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THE PATTERNS AND CAUSES OF SOCIAL EXCLUSION IN LUXEMBOURG*

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Abstract

The paper investigates the forms and determinants of social exclusion in Luxembourg and addresses both conceptual and empirical issues. We examine what definition of social exclusion is more appropriate for Luxembourg, if the economic and social disadvantages cumulate within the social exclusion process in Luxembourg, if the “spiral of precariousness” applies for Luxembourg, how poverty and deprivation lead to social exclusion, which are the main determinants of social exclusion and deprivation and if there are significant differences between them. The analysis is based on data from the Luxembourg socioeconomic panel "Liewen zu Lëtzebuerg" 1995-2002 (PSELL-2).

Key words: social exclusion, deprivation, cumulative disadvantage

JEL codes: I32

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1. Introduction

Social exclusion has been the subject of many conceptual and empirical studies lately, but equally it has raised many research questions, different approaches and in many cases different results, principally due to its relative nature (Paugam, 1995; Moisiu, 2000; Tsakloglou, 2001, 2002; Whelan et al., 2004). Although it is commonly agreed that social exclusion is a dynamic and multidimensional phenomenon, it is still debatable if the underlying process can be described as a cumulative process and if this is true, what kind of economic and/or social disadvantages are accumulated. Given that social exclusion involves the accumulation of different symptoms of deprivation over time, it is suspected that different determinants are responsible for this, at different times. The delimitation of the most powerful determinants on the last stages of this process may provide insights to the social policies aimed to reduce and prevent social exclusion.

The paper particularly analyzes social exclusion in Luxembourg, even though Luxembourg is known as one of the richest EU countries. Luxembourg had the highest GDP per capita among all OECD countries in 2004. According to the UNDP's 2006 Human Development Report, Luxembourg had the 12th highest human development index (HDI) out of 177 countries. But social exclusion affects all countries, as it is defined as a relative and multidimensional phenomenon. Although the absolute poverty is not anymore a matter of concern in Europe, the economic and social changes in the last decades have created new forms of deprivation. According to the 2003-2006 reports on social inclusion from the EU member states, poverty and social exclusion continue to be serious challenges across the European Union. Globalization, as well as the EU enlargement process, has lately increased the labour mobility across the EU. In Luxembourg, the immigration, the particularities of the labour market and the patterns of the contemporary society (the increasing rate of divorces, the status of woman and particularly the situation of single women in society and on the labour market) have created "vulnerable" groups and generated deprivation and social exclusion over years.

The paper is organized as follows. In the following section social exclusion is examined at a conceptual level along with income poverty and deprivation, through their particularities and differences, in order to analyze the process leading to social exclusion, at different stages. The third section describes the methodology used to create a latent variable of social exclusion. Following the line of research proposed by Paugam (1995), in the fourth section we want to check whether social exclusion has an accumulative nature in the case of Luxembourg, or if it can be described as an accumulation of economic and social disadvantages. This exercise also allows us to determine the rank of each deprivation item in the social exclusion process. A unitary approach to income poverty, deprivation and social exclusion is given in the fifth section, by calculating rates for each state (and also for the non-poverty state). The sixth section presents the dynamic analysis of the determinants of income poverty and social exclusion. The description of the methodological framework is followed by the empirical analysis. In the last section, the conclusions regard the empirical findings for the case of Luxembourg.

2. Theoretical approach to social exclusion

According to the Report on Social Exclusion in Europe in 2006, issued by the European Commission, poverty and social exclusion continue to represent serious challenges across the EU. In many countries there is a big gap between the social inclusion objectives and national policies aimed to achieve them. Social exclusion therefore remains a subject of interest for EU authorities and institutions.

Recent years have seen increasing concern about the social exclusion concept as a consequence of the new changes in contemporary western societies. This term has become popular in the welfare literature since the late 1980s when there has been a shift in emphasis from 'poverty' to 'social exclusion'. Despite of a broad range of papers given in the literature of social exclusion since 1990s, the vagueness and multidimensionality of this phenomenon have imposed different approaches and models.

Over time, social exclusion has been conceptualised in many ways, based on the relationships between poverty, deprivation and social exclusion. But most of them define and analyze social exclusion through the multidimensional, relative, dynamic and accumulative aspects. It can be seen as a dynamic process, understood as a "spiral of precariousness" (Paugam, 1996), related to a broad range of aspects of deprivation, and also as a chronic deprivation state or "chronic cumulative disadvantage" (Tsakoglou, 2002). Social exclusion has been approached in relation to the concepts of capabilities, functionings (Sen, A., 1998) and employability (Room, 1995). We also see social exclusion as a breakdown or malfunctioning of the major societal systems that should guarantee full citizenship (Silver, 1994; Room, 1995) or as a common outcome of a varied pattern of social disadvantages, leading to a state of income poverty and deprivation (Berghman, 1995).

Although the concepts of poverty, deprivation and social exclusion are closely related, they are not synonyms. Poverty can be defined as a static and unidimensional outcome, while social exclusion as a dynamic and multidimensional process (Bruto da Costa et al., 1994). While the concept of poverty primarily focuses upon distributional issues, the concept of social exclusion focuses primarily on relation issues, in the sense of inadequate social participation (Room, 1995). Sen (1998) argued that unlike poverty, social exclusion is better defined in the space of capabilities rather than the space of commodities and is a state or process leading to deprivation. Following this line, its measurement move the analysis in areas such as unemployment, lack of access to healthcare, lack of education opportunities, absence of social safety nets, credit market exclusion, lack of facilities for disabled persons, marketing limitations etc.

The accumulation of disadvantages over a number of domains was first used by Gailly and Hausman (1984), in order to define a unidimensional scale for the measurement of deprivation based on 32 items. Then, same basic methodological framework has been used to see if the economic and social dimensions of deprivation do cumulate over time, resulting in a state of social exclusion (Tsakoglou, 2002).

