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Towards an inclusion balance: accounting for gross change in Europeans living conditions

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Eurostat is the Statistical Office of the European Union (EU). Its mission is to provide the EU with high-quality statistical information. To that end, it gathers and analyses data from the National Statistical Institutes (NSIs) across Europe and provides comparable and harmonised data for the EU to use in the definition, implementation and analysis of EU policies. Its statistical products and services are also of great value to Europe's business community, professional organisations, academics, librarians, NGOs, the media and citizens. In the social field, the EU Statistics on Income and Living Conditions (EU-SILC) instrument is the main source for statistics on income, poverty, social exclusion and living conditions.

Over the last years, important progress has been made in EU-SILC. This is the result of the coordinated work of Eurostat and the NSIs, *inter alia* in the context of the EU 'Living Conditions' Working Group and various thematic Task-Forces. Despite these significant achievements, EU-SILC data are still insufficiently analysed and used.

It is in this context that Eurostat launched in 2008 a call for applications with the following aims:

(1) develop methodology for advanced analysis of EU-SILC data;
(2) discuss analytical and methodological papers at an international conference;
(3) produce a number of publications presenting methodological and analytical results.

The 'Network for the Analysis of EU-SILC' (Net-SILC), an ambitious 18-partner Network bringing together expertise from both data producers and data users, was set up as in response to this call. The initial Net-SILC findings were presented at the international conference on 'Comparative EU Statistics on Income and Living Conditions' (Warsaw, 25-26 March 2010), which was organised jointly by Eurostat and the Net-SILC network and hosted by the Central Statistical Office of Poland. A major deliverable from Net-SILC is a book edited by Anthony B. Atkinson (Nuffield College and London School of Economics, United Kingdom) and Eric Marlier (CEPS/INSTEAD Research Institute, Luxembourg). It was published by the EU Publications Office (OPOCE) in December 2010 and can be downloaded free of charge from: (http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/publication?p_product_code=KS-31-10-555)

The present methodological paper is also an outcome from Net-SILC. It has been prepared by Matthias Till and Franz Eiffe (Statistics Austria). Gara Rojas González was responsible at Eurostat for coordinating the publication of the methodological papers produced by Net-SILC members.

It should be stressed that this methodological paper does not in any way represent the views of Eurostat, the European Commission or the European Union. The authors have contributed in a strictly personal capacity and not as representatives of any Government or official body. Thus they have been free to express their own views and to take full responsibility both for the judgments made about past and current policy and for the recommendations for future policy.

This document is part of Eurostat's *Methodologies and working papers* collection which are technical publications for statistical experts working in a particular field. All publications are downloadable free of charge in PDF format from the Eurostat website: (http://epp.eurostat.ec.europa.eu/portal/page/portal/income_social_inclusion_living_conditions/publications/Methodologies_and_working_papers). Furthermore, Eurostat databases are freely available at this address, as are tables with the most frequently used and requested short- and long-term indicators.

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Towards an inclusion balance: accounting for gross change in Europeans' living conditions

Matthias Till and Franz Eiffe, Statistics Austria

Abstract: In this paper we argue for a dynamic perspective of change in Europeans' living conditions. Using the EU-SILC longitudinal data for the waves 2006 and 2007 in 20 European Member States for which data were available in the Users' database, we analyze the development of disaggregated lifestyle dimensions in the European Union. As it turns out, net balances tend to show little positive change, indicating gradual improvement. The common indicators on social inclusion can only provide snapshots of living conditions as they almost exclusively rely on cross-sectional data. For an appropriate monitoring of social progress, however, it is crucial to understand inclusion as a process and to analyse EU-SILC longitudinal data to further qualify the nature of change. In our paper we explicitly focus on changes in terms of individual transitions between disadvantaged and more advantaged living conditions. The regression analysis used for our model of multiple change shows that activation resources such as health, employment or education are highly associated with changes in lifestyle dimensions. The largest differences, however, remain between countries.

1. Introduction

The European integration process is driven by a paradigm of advancing prosperity through economic growth. But there are also concerns that progress has to be aligned with advancing social inclusion defined as follows:

> *'Social inclusion is a process which ensures that those at risk of poverty and social exclusion gain the opportunities and resources necessary to participate fully in economic, social and cultural life and to enjoy a standard of living and well-being that is considered normal in the society in which they live. It ensures that they have greater participation in decision making which affects their lives and access to their fundamental rights.'* (European Commission 2004, p. 2)

Among the EU-Member States a consensus was established that poverty must be reduced in joint efforts, following an Open Method of Coordination (OMC). This process relies heavily on statistical indicators. For example, inclusion strategies may be evaluated by whether the 'at-risk-of-poverty' rate[1] improves or is kept from rising under adverse economic conditions.

The primary interest of statistical indicators is to monitor observable differences over time and between groups. Indicators are guidelines which are sensitive to change. To this end, they need not – and often cannot with any justifiable effort – give an exact number of people facing disadvantage.

For an appropriate monitoring it is crucial to understand inclusion as a process. Currently an EU-27 at-risk-of-poverty rate of 16% is measured. But only upon longitudinal observation we can truly determine, whether this implies that all of us will be disadvantaged once every six years or disadvantage is permanent for one in six of our fellow citizens. While there is already clear evidence that neither of these extreme assertions is fully correct (cf. eg. Asposory & Millar 2003), it requires the study of longitudinal data to further qualify the nature of change. Ultimately, only analysis of panel data can reveal the extent of oscillation of precarious positions and present evidence on the sequence of events leading to disadvantage or its alleviation.

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[1] The definition of poverty is ultimately normative. Sociologically, the term 'poverty' denotes recognised need and is equivalent to the phrase 'support shall be given' (Simmel 1908, transl, Coser 1970). This makes the definition and measurement of 'poverty' a controversial matter and indicators usually refer to 'poverty risks' instead.

