

The Gloomy Side of Entrepreneurship: Poverty and Entrepreneurship in Portuguese Municipalities

O Lado Sombrio do Empreendedorismo: Pobreza e Empreendedorismo nos Municípios Portugueses

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Abstract/ Resumo

Entrepreneurship is often perceived as a means to boost economic activity, to achieve convergence and the development of regions. It is expected that the creation of new businesses, by stimulating the development of regions, will lead to low levels of regional poverty. However, the empirical evidence on this topic is scarce, focusing mainly on the study of regions in developed countries. Based on the 278 municipalities of mainland Portugal, to which a descriptive statistical analysis and multivariate regression estimation was applied, we conclude that, on average, the more entrepreneurial these regions (mainly rural), the poorer they are. This result raises serious doubts about the capacity and effectiveness of recent policies addressed at the creation of start-ups, particularly in rural areas, intended to boost these regions economically and break the cycle of poverty that characterizes them.

Keywords: Entrepreneurship; Poverty; Municipalities; Portugal

JEL Codes: L26, P25

O empreendedorismo é frequentemente visto como um mecanismo capaz de impulsionar a atividade económica, com vista à convergência e ao desenvolvimento das regiões. A expectativa é a de que a criação de novos negócios ao estimular o desenvolvimento das regiões conduzirá a baixos níveis de pobreza regional. No entanto, a evidência empírica sobre este tópico é escassa, principalmente tendo como objeto de análise regiões de países desenvolvidos. Tendo por base os 278 municípios de Portugal Continental, recorrendo a uma análise estatística descritiva e estimações de regressão multivariáveis, concluímos que as regiões (sobretudo rurais) mais empreendedoras são regiões, em média, mais pobres. Tal resultado lança sérias dúvidas sobre a capacidade e eficácia de políticas recentes no domínio da criação de empresas, nomeadamente nas áreas rurais, para dinamizar economicamente essas regiões e quebrar o ciclo de pobreza que as caracterizam.

Palavras-chave: Empreendedorismo; Pobreza; Portugal

Códigos JEL: L26, P25

1. INTRODUCTION

Each country or region has geographical, demographic, natural, social and economic characteristics that influence its development and economic growth (Rodríguez-Pose & Hardy, 2015). Uneven development between countries and between regions within each country is to be expected, and can be verified (Commins, 2004; Amóros & Cristi, 2011; Radeny *et al.*, 2012).

Rural regions far from urban centers are characterized by low population density and demographic ageing (Rolo & Cordovil, 2014), which linked to a weak business structure, will, according to Commins (2004) and Sikora & Nybakk (2012), result in low employment opportunities and low levels of services available to the population. These factors contribute to the classification of the regions as poor, backward and underdeveloped. However, these regions are rich in terms of biodiversity and endogenous resources (Guedes *et al.*, 2012). Thus, entrepreneurship linked to the creation of businesses focused on the resources of these rural regions can be a strategy to achieve sustainable economic development (Sanders & Galloway, 2013).

Rural areas are characterized by high poverty rates (Lazos-Ruiz *et al.*, 2014), especially in underdeveloped countries (Teekens, 1990; Dehury & Mohanty 2015; Kwadzo, 2015). However, poverty is not restricted to this group of countries, and can also occur in regions of more developed countries, especially in regions far from urban and technological centers (Commins, 2004). In a recent study, Węziak-Białowolska (2015) showed that in 2012, 24.8% of the European population was at risk of poverty or social exclusion. The peripheral regions of European countries, such as Portugal, Greece, Malta, Slovakia and Hungary, registered higher levels of poverty than the regions of central European countries, considered to be more urban and technological. This finding highlights the existence of rural regions in developed countries that stand out for their delay and underdevelopment. Although this is one of only a few studies that compare the regions of developed countries, it does so at a relatively low level of disaggregation, taking NUTS II as the territorial unit. In addition, there is no link between regional poverty and the level of entrepreneurship in the regions.

A simple bibliometric exercise using the SciVerse Scopus database, in which "Rural entrepreneur *"¹ was used as the search keyword for the title, abstract and keyword fields, resulted in 117 articles. of which 26 refer to issues related to poverty (e.g., Kimhi, 2009; Lazos-Ruiz *et al.*, 2014), but only 8 articles are exclusively dedicated to underdeveloped countries, conducting comparisons between regions (e.g., Chadha & Chadha, 2008). Repeating the exercise with "poverty" yielded a greater number of indexed articles (1523), of which 10% are related to entrepreneurship (e.g., Chikweche & Fletcher, 2013; Mahmood *et al.*, 2014; Bruton *et al.*, 2015), and 8.3% mention rural entrepreneurship (e.g., Yang & Hung, 2014; Imai *et al.*, 2015; Rasiah & Miao, 2015). However, only 18 (1.1%) carry out a regional comparison of poverty, focusing on underdeveloped countries (e.g., Marivoet & De Herdt, 2015) and on development (e.g., Kang & Imai, 2012; Dehury & Mohanty, 2015; De Caldas & De Sampaio, 2015).

There is, therefore, a noticeable gap in the literature that relates rural entrepreneurship and the poverty of the regions. In addition to being an underexplored topic, the existing studies focus mostly on developing countries (e.g., Kang & Imai, 2012; Imai *et al.*, 2015) and underdeveloped countries (e.g., Tieguhon *et al.*, 2012), highlighting cases of extreme poverty, conducting a national analysis on the level of poverty and how rural entrepreneurship can reduce household inequality.

The main goal of the present study is, in the first stage, an exploratory analysis of the regional poverty of a developed country, Portugal, followed by a comparative regional study assessing whether rural entrepreneurship in Portuguese municipalities is associated with (a lower index of) poverty.

The article is structured as follows. In Section 2, we describe and review the relevant literature. Subsequently, Section 3 details the methodology. The results are presented and discussed in Section 4. Finally, Section 5 presents the final considerations, the study's limitations and future research proposals.

¹ The * means that the search is done through the term 'rural entrepreneur' and words derived from the latter concept derived ('entrepreneurship', 'entrepreneurial', ...).