As regards the operationalisation method, social exclusion can be measured as an accumulation of economic and social risk factors (Moisio, 2000), as the increased risk of disadvantageous social conditions (Hallerod, 1999) or as the overlapping of poor living conditions and lack of resources (Nolan and Whelan, 2001).

The paper examine if social exclusion can be described as an accumulative process in Luxembourg, following the approach proposed by Berghman (1995), Hallerod (1999), Moisio (2000) and Tsakoglou (2002).

3. Dimensions of social exclusion - analysis and measurement

Data characteristics

The dataset used is the Socio-Economic Panel/ Liewen zu Lëtzebuerg (PSELL), which covers the residents who live in the Grand Duchy in a private household and who are protected by the national social security. The present analysis uses the waves 1996-2000 of PSELL2. In 1995, 8192 individuals from 2978 households were interviewed, and this initial sample has been re-interviewed annually until 2002.

As the analysis of social exclusion has a dynamic nature, the longitudinal dimension of the PSELL dataset is a key advantage because it makes it possible to follow the same individuals or households over time, to investigate separately cause and effect, to separate the sequences of events and behaviours involved and to indicate to what extent people move in and out social exclusion states. The main limitation of the dataset is that it does not cover many aspects of deprivation, such as health, food and clothing, recreation and family activities, while other aspects cannot be followed longitudinally in all waves. But PSELL provides variables on education, employment, income, consumption, saving, housing, durable goods and child care, being a rich source of data for the analysis of deprivation and social exclusion.

A problem specific to any panel survey is attrition. In PSELL2, only 59.15% of individuals in the initial sample responded in all waves from 1995 to 2001 and 63.68% were present from 1996 to 2000. In the working dataset, only the adult individuals who are present all waves, from 1996 to 2000, were selected.

Operationalisation of poverty, deprivation and social exclusion

In this paper we conceptualise poverty, deprivation and social exclusion following the theoretical lines proposed by Berghman (1995). Our definition and the design of methodology also take into account the particularities of PSELL2. Berghman explains these concepts in terms of a conceptual matrix which combines the twin concepts “direct-indirect” and “static-dynamic”.

TABLE 1
The conceptualization of poverty, deprivation and social exclusion

	Static outcome	Dynamic process
Income	Poverty	Impoverishment
Multidimensional	Deprivation	Social exclusion

Source: Berghman (1995)

In literature, poverty denotes a unidimensional and static outcome and usually refers at income poverty. The process causing a person or household to remain for a very long time below an income poverty line is called impoverishment. In our study, a person, who keeps no more than one disadvantage, which is income, during the entire period of analysis, is defined as poor. We therefore include in this category those who are poor at a moment in time as well as those who experienced a process of impoverishment. We do not put much emphasize in the

empirical part on the distinction poverty-impoverty, as our main concepts to analyze here are deprivation and social exclusion.

In theory, deprivation refers to a multidimensional situation where a person lacks several goods and services, and it also denotes a static outcome. According to our definition, an individual is classified as “deprived” if he/she has accumulated at least two economic disadvantages, for one or two years. Even though the length of spell may not reflect in this case a “static” situation, we still account it as a spell of deprivation. The reason is that a situation which lasts no more than two years does not describe a significant process. For instance, social exclusion needs more years to develop.

At a conceptual level, social exclusion describes a relative, multidimensional and dynamic phenomenon, which requires the accumulation of several economic disadvantages over time. In line with this approach, we define social exclusion as a state of deprivation lasting at least three consecutive years. Therefore, people who developed more than two disadvantages for at least three consecutive years are defined as socially excluded.

The three concepts presented above are related each to another. In our approach, they are defined as to describe separate categories, although people who are poor may also be deprived (and socially excluded), and people who are deprived may also be socially excluded. On the other hand, the analysis of poverty and deprivation may reveal some patterns of social exclusion, when we add a time dimension (Paugam, 1995).

In our paper, the social and economic disadvantages rely on what we call next “dimensions of social exclusion”. According to our above definitions, the dimensions of deprivation are also dimensions of social exclusion.

Dimensions of social exclusion

The first stage of our analysis was to select the dimensions of social exclusion. At this step, only the variables which are available in all waves are considered, because social exclusion has a longitudinal dimension. The analysis was restrained to 5 dimensions: unemployment, economic hardship, possession of durable goods, housing conditions and dwelling type (annex 1). The reliability of the deprivation scales is assessed with reference to the Cronbach alpha statistic, α . The estimate of α for the sample as a whole is 0.553. For living conditions α is 0.744, for durable goods is 0.663 and for housing conditions is 0.344. These values indicate that the indicators/dimensions which form a deprivation scale are consistent with each other.

The unemployment plays a double role in the process of social exclusion, because it can be seen as a dimension of deprivation as well as a determinant or as the first step in the accumulation of economic and social disadvantages. In order to see whether unemployment could be considered as a determinant of social exclusion, we exclude unemployment from the social exclusion definition and use a variable reflecting the individual’s status on labour market on long term. Because the unemployment rate is generally low in Luxembourg (0.5-1.5% in our sample), we have selected as potential determinant of social exclusion a binary variable which shows if a person was ever unemployed at least once in the last 5 years¹.

