Macroeconomic Fundamentals of Poverty and Deprivation: an empirical study for developed countries

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Master in Economics

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September 2011

Acknowledgements

First and foremost I am thankful to my supervisors, Ana Paula Ribeiro and Sandra T. Silva, for their patience and helpful support in all phases of this dissertation, giving me always strength and encouragement. Without such valuable support, this work would have been much harder to accomplish.

I am also thankful to Filipa Melo with whom I spent straight hours working side by side, both of us writing our own dissertations. Although working with friends can be very difficult, this was not certainly the case.

Last, but not least, I want to thank to my family, particularly to my mother and father, who always provided me with all the necessary material and emotional conditions for a successful student's life.

Abstract

This study aims at providing a positive contribution to the literature on the macroeconomic determinants of poverty. The literature points, on the one hand, to the evolution of poverty concept from a pure material deprivation to a multidimensional phenomenon, encompassing both physiological and social deprivations. In this regard, most of the applications are targeted to the measurement of poverty in the less developed countries. On the other hand, the research on the role of Macroeconomics in explaining poverty is rather scarce. In this context, this dissertation proposes a composite poverty index that captures seven deprivation dimensions which, relying on the literature and data availability, are important to a comparative assessment of deprivation across developed countries. The sample includes 18 countries of the European Union, from 2005 to 2008. Moreover, relying on the macroeconomic transmission mechanisms that influence poverty, a panel data econometric approach is implemented in order to study the relation between the proposed composite index and macroeconomic variables. Results show that a multidimensional poverty concept is also relevant for assessing deprivation in developed countries and that, in line with the relevant literature, the dynamics of some macroeconomic variables is crucial to deprivation performances.

Keywords: Poverty; Deprivation; Macroeconomic transmission mechanisms; Poverty indexes; Panel data; European Union.

JEL Codes: I32; C13; C33

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1. Introduction

Poverty is defined nowadays as a multidimensional phenomenon, but it took a lot of time for social, in particular, economic research to attain this stage of maturity. From the beginning of human History until some decades ago, poverty was seen as a neutral phenomenon, particularly related with differentials on earnings or on the quantity of material wealth. Yet, currently, it is recognized as encompassing virtually all features characterizing the human being. Fighting poverty is now at the top of the political agenda of the most relevant international institutions, like the World Bank (WB) and the International Monetary Fund (IMF).

Hence, the concept of poverty has been evolving as the following quotations show: "Poverty amid plenty is the world's greatest challenge" (Wolfensohn, 2005: 240, quoted from Akoum, 2008: 226); "Eradicating poverty is an ethical, social, political and economic imperative of humankind", (Resolutions adopted by the UN General Assembly, 1996, quoted from Akoum, 2008: 226). Nevertheless, despite this evolution of the concept, some caveats still persist when it comes to the measurement of the different dimensions of poverty and also on how to encompass them. Further discussion on the concept is needed.

Some authors (*e.g.*, Agénor, 2005) claim that research relating macro aspects with poverty are rare, and emphasize that, in order to better understand poverty and contribute to its reduction, microeconomic decisions must be encompassed with macro outcomes. So, it is crucial to study, in detail, the macroeconomic transmission mechanisms focused on the poor and the socially excluded ones. Such an analysis demands an incursion into a complex matrix that covers not only economic growth and poverty, but also macroeconomic stabilization and institutions.

After a discussion around the concept of poverty, our work goes deep on reviewing the macroeconomic determinants, as well as the corresponding mechanisms, related to the phenomenon.

In the second part of our analysis, we proceed with an empirical approach to the subject. Since measurement issues are still highly debated in this field, we implement a review on studies focused on assessing poverty. This review is our departing point to propose our own measure, the Index of Multiple Deprivation for Developed Countries (IMD_D), to assess deprivation in 18 countries of the European Union (EU), from 2005

to 2008. This index aims at encompassing and measuring different deprivation dimensions, specifically for developed countries.

Finally, based on our IMD_D, we use an econometric model to analyse if the macroeconomic variables, pointed out in the literature, are able to explain the evolution of IMD_D. The results of this exercise are then compared with the related literature in order to check for the robustness of the most relevant theoretical explanations.

This thesis is structured as follows. In Chapter 2 the concepts of poverty and development, and measurement related issues are revised. Chapter 3 offers an encompassing review on the literature about macroeconomics and poverty. The empirical part starts with Chapter 4 that presents our IMD_D index and continues in Chapter 5 with a panel data econometric study. Chapter 6 concludes.

2. Poverty: concepts and measurement

The definition of poverty is not straightforward. Arthur Shostak shows how problematic this issue is, by claiming that poverty is such a personal experience that only the poor can understand it (in Misturelli and Heffernan, 2008). Despite this complexity, a working definition is required.

Before trying to define poverty there are some important issues that should be referred in advance, because the way poverty is understood and represented is of great importance to set the boundaries of the development of the concept. First, if poverty is to be defined as an economic problem, interventions on economic issues will be the main focus. Reciprocally, if the definition is framed as a national-phenomenon, the main focus of interventions will have to be on national issues (Misturelli and Heffernan, 2008). Second, Lomasky and Swan (2009), among others, identify two types of contemporary definitions of poverty. The definitions can invoke absolute or relative measures, *i.e.*, if we have a society in where everyone's wealth increases the same, the absolute poverty will decline, yet, relative poverty will stay the same. As Mabughi and Selim (2006: 184) mention "[a]bsolute poverty [is] referred to the subsistence below a minimum, socially acceptable living condition, established based on nutritional requirements and other essential goods". Thus, absolute poverty refers directly and only to the poorer classes: if their wealth increases, the index shows a decline of absolute poverty. Relative poverty compares the situation across different classes of income, increasing or decreasing with streams in the gap between classes. This is a good measure because while differences between individuals persist, this definition is dynamic in nature. Relative poverty is more used in developed countries, but nowadays is also increasingly used in less developed and developing countries (Mabughi and Selim, 2006).

Certainly, an important aspect to assess the links between macroeconomic performance and poverty is the way poverty is measured. For example, as DeFina (2002: 44) states, "An understanding of how aggregate labor market changes affect poverty theoretically depends on how poverty is measured". Distinct official aggregation methods of poverty rates in each country brings different effects from labor market functioning. This happens because some aggregation methods neglect not only important characteristics of the poor population but also the number of poor individuals.

Hence, "[d]issatisfaction with the measure results both from the way in which individuals are officially identified as poor and from the way in which poor individuals are aggregated into an index of poverty" (DeFina, 2002: 30). DeFina (2002) , adjusting the usual method used in the United States, compares if identical aggregate economic conditions will have different implications under two different methods of poverty measurement. The author analyses if the two different types of poverty measures, "prepolicy" - defined as the private money income (market activity and private transfers) less money spent to obtain the income -, and "postpolicy" - defined as the prepolicy income less direct tax paid, plus public transfers -, will respond differently to changes in aggregate economic conditions. He proves that the precise definition of poverty is critical to choose whether and how policy should be conducted. Different results from identical changes in aggregate demand economic conditions can be expected if different measurement methods of poverty are used.

A good definition to start with is given in the book *World Development Report 2000/2001: Attacking Poverty*, where poverty is defined within two different kinds of deprivations: physiological and social. Deprivation refers to all that restricts the "capabilities that a person has, that is, the substantive freedoms he or she enjoys to lead the kind of life he or she values." (Amartya Sen quoted from World Bank, 2000:15). The physiological deprivation covers basic material or biological needs (nutrition, health, education, and shelter). The second concept of deprivation includes risk, vulnerability, lack of autonomy, powerlessness, voicelessness and lack of self-respect. The first definition includes mostly tangible dimensions, and can be more straightforwardly related with low monetary income. But gathering both concepts we can understand that poverty has qualitative as well as quantitative dimensions (Mabughi and Selim, 2006).

As Misturelli and Heffernan (2008: 668) highlight "The arrival at our current conceptualizations of poverty, as a series of explicit characteristics, encompassing virtually all elements of the human condition, has been a long journey". A lot of authors describe the evolution of the definition of poverty throughout time (*e.g.*, Mabughi and Selim, 2006; Misturelli and Heffernan, 2008; Lomasky and Swan, 2009).

Until some decades ago, poverty was mostly understood as neutral and inevitable phenomena. Back then, poverty was identified just with the failure to meet a minimum

level of nutrition or subsistence, *i.e.*, the lack of monetary income (monetary poverty) or material possessions. Studies defining poverty within these dimensions can be found from the beginning of the 20th century (Mabughi and Selim, 2006).

In the 1970s the concept has evolved from taking a minimum of nutrition or subsistence level as a benchmark, to the need for keeping up with the standards prevalent in a given society, taking into account not only the lack of income but also the lack of access to health, education, and basic social services (Mabughi and Selim, 2006).

The 1980s brought new layers of complexity to the concept of poverty. "The role of income and wealth... has to be integrated into a broader and fuller picture of success and deprivation" (Amartya Sen quoted from Atkinson, 2003: 51). Poverty grows even wider to become a multi-dimensional problem also deeply rooted in social and cultural norms. Hence, "Poverty, we are now told, is among other things a social construct" (Misturelli and Heffernan, 2008: 667).

Nowadays it is believed that poverty may be the result either of a social problem, a particular economic variable, or even of specific political choices. Moreover, the multi-dimensional concept of poverty is also related with the participatory paradigm. An individual that is powerlessness, voicelessness, can also be considered poor. Besides these aspects, there is another important reason for considering that poverty has a wide range of dimensions. Policies have a primary objective, but second order benefits may arise. For instance, policies targeted at improvements in health conditions not only improve the physical well-being, but also increase the income-earning potential; or a specific policy that calls for a better education will not only improve learning abilities but will also lead to better health outcomes and to higher incomes (World Bank, 2000)). Thus, policies targeted to a specific dimension can influence other dimensions of poverty.

Vulnerability is also an important issue inherited from the 1980s to study poverty situations. Studies on poverty are normally snapshots of the present, the actual poverty, but it is necessary to study what will happen in abnormal circumstances (seasonal stresses, shocks, *etc.*) that can make movements into and out from poverty. This is crucial to assess the potential poverty of a society, characterised by gender of individual or types of families that are more in risk to become poor (Mabughi and Selim, 2006).

"Some groups may be at risk of becoming poor because of inherent vulnerabilities. That is, due to different types of discrimination based on class, gender, ethnicity, or factors such as disability or region of residence. Furthermore, certain combinations of vulnerability may be strongly correlated with poverty, such as female-headed households", (Mabughi and Selim, 2006: 185).

Poverty in this new layers of complexity is also synonymous of ill-being (state of mind, in the sense of being opposite to well-being), *i.e.*, someone that suffers from any kind of deprivation (money, shelter, food, *etc.*, or social and psychological needs) has higher probability of being psychologically affected (mental distress, breakdown, depression, madness, *etc.*), and this affects the individual's experience of life. "Well-being was variously described as happiness, harmony, peace, freedom from anxiety, and peace of mind" (World Bank, 2000: 16). The term poverty covers then a wide range of individual experiences, and this is the great advantage of relating poverty with ill-being individuals.

Anything that creates exclusion from the widely accepted lifestyle of a community can be traced as poverty as it may deeply affect the individual. Combating poverty should be the main objective of both national and international institutions. As Silva (2010: 61) stresses, "involuntary poverty is a violation of the human rights and because of that should be placed on top of the agenda of the international institutions".

Alves (2010: 105) points to the persistence of poverty in an intergenerational perspective, showing that poverty is strongly connected with intergeneration characteristics, *i.e.*, a poor family background is highly related with the children's lack of education, which will influence his or her future earnings.

