



Research Article

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An Empirical Assessment of Pro-Poor Growth in Moroccan Regions: Inclusion of Intra-Regional Inequalities

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Abstract

Aware of the issues linked to inequality and growth and their implications for poverty, our article aims to empirically assess the “poverty-growth-inequality” triangle at the level of Morocco's 12 regions over the period 2001 to 2014. The approach adopted is based on the decomposition methods of Kakwani and Prenia, making it possible to measure the total elasticity of poverty to growth and inequality, and then to quantify pro-poor growth and pro-poor policy indices by region. As such, the contribution of this work is to introduce income inequalities within regions instead of total inequalities in the understanding of spatial inequality policies affecting regional poverty and growth. These inequalities are calculated using Dagum's (1989) decomposition and incorporated into the estimated models. The main results of our study confirm the presence of significant and differentiated effects of inequality and growth on regional poverty reduction, with a greater effect of inequality.

Keywords: Pro-poor growth, pro-poor policy, Within-inequality, panel regression

1. Introduction

Morocco has come a long way in terms of fiscal reforms and outward-looking policies, and has made significant progress in reducing inequality and poverty (Touhami & Boccanfuso & Savard, 2009). Nevertheless, despite the efforts made to reduce poverty at the national level, inequalities persist at the regional level (HCP & WB, 2018). Hence the interest in studying the interactions between poverty and inequality at regional level, and determining whether the level of income generated at spatial level is accompanied by a reduction in inequality and poverty. Mindful of the issues raised by inequality and growth and their impact on poverty, our paper focuses on the construction of pro-poor growth and pro-poor policy indices to characterize the growth process adopted in the Kingdom's 12

regions.

In this vein, the evaluation of the pro-poor nature of the regional growth process within the framework of this work will follow the approach based on the poverty decomposition method developed by (Kakwani & Pernia, 2000) and (Kakwani & Son, 2002). In the line with this approach, poverty reduction depends on two factors. On the one hand, an increase in the average income of the population with an unchanged relative income distribution leads to a reduction in poverty (income factor). On the other hand, any equitable redistribution of income towards the poor. Along these lines, Morocco, like other countries, is exposed to intra-regional disparities that characterize the real level of inequalities in its regions and provinces, and impact its territorial development. Hence the idea behind our proposal, which consists in complementing the Kakwani & Pernia approach by integrating intra-regional inequalities. This will involve measuring an indicator of inequality within regions using the Gini index decomposition method of Dagum (Dagum, 1989).

The paper is structured as follows: the first section provides a theoretical and empirical overview of the growth, poverty, and inequality trilogy, reviewing the main theoretical writings dealing with this issue, as well as the measurement indicators and equations used to quantify and assess this relationship. The second section focuses on the analytical aspect of the dynamics of poverty, inequality, and wealth at the regional level, making it possible to situate and compare the regions in terms of the effectiveness of public policies and the catching-up process over the years. The section 3 estimates the models that will determine the pro-poor nature of growth and the appropriate policies for reducing poverty in each region. Finally, the article concludes with a summary of the major findings and highlights the lessons and recommendations for reducing poverty and inequality in order to benefit fully from growth.

2. Literature Review

The 1950s saw the concept of impoverishing growth (Kakwani & Son, 2003). According to this view, growth benefits the rich more than the poor, due to a lack of financial and human capital, and the poor are only able to benefit to a very limited extent from the fruits of growth. This notion is part of the trickle-down theory. It was not until the early 2000s that poverty was placed at the heart of any growth policy. According to (Kraay & Dollar, 2001), to (Lopez & Serven, 2009), growth is a key factor in poverty reduction, but the strategies pursued by public authorities need to be more geared towards the poor and may even be country-specific (Bourguignon, 2003). To this end, the results of pro-poor programs and policies can be differentiated according to the group of countries chosen and the period considered.