2. LITERATURE REVIEW

In spite of its complex dynamics, in the last few decades, entrepreneurship has been considered a relevant factor for economic growth (Amorós & Cristi, 2011; Tobias *et al.*, 2013) and also for poverty reduction (Goel & Rishi, 2012). According to Goel & Rishi (2012), the link between these two concepts results in job creation, promotion of innovation and positive effects on the well-being of populations. Thus, there has been a growing interest in fostering entrepreneurial activities through incentives and government micro-entrepreneurship programs aimed at job and wealth creation, and the development of local economies (Halim *et al.*, 2014), giving the poorest people the possibility to escape the poverty trap (Tobias *et al.*, 2013). Entrepreneurship can be classified as necessity or opportunity, depending on the motivations of the entrepreneur (Goel & Rishi, 2012). In the case of necessity entrepreneurship, an individual, when faced with the scarcity of employment, especially in the formal market, creates a new business that provides him/her with the opportunity to escape poverty (Goel & Rishi, 2012). This type of entrepreneurship generally presents relatively low levels of productivity (Goel & Rishi, 2012) but, by creating an activity and self-employment, it is a means to at least prevent poverty from intensifying (Amorós & Cristi, 2011; Si *et al.*, 2015). Opportunity entrepreneurship generally presents a higher level of productivity and contributes equally to poverty reduction through the transfer of wealth created by entrepreneurs, the redistribution of income generated, and job creation, thus promoting economic growth in favor of the poorest (De Janvry & Sadoulet, 2009; Bruton *et al.*, 2013; Halim *et al.*, 2014).

A positive economic growth rate at the aggregate level does not mean that rural regions are growing at the same rate, as these regions show significant levels of unequal distribution of income (Radeny *et al.*, 2012), difficult access to infrastructure and a lack of employment (Petrin, 1994). There has been a concern to converge rural regions to national-level growth rates through the sustainable development of these regions (Rodríguez-Pose & Hardy, 2015). However, rural areas are usually dominated by subsistence agriculture and the informal sector, with low levels of productivity and poor market connections (Sikora & Nybakk,

2012). Thus, Rodríguez-Pose and Hardy (2015) focus on the importance of agriculture, highlighting marketing and productive innovations geared at fostering rural development through the creation of new businesses and employment, which can retain the population in rural areas (Petrin, 1994) and lead to poverty reduction.

Despite the existence of an empirical link between entrepreneurship and economic growth, with impact on the poverty level, Goel and Rishi (2012) argue that not all entrepreneurship has a positive impact on growth.

There are a growing number of studies that stress the empirical link between entrepreneurial activities and poverty but they are still very few (Amorós & Cristi, 2011), focusing especially on economic growth rather than poverty. Nevertheless, empirical studies have shown that entrepreneurship has a positive effect on human development and poverty reduction, and is important for both developed and developing countries (Amorós & Cristi, 2011).

The studies related to this framework seek to explain the multidirectional relationship between entrepreneurship and economic growth. On the one hand, they focus on entrepreneurship as a factor capable of influencing economic growth (Tobias *et al.*, 2013; Halim *et al.*, 2014) and, on the other, the impact of economic growth and the level of development of a country on its entrepreneurial capacity (e.g., Urbano & Aparicio, 2016).

However, there are authors who have been concerned with establishing a link between the levels of poverty and the entrepreneurial capacity of a country or region (e.g., Amorós & Cristi, 2011; Halim *et al.*, 2014, Si, 2015).

Based on an empirical analysis, Amorós and Cristi (2011) sought to establish a relationship between poverty rates, income inequality and entrepreneurship. Their study indicates that in countries where there is greater income inequality, individuals tend to create their own jobs, resulting in a higher incidence of new business. This means that necessity entrepreneurship has had significant expression in less developed countries, contributing to poverty reduction over time.

The study by Si *et al.* (2015) has shown that the reduction of poverty, in the context of a very poor region with few resources, is mainly derived from changes in the attitude and behavior of individuals and not from the implementation of micro-entrepreneurship programs.

In the Chinese region they analyzed, an increase in entrepreneurship and innovation was observed when the local population, in order to escape the poverty trap, identified and exploited market opportunities that allowed them not only to generate their own income but also to influence neighboring regions. Consequently, the entrepreneurial spirit of this region influenced contiguous regions by creating and expanding businesses, thus alleviating poverty rates.

Contrary to the findings of Si *et al.* (2015), Halim *et al.* (2014) showed that micro-entrepreneurship, generated from Malaysian government programs, has had effects on poverty eradication. The evidence of poverty reduction can be detected in the creation of employment, new business opportunities and new investors, which have appeared because of these incentives for entrepreneurship.

Dehury and Mohanty (2015) and Węziak-Białowolska (2015) are the only studies published to date on entrepreneurship and poverty focusing on regions in developed countries. There are, however, differences in these two studies in terms of poverty measure, methodology, sample and level of development of the countries analyzed. Dehury and Mohanty (2015) analyze poverty in rural areas through the multidimensional poverty index (MPI), whereas Węziak-Białowolska (2015) focuses on the measurement of poverty in the NUTS II regions of the 28 countries of the European Union, calculating the human poverty index.

These two contributions are important, not only for the methodology used, since they perform a multidimensional analysis of poverty, constructing composite indexes of monetary and non-monetary indicators, but also because they highlight the need to investigate poverty at a more disaggregated territorial level. However, these studies involve descriptive analyses, as they are not concerned with making comparisons between regions of a country (developed or developing). They have solely identified dimensions and indicators appropriate to each situation of poverty and level of development, and therefore failed to define the relationship among other relevant concepts.

It should be noted that studies focused on rural entrepreneurship are mainly conceptual (e.g., Avrakmenko & Silver, 2010; Fortunato, 2014), seeking to distinguish rural entrepreneurship from entrepreneurship in rural areas and urban entrepreneurship, with few empirical

studies on rural entrepreneurship. The few existing studies on the effect of entrepreneurship in rural areas, in developing and underdeveloped countries (e.g., Sikora & Nybakk, 2012; Lazos-Ruiz *et al.*, 2014), conjecture only that rural entrepreneurship can be a means to prevent rural populations from falling into the poverty trap.

Given the scarcity of the literature on these two topics, there are even fewer studies that relate the incidence of poverty to the entrepreneurial capacity of a rural region, and how rural entrepreneurship can play a role in the region's poverty reduction. These types of study are important not only for the counties and regions analyzed, but also for national institutions and organizations, as they examine how regions suffer from the various dimensions of poverty. They further appraise how populations, municipalities and institutions can use entrepreneurship as an instrument to reduce poverty and as an engine for growth and economic development. Such analyses are therefore important instruments for the formulation and implementation of policies by regional and central authorities, aimed at reducing regional poverty through rural entrepreneurship.

