



Externalities of public spending for education in economic growth

Externalidades del gasto público destinado a la educación en el crecimiento económico

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When economic growth is considered as a measure of the welfare of the population, it constitutes one of the basic objectives of economic policy; Therefore, the study of the factors or causes that originate it has been, and continues to be, one of the relevant topics in the economic discussion. The foregoing gave rise to the interest of determining whether public spending for education generated a positive or negative externality in the economic growth of the countries of the Andean region in the period 2000-2015. The study was conducted under the quantitative approach, specifically through the development of an econometric model. The main results show that in the study period, the countries of the Andean region developed under similar contexts and policies, where the characteristics and decisions of each country regarding public spending, although they differentiated them, in turn allowed to identify a joint reaction at the level of the region, regarding the results of social policies, concluding that public spending for education came to generate positive externalities in the economic growth of the Andean region.

PALABRAS CLAVE

Crecimiento
económico,
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externalidades

Al ser considerado el crecimiento económico como una medida del bienestar de la población, se constituye en uno de los objetivos básicos de la política económica; por lo tanto, el estudio de los factores o causas que la originan, ha sido, y continúa siendo, uno de los temas relevantes en la discusión económica. Lo expuesto dio origen al interés de determinar si el gasto público destinado a la educación generó una externalidad positiva o negativa en el crecimiento económico de los países de la región andina en el periodo 2000-2015. El estudio se realizó bajo el enfoque cuantitativo, específicamente por medio del desarrollo de un modelo econométrico. Los principales resultados evidencian que en el periodo de estudio, los países de la región andina se desarrollaron bajo contextos y políticas similares, donde las características y decisiones propias de cada país respecto al gasto público, si bien los diferenciaron, a su vez permitieron identificar una reacción conjunta a nivel de la región, en cuanto a los resultados de las políticas sociales, concluyendo que el gasto público destinado a la educación llegó a generar externalidades positivas en el crecimiento económico de la región andina.

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1. INTRODUCTION

There is a vast theoretical and empirical literature related to the theory of economic growth and the factors that determine it; the studies differ from the point of view of analysis, as well as from the conception of the social, historical, political, institutional, geographical context among others; However, despite the large bibliographic baggage, there is no consensus on the factors that cause greater or lesser growth.

In that context, the research works of Solow (1957), Romer (1986), Barro (1990), Mankiw, Romer and Weil (1992), Kaufmann and Kraay (2002), Sala-i-Martin (2002), Glaeser, LaPorta, Lopes and Shleifer (2004), Acemoglu, Johnson and Robinson (2004), Rajan and Zingales (2006) and Ravallion (2014) allowed to identify three periods of study: the first, from the 50's until the middle of the 80's, where the accumulation of physical capital accompanied by technological development was considered as the predominant factors in economic growth; subsequently, the second period, between the 80's and mid-2000, the studies concluded that the accumulation of human capital and public capital are additional factors that promote economic growth in the countries and, finally, the third period, since the mid-2000 to date, where human capital continues to be studied as a fundamental variable of economic growth but from a social and institutional approach; from the study of the implementation of social policies that favor individual well-being and reduce social inequality.

With regard to human capital and public capital, different investigations realize the need to study the effect they cause on economic growth. Thus, there are contributions from Lucas (1988), arguing that the process of acquiring human capital occurs through two sources: formal education itself and learning through practice. Likewise, that the differences between the growth rates of the countries are attributable to the rate at which economies accumulate human capital over time. On the other hand, Becker (1995) points out that more demanding educational systems, cultures that value education more, prepare people more and better to develop more productively in the labor market, contributing in this way to economic growth.

A common characteristic found in the contributions of Lucas and Becker is that, through better education, greater productivity is achieved in workers; that if analyzed from the field of externalities², it can be concluded by pointing out that: “the positive externalities or collective

² Externality occurs when indirect effects of one person's activities occur on the welfare of another and manifests itself in two ways, such as a positive externality, when the indirect effect benefits the well-being of the other person, and negative when the effect is contrary

benefits generated by education specifically involve the capacity for innovation and competitiveness of workers, impacting favorably on the economic growth of a country".