The dimension of economic hardship includes the income poverty and other variables which denote the “economic strain”. The variables of economic strain are: the living conditions, subjective appraisal of well-being and saving capacity. The economic hardship is a binary variable scoring 1 if an individual faces at least 2 hardships, and 0 in rest. The living conditions refer to affordability. This has been constructed as a binary variable based on 9

¹ Only individuals who are registered at the national security system are selected in the PSELL2 population. That means that the unemployed who do not receive an unemployment benefit are not recorded in PSELL2. The unemployment rate may therefore be underestimated, according to the PSELL2 dataset.

variables. The most representative variable is the first of them, as it is exposed in the annex 1. Its importance rely on the fact that the proportion of people living in households that have been in arrears on rent or mortgage payment at any time in the previous 12 months is considered as a Level 2 indicator (Atkinson et al., 2002). Since affordability has a financial nature, it has been included in the category of economic strain.

The poverty line is set at 60 per cent of the median net equivalent household income per capita, based on the “modified OECD equivalence scale”. The resulting income poverty indicator is the most “dynamic” part of the economic hardship dimension.

As shown in annex 1, 8 variables account for the dimension of durable goods. Within this group, the variable of PC possession is responsible for the high rate of deprivation of this dimension. The threshold of this dimension has been defined as the lack of at least two items².

The dwelling type and housing conditions reflect different aspects of housing and the correlation between them is rather weak. The housing conditions represent an important aspect of deprivation³. It could be seen as a symptom of poverty and, in a dynamic approach, it may lead to social exclusion. The overcrowding and the housing quality equally reflect the housing conditions. But the analysis here is restrained only to the inadequately equipped housing. The proportion of people living in households that lack specified housing amenities is included by the member states in their National Action Plans on Social Inclusion, and it is referred as a level 1 indicator (Atkinson et al., 2002). The dwelling type is a dichotomous variable which refers to overcrowding in the living area or building, being in the same time an attribute of the quality of housing.

TABLE 2
Rates of deprivation over the period of analysis

Dimensions of social exclusion	1997	1998	1999	2000	Longitudinal rates
Unemployment	1.33	0.91	0.62	0.58	0.86
Dwelling type	10.37	10.33	10.35	10.82	10.47
Possession of durable goods ⁴	26.63	21.24	19	15.52	20.60
Housing conditions	5.39	4.74	4.77	4.71	4.9
Economic hardship	12.34	19.26	16.99	15.43	16

Note: The rates of deprivation are calculated based on the working dataset, which has been described in the previous section. The longitudinal rates are based on pooled data 1997-2000.

² Some people commenting our research have argued that the construction of this group of PSELL2 variables do not tell us if the absence of an item can be account as a symptom of deprivation or not. This problem is solved in PSELL3, where a question about the reason that relies on that lack, joins the original question about the possession of that durable good. Anyway, we include here durable goods, because this is a fundamental dimension of deprivation and social exclusion and also because in general, the analysis of deprivation has a relative nature.

³ All items that we have selected as to describe the dimension of housing conditions are usually included in the studies on deprivation and social exclusion (see Tsakloglou and Papadopoulos, 2002). In our paper 4 items describe this dimension.

⁴ The high proportion of people lacking durable goods over time is partially due to the item of personal computer (PC) possession, which was not as widespread in the period 1996-2000 as it presently is. We keep this variable in the analysis because, as it was also mentioned in a previous section, the analysis is done in relative terms.

From 1997 to 1998 the proportion of people lacking durable goods has significantly decreased, while the proportion of people experiencing economic hardships has increased. The dimensions of housing conditions and dwelling type have slow dynamics and they do not reveal any spectacular change from one year to another. The most “dynamic” dimension is the economic hardship. There are significant ups and downs from 1997 to 2000, which is not surprising since this dimension reflects the current financial well-being, which often changes on short term. Data also show up a slow decrease in the rate of unemployment over time, but since the rate is, however, very low and probably underestimated, we do not particularly focus on this.

4. Representation and identification of social exclusion

This part is aimed to examine if social exclusion can be described in Luxembourg as an accumulation of economic and social disadvantages. Previous research applied on the EU countries, based on the ECHP dataset, found out that social exclusion can be described as a spiral of precariousness as well as a statistical category (Paugam 1995, Moisiu 2000, Tsakoglou 2002).

The proportion of people excluded in 0-5 dimensions in table 2 gives insights to the accumulative nature of social exclusion. As the proportion of individuals deprived in more than three dimensions is insignificant, the accumulative process of social exclusion is described only by three dimensions, and this is done to a low extend. The results below show that the proportion of deprived persons slightly decreases over time. There is a shift from 1998 to 1999 and from 1999 to 2000, when the proportion of non- deprived individuals (0 or 1 dimension) increased.

TABLE 3
Cumulative nature of different items of deprivation, 1996-2000

Proportion of population classified as deprived according to:	1997	1998	1999	2000
No dimension	58.93%	58.15%	61.71%	64.59%
One dimension	29.48%	30.56%	27.86%	26.27%
Two dimensions	8.70%	8.36%	7.87%	6.95%
Three dimensions	2.38%	2.48%	1.98%	1.81%
Four dimensions	0.42%	0.39%	0.55%	0.35%
Five dimensions	0.06%	0.03%	0	0

Although the proportion of people who didn’t experience any form of deprivation from 1996 to 2000 is not very high, most of those who are poor/deprived accumulate 1 or 2 economic disadvantages. This shows that poverty is rather unidimensional than multidimensional in Luxembourg.