3. METHODOLOGY

In line with existing research on entrepreneurship and poverty, this study involves exploratory and quantitative methodologies.² We chose to follow the study of Węziak-Białowolska (2015) in order to construct a regional poverty index with the Portuguese regions as a unit of analysis at the municipal level.

3.1 Calculation of the municipal poverty index

The United Nations Development Program (1997) defines the Human Poverty Index (HPI)³ for developed countries according to the following formula:

² See Table A1 for a summary of the studies focused on regional poverty

³ In 1997, The United Nations constructed two Human Poverty indices: one for developing countries (HPI - 1) and the other for developed countries (HPI - 2). To simplify the use of acronyms in this study only the acronym HPI is used, referring to the Human Poverty Index for developed countries.

$$HPI = \left[\frac{1}{4} (P_1^3 + P_2^3 + P_3^3 + P_4^3) \right]^{\frac{1}{3}}$$

Where

P1 - probability at birth of not surviving to age 60 (long and healthy life of the population);

P2 – adults lacking functional literacy skills (knowledge and education of the population);

P3 – population below the income poverty line (50% of median adjusted household disposable income) (decent standard of living);

P4 – long-term unemployment rate (at least 12 months) (social exclusion).

Based on Węziak-Białowolska's (2015) research, the dimensions of poverty we intended to analyze for the Portuguese regions include healthy and long life, knowledge and education level of the population, decent standard of living, and social exclusion. Although there is a degree of parallelism between the indicators chosen by Węziak-Białowolska (2015), some data is not available at the level of the Portuguese municipalities, such as "Percentage of the population below the poverty line (60% of median household disposable income)". It thus became necessary to choose other indicators that similarly reflect the dimensions of poverty. Due to the lack of data, certain indicators are difficult to calculate, namely the long-term unemployment rate and the percentage of the population living below the poverty line, with a breakdown below the national level. Furthermore, there are no official indicators representing the dimensions of social exclusion and the standard of living. Consequently, we opted to build the long-term unemployment rate using the data provided by the INE, the Portuguese Statistics Institute (number of unemployed people enrolled in employment centers and vocational training for 1 year or more, over the working population of the municipality). Similarly, the municipal purchasing power per capita index was used as the monetary indicator, representative of the standard of living of the Portuguese population.

Table 1 summarizes the dimensions of the study by Węziak-Białowolska (2015), adapted to the study of regional poverty in Portugal and the respective indicators, contrasting them with the indicators chosen for this research.

To calculate the Regional Poverty Index, it is necessary to calculate the inverse of the

Longevity Index (INE, 2011) and the indicators of the standard of living (which serve to identify which municipalities present less longevity and lower purchasing power), followed by normalization of the data. We chose to assign an equal weight to each dimension and indicator, so that no specific dimension would stand out over another (Węziak-Białowolska, 2015).

3.2 Calculation of the indicator of municipal entrepreneurship

The measure of multidimensional entrepreneurship serves to capture entrepreneurial levels more accurately (Komlósi *et al.*, 2015). However, because they require a complex mechanism of sub-indices and pillars, the construction of a rural entrepreneurship index would have to be based on a national measure, given the statistical information that is needed and currently available. Since the goal of this study is to examine rural entrepreneurship in a more localized manner, the existing statistical data for the construction of a regional base index is considerably scarce and difficult to calculate.

Therefore, a one-dimensional measure was used to calculate rural entrepreneurship at the municipal level. We chose to build an index that reflects the number of new companies created in a given year for each Portuguese municipality. Although it does not distinguish innovative and non-innovative companies, it provides the means to understand the entrepreneurial intensity in each municipality (number of new companies in the total existing companies) whether rural or not, facilitating the comparison between them. It should also be pointed out that, given the available statistics, the separation of new businesses created by type of entrepreneurship (rural or in rural areas) is a very complex process. Therefore, to simplify the present study, the above-mentioned measure was used, combined with the classification of the Portuguese municipalities (as rural or urban), to assess approximately their levels of rural entrepreneurship.

Entrepreneurial intensity underlies the 'traditional' concept of entrepreneurship, that is, the creation of new firms is the mirror of entrepreneurial capacity, influencing the economy through the creation of new sectors, industry and employment (Reynolds, 2007). Although it is a one-dimensional indicator, the

Table 1. Dimensions and indicators used in the calculation of the Regional Human Poverty Index

Dimension	RHPI Indicators Węziak-Białowolska (2015)	RHPI Indicators - Portugal	Definition of RHPI Indicators– Portugal
Long and healthy life	Life expectancy at birth (Eurostat, 2010-2012)	I ₁ - Longevity Index (INE, 2011)	The longevity index represents the number of people aged 75 and over for every 100 people aged 65 and over. The higher the index, the more elderly the population.
	Child mortality rate (Eurostat, 2010-2012)		
Knowledge and education level	Percentage of population aged 25-64 years with low educational level (Eurostat, 2011-2013)	I ₂ Illiteracy rate (INE, 2011)	The illiteracy rate indicates the percentage of individuals aged 10 or over who cannot read or write, unable to read and understand a written sentence or write a complete sentence
	Percentage of the population aged 18-24 who are without jobs, education or training (Eurostat, 2011 - 2013)		
Social Exclusion	Long-term unemployment rate (Eurostat, 2011-2013)	I ₃ - Long-term unemployment rate (INE, 2011)	The percentage of unemployed, available for work and searching for jobs for 12 months or more, with reference to the total active population.
Decent standard of living	Percentage of the population below the poverty line (60% of median household disposable income) (Eurostat, 2010 - 2012)	I ₄ - Purchasing power per capita (INE, 2011)	Purchasing power per capita is a composite indicator for translating purchasing power into per capita terms. It is an index number with a value of 100 in the country average, which compares the purchasing power manifested daily, in per capita terms, in the different municipalities or regions.

rate of new firm creation makes it possible to understand which municipalities have the greatest entrepreneurial capacity (Iversen & Malchow-Moeller, 2008) in Portugal. This rate has thus been calculated based on the ratio between the number of newly created companies and the number of existing companies, using data from 2011.

4. EMPIRICAL RESULTS

4.1 Municipal entrepreneurship rate

On average, in 2011, the entrepreneurship rate of the Portuguese municipalities stood at 2.4%. Barrancos, a rural municipality located in Alentejo (*Baixo Alentejo*), presents the highest rate of entrepreneurship (6%), while Monchique, a rural municipality in Algarve, shows the lowest entrepreneurship rate among all the municipalities analyzed, 0.28%.

