Can public policies help developing countries escape from the poverty trap?

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CAN PUBLIC POLICIES HELP DEVELOPING COUNTRIES ESCAPE FROM THE POVERTY TRAP?

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1. Introduction

Every day, developing countries represent a larger share of the world's population. They have currently a significant and major impact on global trends in many areas. Indeed, over the past four decades, the fight against extreme poverty has made great progress around the world, at a faster pace than ever before. This is nothing less than a historic period of global economic growth and development in all socio-economic areas.

Nevertheless, the continuity of this progress is far from guaranteed. Despite all the advances made, inequality between and within countries has recently increased, leaving the remaining poor with even fewer opportunities to escape from the poverty trap. Inequality is therefore a growing concern and the debate on how developing countries can escape poverty is becoming a major political concern.

The fight against global poverty remains one of the most important issues for humanity. The United Nations and the World Bank have even made it their first major goal for 2030. At the heart of this concern is the role of public policy and public spending in helping developing countries reach their goal. Where should governments set their targets? Where should spending be prioritized?

Many governments have attempted to address this issue by developing a number of public policies, such as labour market regulation or social protection. But are these policies really efficient? Do they really contribute to the economic development of these countries? This is clearly a hot topic. Nevertheless, there is not much research on the subject for developing countries compared to developed ones. This is because the available data is poor and there is not the temporal distance needed to have concrete evidence.

The main objective of this paper is to fill this gap in the literature by analyzing the impact of several public policies and government expenditures on poverty in several developing countries. To achieve this objective, we will conduct fixed effect models with a poverty index as the dependent variable and several policies as independent variables.

2. Literature review

Poverty in developing countries represents a major political issue and fighting against it is a fundamental goal. Governments deal with this issue by implementing diverse public policies related to development and labour market. Many studies on the determinants of economic growth and poverty reduction strategies have already been conducted. Several authors have accomplished high-quality analyses that will be very useful for the following of this paper.

First of all, (Sen, 1999) introduced in his book "Development as Freedom "his vision of poverty, instead of defining poverty exclusively as a lack of income he considered poverty as a deprivation of human capabilities. Human development and poverty alleviation mainly depend on the people's capacity to take advantage of their own capabilities as free individuals. Therefore, for Sen, freedom is the means to obtain development and reduce poverty, governments should leave individuals to learn by themselves without regulating too much the markets.

In the USA, all measures to reduce poverty are designed by the Census Bureau. In his paper (Slesnick, 1993) studied the level of poverty by using expenditure data from the Consumer Expenditure Survey and showed that poverty indices based on consumption are much lower than income-based ones. The tendency of poverty rates is sensible to anti-poverty government policies.

Concerning economic growth, the literature agrees that it is a necessary condition for poverty alleviation. To decrease the level of poverty you must have an increase in GDP per capita, and even more in developing countries. By the way, this condition is not a sufficient one. This leaves room for governments to design specific economic development policies (Moges, 2013). Despite the absence of a unique and consistent growth framework, several theories debate the various determinants of economic growth. Two major trends can be distinguished: the neoclassical exogenous theory (Solow, 1956) which emphasized the investment in technology and the endogenous growth theory (Romer et al., 1992) which highlighted human capital.

However, (Dollar et al., 2016) have devoted considerable energy to studying differences in economic growth and poverty across more than 100 countries for 40 years. The average income of the poorest quintile grows in proportion to average income. This is because the income share of the poorest quintile does not fluctuate in line with the mean income. Nor does it vary with most of the policies that account for average income growth rates, nor with those targeting the poorest in society. These data underscore the importance of economic growth for improving the standard of living of the poorest. As well as the difficulty of identifying significant results of government policies to fight poverty.

The close links between growth and human development are frequently debated by policy decisions and institutional factors, like prioritizing investment in health and education over other possible policy measures to reach higher growth rates. A DFID[1] report from 2008 states that growth can trigger virtuous circles by creating more jobs and thus increasing the incentives for families to invest in education by enrolling their children in school. This can result in the emergence of a growing group of entrepreneurs, who will push for better economic governance. Strong economic growth thus enhances human development, which in turn fosters economic growth. The connection also operates in the opposite direction. Higher public expenditures on health and education tend to stimulate growth in the long run because households will benefit from these investments by receiving higher future wages.

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[1] Growth: Building Jobs and prosperity in developing countries (DFID, 2008).

One study demonstrated this link by tracking nine developing countries during the 1990s (Fiestas et al., 2005). This empirical study shows that stronger growth is indeed associated with larger increases in public budgets. In fact, for less economically developed countries, a 10 percent increase in per capita income is associated, on average, with an 11 percent increase in education spending and an 11.4 percent increase in health spending.

(Alexiou, 2009) provided supplementary evidence on the relation between economic growth and public expenditure. This study surveyed several less developed countries in Southeast Europe between 1995 and 2005 using an econometric fixed effect model. Exploring the impact of a range of variables expected to boost economic growth, it found that government spending on capital formation, development assistance and trade openness all have a positive and significant effect on economic development. These results are very useful because they highlight the fact that policymakers can, through economic policies, create the right environment to improve the economic situation of countries. But in the analysis of the impacts of public policies, the structure of economic growth also matters. According to (Khan, 2001), in a traditional capital-intensive growth, these government policies have frequently not helped to reduce poverty, whereas in an agricultural growth environment they almost always had strong positive effects.

Furthermore, many economists devote a considerable part of their research to the study of inequality and poverty in different regions of the world. Martin Ravallion is part of this movement. Throughout his book "The economics of poverty: History, measurement, and policy" (Ravallion, 2015), he studied the role that social policies have played in countries that have already succeeded in eliminating poverty to become richer countries. His work has allowed him to conclude that even in very poor economies, it is possible to implement targeted social policies to raise the living standards of the poorest and decrease inequality within the population. Inequalities in economic growth across OECD countries can extensively be explained by differences in investments, human capital and policy settings. Variations in institutional policies are definitely translated into changes in living standards (Bassanini et al., 2001).

Still going further, in an empirical study carried out in India (Jha et al., 2000), the impacts of government expenditures on poverty had been tested through unbalanced panel data techniques over 17 Indian states. This study affirms that education and health expenditures reduce significantly poverty. Effects are even bigger for high levels of education. In turn, (Chang, 2002) showed that in several developing countries of East Asia, social-economic policies had played a major role in the economic development. They had been very useful to solve various social problems and produce an increase in investments and technological progress. By analyzing more than a hundred developing countries in the late 20th century, (Baldacci et al., 2004) explored in a panel data the impacts of social policies and spending on living standards. Their findings are that education and health expenses have a positive effect on the accumulation of education and health capital. Therefore, a rise in expenditures in these specific sectors can be helpful to drive a country to a lower level of poverty. Although this paper also assumes that higher spending is not a sufficient condition, other policy interventions on inflation and governance are needed to obtain these outcomes.

Furthermore, (Furceri et al., 2012) have focused on the short-term impacts of different social spending on economic trends in OECD countries. Their empirical results are statistically significant and state that a rise of 1 per cent in social spending increases GDP per capita by approximately 0.1 percentage point. More specifically, they claimed that expenditures on social protection such as unemployment benefits have the largest effects. However, (Laabas and Limam, 2004) have used an endogenous framework to analyze interactions between public policies, poverty and economic growth. Their results expose that government policies have only an indirect impact on poverty by affecting the income distribution and those public expenditures affect more positively the degree of severity of poverty than the number of poor people.

Then, minimum wage is a key measure of worker protection in many countries. Its main goal is to ensure a decent level of living for employees and is commonly implemented by law or through collective bargaining. In many developing countries, its importance is even stronger because of the split in their labour markets between formal and informal employment. Nevertheless, the effectiveness of minimum wages is a subject of constant controversy. The best-known model on this topic is the one developed by the neoclassicals (Card et al., 1995), which states that the level of employment depends on the supply of labour, the demand for labour and the minimum wage. According to this theory, the existence of a minimum wage is detrimental to the equilibrium of the labour market. Firms, which are supposed to pay employees according to their productivity, are disadvantaged if they hire a worker who yields less than the cost of the minimum wage.

Concretely, concerning the effects of minimum wage laws, we obtain some ambiguous conclusions (Gindling, 2018). (Wilson, 2012) studied their impacts in the USA since 1938. This analysis points out two major issues of increasing the minimum wage. First, it does not empirically reduce poverty but in addition, it causes collateral economic damage by decreasing job opportunities for low-skilled workers.

Still going in the same direction, (Lustig et al., 1997) followed numerous developing countries to focus on the influence of rigid government decisions. Many poor countries are acting on salary thresholds to become more internationally competitive, but this research highlighted the fact that raising minimum wages in developing countries can notably hurt the low-income population by raising unemployment and reducing efficiency in the long-term. This theory had been demonstrated by the research of (Laroque et al., 2000). According to its findings, a 10 percent increase in the minimum wage in France would eliminate about 290,000 jobs in the long run. The least qualified and young people would be the most affected. In fact, the minimum wage would make these workers unaffordable because the salary would be higher than their marginal productivity, which makes them vulnerable.

Then, a Turkish study (Aslan et al., 2015) used as methodology a regression of the number of jobs on a minimum wage variable, a demand variable (GDP) and a labour supply control variable (labour force). The results indicate that in the long-run equilibrium, the minimum wage has a negative impact on the total number of jobs, while GDP and the labour force have a positive impact. This elasticity of total employment with respect to the real minimum wage is negative and of the magnitude of -0.26. Hence, a 10 percent increase in the real minimum wage would, all other factors being equal, lead to a 2.6 percent decrease in total employment in the long run.

On the other side, other studies have highlighted the positive effects. In Brazil, (Carneiro et al., 2001) analyzed the effects of the minimum wage on both the formal and informal labour markets for the period 1982-2000. These results confirmed a robust and negative impact of the minimum salary on the employment level of the formal sector. However, this study also looked at the informal market and found the opposite effect on it. In other words, an increase in minimum wages creates unemployed workers in the formal sector who then move to the informal sector and thus increasing the quantity of employment in that market. Moreover, they claim that increases in the minimum wage have resulted in a significant reduction in poverty in Brazil. While in Ghana (Obeng, 2015), estimation results showed evidence that an increase in minimum wage can have a positive and statistically significant effect on economic growth and poverty both in the long and short run. But this raise must be joined by a simultaneous increase in investment spending.

To extend the study to other public policies, (Goodspeed et al., 2011) studied the impact of public policies on foreign investment in developing countries. This econometric analysis demonstrates that government policies have a positive significant effect on foreign direct investment and so indirectly on wages, exports and growth. And for their part (Romer et al., 1998) observed the impacts of

monetary policies on poverty and inequality. Their econometric regression revealed that an expansionary monetary policy has positive and significant effects on living standards for the poor in the short run, especially measures that aim for low inflation and stable aggregate demand.