There are also jobs that relate health to education and economic growth, they are analyzed from two approaches, the first, addresses a sense of dependence, between higher income of individuals - good health - generator of greater economic growth and, the second, raises the link between health policies oriented to primary care - good health status - generator of greater economic growth (Aghion and Howitt, 1998). In that direction, Mogollón, (2009: 7) argues that, the health of the population is closely linked to education, the accumulation of human capital and the productivity of the workforce and, it is through this link that is achieved Greater economic growth. In the words of the author: "Healthier workers are more productive, greater life expectancy provides greater incentives for people to educate themselves more, thereby increasing the stock of human capital, health care in childhood, improve people's ability to learn, generating a greater stock of effective human capital, childcare makes people more creative, innovative and with greater skills to adapt to changing environments due to rapid technological change, the focus of care of health in the less favored people of society helps to reduce the degree of social inequality".

In that context, Valdés and Espina (2011) incorporate public goods as the guiding axis of social policy and as part of public policies. According to the authors, social policy refers to the delivery of public or semi-public goods where there are no complete markets or complex redistributive problems. In this regard, Katz cited by Dick (2010) points out that the provision of public goods must be in charge of the State in response to fundamental basic needs and in the absence of provision by the market or society. The author refers mainly to public health, education, working conditions, housing, social security, national defense and internal security.

The foregoing allowed us to ask the following research question: What kind of externality generated public spending for education in the economic growth of the countries that make up the Andean region in the period 2000-2015? From the theoretical review carried out, it was proposed as a work hypothesis: Public spending for education generated a collective benefit or positive externality in the economic growth of the countries that make up the Andean region in the period 2000-2015.

Finally, the purpose of the work was to determine: if public spending for education generated a positive or negative externality in the economic growth of the countries of the Andean region in the period 2000-2015.

2. METHOD AND MATERIALS

As a method, the research relied on the “hypothetical deductive” theoretical research method, whose procedure starts from assertions as hypotheses and seeks to refute or falsify such hypotheses, deducing from them conclusions that must be confronted with the facts.

Considering the depth of study, the scope of the results and the location of the events over time, the research was based on three types of studies: descriptive, explanatory and retrospective, since it focused on trying to explain why and how the public expenditure that the governments of Andean countries allocated to education, came to generate an externality in economic growth, in the period 2000-2015.

To achieve the stated purpose, a research process was developed under the quantitative approach. The econometric technique was used, so the econometric model used panel data establishing two study populations: cross-sectional and temporal. For the cross-sectional population, the countries that make up the Andean region were selected: Bolivia, Colombia, Ecuador and Peru and, for the temporary population, the period between 2000 and 2015 was defined. The criteria for selecting the cross-sectional population were: they are Andean-Amazonian countries that share a mega-diverse biozone, have a great potential for natural wealth and the concentration of the productive structures of these countries is based mainly on mineral, energy and agricultural resources that characterized their economies since colonial times. On the other hand, with respect to the temporary population, the period 2000-2015 was selected, because between 2004 and 2014, there was a strong increase in international prices of natural resources, causing the countries of the Andean region expand their exports of primary goods, situation that enabled the implementation of social policies that significantly improved social indicators.

Following Mayorga (2000), Mahía (2000) and Park (2011), the advantage of models based on panel data, compared to time series or cross-section models, is that analysis with data panels allows identification of certain parameters or questions without the need to make restrictive assumptions. Thus, for example, it is possible to see changes at the individual level - which in this case are represented by the Andean countries - over time, that is, it offers the possibility of observing the differences between countries due to their own characteristics but also the circumstances that make that these characteristics be modified between periods.

The information was collected with the support of statistics and indicators published by the Economic Commission for Latin America and the Caribbean (ECLAC) and by the World Bank (WB). The information processing and analysis was performed using the STATA statistical package and different statistical tests.

3. RESULTS AND DISCUSSIONS

The results of the research are presented in three points. In the first place, the own characteristics or independent decisions that each Andean country made in relation to the allocation of public expenditure are described³; Next are the common characteristics under which social policies were developed in the region and finally, the results obtained from the developed econometric model are explained.