EU-SILC as the key data source for monitoring change in Europe

It was a key objective to provide data to monitor change when the European Parliament and the Council of the European Union jointly adopted Regulation (EC) 1177/2003 to establish the Community Statistics on Income and Living Conditions (EU-SILC). With 30 countries participating and more than 500 000 respondents it became one of the most ambitious data collection efforts in the world. EU-SILC has become the source for many indicators complementing conventional benchmarks of economic growth. Nonetheless, its potential as a comprehensive profile of living conditions, the relationships between conditions and trajectories over time are still insufficiently recognised.

EU-SILC has a cross-sectional and a panel (longitudinal) component. The latter refers to repeated observations for identical statistical units. The Regulation requires that individuals of the original sample shall be traced over at least four successive years. In most countries, the sample of the longitudinal component is integrated into the cross-sectional component.

The common indicators on social inclusion can only provide snapshots of living conditions as they rely almost exclusively on cross-sectional data (with the only important exception of the indicator on persistent risks of poverty, which, for most countries, will not be available from EU-SILC before 2010).

Static indicators only capture net change

The headline indicator obtained from EU-SILC is the at-risk-of-poverty rate. It measures the proportion of the population living on a low income, compared to the living standard of their Member States.[2] For the EU-25 the at-risk-of-poverty-rate remained unchanged at 16% for all years between 2005 and 2007. For only seven of the EU-25 Member States, the rounded at-risk-of-poverty indicator changed by more than one percentage point between 2005 and 2007. Hence, spectacular news headlines which proclaim a 'rise of poverty' - especially in times of crisis - may not necessarily be backed up by the statistical indicators.

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[2] The threshold currently being defined as an income below 60% of the median equivalised disposable income of the household within one year.

Does this however imply that change is not taking place? Or even worse, does massive impoverishment remain undetected by the available data? Is it worth the cost and effort of taking data every year when results are hardly different? An affirmative answer would mean to throw the baby with the bathwater. The social inclusion indicators are the main results of EU-SILC but they do not yet exploit the full analytic potential of EU-SILC. A potential fallacy of the present indicators is that they are mainly static. Their capacity to capture change is limited to differences of levels over time. This reflects the net balance of two distinct aspects of change (Atkinson *et al.* 2002, p. 32):

> ➢ transitions of individuals within an otherwise identical population (e.g. when low incomes increase above the at-risk-of-poverty threshold);

> ➢ flows of cohorts which gradually change the structure of a population (e.g. new born children, pupils graduate or migrants arrive).

In this paper we will explicitly focus on the first sort of 'changes' in terms of individual transitions between disadvantaged and more advantaged living conditions. The most recently available User's Database (UDB) relates to the year 2007. For longitudinal analysis we will therefore concentrate on transitions between 2006 and 2007.[3] We shall focus on the proportion of individuals across Europe, whose situation has improved, or deteriorated from one year to the next.

Individuals can move between households over time. Hence, individuals are the natural unit of the subsequent longitudinal analysis. Nonetheless, most of the variables discussed describe the situation of the whole household, disregarding possible inequalities between household members. Only variables such as education, employment and health are genuinely individual characteristics. Given the nature of longitudinal analysis, the reference population is slightly different than for cross-sectional data in that individuals which were born, died or moved into or out of the reference population are excluded from the analysis. Individuals forming new 'split' households are however included in the analysis.

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[3] Unless stated otherwise all results are based on: European Commission, Eurostat, longitudinal EU-SILC 2007 Users' database. Release 2009.

Longitudinal analysis reveals 'bad' changes and 'good changes

A major implication of longitudinal analysis is to acknowledge that social problems are more widespread than they appear from a static perspective (Walker 1995). As an obvious example we may think of school problems which are familiar to most people who ever went to school, although this experience is only affecting specific birth cohorts at any specific time. This appears less evident for poverty or unemployment. However, the numbers of people experiencing disadvantage during one year or over a longer period is usually a lot higher than the snapshot figures suggest. For example, about half of those 79 million who were placed below the at-risk-of-poverty threshold in 2007 were not at-risk-of poverty in the previous year. But if so many enter the ranks of the disadvantaged year by year, impoverishment will be a much wider concern than the at-risk-of-poverty rate would suggest.

Temporary disadvantage for a large part of the population may appear less serious than permanent disadvantage among a minority. Such a view is not always appropriate. In reality, precarious transitions will be more common and perhaps experienced repeatedly among critical borderline groups and hardly affect the most well off social positions. Further turnover will be affected by arbitrary measurement errors (Moisio 2004). Hence, Lazarsfeld's (1972) model of an oscillating turnover of positions may apply. This implies simply that latent (permanent) disadvantage is interrupted by favourable events of temporary effect. In this scenario gross change is to be taken as a serious indication that the magnitude of (latent) disadvantage is underestimated from a static perspective.

Monitoring transitions into disadvantaged positions is important to understand perceived change and its possible political momentum. It is not unlikely that those who experience deteriorated living conditions will subjectively perceive their fate worse and be more articulate than those who have adapted their expectations over years of persistent disadvantage (e.g. Burchardt 2003). When many people perceive a decline in living standards this may also seriously affect identification with common European ideas. This hypothesis is supported by the way the economic crisis is reflected in recent Eurobarometer findings '*[The] emergence of a pattern in European public opinion with regard to the EU and public life in general can be observed: Europeans are turning to the European Union and its institutions for support and solutions in these difficult times.*' (European Commission 2009 p. 4)

On the other hand, strategic interventions to provide options for the discouraged are particularly apt. If persisting disadvantage is concentrated among minorities, it will foster segregation and make social cohesion very difficult. There is a clear normative implication to reduce persisting disadvantage. Reaching this target requires change. The number of people whose livelihoods improve must be higher than the number of people experiencing deteriorated living conditions. The set of indicators would therefore benefit from additional information on the net balance between improvements and deterioration within the same population between two successive years. Monitoring change will be equally important to monitoring persistence, in order to understand the process in which social conditions are altered.