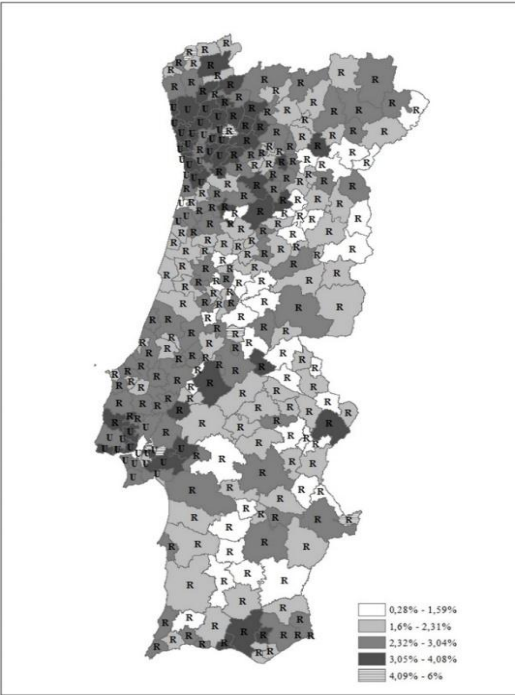
There are higher entrepreneurship rates in the coastal zone of the country, with greater relevance for the metropolitan areas of Lisbon and Porto (see Figure 1). Most of these areas are characterized as urban; nevertheless, some rural municipalities with high rates of entre-

preneurship, such as Mafra and Vale de Cambra, also belong to these metropolitan areas.

Figure 2 shows the outliers as well as possible clusters of entrepreneurship.⁴ Two clusters are identified in an area where a high entrepreneurship rate prevails (high-high clusters). These clusters encompass 40 municipalities, mostly urban, located in the metropolitan areas of Lisbon and Porto, or belonging to areas contiguous to these metropolitan municipalities, such as Braga, Vizela and Vila Verde. Most of the municipalities belonging to high-high clusters have very similar economic characteristics, namely in terms of purchasing

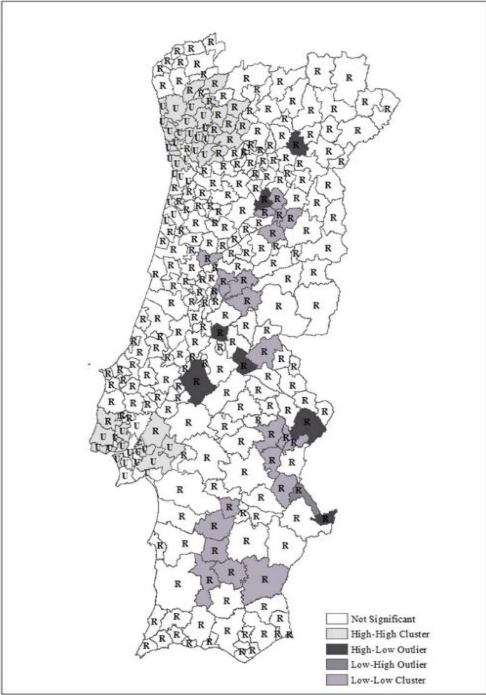
⁴ Based on the Anselin Local Moran's I statistic to calculate the z-scores of each data set, it is possible to identify statistically significant clusters with high values (high-high cluster) and low values (low-low cluster), when the z-score is positive and high. A negative z-score indicates an outlier. Outliers can be high-low if the highlighted municipality registers a high value for the statistic analyzed, but is surrounded by municipalities that present low values, or low-high if the municipality analyzed presents a low statistical value, but is surrounded by municipalities with high values (GeoDA Center, 2016).

Figure 1. Entrepreneurship rate: Portuguese municipalities, 2011



Legend: U - Urban; R - Rural.

Figure 2. Entrepreneurship rate, clusters and outliers: Portuguese municipalities, 2011



Note: For a complete list of the municipalities that comprise the distinct clusters, see Tables A2-A3, in the Appendix.

Legend: U - Urban; R - Rural.

power, evidencing figures close to or above the national average. Nevertheless, it is noteworthy that the cases of Celorico de Basto, Mondim de Basto and Terras de Bouro also

belong to this high-high cluster. They present a high (entrepreneurial) rate similar to their neighboring municipalities, despite having unequal economic and demographic charac-

teristics, i.e., a lower level of purchasing power than the other municipalities (Instituto Nacional de Estatística, 2014) and a rural typology.

It should also be noted that the high-high cluster councils are located near major business centers (Lisbon and Porto), Science and Technology Parks (UPTEC, 2C2T, etc.), sea-ports (Leixões, Lisbon), international airports (Sá Carneiro, Humberto Delgado), and internationally recognized universities (Porto, Lisbon and Braga). These municipalities also have a high population density, except for rural counties (including those enumerated above) (Direção-Geral do Território, 2015).

Crossing the information provided by this map with the poverty index calculated according to the Węziak-Białowolska (2015) method, it can be seen that the municipalities that belong to this cluster show disparate values for the poverty index. For example, Celorico de Basto, Vizela and Paços de Ferreira present higher poverty rates than those observed in the remaining municipalities that make up the cluster, which are also higher than the national average, justified by a higher incidence of the long-term unemployment rate and illiteracy, respectively. On the other hand, Lisbon, Porto and Almada are the municipalities that show a lower incidence of poverty, since the values of illiteracy and unemployment are considered relatively low, and the purchasing power per capita is high, compared to the other Portuguese municipalities (Instituto Nacional de Estatística, 2014).

There are several clusters where the incidence of entrepreneurship is low (low-low clusters) – Figure 2. These municipalities are found in inland areas of mainland Portugal, especially in the regions of Baixo Alentejo, Alentejo Central, Beiras and Serra da Estrela and Viseu Dão-Lafões. Located far from the main cities of Lisbon and Porto, they do not have widespread, easy access to different support infrastructures, transportation facilities and business and cultural centers. These municipalities are entirely rural and with much lower population densities than those verified in the municipalities close to the large metropolitan areas (Direção-Geral do Território, 2015). The level of purchasing power per capita of the municipalities in this cluster shows that they have a low purchasing power, about 50% of the national average (Instituto Nacional de Estatística, 2014), while the unemployment

rate is around 4%. It should be noted that the councils of the clusters that have a higher purchasing power also show lower poverty rates, among which Vila Viçosa stands out as having these characteristics.