3.1. Allocation of public spending in the countries of the Andean region

According to information obtained from the publications made by ECLAC (2015), CEDLAS and BM (2017), CEDLAS and BM (2014) and from the web portals of (Atlas Resdal, s.f.) and (Statistics CEPAL, s.f.); In the 2010-2015 period, Bolivia allocated between 6.3% and 7.6% of GDP to education, then Ecuador, with an allocation ranging from 4.3% to 5.2%, in Colombia the values fluctuated between 4.4% and 4.9% , the country that allocated the least resources was Peru with values between 2.7% and 4.0% of GDP.

In relation to resources allocated to health, in the period 2010-2014, Colombia allocated between 6.6% and 7.2% of GDP, followed by Ecuador, this country allocated between 5.6% and 9.2% of GDP; in third place is Bolivia with an allocation that ranges from 5.4% to 6.3%. Finally, Peru allocated between 4.9% and 5.5% of GDP.

Similar to that what happened in Health, in the allocation of resources to Defense, Colombia allocated between 3.1% and 3.6% of GDP, in second place is Ecuador with an allocation between 2.2% and 3.1%, followed by Bolivia, with values that fluctuate between 1.7% and 1.9% of GDP; The country with the least public expenditure destined to Defense was Peru, with values that are between 1.2% and 1.7% of GDP.

As a synthesis, the four countries presented an increasing trend in public spending as a percentage of GDP, as shown in the following Table.

³ There are two widely used classifications that distinguish the components of public spending: by their function and by economic characteristics. The first is called the functional classification of public expenditure and breaks down the total expenditure into categories such as medical care, education and defense. The second is called the economic classification of expenditure and divides total expenditure into current expenditure and capital expenditure. For the purposes of this work, the functional classification of public expenditure is taken into account (Armendariz and Carrasco, 2019).

Table 1: Summary of resources allocated as a percentage of GDP

Country	Education	Health	National Defense
Bolivia	6.3 – 7.6	5.4 – 6.3	1.7 – 1.9
Colombia	4.4 – 4.9	6.6 – 7.2	3.1 – 3.6
Ecuador	4.3 – 5.2	5.6 – 9.2	2.2 – 3.1
Perú	2.7 – 4.0	4.9 – 5.5	1.2 – 1.7

Source: Own elaboration with data extracted from ECLAC and the World Bank

3.2. Common characteristics under which social policies were developed in the Andean region

Taking stock of the 15-year context in which social policies were developed in the Andean region is a fairly broad and complex work, therefore, are exposed those that from a personal criterion, had an effect on the allocation of public expenditure.

In the period 1982 and at least 2004 the economic policies implemented in Latin America and therefore in the Andean countries were based on the so-called Washington Consensus that responded more to a logic of stabilization than to a logic of development, where social policy was conceived as a complement to economic policy, with very little linked objectives (UNDP-IDB, 1993).

The so-called Washington Consensus was initially designed as a package of measures widely recommended by the World Bank and the IMF to all governments of Latin American countries, based on: i) establishing a fiscal discipline, ii) prioritizing public spending on education and health, iii) carry out a tax reform, iv) establish positive interest rates determined by the market, v) achieve competitive exchange rates, vi) develop liberal trade policies, vii) promote greater openness to foreign investment, viii) privatize public companies, ix) carry out a deep deregulation and, x) guarantee the protection of private property (Williamson, 1989).

According to ECLAC (2004) the measures implemented failed to reduce poverty; on the contrary, the gaps between high and low socioeconomic strata widened dramatically in most countries in the region. Given this situation, the Andean countries carried out a Social Reform based mainly on increasing the efficiency and decentralization of public spending towards the social sector, focused on the groups of people with the greatest deficiencies and focused mainly on education, sanitation and health (Medellin, 2004).

Decentralization was basically linked to providing responsibility for the provision of social services, establishing transfer systems from the central government to the municipalities; systems that included compensation criteria that allowed to level the unequal capacity of local governments to collect. The decentralization process began in Colombia with the 1991 Constitution (Law No. 1381), in Ecuador through the State Modernization Act of 1993 (Law No. 50), in Bolivia in 1994, through the Popular Participation Law (Law No. 1551) and, finally, in Peru as of the Constitutional Reform of 2002 (Law No. 27680) (Barrios, 2017).