Identification of pathways for improvement, not arbitrary income gains

The normative implications of gross change are not unambiguous. A high degree of dynamic can reflect precarious borderline positions with alternating improvements and deterioration. Hence, the analysis of the context and concomitant changes of improvements and deterioration aims to identify possible barriers and pathways which can lead to improvement. Given the vast number of possibilities, the paper will put exemplary issues at centre stage

Our descriptive accounts will concentrate on three key questions:

1. How many Europeans experience a transition from one year to the next?

2. Which changes occur concomitantly?

3. Who are the winners and losers of change?

Change for the data analyst means that the same variable takes a different value in different years. The experience of change by the respondents may be quite a different affair. We cannot exclude the possibility that in some cases change will be purely artificial, because a different interviewer may read questions differently. It is even possible that change is observed because another person provided the answer, for example for the household questionnaire or when a proxy interview was conducted. Consequently, dynamics can be overestimated by the observed changes of variables. One way to ascertain if the observed change is meaningful is to identify simultaneous change in other variables. Such concomitance will help to distinguish substantial change from purely random variation.

Annual income is not ideally suited for this longitudinal analysis. Household income is measured by aggregation over all household members, over one calendar year and over all income components. The income reference period is usually the previous calendar year while household composition and non-income questions refer to the time of the interview. For about one in ten individuals we note a change of their household's composition during the income reference period. For this population annual household income can be at best approximated. (cf. Heuberger 2003) Further, the observed income transitions have a time lag (referring to t-1 and t-2) against change not related to income (referring to t and t-1). Hence, it is impossible to identify concomitant change within 2 observation years. Also, the low income transitions may often reflect arbitrary fluctuations around an essentially arbitrary threshold (obtained by aggregation over the whole population). In any case these aggregations are alien to the households and their exact position will be unknown to them. We cannot seriously expect that persons who changed their position by a few Euro around the at-risk-of-poverty threshold will also have consciously experienced 'change'. Hence, we aim to describe changes in living conditions more directly.

The comparability of non income data has not yet been made a priority issue in the Statistics on Living Conditions. Comparative income statistics had time to evolve over several decades.[4] Even if by now methodological standards have been established as international conventions, some of the most fundamental issues for the monitoring of social conditions are still pertinent. The choice for scales of equivalence and poverty thresholds as well as the appropriate measurement of certain income components such as from self employed economic activity or income in kind are just a few examples of the many problems which still exist. Nonetheless, income is usually considered as a relatively straightforward metric.[5] If income is difficult to measure, we may expect problems of definition and measurement in subjects other than income as well.

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[4] As major milestone can be taken the launch of the Luxembourg Income Study in 1983 while the introduction of the European Community Household Panel (ECHP) in 1994 would possibly mark the first attempt to establish harmonised micro data on general living conditions.

[5] Income is also a volatile and responsive measure. By means of transfers and taxation its distribution is subject to direct political influence. This makes income an ideal variable for simulation models such as Euromod. Its empirical variation over time is however also subject to problems of measurement which may not yet be fully understood.

Looking at the changing 'European Society', not nations

The 'Common Market' and its embedding in a global economy imply that change will be shared beyond national borders regardless whether favourable or not. However, the main actors implementing social inclusion policies are still the Member States of the European Union. To them, the Open Method of Coordination is mainly a tool to channel information which is relevant for common objectives (e.g. Daly 2006). This is reflected also in research priorities, which – if at all present – will focus on living condition within Member States and give less importance to the monitoring of the state of the Union as a whole. Often, the national inclusion processes will even be better understood with national data sources which are more tailored to the national needs and have bigger samples available than the harmonised EU-data.[6]

The genuine advantage of EU-SILC is to provide evidence on the living conditions which are shared among European Citizens. Hence, our analysis tentatively sets out to account for change within a 'European Society'. For example, for the year 2007 this could be the population living in the EU-27. Unfortunately, presently no longitudinal data are accessible for Denmark, Greece, Ireland[7], Germany, Malta[8], and Romania and Bulgaria.[9] The remaining 20 EU countries represent about 73% of the EU-27 population. As EU-SILC is conducted also in Non-Member-States which are associated to the European Economic Area (EEA), it appears useful to include also the available data for Norway and Iceland.[10] In total, the available data cover transitions, which took place in 22 countries, and are weighted such that each citizen is equally represented and each country proportionally to its population.[11]

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[6] Unfortunately, even many of the variables which are recorded in the cross sectional component are not available in the longitudinal Users' Database. The Regulation ((EC) 1177/2003) does not foresee the collection of all variables in the longitudinal component of EU-SILC. As most countries follow an integrated design this information is available in the national data and should also be made accessible to users.

[7] In the most recently available release of longitudinal EU-SILC 2007 Users' data base, Greece, Ireland and Denmark are not included because of weighting and quality problems.

[8] Germany and Malta did not allow the public dissemination of their longitudinal data.

[9] Romania and Bulgaria joined the European Union in 2007 and the first longitudinal data will be available only for the years 2007/8.

[10] The population of Norway and Iceland taken together amounts for about 1% of EU-27 population and their inclusion does not seriously alter the whole picture.

[11] This holds for the descriptive analysis. For the multivariate analysis countries were weighted proportional to sample size in order to obtain more precise estimates.

Necessarily, the findings presented here can only represent a fragment of the imaginary 'European Society', even if it may be a substantial one. Once the analysis of transitions among European Citizens will be established, we will turn to the relevant disaggregations. As will be seen, these do not necessarily reflect national boundaries. Such a strategy makes full use of the statistical power given the huge number of observations across countries. Therefore, sampling errors will generally be negligible for most estimates, even if some changes affect only a minority of the European population. Instead, great attention is to be paid concerning systematic errors due to lacking comparability of certain variables between countries.[12]

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[12] As the population of each country is represented proportionately in the following estimations, a lack of comparability is especially problematic when bigger countries depart from the harmonised framework.