Misturelli and Heffernan (2008) claim that although there are a lot of different definitions of poverty, based on different characteristics, there are three main ones: monetary poverty, multidimensional poverty, and the capabilities approach. The capabilities approach contrasts crucially with the monetary view. Instead of being directly related to what someone has, capability relies on what each individual can do with it. "Capability is, thus, a set of vectors of functionings, reflecting the person's freedom to lead one type of life or another" (Amartya Sen quoted from Mabughi and Selim, 2006: 191). "In sum, the human capability approach to poverty measurement attempts to measure poverty in terms of outcomes or 'ends' and not in terms of material

'means.' It defines and interprets the poverty phenomena as the absence of basic human capabilities to function at a minimally acceptable level within a society" (Mabughi and Selim, 2006: 192). This approach also complements somehow the monetary income view, because poverty as a lack of material things can be viewed as limited and partial (Misturelli and Heffernan, 2008).

It is important to acknowledge that, related to these distinct definitions (despite a strong agreement towards a more comprehensive definition of poverty), important discussions when it comes to measurement methods of poverty and/or on how they encompass all the dimensions of poverty definition are present. Although the currently widely-accepted definition of poverty is much more comprehensive than monetary poverty alone, indexes capturing the latter have still great importance. No doubt such indexes are very limited in capturing a wide-ranging definition of poverty but, from an economic point of view, like Misturelli and Heffernan (2008) argue, they are very useful. It is easier to measure and separate the poor from the non poor just by defining a poverty line but, as they fail to capture the full experience of poverty, makes also understandable why these measures are not fully accepted from a social point of view. Thereby, economic studies are usually discussed by several authors/institutions on the basis that monetary poverty indexes do not encompass all the important aspects of poverty; however, it is, in fact, very difficult to integrate all the different dimensions of poverty (Atkinson, 2003). The biggest advantage of this method is the clarity of the definition. No one will ever argue that poverty is not related to lack of money; in fact, rising the earnings of the poor will result in improving all the others characteristics (health, education, shelter, *etc.*). Of course improving the earnings should be tackled by giving people the skills to ensure, for themselves, a decent life. Social welfare, only by itself, can be directly linked with poverty and, thus, individuals or households dependents on social welfare systems can be defined as poor people (Silva, 2010). Also, monetary poverty convinces for the simplicity of measurement and the ease to compare across different cases. That is why most of the academic studies and international reports still use this method (Silva, 2010).

The most usual way to measure monetary poverty is to define a poverty line based on the proportion of individuals or households earning less than a given level of income (Agénor, 2005). In developing countries the poverty line may vary from 1 to 2 dollars

for day, the first describing extreme poverty and the second a most generous criterion (Silva, 2010). But other indicators are now also used by the World Bank and OECD to study the incidence of poverty, like the life expectancy at birth, mortality rate, prevalence of diseases, households without water, sanitation, electricity, households that use their house to business purposes, households of seven persons or more, *etc.* A subsidiary line of indicators can be used: *e.g.*, if households have electricity, do they also have electronic devices, or if they have water, is it good to drink? It is a long list of indicators.

Instead, for developed countries, the monetary indicators have some different characteristics. Normally, the poverty line is defined as having income below 40, 50 or 60% of median income of a specific country (Alves, 2010; Silva, 2010; World Bank, 2000). Another usual method is the Gini coefficient. This is mostly used to measure the disposable income inequality in each country. The coefficient varies between 0 (complete equality) and 1 or 100 (complete inequality). But other indicators are also used, like *per capita* energy consumption, migration rates, road fatalities, suicide rates, public expenditure in health, import and export of goods and services, individuals without internet or washing machine, school enrolment, unemployment, literacy rates, *etc.* (*e.g.*, www.worldbank.org).

There is a long list of indicators but, and besides the problems in measuring each dimension of poverty, there are further difficulties in how to encompass all the dimensions in a single index.

Atkinson (2003) discusses the problem of integrating in a measurement method different dimensions of the definition of poverty. Some authors prefer a unified approach while others prefer an interaction measure; *i.e.*, some are more concerned about those who have a low income or a low quality house or low quality education, while other authors are concerned with those who have a low income and both a low quality house and education. Atkinson (2003) gives the example of the National Anti-Poverty Strategy implemented by the Irish Government and that was targeted to those who were below a relative income line and experiencing, at the same time, other deprivations as measured by non-monetary indicators.

There are also problems in measuring the dimensions uncovered by the capabilities view. The first problem is that the value functions (the several things people may value

doing or being) can run from elementary ones (the need to avoid diseases, *etc.*) to very complex activities or personal states (the need for self respect, *etc.*). And secondly, functions can change according to society. For instance, the need to avoid a disease may differ according to the level of economic development: a disease that is preventable in a relatively rich country, where medical services are highly developed, may not be that preventable in a poor country (Mabughi and Selim, 2006).

It is now possible to understand that poverty is a great problem to all societies because it influences the individuals, and shapes their life experiences. "When inadequately clothed persons shiver and their empty bellies growl, no definitional fine points are required to form a lively conception of the features of poverty. The problem at hand under such conditions is to save individuals from falling over the edge of exigency, not to satisfy some arcane criteria of distributive justice", (Lomasky and Swan, 2009: 495). Poverty, like we saw, is composed of different dimensions, some more strict than others. Although it is very difficult to get the exact facts about poverty, most observers will agree that millions of individuals continue to suffer lives of deprivations and that the policies against poverty continue to be powerless in some regions (Agénor, 2005).

Agénor (2005) starts his paper with some data, gathered from the World Bank, about poverty in developing countries. The data is based on a poverty line fixed at 1.08 dollar a day, showing that the percentage of the world population earning less than this value dropped from 40.4 to 21.1 per cent from 1981 to 2001. But excluding China, which is undergoing a major development, the decrease is only from 31.7 to 22.5 per cent. In contrast, only accounting for sub-Saharan Africa, poverty increased from 41.6 to 46.4 per cent in the same period. If the poverty line is set at 2.15 dollars per day, poverty in Sub-Saharan Africa would have increased by less, from 73.3 to 76.6.

OECD (2008) presents data on growing inequality in developed countries, over the past two decades. This increase in inequality affected two-thirds of all countries. The Gini coefficient also shows an average increase of 2 points. Additionally, this report presents the results of a poll made by the British Broadcasting Corporation (BBC) that demonstrate that about two-thirds of the population of 34 countries thinks that the economic development of the last years has not been fairly shared. In some countries, including Portugal, 80% of the population agrees with that. Results from analysis made

by the OECD established that some rich countries have indeed gone richer and some poor countries have gone poorer. Moreover, it is also true that the majority of the population in some countries has gone poorer and only a minority has gone richer. Yet, China and India have shown growth and dragged millions upon millions of people out of poverty. "So whether you are optimistic or pessimistic about what is happening in the world to income inequality and poverty depends on whether you think a glass is half filled or half empty. Both are true." (OECD, 2008: 15) Some countries such as Germany, Canada, Norway, Italy, United States, and Finland show an increase on income inequality, but others, like Mexico, Greece, United Kingdom, and Australia, show the opposite (OECD, 2008).

The recent evolution in the concept of poverty brought not only a measurement problem of how to encompass all the different dimensions of deprivation, but also the need for economic policy to find alternative ways to fight it. Some authors, like Agénor (2005), defend that more macroeconomic-oriented research is essential to a better targeted intervention. In this context, the next chapter reviews the literature on the intrinsic transmission mechanisms that establish the links between macroeconomic performance and poverty.

3. Poverty fundamentals

Poverty, as ultimately defined in the previous chapter, is a multidimensional phenomenon that besides lack of income, should also account for deprived health, housing, education and other material conditions, as well as personal violence or even natural disasters.

Agénor (2005) sustains that works relating macro aspects with poverty are rare, and the papers that do exist are normally underrated because, while focusing on the transmission mechanisms of macro shocks to the poor in developing countries, they fail to capture, for instance, the complex nature of labor markets. Hence, the author points to the need to redirect research on converging macroeconomics with poverty reduction goals. He stresses that microeconomics has been the central scientific approach used to fight against poverty, whereas macroeconomics has been, to this regard, mostly neglected. Moreover, he complains that economists suffer from lack of research interest in poverty subject, being only preoccupied with measurement aspects. However, to reduce poverty, microeconomic decisions must be encompassed with macro outcomes.

In order to better understand the links between poverty and macroeconomics, in the short-, medium- and long-run, we rely on a literature review to discuss the intrinsic transmission mechanisms, aggregated into three groups: i) those that have a major influence on poverty through the economic growth channel, ii) the ones capturing the links between macroeconomic stabilization and poverty, iii) and those induced by the institutional environment, influencing both the economic growth and the stabilization mechanisms.

In Section 3.1 we will focus on the macroeconomic transmission mechanisms that can influence growth, and on whether they also impinge on poverty. In Section 3.2 the main focus will be on the macroeconomic transmission mechanisms that can influence poverty through affecting the stabilization performance. Finally, Section 3.3 covers the institutional environment-related mechanisms. A reform of the institutional framework, with positive outcomes both on growth and stabilization, is expected to influence poverty positively.

A compact summary of the literature survey is presented in Table A.1 in Annex A, which reports the reference entry, main aims and results on the links between

macroeconomic variables and poverty measures. The corresponding transmission mechanisms are also briefly reported.

3.1. Economic growth and poverty

In order to eradicate poverty, some authors like Epaulard (2003), Agénor (2005), and Akoum (2008), defend 'pro-poor growth' policies. This new term is now widely used in both academic and international policy environments and "[a] common view is that growth is pro-poor if it reduces poverty significantly" (Agénor, 2005: 376). Growth, by itself, is seen as the most important characteristic to push a society out from poverty. "Growth is necessary to reduce poverty, and pro-poor macroeconomic policies are those that enhance the efficiency of growth to reduce poverty" (Epaulard, 2003: 21).

Epaulard (2003) focus the importance of growth, but also emphasizes the importance of the distributional patterns. The larger median income is the more will be the impact of growth on poverty reduction. Ames *et al.* (2001) also sustain the importance of the so called 'growth effect' in order to achieve poverty reduction and emphasize two important characteristics that can affect the mechanisms through which growth impinges on poverty reduction: distributional patterns and sector composition. In a poverty reduction strategy, growth would be more efficient if distributional patterns were improved at first but, if not, growth will, in the end, push for such improvement, as growth, by itself, improves the distributional patterns (Ames *et al*., 2001). Enhancing the quality of growth by increasing the growth share to the poor is essential: thus, policies that reform land tenure, change marginal and average tax rates, and increase pro-poor social spending, should be used. The second characteristic emphasized by the authors is normally related to the conventional wisdom that growth strategies, linked with poverty reduction strategies, should be biased towards sectors where poor people are more allocated to. However, as the authors highlight, these kind of actions can actually influence positively the poor's situation in the short run but, in the long run, they can contribute to increase poverty rather than decreasing it (*e.g*., if investments are mainly allocated to agriculture, they will have positive influence in decreasing rural poverty in the short run, but the increased dependence on this activity may, over the long run, intensify output variability). So, growth strategies should not be conducted

only towards one sector; instead, these strategies should focus on removing distortions that constrain growth in any sector.

Nevertheless, some authors disagree on the negative relation between growth and poverty. For instance, Akoum (2008) concludes that although some countries have experienced high growth rates, they have not necessarily exhibited a decrease in poverty. This may be related with macroeconomic instability and/or poverty traps. As Azis (2008: 22) concludes, "the mechanisms by which macroeconomic policy affects poverty are too complex to be generalized".

In fact, poverty traps are usually referred in the literature to explain the difficulties developing countries have to perform the 'initial jump' to emerge out from poverty. Developed countries usually use external aid to help inducing growth in developing countries. Agénor (2005) defends that establishing empirically the existence of poverty traps is a crucial step for sensible policy design. Moreover, "[t]he relevance of aid to growth is often statistical insignificant, and when positive and significant, relatively small" (Agénor *et al*., 2008: 278). In an effort to assess empirically how poverty traps relate with low savings and productivity, Kraay and Raddatz (2007) do not seem to find strong evidence to support this relation, which casts doubts on the underlying theoretical motivations for the existence of poverty traps. It is important to recall that, in general, poverty traps related literature points to low savings rates at low levels of development, a sharp increase at intermediate-development ranges, leveling out at high development rates, and to a sharp increase in productivity once a certain level of development is achieved. Kraay and Raddatz (2007) seem to stress the opposite. The paper identifies sharp increases in savings at very low capital stocks, then a flat section followed by another increase in savings section for high capital stock levels. As for productivity, only constant and moderate increasing returns are found. Therefore, the association of poverty traps with low savings and productivity does not seem to be empirically relevant.