In Figure 2, we can also identify municipalities that are considered outliers, whether they are outliers with a high rate of entrepreneurship, which stand out in an area where low entrepreneurship rates prevail, or located in an area of high entrepreneurship, presenting low values for that rate. In the first type of outliers, i.e., municipalities with high rates of entrepreneurship but located in a region of low entrepreneurship, 7 municipalities stand out (Carraceda de Ansiães, Sátão, Elvas, Gavião, Vila de Rei, Barrancos and Chamusca). They are all located in inland regions of mainland Portugal, are rural and have a low population density (Direção-Geral do Território, 2015). Although they differ from their neighbors in terms of entrepreneurship, as seen in the low entrepreneurship cluster, these municipalities show, on average, low levels of purchasing power (around 60% of the national average) and high unemployment rates, except Vila de Rei (Instituto Nacional de Estatística, 2014). The municipalities with the highest unemployment rates have also a higher level of poverty, such as Carraceda de Ansiães.

There is only one low entrepreneurship municipality in an area of high entrepreneurship, Mourão, in Alentejo Central. This municipality presents a 1.1% entrepreneurship rate, which in comparison to the region where it is located is considered a relatively low entrepreneurship rate. It also shows a poverty index above the national average (52.89), and the longevity index (53.7), the illiteracy rate (11.8) and unemployment rate (5.48) are significant.

In terms of geospatial correlation, we can further identify (see Figure 3) hot and cold spots.⁵ The hot spots correspond, generally, to the metropolitan areas of Lisbon and Porto and some surrounding municipalities. These spatial

⁵ The ArcGis program calculates the Getis-Ord G_i^* statistic in each data set, obtaining z-scores and p-scores that enable the spatial grouping of low and high values of any statistical field (ESRI, 2016c). Thus, a municipality is a statistically relevant hot spot if it presents a high value (in this case, for the entrepreneurship rate) and is surrounded by municipalities that also present high entrepreneurship rates, that is, it has to present a high z-score and a low p-value. Otherwise, it will be a cold spot, that is, it presents relatively low values for the entrepreneurship rate, being surrounded by municipalities with similar entrepreneurship rates. (ESRI, 2016b).

hot spots represent municipalities with high rates of entrepreneurship and are surrounded by others with the same level of entrepreneurship. Eight municipalities are considered cold spots: Castro Verde, Ourique, Guarda, Aljustrel, Ferreira do Alentejo, Góis, Alandroal,

Redondo and Castanheira de Pera. These municipalities with low levels of entrepreneurship, and surrounded by similar municipalities, are located inland and have rural characteristics.

Figure 3. Hot and cold spots of entrepreneurship: Portuguese municipalities, 2011



Legend: U - Urban; R - Rural.

4.2 Municipal Poverty Index

The poverty index, calculated according to the Węziak-Białowolska method (2015) and obtained through the data available for the year 2011 (Instituto Nacional de Estatística, 2014), presents an average of 49.4 for the 278 municipalities of mainland Portugal, where the minimum rate verified is 23.6 (Lisbon, Metropolitan Area of Lisbon) and the maximum is 75.5 in Mesão Frio, in Região do Douro, Norte.

Figure 4 shows that the north and central regions and the southern municipalities of Alentejo are the areas where poverty is most noticeable. However, it would be misleading to limit poverty to these regions since it is not possible to identify a clear distribution pattern of this phenomenon.

The municipality with the highest poverty level, Mesão Frio, in the district of Vila Real and belonging to Região do Douro, is a rural municipality with a longevity index of 50.9%,

that is, only half the elderly population (with more than 65 years old) is over 75 years old, so longevity is relatively small. Furthermore, about 10.3% of its residents do not know how to read or write. With a purchasing power level of 57.8 per capita, about half of the national average, and with a long-term unemployment rate of around 15.0%, it would be expected that the poverty level of this municipality would be high, since the indicators used in the measure of the index are not favorable.

At the extreme opposite is Lisbon (belonging to the Metropolitan Area of Lisbon), where 53% of the elderly population is more than 75 years old, meaning a relatively higher longevity than in Mesão Frio, for example, and only 3.2 % of the population over 10 years old cannot read or write. Economic indicators are positive since they have a low long-term unemployment rate (3.6%) and the purchasing power per capita is around double the national average, circa 217. Thus, it is understandable

that Lisbon has the best results regarding the level of poverty, since the purchasing power indicator, which is also used to quantify po-

verty, is also a one-dimensional instrument to measure poverty and has a significant effect on this index.

Figure 4. Poverty Index: Portuguese municipalities, 2011

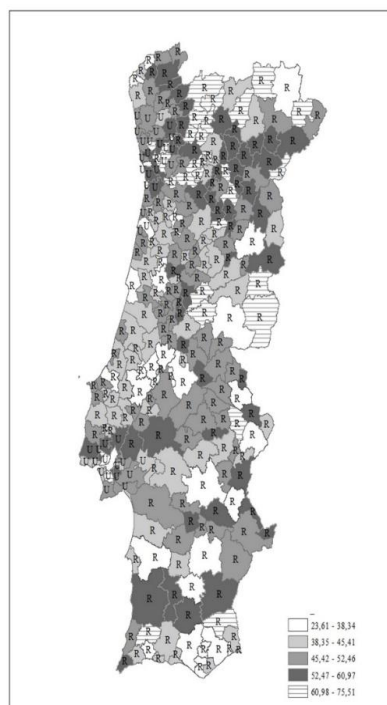
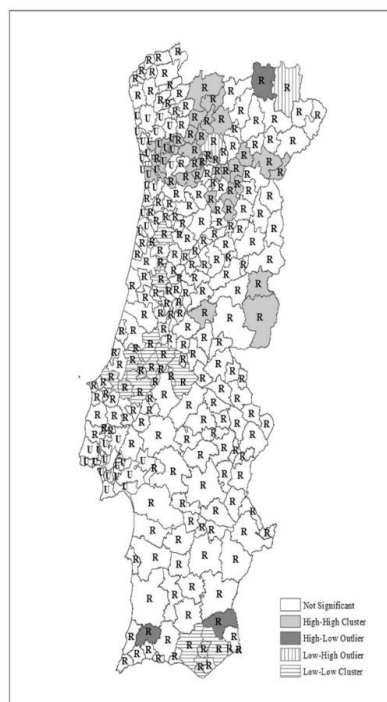


Figure 5. Clusters and outliers of the Poverty Index: Portuguese municipalities, 2011



Note: For a complete list of the municipalities that comprise the distinct clusters, see Tables A4-A5, in the Appendix.

Legend: U - Urban; R - Rural.