2. A checklist for measuring changing livelihoods

Living conditions must be understood as truly all-encompassing. Among the data collected in EU-SILC this includes questions on material deprivation and measures of housing integration, but also health problems, education, economic activity. On that basis two different groups of characteristics of disadvantage may be distinguished:

> ➢ lifestyle characteristics

> ➢ resources for activation

The first type of characteristic refers to the perceived affordability of certain necessities and consumer durables, but also to poor housing integration. These characteristics are difficult to hide and likely to be directly recognised in and by the general public. They refer to material deprivation but are not necessarily associated with a lack of monetary resources. In particular, housing items may express lifestyles independent of money as for example in the case of urban agglomerations or temporary crowding following births.

The second aspect of disadvantage concentrates on characteristics that can be interpreted as barriers of or facilitators to active inclusion. They are determined by health problems, education and economic activity. Depending on the analytical perspective, they can be held as direct manifestations of disadvantage or instrumental conditions determining income and lifestyle opportunities (cf. Till *et al.* 2009). The crucial question is: Does the household possess sufficient resources in formal education, health conditions and labour market access to avoid or to get out of poverty risks?

The approach followed here is to identify profiles for a diagnostic checklist of disadvantaged lifestyles and barriers to activation. We analyse how many people cannot afford necessities and consumer durables, face inadequate housing conditions, have health problems, are placed outside the labour market or do not participate in education.

Equivalised annual income and the overlap of income poverty and deprivation is not subject of this analysis[13] as variables used in this paper relate consistently to the moment when the household was interviewed (whereas equivalised income mixes information from two years rendering the interpretation of change problematic).

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[13] See Dahl et al. 2008, Whelan et al. 2003, Whelan and Maitre 2006 or to the complementary of both approaches Guio et al. 2009b

The items on the checklist considered are the following variables which are available in the longitudinal EU-SILC database. (Abbreviations which will be subsequently used are put within ' '):

I. Checklist for deprived lifestyle

Does the household have the financial means to afford necessities?
HH050: Ability to 'keep home adequately warm'
'Arrears' on at least one of the following:
      HS010: mortgage or rent payments
      HS020: utility bills
      HS030: hire purchase instalments or other loan payments
      HS040: Capacity to afford paying for one week annual 'holiday' away from home
      HS050: Capacity to afford a 'meal' with meat, chicken, fish (or vegetarian equivalent) every second day
      HS060: Capacity to face 'unexpected financial expenses'
      HS120: Ability to 'make ends meet'
Does the household have financial means to afford consumer durables?
HS070: Do you have a 'telephone' (including mobile phone)?
HS080: Do you have a 'colour TV'?
HS090: Do you have a 'computer'?
HS100: Do you have a 'washing machine'?
HS110: Do you have a 'car'?

II. Checklist for adequate housing conditions

HS140: Financial 'burden of the total housing cost'
HH030: 'Number of rooms' available to the household
HH040: 'Leaking roof', damp walls/floors/foundation, or rot in window frames or floor
Not having any of the following in the dwelling („toilet'):
HH080: Bath or shower
HH090: Indoor flushing toilet for sole use of household

III. Checklist of barriers to activation

Are educational resources available?
PE040: Highest ISCED level attained
RB210: Basic activity status
Is health a problem?
PH010: 'General health'
PH020: Suffer from any a chronic (long-standing) 'illness' or condition
PH030: 'Limitation' in activities because of health problems
Is employment available?
PL030: Self-defined current 'economic status'

Items on such a broad checklist cannot be additive on any common scale. They cover different phenomena which are not necessarily related to each other. We therefore aim to establish descriptive profiles and not indices. But it appears useful to present groups of questions of a similar semantic meaning. It is not assumed, that responses represent more or less redundant measurements of the same 'concepts' (e.g. lifestyle deprivation and housing deprivation).[14]

The descriptive accounts of individual variables in EU-SILC provide a rich picture of social conditions. The presentation of individual characteristics gives great flexibility but also requires choices to filter relevant information and implies an exemplary approach. It has to be expected that for all questions, some of the responses recorded will be polluted by erroneous measurement, e.g. due to a question which was misunderstood or coded wrongly. This holds in particular for any comparative data, where different questions may be used to collect the same content in different countries or even in the same countries in different reference years.

To facilitate longitudinal comparison, we favour binary information indicating whether an individual is disadvantaged or not. Most of the required data are already collected in such dichotomies based on questions of the format 'can your household afford…' and the corresponding answer categories 'yes' and 'no'. Other questions concerning the availability of durables are slightly more complex. Their answer categories identify individuals who possess the item (e.g. TV set) and distinguishes between those who do not want to have it and those who cannot afford to have it.[15] In such cases we shall concentrate on responses which express a perceived lack of monetary resources.

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[14] In particular, we refrain from the popular technique of evaluating appropriate aggregations across different variables by factor analysis. In such a method, answers which do not comply with the underlying assumption are deemed as irrelevant noise, sometimes even justifying the exclusion of certain variables. However, the questions concerned will usually express some sort of disadvantage even if it may be peculiar to a certain social group which is not affected by other forms of disadvantage. Thus, aggregation will result in an unnecessary loss of information. A further problem with aggregation relates to the sometimes vastly differing prevalence of items which reflect disadvantage. These differences will not be removed by any weighting procedure, which would only introduce arbitrariness and further limit any straightforward interpretation.