(Besley et al., 1992) have analyzed the effects of an improvement in working conditions on poverty in both developed and developing countries. Thanks to their experiment, they were able to conclude that there exists a deterrent argument that well-implemented policies on work requirements can be used as a device to motivate poverty-reducing investments. Then, regarding trade unions, there is not much research on their direct impacts on poverty, they are often neglected. However, (Brady et al., 2021) tried to capture this by analyzing how the US poverty level evolves while state-level union density is incorporated. This study showed that trade unions have a significant negative effect on poverty, thus increasing state union density could be very useful for governments and should be considered when designing public policies.

Yet, according to (Galli, 2001), child labour can highly affect long-run growth and social development, and thus government should act against it. Indeed, child labour might have a negative impact on economic growth through different paths: lower human capital accumulation, higher fertility and worse health. Hence, having a high rate of children's participation in the labour force slows down growth but also social development and poverty. By the way, without some significant and efficient changes through public policies, the negative impacts of child labour will continue to grow in many developing countries for a long time. Having economic growth is not sufficient to alleviate child labour and its arising issues. This is due to an inverted-U relationship between child labour participation and GDP per capita (Tesfay, 2003).

Moreover, to study the effects of investments on education, (Coulombe et al., 2004) used literacy rates in a panel data analysis between 14 OECD countries. The outcomes indicate that an increase of 1 percent in literacy scores conduct to a rise of 1.5 percentage points in GDP per capita and have also an impact on the long run welfare of nations. (AFZAL, 2011) also showed that education is an important determinant of income for individuals through a micro econometric study. On the other hand, in a Swedish experiment, (Krueger et al., 1999) discovered that in OECD countries the level of education does not have a significant effect on economic growth and would induce that education public policies are inefficient. A comparable study had been conducted in Jordan (Al-Shatti, 2014) and came to the same conclusions that public expenditures on education do not impact positively economic growth and poverty. Unlike expenditures on health and economic affairs. Hence, the relationship between educational level and poverty alleviation is not universally accepted.

Finally, many authors highlighted the fact that analyzing public policies effects is very difficult due to time lags between the implementation and the outcomes. Even for high-income countries, there are a limited number of studies (Krueger et al., 1999). However, through the experience carried out in the Indian state of Kerala since 1956, (Jeffrey, 1992) and (Sinha, 1977) both concluded that this is a clear proof that well-planned policies and high public spending on social sectors such as education and health can clearly improve the quality of life for citizens, the level of development and generate a long-term sustainable economic growth.

As far as we know, there are no papers that quantify the impact of multiple public policies and public expenditures at the same time on poverty in developing countries. The literature often focuses on the welfare outcomes of a single component of social variables and rarely captures feedback effects. The main goal of this paper is to fill this gap in the literature by analyzing the impact of several public policies and government expenditures on poverty.

3. Definitions and concepts

3.1 Developing countries

A developing country is often defined as a sovereign state with an underdeveloped industrial base, low standard of living and low Human Development Index (HDI) relative to other countries.

By the way, this categorization developing/developed is becoming less relevant and is not really used anymore because there was no clear agreement on the frontier between these 2 groups. The World Bank replaced this with a more economic classification based on the gross national income (GNI) per capita in U.S. dollars converted from local currency using the World Bank Atlas method.

There are currently 4 income groups (thresholds are updated each year):

1. low-income countries: GNI per capita of $1,045 or less
Example: Mali, Afghanistan, Somalia, …

2. lower-middle income countries: GNI per capita between $1,046 and $4,095
Example: Algeria, Bolivia, India, …

3. upper-middle income countries: GNI per capita between $4,096 and $12,695
Example: Mexico, China, Brazil, …

4. high income countries: GNI per capita of $12,696 or more.
Example: Canada, Belgium, Spain, …

The three first groups are together named as "low- and middle-income countries" (LMICs) and are often used to refer to developing countries while high-income countries make reference to developed countries.

Some common characteristics of developing countries:

- Low living standards and productivity
- Low share of industry in GDP
- Low level of human capital
- Poor infrastructure
- High degree of inequality
- High level of absolute poverty
- Large rural population

Nowadays, developing countries represent a bigger share of the world population. According to the World Bank, there are currently 152 developing countries with a global demographic of about 6.2 billion which represents a share of 85.22% of the world's inhabitants.

Hereunder, we can observe that there is a general geographical trend. "Developed countries" are nearly limited to North America, Australia and Europe, whereas "developing countries" are highly represented in Africa, Asia and Southern America.
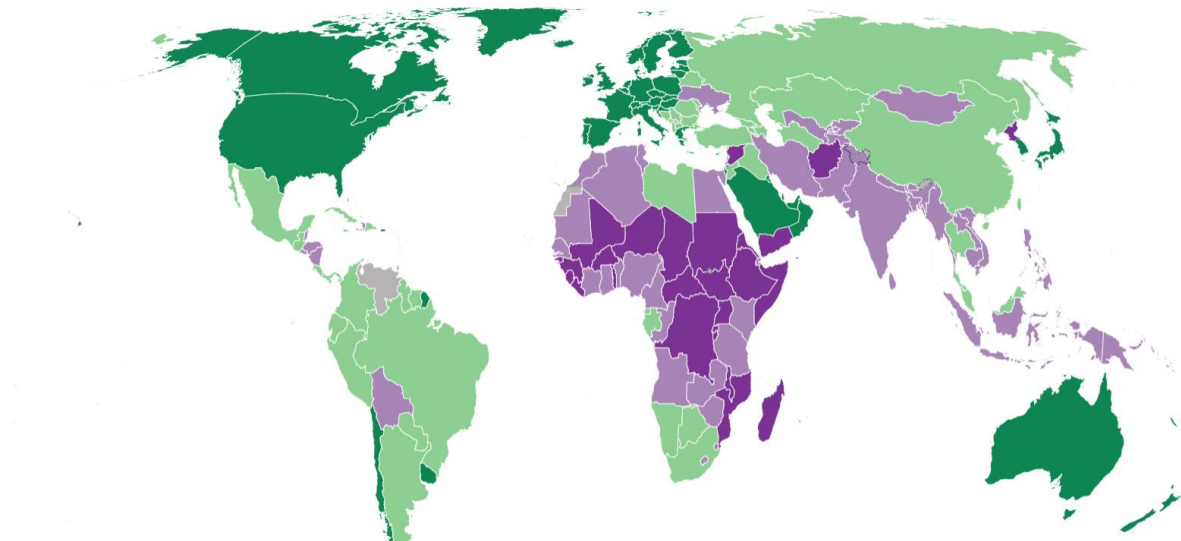
Source: The World Bank

3.2 Public Policies

In any country, governmental entities design policies, elaborate laws and allocate resources. The lives and behaviours of citizens all around the world are regulated and bounded by public policies, whether we are aware or not.

According to Thomas Dye, public policy is "whatever governments choose to do or not to do".

Chandler and Plano defined them as "the strategic use of resources to alleviate national problems or governmental concerns".

While David Easton stated public policy as « the authoritative allocation of values for the whole society ».

In general, public policy can be defined as a set of regulatory measures and funding priorities conducted by a government to solve social issues. They can take various forms like legislation, executive orders, official acts or regulations. But no matter the nature of the policy, this one must contain a clear objective or purpose. In addition, this concept is obviously linked to areas where collectivity is involved.

The role of a public policy is to increase the standard of living in society and to eliminate socio-economic problems by acting in many different fields.

Indeed, public policies can act in numerous major segments such as:

- Agriculture and sustainable development
- Economy
- Employment and work
- Health
- Social affairs
- Security and justice
- Education

However, the attention given to public policies is in general far too strait and limited to a political point of view. There are rarely seen as an essential component of long-term growth or as a measure to fight poverty.

3.3 Poverty

Definition

Poverty is a multidimensional concept that is commonly considered to be a measure of the deprivation of basic needs that face an individual, family or population. It refers to the state where a person cannot afford minimum standards of living. This deprivation can consist either in a lack of resources (monetary or not), capabilities (skills, knowledge, …) or access (water, health, job opportunities, …).

Worldwide figures and trends

According to United Nations:

- Around 700 million people live with less than $1.9 a day in the world in 2021.
- +- 9.2% of the current world population lives in extreme poverty, while we were at 36% in 1990.
- In developing regions, around 20% of the population lives in extreme poverty.
- Women have a bigger probability to live in poverty compared to men.
- Children and youth (below 25 years old) represent 2/3 of the world's poor.
- About 70% of people older than 15 who are in a state of extreme poverty have no schooling.
- Currently, rural poverty rate is higher than urban poverty rate.
- For the first time in over 20 years, we moved backwards in 2020 in the fight against global poverty (+ 97 million new poor people). This is mainly due to the Covid-19 pandemic, but also to the lack of efficient public policies for this low-income population.
- By 2030, the main goal of the UN Sustainable Development is to totally eradicate poverty all around the world.
- Africa is by far the most represented continent in terms of extreme poverty, followed by South America and Asia. The spread of poverty is very uneven all around the world.

Types of poverty

There exist several types of poverty based on the way to identify and analyze it:
- Absolute (it is the lack of means to afford basic needs such as food, clean water and health. This type of poverty is usually measured by the "1 dollar a day line". Mainly used in developing countries).
- Relative (it is a poverty viewed from a social perspective; it is a comparison with living standards within a population. It can be considered as a measure of income inequality. Mainly represented in developing countries).
- Situational (temporary poverty that occurred following an adverse event).
- Generational (long term poverty, people and family are trapped in it).
- Urban (occurs in metropolitan with bigger population).
- Rural (occurs in rural areas with low population).

Poverty measures

The most frequently used tool to measure poverty is the international poverty line (PL), which works as a threshold separating poor from non-poor. The poverty line is set at a monetary value for a daily basic basket of goods and services necessary to survive. If a person's income is below, he will be considered as a poor person. This method focuses exclusively on the monetary aspect. First, in 1985, the World Bank had settled the one-dollar-a-day PL using the purchasing power parity exchange rate to convert this PL into national currencies for every country. Then, they made some updates (as the cost of living raises) and move on to $1.08 (2000), $1.25 (2005) and finally the current universal standard is $1.90. All quantitative measures of a country's poverty level are based on this line in their calculation (Headcount ratio, Poverty gap, ...).

Poverty trap

A poverty trap is a situation in which poverty forces people to stay poor. It is a hellish cycle in which individuals or populations remain stuck in a state of poverty without being able to escape from it. It is a genuine trap where poverty itself is a clear cause of poverty. This trap is a generational type of poverty because it is not temporary but persistent in the long term.

There are various factors that cause poverty traps to emerge and make this issue multidimensional and very complex to deal with it. However, governments are not out of options. There is still room to design public policies to attempt pulling out one economy from the trap.

4. Link between economic growth and poverty

For a very long period of time, people have considered economic growth as the ultimate solution to raise living standards and eliminate poverty in the world. In this section, we will study the exact relationship between economic growth and poverty.

4.1 Definition

As a definition, we can use: "Economic growth is a long-term increase in the quantity and quality of the economic goods that a society produces and consumes." (Roser, 2013)

Concretely, it means that economic growth is the process by which a country's wealth rises over time, generally over a long period.

