Declining inequality in Bolivia: How and Why

Fortun Vargas, Jonathan M.

Graduate School of International Cooperation Studies, Kobe University

July 2012

Declining inequality in Bolivia: How and Why

Jonathan M. Fortun Vargas[+]

Graduate School of International Cooperation Studies, Kobe University, Japan

Abstract. Latin America has often been depicted as one of the most unequal regions in the world. However, after the rising of inequality, the figure decline dramatically starting from the year 2000. In this setting, Bolivia has been one of the poorest performers on income distribution efforts, lately, this situation has been improving. The author investigates the dynamics of this change through an analysis of household level surveys for 4 different years (2003/04, 2005, 2008 and 2009). The research applies a method of inequality decomposition– as developed by (Fields, 2003)-, this technique consists on regressing the expenditure of households against a vector of explanatory variables. The results suggest that education (more than other variables) has contributed on the reduction of inequality in Bolivia. Moreover, the sources of inequality are mainly attributed to the differences on human capital accumulation more than any other variables, such as the gender of the household head or the ethnical origin of the household. The results are in line with similar work made by other authors on the same issue (Gray-Molina, et al., 2001; Gray Molina &Yañez, 2009)

1. Introduction

Latin America is often depicted as the most unequal region in the world. The inequality statistics for the region are surprising: Latin American Countries present a Gini coefficient of 0.53 in the mid-2000s, which is 18 percent more unequal than Sub-Saharan Africa, 36 percent more unequal than East Asia and the Pacific and 65 percent more unequal than high income countries (Ferrari &Ravallion, 2008).

Income inequality in Latin American increased substantially during the so called "lost decade of the 80s" and the consequent period of structural reforms during the decade of the 90s. The evidence (Hoffman &Centeno, 2003; Korzeniewicz& Smith, 2000; Leamer, Maul, Rodriguez, & Schott, 1999; Londoño&Székely, 2000; Székely&Hilgert, 1999) suggests that the effects of the debt crisis during the 1980s –along with the periods of hyperinflation in the region- were unequalizing. The path of transmission is explained in (LópezCalva&Lustig, 2010): "the poor were less able to protect themselves from high and runaway inflation and orthodox adjustment programs frequently resulted in overkill, those in the poor and the middle-income wages were hurt disproportionately while the income share of the top 10% rose".

Moreover, as (Janvry&Sadoulet, 2000) explain, "the un-equalizing effect of the crisis was compounded because safety nets for the poor and vulnerable were conspicuously absent (or poorly designed and inadequate) in the Washington led structural adjustment programs in the 1980s and some part of the 1990s".

However, after the rising of inequality, the figure decline dramatically from 2000. Out of the seventeen countries on which data is available, twelve experienced a decline in their Gini coefficients. The average decline for the twelve countries was 6 percent (for the period 2001 to 2009).The interesting fact about this new movement towards equality in Latin America is that the effect was widespread. Inequality declined in high inequality countries (such as Brazil and Bolivia), countries with traditional low inequality (for LAC standards) such as Argentina. The indices of inequality declined for fast growing countries (Chile and Peru), but also slow growing giants (Brazil and Mexico), countries recently hit by crises (Argentina), or countries with relatively stable macroeconomic figures (Peru, Chile and Panama).Given this circumstances, it is imperative to ask how and why this decline occurred.

2. The Case for Bolivia

2.1. High Inequality

[+]Corresponding author. Tel.: +81-(78)803-7267
E-mail address: fortun@stu.kobe-u.ac.jp

Bolivia has traditionally been one of the weakest performers on both economic growth and poverty reduction in Latin America(Gray Molina &Yañez, 2009). The low economic growth rate is typical of a natural resource based economy; a diverse range of authors, such as(Burchfield, 2002; Faye, McArthur, Sachs, & Snow, 2004; Grootaert& Narayan, 2004; Merryman& Ackerman, 1969; Sandóval& Cordova, 1998) comment the different reasons for Bolivia's slow growth; they present several reason which go from institutional and productivity obstacles to effects derived from the fact that Bolivia is a landlocked country.