In 2000, the United Nations Millennium Summit was held, 189 countries including the countries of the Andean region signed the so-called Millennium Declaration, committing to make the necessary efforts to achieve the objectives called “Development Objectives of the Millennium” and the goals set there, highlighting as central axes the reduction of poverty, sustainable development, gender equality and respect for human rights. Consequently, the signing of this international agreement has promoted a significant number of initiatives carried out by the Andean countries both at the level of legislation and social policy, aimed at expanding the coverage of basic social services in education, health, water and sanitation (United Nations, 2000).

Additionally, it can be noted that in the year 2001 the Andean Community, ordered the preparation of an Integrated Social Development Plan (PIDS) with the purpose of promoting cooperation and coordination of policies and actions among member countries, as well as the execution of Regional projects, in order to add value to national policies against poverty, exclusion and social inequality within the framework of the commitments made at the 1995 World Summit on Social Development and the Millennium Development Goals, this Plan was approved by Decision 601 in September 2004. The PIDS was based on three lines of work: technical cooperation in social policies among the member states of the Andean Community; the joint monitoring and evaluation of shared social objectives and goals and; the execution of community programs and projects of regional scope related to a wide thematic range related to: health, education, interculturality, rural development, socio-labor, food security, sustainable use of biodiversity, preservation and management of shared water sources and social development in border areas (Andean Community, 2013).

Another important aspect is that, since 2004, the Andean region returns to a relatively sustained economic growth, based mainly on the expansion of its exports of primary goods, such as: copper in Peru, oil in Ecuador, coal in Colombia and minerals and hydrocarbons in Bolivia, the result of the rapid growth of the Chinese economy that boosted the demand for minerals and food. The economic boom caused a significant increase in public investment in education, health and



social security and, consequently, the Andean countries tended to carry out social policies with a greater universal approach based on the notion of rights and the consolidation of Transfer Programs Conditional Monetary Under this encouraging economic scenario, the countries of the Andean region adopted a new social development strategy, which in the words of Maurizio (2010) was based on four main axes: expansion of education and health spending, and of social security in general ; increase in real average wages and minimum wages; increase in coverage and quality of social protection for workers and expansion and consolidation of conditional transfers of income to poor households. Regarding conditional transfers, the four countries that make up the Andean region implemented Conditional Transfer Programs aimed at reducing school dropout, infant mortality, and malnutrition. Colombia began in 2001, with the “More Families in Action” Program, years later, in 2007; it implemented the “Unidos Network” Program. In 2004, Ecuador began the Conditional Transfer Program with the “Human Development Bonus” and in 2011 the “Zero Malnutrition” Program. Peru in 2005, with the Program of Direct Support to the Poorest called “Together”. Finally, in 2006, Bolivia started the Conditional Transfer Program called “Juancito Pinto Bonus” and in 2009 it implemented the “Mother Boy-Girl Bonus” and the “Juana Azurduy de Padilla Bonus”.

Additionally, at the World Summit on Social Development that took place in 2005, governments committed themselves to developing more ambitious National Development Strategies, to build socially inclusive countries that generate employment, economic growth and political stability. Likewise, develop innovative sources of financing, including actions by groups of countries to implement the international financing mechanism and other initiatives to finance development projects, particularly in the health sector (United Nations, 2005).

As a synthesis, in the study period (2000-2015), the countries of the Andean region, developed under similar contexts, processes and policies that allow us to talk about a possible joint (systemic) reaction regarding the results of the social policies and the endowment of public goods.

3.3. Results of the econometric model

The econometric model was based on the variables proposed by the endogenous growth model proposed by Barro (1990):

$$(1.1.) \quad Y = AK^\alpha G^{1-\alpha}$$

Where; K represents capital, both physical and human, A technology and G public goods. The incorporation of public goods responds to the argument that the State's investment in infrastructure, research, education and public services produces externalities that contribute to the

productivity growth of the productive sectors, thus creating a potentially positive link between the provision of goods and public and economic growth.

Under the previous consideration and following the proposal of Greene (2008) and Gujarati (2010), the following econometric model was specified:

$$(1.2.) \quad Y_{it} = \alpha + \beta_1 X_{1it} + e_{it}$$

Where:

i : are counties under study: Bolivia, Colombia, Ecuador y Perú

t : the analysis period: 2000, 2001, 2002, ..., 2015

Y_{it} : the dependent variable (economic growth) of country i in year t

X_{it} : the explanatory variables (public investment, represented by gross fixed capital formation and public goods, disaggregated into: education, health, housing, social security and military spending) of country i in year t .

e_{it} : It is the error term.