Figure 5 shows the clusters that constitute high poverty clusters, located in the North and Centre regions, and the low poverty clusters: Algarve, Lezíria do Tejo, Médio Tejo, Oeste, Aveiro Coimbra and Leiria. Aggregating according to the (high) level of poverty and proximity to other municipalities with this same characteristic, we can see they are located in the Metropolitan Area of Porto, Alto Tâmega, Ave, Douro, Tâmega and Sousa and Viseu Dão-Lafões where there is a higher incidence of poverty, concluding that the north is poorer than the center and south. Included in this cluster is Mesão Frio (Região do Douro), the poorest municipality in mainland Portugal with the highest poverty index of 75.5. It should also be noted that 78% of the municipalities in this high-high poverty cluster are rural, so although poverty is not restricted to rural or inland municipalities, it has a higher incidence in these territories.

The low poverty cluster is constituted, mainly, by southern municipalities. Faro, Loulé, São Brás de Alportel and Tavira are located in Algarve and constitute the low-low cluster. The largest low poverty cluster has 11 municipalities in the regions of Lezíria do Tejo, Médio Tejo and Oeste. The regions that make up the various low-low clusters are close to the Portuguese coast and metropolitan areas, however, the municipalities belonging to the respective clusters are, without exception, rural.

Regarding the high poverty outliers, Figure 5 highlights the existence of three rural municipalities: Alcoutim and Monchique in Algarve and Vinhais in Trás-os-Montes. Like Alcoutim (68.3), Monchique (61.5) stands out because of its high poverty in an area where contiguous municipalities have lower levels of poverty, mainly because of their low purchasing power (59.9 and 53.9, respectively) and high rates of illiteracy. The municipality of Vinhais, with a poverty index of 69.2, is worse off than its neighbors. In terms of the measurement of multidimensional poverty, the indicators used for its calculation reflect an elderly population (but with a low level of longevity (51.3)), illiterate (14.6%), with low purchasing power (half the national average, 51.3), and with a high rate of long-term unemployment (6.4%).

Analyzing the low poverty outliers, two rural and two urban municipalities stand out. The

rural cases, Bragança, in Trás-os-Montes and Vila Real, in Douro, capitals of their respective districts, have low poverty levels compared to the nearby municipalities, 35.9 and 39.2, respectively. They stand out because they have an older population (about half of the elderly population is over 75 years old), with an average illiteracy rate of 6.7%, and a level of purchasing power close to the national average (96.5 and 101.5, respectively).

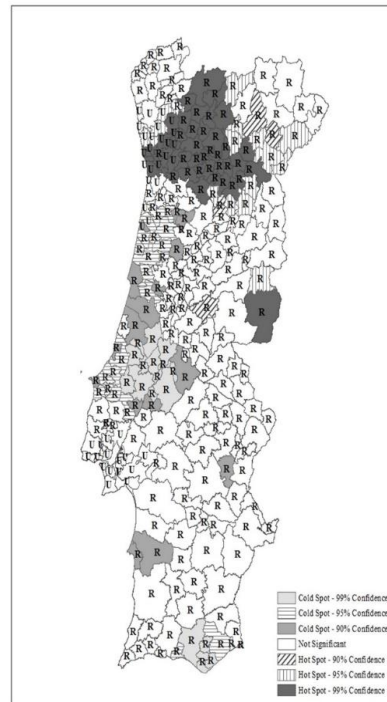
The urban councils that stand out for their reduced level of poverty, Lisbon and Porto, compared to their contiguous municipalities, are the most important cities in terms of economic power, infrastructures and the greatest concentration of population. Lisbon is, as we have seen, the least poor of all the 278 municipalities analyzed (with a 23.61 index), which contributes to its level of purchasing power per capita, at about twice the national average. The municipality of Porto has a poverty index of 34.58, where most of the population can read and write (2.8% illiteracy rate), the standard of living is well above average (161.7), but the long-term unemployment rate is high (6.98%).

The map of hot and cold spots created for the poverty index (Figure 6) shows, as does the map of clusters and outliers, the relationship between the poverty index of a municipality and the municipalities that surround it. Thus, in Northern Portugal and Beira Baixa, the municipalities are more likely to have high levels of poverty, creating a hot spot. As noted above, the municipalities of the Metropolitan Area of Porto, Alto Tâmega, Ave, Beira Baixa, Beiras and Serra da Estrela, Douro, Tâmega and Sousa, Terras de Trás-os-Montes and Viseu Dão-Lafões show high levels of poverty, being many contiguous.

Some municipalities belonging to the regions of Algarve and Central Portugal (Médio Tejo, Leiria and Lezíria do Tejo) are, in contrast, the municipalities that make up the cold spot, that is, they coincide with the low poverty cluster built in Figure 6.

Spearman's correlation coefficient between the poverty index and the entrepreneurship rate is -0.696 (p-value = 0.000), thus it can be stated that, on average, municipalities with higher entrepreneurship rates observe lower poverty rates.

Figure 6. Hot and cold spots of the Poverty Index: Portuguese municipalities, 2011



Legend: U - Urban; R - Rural.

4.3 Causality analysis between the entrepreneurship rate and the poverty index at a regional level

Although preliminary and tentative, this study makes an econometric evaluation of the factors that could, potentially, explain the poverty level of a municipality and region. Based on the literature review, the main hypothesis proposed in this study is that the entrepreneur-

ship rate of each municipality will be related to its poverty index. Specifically, it is expected that, by controlling for other relevant factors that may explain the poverty index of each area (e.g., purchasing power index, unemployment rate, sectoral distribution of economic activity, and rural/urban location), a more entrepreneurial municipality has, on average, a lower level of poverty.

Generally:

$$\begin{aligned} Poverty_i = & \beta_1 + \beta_2 Entrepreneurship\ rate_i + \beta_3 Purchasing\ Power\ Index_i \\ & + \beta_4 Unemployment\ rate_i + \beta_5 Activity\ rate_i + \beta_6 Primary\ sector\ weight_i \\ & + \beta_7 Tertiary\ sector\ weight_i + \beta_8 Rural_i + \varepsilon_i \end{aligned}$$

Where i represents the municipality / region and ε_i is the random perturbation term.

In order to obtain adequate statistics to construct the explanatory variables of the model, the PORDATA online database was used to aggregate statistical information from the Instituto Nacional de Estatística (data from the 2011 Census), such as municipal databases of purchasing power, unemployment rate, and predominant sectors of activity in the economy of each municipality (primary and tertiary).⁶ Regarding the information available for the classification of municipalities as rural or ur-

ban, Pato (2017) classified the Portuguese municipalities according to the OECD methodology for this particular area, and concluded that 85% of the national territory is considered rural under the National Strategic Development Plan for Regional Development (2007-2013).