Kraay and Raddatz (2007) also reject the relation between aid, investment, and growth, since it finds no evidence that aid will be necessary to influence the 'initial jump' to run away from poverty. Moreover, the results also do not support the idea that aid raises investment. Easterly (1999), cited by Kraay and Raddatz (2007), finds that this effect is positive and statistical significant in only 17 out of 88 countries, while no

support is found for the relation between investment and growth. This lack of evidence does not mean that aid is not important; only that the relation should be more carefully analyzed by incorporating the quality of public institutions. The issue on institutions will be further discussed in Section 3.3.

According to Azis (2008), although many authors argue that growth is by itself one of the most important determinants to reduce poverty, this claim is incomplete. The effects of growth cannot and should not be generalized. Clarifying the specific effects of growth on the poor of each country is essential to choose the right policies. The quality of the distributional patterns is also too general, because this quality problem requires more explanations on how the distributional patterns can be improved while still preserving growth. Tarabini (2010) also argues that economic growth is insufficient for poverty reduction and that education is essential to fight poverty. Being so, a strong investment in education should be a priority in national development strategies. "The great amount of reports and documents published by the World Bank to date contribute not only to developing and to consolidating its 'new' top priority of fighting poverty, but also to highlighting the importance of education as one of the key mechanisms in achieving this goal. (…) basic education for poor people is understood as a crucial element for stimulating their empowerment and activation and, consequently, for increasing their capacity to create income and their chances of breaking the intergenerational cycle of poverty" (Tarabini, 2010: 207). Hence, education can positively influence productivity, economic growth and social development. Furthermore, Petrakis and Stamatakis (2002) show that primary education is essential to increase productivity levels and growth in low-income countries, being the importance of the secondary education more moderate, but still high. Instead, higher education levels seem to be more advantageous to growth and development in wealthy developed countries. As the level of development increases, the countries need higher levels of education that will generate higher levels of labor productivity. The two processes, education and development, are, thus, complementary.

The investments on pro-poor programs and on efficient delivery of essential public services are also crucial (public education, public health, social welfare, infrastructure, *etc.*). Moreover, public investment can also enhance private investment (Ames *et al*., 2001).

In the next section, and since macroeconomic stabilization may also be directly or indirectly (as a means to achieve economic growth) related to poverty, we will focus on the main mechanisms that, to this respect, are referred amongst the literature.

3.2. Macroeconomic stabilization and poverty

Stability exists when economic relationships are balanced (*e.g.*, domestic demand/output, payments/domestic revenues, savings/investments, *etc.*). However, stability does not mean that deficits or surpluses cannot exist; instead, it just requires that they are financed in a sustainable manner. Defining an economic situation as stable or unstable is not straightforward, being necessary to look at a combination of key macroeconomic variables (*e.g.*, inflation, growth, public sector deficit and debt, current account deficit, international reserves). Economic instability is normally associated, among others, with stagnant or declining Gross Domestic Product (GDP), double-digit inflation rates, high and rising levels of public debt, and large current account deficits financed by short-term borrowing. Moreover, it has two main sources: exogenous shocks (*e.g.*, natural disasters, terms of trade shocks, reversals in capital flows, *etc*.) and inappropriate policies (loose fiscal or monetary policy stance).

Macroeconomic instability hurts more the poor, relatively more vulnerable to, for example, high inflation rates and recessions. According to Ames *et al.* (2001), and by the same line of reasoning, any poverty reduction strategy should be financed in a sustainable and noninflationary manner, in order to maintain macro stability. Hence, policymakers should define a set of attainable macroeconomic targets (*i.e.*, inflation, external debt, growth and net international reserves) to sustain macroeconomic stability, and pursue macroeconomic policies (monetary, exchange rate, and fiscal) accordingly. Macroeconomic stability is essential to economic growth, and also for this reason macroeconomic stability should be promoted. Ames *et al.* (2001) point to an important consequence of low or negative output growth in a country: the 'hysteresis' phenomenon. This phenomenon operates typically through shocks to the human capital of the poor: *e.g.*, poor families' children tend to abandon school during crises, which will influence negatively poverty in long run.

Macroeconomic stabilization is, among others, characterized by the maintenance of low inflation goals that, by itself, appears to be essential for poverty reduction. Inflation can have a direct impact on poverty. In fact, poor people allocate a large share of their income to subsistence and, so, changes on the prices of goods and services that the poor consume, or changes on the government expenditures, significantly matter to them (Agénor, 2005; Ames *et al.*, 2001). If the goods that are consumed in large amounts are kept under control by the government, inflation may have little impact on the poor; otherwise, it will affect negatively and significantly the poor. Reduction in subsidies of goods and services will have similar effects. The behavior of overall inflation also matters because poor people are more vulnerable to inflation than higher-income groups. Poor people income is normally defined in nominal terms, not benefiting from indexation mechanisms. Moreover, they lack access to assets such as land or art objects that are not subject to inflation depletion. Hence, lowering the level of inflation can benefit the poor.

Nevertheless, some authors, namely Azis (2008), claim that these effects of inflation cannot and should not be generalized. Clarifying the effects of inflation on the poverty line or the effects of output reduction on the income of poor households is essential to choose the right policies. In fact, disinflation can also be critical to all society, including the poor, if it is accompanied by a contraction of the aggregate demand and employment. This will increase labor supply which may lead to downward pressures on wages, increasing poverty. Also, a reduction of the inflation level through tight macroeconomic policies increase real interest rates and reduce growth rates through the effect of the former on the level and efficiency of investment.

Changes in aggregate demand correspond to another macroeconomic transmission channel that may have impact on poverty through changes in employment and wages (Agénor, 2005); *e.g.*, fiscal shocks like wage cuts in the public sector may directly raise the poverty rate, particularly if it happens during periods when economic activity is subdued or in the absence of a proper safety net, since the public sector employees have normally low wages. Reduction in government transfers, cuts in current spending on goods and services or capital spending may also increase poverty by reducing the demand for labor and the aggregate demand.

Macroeconomic policies that change aggregate demand by affecting private spending are also possible (Agénor, 2005); *e.g.*, fiscal adjustments such as increases in tax rates on wages or profits lowers the expected profit and net rate of return on capital, which may reduce private expenditure on consumption and investment, lowering the aggregate demand. Another way of lowering private expenditures is based on restrictive credit through tight monetary policy. Conversely, cuts in public expenditures can also increase private expenditures if they reduce the cost or increase the availability of bank credit to the private sector, increasing aggregate demand. Additionally, fiscal adjustments that reduce government expenditures also reduce the pressures for monetization of the deficit, which may pull inflation down.

Real exchange rate appears also to be a crucial macroeconomic variable in affecting poverty. In order to understand how a depreciation of the real exchange rate can affect the poor, we need, first, to know where the poor are predominantly allocated in terms of economic activity and, second, if the poor tend to consume more of imported goods relative to non-tradable goods (Agénor, 2005). A real depreciation increases the prices of imported goods and fosters a reallocation of resources towards (agricultural) export sectors, raising the income of the corresponding workers (farmer and rural households). Inequalities in poverty may arise, because rural poverty can be decreasing while urban poverty is most probably increasing; this happens because while a reallocation of resources towards the agricultural sector is being made, the demand for labor in the urban areas can decrease, and also because the poor from urban areas tend to consume more imported goods, that are more expensive after the real depreciation.

Moreover, the increase in the prices of imported goods (machinery and equipment), if not accompanied by a cut in tariffs, may reduce the demand for skilled workers. If we assume that skilled and unskilled workers are substitutes, the demand for unskilled workers will increase, raising employment and income for the poorer (as the poor are usually less skilled). If cuts in tariffs are implemented, the prices for imported goods may actually fall, raising the demand for skilled workers, and the opposite situation may occur. If the economy depends on crucial imported intermediate inputs (in particular, commodities), demand for labor may decrease, unemployment may rise, and poverty may increase. Hence, the external competitiveness of a country can have a direct impact on the poor (Agénor, 2005).

It is also important to refer that business cycles have asymmetric impacts on poverty. Recessions and crises tend to increase poverty rates significantly, whereas expansions tend to have a more limited effect. Hence, the ability of the institutional framework to smooth these cycles is essential. Recessions reduce the demand for labor and tend to put downturn pressures on wages, raising unemployment in the formal sector (Agénor, 2005). In developing countries, with rather imperfect credit markets and where no state benefits for the unemployed are available, individuals cannot afford to stay for long time unemployed, so they will move to the informal and the rural sectors. This will tend to put downturn pressures on wages in these two sectors as well. Also, in a recession, firms tend to fire first the unskilled workers while keeping the skilled ones. When the crisis ends, firms have incentives to recover the productivity losses. Given the high complementarity between skilled workers and physical capital, firms may be tempted to increased fixed investment instead of hiring unskilled workers. Hence, any pro-poor macroeconomic policy should aim at smoothing economic fluctuations, particularly, downturns (Epaulard, 2003).

Furthermore, among other authors, Ames *et al.* (2001) claim also that countries should support structural reforms in order to improve and strengthen flexibility in markets' adjustments. Hence, quality of institutions seems also to be determinant for achieving lower stabilization costs. Since the quality of institutions appears as a crucial determinant either for economic growth or for macro stabilization, in the next section we bring the institutional framework into discussion.

3.3. Institutional framework and poverty

"Over the last decades, national governments across the developing world have implemented economic structural adjustment programs (ESAP)" (Marquette, 1997: 1141). ESAP programs have, within their principal objectives, decreasing state interventionism and improve regulation towards non-interventionism, privatization and deregulation. Some structural adjustments may have impact at the same time on growth and on stabilization, (*e.g.* reforms in the fiscal structure such as on budget and treasury management, public administration, and governance) will increase efficiency and transparency, benefiting the poor *via* the increase on efficiency *per se* and through the better use of public resources (Ames *et al*., 2001). "Poverty reduction - in the world or

in a particular region or country - depends primarily on the quality of economic policy. Where we find in the developing world good environments for the households and firms to save and invest, we generally observe poverty reduction", (Collier and Dollar, 2001: 1800). So, changes in the institutional framework can have an important impact on both growth and stabilization, and thus, may be equally essential to affect poverty.

"An economy with a robust system to control corruption, an effective government, and with a stable political system will create the necessary conditions to promote economic growth, minimize income distribution conflicts, and reduce poverty in developing countries" (Tebaldi and Mohan, 2010: 16). Tebaldi and Mohan (2010) argue that improving the quality of institutions is an essential step to fight poverty. The other mechanisms (government transfers, aid programs, *etc.*), will have only a limited and a short effect on reducing poverty if improvements on the quality of institutions are left out of the strategy. Their paper suggests that "(…) policies aimed at reducing poverty should first consider improving institutions in developing countries as a pre-requisite for economic development and poverty eradication" (Tebaldi and Mohan, 2010: 17). Is also defended that "(…) corruption, ineffective governments, and political instability will not only hurt income levels through market inefficiencies, but also escalate poverty incidence via increased income inequality" (Tebaldi and Mohan, 2010: 16).

As already mentioned in the previous section, macroeconomic volatility can arise due to domestic policy misconduct resulting from failures in the institutional design of policy authorities regarding objectives and procedures (Ames *et al.*, 2001). This biased policy framework can affect poor in various ways. As already referred, volatility tends to distort price signals and the expected rate of return to the investors, which may delay decisions and lower both private investment and growth rates. It can also lead to higher risk premium or credit rationing, and this will affect directly the capability of obtaining loans by individuals and small and labor-intensive firms, which may result in lower private investment and lower growth rates. Lower macroeconomic volatility signals higher policy credibility, which brings the benefits mentioned above. To this regard, policy credibility is an essential characteristic to promote. "If a policy lacks credibility, the private sector does not believe that the authorities are truly committed to their policy targets, and hence does not fully factor the authorities' targets into its inflation expectations, for instance when setting wage bargains" (Ames *et al.*, 2001: 20). The

absence of this characteristic can then be disastrous as private sector will feel the lack of commitment by the government, which can negatively influence private investment, job demand, inflation, *etc.* "Credibility can sometimes be enhanced by imposing restrictions on policy (*i.e.*, limiting the degree of discretion of the monetary authorities), or by adopting specific institutional arrangements" (Ames *et al.*, 2001:20).

