
Brazil	Haiti	Nepal	Togo
Cameroon	Honduras	Netherlands	Trinidad and Tobago
Canada	Hungary	New Zealand	Tunisia
Central African Republic	Iceland	Nicaragua	Turkey
Chile	India	Norway	Uganda
China	Indonesia	Pakistan	United Kingdom
Colombia	Iran, Islamic Rep.	Panama	United States
Congo, Rep.	Ireland	Papua New Guinea	Uruguay
Costa Rica	Israel	Paraguay	Venezuela, RB
Cyprus	Italy	Peru	Zambia
Denmark	Jamaica	Philippines	Zimbabwe
Dominican Republic	Japan	Poland	
Ecuador	Jordan	Portugal	