However, there has been very little research regarding the determinants of inequality in Bolivia. This is a surprising factor since this country has presented through the years some of the highest Gini coefficients in the region. This then, becomes an important field given the consequences of inequality presented in standard literature. (Urquiola, 2000) argues that high levels of inequality impact on growth, also, disparities in education and labor markets for women, indigenous peoples and rural population have diminished the capacity to build cumulative capital in Bolivia. Some authors, such as (Gray-Molina, Jiménez, Pérez de Rada, &Yáñez, 2001; Lora, 1998) suggest that despite the fact that Bolivia has been one of the most active reformers in education, health and decentralization; the cumulative impact of these policies is not seen in the improvement of development indicators.

2.2. Poverty and Inequality

Bolivia has had a below average overall level of growth in the last decade, when compared to other Latin American countries, averaging an annual GDP growth rate of 3.8% (see Table 1 and Table 2). Per capita growth had an average of 2% which is also below average than the peer group. On both counts, Bolivia is lagged in the region.

Table 1: GDP Figures Bolivia. Source: own elaboration based on: IMF's International Financial Statistics, January 2012

Bolivia	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
GDP constant million 2000 US$	8,397.86	8,539.26	8,751.51	8,988.79	9,363.92	9,777.94	10,246.99	10,714.70	11,373.50	11,755.30	12,240.41

Bolivia	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	Simple avg.
Growth rate	1.7%	2.5%	2.7%	4.2%	4.4%	4.8%	4.6%	6.1%	3.4%	4.1%	3.8%

The important issue; however is that the poverty level has experienced a decrease since 2007. Most of the decline in poverty figures could be traced to decline in urban poverty and an important decline in rural poverty between 2008 and 2009. Moreover, extreme poverty, proxied by indigence measures, has declined over the period.It is argued by policymakers in Bolivia, that the reduction of poverty is attributed to the implementation of programs of Cash Conditional Transfers (CCTs) and other pro-poor growth policies inducted by the recent government. However a formal research presenting empirical evidence of these claims has not been presented to date.

The existent work regarding pro poor growth in Bolivia has been mainly concentrated in the relatively low growth/poverty reduction sensitivity, and the long lasting nature of income and non-income inequality. For example (Klasen et al., 2004) show that while economic growth has been pro poor in the early 90s it was not fast enough to lead to significant poverty reduction. They also investigate about the causes of poverty reduction in Bolivia, they state that close to two thirds of poverty reduction was due to growth effects rather than distributional effects; moreover they explain that urban economic growth tended to be relatively anti-poor. (Klasen et al., 2004) use a CGE model to estimate potential scenarios for future poverty reduction. They find that positive shocks attributed to an increased national rent -due to exports of natural resources, for example-are likely to boost growth and reduced urban poverty. However, they also argue that this effect would lead to rising inequality and rising rural poverty. The findings by Klasen et al., (2004) go in line with other research on growth and pro poor growth in Bolivia, such as (Calvo, 2006; Gray-Molina et al., 2001; Kaufmann, Mastruzzi, &Zavaleta, 2002).

With the exception of recent research by (Gray Molina &Yañez, 2009) empirical research that explains the reasons behind the declining inequality in Bolivia is not provided. Therefore an analysis to decompose the elements of inequality in Bolivia would add important information for policymakers, scholars and

practitioners in general. Moreover the suspected contribution of recent CCT programs to the reduction of poverty and inequality needs special attention.

2.3. Social Transfers in Bolivia's Recent History

Recent policies related to conditional cash transfers have been very popular in recent times in Bolivia. Additional revenues from the hydrocarbons sector provide funding for two social transfer programs. The first program is called *Juancito Pinto*, which supports schooling age children. The second program is called *RentaDignidad* which aims at the elderly. Both programs account for over US$ 230 million or approximately 2% of the GDP.According to official data for 2011[1], transfers reach over 1.6 million children and approximately 891.000 men and women over 60 years old. While the first program is modelled over the *Bono Escuela* program for the city of El Alto in Bolivia, it maintains lots of similarities with other programs in the region[2]. On the other hand, the second program *RentaDignidad* is an expansion of the *Bonosol* program, which was financed with the revenue of privatized[3] companies in Bolivia; the difference between *Bonosol* and the current program is the source of funding: for nine consecutive years the *Bonosol* program was financed through a combination of collected revenue from privatized companies and internal debt, from 2008 the new program *RentaDignidad* is financed through hydrocarbons taxes and royalty payments to the regions product of the nationalization of the hydrocarbons industry.