[15] The latter response is often referred to as an 'enforced lack of an item'. This label is not fully appropriate. Individuals, who say they do not want to have an item, may have adjusted their expectations. Actually, their situation may reflect the same enforced lack than those who respond that some necessity is not affordable to them. Any statement on perceived affordability must consider available resources and expenses which will not necessarily be independent of preferences. If for example people say they cannot afford at least one week holiday away from home they may express that they chose for a couple of years to put all their money in building a house on the countryside rather than spending money on holidays. This hypothesis is confirmed by Austrian data, which shows marked regional variations in the affordability of holidays beyond regional disparities of resources (cf. Till-Tentschert/ Weiss 2008).

A decision needs to be taken to identify a threshold for severe disadvantage when more than 2 response categories are possible.[16] This is necessarily an arbitrary choice which is required only to allow a straightforward monitoring of change. We suggest following a principled approach. As a first general principle, disadvantage should relate to a minority population only and therefore only extreme categories comprising less than 50% of the population should be considered. As a second, more specific principle, we will take the mean plus one standard deviation of any approximately interval scaled variable as a benchmark.[17]

Thus, disadvantage was defined by the following response categories:

- 'make ends meet'(HS120): with difficulty or with great difficulty (codes 1 and 2 of 6);

- 'general health'(PH010): bad or very bad (= codes 4 and 5 out of 5);

- 'health limitations' (PH030): strongly limited (= code 1 of 3);

- 'housing cost' (HS140): somewhat a burden or a heavy burden (codes 1 and 2 out of 3).

The suggested procedure does allow for some discrimination between more severely disadvantaged and more advantaged positions when information is collected on an ordinal scale. Although less obvious, the same problem applies to questions which only allow for dichotomous answers. When the affordability of items such as holidays or meals is asked, the response could as well be understood as a matter of degree. For example, the Austrian Health Interview (HIS) survey 2006/7 contained this question from the so called WHOQUOL questionnaire: '*To what extent do you have enough money to meet your needs?*' Only 3% answered the extreme category '*not at all*' while 19% gave the opposite answer '*completely*'. The remaining 78% took one of the other 3 intermediary positions. From this perspective it appears advisable to collect more detailed information on the extent to which an item is perceived as affordable in order to gain better analytic control over the classification of disadvantage. In any case a careful cross-cultural evaluation of the cognitive perception of the labels provided with the response categories seems in place.

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[16] i.e. questions on the 'ability to make ends meet' (6 categories); general health (5 categories); burden of; limitations in daily activities (3 categories), housing cost (3 categories).

[17] In a normal Gaussian distribution about one sixth of the distribution would fall beyond this threshold. Therefore we can expect to identify minority populations of a similar size as given by the 'at-risk-of-poverty rate' in the European Population.

3. Gross change between 2006 and 2007

The following section introduces the available variables and gives an indication on how widespread different forms of disadvantage are in the population. For characteristics related to activation the reference population is the working age population.

To illustrate the magnitude of change, the figures presented here are percentages of the reference population. Thus, they do not express propensities for an event to occur. To estimate likelihoods of improvement, the numbers of persons experiencing an improvement would have to be related to the numbers of persons who were disadvantaged only.[18]

It should be borne in mind that change which is frequent in absolute terms will usually tend to produce also a large incidence at some point in time. In analogy, for items which are relevant to only small fractions of the population, also the numbers of people who change their position must be low. For example, if 1% of the population is disadvantaged in one year and 1% in the next, change can at most affect 2% of the total population.

3.1 Material deprivation

Changes in material deprivation items refer to basic needs such as the capacity to afford nutritious meals, to keep the house adequately warm, to pay a holiday from home, durables (telephone, computer, washing machine, colour TV and car) and the ability to cover unexpected financial expenses and not being in arrears with regular payments. It appears that turnover, or gross change differs significantly across these characteristics.

Least change is observed in the possession of household appliances which are widely available, such as a colour TV a telephone or a washing machine. Across the selected countries, 0.2 per cent of the population had no colour TV in 2006, but managed to get one in 2007. Similarly, the incidence of losing the ability to afford a TV is hardly noticeable. Also the frequency of changes in the affordability of telephones and washing machines remains below 1%.

A couple of items indicate change for between 4 and 10 per cent of the population. These include arrears, the affordability of food (meat, chicken or fish every second day), or a car.

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[18] An emphasis on differential propensities has the advantage that it allows to better identify driving factors and will be attempted at a later stage of the analysis. However, given that such risk factors are no longer tied to the absolute prevalence of any factor we deliberately limit this exploration to population counts.

More than 15 percent of the population changed their answers on questions on the affordability of a holiday, unexpected expenses or making ends meet.

Figure 1: Gross change for deprivation items, 2006-2007
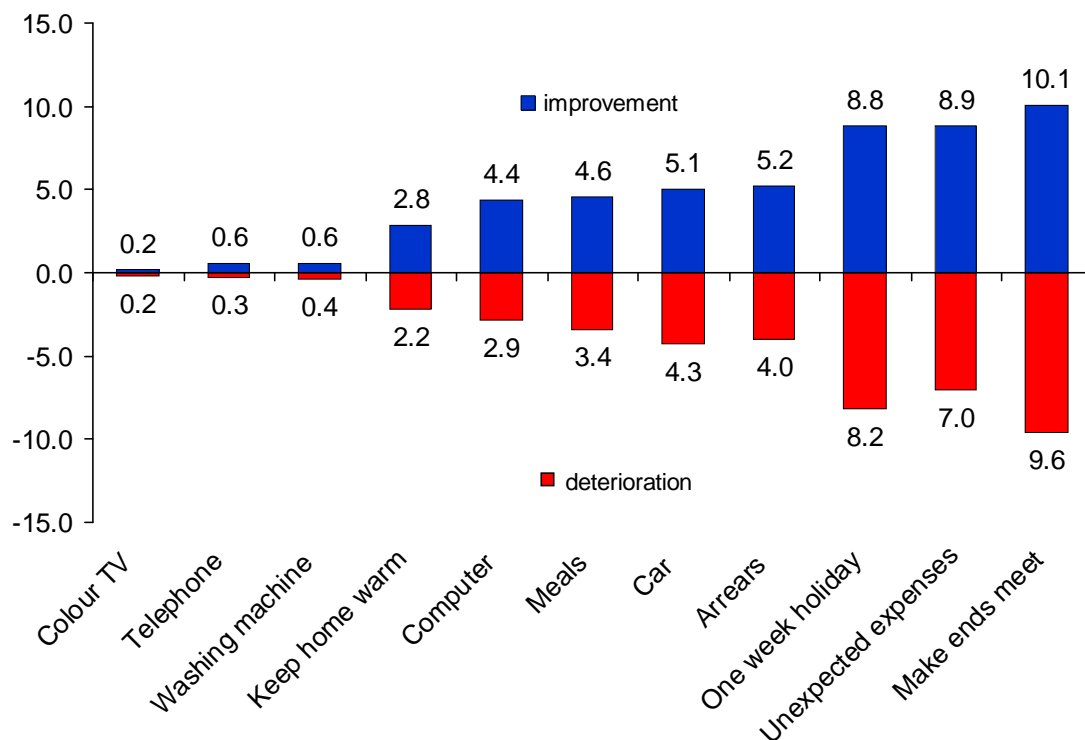
Source*:* EU-SILC Users' database (longitudinal EU-SILC 2007, release 2009)