Using the Variance Inflation Factors (VIF) and the White Test to evaluate, respectively, the multicollinearity between the independent variables and the homoscedasticity of the residues, we conclude that there are no multicollinearity problems (all VIFs associated with the independent variables are equal to or

⁶ These statistics, for the year 2011 (Census 2011), were obtained from the PORDATA online database.

less than 2.81). However, there is evidence of heteroscedasticity (the homoscedasticity hypothesis is rejected for $\chi^2(43) = 103.49$ and a p -value = 0.0000). Thus, when the model has heteroscedastic errors the problem of inference can be solved, keeping the estimator consistent and inefficient, considering an alternative estimator of the ordinary least squares (OLS) that is efficient (BLUE – best linear unbiased estimator –, with the lowest conditional variance). This is called weighted least squares, which uses the OLS to estimate the model and White's variance-covariance matrix is robust to heteroscedasticity for the t -tests and intervals of confidence.

We estimated three models - one including all municipalities (Model 1), and the others including only rural municipalities (Model 2)

and urban municipalities (Model 3). The results obtained for the F statistic indicate that the models have a high global significance, and that over 70% of the variance of the dependent variable is explained by the set and variables included in the models (see Table 2).

Considering all the municipalities (Model 1) and rural municipalities (Model 2), all else kept constant, on average, municipalities with higher entrepreneurship rates also have higher poverty rates. That is, contrary to what would be expected in theoretical terms, regional poverty and entrepreneurship appear positively related. Regarding urban municipalities (Model 3), there is not sufficient statistical evidence to establish a causal link between the rate of entrepreneurship and poverty.

Table 2. Determinants of the municipal poverty index, Portugal

		Model 1 (All)	Model 2 (Rural)	Model 3 (Urban)
Entrepreneurship	Entrepreneurship Rate	0.0349** (0.0171)	0.0240* (0.0147)	-0.1621 (0.1144)
Development level/ Purchasing Power	Purchasing Power Index	-0.7118*** (0.0676)	-0.7221*** (0.0721)	-0.4932*** (0.1814)
Labor Market	Unemployment rate	0.0912*** (0.0308)	0.0842*** (0.0301)	0.4536*** (0.1059)
	Activity rate	-0.1178 (0.0797)	-0.0972 (0.0821)	1.3752*** (0.4698)
Productive Specialization (default: Secondary sector weight)	Primary sector weight	0.1907** (0.0964)	0.2081** (0.0943)	-.9139 (.6051)
	Tertiary sector weight	0.0453 (0.0897)	-0.1217 (0.0979)	0.1886 (0.2088)
Rural location	Rural (dummy=1 if rural municipality; 0 if urban municipality)	-0.2796*** (0.0297)		
	N° of observations	278	235	43
Adjustment quality	F Statistics	56.28 (0.000)	63.78 (0.000)	15.12 (0.000)
	R²	0.7039	0.7423	0.7339

Note: *** (**) [*] Statistically significant at 1% (5%) [10%]. Grey cells indicate the estimations that are statistically significant. The variances are between brackets and are robust. All dependent and independent variables (other than the categorical rural and sector) are logarithmic. Estimations by weighted OLS, made with Stata 14.0 © software.

Additionally, on average, the poorest municipalities tend to have the lowest purchasing power, higher unemployment rates, and higher weight of primary activities, and are rural.

The theoretical link between entrepreneurship and poverty has suggested that business creation should generate higher growth (Audretsch *et al.*, 2006), particularly at the regional level and, therefore, could reduce the poverty of regions and municipalities.

Audretsch *et al.* (2006), although they did not try to establish any direct relationship between entrepreneurship and poverty, showed that for the 327 German municipalities, entrepreneurship (measured by the number of companies created in relation to the population) is a fundamental factor to explain municipal economic performance. In particular, they concluded that in German municipalities where there is more entrepreneurship, economic growth is greater. Where poverty should, con-

sequently, be lower.

In the Schumpeterian model proposed by Aghion and Howitt (2005), there is a possibility that the importance of entrepreneurship may be different for growth (and hence for poverty), depending on the country's development phase. Specifically, the model postulates that the creation of new enterprises (or threats of new entrants in the market) fosters more innovation and increased productivity resulting from the greater innovative profile of the new companies and the fact that new entrants' threats generate incentives for innovation and prevent the entry of competitors. Empirically, this model supports the idea that the creation of new enterprises, i.e., entrepreneurship, has a greater positive effect on growth in sectors, regions or countries that are closer to the technological frontier, but a smaller positive effect, or even negative one, on sectors, regions or countries that are laggards in technological terms. Again, nothing is said about poverty, but assuming that economic growth and poverty have a negative relationship, Aghion and Howitt's model would help explain the equally negative relationship between entrepreneurship and poverty.

Our results seem to support the idea that rural municipalities, less well equipped from the technological point of view, where necessity entrepreneurship is more frequent than opportunity entrepreneurship, a higher entrepreneurial rate does not mean higher economic growth and/or lower poverty, on the contrary. Usually, necessity entrepreneurship is not planned nor is it motivated by a legitimate desire to accomplish. It is, rather, an attempt (also legitimate, but not necessarily economically efficient) to find an alternative occupation to jobs created by others that generates income. In this context, the companies generated by necessity entrepreneurship tend to be very fragile and have a (very) high probability of bankruptcy, generating losses of wealth and destruction of value.

Barros and Pereira (2008), who analyzed the impact of entrepreneurship on economic growth rates for 853 Brazilian municipalities, found that in the municipalities with the highest entrepreneurial rate, economic growth was lower. The authors attribute this result to the fact that Brazil is a relatively backward country from the technological point of view and the most common entrepreneurship in the municipalities under analysis is the necessity kind,

generated by lack of employment and characterized by levels of productivity lower than those found in large incumbent companies. Although this study, like the Aghion and Howitt (2005) model, does not link entrepreneurship with poverty, it seems that the higher rate of entrepreneurship in Brazilian municipalities may be linked to a higher poverty rate due to lower economic performance.

In the present study, we did not classify the type of entrepreneurship by type of municipality - rural versus urban. However, Brás (2016) has highlighted that a huge part of Portuguese entrepreneurship is motivated by unemployment, that is, associated to necessity and not to opportunity, with little impact on economic growth. The scarcity of employment opportunities in structured sectors of the economy is more prevalent in rural than urban municipalities, where it is acceptable that necessity entrepreneurship has, when compared with urban municipalities, a much higher magnitude.