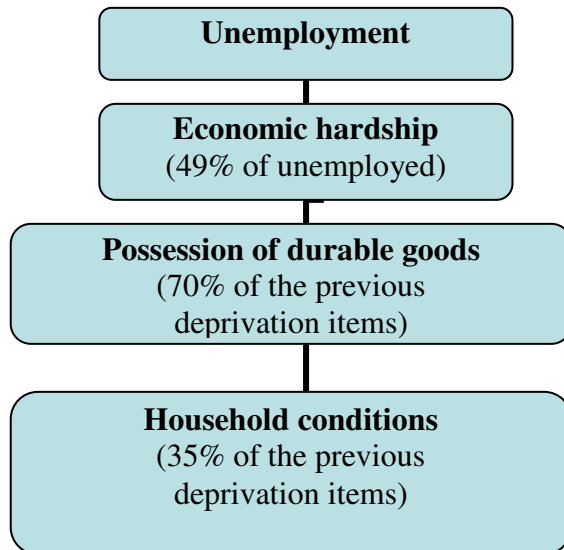
As shown in the table 3, people are more likely to experience short spells of deprivation than long spells. However, it seems that people who are in severe forms of social exclusion (permanent deprivation) represent a special group, who doesn’t necessarily fit this rule. For social policies purposes they may require special attention.

TABLE 4
Different profiles of deprivation

Proportion of population classified as suffering from cumulative disadvantage during the entire period of analysis	
Non-deprived	80.3%
One year	7.0%
Two years	5.3%
Three years	3.0%
Four years	4.4%

The attempt to figure out the accumulative nature of the deprivation items is definitely a relative one, because the analysis is sensitive to the variables taken into account. The variables of labour market participation and economic hardship describe the most “accumulative” dimensions. The empirical evidence shows that 49% of unemployed suffer from economic hardship and 70% of those who are unemployed and face economic hardship, also have a poor possession of durable goods. The housing conditions accumulate only to a low extent over the rest dimensions of social exclusion. Therefore, only for unemployment, economic hardship and durable goods, do the economic disadvantages accumulate, indicating that those who are unemployed or who meet economic hardship are likely to also lack some basic durable goods.

FIGURE 1
The cumulative nature of social exclusion



We assume that a cumulative process is indicated by a membership percent higher than 50%. According to this definition, only three dimensions of deprivation are cumulative.

The dimension of housing facilities is not included in the graphic besides because it accumulates over the rest of dimensions to a very low extent (less than 10%).

Note: Proportion of population experiencing economic disadvantages, in a longitudinal perspective.

While the definition and measurement of deprivation is possible in the framework of a static approach, the social exclusion analysis needs a dynamic and longitudinal framework. Up to this point, the accumulation of economic disadvantages has been carried at a static level. But in order to examine social exclusion, it is necessary to move from the static to the

dynamic perspective. Within the dynamic approach to social exclusion, the analysis is aimed to find:

- If unemployment can be seen as a determinant of social exclusion (when unemployment doesn't account as a dimension of social exclusion);
- If the individuals who accumulate a number of economic disadvantages over time are more likely to also have a poor social and political involvement in society;
- If there is social exclusion in Luxembourg, apart from deprivation, and if it is so, to find the factors leading people from deprivation into social exclusion.

The first step in explaining the dynamic representation of social exclusion is to figure out the role played by unemployment in the process of social exclusion. Table 4 shows that there is a relation between unemployment and other dimensions of social exclusion. The unemployed are more likely to experience more economic disadvantages, compared to the others.

TABLE 5
Unemployment, at different stages of social exclusion

		Proportion of population deprived according to:				
		No dimens.	1 dimens.	2 dimens.	3 dimens.	4 dimens.
Unemployed	yes	0.4	1.03	2.98	3.27	6.25
	not	99.6	98.97	97.02	96.73	93.75

Note: Cross tabulation, longitudinal data.

The analysis of social exclusion has in our analysis a pure “economic” nature, because the variables of the “social relations” dimension are not available all waves of the PSELL dataset. The analysis misses thus a very important part, since the dynamic approach to social exclusion should involve both economic and social cumulative aspects.

The social and political participation cannot be dynamically followed over time, but it can be examined in a cross-sectional perspective. We consider important to include the political involvement in the analysis of social exclusion because this is an indicator attesting a fundamental civil right (Moisio, 2000). As we expected, those who are excluded in more than three dimensions, also have a weak participation in the social or political activities of the community. This means that the economic deprivation may be associated with a poor social and political involvement.

TABLE 6
Participation in social/ political organizations, at different stages of social exclusion

		Proportion of population deprived according to:					
		0 dimens.	1 dimens.	2 dimens.	3 dimens.	4 dimens.	5 dimens.
Participation to soc./ pol. organizations	yes	39.82%	31.15%	21.96%	17.86%	13.4%	0
	not	60.18%	68.85%	78.04%	82.14%	86.6%	100%

Note: Cross tabulation, longitudinal data.

The main conclusion that we draw from this section is that not all indicators of financial and material deprivation accumulate to a high degree within the process of social exclusion, but it is more likely that those individuals, who are defined as socially excluded according to our definition, do not involve in the social and political life of community. We therefore get that the social dimension accumulates over the economic dimension, in the process of social exclusion (even though this issue has been approached only at a cross-sectional level). Within the economic dimension, the most cumulative indicators are those related to the financial stress and labour market participation. The unemployed are more likely to also experience more other disadvantages, compared to the rest of population.

5. Interactions between income poverty, deprivation and social exclusion

As it was mentioned in the previous sections, social exclusion is a multifaceted and dynamic phenomenon, which takes a number of years to develop (at least three consecutive years, according to our research). The concept of social exclusion deeply relates to income poverty and deprivation, without being synonymous. Income poverty is a variable of economic hardship, which is the most dynamic dimension of social exclusion, while deprivation is the static framework of social exclusion. An individual, who is socially excluded, definitely is deprived too, but he is not necessary income poor. Due to this close interrelation between those three concepts, it could be useful for policies purposes to also distinguish between them. By delimitating between income poverty, deprivation and social exclusion and by establishing the proportions of people falling in each category, we highlight that social exclusion is the result of a dynamic and complex process, having different patterns and causes at each stage. From this point of view, income poverty and deprivation can be seen as two different stages of the social exclusion process. Different policies should therefore target income poverty, deprivation and social exclusion, since they have different peculiarities, determinants and vulnerable groups.