The result of the process of preparing the econometric model determined that the econometric model based on panel data that best fits to explain the relationship between economic growth and the allocation of public expenditure to public goods in the countries that make up the Andean region, In the study period, it corresponds to a dynamic model of fixed effects panel data, which is presented below:⁴

$$(1.3.) \quad CE_{it} = 2.77 + 0.16CE_{it-1} + 1.3ED_{it-1} + 0.56DE_{it-1} - 1.1SA_{it} + 0.21FBC_{it}$$

Where: CE represents the economic growth of each country of the Andean region in the period 2000-2015; ED, DE, SA are the variables assigned to the resources that governments allocated to public spending: education, defense and health as a percentage of the GDP of each Andean country in the period 2000-2015, and FBC represents the public investment defined as Gross Fixed Capital Formation also measured as a percentage of the GDP of the countries that make up the Andean region; This variable includes physical infrastructure financed by public investment, such as: roads, water supply and sewerage systems, gas and electricity distribution networks, schools, hospitals, among others. In that scenario, the results indicate:

⁴ To determine the econometric model that best fits the object of study, it is necessary to perform tests of specification and validity, which in many cases requires the incorporation or elimination of variables that do not turn out to be statistically significant. The resulting econometric model is found in Annexes.



First: the fact that the resulting econometric model corresponds to a fixed effects model, means that the endowment of public goods affects all countries of the Andean region equally and that the differences between them are due to the characteristics or decisions typical of each country, allows us to talk about a joint or systemic reaction to the impact of public spending and public investment on the economic growth of the Andean region. The fact that the fixed effects model has been the selected model confirms what was stated by Franco, Ramos and Hernández (2016: 301) “if you work with a selected sample for convenience and when the number of subjects or time period is not large, the fixed effects model is recommended”.

Second: the positive sign of the coefficients indicates that public spending for "Education" and "National Defense" created an opportunity for economic growth in the Andean countries. Result that coincides with the postulates of Lucas (1988) and Howitt (2004), who, as a result of the research carried out, conclude that an educated workforce has greater capacity for innovation and competitiveness to perform productive activities, whether to create, execute or adapting new technologies, therefore, improves worker productivity; situation that comes to cause greater economic growth. In the same way, the results support the results of the works of Benoit (1973), Biswas-Ram (1986), Atahuichi (2002) and Crespo-Reitschuler (2003), which conclude by pointing out that the need to invest in defense is derived of the need to guarantee an environment of normality and tranquility that a country requires for the development of its activities, thus generating positive externalities in the country's productivity and therefore greater economic growth.

On the other hand, the negative sign of the public expenditure coefficient for “Health” shows that the resources allocated to this public good did not become an opportunity for economic growth. In this regard, taking into account that on average the countries of the Andean region allocated more resources as a percentage of GDP to “Health” than to “Education”, it shows that, during the study period, public spending on health It was not necessarily related to greater efficiency of public spending. The previous statement is supported by the publication edited by Izquierdo, Pessino and Vueltin (2018) where it is stated that in the health sector, the inefficiency of spending can occur when patients do not receive the best possible care for a certain level of allocated resources (allocative inefficiency) or when excessive consumption of resources steals from other patients the possibility of treatment and health gains (technical inefficiency). The publication presents empirical evidence of the efficiency levels of health systems based on data envelopment analysis; with information from the 2006–2015 period; Efficiency performance is

measured using three categories: health, access to services and equity in access to services⁵. The results at the level of the Andean countries show that: Colombia obtained a score of 0.938, followed by Ecuador with 0.916, third is Peru with 0.887 and finally Bolivia is 0.845. Additionally, the scores place Colombia in the bottom half of the scores of 60 of the countries that were part of the study, and Ecuador, Peru and Bolivia in bottom 25%.