Reading note: The bars above the horizontal axis represent the percentage of the population which has improved on the particular deprivation item, while bars below the axis represent deterioration rates

The following image summarises the net balance between two years for the longitudinal population. All items show a small positive balance indicating that living conditions did gradually improve. It appears that a lot of information remains hidden. Although the net balance for the availability of a 'car' (0.8%) and 'one week holiday' (0.6%) is very similar, positive and negative changes are nearly two times more frequent in the latter (17%) than in the former item (9.2%) Evidently, cross-sectional comparisons must underestimate the dynamics of living conditions and interventive strategies may benefit from further knowledge on how net change is actually generated.

Figure 2: Net change for deprivation items, 2006-2007
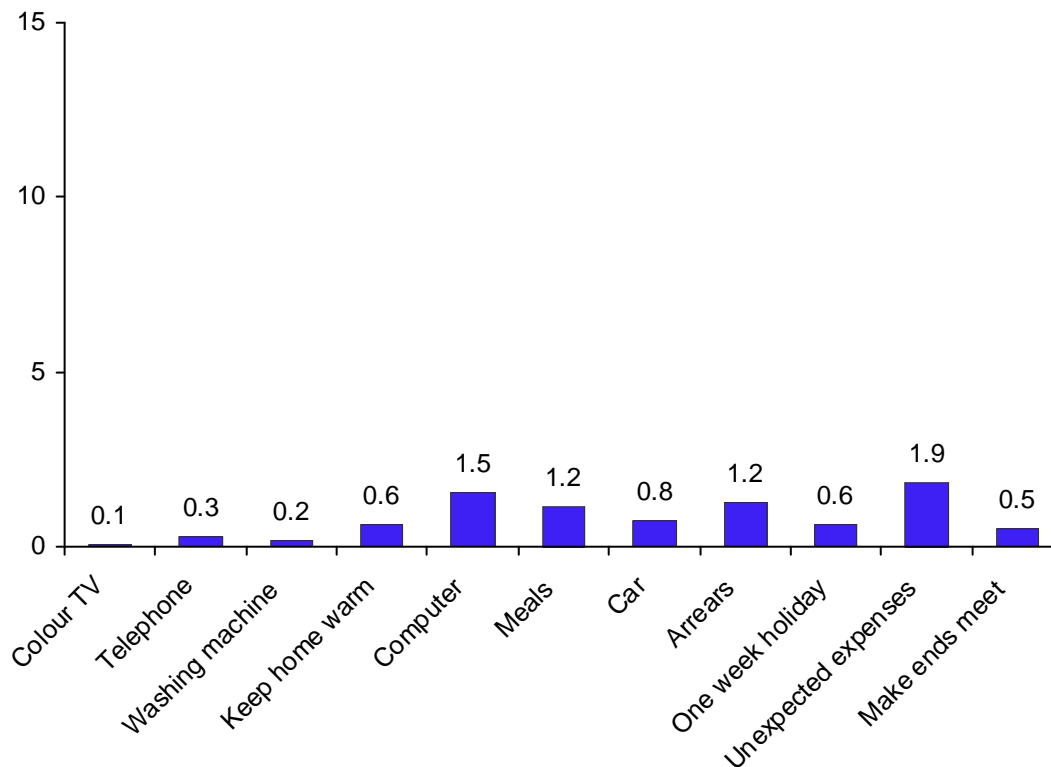
Source: EU-SILC Users' database

Reading note: The bars above the horizontal axis represent the percentage of the population which has improved on the particular deprivation item, while bars below the axis represent deterioration rates.

3.1.1 Implications for the further development of deprivation indicators

The measurement of change in material deprivation deserves special attention. In 2009 the Indicator Sub Group (ISG) of the Social Protection Committee (SPC) adopted additional indicators in the field of social inclusion for material deprivation and housing. The material deprivation rate was defined as: Share of population living in households lacking at least 3 items among the following 9 items: The household could not afford: i) to face unexpected expenses, ii) one week annual holiday away from home, iii) to pay for arrears (mortgage or rent, utility bills or hire purchase instalments), iv) a meal with meat, chicken or fish every second day, v) to keep home adequately warm, or could not afford (even if wanted to): vi) a washing machine, vii) a colour TV, viii) a telephone, ix) a personal car (European Commission 2010).