The concept of pro-poor growth (PPG) has been defined by several authors (Anand & Kanbur, 1993); (Bourguignon, 2004); (Klasen, 2007), who have contributed to the understanding of this multidimensional concept. There are two approaches to defining PPG, the first of which is relative (White & Anderson, 2001), where growth is said to be pro-poor if it reduces inequalities to the benefit of the poor. Otherwise, growth-related economic policies make it possible to increase the income of the poorest in relation to that of the rest of the population, which will significantly reduce inequalities in income distribution (Jmurova, 2017). The absolute approach, (Ravallion & Chen, 2003) and (Kraay, 2006) state that growth is pro-poor if the increase in the income of the poor succeeds in reducing the poverty rate in absolute terms. The rate at which absolute poverty is reduced, depends on the growth rate of average income, the initial level of inequality and the inflation rate, average income, the initial level of inequality, and changes in the level of inequality (Klasen, 2008). Assessing the pro-poor nature of growth is of major interest, and there are several methodological approaches that have attempted to quantify the impact of inequalities on poverty. These include the Growth Incidence Curve (GIC) and the pro-poor growth rate of (Ravallion & Chen, 2003), the poverty growth curve of (Son & Kakwani, 2004), the poverty growth bias of (McCulloch & Baulch, 1999) and the pro-poor growth index of (Kakwani & Son & Qureshi & Arif, 2003).

With regard to the relationship between growth and inequality, according to the Kaldor-Kuznets-Solow consensus, (Kuznets, 1955) and Solow have established an inverse relationship

between growth and reduced inequality (Fisher & Erickson, 2007). (Ostry & Berg & Tsangarides, 2007) also argue that the presence of relatively low inequalities is strongly correlated with sustained growth for a given level of distribution. This finding can be explained by two mechanisms: the political mechanism through progressive taxation and the economic mechanism, where the after-tax rate on savings is smaller than the rate on capital income. In addition, several factors (Duclos & Wodon, 2003), identified in the literature, may be at the root of the effect that inequality and growth can have on poverty. These include access by the poor to the labor market, access to socio-economic infrastructure, geographical location, the diversity of the economic fabric, the efficiency of the labor market. The nature of the impact of growth on inequality and poverty can be explained by the distribution of income, the context of economic growth and the ability of the poor to adapt and participate in the growth process.

According to the OECD (OECD, 2021), demographic change and lifestyle, taxation and the redistributive effect of services linked to education, health and housing appear as the most striking factors and weigh on redistribution factors. Growth and the initial level of economic development can also have a positive impact on poverty reduction, according to (Bourguignon, 2004) and (Son & Kakwani, 2004). The "trickle down" principle stipulates that the fruits of growth benefit the rich first before spreading to the poor; although the poor benefit less than the rich, this helps to reduce the poverty rate (Kakwani & Pernia, 2000).

With regard to the relationship between spatial inequalities and growth, inequalities can be beneficial or detrimental to development, where spatial inequalities can contribute to improved production and consequently to growth. On the other hand, inequalities can be detrimental to development in the presence of external economies, causing the squandering of wealth and amplifying social inequalities, thereby condemning long-term development (Kim, 2008). Similarly, according to (Trachen, 1985), developed economies are characterized by inter-regional disparities, unlike developing economies which experience both inter-spatial and intra-spatial inequalities. Also, regions in advanced countries benefit from a transfer of progress to the whole territory when growth is achieved, whereas regions in developing countries experience an economic and social dualism that prevents the fruits of growth from spreading to the whole territory, and widens the gaps between spaces.

3. Data Description and Stylized Facts

Following the existing literature, the notion of pro-poor growth is based on the triangle of poverty, growth, and inequality. The study uses a sample of balanced panel data from 12 regions of Morocco for the years: 2001, 2004, 2007 and 2014.

Table 1: Variables definition, sources and summary statistics

Variable	Poverty	Income Inequality		Growth
Description and Abbreviation	Poverty ratio (Pov)	Gini Index (GiniI)	Within inequality (WGini)	Real per capita income (GDP-Cap)
Source of data	High Commission for Planning- National Household Consumption and Expenditure Survey		Calculations are based on provincial data for each region	Ministry of Economy and Finance - Department of Economic Studies and Financial Forecast (DESF)
Observation	48	48	48	48
Mean	0.11	0.38	0.40	21 086
Std.Dev	0.09	0.04	0.10	11 829
Minimum	0	0.22	0.22	7 910
Maximum	0.40	0.45	0.63	66 399

Note: the period selected is constrained by the availability of data on poverty rate and the Gini index; Within inequality is calculated by the authors on the basis of GDP per capita data at the provincial level for each region. The method adopted is the decomposition of the Gini income inequality (Dagum, 1989).

Source: Authors computations.