Third, the coefficient values allowed quantifying the impact of public spending on economic growth. About:

- The increase of 1 p.p. of the public expenditure destined to “National Defense” caused the economic growth to increase by 0.56 p.p., but the increase occurred one year after the allocation of resources.
- The increase of 1 p.p. in public spending allocated to "Education" generated an increase of 1.3 p.p. in economic growth a year after governments increased resources.
- The increase of 1 p.p. in the resources allocated to “Health” caused a decrease of 1.1 p.p. in economic growth, this decrease occurred the same year that governments allocated resources.

Fourth, since the coefficient of the variable “Education” is positive and the highest compared to the rest of the variables, it shows that the public expenditure destined to Education was the one that had the greatest impact on the economic growth of the countries of the Andean region, Therefore, social policies aimed at improving the education of the inhabitants of the countries of the Andean region became an opportunity for growth.

Fifth, there are other variables that positively impacted on the economic growth of the countries, among which are:

- Gross Capital Formation (BCF), indicates that an increase of 1 p.p. in the BCF it caused the economic growth of the Andean region to increase by 0.21 p.p. in the same year that the increase in the BCF occurred. Result that supports the work of Manuelito and Jiménez (2013), who point out that properly channeled investment is a fundamental element for

⁵ Efficiency performance is measured for eight health system products grouped into three categories: i) health: life expectancy at birth and at age 60, mortality of children under 5 years of age and disability-adjusted life years; ii) access to services: immunization rates DTP (Diphtheria, Tetanus and Pertussis) and specialized care during childbirth; iii) equity in access to services: rates of specialized care during rural delivery vs. urban and poorer vs. more rich.

economic development, in the short and medium term the investment generates growth through the boost to aggregate demand; Additionally, in the long term, quality investment generates technological changes, allows to develop a greater productive capacity and encourages the reallocation of resources towards the most productive sectors.

- Economic growth also has a positive effect on the growth of the following year, the impact is 0.16 p.p.

Integrating the results, the research process carried out allowed us to identify that in the study period (2000-2015), the countries of the Andean region, were developed under similar contexts and policies, where the characteristics and decisions of each country inherent in the common processes, although they differentiated them, at the same time allow us to talk about a joint reaction at the regional level, regarding the results of social policies and the allocation of public spending. Analysis contrasted with the results of the econometric model of fixed effects.

The joint or systemic reaction made it possible to distinguish that public spending for "Education" and "Defense" created an opportunity for economic growth. Additionally, it was identified that the public expenditure allocated to "Education" is the one that contributes most to economic growth. The nature of the link between education and economic growth depends on a set of factors such as: the type of social policies implemented, the characteristics of the labor market, among others. One way to analyze the dependence is: "If a country directs social policy actions to achieve a better education but there are few possibilities for formal employment, even though the population has greater capacities will not be able to enter the labor market and therefore not the expected effect on economic growth will be achieved".

In this context, although it is necessary that social policy actions are aimed at reducing the levels of marginalization of the school system and improving coverage and educational access, retention and promotion rates, performance levels, qualification of the workforce, among others, it is equally necessary that social policies be accompanied by productive development policies and labor policies. In the first case, policies to promote micro, small and medium enterprises, since these not only contribute to economic growth but also generate formal employment and, in the second, policies that improve insertion and access to job opportunities.

Another way to strengthen the relationship or link between education and economic growth is through the implementation of multiple development policies and programs, such as those that link support to the productive sector with education and training.

The results also identified that public spending for "Health" failed to generate an opportunity in economic growth during the study period. This situation does not mean that they should stop implementing social policies aimed at reducing morbidity and mortality, improving nutrition, access to health, among others, first, because it is a fundamental human right and second, because it generates positive externalities in Education, as expressed above, a healthy population increases and makes the years of schooling more effective, enabling greater training and, in addition, improving the productivity of workers, therefore, it manages to promote inclusive economic growth.

The points presented, visualize the importance of articulating interdependently to economic and social policies as conditions for growth with inclusion and equity.

A point that deserves to be clarified is that because public spending is borne by the State, there is a need to analyze the efficiency of public expenditure disaggregated into: i) technical efficiency, which analyzes the relationship between resources and results, given the distribution of current spending; ii) allocative efficiency, related to the prioritization of spending on items with higher socioeconomic returns; that is, how governments allocate their expenditure in different functions, such as: education, health, investment and defense; In order to maximize the productivity and growth of the economy and, iii) management efficiency, it refers to the quality of the processes and institutions that manage public spending. However, to date there are few databases of total expenditure on disaggregated public investment under the economic-institutional-functional cross-classifications (Armendariz and Carrasco, 2019).