In summary, in Portugal and, particularly, in rural municipalities, given the prevalence of necessity entrepreneurship, the creation of companies has not been a poverty reducing factor, but instead, the more entrepreneurial these municipalities, on average, the poorer they are.

5. CONCLUSION

5.1 Main contributions and policy implications

The main goal of the present study was to analyze the relationship between entrepreneurship and poverty in the regions, particularly rural regions, in a developed country.

There are three main contributions. First, although there is already a substantial number of studies that have focused on analyzing the causality between entrepreneurship and economic growth at a regional level, little attention has been paid to the causal link between entrepreneurship and poverty. In addition, the literature on regional entrepreneurship supports the idea that regions with higher levels of entrepreneurship tend to show lower poverty rates. However, such evidence is based on empirical studies that focus mostly on regions of underdeveloped or developing countries. There are very few studies focusing on regions (rural and urban) of developed countries. For this reason, the present study adds significantly

to the scientific literature on the topic by explicitly establishing a causal link between entrepreneurship and poverty in rural and urban regions of a developed country (Portugal).

Second, a poverty index was built at the municipal level involving a multidimensional concept of poverty, thus contributing to the development of a Portuguese municipal ranking of poverty indices.

Third, the results obtained serve to uncover a dark side of entrepreneurship. Specifically, they underline the danger of preconceived ideas, such as (all) entrepreneurship is the 'miracle' solution to economic performance and a way out of the poverty cycle. In particular, it shows that, in Portugal, a developed but technologically backward country, entrepreneurship at regional level, which is mostly of the necessity type, has contributed to higher levels of poverty, especially in rural municipalities.

As highlighted by Brás (2016), one of the most worrying characteristics of entrepreneurship in Portugal is that it is (excessively) dependent on government initiatives, such as the former 'Programa de Estímulo à Oferta de Emprego', the 'Programa de Apoio ao Empreendedorismo e Criação do Próprio Emprego', or programs such as 'Empreende Já',⁷ whose prerequisite to award support/subsidies is unemployment. This necessity entrepreneurship is connected with high risk, because it targets populations (young and/or unemployed) that have, typically, gaps in terms of training, experience and/or preparation for business, and who also poorly informed about the existing business opportunities in the market. In addition, they generally lack an effective entrepreneurial vocation, revealing low motivation and limited capacity to respond to the demands imposed by the business world.

Portuguese public policies have accentuated the bias towards necessity entrepreneurship, to the disadvantage of opportunity entrepreneurship, based on innovation, training and the

creation of goods and services with high benefit, which should be built on an endogenous growth model with capital and technology as basic pillars. The present study highlights the need for new, alternative policies to boost entrepreneurship and rural entrepreneurship where business creation, focused on market opportunities and endogenous resources of the regions, becomes a relevant instrument for economic growth and the regions' development.

5.2 Limitations and future research

The study presents, in terms of index construction, some limitations. The use of secondary data collected from the *Instituto Nacional de Estatística* restricts the possibility of using some indicators referred to in the literature required to build the poverty index. Specifically, the absence of a material poverty measure at the county level (the threshold of municipal poverty), makes it impossible to directly adapt the Węziak-Białowolska (2015) human poverty index. The choice of a one-dimensional method to calculate the entrepreneurship rate restricts the research, so the use of a more complex indicator that distinguishes, for example, necessity and opportunity entrepreneurship would be a benefit to the study.

Another important limitation regards the use of one-time (2011) cross-sectional data. The year of 2011 was a 'special' year to Portugal. The country faced severe economic constraints and requested a €78 billion IMF-EU bailout package in a bid to stabilize its public finances. In this vein, the selected period might biased the analysis. Future research efforts should target the construction and estimation of a panel data, which could shed additional light on the evolution of poverty and entrepreneurship.

⁷ See <https://eja.juventude.gov.pt/#/>, accessed in May 2017.

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ANNEX

Table A1: Summary of the studies focused on regional poverty

	Authors (year)	Country/Region	No of analyzed regions	Period of analysis	Poverty measurement	Methodology	Main Results
Developed countries	Weziak - Bialowolska (2015)	European Union	276 NUT II regions from 28 countries	2010-2013	Human Poverty Index for developed countries $HPI - 2 = \left[\frac{1}{4} (P_1^3 + P_2^3 + P_3^3 + P_4^3) \right]^{\frac{1}{3}}$	Quantitative Descriptive/exploratory analysis	1. Scales of poverty differ largely between EU countries; 2. There are statistically significant differences in poverty levels between regions of the same country, throughout all EU
	Mogstad, <i>et al.</i> (2007)	Norway	21	2001	Regional poverty line	Causality quantitative analysis	1. Poverty analysis based on the national poverty line tends to increase urban poverty rates and reduce rural poverty rates; 2. The poverty level of a country is not significantly changed by the definition of the poverty line (if national or regional)
Developing countries	Guedes <i>et al.</i> (2012)	Brazil/Amazonia	1	1997-1998 and 2005	Multidimensional Poverty Index and poverty and inequality measures based on household income	Causality quantitative analysis	1. The one-dimensional measure of poverty tends to overestimate poverty rates, especially in the rural context; 2. The use of relative poverty measures reduces the differences between poverty rates for different samples
	Dehury & Mohanty (2015)	India	82	2011-2012	Multidimensional Poverty Index - MPI	Causality quantitative analysis	1. 43% of the Indian population is considered

Developing countries							to be multidimensionally poor; 2. The MPI decomposition points to health (36%) as the largest dimension in the poverty index, followed by housing (31%), income (22%) and education (11%)
	Radeny <i>et al.</i> (2012)	Kenya	8	2000-2009	Consumption expenditure and income poverty lines	Causality quantitative analysis	1. Kenya has a high incidence of rural poverty; 2. An increase in poverty headcount and poverty gap is observed; 3. There is a benefit in using complementary methods of measuring poverty, allowing a better understanding of the causes of poverty
	Cuong <i>et al.</i> (2010)	Vietnam	8	1999-2006	Expenditure and income poverty line	Causality quantitative analysis	1. Regions with a poverty rate close to the national poverty rate are the ones that show a greater reduction in poverty during the period under analysis; 2. The poorest provinces reveal reduction in the poverty rate, but at a slower pace than the other regions; 3. The results obtained from the income-

							based pov- erty estima- tion are similar to the results obtained from the consumption / expendi- ture-based poverty estimation
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