Analysis of per capita income shows a dispersion around the national average. The Dakhla Oued Eddahab region recorded the highest GDP per capita over the period 2001-2014, with an average GDP per dwelling of 43187, compared with 21576 DH/capita at national level. The Drâa Tafilalet region consequently achieved the lowest GDP per capita over the period, at 11128 DH/head. Growth in GDP per capita by region showed a positive trend over the period 2001-2014. Despite this progression, there is great disparity between regions, with seven out of twelve exceeding the national average annual growth rate (4.6%), thus achieving the highest rates over the period. The highest rate was recorded in the Laâyoune-Sakia El Hamra region (8.1%), while the region with the lowest rate was Dakhla-Oued Ed-Dahab (1.8%).

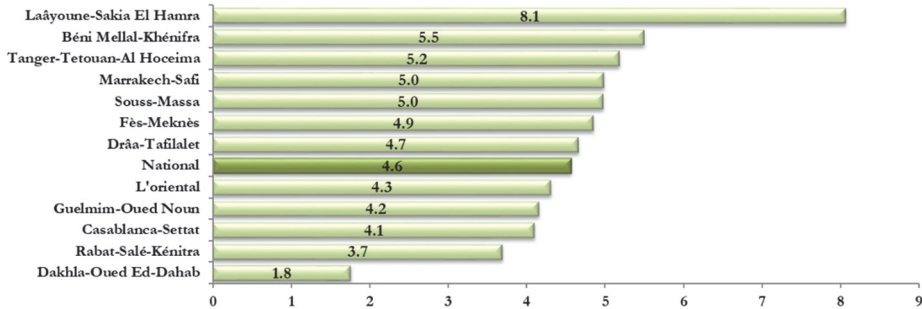


Figure 1: Average annual growth in GDP per capita by region, 2001-2014 (%)

Source: Author's construction.

A focus on the poverty rate by region reveals a concentration of the poverty rate over the period in two regions, namely: Drâa-Tafilalt (40.3% compared with 16.01%) and Marrakech-Safi (20.2% compared with 15.5%). In 2014, the poverty rate ranged from 0.3% in Dakhla-Oued Eddahab to 14.6% in Drâa-Tafilalt. Analysis of the average poverty rate by region over the period reveals a concentration in Drâa-Tafilalt (19.5%) and Marrakech-Safi (18.8%). In terms of dynamics, the poverty rate achieved an average annual decline of 8.5%. Similarly, all regions succeeded in reducing their poverty rate over the period. If this downward trend continues at the same pace in the coming years, all these regions will be able to halve their poverty rates before the arrival of 2030 by 2030, according to a study drawn up by the Moroccan Ministry of Economy and Finance (MEF, 2018). This deadline is defined by the Sustainable Development Goals (UN, 2023) adopted by the UN in 2015.

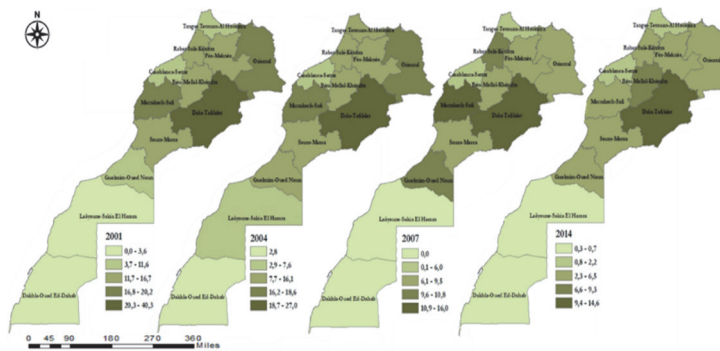


Figure 2: Regional poverty rate, 2001-2014 (%)

Source: author's construction.

These results testify to the favorable impact of socio-economic programs and sectoral strategies aimed at reducing poverty in the regions. Moreover, all regions have benefited from the programs planned under the National Initiative for Human Development (CESE, 2013), the fight against rural poverty and urban exclusion and precariousness. Poverty reduction has been associated with a number of success factors that have made growth more inclusive (WB, 2018), including: improved access to credit for households and businesses, improved public health services including the medical assistance scheme (known by RAMEd) in 2008.