To measure growth, it is common to use inflation-adjusted GDP (real GDP). The gross domestic product (GDP) of an economy is a measure of total output. Specifically, it is the monetary value of all final goods and services produced in a country during a specific period.

4.2 History

Sustainable economic growth is a very recent phenomenon, that appeared about 200 years ago with the Industrial Revolution. Until that time, GDP and world population were growing at the same rhythm, which resulted in constant standards of living on average. During this era, we were in what economists commonly call the Malthusian trap. `

This growth model is used to explain the stagnation of living standards in pre-industrial economies (a mix of ups and downs in the growth rate of GDP per capita, with no upward trend over time).

In this pattern, technological improvement does not lead to a rise in the standard of living but to an increase in the size of the population. Indeed, all productivity gains were spent on feeding the additional newborns. Thus, the long-term effect of an increase in productivity is an increase in population size.

However, the Industrial Revolution marks a radical break in history, resulting in population growth, increased life expectancy, strong growth in productivity and a rise in the schooling of children.

Since then, the economy has relied on physical and human capital and the growth of per capita income has absolutely taken off. As we can see in the figure below, the world's GDP per capita started to grow exponentially around 1800.

World GDP over the last two millennia
Total output of the world economy; adjusted for inflation and expressed in international-$ in 2011 prices.
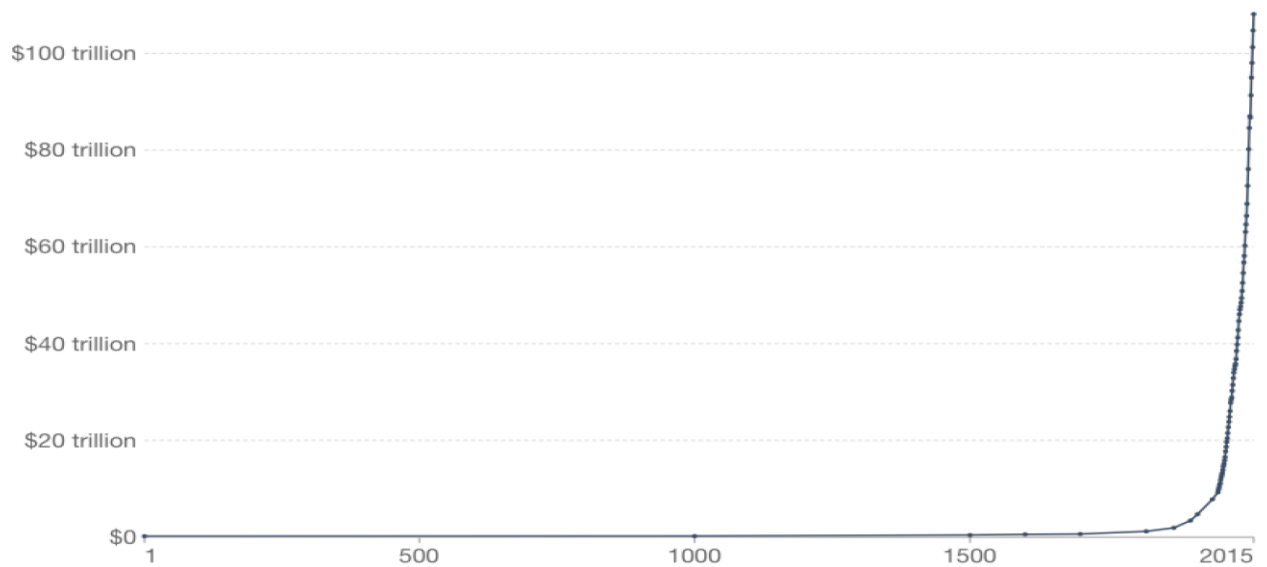
Source: World GDP - Our World In Data based on World Bank & Maddison (2017)   OurWorldInData.org/economic-growth • CC BY

Without going into any details, several economic models have tried to explain the long-term growth. One of the best known is the Solow model (1956), which states that, at constant saving rate, income per worker increases only if the capital stock per worker also increases. The problem is that this stock of capital per worker cannot grow forever because it depends on capital investment, which has diminishing marginal returns.

And raising the saving rate would only be a short-term solution because it cannot be raised forever; its limit is 100% of income. Therefore, diminishing marginal returns to capital investment will always prevail. Hence, for Solow's supporters, technology is the main and unique engine of growth.

Then, there have been also many endogenous growth theories, such as the Romer model (1986) or the Lucas model (1988), that have brought their contribution to growth theory. Overall, they agree that technological progress is essential to obtain growth, but this progress depends on several factors such as the economic system and /or human capital.

4.3 Link with economic development

Unlike economic growth, which is a narrow term that implies only an increase in output in quantitative terms, economic development is a broader concept that includes improvements in qualitative terms (such as social attitudes and health status) in addition to quantitative growth in output or national income.

Indeed, economic growth is only a component of development. Economic development is defined as a sustained improvement in the well-being of the society and embraces changes in the rate of capital formation, the size and composition of the population, technology, skills and efficiency, etc.
This is intended to achieve broader goals such as a more equitable distribution of income, increased employment and poverty reduction. Overall, economic development reflects progress in the quality of life in a country and the growth of human capital.

To measure economic development, the HDI (Human Development Index) is mainly used, which is a composite indicator of different variables: life expectancy (health), schooling duration (education) and income per capita (standard of living). Its goal is to summarize a healthy and decent standard of living.

When we compare both measures together, we can observe a strong correlation between HDI and GDP per capita. This is quite normal because the average income is part of the computation to obtain HDI, but it's still interesting.

4.4 Is economic growth the solution to eliminate poverty?

Now that we have explained what is economic growth, one question is obviously arising: can economic growth be the solution to eradicate poverty?
Of course, many people make the mental shortcut between economic growth and prosperity because the wealth of a country is a powerful indicator of the standard of living within a population.

Many economists, such as (Agrawal, 2007), studied the relationship between economic growth and poverty, and it has been unanimously concluded that growth is essential in the fight against poverty.

The share of people living in extreme poverty vs GDP per capita, 2017

Both measures are adjusted for inflation over time and for price differences between countries (PPP adjustment) and are expressed in 'international dollars' in 2011 prices. Extreme poverty is defined as living with less than 1.90 int.-$ per day.

Source: World Bank, PovcalNet

OurWorldInData.org/extreme-poverty/ • CC BY

The graph above represents the relation between the average income (GDP per capita) and the share of the population living in extreme poverty. We can clearly observe that the proportion of the population living in severe poverty is low when average incomes are high. For instance, the figure shows that currently there is not even a single nation with a GDP per capita of over US$ 16,000 where more than 6% of the population is suffering from extreme poverty.
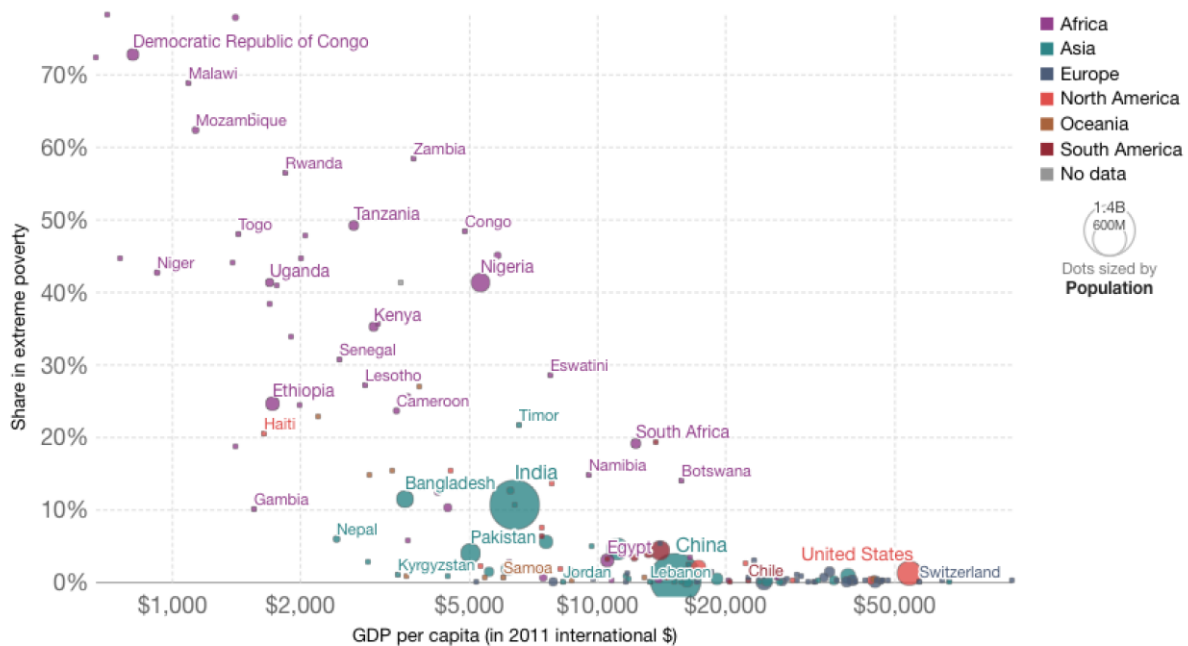
Therefore, the graph supports the findings of the literature that there is definitely a negative relationship between the economic growth of a country and its poverty level.

In this regard, (Dollar et al., 2002) have studied the importance of economic growth and inequality for poverty reduction. Their results were clear: economic growth is good for the poor, and even necessary in the fight against poverty. Specifically, they observed that the incomes of the poor increase on average in proportion to average incomes, hence growth is as beneficial to the poor as to any other person in society. In fact, if there is enough wealth in the country, all segments of the population will gradually benefit from it. This is regularly known as the "trickle-down" effect. The more the country grows economically and becomes rich, the more the poor will benefit from the money reinvested in the country through investment and consumption. Thus, public policies should put the target of economic growth at the centre of any poverty reduction strategy.

However, the literature is unanimous that growth in GDP per capita is necessary but by no means sufficient to improve the quality of life of the poor (Odhiambo, 2011). History has shown that the trickle-down effect does not always work for developing countries, as it was the case at the end of the 20th century in Africa for several less developed countries. In fact, the evolution of poverty also depends on the evolution of inequality. If economic growth only raises the incomes of the rich, poverty levels will remain constant. For example, since the beginning of 1990 inequality has increased in India, while in Latin America it has decreased, even though both regions have experienced growth (Lustig et al., 2013).

In addition, as we saw earlier in the previous section, poverty is multidisciplinary and does not depend only on the income level of the individual but gets closer to the HDI definition. If we compare countries in the table below which displays the HDI and GDP per capita of several nations, we may obtain surprising results. This is the case for Guinea and Nigeria for example. Indeed, even if the 2 countries have the same HDI, they have very different GDP per capita. Guinea has a GDP per capita almost twice that of Nigeria, yet it is not more developed. A good average income is therefore not enough for a country to develop and improve the quality of life of its entire population.