Policies aiming at removing market distortions and distortive regulation or at promoting trade liberalization can also be crucial to deliver higher growth and better stabilization because, among others, they will improve competitiveness and fairness in the labor market. Additionally, trade liberalization and the improvement of social safety nets can smooth economic fluctuations (Ames *et al.*, 2001; Epaulard, 2003). According to Epaulard (2003), during a period of economic downturn, *per capita* income declines, but a more open economy helps reducing the increase of poverty.

As for the need to dismantle corruption, the conventional literature usually goes within the quote:_ "[c]onventional economic thinking says that lower corruption reduces income inequality through various channels" (Dobson and Ramlogan-Dobson, 2009: 102), and normally defends a negative circle-link between corruption and level of development or growth; "…high growth reduces corruption which, in turn, increases growth" (Aidt *et al.*, 2008: 196), "Corruption vanishes as countries get rich" (Gundlach and Paldam, 2009: 147). It is then expected that a corruption-free environment should support sustained growth and a more stable multidimensional environment, and that policies that fight against corruption should then be developed, improving the institutional environment. In spite of this conventional wisdom about corruption, empirical works are rather inconclusive about the effects of corruption on poverty reduction. Aidt *et al.* (2008) show small or no impacts of corruption on growth if we are in the presence of weak quality institutions, being more harmful where good quality institutions are present. Epaulard (2003) also finds that corruption does not seem to have any effect on poverty and, according to his results, it is not possible to show that less corruption is associated with more efficiency concerning the impact of growth in reducing poverty. Additionally, no evidence is found on that less corruption causes a smaller impact of economic downturns in increasing poverty.

Other studies show that aid is not, for itself, enough to induce economic growth; capable macroeconomic policies are also needed: "positive effects of aid on growth are

conditional of having ‘good’ institutions” (Agénor *et al*., 2008: 278). Most of the results show that it is essential to improve aid but, alongside, the management of public resources should be reformed. Following this path, it is possible to maximize growth effects on reducing poverty. Collier and Dollar (2001) and Kraay and Raddatz (2007) also point in this direction.

In summary, almost all works reported in Table A.1, Annex A, include growth-related variables as poverty determinants; the institutional framework is refereed by nine out of the fourteen papers, while macroeconomic stabilization-related variables are mentioned only four times. While monetary poverty still dominates as a measurement device, the most recent papers (2009 and 2010) measure poverty as a multidimensional phenomenon.

It is now clear that poverty, seen as a multidimensional phenomenon, can be influenced by distinct macroeconomic transmissions mechanisms, some influencing exclusively growth or stabilization, others influencing both at the same time. Following this idea, we propose, in the following chapters, an empirical application to assess how macroeconomic performance can affect several deprivation dimensions in the developed countries. In the next chapter we attempt to build an index to capture multidimensional poverty in developed countries. Then, in Chapter 5, we will use an econometric model to test the effects of the macroeconomic transmission mechanisms in such poverty index, analyzing if the results confirm, or not, with those in the literature.

4. Assessing multidimensional poverty across some European Union countries

Throughout this work it is clear that poverty is a multidimensional phenomenon and this property poses measurement problems in assessing its effective extent. Although there is a strong agreement about the need of comprehensive definition of poverty (see Chapter 2), there are still some discussions when it comes to the most adequate measurement methods of poverty and/or on how they encompass all the dimensions of poverty definition.

In this chapter we aim, first, to review some indexes that measure poverty as a multidimensional phenomenon. Second, we aim at constructing a composite index in order to compare multidimensional deprivation across some European Union (EU) countries.

4.1. Measures of multidimensional deprivation

Alkire and Santos (2010) give a great step to overcome the problem of how to encompass all the dimensions of poverty in a single index. They propose a new composite index for developing countries, the Multidimensional Poverty Index (MPI). Although our objective will be targeting the developed countries, the presentation of this index is in order. The MPI covers three dimensions: education, health, and standard of living. These dimensions are measured using ten indicators: i) health is measured using indicators of child mortality and nutrition; ii) education by the years of schooling and child enrolment; and iii) standard of living by the access to electricity, drinking water, sanitation, cooking fuel, assets, and the type of flooring. All dimensions have the same weight. From this index we know the percentage of people that are deprived, and to what extent (proportions of dimensions) households are deprived. "A household is identified as multidimensionally poor if, and only if, it is deprived in some combination of indicators whose weighted sum exceeds 30 percent of deprivations" (Alkire and Santos, 2010: 4).

Alkire and Santos (2010) compare the ranking of developing countries when using the MPI index and the poverty line of 1.25 dollar a day. Only for a minority of countries the two measures yield similar results on the proportion of poor population; moreover,

in most of the cases, the extent of poverty is higher when measured by the MPI, meaning that the poverty line fails to fully capture the effective proportion of poor people.

Regarding developed countries, the EU Social Protection Committee adopted in 2009 a new broader list of indicators to measure the multidimensionality of poverty, namely: 1) Inability to face unexpected financial expenses; 2) Inability to afford paying for one week annual holiday away from home; 3) Arrears (mortgage or rent payments, utility bills or hire purchase); 4) Inability to afford a meal with meat, chicken or fish, every second day; 5) Inability to keep home adequately warm; 6) Enforced lack of a washing machine; 7) Enforced lack of a colour TV; 8) Enforced lack of a telephone; and 9) Enforced lack of a personal car.

A first multidimensional assessment of poverty for Portugal, when compared with the European Union (UE27) average, using those indicators and covering also monetary poverty is provided by Rodrigues and Andrade (2010). Both can be measured in terms of incidence (number of people that suffers from poverty or deprivations) or intensity (how much poor or how much deprived households are). Monetary poverty is measured using the poverty line defined as 60% of the median of the equivalent disposable income, while material deprivation tries to cover material poverty in a broader sense, using the above indicators. Rodrigues and Andrade (2010) propose different types of weighting for the indicators in the index composition: data driven, normative and hybrid weights. Using the first method, the weight of each item is taken from the data and refers to the percentage of people that have that particular item, *i.e.*, the larger the proportion of population with access to a certain item, the higher the weight of the item because it reflects higher society preferences. The second method - normative weights - uses equal or arbitrary weight for all the items. The third method is directly based on reported individual's perceived importance attached to each item. They first use normative weights and give equal weight for all indicators, and second use the hybrid weight, being this last methodology the one Rodrigues and Andrade (2010: 14) give more importance, since it "...[has] a strong advantage over the other two types of weights because they avoid the argument between the 'is' and 'ought to be' methods". Across weighting methods, the hybrid method's results are robust in showing a significant reduction on the number of deprived and consistent poor (people that are

both poor and deprived) in Portugal, being the results even lower than the poverty incidence, which makes this results oppose the results of the Alkire and Santos (2010). But when the normative method is used, the deprivation incidence is stronger than the poverty incidence, a result in the same direction of those in Alkire and Santos (2010): monetary poverty does not fully capture the effective proportion of poor people. This analysis shows that the weight of the indicators can deeply change the results.

Another work that uses a multidimensional index, adapted to the United Kingdom, is McLennan *et al.* (2011). This index - the Index of Multiple Deprivation (IMD) - encompasses 7 dimensions (domains) with different weights: i) Income deprivation (22.5%); ii) Employment deprivation (22.5%); iii) Health deprivation and disability (13.5%); iv) Education, skills and training deprivation (13.5%); v) Barriers to housing and services (9.3%); vi) Crime (9.3%); and vii) Living environment deprivation (9.3%). The weights were set following the hybrid method (McLennan *et al.*, 2011). After choosing the relevant dimensions, the authors sustain the choice of indicators as those "which provide the best possible measure of each dimension of deprivation" (McLennan *et al.*, 2011: 14).

This latter index, differently from those in Alkire and Santos (2010) and Rodrigues and Andrade (2010), is not micro based. Micro-based indexes report the percentage of poor people, *i.e.*, the percentage of people that is, simultaneously, deprived on a set of dimensions, or is below a minimum threshold for average dimensions. Instead, McLennan *et al.* (2011), is macro based, and for that reason indicators have a different interpretation implied by a different construction methodology. The IMD is an average weighted sum of scores that ranks, for a given moment in time, regions from the most deprived to the least deprived, taking into account the above-mentioned set of domains and corresponding indicators. Or, for a given country, the index allows accessing how average deprivation has evolved across time when compared with other countries. It is not possible to quantify how much more deprived a country is when compared with another one, being only possible to assess that a country is more deprived relative to the others. Following this idea, if a country scores 40 and other 20, is not possible to say that one country is twice as deprived as the other. The "...score is the combined sum of the weighted, exponentially transformed domain rank of the domain score" (McLennan *et al.*, 2011: 51).

An IMD-type index makes possible to identify the most vulnerable sectors of a society and to separate the dimensions of poverty because one can identify on which dimension stronger deprivations exist. Therefore, in the specific context of our research, since we are interested in measuring multidimensional poverty for developed countries, the computed index we construct should follow more closely the dimensions, indicators and weights embedded in this last work.

4.2. Index of multiple deprivation for developed countries: a proposal

Taking as a reference the work of McLennan *et al.* (2011), we construct a composite macro-based index for developed (EU) countries. We follow the same list of domains as well as the respective weights, but the indicators are necessarily different. This results from: (i) McLennan *et al.* (2011) indicators apply to (UK) regions while in our work they apply for (EU) countries and some indicators are not meaningful at the country level; (ii) some indicators are not available across time and/or country; (iii) we chose to privilege a single database source – Eurostat. Nevertheless, the criteria for choosing the indicators should follow some rules, namely, they must:

- provide direct measures for the deprivation domains where they are included;
- be computed from an universe that covers the majority of the population in each country;
- be up-to-date;
- be ease to update on a regular basis.

The above-mentioned criteria and limitations, regarding the parsimonious use of indicators, led us to choose a representative sample of 18 EU countries (Czech Republic, Denmark, Germany, Estonia, Greece, Spain, France, Cyprus, Latvia, Lithuania, Luxembourg, Hungary, Austria, Poland, Portugal, Slovenia, Slovakia, Finland) for the most recent period of data availability (2005 to 2008).

Table 4.1 summarises the dimensions, respective weights, indicators, measurement units and the ordering of how indicators rank deprivation that we have chosen to include in the Index of Multiple Deprivation for Developed Countries (IMD_D).

Table 4.1: Structure of the IMD_D

Weights (%)	Dimensions	Indicators	Measurement units	Rank ordering
22.5	Income Deprivation (proportion of people that live on income deprivation)	At risk of poverty (at risk of poverty threshold)	Percentage of total population	Ascendant
		Inability to face unexpected financial expenses	Percentage of total population	Ascendant
22.5	Employment Deprivation (involuntary exclusion from work)	Long-term unemployment	Long-term unemployment in percentage of active population	Ascendant
		Population in jobless households	Percentage of people aged 18-59	Ascendant
13.5	Health Deprivation and Disability (physical and mental health)	Hospital beds	Beds per 100,000 inhabitants	Descendant
		Suicide rate	Percentage of suicide on the standardized death rate by 100 000 inhabitants	Ascendant
13,5	Education, Skills and Training Deprivation	Persons with upper secondary or tertiary education attainment	Percentage of population aged15 -64 years	Descendant
		Early leavers from education and training	Percentage of total population	Ascendant
9.3	Barriers to Housing and Service (accessibility of housing)	Housing overburden	Percentage of total population	Ascendant
		Severe house deprivation	Percentage of total population	Ascendant
		Overcrowding rate	Percentage of total population	Ascendant
9.3	Crime (rate of recorded crimes)	Crimes reported by the Police	Total (all recorded offences)*	Ascendant
9.3	Living Environment Deprivation (quality both in and out the house)	Inability to keep home adequately warm	Percentage of total population	Ascendant
		Inability to afford a meal with meat, chicken, fish (or vegetarian equivalent) every second day	Percentage of total population	Ascendant
		Greenhouse gas emissions	Total emissions*	Ascendant

Source: Eurostat (several years) (http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/themes, accessed in May, 2011).
Note 1: Within each dimension, indicators have equal weights.
Note 2: All measurement units marked with * were divided by the total population of each country.
Note 3: Rank ordering scores from 1, referring to the least deprived country, to a maximum value (no larger than the number of countries in the sample), referring to the most deprived country (if two countries have the same value on one indicator, they will score the same on the ranking).