The evaluation of the material deprivation indicator will be different from a longitudinal perspective. With the exception of 'computer' and 'make ends meet' all the variables discussed above are used to construct the social inclusion indicator on 'material deprivation'. To limit the effect of measurement error and give higher importance to the least frequently lacked items, it had been decided

to define material deprivation on the basis of a threshold of at least 3 lacking items. However, not only the cross-sectional prevalence but also the longitudinal pattern of these variables is quite different. Two of the nine items depict massive turnover, while three items hardly change. As a consequence, the longitudinal pattern is highly sensitive to the change of certain items.

In particular, items on the possession of widely available durables such as 'TV' or 'washing machine' appear unsuitable for a longitudinal assessment of change in living standards. They typically exhibit an asymmetric turnover pattern, in which improvements dominate. Partly this results from technological progress, diverse product qualities and falling prices. But the affordability of durables may also give a distorted picture as the main cost of durables incur at their purchase and rather reflects past financial capabilities than current conditions. Once an item has been purchased, a deteriorated financial situation becomes visible only when an item needs an unaffordable repair or replacement or when an item can be sold to sustain living costs. As the life span of durables may expand over several years and the resale value may be diminishing, we find little variation in their affordability over time.[19]

For example, among those 34 million people who changed their position on the deprivation indicator between 2006 and 2007, very few had experienced a change on 'telephone' (2%), 'TV' (1%) and 'washing machine' (3%). These items hardly contribute to measured change on the deprivation indicator. On the other hand, only 25% of those who changed their answer on the item 'TV' did also change their position on the deprivation indicator. Hence, the majority of the already small turnover on this item is not reflected in the deprivation indicator.

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[19] Regular cost which typically incur for cars and telephones, but also as public broadcasting fees for TV would be more sensitive but are not the explicit focus of the question.

Table 1: Comparison of total turnover of deprivation items and the deprivation indicator, 2006-2007

	same answer on item		different answer on item			
	no change of material deprivation indicator	change of material deprivation indicator	no change of material deprivation indicator	change of material deprivation indicator		
	1	2	3	4	4/(3+4)	4/(2+4)
	in 1.000				in % of item change	in % of indicator change
TV	307 715	37 058	1 063	361	25	1
telephone	306 182	36 496	2 595	923	26	2
washing machine	306 741	36 379	2 037	1 040	34	3
car	298 259	30 631	10 519	6 788	39	18
holiday	266 562	24 813	42 216	12 607	23	34
arrears	289 167	24 652	19 610	12 767	39	34
meal	294 841	23 849	13 936	13 570	49	36
keep warm	291 083	23 409	17 694	14 011	44	37
unexpected expenses	265 004	22 487	43 774	14 933	25	40

Source: EU-SILC Users' database

Reading note: Column 4 implies that 361 thousand individuals have changed their answer on whether they can afford a TV and have at the same time changed their position on the material deprivation indicator. This amounts to 25% of all who changed their answer on this question but only 1% of all who have changed their position on the material deprivation indicator (last two columns)

On the other hand, turnover on the items 'holiday' and 'financial expenses' exceeds that of the most stable items by a factor of at least 15. People often change their answer on these questions. This is not necessarily a good indication of substantial improvement or deterioration. For example, respondents for whom affording a holiday is difficult but perhaps not completely impossible may answer differently between years although their situation did not change at all.

A consequence of the imbalanced turnover rates is that the observed change of the material deprivation indicator reflects the development of some items over proportionally. The Indicator Sub Group (ISG) of the Social Protection Committee (SPC) discussed the issue of weighting items. It had been decided to keep items unweighted to yield more transparent and understandable results. The underlying problem however appears aggravated from a longitudinal perspective. For the further development of indicators on material deprivation it appears desirable to establish a more balanced set of items on the EU-27 level.

As a possible solution, it may be considered to collect more differentiated information on the degree to which some items are perceived as unaffordable. When the response patterns are more diverse, this allows determining disadvantage more flexibly, also in view of a more balanced prevalence and longitudinal pattern.

Further, those items which exhibit only very low turnover (and prevalence) should possibly be excluded. These items cannot meet the criterion of responsiveness to changes in the standard of living of people and policy interventions (cf. Guio 2009 p. 3). Admittedly, in some countries, notably the Baltic States, items such as telephone appear of greater relevance to understand deprived livelihoods. To duly acknowledge their importance it would be necessary to include questions which are more tailored to national requirements in national (tertiary) social inclusion indicators.

It does not appear useful to further augment the set of items upon which the deprivation indicator should be constructed with questions on 'making ends meet' as they appear too volatile.[20] But it may be worthwhile to reconsider adding the question on accessibility of a PC and additional information on Internet access – if such data will be available from the EU-SILC 2009 module on material deprivation.

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[20] For pragmatic reasons it may be useful to select deprivation items such that the magnitude of change in the overall EU-27 deprivation indicator remains within the magnitude of the overall EU-27 at-risk-of-poverty rate. Items with a turnover drastically exceeding that magnitude will imply a low correlation of poverty risks and manifest deprivation and potentially undermine the credibility of the resulting indicators. A strategy of deliberately reestablishing the magnitude of the deprivation level on the European Level does not preclude significant departures for individual countries and hence allows a straightforward evaluation of differences between countries.

In any case, the measurement of deprivation requires extremely careful selection, translation and empirical testing of questions as well as response categories to obtain a reliable measure of deprivation and make the most efficient use of EU-SILC. The development of the WHOQUOL instrument gives an example how validity and cross cultural comparability of questions which involve subjective perceptions, can be ensured empirically In this effort, smaller scale surveys, cognitive testing and qualitative methods such as focus groups play an important role (cf. Angermeyer *et al.* 2000). At present such methods are not widely used in official statistics. While in the past, NSI's were mostly concerned with the collection of factual data, more recent legal acts such as the EU-SILC Regulation 1177/2003 clearly point beyond that.[21] To improve methods for the comparative collection of data on perceptions, better use of the methodological experience gathered in comparative academic surveys such as the European Social Survey is recommendable.[22]

3.1.2 An alternative option in the advancement of longitudinal deprivation measurement

One shortcoming of the present material deprivation indicator is its sensitivity to changes in one single item. Consider for example households who are in arrears and cannot afford unexpected expenses and holidays. This is the most frequent deprivation pattern among those who qualify under the material deprivation indicator. It comprises about 40% of all deprived persons. Even it is assumed that respondents report actual behaviour and are not forced to make difficult judgments on affordability, a change of the deprivation indicator can be misleading in this situation. Some households may decide to make a vacation, even if not reasonable given their financial situation. Their behavioural change may result from a shift of preferences and sacrificing of other needs or simply by taking the risk of running into further debts. In such a case the deprivation indicator implies an improvement where it may not be justified.