5. CONCLUSIONS

As a result of the work, it was determined that public spending for education generated a positive externality in the economic growth of the countries of the Andean region in the period 2000-2015, thus accepting the hypothesis raised in response to research work accomplished.

Additionally, the empirical evidence and the results of the econometric model allow us to indicate that the decisions of each country derived from the common processes that were present in the region, which allowed us to speak of a systemic reaction at the regional level regarding the results of the allocation of public expenditure.

The joint (systemic) reaction in economic growth in the face of changes in the allocation of public spending allowed us to determine, through the positive sign of the coefficient of the variables "Education" and "Defense", that the public expenditure allocated to these types of goods generated an externality in the economic growth of the Andean region, meanwhile, the negative

sign of the estimator of the variable "Health" revealed that the public expenditure allocated to health did not generate an opportunity in economic growth. Also, it is established that public spending for "Education" was the expense that generated greater opportunities in the economic growth of the countries of the Andean region. For all the above, the research work came to fulfill the stated purpose.

Finally, it is necessary to point out that the scope of study of economic growth is quite wide, which caused that during the development of the work different concerns arose, they are raised as recommendations for future research. Therefore, it is recommended to carry out studies that: i) deepen the study of social policies incorporating in the analysis the power factors, social tensions and cultural aspects that influence the success of the policies and economic growth; ii) explore the relationship between governance, economic growth and development, based on an analysis of the characteristics of social policies; iii) systematize empirical evidence on the impacts and results of social policies on economic growth; iv) examine social policies aimed at the provision of public goods from an equality approach, in terms of gender, ethnic-cultural and generational disparities, v) analyze the efficiency of public spending, according to their function, disaggregated into technical efficiency and efficiency. The two types of efficiency are crucial for promoting long-term economic growth and improving equity, and vi) include in the debate the failures of development models and social policies from a vision that gives disciplines such as political science and sociology.

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ANNEXES

Resulting econometric model

Dynamic panel-data estimation, one-step system GMM

Group variable: id	Number of obs	=	66
Time variable : year	Number of groups	=	4
Number of instruments = 66	Obs per group: min	=	16
Wald chi2(6) = 60.46	avg	=	16.50
Prob > chi2 = 0.000	max	=	17

tc	Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]	
tc						
L1.	.1570291	.0608431	2.58	0.010	.0377787	.2762794
ed						
L1.	1.304017	.3769338	3.46	0.001	.5652398	2.042793
gm						
L1.	.5637687	.1061574	5.31	0.000	.355704	.7718333
sa	-1.07255	.1968404	-5.45	0.000	-1.45835	-.6867496
ed	-1.193741	.3619971	-3.30	0.001	-1.903242	-.4842395
inv	.2103462	.0650622	3.23	0.001	.0828266	.3378658
_cons	2.779242	.3756508	7.40	0.000	2.04298	3.515504

Arellano-Bond test for AR(1) in first differences: z = -1.58 Pr > z = 0.114

Arellano-Bond test for AR(2) in first differences: z = 0.44 Pr > z = 0.660

Sargan test of overid. restrictions: chi2(59) = 61.30 Prob > chi2 = 0.394

Condition 1: Validity of instruments

Ho: Overidentification restrictions are valid.

Ha: Overidentification restrictions are invalid.

The Sargan test shows that the value of the probability (0.394) is greater than 0.05, therefore, the instruments used in the estimation are valid and there is no overidentification.

Condition 2: Autocorrelation

Ho: there is no autocorrelation.

Ha. There is autocorrelation

The Arellano and Bond Test provides that the $pr > z = 0.66$ for Ar (2), since the value is greater than 0.05, the null hypothesis is not rejected, concluding that there is no autocorrelation



Conflicto de intereses / Competing interests:

La autora declara que no incurre en conflictos de intereses.

Rol de los autores / Authors Roles:

No aplica.

Fuentes de financiamiento / Funding:

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Aspectos éticos / legales; Ethics / legals:

La autora declara no haber incurrido en aspectos antiéticos, ni haber omitido aspectos legales en la realización de la investigación.