An analysis of inequality, reveals disparities based on the level of development of each region, which in turn depends on a number of social, economic and institutional factors. The regional inequality indices fell/rose over the period, but to varying degrees. Thus, the level of inequality reached the highest rates in Rabat-Salé-Kénitra (0.442) and Casablanca-Settat (0.396) in 2014, exceeding the level posted at national level (0.395), against Dakhla-Oued Ed-Dahab, which achieved the lowest rate with 0.111 in the same year. FIGURE 3 summarizes the dynamic of regional inequality.

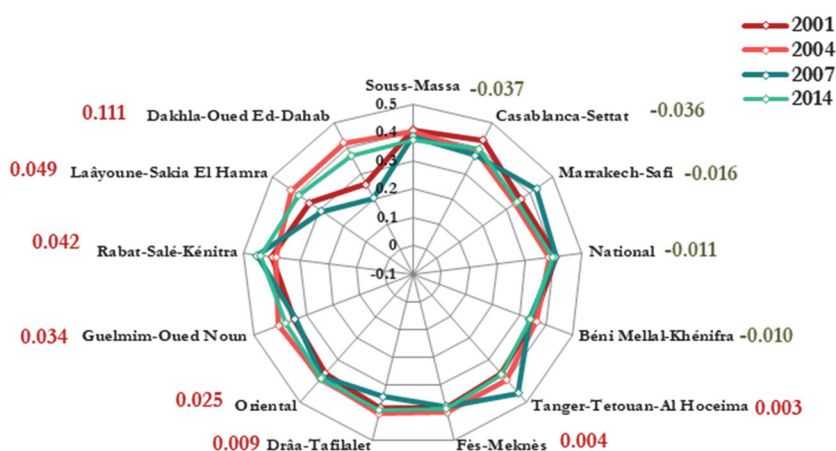


Figure 3: Radar of Inequality trends by region, 2001-2014 (%)

Source: author's construction.

Although the level of inequality has fallen in some regions, this improvement has not exceeded 0.04 points over the period. There are several possible explanations for this rise in inequality, which is similar in other countries. These findings are indicative of the slow pace at which inequalities are being reduced in Morocco and endorse the need to redouble the efforts of all stakeholders. The gaps in terms of reducing inequalities in terms of trend and incidence can be the source of several factors, as highlighted by the National Observatory of Human Development (ONDH, 2017). These include infant mortality in the case of health, the level of schooling in the case of education, access to social services and absolute poverty in the case of standard of living. The cost of this income inequality is wasted human resources, with working people out of work or trapped in precarious or unskilled jobs (OECD, 2008), hence the need to adopt effective social policies without increasing social spending.

4. Methodology and Empirical Results

To assess the pro-poor nature of the growth process, the approach adopted in this study is based on the poverty decomposition method developed by Kakwani and Pernia mentioned above. Three models (FIGURE 4) will be estimated using panel data regression, enabling total poverty elasticities to be calculated and regions to be classified according to Pro-Poor Growth (PPGI) Index and Pro-Poor

Policy Index (PPPI). Note that three other models will be estimated using the same approach, except for intra-regional inequalities, which will be introduced instead of income inequalities at global level. The study uses a balanced panel sample of Morocco's 12 regions for the years 2001, 2004, 2007 and 2014. Specifications are defined as LOG-LOG and LIN-LOG models.

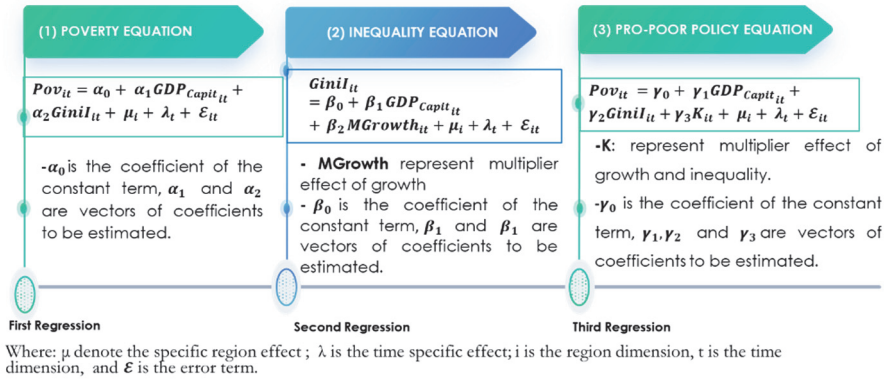


Figure 4: Models specification
Source: author's construction

FIGURE 5 presents a hierarchical and synthetic diagram of the steps applied to calculate the different elasticities (step one). The PPGI and PPPI indices (step two) are constructed from the coefficients taken from equations (1) and (2) described in FIGURE 4. The key to reading the results obtained is contained in step 3.