After deciding which indicators to use, we calculate the ranking order for each of them. The next step is, following the methodology in McLennan *et al.* (2011), the construction of the domains. Since all indicators have the same weight in each respective domain, we just have to average across the indicators' ranking orders within each domain. After computing each domain ranking, McLennan *et al.* (2011) suggest that a transformation to an exponential distribution should be implemented according to the following formula:

$$E = -23 \cdot \ln\left\{1 - r\left[1 - e^{-\frac{100}{23}}\right]\right\} \quad (4.1)$$

Where E is the transformed domain score, and r is calculated by dividing the domain ranking order for the maximum value in the ranking, R (r varies from $1/R$ for the least deprived country, to R/R for the most deprived country)[1]. The rank transformation through equation (4.1) enables to comprise the rank scores between 1 and 100, being that the countries scoring more than 50 are among the 10% most deprived for a given domain. Tables in Annex B show the transformed ranking for each domain. Table 4.2 shows the countries that were, on average, among the 10% most deprived in each dimension.

Table 4.2: Most deprived countries by dimension

Dimensions	Countries among the 10% most deprived (average 2005-2008)
Income deprivation	Latvia; Lithuania
Employment deprivation	Poland, Hungary
Health deprivation and disability	Slovenia, Estonia
Education, Skills and Training deprivation	Portugal, Spain
Barriers to Housing and Service	Poland, Latvia
Crime	Denmark, Germany
Living Environment Deprivation	Poland, Czech Republic

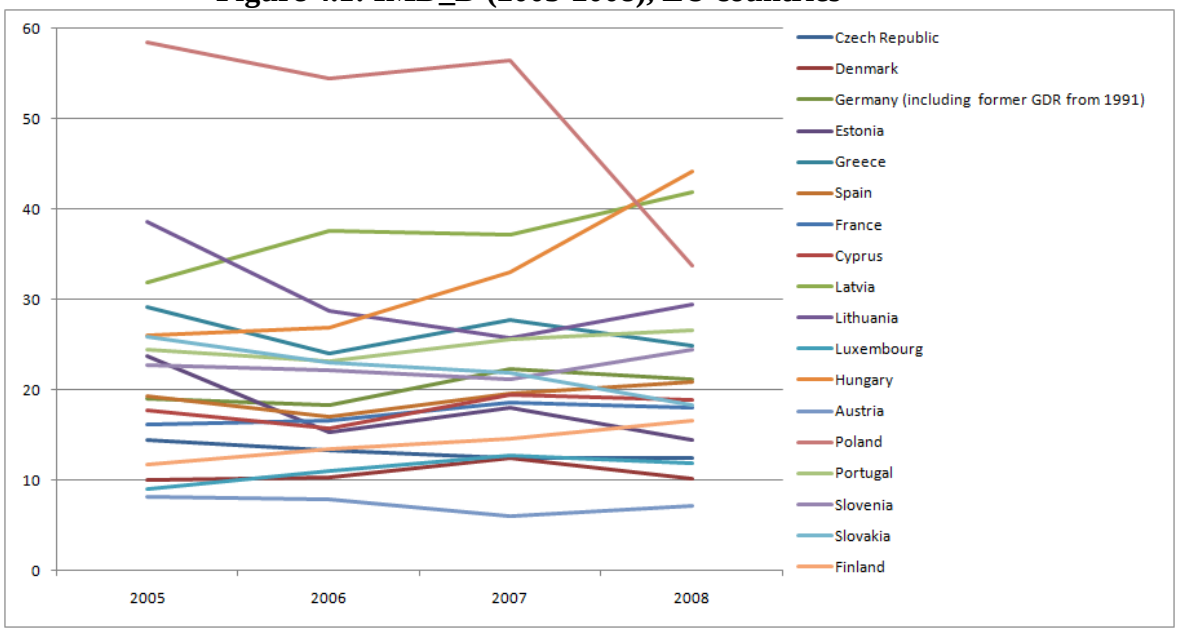
Source: Own calculations (see tables in Annex B).

[1] In our study, the maximum value in the ranking (R) is 18 (total number of countries). If two countries, or more, have the same domain ranking, the maximum score (R) will not be 18, but a lower one.

We conclude from the table that Poland is the only country appearing three times in different dimensions, followed by Latvia, appearing two times. The remaining countries reported in the table appear only once. The crime dimension causes some suspicion, but it can be because most of the crimes, even the less serious ones, are reported in these countries (Denmark and Germany). As for the rest of the dimensions, excluding Education, Skills and Training deprivation, notice that the most deprived countries were the latest to join the European Union (1 of May of 2004) and have also been the ones most recently admitted in the Euro Area (Slovenia, 2007, and Estonia, 2011), or are still non-participants (Poland, Hungary, Czech Republic, Latvia and Lithuania). We can, albeit timidly, conjecture that the co-investment from European funds and the monetary and fiscal discipline are non-negligible for the performance in terms of deprivation. As for the Education, Skills and Training deprivation dimension, Portugal is, in all years, the most deprived country, followed by Spain.

The next step was to calculate the IMD_D through a weighted average across the transformed domain scores for each country/year. Results can be seen in. Figure 4.1 depicts the evolution of the multidimensional deprivation index for the EU countries in our sample from 2005 to 2008.

Figure 4.1: IMD_D (2005-2008), EU countries



Source: Own calculations (see Annex C).

The IMD_D averages deprivation across seven domains. From Figure 4.1 it is possible to observe that Poland is the most deprived country for the first three years under study, 2005-2007, being that position occupied by Hungary in the last year, 2008. Poland and Latvia are always between the three most deprived countries during the time span considered. Hungary starts from the fifth position in 2005, behind Lithuania and Greece, to end up the most deprived country in 2008. This degradation results from a worse performance in all dimensions; however, if we look closely to the Employment deprivation dimension (Table B.2 in Annex B) it is possible to see clearly that Poland and Latvia are getting better, while Hungary is getting worse. Austria is, consistently, the least deprived countries. As for Portugal, which starts on the seventh position, maintains in 2006-2007 the sixth position, and ends on the fifth place, is possible to understand that is growing worse in almost all dimensions, particularly in the employment deprivation and in the crime dimensions (see tables in Annex B).

If we calculate the average composite index for the 18 countries, it is possible to see that this value stays around 21-23 for all years. For Portugal, we confirm that the country is near 24 in 2005; decreases in 2006 following the EU18 average trend, but increases during the last two years (see Table 4.3). Hence, the IMD_D shows that deprivation is growing worse in Portugal.

Table 4.3: IMD_D – Portugal *vs* EU18 average

Country	2005	2006	2007	2008
EU18 average	22.59	21.07	22.51	21.96
Portugal	24.47	23.20	25.57	26.60

Source: Own calculations (see Table C.1 in Annex C).

Motivated by the results presented in Alkire and Santos (2010: 30), in Table 4.4 we compare the monetary poverty (MP), measured by the indicator "At risk of poverty rates" (poverty line defined as 60% of the median of the equivalent disposable income, usually used to measure monetary poverty) with the IMD_D. If the position of a country in the ranking of the IMD_D is worse than the position in the ranking of the "At risk of poverty rates" indicator, then the IMD_D will appear in the table (shadowed areas) as the latter puts the country in a worse position. If, on the contrary, the position of a country in the ranking of the IMD_D is better or equal than the position in the ranking of the "At risk of poverty rates" indicator, the MP will appear because MP puts the country in a worse position.

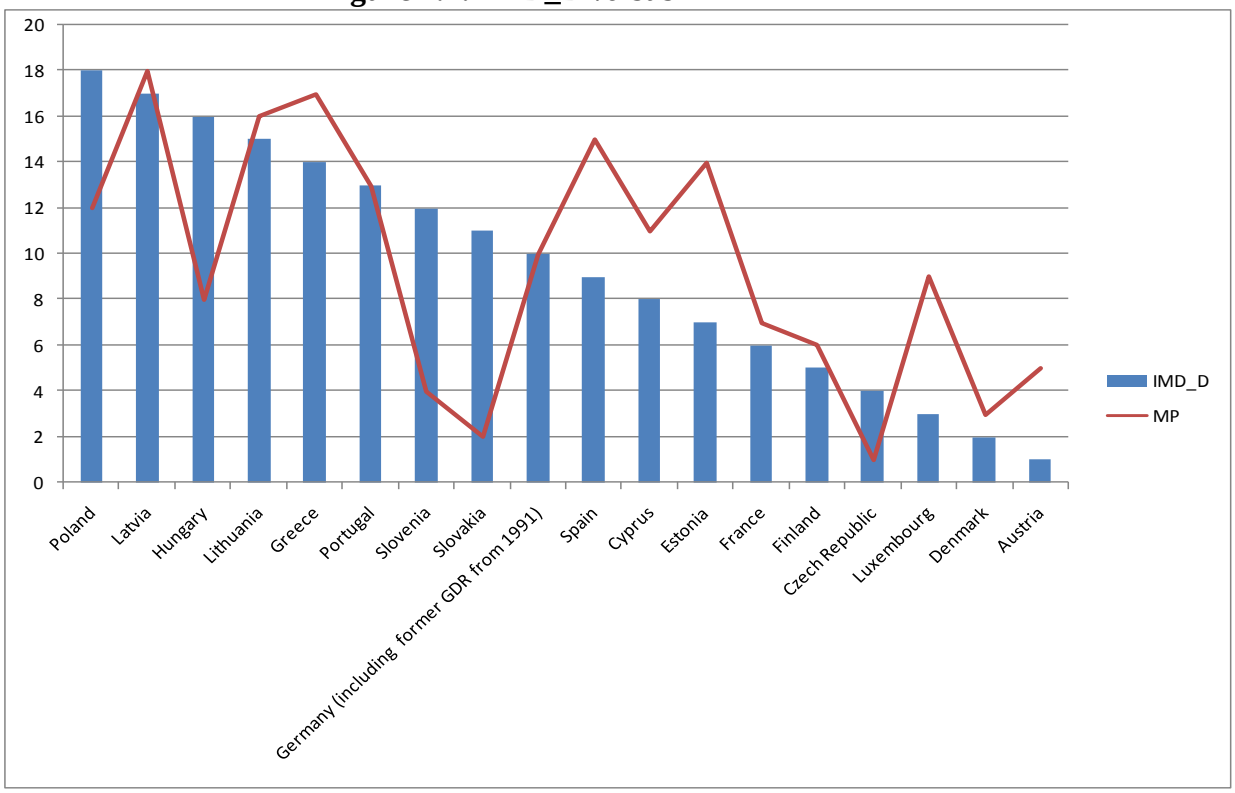
Table 4.4: MP *vs* IMD_D

GEO/TIME	2005	2006	2007	2008
Czech Republic	IMD_D	IMD_D	IMD_D	IMD_D
Denmark	MP	MP	MP	MP
Germany (including former GDR from 1991)	IMD_D	IMD_D	IMD_D	IMD_D
Estonia	MP	MP	MP	MP
Greece	IMD_D	MP	MP	MP
Spain	MP	MP	MP	MP
France	MP	IMD_D	MP	IMD_D
Cyprus	MP	MP	MP	MP
Latvia	IMD_D	IMD_D	MP	MP
Lithuania	IMD_D	IMD_D	MP	MP
Luxembourg	MP	MP	MP	MP
Hungary	IMD_D	IMD_D	IMD_D	IMD_D
Austria	MP	MP	MP	MP
Poland	IMD_D	IMD_D	IMD_D	IMD_D
Portugal	MP	IMD_D	MP	IMD_D
Slovenia	IMD_D	IMD_D	IMD_D	IMD_D
Slovakia	IMD_D	IMD_D	IMD_D	IMD_D
Finland	IMD_D	MP	MP	MP

Source: Own calculations.