Table 7 summarizes the proportion of individuals who are at each stage of social exclusion (income poverty, deprivation and social exclusion). We therefore got that in Luxembourg, from 1997 to 2000, 6% of individuals are socially excluded, 13.7% are just deprived and 7.8% have been poor, without being deprived, at least once in the period of analysis. According to our definition, 72.5% of population is not poor, not deprived and not socially excluded.

TABLE 7
Interactions between poverty, deprivation and social exclusion

Social exclusion and deprivation statuses		Dimensions of social exclusion	Length of poverty spell	Proportion of individuals
Not deprived	Non- poor, Non-deprived	0 dimension	0	72.5%
	Poor	1 dimension	1-4 years	7.8%
	Total non-deprived	0-1 dimension	0-4 years	80.3%
Deprived, but not socially excluded		2 dimensions or more	1 year	7%
		2 dimensions or more	2 consecutive years	2.9%
		2 dimensions or more	2 non-consecutive years	2.4%
		2 dimensions or more	3 non-consecutive years	1.4%
		Total deprived	1-2 years	13.7%
Socially excluded		2 dimensions or more	3 consecutive years	1.6%
		2 dimensions or more	4 years	4.4%
		Total socially excluded		6.0%
Total				100%

Notes: Calculations are based on the waves 1997-2000 of PSELL2. Those categories have been created as to be completely distinctive, to not intersect each other and to take into account the entire population.

6. The determinants of social exclusion – a dynamic analysis

a) Econometric model

The dynamic analysis of deprivation and social exclusion carries unobserved heterogeneity. Due to the unobserved heterogeneity, the individuals who experience deprivation or social exclusion at any point in time are likely to persist in this state because of the same adverse characteristics. From an econometrical point of view, the fixed effects and random effects models solve this problem because they allow to each cross-sectional unit to have a different intercept term that capture unobserved heterogeneity though all slopes are the same.

While the fixed effects model consider the intercept term to be an unobserved random variable that could be correlated with the observed regressors, the random effects model treats the unobserved individual effects as random variables that are not correlated with the regressors. As N is large and T is small in our analysis, under the hypothesis that the

assumptions underlying the random effects model hold, the random effects estimators are more efficient than the fixed effects estimators. Although the random effects model is more efficient than the fixed effects model, there is a concern about the correlation of the individual unobserved effects with the regressors. If they are correlated, this leads to inconsistent parameter estimates.

The Hausman test allows deciding between using the fixed effects or the random effects model. In fact, it tests the null hypothesis that the coefficients estimated by the efficient random effects estimator are the same as the ones estimated by the consistent fixed effects estimator. As in our case they are the same, the random effects model has been selected to explain the dynamics of social exclusion and deprivation over time.

The econometric model can be summarized as follows:

$$y_{it}^* = x_{it}\beta + e_{it}, \quad i=1,2,\dots,n \text{ and } t=1,\dots,T$$

$$e_{it} = \alpha_i + u_{it}$$

where, α_i is the individual specific error component and u_{it} combines time series and cross-section error component.

And,

$$y_{it} = 1 \quad \text{if } y_{it}^* > 0 \quad \text{and } = 0 \text{ else.}$$

where, y^* is the latent variable of deprivation or social exclusion, y is the observed variable, X is the vector of time-varying or time invariant covariates, β is the vector of coefficients associated with the X , α_i denotes the individual specific unobserved effect and u_{it} is the random error term. It is assumed that $u_{it} \sim N(0, \sigma_u^2)$.

The error term e_{it} is homoscedastic. The error terms of a given cross-sectional unit at two different points in time are correlated. The correlation structure remains the same, for all cross-sectional units.

$$\rho = \text{corr}(e_{it}, e_{it-1}) = \frac{\sigma_\alpha^2}{\sigma_\alpha^2 + \sigma_u^2}$$

where, ρ is the correlation coefficient.

If we note that the distribution of y_{it}^* , conditional on α_i , is independent normal, then we have:

$$\text{Prob}(y_{it}=1 \mid \alpha_i, x_{it}) = \text{Prob}\left(\frac{u_{it}}{\sigma_u} > \frac{-x_{it}'\beta - \alpha_i}{\sigma_u}\right) = \Phi(z_{it})$$

Where, $z_{it} = -(x_{it}'\beta + \alpha_i) / \sigma_u$ and Φ is the normal standard distribution function.

b) Analysis of social exclusion determinants

The analysis of determinants particularly focuses on deprivation and social exclusion, in order to reveal the differences between their determinants and vulnerable groups. As social exclusion is a more restrictive category, in comparison with deprivation, the analysis also examines how the effect of covariates changes when we move from explaining deprivation to explaining social exclusion. At this step, we may be able to identify the most vulnerable

groups of population and to distinguish between different groups of population, according to the cumulative strength of their problems.

According to our findings in the previous section, the overall proportion of individuals who are in the situation of social exclusion is 6%, while the proportion of deprived persons is 13.7%. Although, according to definition, the socially excluded individuals are deprived as well, they are classified only as socially excluded. We do that in order to see if the determinants of the two groups may be different.

Social exclusion and deprivation are explained by the same sets of covariates. The changes in the covariates explain, through the random effects probit regression, the changes in the individual levels of deprivation or social exclusion. Some covariates that are significant in the case of deprivation become insignificant when they apply to social exclusion (some of them have not been included in our analysis because of this reason). This is so, because the category of social exclusion is more restrictive compared to the category of deprivation.

Among the explanatory variables, the people living alone, the immigrants, the people having a low level of education, the young people and the blue-collar workers are vulnerable groups at risk of deprivation and also at risk of social exclusion. The retired are not at risk of deprivation or social exclusion in Luxembourg.