Country	Relative Ranking (lowest to highest)	Human Development Index (HDI)	Real 2004 GDP Per Capita (PPP, U.S. $)	GDP Rank Minus HDI Rank
Low Human Development				
Niger	177	0.311	779	−7
Ethiopia	170	0.371	756	+1
Malawi	166	0.400	646	+10
Tanzania	162	0.430	674	+13
Angola	161	0.439	2,180	−32
Guinea	160	0.445	2,180	−30
Nigeria	159	0.448	1,154	−1
Medium Human Development				
Bangladesh	137	0.530	1,870	+7
Pakistan	134	0.539	2,225	−6
India	126	0.611	3,139	−9
South Africa	121	0.653	11,192	−66
Turkey	92	0.757	7,753	−22
Peru	82	0.767	5,678	+12
China	81	0.768	5,896	+9
Saudi Arabia	76	0.777	13,825	−31
Brazil	69	0.792	8,195	−5

To resume, the main lesson is that consistent growth has already lifted millions of people out of severe poverty and is a key to improving the quality of life around the world.
While much of the variation in poverty levels across countries over time can be explained by differences in economic growth rates, not all can. The degree to which growth decreases poverty is dependent on the measure to which the poor participate in the growth cycle and benefit from it. Economic growth is therefore a necessary but not a sufficient condition for poverty eradication (Moges, 2013).

5. Empirical evidence: a closer look at the Kerala model

In order to provide support for our hypothesis that public policies can play a role in reducing poverty in developing countries, we will develop an empirical result that took place in India at the end of the 20th century. This model is called the Kerala model and is an illustration of the effectiveness of development policies.

5.1 Initial situation

In the beginning, the region of Kerala was known as one of the poorest in India. In addition to being very poor, the state of Kerala had also one of the smallest development levels of the country. It suffered from very high infant mortality rate, gender inequality and low life expectancy. Then in 1956, Kerala became an Indian state and could make its own development decision and design its own policies in some fields.

5.2 Policies implementation

Since this, the state's leaders took legislative actions on education by implementing the Kerala Education Bill. This law says that teachers' wages and working conditions are now regulated by the state government with the aim of improving them. Then, they continued in the same direction by increasing significantly their spending in social sectors such as public health, education and land distribution. They considered human development as the key point to raising the living standards of the population and gave full attention to it.

As we can see in the next figure, in India it was uncommon to make so much spending in social sectors at least until 1980. For example, in the year 1981, the expenditure on social sectors as a proportion of all budgetary expenditures of state governments was 45.7%in Kerala while the average for all the other states of India was 29.8%.

Figure: Expenditure on social sectors as a proportion of all budgetary expenditures of state governments, Kerala and all Indian states.
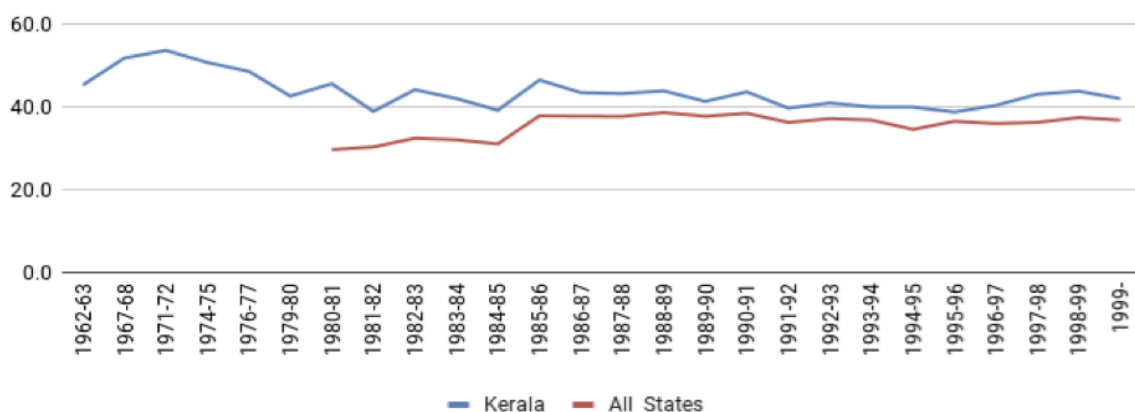
Source: The India Forum

Further, the state government also managed to boost the economy by augmenting the general level of real wages received by casual workers. They ensured that the benefits earned by the labour force were spread equally within the state's population. These higher wages have stimulated Kerala's economic growth process and led to a rise in demand and consumption.

5.3 Results

Nowadays, Kerala is clearly one of the most prosperous states in India. Since the 1970s, this region has experienced year after year outstanding progress in human development areas, mainly in education, health sector and inequalities. Its economy continues to grow rapidly and benefit from all the human capital investments over the decades.

Concerning GDP per capita, the evolution of Kerala is even more stunning. In 1987-88, it was 22% less than the average per capita income of India, but then it experienced a rise to catch up with the Indian average level in 1993-94 and climbed even higher since then. In 2018-19, it was even 60% higher than the average.

Figure: Ratio between per capita income of Kerala and per capita income of India, various years.
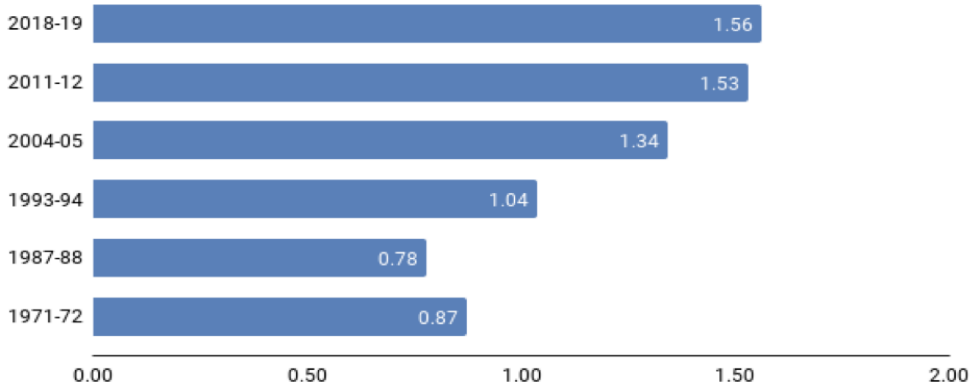
Source: The India Forum

The reason why this evident income growth had arisen in the late 80s and not directly after the policy's implementation is because of the feedback effect. With human capital, it is normal that it takes a long period to really bear the fruits of the investments and to create a real reserve of talent.

Moreover, this growth had been quite egalitarian. Nearly all sectors have benefitted from it. Agriculture, construction, banking, transport and services have all been able to take advantage of the stock of human capital and have encountered a long-term growth.

5.4 Conclusion

Overall, this experience carried out in Kerala in the second half of the 20th century showed the falsehood of the thinking that an increase in government spending in social sectors moderates and slows down economic growth.

Thanks to the many policies implemented progressively during decades, rises in education and health level provided the foundation for a positive thrust in economic growth and business activities. It is a clear illustration of the power of public actions.

In accordance with the last ranking submitted by the Indian Union Government, Kerala is part of the top 3 Indian states in terms of investment and business environment.

To sum up, high investment in social sectors through policies and public spending improved inhabitants' quality of life and contribute to an increase in economic growth.

6. Empirical work

6.1 Methodology

As most developing country governments place poverty eradication at the top of their agenda, they design many public policies to achieve this goal. Therefore, the intuition behind this study is that public policies should have a positive impact on a country's level of poverty. For example, an increase in the share of government expenditure targeting the education sector should induce a better level of literacy, a decrease in children out of school and in the long-term, fewer unskilled workers and consequently, less unemployment and higher wages. Hence, the number of poor people should definitely decrease. Of course, this would be the ideal framework, and it is what we want to verify with some econometric regressions.

To capture how developing countries are impacted by public policies, datasets on various governmental measures are treated. These databases have been mainly extracted from The World Bank and International Labour Organization websites.

The period covered is from 2000 to 2019. Therefore, it will be possible to have the necessary hindsight to really observe the effects of policy measures in the short term but also in the longer term.

In the econometric model, data on minimum wage, child labour, public spending on health, public spending on education, total government expenditure, GDP level, average years of schooling, and poverty indices will be used. This will enable the creation of 3 models, each with a different poverty index as a dependent variable. Concerning the independent variables, these are all the others listed above.

In addition, a selection of developing countries had to be made in the process. In fact, some of them did not report data for all the variables included in the models. Therefore, the concept of developing countries is reduced to a sample of 34 developing countries coming from different continents (Europe, Asia, South America, North America and Africa).

Hereunder is the list of the studied countries:
- Africa: Benin, Burundi, Cameroon, Chad, Cote d'Ivoire, Ghana, Jamaica, Lesotho, Madagascar, Mali, Niger, Senegal and Togo
- South America: Argentina, Brazil, Colombia and Paraguay
- North America: Costa Rica, El Salvador and Mexico
- Asia: Azerbaijan, Bangladesh, Georgia, Indonesia, Iran, Lebanon, Pakistan, Philippines, Thailand and Tajikistan
- Europe: Moldova, Romania, Russia and Ukraine

6.2 Sample and data

All the data regarding the variables below will extend from the 2000 to 2019 period and will be given yearly.

Poverty index

The most widely used measurements of poverty are the first three measures of the FGT class (Foster, Greer, and Thorbecke, 1984).

This is given as follows:

$$Y_\alpha = \sum [(z - y_i) / z]^\alpha / n$$

where Y is the poverty measure, yi is the income of the ith household, z is the poverty line, n is the population size, and α is a nonnegative parameter that takes the value 0,1 or 2 depending on the poverty index (respectively Headcount ratio, Poverty gap, Squared Poverty gap). These 3 indices are referred to as providing measures of the incidence, depth and severity of poverty.

Headcount ratio (α=0)

This is the most common way to quantify poverty. The first step is to set a poverty line (ex: $1.90 per day), then all you must do is to count the number of people living with less than this threshold and finally divide the amount obtained by the whole population. This method brings blunt information easy to interpret, it gives the proportion of the population living in a state of poverty. However, this method fails to capture the intensity of poverty. A person that lives with an income far below the poverty line will be accounted for the same weight as an individual living close to this line.

<div style="text-align:center">Mean: 20.62   Max: 84.36   Min: 0</div>

Poverty gap index (α=1)

The poverty gap index is another measure of poverty that shows the size and the intensity of poverty in a country, it gives a new dimension compared to the HC ratio. It is computed as the average shortfall (amount of money needed to reach the poverty line, calculated across the total population) of the entire population and expressed as a percentage of this line.

<div style="text-align:center">Mean: 7.74   Max: 44.24   Min: 0.00</div>

Squared poverty gap (α=2)

It consists in the mean squared shortfall of income from the poverty line, where the shortfall is expressed as a proportion of the poverty line and then squared. The SPG captures not only the distance of the poor from the poverty line but also the inequality among the poor by squaring the distance of the poor from the poverty line. Therefore, in this empirical analysis, we will make regressions on these 3 measures as dependent variables.