The *Juancito Pinto* transfer was created in 2006 establishing an annual cash grant of around US$ 30 for each child from first to sixth grade in public elementary schools, in July 2008 the program was expanded to benefit children up to 8th grade of elementary public schools. The current program RentaDignidad was formally introduced in 2008, while the original program dates back to 1996. In its present form, the program is granted to all elderly citizens (over 60 years old); the amount of the grant varies from US$ 260 to US$ 345 depending on the social security payments of the beneficiaries.

To date, there are no specific studies that analyse the impact of these recent programs regarding poverty and inequality. However (Jemio, 2006) presents an study regarding the Bonosol program. Using Household survey data for the years 2001, 2002 and 2003/4, Jemio finds two important welfare effects related to this specific program. First, cash transfers to the elderly, while universal, have a stronger incidence among the poorest deciles of the population. In the bottom three deciles close to 15% of households receive the payment. In the top three deciles the figure drops to around 10%. Close to 20% of rural households receive the benefit in the 3 poorest deciles. The second important finding is that, while mostly concentrated on the poor, the poverty-reducing effect is relatively small for 2001/02; however the impact for the 2003/4 period is stronger.

3. Empirical Analysis

3.1. Data Description

The data utilized for the analysis will be based on Household surveys compiled by Bolivia's National Statistical Institute (INE) and Bolivia's Analysis Unit for Social, Economic and Political Policies (UDAPE). The Household Surveys utilized are the ones for the years 2003/04, 2005, 2008 and 2009. Even though the data used is not constructed as a panel, according to documentation from INE and UDAPE, the greatest effort has been made to establish an acceptable level of similarity between the households in each different year of the surveys. For each year, the household surveys are composed of 4260 (except for the period 2003/04) households distributed across the country[4]. The specifics on the data construction and sample distribution are explained in the accompanying documents to the surveys. (Instituto Nacional de Estadistica Bolivia, 2005, 2009, 2010; Unidad de Análisis de Políticas Sociales y Económicas, 2011). The variables

---

[1]For the figures of the program RentaDignidad data is retrieved from Bolivia's National Social Security Regulator, for the case of the program Juancito Pinto the figures come from Bolivia's Ministry of Education
[2]BolsaFamilia in Brazil, Progresa in Mexico, to cite some
[3]In the period of 1993 to 1997 the government of then president Gonzalo Sanchez de Lozada applied a policy called capitalization, where numerous public sector enterprises were privatized in a specific scheme: Investors acquired a 50% share and management of the enterprises, while the Bolivian government kept the remaining 50% share
[4]The distribution of households among administrative-geographical units in Bolivia for each of the utilized surveys is available on the methodology documents accompanying the surveys

presented in the surveys present the typical information for household level surveys. The selection of the years to be utilized was based on the availability of the surveys.

3.2. Econometric Technique

To assess the contribution to the reduction in poverty and inequality of several factors, I will use a regression-based decomposition technique, similar to the one developed by (Fields, 2003). This technique consists on regressing the expenditure of households against a vector of explanatory variables.

As explained by (Fields, 2003) this approach allows to answer two questions. First, how much inequality in per capita expenditures can be accounted for by various household characteristics. Second, it enables to evaluate the impact of each characteristic. The general model is described by the following equation:

$$\ln(Y_{it}) = \alpha_t + \beta_{1t} X_{it} + \beta_{2t} CT_{it} + \varepsilon_{it} \tag{1}$$

Where irefers to each household, t is year, Y is the per capita expenditure for each household, and X is a vector of explanatory variables composed of relevant household characteristics. To assess for the contribution of cash transfers, CT is a variable that represents the reception of cash transfers by the household. In this case, the variable CT1 will represent the reception of the cash transfers for the elderly, either the *Bono Sol* (for the years2003/04 and 2005) or *RentaDignidad*for the remaining years, CT2 will represent a transfer for families with new-born babies *Bono de Natalidad*, and CT3 will represent the reception of a transfer for primary school children *Bono Juancito Pinto*.

The vector X can include several characteristics from the diverse set of variables presented in the household survey, in this specific research I have picked the following: a dummy variable to indicate if the household's head considers belonging to a specific ethnic group, a dummy variable for gender and dummy variables for educational attainment. Additionally, and to avoid spurious regression results, the variable age squared which represents the squared age of the household head age is input.

3.3. Empirical Results

The regression results for the model specified in Equation (1) are reported in Table 2. The empirical results presented, confirm the results made by other authors on the same issue (Gray-Molina, et al., 2001; Gray Molina &Yañez, 2009).In the long run, education and demographic change tend to explain the income inequality. In the results, the gender of the head of household does not present a statistical significance.