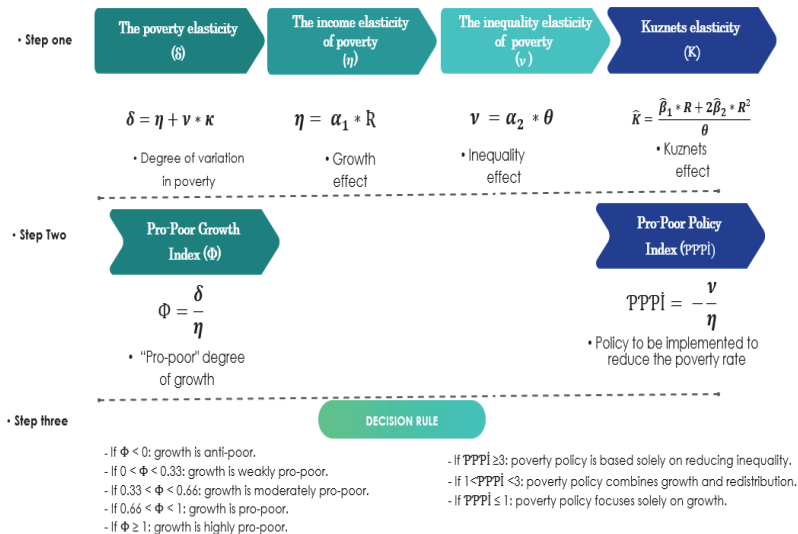


Figure 5: Total poverty elasticity, pro-poor growth indices and pro-poor policies
Source: author's construction.

The methodology used to calculate spatial inequalities by region is based on Dagum's (1997) approach. We calculated inequalities within regions, using GDP per capita data broken down by province for each region. The difference-in-means Gini index is calculated as follows:

$$WGini = \frac{\sum_{i=1}^n \sum_{r=1}^n |y_i - y_r|}{2n^2\mu}$$

Where y_i is income for individual region i ; n is the sample size, μ is the average income in the total region.

4.1 Assessing the pro-poor nature of the regional economic growth process

Before estimating the equations, pre- and post-estimation tests have been developed to validate the model results. These include sample heterogeneity, the presence of specific effects, and the Hausman specification test. Error tests cover normality, heteroscedasticity and autocorrelation.

4.2 Pro-poor growth: quantification and regional ranking

Main regression results are presented in Table 2 below.

Table 2: Results of effects on poverty of inequality, income level and the Kuznets effect

	(1)	(2)	(3)	(4)	(5)	(6)
Variables	Pov	Pov	GiniI	WGini	LPov	LPov
GDP-Cap	-0.13*** (0.028)	-0.11** (0.038)	-0.648** (0.262)	-0.16 (0.407)	-3.95*** (0.635)	-0.94*** (0.104)
GiniI	0.280*** (0.099)					
WGini		0.47** (0.199)				1.62 (1.634)
MGrowth			0.03** (0.014)	0.006 (0.021)		
LGiniI					30.49*** (6.523)	
K					-3.19*** (0.597)	-0.21*** (0.052)
Constant	1.27*** (0.269)	1.04** (0.435)	3.49** (1.265)	1.36 (1.969)	36.94*** (6.886)	5.54*** (1.319)
R-squared	-	0.55	0.05	-	0.71	0.60
Hausman conclusion	Random effect	Fixed effect	Fixed effect	Random effect	Fixed effect	Fixed effect

Robust standard errors in parentheses *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Abbreviation: L, Log; M: represent the square of Real per capita income.

Source: author's construction.

The estimation results highlight a series of conclusions and implications. Firstly, there is a significant inverse relationship between growth and poverty reduction, and a significant relationship in the same direction between inequality and poverty worsening. The empirical results also show that poverty reduction is more sensitive to the reduction in inequality than to the level of income. For example, a one percentage point increase in the Gini coefficient leads to a 0.28 percentage point increase in the poverty rate, while a one percentage point increase in GDP per capita leads to a 0.13 percentage point reduction in the poverty rate. Moreover, Poverty is more affected by the presence of within-regional inequalities (0.47) than inequalities at global level (0.28), confirming the impact of inequalities in relation to growth.