TABLE 8
The determinants of deprivation

Determinants of deprivation	Coef.	dy/dx (Marginal effects)	Std. err.
Age***	-.0147394	-.0000759	.00003
Aged <30*	.4174357	.0036594	.00241
Low educational attainments***	1.007828	.0088762	.00211
Nationality of the household's head***	1.124406	.0169742	.00425
Number of the household's members***	-.2236969	-.0011526	.00032
The household's head works minimum 10h per week***	-.8416537	-.0064233	.00235
Single mothers***	.901487	.016027	.00648
Single***	1.748402	.0765286	.02108
Singles living together***	.6644803	.0083493	.0034
The household's head is retired***	-1.091204	-.0037131	.00101
The household's head receives an invalidity pension***	-.4947985	-.0014683	.00048
The household's head receives an survival pension***	-1.165694	-.0019964	.00048
Blue collar worker***	.1000148	.0000168	.00001
Constant	-2.824746		.2856508
Sigma_u	1.780213		.0519505
rho	.7601434		.0106413
Insig2u_cons	1.153466		.0583644
Log likelihood	-2629.5495		

Notes: Estimates from a random effects probit regression, where the dependant variable is deprivation.

* p<.1; ** p<.05; *** p<.01

(*) dy/dx is for discrete change of dummy variable from 0 to 1.

According to our results, the most exposed are the single and the immigrants. But the singles represent a particular case. As they are single, their needs may be different from those who live together. If this is the case, they appear as “deprived”, but they may not need to possess some durable goods or “appropriate” housing facilities. Probably another approach to deprivation wouldn’t place them anymore in the category of vulnerable people.

Although some covariates explain both processes, they are more significant and powerful in the case of deprivation, compared to social exclusion. The impact of covariates on both deprivation and social exclusion is rather low, even though deprivation is “better” explained by them, than social exclusion. We find two explanations for this. First, the number of deprived and socially excluded in Luxembourg is also low. Second, there may be other factors which better explain deprivation and especially social exclusion, but they cannot be captured by datasets and thus cannot be measured, being “visible” symptoms of deprivation.

TABLE 9
The determinants of social exclusion

Determinants of social exclusion	Coef.	dy/dx (Marginal effects)	Std. err.
Age	-.0037986	-7.41e-07	.00000
Aged <30	.3531095*	.0001273	.00013
Low educational attainments	.9976686***	.0004482***	.00016
Nationality of the household’s head	1.348655***	.001898***	.00068
Number of the household’s members	-.1788381***	-.0000349**	.00001
The household’s head works minimum 10h per week	-.7583961***	-.0002525*	.00015
Single mothers	1.057043***	.0016964*	.00101
Single	1.768893***	.0090961***	.0044
Singles living together	.6902261***	.0005002**	.00032
The household’s head is retired	-.6994826***	-.0000926**	.00004
The household’s head receives an invalidity pension	-.5245122*	-.0000499***	.00002
The household’s head receives an survival pension	.9936425***	-.0000606***	.00002
Blue collar worker	.1097956***	-7.92e-06*	0
Constant	-4.492743***		.3729209
Sigma_u	1.98223		.0469059
rho	.7971288		.0076534
Insig2u_cons	1.368445		.0473264
Log likelihood	-1453.3449		

Notes: Estimates from a random effects probit regression, where the dependant variable is deprivation.

* p<.1; ** p<.05; *** p<.01

(*) dy/dx is for discrete change of dummy variable from 0 to 1

Social exclusion has been also analyzed in comparison with persistent income poverty. The persistent income poor are those who are below the income poverty line, for at least three consecutive years. Poverty line is defined as 60% of the median income distribution.

Although income poverty is not the subject of our paper, we compare it to social exclusion, because it is the most dynamic aspect of social exclusion. Families having incomes below 60% of the median for three years running are likely to face financial pressure. This is not due to measurement error or to temporary deviation in income. This financial pressure may lead to social exclusion (Atkinson et al., 2002).

According to our estimates, education is a factor of persistent income poverty, without being a factor of social exclusion as well, while marital status is a factor of social exclusion, without being a factor of persistent income poverty. The isolated active people are more exposed to social exclusion than to persistent income poverty and the determinants related to participation on labour market better explain persistent income poverty than social exclusion (annex 3).

7. Conclusions

Few papers have investigated social exclusion in Luxembourg, using the PSELL dataset. Most of them run cross-country comparisons in order to examine social exclusion in the European Union, based on the European Consortium Household Panel (ECHP) dataset. As Luxembourg is present in the ECHP, there are just few papers on social exclusion providing data and results about social exclusion in Luxembourg, as well as in other countries. Such papers (Moiso, 2000) usually find that social exclusion in Luxembourg is not significant, or it is reflected by only one or two dimensions. In this paper we intended to see if the use of the PSELL2 dataset, instead of the ECHP, gives more results or other results, since PSELL carries more variables on deprivation, providing a broader field of analysis.

The national panels generally are richer than the European datasets and thus they may provide additional information on deprivation and social exclusion. Being a broad and vague concept, social exclusion should primarily be examined in the national context, in order to reveal the vulnerable groups and the patterns of each country.

Social exclusion and its determinants in Luxembourg were the main focus of this paper. Therefore, the conclusions mainly regard their dynamics and determinants in Luxembourg. But most of results carry a certain degree of relativity, since the choice of indicators and the setting of thresholds involve some subjectivity. They should be interpreted in the context of the limitations of our study. We remind at this point that only the adult population was selected in our sample, the representativity of the sample may be affected by a high attrition rate and there are some missing dimensions (such as the social and political participation, which was analyzed only at a cross-sectional level).