<div style="text-align:center">Mean: 171.00   Max: 1956.74   Min: 0.00</div>

Child labour

Here for child labour, we are going to use a dummy variable that refers to the ratification of policy C138 (Minimum wage convention No.138). This convention specifies that each member state for which this convention is in force commits itself to develop a national policy for the effective abolition of child labour and to gradually increase the minimum age for admission to employment (except light work) to 15 years. However, it is important to notice that "a Member whose economy and educational facilities are insufficiently developed may, after consultation with the organisations of employers and workers concerned, where such exist, initially specify a minimum age of 14 years." (C138, art. 2).

Thus, this variable would take the value of 1 if the country has adopted this convention or have a minimum age for work of 14 years or older through another convention, and 0 if the country allows work at a younger age.

Many low-income countries allow young children to work, thinking that having a larger labour force will boost the market. According to ILO, there are more than 150 million children working worldwide. The biggest problem is that child labour has obvious negative effects on the human accumulation of children and hinders inter-generational development.

Under a latest study carried out by ILO in 2004, it has been shown that there is a strong relationship between poverty and child labour. It also stated that cutting back on child labour in developing countries can yield high economic benefits.

Mean: 0.88   Max: 1   Min: 0

Government education/health spending

These variables are the share of total government expenditure that has been distributed to the health sector and to education. They are expressed in percentages and are computed by dividing expenses on education (or health) by the total government expenditure on all sectors and then multiplied by 100 (data taken from the World Bank and World Health Organization websites). They indicate to what extent the government considers education and health as a priority and how much they believe in the benefits of investing in human capital. These expenses refer to all the money spent in these fields by national, regional and local government authorities.

There are already a few empirical studies that have analyzed the impact of these two variables on poverty indices. (Jha et al., 2000) and (Baldacci et al., 2004) have demonstrated through panel data that education and health expenditures have a negative relation to poverty and therefore contribute significantly to its reduction. We will analyze whether now, with better databases and added to other variables, they still have the same impact.

Education: Mean: 16.23   Max: 37.52   Min: 5.50

Health: Mean: 9.32   Max: 33.10   Min: 0.63

Minimum wage

As explained in the literature review, the minimum wage is an essential measure of worker protection in many countries. Nevertheless, there is no consensus on its effectiveness.

For example, (Lustig et al., 1997) tracked many developing countries acting on the wage threshold. This research highlighted the fact that increasing minimum wages in developing countries can harm

the low-income population by increasing unemployment and reducing the efficiency of the labour market in the long run and ultimately increasing the poverty rate.

While in Ghana (Obeng, 2015), results of a similar survey showed that an increase in the minimum wage can have a positive and statistically significant effect on a country's economic growth and poverty in both the long and short run.

The data of this variable corresponds to the nominal gross monthly minimum wage for any employees in each country. We applied the minimum wage reported by the country, or in the case if there is no national threshold a mean of several regional minimum earnings is computed. For countries where this limit is set at the sectoral level, the minimum wage in manufacturing (often unskilled workers) is used. These datasets were retrieved from ILOSTAT except in a few cases where we had to take information from the WageIndicator website. This data is converted to U.S. dollars using the 2017 purchasing power parity exchange rate.

<center>Mean: 125.33   Max: 605.21   Min: 0</center>

Government expenses

This variable (data comes from the World Bank) is the total government spending as a share of national GDP, expressed in percentage. These expenditures refer to all cash payments for government activities to provide goods and services. It embraces employees' compensation, interests, subsidies, social benefits, grants and rents. Indeed, government expenditure is the most important tool of a country and the one that best reflects a country's public strategies. This variable is at the heart of the study we are conducting because governments spend a lot of money in order to achieve their objectives such as the elimination of poverty. Moreover, we have seen through the example of Kerala in India that this could be useful to countries, so we will see if this is really the case.

<center>Mean: 13.93   Max: 43.48   Min: 3.59</center>

GDP per capita

We will use the GDP per capita, PPP at constant 2017 international dollar price. It corresponds to the per capita gross domestic product converted to international dollars using purchasing power parity rates. It measures a country's economic output per person, thus the economic wealth of a population. As shown in the section dedicated to growth, GDP per capita is a necessary condition to fight against poverty. Therefore, we will use GDP per capita as a control variable which aims at accounting for wealth factors that clearly impact poverty. The data comes from The World Bank.

<center>Mean: 8477.26   Max: 29875.06   Min: 751.66</center>

Education index

The link between poverty and educational level is a very common topic in economic research. The literature is unanimous on the subject in saying that there is a correlation between the levels of education and poverty in a country, the latter decreasing considerably as the level of education increases. According to a study conducted by UNESCO[2], if all adults were to complete secondary education, it would lift 60 million people out of poverty.

As a variable for educational attainment, we use the average number of years of education received by people ages 25 and older. This data had been retrieved from the United Nations Development Programme.

<center>Mean: 6.95   Max: 13.10   Min: 1.10</center>

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[2] World Poverty Could Be Cut in Half if All Adults Completed Secondary Education (UNESCO, 2017).

6.3 Descriptive statistics

International Head-count ratio (HC)

Ranking	Country	Difference HC between 2019 and 2000	Ranking	Country	Difference HC between 2019 and 2000
1	Niger	40.95	18	Brazil	7.49
2	Moldova	35.07	19	Cameroon	7.31
3	Tajikistan	32.63	20	Mexico	7.24
4	Indonesia	32.01	21	Togo	6.85
5	Lesotho	30.87	22	Costa Rica	5.71
6	Mali	30.67	23	Argentina	5.33
7	Chad	29.69	24	Burundi	4.83
8	Bangladesh	27.60	25	Cote d'Ivoire	3.69
9	Pakistan	24.16	26	Romania	3.37
10	Senegal	23.51	27	Russia	3.06
11	Ghana	21.58	28	Ukraine	2.92
12	Georgia	15.42	29	Thailand	2.32
13	Colombia	11.81	30	Iran	2.10
14	El Salvador	11.14	31	Azerbaijan	2.08
15	Benin	10.86	32	Jamaica	1.11
16	Philippines	10.51	33	Lebanon	0.00
17	Paraguay	8.67	34	Madagascar	-10.21

Data source: The World Bank

Here is a table of all the poverty reduction performances of the developing countries included in the sample. To measure progress, we have calculated the difference for each country between the HC ratio in 2000 and in 2019. The countries with the largest amounts are the ones that have been able to reduce the most poverty in their territory in absolute terms. We can observe that the 3 best performing countries are Niger, Moldova and Tajikistan.

Therefore, in the following descriptive statistics, only these top 3 countries will be discussed for simplicity (except for child labour). However, an overall analysis covering all countries in the sample is given at the end of each section.

Evolution poverty gap index
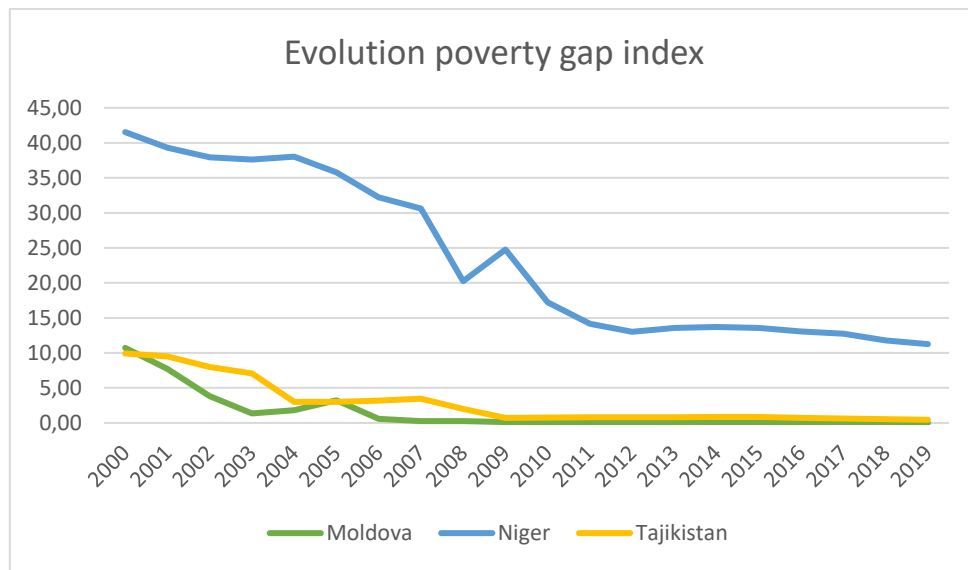
Data source: The World Bank

This graph shows the evolution of the poverty gap index through the years. We can observe that these 3 countries in addition to having performed very well on the proportion of the population living in a state of poverty, have also been effective in reducing the intensity of poverty through the PG index.

All three countries experienced a large decrease. Niger suffered the largest decline (but from a much higher baseline), going from 41.53 in 2000 to just over 11 in 2019. During the same period, Moldova and Tajikistan have practically managed to reach a score of 0.

Note that most developing countries used in the sample showed a clear decrease in the poverty gap but still less important than the 3 countries above.

National minimum wage

Evolution minimum wage
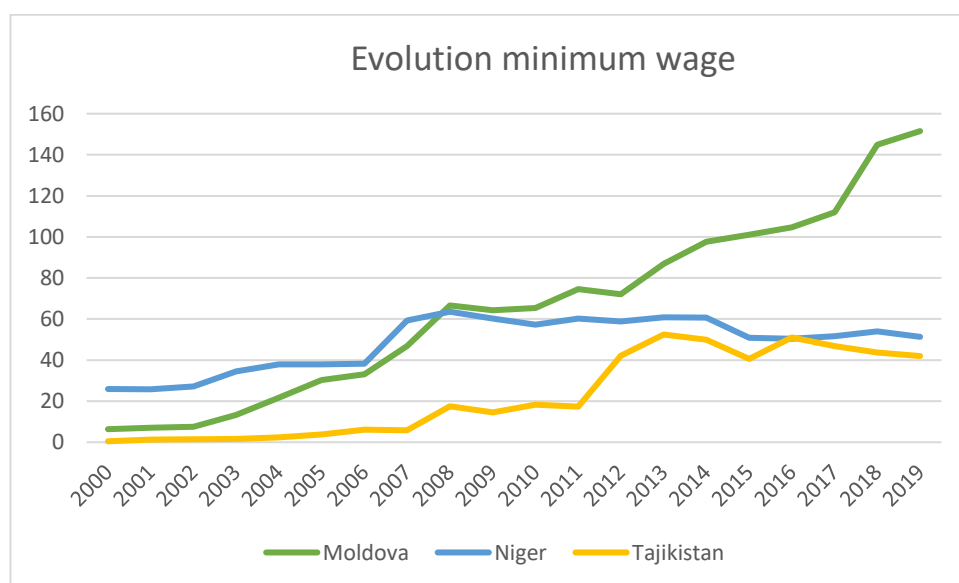
Data source: ILO

In this illustration, the evolution of the national minimum wage from 2000 to 2019 in Moldova, Niger and Tajikistan can be observed. All three countries experienced an increase in their minimum wage threshold. Moldova has shown the largest increase going from $6 to more than $150 over the past 20 years. This provides the population with greater security against low-paying jobs. During the same period, Niger doubled its minimum wage.