This empirical result is in line with the literature of (Ravallion, 2014) which stipulate a preponderance of the effect of inequality within over the effect of growth on poverty reduction. This finding calls for greater emphasis on corrective policies to reduce intra-regional inequalities as a means of improving the living standards of the poor at regional level (Bourguignon, 2015).

Secondly, the Kuznets effect has a negative sign, which can be explained by the importance of the income level, which absorbs the effect of inequality and therefore has a poverty-reducing effect. Consequently, these results corroborate those of (Galor & Zeira, 1993), (Alesina & Rodrik, 1994) and (Persson & Tabellini, 1991), who confirm the presence of an inverse relationship between inequality and growth, and those of (Alesina & Rodrik, 1994), who state that inequality generates political and economic instability that reduces investment, which consequently has a negative impact on growth. On the other hand, the evaluation of the results of the estimation of the Gini equation confirms an inverse relationship between growth and inequality (short term), which means that any 1% increase in growth will lead to a 0.65% decrease in inequality. This finding is the same as that of the (OECD, 2007), which emphasised the inverse relationship between growth and inequality in OECD Countries. On the other hand, the level of income over the long term intensifies inequality, where any increase in income over the long term of one unit leads to a parallel increase in inequality.

5. Result and Discussion

5.1 Total elasticity of poverty: Total vs Within-regional analysis

Our approach is to use intra-regional inequalities in the decomposition of total poverty elasticity. In this respect, our calculations show that the sensitivity of poverty reduction changes according to the chosen inequality indicator. Moreover, regional poverty is also more sensitive to an increase in intra-regional inequality.

Table 3: Breakdown of total poverty elasticity: total inequality versus within inequality (2001-2014)

Region	Total elasticity of poverty		Growth effect		Inequality effect		Kuznets elasticity	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Tanger-Tetouan-Al Hoceima	-1.23	-1.33	-1.28	-1.14	0.11	0.21	0.39	-0.92
Oriental	-1.25	-1.31	-1.24	-1.10	0.11	0.18	-0.11	-1.15
Fes- Meknes	-1.25	-1.31	-1.24	-1.10	0.11	0.18	-0.08	-1.12
Rabat-Sale- Kenitra	-1.22	-1.35	-1.31	-1.17	0.12	0.22	0.79	-0.84
Beni Mellal- Khenifra	-1.25	-1.30	-1.23	-1.09	0.10	0.12	-0.23	-1.66
Casablanca Settat	-1.20	-1.37	-1.35	-1.20	0.11	0.28	1.36	-0.61
Marrakech-Safi	-1.26	-1.29	-1.22	-1.08	0.10	0.19	-0.40	-1.13
Drâa-Tafilalt	-1.26	-1.28	-1.19	-1.06	0.11	0.11	-0.66	-1.99
Sous-Massa	-1.24	-1.32	-1.26	-1.12	0.11	0.18	0.14	-1.09
Guelmim-Oued Noun	-1.23	-1.34	-1.29	-1.15	0.10	0.13	0.59	-1.48
Laayoune-Saquia El Hamra	-1.23	-1.33	-1.28	-1.14	0.10	0.23	0.46	-0.83
Dakhla-Oued Eddahab	-1.17	-1.39	-1.39	-1.23	0.09	0.21	2.66	-0.75

Note: calculation of elasticity is based on : (1) total inequality; (2) Within inequality.

Source: author's calculation.

The analysis by region of the sensitivity of the poverty gap to growth, at constant inequalities, shows significant regional disparities. For example, poverty reduction is lower in response to a 1% increase in GDP/capita growth in regions with low poverty rates. This shows that the higher the initial poverty level, the greater the potential to benefit from growth and inequality (multiplier effect). Two conclusions can be drawn: Regions with high initial incomes are those where growth is most effective in reducing poverty. This is the case of the southern regions, as well as Casablanca Settat, Rabat-Sale-Kenitra and Tanger-Tétouan-Al Hoceima. Regions with initially high levels of inequality

are more likely to reduce their poverty rates (case of Drâa-Tafilalt).