In the case of Luxembourg, social exclusion cannot be defined as a “spiral of precariousness”, since only three dimensions participate to the accumulative process. If unemployment is seen as a cause and not as a dimension of social exclusion, then participation on the labour market should be the first factor in explaining the process of social exclusion. A poor participation on the labour market or the unemployment generates first the accumulation of financial disadvantages and then other aspects of deprivation like absence of some durable goods and a poor social life. The housing conditions and dwelling type do not accumulate over the rest of dimensions, suggesting that they could be the result of a process lasting longer than 4 years.

Although the social indicators cannot be followed longitudinally in the PSELL, the analysis shown that those who meet severe economic hardships are less likely to participate in the social life of the community and to involve in any political activities.

Our estimates suggest that only 6% of the adult population was in social exclusion, in the period covered by this study (1996-2000), while the proportion of deprived people is 13.7%. We have defined social exclusion as an accumulative, multidimensional and dynamic process. But the empirical evidence shows that, according to the PSELL dataset, most of dimensions do not cumulate in the case of Luxembourg. All those findings indicate that in Luxembourg, social exclusion is rather low. As defined above, social exclusion is a chronic state and thus, those who are excluded are very likely to experience this phenomenon for a long time. So, it is worthy to investigate in detail the most vulnerable groups of population.

Most of the social exclusion determinants rely on labour market participation and family structure. Unemployment represents a cause, as well as a symptom of deprivation and social exclusion. The analysis revealed that deprivation and social exclusion have the same determinants. The household of singles (especially the single mothers), the immigrants and the low educated people are the most exposed groups at risk of deprivation as well as at risk of social exclusion.

We have concluded that social exclusion has not an accumulative nature in Luxembourg, since just two or three dimensions of economic deprivation accumulate over time. But the empirical evidence shows that social disadvantages cumulate over economic disadvantages.

The descriptive analysis of deprivation in Luxembourg also points out several social exclusion patterns, which are in line with those who are mentioned in the Report on Social Exclusion in Europe in 2006. Therefore, increasing labour market participation plays the most important role in fostering social inclusion. Discouraging early school leaving, especially for those coming from disadvantaged families, is the most important factor of preventing poverty, deprivation and indirectly social exclusion, during the life course. Single parent families are the most vulnerable at the risk of intergenerational inheritance of poverty. They represent a social category at risk of income poverty as well as of social exclusion, because the high cost of child care services discourage them to come back on the labour market.

Our further research directions regard the analysis of social exclusion in Luxembourg using the PSELL3 dataset. The prospect of examining PSELL3 opens new perspectives for our research, as regards the methodological tools and the empirical findings.

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ANNEX 1

SOCIAL EXCLUSION

List of variables (PSELL2)

Income

Household equivalised income

Unemployment

“Person has ever been unemployed during the five years before joining the survey?”

“Main activity status”

Housing conditions

“Does the dwelling have separate kitchen?”

“Does the dwelling have indoor flushing toilet?”

“Does the dwelling have a place to sit outside, e.g. terrace or garden?”

“Does the dwelling have hot running water?”

Dwelling type

“Kind of accommodation”

Living conditions

“During the past 12 months, has the household been unable to pay scheduled rent or mortgage payments for the accommodation?”

“Has the household been unable to pay expenditures with the car?”

“Has the household been unable to pay scheduled utility bills, such as electricity, water, gas?”

“Has the household been unable to pay hire purchase instalments or other loan repayments?”

“Has the household been unable to pay insurances?”

“Has the household been unable to pay medical services?”

“Has the household been unable to pay food expenditures?”

“Has the household been unable to pay taxes?”

“Has the household been unable to fix or replace the damaged equipments?”

Durable goods

“Possession of a car (for private use)”

“Possession of colour TV”

“Possession of a video recorder”

“Possession of a micro wave”

“Possession of a dishwasher”

“Possession of a telephone”

“Possession of a GMS”

“Possession of a home computer”

Subjective appraisal of the well being

“How satisfied are you with your present economic situation”