As for the other countries in the sample, the vast majority of them have experienced a steady increase in their national minimum wage over the study period. However, African countries appear to have had a smaller overall increase than other countries.

Child labour

Share of countries that have signed a convention to abolish child labour 2000

- Signed convention to abolish Child labour
- Not signed any convention to abolish Child labour

Share of countries that have signed a convention to abolish child labour 2019

- Signed convention to abolish Child labour
- Not signed any convention to abolish Child labour
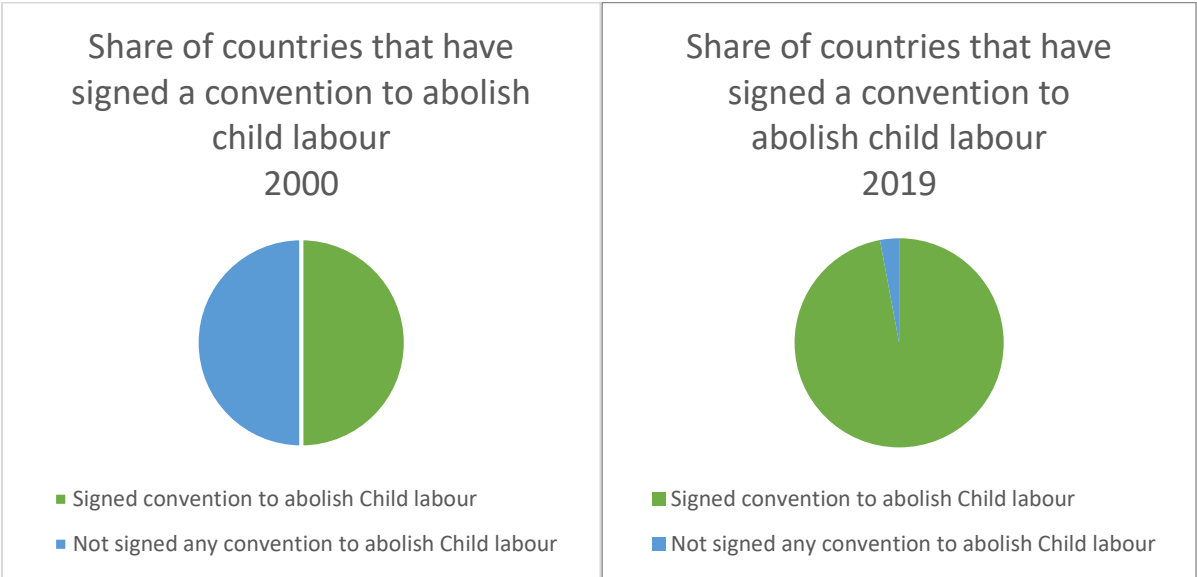
Data source: ILO

These two pie charts illustrate a sharp increase in the attention given to child labour. In 2000, only 50% of the countries surveyed had already signed a convention to abolish child labour, whereas in 2019 only one country (Bangladesh) had not yet signed. However, it may be interesting to know that Bangladesh has just signed the ILO Convention 138 in March 2022 and will enter into force in 2023.

Expenditure

Evolution of the share of government expenses compared to GDP
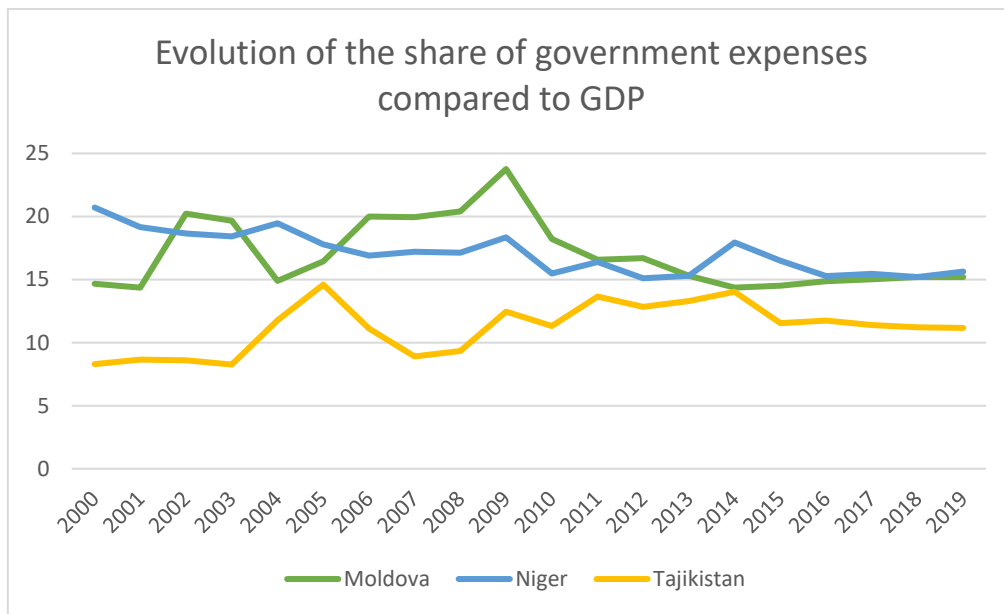
Data source: The World Bank

This graph illustrates the evolution of government expenses as a share of the national GDP for the same three countries. A relatively stable trend can be observed over the years despite a succession of short-term ups and downs. But in the end, Tajikistan and Moldova slightly increased their share of government spending, while Niger slightly decreased.

Note that most countries used in the sample showed a slight increase in the share of government expenses at a global constant rate until 2019.

GDP per capita

Evolution GDP per capita PPP at constant 2017 international dollar price
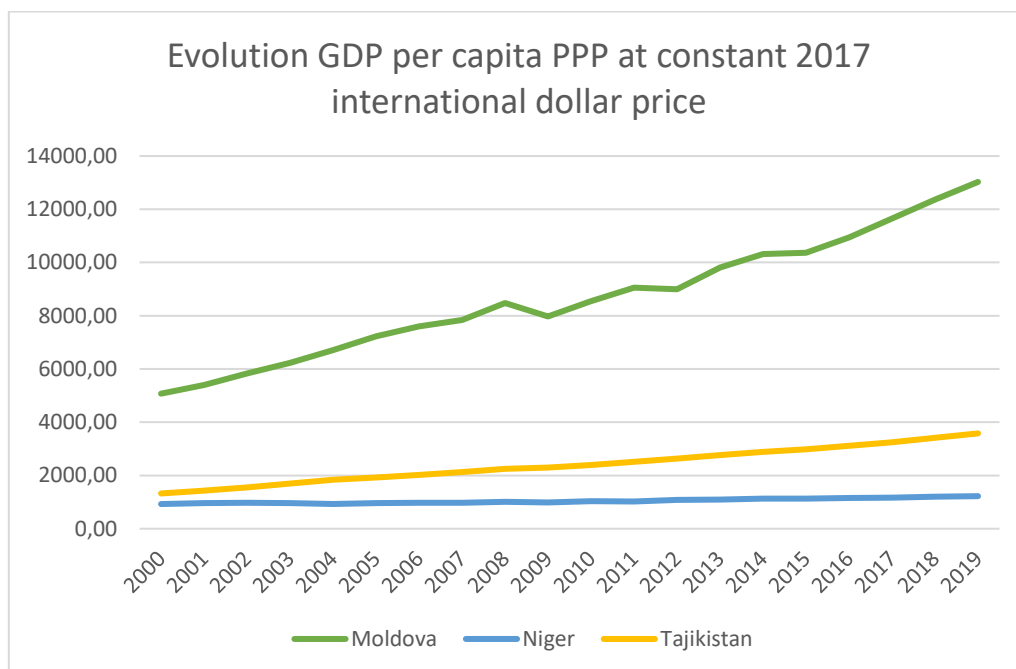
Data source: The World Bank

This figure represents the evolution of GDP per capita for the 3 surveyed countries over the last 20 years. All 3 countries have experienced large stable growth of different magnitudes but are still strong. Moldova is the country with the biggest growth from 1324$ in 2000 to 3581$ in 2019, which is a growth of 170%. It only had a bad period in 2008 which is probably due to the financial crisis that happened that year. Then Tajikistan and Niger have also experienced good growth, with respectively +160% and almost +35%.

For the other countries in the sample, most of them have also experienced relatively strong and stable growth since the beginning of the century.

6.4 Models

In order to capture the effects of several public policies on the level of poverty and to see if they can help developing countries escape the poverty trap, three regressions will be treated. In light of what has been discussed in the literature review and previous sections, the data and results presented hereafter would aim to test the hypothesis that public policies can help developing countries reduce poverty. In other words, by implementing efficient government measures, countries could escape from the poverty trap.

To study and answer this research question, we will use three regressions, each with a different poverty index. This will allow us to see if public policies have an impact on the size of poverty but also on its depth and severity.

The first model is using the Head-count ratio as the dependent variable and is given as follows:

$$HC_{it} = B0 + B1.child_{it} + B2.health_{it} + B3.educ_{it} + B4.exp_{it} + B5.log\_minwage_{it} + \sum_{j=6}^{s} Bj.Xit + v_{it}$$

where
i = country; t = time (yearly) ; j = coefficient number ; s = number of coefficients
where HC_{it} is the dependent variable standing for "Head-count ratio" of poverty
where B0 is the intercept
where the main variables of interest are:
- *child* = dummy for child labour
- *health* = government health expenditure (% of total government expenditure)
- *educ* = government education expenditure (% of total government expenditure)
- *exp* = total government expenses (% of GDP)
- *log_minwage* = logarithmic transformation of the national minimum wage
where X corresponds to a set of control variables of country i at year t. It includes,
- *log_GDPc* = logarithmic transformation of the national GDP per capita
- *indexeduc* = mean number of years of education
and where v_{it} is the composite error term which must be set according to the type of model chosen between random effect model and fixed effect model.

Note that the GDP per capita and the national minimum wage variables are under their logarithmic transformation form. This was done with the aim of having more easily visualisable and interpretable results.

This model will allow us to analyse the positive or negative consequences of implementing these different policies on the share of people living in a state of poverty while accounting for other control variables.

Next, the same model is treated again, with the difference that this time, the dependent variable is replaced by the poverty gap. The aim is to show impacts on the intensity of poverty within the population.

Finally, we still run the same model but this time with the squared poverty index as dependant variable. The main purpose of this model is to display the effects of policies on inequality among the poor.

6.5 Correlation

The correlation matrix can be found in the Appendix. It is the same for the 3 models developed in this thesis because we do not include the dependent variables in this type of matrix.

Its usefulness is to check if the multicollinearity between the independent variables is excessive or not. If it is considered excessive, the problem that arises is that it will be difficult to determine which of the two correlated variables has a proper influence on the dependent variable. Be aware that there is no strict threshold for a correlation coefficient to be classified as "excessive", so this is open to personal interpretation.

A correlation coefficient illustrates a relationship between two variables, but causality is not specified. In other words, one variable may have an effect on another one or vice versa.