5.2 Pro-poor growth index

According to the pro-poor growth index over the period, the 12 regions fell into two groups. The first achieved strongly pro-poor growth versus pro-poor growth. In fact, this result conceals disparities within regions that are far greater than total inequalities, as shown in figure 6. This result demonstrates the importance of taking account of inequalities within regions in any poverty reduction strategy.

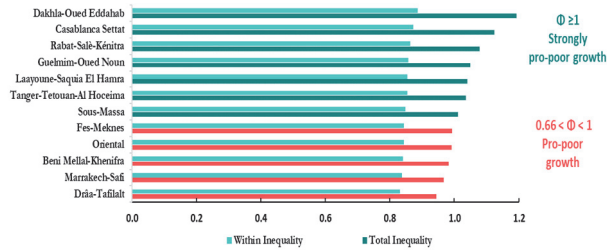


Figure 6: Pro-poor growth index: total inequality versus within inequality (Average on period 2001-2014)

Source: author's calculation.

Once the regions have been ranked, the pro-poor policy index will complete the analysis and help define the policy applied to reduce the poverty rate in each region.

5.3 Pro-poor policy index: a trade-off to be made

As a reminder, the pro-poor policy index, measures the degree of substitution between increasing growth and reducing income inequality in order to keep poverty levels stable. Looking at the results in TABLE 4, Drâa-Tafilalt region has adopted a mixed policy of growth and income redistribution to reduce its poverty rate. For the other regions (PPPI less than 1), the benefits of poverty reduction strategies are weak, where the appropriation of growth policies enables poverty to be reduced rapidly.

Table 4: Pro-poor policy indicator by region based on total and within inequalities (average on period 2001-2014)

Region	Pro-poor Policy Index		
	Total Inequality	Within Inequality	Decision
Tanger-Tetouan-Al Hoceima	0.95	0.50	PPPI ≤ 1 Policy based on economic growth
l'Oriental	0.97	0.51	
Fès-Meknes	0.97	0.51	
Rabat-Salé-Kénitra	0.92	0.49	
Beni Mellal-Khénifra	0.99	0.52	
Casablanca Settat	0.90	0.47	
Marrakech-Safi	0.99	0.52	
Sous-Massa	0.96	0.51	
Guelmim-Oued Noun	0.94	0.50	
Laayoune-Saquia El Hamra	0.95	0.49	
Dakhla-Oued Eddahab	0.90	0.47	
Drâa-Tafilalt	1.01	0.54	$1 < \text{PPPI} < 3$ Policy based on growth and income redistribution

Source: author's calculation.

6. Conclusion and Policy Implications

This study addresses the relationship between the trilogy of poverty, growth and inequality in its two aspects (total and intra-regional) for the Moroccan regions. The methodology consists of constructing of the pro-poor growth index and the pro-poor policy index to quantify and qualify the pro-poor nature of regional growth. The finding shows the presence of significant effects of inequality (positive effect) and growth (negative effect) on regional poverty reduction, with a superiority of the effect of inequality. Growth benefits to the poorest regions, but with substantial effects linked to the growth strategies adopted by each of them to improve the standard of living of their citizens (redistribution or growth policy, or a blend of both policies). In addition, the impact on poverty differs from one region to another and may be linked to the heterogeneity of the spatial distribution of wealth, to differences in the access of the poor to socio-economic infrastructures, to the employment market, to geographical location, to the diversity of the economic fabric of the regions, to the efficiency of the labor market, to the quality of life, etc. These differences in terms of inequality may be linked to effects specific to each territory (geographical positioning, natural resources, demographics, cultural aspects...), but may also be linked to political, economic or institutional factors.

However, the regions are faced with a trade-off on promoting growth and reducing inequalities. It is therefore impossible to envisage a successful economic and social policy in context where poverty coexists. This is why it is important to understand the multifaceted and complex nature of poverty and to place inequalities at the heart of social policies and strategies. To improve the economic level of regions and benefit equitably from growth, it is recommended to broaden thinking on pro-poor growth by adapting equitable regional policies, making the most of untapped or under-exploited sources of growth, and channelling wealth more equitably. Similarly, public authorities need to implement personalized regional policies, adopting a specific local approach (investment in economic and social infrastructure, etc.), rather than a national approach that may neglect the specificities and needs of each region. Supporting areas facing structural difficulties, strengthening links between prosperous and less disadvantaged regions.

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