For the countries where IMD_D appears we can say that in those cases monetary poverty does not fully capture the effective extent of deprivation. We can observe that for the countries performing worse in the IMD_D - Poland, Latvia, or Hungary - monetary poverty fails, on most of the cases, to fully capture the effective degree of deprivation. On the contrary, for countries ranking lower in the IMD_D, like Austria, Luxembourg, or Denmark, monetary poverty overestimates effective deprivation. Again following Alkire and Santos (2010: 30), Figure 4.2 plots the average (2005-2008) monetary poverty (MP), measured by the indicator "At risk of poverty rates" and the average (2005-2008) of IMD_D.

Figure 4.2: IMD_D *versus* MP



Source: Own calculations.

We can observe that, broadly, Figure 4.2 offers the same conclusions of Table 4.4. In 11 out of the 18 EU countries under analysis, the ranking using MP dimension alone overestimates the degree of deprivation when compared with the IMD_D position. In particular, larger differences between MP and IMD_D appear in those countries performing better in terms of lower degree of multi-dimension deprivation (countries in the second half of the figure). Apparently, and in general, differences in MP are smaller across those countries when compared with those observed using a more comprehensive measure. Moreover, only in 2 countries – Portugal and Germany – relative deprivation can be assessed either on the basis of MP alone or with the IMD_D.

In the next chapter we will use the IMD_D as the relevant variable for measuring poverty/deprivation phenomena and pursue an econometric study in order to analyze what are the main potential explanatory macroeconomic variables behind deprivation in our set of EU countries.

5. Deprivation and macro mechanisms: a panel data analysis

5.1. A brief review on methodology

After the construction of the IMD_D, and following the line of argumentation in the previous chapters, namely in Chapter 3, we propose now to study the role of macroeconomic variables in explaining deprivation, as measured by the IMD_D index, using a sample of developed countries. Since we have IMD_D data for 18 countries during four years, we can use panel data methodology, which we next briefly review.

There are, generally, three types of data available for empirical analysis: cross section, time series and panel data. Using cross section data, following our example, we could analyze empirically the 18 countries but only for one year each time. In time series data, we could have, following again our example, one empirical analysis for each country for the period of four years. In a panel data, the same cross section data is surveyed over time: "(…), panel data have space as well as time dimensions" (Gujarati, 2004: 636). Gujarati (2004) defends that there are many advantages of using panel data. In short, panel data, when compared with cross section or time series, enrich substantially the empirical analysis.

In our analysis we consider an econometric model of the following type:

$$IMD\_D_{it} = \beta_1 + \boldsymbol{\beta}\mathbf{X}_{it} + u_{it},\ i = 1,\ldots, 18,\ t = 1,\ldots,4, \qquad (5.1)$$

Where:

- IMD_D_{it} is the dependent variable for country i at time t;
- β_1 is the common intercept;
- $\boldsymbol{\beta}$ is a vector of coefficients associated with the independent explanatory (macroeconomic) variables;
- $\mathbf{X}_{it}$ is a vector of independent explanatory (macroeconomic) variables for country i at time t;
- u_{it} is the random term for country i at time t;
- i represents the i^{th} cross-section unit (country); t represents time (t = 2005, 2006, 2007, 2008).

Hence, there are a maximum of N=18 observations (countries) and a maximum of T=4 time periods (years).[2] If the number of time series observations is the same for all the cross-section observations, the panel is balanced, if not, it is called an unbalanced panel. In our case, we have a balanced panel.

When using panel data we must choose between fixed effects model (FEM) or random effects model (REM) (Gujarati, 2004). "The simplest, and possible naive, approach is to disregard the space and time dimensions of the pooled data and just estimate the usual OLS regression" (Gujarati,2004: 641), which puts us in the position of choosing between fixed or random effects, the biggest challenge when using panel data. The fixed effects approach accounts for the possibility of different intercepts, changing across countries or/and years. Instead, random effects approach accounts for a random effect for each cross-section or/and years unit.

As Gujarati (2004: 650) emphasizes: "The challenge facing a researcher is: Which model is better, FEM or [REM]?" REM can be heteroscedastic and autocorrelated, if we assume that the error component ε_i is correlated with one or more regressors. And, as Gujarati (2004: 650) highlights: "If the individual error component ε_i and one or more regressors are correlated, then the REM estimators are biased, whereas those obtained from FEM are unbiased". Even so, when N is large and T is small, like in our case, significant differences on the resulting estimates from the two methods are expected. If we sustain that our cross-section units are not random drawings from a larger sample, FEM is a more suitable method (in fact, our sample includes 18 out of the 27 members of the European Union). Hence, we decided to use the fixed effects model.

In line with equation (5.1), the FEM may have different configurations:

$$IMD\_D_{it} = \beta_{1i} + \boldsymbol{\beta}\mathbf{X}_{it} + u_{it},\ i = 1,\ldots, 18,\ t = 1,\ldots,4 \qquad (5.2)$$

$$IMD\_D_{it} = \beta_{1t} + \boldsymbol{\beta}\mathbf{X}_{it} + u_{it},\ i = 1,\ldots, 18,\ t = 1,\ldots,4 \qquad (5.3)$$

$$IMD\_D_{it} = \beta_{1it} + \boldsymbol{\beta}\mathbf{X}_{it} + u_{it},\ i = 1,\ldots, 18,\ t = 1,\ldots,4 \qquad (5.4)$$

Considering that the intercept changes across countries, but that the slope coefficients do not, FEM may be implemented by applying dummy variables to the intercept. Hence, we may re-write equation (5.2) as (and similarly for equations (5.3) and (5.4)):

[2] See Chapter 4 for country and time lengths.

$$IMD\_D_{it} = \beta_1 + \boldsymbol{\alpha}\mathbf{D}_{i-1} + \boldsymbol{\beta}\mathbf{X}_{it} + u_{it},\ i = 1,\ldots, 18;\ t = 1,\ldots,4, \qquad (5.5)$$

Where:

- β_1 is the fixed effect for one of the countries;
- $\mathbf{D}_{i-1}$ is a vector of dummy variables, each of which corresponding to each of the remainder *i-1* countries*;*
- α is the constant associated to each dummy variable, that should be added (+) or subtracted (-) to β_1.

In order to estimate the FEM we use the software Eviews that provides built-in tools for testing FEM against REM, and also for testing the joint significance of the fixed effects, cross-section or/and time series.

5.2. Model specification and results

As mentioned before, the dependent variable in our model is the IMD_D. In line with the arguments and mechanisms presented throughout Chapter 3, the literature points to some relevant macroeconomic variables that should be used as independent variables in the model: public investment, GDP growth rate, inflation, unemployment rate, government budget, and quality of institutions, among others.

However, among those invoked by the literature, we chose to exclude, on the following grounds, some of the variables from the model specification:

- Inflation and current tax burden, referred as impinging negatively with poverty by some authors (Ames *et al.*, 2001; Agénor, 2005), were not significant at an individual level and, when added to the model, worsened results on the significance for the other independent variables in use. Since inflation is now rather low and stable among the (developed) EU countries and tax burden is also rather similar across the sample, these variables appear to be more important in explaining poverty in developing countries than in determining deprivation in developed ones;
- Short-term unemployment rates, with negative impacts on monetary poverty (DeFina, 2002; Agénor, 2005), were strongly significant at an individual level, but when treated together with other explanatory variables the model produced

significant changes on the significance results. Apparently, short-run unemployment rates are strongly correlated with indicators already used in the construction of the IMD_D (namely with those embedded in the Employment Deprivation dimension), as well as with other explanatory variables, namely governance index and government budget;

- Finally, variables such as investment in education, consensually acknowledged as essential to fight poverty (*e.g.* Petrakis and Stamatakis, 2002; Tarabini, 2010) were also disregarded due to lack of related data across time and/or countries.

After several trial and error experiences, we have established the explanatory macroeconomic variables of overall deprivation: overall public investment, GDP growth rate, Gini coefficient, government budget and a governance index. All the indicators were taken from the Eurostat database (http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/themes, accessed in July, 2011), except for the governance index, taken from the World Bank (http://info.worldbank.org/governance/wgi/sc_country.asp, accessed in July, 2011). Briefly,

- Public investment refers to general government gross fixed capital formation, as percentage of GDP;
- GDP growth rate is measured by the growth rate of GDP in volume, as percentage change on previous year;
- Gini coefficient is a measure of disposable income inequality in each country; the coefficient varies between 0, for full equality, and 100, for maximum inequality;
- Government budget is defined as total revenues less total expenditures of general government, as percentage of the GDP;
- Governance index is used to capture the quality of the institutions in each country; it refers to the simple average of six indicators - the Worldwide Governance Indicators (WGI) - available at the World Bank site (http://info.worldbank.org/governance/wgi/sc_country.asp, accessed in July, 2011), covering 200 countries and territories and including six dimensions of governance starting in 1996: "Voice and Accountability, Political Stability and Absence of Violence/Terrorism, Government Effectiveness, Regulatory Quality,

Rule of Law, and Control of Corruption" (Kaufmann *et al*., 2010: 1). The six indicators can vary between -2.5, for the worst, and 2.5, for the best performance of institutions.

Running, under FEM for both cross-section and period effects, the regression using IMD_D over the selected explanatory variables and a constant term, Eviews provides the test for the nature of the fixed effects. Test results are presented in Table 5.1, below.

Table 5.1: Tests on cross-section and period fixed effects

Redundant Fixed Effects Tests
Equation: EQ01
Test cross-section and period fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	13.690039	(17,46)	0.0000
Cross-section Chi-square	129.715529	17	0.0000
Period F	0.554290	(3,46)	0.6479
Period Chi-square	2.556812	3	0.4651
Cross-Section/Period F	11.737724	(20,46)	0.0000
Cross-Section/Period Chi-square	130.236421	20	0.0000

Table 5.1 confirms the choice for the FEM with cross-section fixed effect. From the table we can observe that, for a confidence level of 95%, the two statistic values for cross-section *F* and *Chi-square* ratios (13.69 and 129.72), as well as the associated *p-values*, strongly reject the null hypothesis that the cross-section effects are redundant. Relatively to the period effects, the two corresponding statistic values and the associated *p-values* do not reject the null hypothesis that the period effects are redundant. Finally, cross-section/period *F* and *Chi-square* ratios strongly reject the null hypothesis that all effects are redundant, but that occurs only because of the results obtained for the cross-section nature of the fixed effects. Thus, it is not needed to use the period fixed effects.

Table 5.2 shows the model estimation results for the specification chosen.

Table 5.2: The Model

Dependent Variable: IMD_D
Method: Panel Least Squares
Date: 09/13/11 Time: 19:26
Sample: 2005 2008
Periods included: 4
Cross-sections included: 18
Total panel (balanced) observations: 72

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	39.10568	14.02035	2.789208	0.0075
PUBLIC_INVESTMENT	-2.765562	1.146542	-2.412089	0.0197
GDP_GROWTH_RATE	-0.471588	0.195034	-2.417971	0.0194
GINI_COEFFICIENT	0.663635	0.355655	1.865955	0.0680
GOVERNMENT_BUDGET	0.787210	0.363810	2.163794	0.0354
GOVERNANCE_INDEX	-22.27177	9.546252	-2.333038	0.0238

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.929239	Mean dependent var	22.03187
Adjusted R-squared	0.897468	S.D. dependent var	11.06022
S.E. of regression	3.541545	Akaike info criterion	5.621046
Sum squared resid	614.5846	Schwarz criterion	6.348315
Log likelihood	-179.3577	Hannan-Quinn criter.	5.910574
F-statistic	29.24859	Durbin-Watson stat	2.014499
Prob(F-statistic)	0.000000		

From Table 5.2 we conclude that, with the exception of the Gini coefficient, all the variables are significant at a 5% level. At the 93% confidence interval, all variables are significant to explain the overall deprivation index IMD_D. Overall, the model delivers a good fit, with the adjusted *R-squared* around 90%.