Table 2: Regression results. Source: own elaboration

Dependent variable is expenditure for each household				
	2003-2004	2005	2008	2009
Head of hh age	0.0156	0.0113	0.0108	0.0139
	(6.42)	(7.84)	(6.94)	(2.47)
Head of hh age squared	0.0003	0.0001	0.0001	0.0001
	(0.00)	(0.00)	(0.00)	(0.00)
Head of hh indigenous	-0.1442	-0.1385	-0.1486	-0.1297
	(-4.78)	(-4.52)	(-4.04)	(-3.94)
Head of hh female	-0.0477	-0.0475	-0.0384	-0.0594
	(-1.23)	(-1.09)	(-1.76)	(1.65)
Head of hh primary education	0.4921	0.4725	0.4239	0.5192
	(3.68)	(4.92)	(5.01)	(3.84)
Head of hh secondary education	0.8154	0.7845	0.7642	0.7264
	(7.01)	(7.46)	(6.41)	(6.01)
Head of hh superior/tech educ	1.7471	1.4278	1.5762	1.6414
	(14.08)	(17.07)	(15.85)	(16.24)
Receive CT1	0.0097	0.0112	0.0348	0.0647
	(1.97)	(1.52)	(1.99)	(2.03)
Receive CT2	0.0098	0.0089	0.0091	0.0083
	(1.87)	(2.21)	(2.26)	(1.98)
Receive CT3			0.0071	0.0084
			(1.13)	(1.20)
C	4.1786	4.1385	4.7895	4.8731
	(28.46)	(30.85)	(29.75)	(27.86)
n	4610	4260	4260	4260
R^2	0.3628	0.3264	0.3345	0.3479

Regarding the specific contribution of cash transfers, it is important to note that the variable cash transfer enjoys statistical significance only on later years, result that goes in line with (Jemio, 2006). The contribution in later years seems to increase; this fact could be attributed to the increment on the beneficiaries for the program *Juancito Pinto*[5] and the natural expansion of beneficiaries of the program *RentaDignidad* given the consequence of more people catching up to the age to receive the benefit.The decomposition technique here presented suggests that the most significant contributor to income inequality is education –both by low levels of achievement and by low rates of return in labour markets-.

4. Conclusion

While the poverty-reducing effects should be analyzed in detail, the evidence presented here suggests that both *RentaDignidad* and *Juancito Pinto* contribute to the reduction in poverty and inequality figures. The available evidence also suggests that it is too early to gauge the full effect of both social transfers over poverty and inequality in the long run. Unfortunately, neither transfer was preceded by a careful baseline survey.

The evidence also suggests a change in the trend with previous years regarding the modification –for good- of trends in poverty and inequality inside Bolivia. It seems that the improvement of education, more than any other policy has contributed to the declining figures of inequality.The important issue however is to single out the policies that contribute to this improvement. This research sheds some light into the policies that are currently contributing to the reduction of poverty and inequality, however further research that accounts for broader temporal sets and redefined econometric techniques is necessary.

Future evaluation studies will require paired comparisons and econometric controls to measure the specific effect of transfers on poor and non-poor households. Over the long run, and from a comparative perspective, conditional cash transfers have been moderately successful in other countries in the region, when accompanied by adequate social service coverage.

It is also important to point out that the econometric technique utilized in the present research is basic regarding the link between CT programs and reduction of poverty and inequality. Despite the arguments that (Fields, 2003) states, it is arguable that the presented results here only provide information on the impact that CTs have on the expansion of expenditure at household level. The model is indirectly used to evaluate the contribution of transfers to the reduction of poverty and inequality; however it fails to establish a clear causality link. A model that empirically links the direct effect and –most importantly- the causality that cash transfers have on the reduction of poverty and inequality is yet to be applied for the specific case of Bolivia.

5. References

[1]   Calvo, S. (2006). Applying the Growth Diagnostics Approach: the Case of Bolivia. The World Bank.

[2]   Faye, M. L., McArthur, J. W., Sachs, J. D., & Snow, T. (2004). The challenges facing landlocked developing countries. *Journal of Human Development*, 5(1), 31-68.

[3]   Ferreira, F. H. G., &Ravallion, M. (2008). Global poverty and inequality: a review of the evidence. WB Policy Research Working Paper Series, 4623.