Also, keep in mind that, the multicollinearity problem is no longer a concern if the correlated variables are control variables. Indeed, the goal is to capture the causal effect of the variables of interest in the models. And any high rates of correlation between the control variables do not increase the difficulty of detecting the effects of the explanatory variables of interest. As a reminder, the control variables in our regressions are GDP per capita and the education index. All others are explanatory variables of interest.

Hence, in our correlation matrix, we can observe that none of our key independent variables raises an apparent problem in terms of multicollinearity. Indeed, the highest correlation coefficient is that between government spending on health and the national minimum wage (0.6037) but it does not reach a limit that could be considered excessive. There is therefore no reason to be concerned about multicollinearity in our models.

6.6 Results

1. Head-count ratio (HC) is the dependent variable

The first step was to run a Pooled OLS regression to see if the simple model could fit. Then we looked at the F-test[3] to see if we can reject the hypothesis of Fixed effect, but the result showed that we cannot. Fixed Effect (FE) model is thus more appropriate.

Next, we computed the Breusch-Pagan Lagragien Multiplier test[4] to display if we can reject the hypothesis of a Random Effect (RE) model. These models are used when it is assumed that the unobserved effects are not correlated with each explanatory variable. The results of the Breush-

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[3] Results of F-test: $F_{(33, 638)} = 70.69$ and Prob > F = 0.0000
[4] Results of the Breusch-Pagan LM test: chibar2(01) = 3300.57 and Prob > chibar2 = 0.0000

Pagan Lagrangian Multiplier test rejected the null hypothesis which is in favour of the OLS model. Hence, Random Effect model is more suitable than pooled OLS.

Now that we have been able to eliminate the Pooled OLS hypothesis, this leaves us with the solution of the Random-Effect (RE) model or the Fixed-Effect (FE)model. Hence, we must run the 2 models and compare them with a specific test to know which one is the best in this case. The appropriate test is the Hausman test[5]. In regards to the two calculations of FE and RE, this test indicates that the Fixed Effect model is better suited. So now that we know which model to use, we can interpret our results with more confidence.

To begin, when we perform a fixed-effect model, the R-squared that interests us most is the within R-squared because it explains the extent to which the variation in poverty within countries is captured by the model. Our regression within R-squared is equal to 0.4662, which is not too bad.

Second, we can say with confidence that at least one of the coefficients is significantly different from 0 at the 1% level, due to the value of the F-test. So, the overall regression is relevant. In our model, all our independent variables are statistically significant at 10% except log_MW which is not. Therefore, we can have confidence in our results.

Regarding the variables that have a significant negative marginal effect on the head-count ratio of developing countries, the abolition of child labour brings a reduction of 1.797 points on the poverty index which is quite high. Then, an increase of 1% in the share of total government expenses or in the share of government spending going to education has roughly the same effect, a decrease of about 0.21 point on the HC ratio.

However, 2 public policies seem to have a positive coefficient. Even if the variable minimum wage is not statistically significant, the sign still gives us some information. Indeed, making an increase of 1% of the national minimum wage leads to a rise in the poverty index.

And surprisingly, raising the share of Government spending going to the health sector is also augmenting HC by 0.509. Moreover, it is important to notice that both control variables (GDP per capita and mean number of years of education) have obviously large negative marginal effects. Thus, it is confirming the fact that GDP per capita is essential to eradicate poverty.

2. Poverty gap index is the dependent variable

In this model, we will no longer study the effects of different public policies on the headcount ratio but on the poverty gap index.

The initial steps remain the same in order to choose the most appropriate model.
After performing a pooled OLS regression, we check with the F-test[6] and the Breusch Pagan test[7] if we can reject the fixed and random models. But here again, the tests cannot reject the hypotheses and so we must continue with the RE model and the FE model. In order to decide between them, we performed the Hausman test[8] which confirmed once again that the most accurate model is the fixed-effect model.

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[5] Results of the Hausman test: chi2-statistic = 64.78 and Prob > chi2 = 0.07
[6] Results of F-test: F(33, 638) = 49.24 and Prob > F = 0.0000
[7] Results of the Breusch-Pagan LM test: chibar2(01) = 2700.48 and Prob > chibar2 = 0.0000
[8] Results of the Hausman test: chi2-statistic = 13.73 and Prob > chi2 = 0.0562

Now, our within R-squared is equal to 0.255, which means that our model explains 25.5% of the poverty variations within countries, which is worse than our previous model.

Again, the regression is relevant because the F-test states that at least one of the coefficients is significantly different from 0 at the 1% level.

However, all our independent variables are no longer statistically significant at the 10% level. Now we have educ and exp which are not. However, all the signs are still the same so we can still be relatively confident in our results.

At the interpretation level, prohibiting child labour will lower the poverty gap index by 0.926 points. Second, a 1% increase in the share of public expenditure as a percentage of GDP or in the share of public expenditure devoted to education has about the same effect, respectively a decrease of 0.037 and 0.056 points on the poverty gap index.

However, 2 public policies continue to have a positive coefficient. Indeed, a 1% increment in the national minimum wage leads to a 0.7% increase in the poverty index. And a rise in the share of public expenditure devoted to the health sector also increases the poverty gap by 0.278 points.

Then again, the control variables log_gdpc and indexeduc both still have a statistically significant negative sign at the 10% level. And the gdpc is again the variable that has by far the largest effect on poverty.

3. Squared Poverty gap index (SPG) is the dependent variable

For the third model, we analyze the impact of public policies on the inequality of the poor across a country via the squared poverty gap index.

Again, after performing the F-test[9] and the BP test[10], we could not reject the hypotheses and so we had to continue with the RE model and the FE model. And then we performed the Hausman test[11] in order to decide between them. This one confirmed once again that the most suitable model was the fixed model.

Looking at the within R-squared, we can see that it is not as good as the others but remains at an acceptable level. It is now equal to 10.82, so it means that the model explains 25.5% of the poverty variations within countries.

Once again, the F-test affirms that at least one of the coefficients is significantly different from 0 at the 1% level and therefore that the regression is relevant.
At the variable level, we see that child, educ and exp are not significant at 10%, unlike the others. However, once again, all signs are the same as in the 2 previous models. Hence, we can still be relatively confident in our results.

In this model, signing a law against child labour will decrease the SPG by 36.99 points. Moreover, increasing the share of total government expenses or the share of government spending going to education by 1% will have more or less the same effect, i.e. a decrease in the poverty index of a little less than 1 point. As for the minimum wage, it always has a positive relationship with the poverty

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[9] Results of F-test: $F_{(33, 638)} = 36.03$ and Prob > F = 0.0000
[10] Results of the Breusch-Pagan LM test: chibar2(01) = 2102.37 and Prob > chibar2 = 0.0000
[11] Results of the Hausman test: chi2-statistic = 175.55 and Prob > chi2 = 0.0000

level of the country. If we increase the national minimum wage threshold by 1%, the SPG will increase by 43.81 points.

Here as well, gdpc is by far the most poverty-reducing variable. A 1% increase in gdp per capita will decrease the SPG by 237.177 points.

6.7 Take-aways

As a conclusion, given that the results of our models are consistent for the three poverty measures used, we can be confident about the direction of the impact obtained from each of the public policies studied. This suggests that the results are not sensitive to poverty measures.

To summarize the results of the three models studied, we can say that eliminating child labour, increasing government expenditure and increasing public spending on education are all negatively related to poverty, meaning that they decrease poverty in developing countries. The public policy with the greatest impact is the abolition of child labour.

On the other hand, raising the minimum wage or increasing the public spending in the health sector will have an undesirable effect and will even increase the poverty level of the country.

6.8 Limitations

The major limitations of this research thesis are mostly related to the data used in the empirical approach. Even if the data collected is still an improvement over previous studies conducted on the topic, there is still a lot of work to be done in the data collection in order to give more robustness to the results obtained.

For example, the period covered is only 20 years (from 2000 to 2019) whereas public policies are often long-term investments. Government spending on health and education are the best examples. The optimal potential of their effects will only appear later when there will have been generations that will have benefited from all these investments from their early age and will have benefited from the whole system. Therefore, having a longer period of time would have allowed us to obtain results with more hindsight and thus surely more precise.

Moreover, we used a sample of 34 countries with a few countries from each continent. It would have been interesting to have the possibility to add more countries in order to have more robustness in our results, but it would also have allowed us to make a division by region or continent. The effects of public policies might have been of different magnitude in one region compared to another and therefore would have made it possible to propose policy implications more adapted to each region. Unfortunately, in our study, we did not have enough countries from each continent to allow us to propose such an analysis.

Next, some countries had gaps in the data provided for certain variables. Luckily, these gaps were relatively minor, as most of them were only for one year. The workaround used was to conduct linear extrapolations to fill these gaps. This approach resulted in data points that may be relatively close to reality but are still less accurate.

Finally, due to the limited amount of data available, the choice of our variables was somewhat limited. It might have been interesting to add other variables to the regressions in order to analyze the effects of other public policies such as social protection (for example, the share of unemployed receiving unemployment benefits or persons above retirement age receiving a pension).

6.9 Future research

In the future, research will likely be supported by more quality data, which will make it easier to do empirical work and deliver more reliable results.

Indeed, more countries will obtain data on a greater number of variables, thus broadening the scope of the research. There will also be more years of hindsight to study the full effect of public policies over the long term.

It would also be beneficial to harmonize data collection criteria across the world. Indeed, some data for the same variable have been gathered differently in various countries and regions. Thus, once again, reliable cross-country comparisons of a variable could be compromised. This is the case for the minimum wage variable. Some countries have a general minimum wage, others divide it by industry, and still, others distinguish between certain regions (mainly rural/urban). Reliable data must be collected according to the same standardized method.

6.10 Policy implications

First of all, as our results indicate, education is a major player in the fight against poverty. The level of education and an increase in public spending in the field of education significantly reduce the level of poverty in developing countries.

(Biswal et al., 2001) conducted a study on the effects of public investment in education in India. But they were able to divide the investment into primary, secondary and tertiary education. In this regard, their results show that the effectiveness of higher education in reducing poverty is greater than that of other types of education. Governments should therefore spend more on universities and colleges that provide people with immediate opportunities to earn money.

In addition, several studies have shown that public spending on education has been shown to be significantly more important in rural and low-income areas than in urban areas for poverty reduction (Hidalgo, 2014).

Therefore, in their poverty reduction strategies, governments should prioritize education by increasing the percentage of public spending going to this sector. As well as placing a greater emphasis on investment in rural areas and on tertiary education. However, it is very important to diversify these investments as much as possible as they all have a significant effect. As expenditures they can spend money on the creation of new schools so that all inhabitants have a school nearby to enroll their children, buy new quality equipment for schools, provide better training for teachers, etc.

Moreover, our results also showed that abolishing child labour has a significant negative relationship with a country's poverty level. The reference legislation in relation to child labour is the ILO Convention concerning Minimum Age for Admission to Employment C138. In our sample of developing countries, all countries have signed this convention except Iran which had signed a similar convention (C.182), and Bangladesh, which had not. However, the first step would be that countries (out of the sample) that have not yet signed it (Australia, Liberia, Somalia, Tonga, ...) should put it on top of their anti-poverty agenda because child labour is harmful to the quality of life of a country.