Moreover, the signs of the coefficients associated with the independent variables are as expected from the literature. A percentage point increase in public investment reduces the IMD_D by 2.77, keeping other things constant. Among others, Ames *et al.* (2001) and Agénor *et al.* (2008) argue that public investment can enhance private investment, which may boost growth and, consequently, reduce poverty/deprivation.

For the GDP growth rate, a percentage point increase will reduce IMD_D by 0.47, keeping other things constant. Like we saw before, some authors, like Epaulard (2003), Agénor (2005) and Akoum (2008), defend 'pro-poor growth' policies. Growth, by itself, is seen like the most important characteristic to push a society out from poverty. Nevertheless, some authors disagree on the negative relation between growth and poverty. For instance, Akoum (2008) concludes that although some countries have

experienced high growth rates, they have not necessarily exhibited a decrease in poverty. We should not forget that our sample includes only developed countries and that, the indicators of deprivation clearly differ from those applying for the developing ones.

Other things kept constant, a percentage point increase of the Gini coefficient increases IMD_D by 0.66. Ames *et al*. (2001) and Epaulard (2003) focus the importance of growth to fight poverty, but also emphasize the importance of the distributional patterns, the inequalities. Besides increasing material living standards and thus, affecting absolute poverty, the impact of growth on poverty reduction will be stronger the larger median income is (Ames *et al*., 2001). In order to increase the growth share of the poor, policies, *e.g.*, that reform land tenure, change marginal and average tax rates and increase pro-poor social spending should be put forward.

Referring to the Government budget, if increased by a percentage point, the IMD_D will increase by 0.79, keeping other things constant. Although neither cycle-adjusted nor excluding temporary measures, this indicator can roughly capture the fiscal policy stance, contractionary or expansionary. A fiscal contraction reduces government spending (pensions, transfers, *etc*.) and/or increases government revenues (taxes). On the contrary, expansionary policies increase government spending and/or reduce government revenues. Relying on the literature, poverty is (asymmetrically) pro-cyclical (Epaulard, 2003); according to Agénor (2005), when government increases taxes or decreases transfers or public spending, it mostly deteriorates the living conditions of the poorer (those less qualified, more dependent on social assistance and on public services).

Finally, an increase by a percentage point in the governance index will reduce IMD_D by 22.27, keeping other things constant. In order to better understand this contribution it is important to have in mind that the aggregate indicators that compose the governance index are based on several hundred underlying variables, gathered at an individual level from a broad selection of existing data sources. Moreover, this data reflects the perceptions on governance of not only survey respondents but also public, private, and non-governmental organizations' experts from all over the world (Kaufmann *et al*., 2010).

We report in Table 5.3 the cross-section fixed effects for each of the 18 countries in the sample. This enables to compute different intercepts across countries. According to Gujarati (2004), these differences may be explained by special features of each country, such as particular differences between the citizens, customs, *etc.* Hence, values in Table 5.3 must be added or subtracted to the coefficient associated to the constant term reported in Table 5.2:

Table 5.3: Cross-section fixed effects values per country

Czech Republic	-5.1
Denmark	-1.9
Germany (including former GDR from 1991)	0.7
Estonia	-4.6
Greece	-3.4
Spain	-7.8
France	-0.5
Cyprus	-7.2
Latvia	5.9
Lithuania	1.2
Luxembourg	1.5
Hungary	11.4
Austria	-7.6
Poland	19.1
Portugal	-3.8
Slovenia	3.8
Slovakia	-4.6
Finland	3

In sum, the results sustain our expectations about the signs of the explanatory variables, which are coherent with the relevant literature. Additionally, our model delivers a good fit. In the next chapter the main conclusions of our work will be presented.

6. Conclusions

What started as a material phenomenon has, nowadays, a multidimensional nature. Poverty is understood as deprivation, which is rather encompassing. As we have seen, deprivation is measured by converging different indicators, and there are now a significant number of studies that follows this approach; furthermore, it is expectable that studies continue to appear in line. In fact, from the pure monetary poverty definition, the concept evolved through a multidimensional nature, even to include a capabilities approach.

Given the multidimensional nature of poverty, the phenomena became of rather difficult measurement in order to encompass different deprivation dimensions. This effort has recently been made and applied for assessing poverty in developing countries. However, to our knowledge, no such index exists to compare poverty across developed nations. Since, obviously, the nature of deprivations differ from that in developing countries, we propose an index of multidimensional deprivation (IMD-D) and compare across 18 developed countries of the European Union.

Following the literature, macroeconomic performance reveals to be non-neutral for poverty dynamics, but research work on this matter appears to be rather scarce. We also contribute to the literature to this regard: through using an econometric model, capable of relating the computed IMD-D with macroeconomic variables, we test several macroeconomic transmissions mechanisms uncovered by the relevant literature.

Although monetary poverty is the easiest way to measure primary nature deprivation, it overestimates or underestimates the actual extent of deprived people. From our study became clear that in developed countries monetary poverty is likely to overestimate the extent of deprivation while, from the literature, the opposite is likely to occur in developing and underdeveloped countries.

According to the IMD-D results, the ranking of the countries is, somehow, expected. Taking the 4-year (2005-2008) average, the ranking from the least deprived to the most deprived country is: 1-Austria, 2-Denmark, 3-Luxembourg, 4-Czech Republic, 5-Finland, 6-France, 7-Estonia, 8-Cyprus, 9-Spain, 10-Germany, 11-Slovakia, 12-Slovenia, 13-Portugal, 14-Greece, 15-Lithuania, 16-Hungary, 17-Latvia, and 18-Poland. In the particular case of Portugal, ranked in the 6^{th} worse position out of the 18 EU countries, it exhibited a gradual depletion in overall well-being: IMD_D has been

increasing since 2005, against a rather stable EU average. Moreover, recent evolution of the IMD_D is possibly underestimated: in our study since data excludes the post-financial crises era and the literature points to aggravated deprivations during cycle downturns that are of difficult recovery during expansions.

Since, as this work sustains, there seems to be insufficient research on the macroeconomic issues associated with poverty and deprivation, we have made our econometric application in order to scrutinize the main mechanisms put forward by the theoretical hypotheses. Applied to developed countries, our results confirm most of the theoretical arguments in terms of the expectable effects of relevant macroeconomic mechanisms. Other things equal, public investment, GDP growth rate, and governance quality, if increasing, impose downturn pressures on the IMD_D. Conversely, other things equal, income dispersion and government budget imbalances, if increasing, impose upturn pressures on the IMD_D. These results seem robust because, from the literature, we can sustain that public investment alone, or through enhancing private investment, may boost growth and, consequently, reduce poverty/deprivation. Growth, by itself, or, better, when complemented by inequality improvements is also seen as one of the most important characteristic to push a society out of poverty. Results are also in line with the literature on the positive effects resulting from aggregate demand (fiscal) expansions and from the improvements in the quality of the institutional framework.

Further research on this matter is obviously in order. Given the multidimensional nature of poverty, other composite indicators, more refined, should be built, together with the development of others relying on micro data. Both would contribute to a robustness check on the main macroeconomic mechanisms that drive poverty in developed countries, and thus, to establish more focused policy objectives. This should, of course, be complemented by the release of updated and the production of new data. Moreover, higher frequency data would enable to produce a deeper analysis on how the different dimensions of deprivations evolve across the cycle phases.

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Annex A: Systematic review on the macroeconomic determinants of poverty/deprivation

Table A.1: Macroeconomic determinants and mechanisms of poverty/deprivation – a summary of the literature

	Economic Growth	**Macroeconomic Stabilization**	**Institutional Framework**
Transmission mechanism	Growth (promoted by foreign aid, investment in human and/or physical capital, *etc.*) increases average material living conditions; the potential positive impact of growth on poverty depends on the evolution of inequality.	Macroeconomic stability is, *per se*, essential for any strategy of poverty reduction and also affects economic growth. For example: poor people are more vulnerable to inflation than higher-income groups; depending on how poor are allocated across activity sectors and on the composition of their consumption basket, real exchange rate affects reallocation of resources and, thus, poverty; changes in the aggregate demand may have direct impact on poverty or, indirectly, through changes in employment and wages; trade liberalization can smooth the impact of the crises in poverty, *etc*.	Quality of institutions contributes for achieving both lower stabilization costs and enhancing economic growth.

			Explanatory variables											
Paper	**Research Aims**	**Scope**	Real (*per capita*) GDP growth rate	Inequality indicators	Foreign aid	Human capital	Public capital	Inflation	Exchange rate	Aggregate demand	Trade liberalization	Legal framework, economic and political organization and rules	**Main results**	**Definition of poverty** (indicator)
Collier and Dollar (2001)	Impact of external aid on fighting poverty.	Developing countries.			X							X	The positive impact of aid on poverty depends, not only on the quantitative amount of aid, but also (crucially) on the quality of the institutions and policies. The paper shows that if aid was used in the right way, the results would be twice more effective than they are now.	Monetary poverty (poverty lines)
Petrakis and Stamatakis (2002)	The effect of human capital on growth across different levels of development.	General to all levels of development countries.	X			X	X						Education strongly influences economic growth. Higher development levels demand for higher levels of education because it will generate higher levels of labor productivity. Education and development are complementary processes.	Monetary poverty (economic growth)

Paper	**Research Aims**	**Scope**	Real (*per capita*) GDP growth rate	Inequality indicators	Foreign aid	Human capital	Public capital	Inflation	Exchange rate	Aggregate demand	Trade liberalization	Legal framework, economic and political organization and rules	**Main results**	**Definition of poverty** (indicator)
Epaulard (2003)	The role of economic growth and distributional patterns on poverty reduction.	Developing countries.	X					X			X	X	Growth is essential for poverty reduction strategies but if complemented with improvements in inequality lead to higher rates of poverty reduction. Moreover, corruption, inflation and trade liberalization also influence the link between growth and poverty.	Monetary poverty (poverty lines)
Agénor (2005)	Overview of recent literature on the macroeconomics of poverty. Study of channels through which macroeconomic policy can affect the poor.	Sub-Saharan Africa. Poor classes in the rural, informal, and formal sectors.				X	X	X	X	X	X		Micro and measurement aspects are not enough to study poverty. A better study of the labor market in the developing countries is needed to overcome some distortions, and to avoid incorrect inference in assessing how a given policy measure affects the poor. The recent attempts to develop a model to be used for poverty analysis have failed.	Monetary poverty (poverty lines)
Kraay and Raddatz (2007)	Empirical relevance of poverty traps caused by low savings/productivity.	Developing countries, in particular, African countries; general poor.	X		X								Contrary to literature, the association of poverty traps with low savings and productivity appears not to be empirically relevant. The paper identifies a sharp increase in savings when capital stocks are very low, then a flat section followed by another increase in savings at very high capital stock levels. As for productivity, only constant and moderate increasing returns are found.	Monetary poverty (poverty lines)