[4]   Fields, G. S. (2003). Accounting for income inequality and its change: A new method, with application to the distribution of earnings in the United States. In S. W. Polachek (Ed.), *Worker well-being and Public Policy (Research in Labor Economics)* (Vol. 22, pp. 1-38). Amsterdam: Elsevier Science.

[5]   Gray-Molina, G., Jiménez, W., Pérez de Rada, E., & Yáñez, E. (2001). Poverty and assets in Bolivia: What role does social capital play. In O. Attanasio& M. Szekely (Eds.), Portrait of the poor: An assets-based approach (pp. 46-83). Washington D.C.: Inter-American Development Bank.

[6]   Gray Molina, G., &Yañez, E. (2009). The Dynamics of Inequality in the Best and Worst Times: Bolivia 1997–2007. UNDP project "Markets, the State, and the Dynamics of Inequality: How to Advance Inclusive Growth," coordinated by Luis Felipe López-Calva and Nora Lustig.

---

[5]As stated before, the government of President Morales expanded the program in 2008

[7] Grootaert, C., & Narayan, D. (2004). Local institutions, poverty and household welfare in Bolivia. World Development, 32(7), 1179-1198.

[8] Hoffman, K., &Centeno, M. A. (2003). The lopsided continent: inequality in Latin America. Annual Review of Sociology, 363-390.

[9] Instituto Nacional de Estadística Bolivia. (2005, 2006, 2009, 2010). Documento Metodológico Encuesta Continua de Hogares ECH-MECOVI 2003-04, 2005, 2008, 2009. La Paz: INE Bolivia.

[10] Janvry, A., &Sadoulet, E. (2000). Growth, poverty, and inequality in Latin America: A causal analysis, 1970–94. Review of Income and Wealth, 46(3), 267-287.

[11] Jemio, L. C. (2006). Efectos Micro- y Macroeconómicos del BONOSOL. La Paz: FundaciónMilenio.

[12] Kaufmann, D., Mastruzzi, M., & Zavaleta, D. (2002). Sustained Macroeconomic Reforms, Tepid Growth: A Governance Puzzle in Bolivia? World Bank Research Working Paper.

[13] Klasen, S., Grosse, M., Thiele, R., Lay, J., Spatz, J., &Wiebelt, M. (2004). Operationalizing Pro-Poor Growth-Country Case Study: Bolivia. Ibero America Institute for Econ. Research (IAI) Discussion Papers.

[14] Korzeniewicz, R. P., & Smith, W. C. (2000). Poverty, inequality, and growth in Latin America: Searching for the high road to globalization. Latin American research review, 7-54.

[15] Leamer, E. E., Maul, H., Rodriguez, S., &Schott, P. K. (1999). Does natural resource abundance increase Latin American income inequality? Journal of Development Economics, 59(1), 3-42.

[16] Londoño, J. L., &Székely, M. (2000). Persistent poverty and excess inequality: Latin America, 1970-1995. Journal of Applied Economics, 3(1), 93-134.

[17] López Calva, L., &Lustig, N. (2010). Explaining the Decline in Inequality in Latin America: Technological Change, Educational Upgrading and Democracy. Declining Inequality in Latin America: a decade of progress, 1-24.

[18] Lora, E. (1998). Una década de reforma estructurales en América Latina: qué se ha reformado y cómo medirlo. Pensamientoiberoamericano, 27, 53.

[19] Lustig, N., & Taylor, J. E. (1994). Mexico: The remaking of an economy. Journal of Economic Literature, 32(1), 134-134.

[20] Merryman, J. H., & Ackerman, E. D. (1969). International law, development and the transit trade of landlocked states: The case of Bolivia: Metzner in Komm.

[21] Sandóval, G., & Cordova, J. (1998). Grassroots organizations and local development in Bolivia: A study of the municipalities of Tiahuanacu, Mizque, Villa Serrano, and Charagua. Washington D.C.: World Bank, Social Development Family, Environmentally and Socially Sustainable Development Network.

[22] Székely, M., &Hilgert, M. (1999). What's Behind the Inequality we Measure: An Investigation Using Latin American Data. IADB Working Papers, 409.

[23] Unidad de Análisis de Políticas Sociales y Económicas. (2011). Dossier de estadísticas sociales y económicas de Bolivia. La Paz: UDAPE Bolivia.

[24] Urquiola, M. (2000). Geography and development in Bolivia: migration, urban and inustrial concentration, welfare, and convergence: 1950-1992. Washington D.C.: Inter-American Development Bank.