Another possible measure is to implement a conditional cash transfer program. This involves transferring income to poor households in compensation for families enrolling their children in school. This reduces the incentives for parents to send their children to work. Indeed, conditional

cash transfers reduce child labour participation in a country and mitigate the effect of economic shocks that may push children into work (De Hoop et al., 2014).

Next, given that our results have shown that government expenditures significantly reduce the level of poverty in developing countries, it is obvious that one of the first policy decisions for states is to increase government expenditures and the proportion of GDP devoted to them.

Of course, we have seen that focusing on the education sector is a good solution, but it is not the only one. Anti-poverty programs involving government spending on infrastructure, rural development, agriculture, and research and development have proven to be effective in significantly improving the lives of the poorest people (Gupta et al., 2003).

In contrast, our results are consistent with (Lustig et al., 1997), and increasing the minimum wage in developing countries does not reduce the poverty level (probably by raising unemployment and reducing market efficiency in the long-term). In our case, poverty will even increase. Hence, governments should not increase minimum wages too much and let the labour market equilibrate a bit more by itself.

Health expenditures, given our results, should not be a priority in a government anti-poverty plan either. By leaving out the social aspect and focusing on the economic impacts on the low-income population, public spending should be focused on other sectors than health.

However, the literature seemed to have more positive results on poverty than we did. Perhaps this is because our analysis only covers 20 years, which is maybe not long enough to fully benefit from the effects of health spending.

As stated in the literature, our results confirm that economic growth is indeed necessary and essential to eliminate poverty. The variable GDP per capita is by far the most effective variable against poverty (highest coefficient). Therefore, governments should put measures aimed at high economic growth at the centre of their strategy. Economic growth is often driven by consumer expenditure and business investment. In this sense, there are many different ways to try to achieve this.

First, as mentioned above public investments in research and development (R&D) have proven to have a positive impact on a country's GDP. In addition, public policies that provide protection for intellectual property, such as patents, increase the willingness of companies to create such property.

Then, governments can act with tax cuts to increase consumer purchasing power and stimulate spending. They can also try to achieve this goal by increasing infrastructure spending to create jobs and increase business productivity.

Moreover, international trade is also a solution for achieving growth. Countries that are open to trade have a tendency to grow more quickly and improve their productivity. Trade openness is also beneficial to low-income individuals by offering consumers more affordable goods and services. It may therefore be useful to implement international openness policies in developing countries as well in order to benefit from the global economy.

7. Conclusion

The main objective of this study was to analyze the public policies that can reduce the level of poverty in developing countries. These public measures include minimum wages, child labour, government expenses, public education spending and public health spending. In addition to this, we also wanted to observe the effect of economic growth through GDP per capita.

To our knowledge, this is the first research of this type in the context of low-income countries. The main reason for the absence of such studies is the lack of adequate and complete data. Thankfully over the last few years, ILO and The World Bank have been able to come up with a few more usable datasets, which allowed us to conduct this paper.

The survey uses different types of public policy while controlling for per capita income and education level, to test their effects on three different poverty indices using fixed estimation. These three indices provide a means of analyzing the effects of government decisions on the size and intensity of poverty. Our results are consistent with the three measures of poverty used. This suggests that the outcomes are not sensitive to the poverty measures.

Our main findings can be briefly summarized this way: ending child labour, boosting public expenditure and increasing spending on education help reduce poverty in the case of developing countries. By contrast, raising the minimum wage or the public spending on health care will have an unfavourable effect and will actually increase the level of poverty.
Furthermore, our results confirmed that economic growth is essential in the fight against poverty.

These outcomes are important because they can help determine the optimal mix of public spending and where the action is needed most. Concretely, in order to escape from the poverty trap, governments in developing countries should act on child labour and increase their total expenditure, especially in the education sector.

However, for a poverty reduction strategy to be effective, it will clearly need to be based on economic growth. Therefore, the challenge for policymakers is to combine growth-promoting policies with measures that enable the poor to participate fully in and contribute to growth opportunities.

8. Appendices

Model 1:

```
----------------------------
                     (1)
                     HC
----------------------------
log_mw               0.420
                    (0.367)

health               0.509***
                    (0.000)

child               -1.797*
                    (0.031)

educ                -0.210**
                    (0.002)

exp                 -0.212
                    (0.054)

log_gdp            -17.40***
                    (0.000)

indexeduc           -2.487***
                    (0.000)

_cons               190.0***
                    (0.000)
----------------------------
N                      679
Within R2            0.466
Between R2           0.799
Overall R2           0.777
F                    79.60
----------------------------
p-values in parentheses
* p<0.05, ** p<0.01, *** p<0.001
```

Model 2:

```
----------------------------
                     (1)
                     PG
----------------------------
log_mw              0.701*
                    (0.017)

health              0.278***
                    (0.000)

child              -0.926
                    (0.078)

educ               -0.0562
                    (0.177)

exp                -0.0375
                    (0.588)

log_gdp            -7.525***
                    (0.000)

indexeduc          -1.106***
                    (0.000)

_cons               77.19***
                    (0.000)
----------------------------
N                    679
Within R2            0.255
Between R2           0.694
Overall R2           0.653
F                    31.25
----------------------------
p-values in parentheses
* p<0.05, ** p<0.01, *** p<0.001
```

Model 3:

```
----------------------------
                      (1)
                      SPG
----------------------------
log_mw               43.81**
                    (0.003)

health               14.11***
                    (0.000)

child                -36.99
                    (0.158)

educ                 -0.958
                    (0.644)

exp                  -0.610
                    (0.860)

log_gdp              -237.2***
                    (0.000)

indexeduc            -31.74*
                    (0.028)

_cons                2180.3***
                    (0.000)
----------------------------
N                       679
Within R2             0.108
Between R2            0.473
Overall R2            0.413
F                     11.06
----------------------------
p-values in parentheses
* p<0.05, ** p<0.01, *** p<0.001
```

Correlation Matrix :

	log_mw	health	child	educ	exp	log_gdp	indexe~c
log_mw	1.0000						
health	0.4846	1.0000					
child	0.0799	0.0959	1.0000				
educ	0.0235	0.1664	-0.0775	1.0000			
exp	0.0153	0.1926	0.2636	0.1056	1.0000		
log_gdp	0.6291	0.4740	0.0426	-0.2250	-0.0222	1.0000	
indexeduc	0.1985	0.2818	0.1613	-0.2713	0.0701	0.7511	1.0000

Do-file:

```
        ***Preliminary steps
clear all
import excel "/Users/maximenicolay/Desktop/Database Master Thesis.xls", sheet("STATA")
cellrange(A1:M681) firstrow
 encode Country, generate (Country2)
 describe
 gen log_gdp=log(GDP)
 gen log_mw=log(MW)

        ***Multicollinearity
corr log_mw health child educ exp log_gdp indexeduc

        ***Pooled OLS regression for First model (HC)
reg HC log_mw health child educ exp log_gdp indexeduc

        ***Breusch-Pagan test for heteroskedasticity
hettest, rhs fstat

        ***Breusch-Pagan Lagrangian Multiplier (LM) test
quietly xtreg HC log_mw health child educ exp log_gdp indexeduc, re
xttest0

        ***Set data as Panel data
sort Country2 Year
xtset Country2 Year
xtdescribe

        ***Fixed Effect regression
xtreg HC log_mw health child educ exp log_gdp indexeduc, fe

        ***Random Effect regression
xtreg HC log_mw health child educ exp log_gdp indexeduc, re

        ***Hausman test
xtset Country2 Year, yearly
```

```
xtreg HC log_mw health child educ exp log_gdp indexeduc, fe
estimate store fe
xtreg HC log_mw health child educ exp log_gdp indexeduc, re
estimate store re
hausman fe re

        ***Second model (PG)

        ***Preliminary steps
clear all
import excel "/Users/maximenicolay/Desktop/Database Master Thesis.xls", sheet("STATA")
cellrange(A1:M681) firstrow
 encode Country, generate (Country2)
 describe
 gen log_gdp=log(GDP)
 gen log_mw=log(MW)

        ***Pooled OLS regression
reg PG log_mw health child educ exp log_gdp indexeduc

        ***Breusch-Pagan test for heteroskedasticity
hettest, rhs fstat

        ***Breusch-Pagan Lagrangian Multiplier (LM) test
quietly xtreg PG log_mw health child educ exp log_gdp indexeduc, re
xttest0

        ***Set data as Panel data
sort Country2 Year
xtset Country2 Year
xtdescribe

        ***Fixed Effect regression
xtreg PG log_mw health child educ exp log_gdp indexeduc, fe vce (cluster Country2)

        ***Random Effect regression
xtreg PG log_mw health child educ exp log_gdp indexeduc, re vce (cluster Country2)

        ***Hausman test
xtset Country2 Year, yearly
xtreg PG log_mw health child educ exp log_gdp indexeduc, fe
estimate store fe
xtreg PG log_mw health child educ exp log_gdp indexeduc, re
estimate store re
hausman fe re

        ***Third model (SPG)

            ***Preliminary steps
clear all
import excel "/Users/maximenicolay/Desktop/Database Master Thesis.xls", sheet("STATA")
cellrange(A1:M681) firstrow
```

```
encode Country, generate (Country2)
describe
gen log_gdp=log(GDP)
gen log_mw=log(MW)


        ***Pooled OLS regression
reg SPG log_mw health child educ exp log_gdp indexeduc
        ***Breusch-Pagan test for heteroskedasticity
hettest, rhs fstat


        ***Breusch-Pagan Lagrangian Multiplier (LM) test
quietly xtreg SPG log_mw health child educ exp log_gdp indexeduc, re
xttest0


        ***Set data as Panel data
sort Country2 Year
xtset Country2 Year
xtdescribe


        ***Fixed Effect regression
xtreg SPG log_mw health child educ exp log_gdp indexeduc, fe vce (cluster Country2)



        ***Random Effect regression
xtreg SPG log_mw health child educ exp log_gdp indexeduc, re vce (cluster Country2)



        ***Hausman test
xtset Country2 Year, yearly
xtreg SPG log_mw health child educ exp log_gdp indexeduc, fe
estimate store fe
xtreg SPG log_mw health child educ exp log_gdp indexeduc, re
estimate store re
hausman fe re
```

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Executive Summary

The main purpose of this study is to test the effectiveness of public education, health and labour market policies in reducing poverty in developing countries.
We use different types of public interventions, namely minimum wages, child labour, government expenses, public education spending and public health spending.

The empirical estimates are based on a balanced panel data set covering 34 developing countries from 2000 to 2019. For sensitivity and robustness of the findings, three different measures of poverty are used in fixed effect models.

The study concludes that abolishing child labour, increasing government spending, and increasing education spending contribute to poverty reduction. However, raising health spending and the minimum wage do not have the desired effects.

Finally, several policy conclusions are made to improve our understanding of why certain policy measures are designed and implemented in developing economies.

Word Count = 12.987