Paper	**Research Aims**	**Scope**	Real (*per capita*) GDP growth rate	Inequality indicators	Foreign aid	Human capital	Public capital	Inflation	Exchange rate	Aggregate demand	Trade liberalization	Legal framework, economic and political organization and rules	**Main results**	**Definition of poverty** (indicator)
Agénor *et al.* (2008)	Model that captures the links between aid, public capital (health, core infrastructure and education), growth, and poverty reduction.	Ethiopia; general poor.	X		X	X	X					X	Aid is crucial to sustain adequate levels of government spending and public investment. The results show that is important to improve aid while the management of public resources is reformed. This maximizes growth and reduces poverty.	Monetary poverty (poverty lines)
Azis, I. (2008)	The role of growth and macroeconomic stability on poverty reduction.	Thailand and Indonesia; general poor.	X	X				X		X		X	The mechanisms by which macroeconomic policies influence poverty rates cannot be generalized. Growth and macroeconomic stability are complements for poverty reduction.	Monetary poverty (poverty lines)
Marquette (1997)	Assessment of an economical structural adjustment program (ESAP) regarding current and future poor.	General poor in countries where the government has strong market control.	X									X	ESAP programs are essential for economies strongly dependent on government control. ESAP, even if raising current poverty, will bring sustainable growth, and will be essential to reduce poverty in the future.	Multi-dimensional poverty (measures of physiological and social deprivation)
Ames *et al.* (2001)	Study of the relations between macroeconomic stability, growth, and poverty reduction.	General poor; general to all countries.	X	X	X		X	X	X	X	X	X	Growth is the most important factor influencing poverty. However, before fighting poverty, policy should first focus on macroeconomic stability. Growth impacts on poverty depend essentially on distributional patterns and sector composition.	Multi-dimensional poverty (measures of physiological and social deprivation)

Paper	**Research Aims**	**Scope**	Real (*per capita*) GDP growth rate	Inequality indicators	Foreign aid	Human capital	Public capital	Inflation	Exchange rate	Aggregate demand	Trade liberalization	Legal framework, economic and political organization and rules	**Main results**	**Definition of poverty** (indicator)
DeFina (2002)	Methods to measure poverty, able to capture how aggregate economic conditions may have different effects on poverty reduction.	General poor, but some other classes are also studied. United States.											The way aggregate labor market changes affect poverty depends on how poverty is measured. The precise definition of poverty is critical to choose whether and how changes should be conducted.	Multi-dimensional poverty (measures of physiologic al and social deprivation)
Gundlach and Paldam (2009)	Assessment of the long-run causality direction between income and corruption.	General poor; general to all countries.										X	Corruption vanishes for higher levels of development. As a country develops there is a changeover from poverty to honesty.	(implicit) Multi-dimensional poverty
Dobson and Ramlogan-Dobson (2009)	The relation between corruption and inequality.	General poor; South American countries where the informal sector represents 25% to 35% of output.		X								X	While conventional literature points supports the idea that if corruption decreases, income inequality will also decrease, the study shows that this is not actually true for countries where there is a large informal sector.	Multi-dimensional poverty (measures of physiologic al and social deprivation)
Tarabini (2010)	The role of education and poverty in the current global developmen t agenda.	General to developing countries; general poor.	X			X	X						Economic growth is insufficient for poverty reduction. Education is essential to fight poverty and, thus, a strong investment in education should be a priority in national development strategies.	Multi-dimensional poverty (measures of physiologic al and social deprivation)

Paper	**Research Aims**	**Scope**	Real (*per capita*) GDP growth rate	Inequality indicators	Foreign aid	Human capital	Public capital	Inflation	Exchange rate	Aggregate demand	Trade liberalization	Legal framework, economic and political organization and rules	**Main results**	**Definition of poverty** (indicator)
Tebaldi and Mohan (2010)	The relevance of the quality of institutions to fight poverty.	General poor; countries with bad quality institutions.	X			X						X	Poverty is directly linked with bad quality institutions. The other mechanisms (aid, *etc.*), will influence poverty only if good quality of institutions prevails: an effective government, a stable political system, and control on corruption.	Multi-dimensional poverty (measures of physiological and social deprivations)

Annex B: Transformed ranking per deprivation dimension

Table B.1: Income deprivation

GEO/TIME	2005	2006	2007	2008
Czech Republic	10.0	5.9	7.2	5.9
Denmark	1.7	1.8	2.2	1.8
Germany (including former GDR from 1991)	3.5	11.0	22.8	17.4
Estonia	19.1	11.0	17.8	11.0
Greece	34.4	26.4	37.9	26.4
Spain	28.1	17.4	29.1	21.5
France	15.6	11.0	13.7	11.0
Cyprus	28.1	21.5	37.9	32.8
Latvia	43.0	100.0	100.0	100.0
Lithuania	100.0	55.7	52.4	55.7
Luxembourg	7.6	3.8	7.2	3.8
Hungary	23.2	32.8	37.9	32.8
Austria	5.5	3.8	4.5	5.9
Poland	57.1	41.5	52.4	41.5
Portugal	12.6	8.3	10.2	14.0
Slovenia	15.6	11.0	10.2	17.4
Slovakia	23.2	14.0	13.7	8.3
Finland	3.5	8.3	10.2	14.0

Table B.2: Employment deprivation

GEO/TIME	2005	2006	2007	2008
Czech Republic	17.4	17.4	17.8	11.6
Denmark	11.0	8.3	7.2	5.1
Germany (including former GDR from 1991)	55.7	41.5	52.4	50.4
Estonia	26.4	8.3	7.2	8.1
Greece	41.5	26.4	29.1	27.0
Spain	5.9	3.8	4.5	20.6
France	26.4	32.8	37.9	35.9
Cyprus	1.8	1.8	2.2	2.4
Latvia	21.5	8.3	7.2	11.6
Lithuania	14.0	11.0	7.2	20.6
Luxembourg	3.8	5.9	4.5	15.6
Hungary	32.8	32.8	52.4	100.0
Austria	11.0	11.0	7.2	8.1
Poland	100.0	100.0	100.0	35.9
Portugal	8.3	8.3	13.7	15.6
Slovenia	11.0	14.0	10.2	11.6
Slovakia	55.7	55.7	52.4	35.9
Finland	17.4	21.5	22.8	15.6

Table B.3: Health deprivation and disability

GEO/TIME	2005	2006	2007	2008
Czech Republic	5.1	3.8	4.5	5.9
Denmark	27.0	32.8	37.9	32.8
Germany (including former GDR from 1991)	2.4	1.8	2.2	1.8
Estonia	50.4	41.5	52.4	41.5
Greece	8.1	8.3	10.2	8.3
Spain	27.0	26.4	29.1	21.5
France	15.6	14.0	13.7	17.4
Cyprus	11.6	11.0	13.7	14.0
Latvia	20.6	17.4	17.8	17.4
Lithuania	35.9	55.7	52.4	41.5
Luxembourg	8.1	21.5	37.9	11.0
Hungary	20.6	14.0	29.1	26.4
Austria	5.1	3.8	4.5	3.8
Poland	27.0	26.4	22.8	17.4
Portugal	27.0	26.4	29.1	26.4
Slovenia	100.0	100.0	100.0	100.0
Slovakia	11.6	5.9	7.2	14.0
Finland	27.0	26.4	37.9	55.7

Table B.4: Education, skills and training deprivation

GEO/TIME	2005	2006	2007	2008
Czech Republic	2.0	1.6	2.0	1.6
Denmark	15.6	9.2	19.7	20.6
Germany (including former GDR from 1991)	24.7	17.2	12.2	11.6
Estonia	12.2	9.2	12.2	14.2
Greece	39.8	44.5	39.8	44.5
Spain	54.1	58.5	54.1	58.5
France	24.7	29.6	31.0	29.6
Cyprus	39.8	35.9	24.7	29.6
Latvia	24.7	20.6	19.7	24.7
Lithuania	9.2	5.1	6.5	7.0
Luxembourg	31.0	35.9	31.0	35.9
Hungary	24.7	24.7	15.6	17.2
Austria	12.2	11.6	9.2	9.2
Poland	6.5	3.2	4.1	3.2
Portugal	100.0	100.0	100.0	100.0
Slovenia	6.5	7.0	4.1	7.0
Slovakia	4.1	3.2	4.1	5.1
Finland	19.7	14.2	9.2	9.2

Table B.5: Barriers to housing and service

GEO/TIME	2005	2006	2007	2008
Czech Republic	23.4	22.1	22.1	26.1
Denmark	12.0	13.0	13.0	10.6
Germany (including former GDR from 1991)	7.9	18.6	15.6	13.0
Estonia	27.4	26.1	22.1	15.6
Greece	38.5	31.0	31.0	31.0
Spain	6.1	4.7	6.5	4.7
France	9.9	8.5	8.5	6.5
Cyprus	2.8	1.5	1.5	1.5
Latvia	100.0	59.7	59.7	100.0
Lithuania	47.1	37.2	26.1	37.2
Luxembourg	4.4	6.5	4.7	6.5
Hungary	60.8	45.8	45.8	59.7
Austria	14.4	10.6	10.6	8.5
Poland	100.0	100.0	100.0	45.8
Portugal	17.0	13.0	18.6	18.6
Slovenia	20.0	15.6	18.6	22.1
Slovakia	32.3	31.0	37.2	22.1
Finland	1.4	3.0	3.0	3.0

Table B.6: Crime

GEO/TIME	2005	2006	2007	2008
Czech Republic	7.4	7.4	9.2	9.2
Denmark	100.0	100.0	100.0	100.0
Germany (including former GDR from 1991)	61.9	61.9	61.9	61.9
Estonia	13.3	13.3	11.1	11.1
Greece	18.3	18.3	15.6	13.3
Spain	24.7	24.7	24.7	24.7
France	33.6	39.8	28.7	28.7
Cyprus	1.3	1.3	1.3	1.3
Latvia	2.7	5.7	5.7	5.7
Lithuania	5.7	4.1	2.7	4.1
Luxembourg	28.7	28.7	33.6	33.6
Hungary	21.3	15.6	18.3	21.3
Austria	48.3	48.3	48.3	48.3
Poland	9.2	9.2	7.4	7.4
Portugal	11.1	11.1	13.3	18.3
Slovenia	15.6	21.3	21.3	15.6
Slovakia	4.1	2.7	4.1	2.7
Finland	39.8	33.6	39.8	39.8

Table B.7: Living environment deprivation

GEO/TIME	2005	2006	2007	2008
Czech Republic	55.7	57.1	41.5	54.1
Denmark	3.8	12.6	14.0	4.1
Germany (including former GDR from 1991)	14.0	23.2	21.5	31.0
Estonia	26.4	19.1	17.4	12.2
Greece	21.5	23.2	32.8	31.0
Spain	1.8	3.5	1.8	2.0
France	3.8	1.7	1.8	6.5
Cyprus	41.5	43.0	55.7	54.1
Latvia	21.5	28.1	26.4	19.7
Lithuania	26.4	23.2	21.5	24.7
Luxembourg	8.3	5.5	3.8	6.5
Hungary	17.4	28.1	26.4	31.0
Austria	8.3	15.6	5.9	15.6
Poland	100.0	100.0	100.0	100.0
Portugal	11.0	12.6	11.0	12.2
Slovenia	5.9	7.6	8.3	15.6
Slovakia	32.8	34.4	21.5	39.8
Finland	5.9	10.0	5.9	9.2

Annex C: Index of multiple deprivation for developed countries

Table C.1: Index of multiple deprivation for developed countries

GEO/TIME	2005	2006	2007	2008
Czech Republic	14.5	13.3	12.4	12.4
Denmark	10.1	10.3	12.4	10.1
Germany (including former GDR from 1991)	19.0	18.3	22.3	21.2
Estonia	23.7	15.4	18.0	14.4
Greece	29.1	24.1	27.8	24.9
Spain	19.3	17.0	19.6	20.9
France	16.2	16.7	18.6	18.1
Cyprus	17.8	15.7	19.5	19.0
Latvia	31.9	37.7	37.2	41.9
Lithuania	38.6	28.8	25.8	29.5
Luxembourg	9.0	11.0	12.7	11.9
Hungary	26.0	26.8	33.1	44.2
Austria	8.1	7.8	6.0	7.1
Poland	58.5	54.4	56.5	33.8
Portugal	24.5	23.2	25.6	26.6
Slovenia	22.8	22.2	21.2	24.5
Slovakia	25.9	23.0	21.9	18.3
Finland	11.7	13.4	14.6	16.6