Saving activity

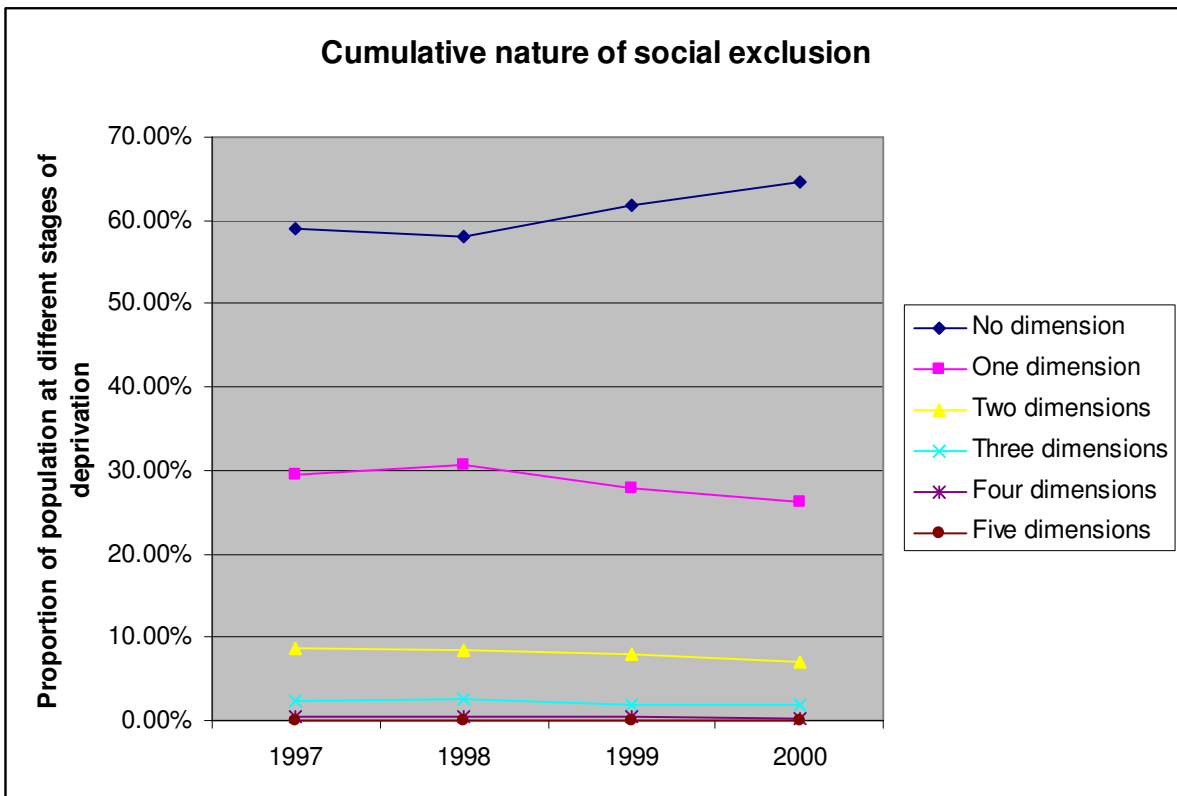
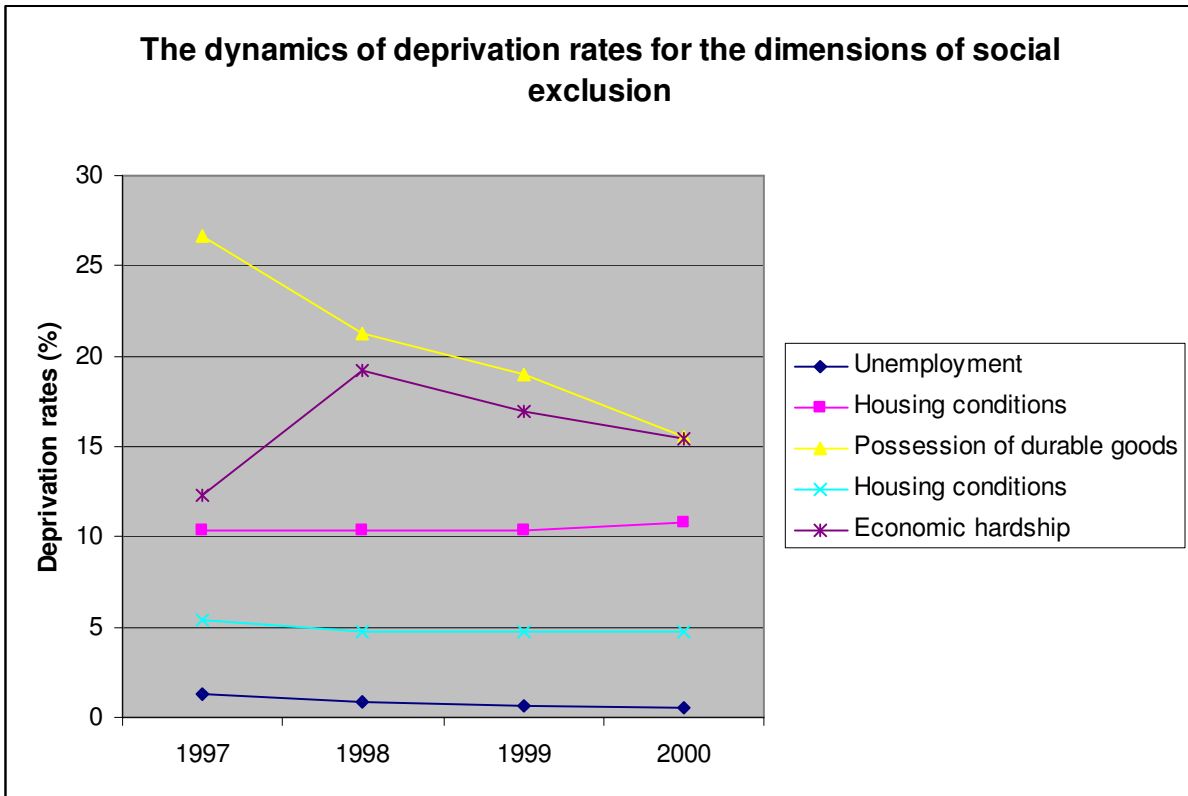
“Is there normally some money left to save (considering household’s income and expenses)”

Social and political involvement

“Are you a member of any club, such as a sport or entertainment club, a local or neighbourhood group, a party etc.?”

“Do you ever feel alone?”

ANNEX 2



ANNEX 3

Determinants of persistent income poverty and social exclusion

Covariates of deprivation	Effects on persistent income poverty	Effects on social exclusion
Mono-active household with non-retired members	3.58**	2.70*
Isolated active people	1.67**	2.33**
Unemployed at least once in the last 5 years	2.31**	1.79**
Blue-collar worker	1.81**	1.52**
Mono-active household, including retired members	1.88**	1.36*
Household of three or more, whose members are active (at least two) and retired (at least one)	1.33**	1.25*
Household of three or more, whose members are active (at least two) and non-retired	1.29**	0.92**
Separated	n.s.	1.51**
Single	n.s.	1.19**
Divorced	n.s.	1.02**
Widow	n.s.	0.91**
Immigrant	1.35**	1.23**
Low educated	1.72*	n.s.
Divorced female	2.20*	1.80*

Note: 1) Selected coefficients from a binary logistic regression, 1996. Unemployment does not account here as a dimension of social exclusion.
2) ** 1% sign, * 5% sign, n.s. not sign.



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