On the other hand the indicator remains insensitive to changes below or above the threshold. This is important given that the Eurobarometer 279 survey which was conducted in 2007 confirmed that every single item of the deprivation scale constitutes some sort of socially perceived necessity. The very same household – as given in the above example – may have additional problems in affording regular meals and keeping the accommodation adequately warm.[23] If this household experiences a qualitative change by which for example heating and meals become affordable, the indicator would fail to detect such improvement. Likewise a change in which a previously not disadvantaged household suddenly gets in trouble facing arrears and inability to cope with unexpected expenses will not be reflected in a change of the deprivation indicator as long as the number of deprivation items remains below 3.

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[21] The need to collect non-factual data to measure progress and quality of life is highlighted also in the Stiglitz-Sen-Fitoussi report.
[22] www.europeansocialsurvey.org
[23] In effect about 7% of all the deprived persons experience disadvantage in all these 5 items.

In analogy to the cross-sectional indicator, a possible solution would be to count the number of items on which change is experienced. The difference between the number of items which improved and the number of items which deteriorated for each person gives a straightforward measure of qualitative change. In order to consider only improvements which are not singular but in accordance with the improvement on other items we suggest to define multiple improvement as a situation where the number of improvements outweighs the number of deteriorated items by at least 2. Hence, we may also refer to qualitative change as (positive or negative) multiple improvement.

Table 2: Comparison of the longitudinal pattern of the material deprivation indicator and number of changed items (in % of the longitudinal population)

	Total	No indicator change	Indicator improved	Indicator deteriorated
Total	100	90	6	5
< 2 items change	88	84	**2**	**2**
2+ items improve	7	**3**	4	
2+ items deteriorate	5	**3**		3

Reading note: the first line of the table shows how many individuals from 100 have changed their situation according the material deprivation indicator (sums differ due to rounding). By contrast, the first column relates to the number of individuals who have changed on two or more items used for constructing this indicator. The diagonal cells show the percentage of the population for which both measures indicate the same longitudinal pattern while the **bold** figures in the second row and column represent the frequency of discordant patterns.

About 12% of the population experience multiple change which yields about the same magnitude of turnover as the deprivation indicator. The overlap between the two measures is surprisingly low, given that both measures refer to identical items. Only about 7 percent of the population have experienced multiple change which would also be detected by comparing the deprivation indicator (4% improved, 3% deteriorated). The same number of people (7%) experienced a confirmed qualitative improvement on at least two items without being detected by a comparison of the material deprivation indicator. On the other hand 4% of the population (about one third of those who changed their position on the material deprivation indicator) did improve only in one single item, which makes this measure particularly sensitive from a longitudinal perspective.

We may decide which approach is more suitable also on the basis of independent variables which are known to be correlated with poverty. An appropriate indicator for change will better reflect changes on these variables. The Rio Expert Group on Poverty Statistics recommended considering ill health and subjective poverty measures for the evaluation of deprivation items (Rio Group 2006, p 127). In EU-SILC these may be best captured by the variable on subjective general health (PH010) and the ability to make ends meet (HS120). While the latter variable captures economic strain of the household, the former is particularly relevant to individual change.[24] As additional household characteristic we may also include income differences, although this will appear as the least reliable indicator of change for the above mentioned problems of income measurement. The three evaluation criteria have a different scale and dispersion and for convenience we divide the absolute change by the standard deviation of each variable.[25] The table reveals that the average deterioration of all evaluative criteria is bigger for multiple deterioration than for indicator deterioration. Also improvement is bigger when qualitative improvement is considered as a measure of change. It is noteworthy that income changes are more pronounced in nominal terms than in national dispersion units. For example, the average loss of equivalised income amounts to about 330 Euro per annum in the case of multiple deterioration and to an average gain of almost 1100 Euro in the case of multiple improvement.

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[24] While the Rio Group recommends to control health variables for age and gender this appears unnecessary when making a judgement on individual change as these characteristics can be assumed as almost static (between two years). Whether a validation of deprivation items against independent but poverty related variables has yet been attempted, remains unclear from the presently available documentation on the development of the deprivation indicator (Guio 2009).

[25] We use the standard deviation of the first of the two years considered (i.e.2006). To take differences between countries (e.g. price levels) into account we use the standard deviation for each country.

Table 3: Validation of different measures of change by changes in independent but poverty related variables

	Differences expressed in standard deviations					
	general health		making ends meet		equivalized income	
	multiple	indicator	multiple	indicator	multiple	indicator
deterioration	-.09	-.08	-.50	-.37	-.02	.02
no change	-.02	-.01	.05	.05	.09	.09
improvement	.08	.05	.53	.40	.16	.15

Source: EU-SILC Users' database

Reading note: The value of -0.9 in first row and column represents the average number of standard deviations by which the general health score is reduced when qualitative deterioration is observed (i.e. more than two items deteriorate). The value of -.08 in the next column gives the equivalent figure for individuals who have a deteriorated status on the material deprivation indicator. The bottom is to be read in analogy as standard deviations of improved health when there is either a qualitative improvement or improvement of the material deprivation indicator

In summary, multiple change appears to better account for transitions in material deprivation than the comparison of the material deprivation indicator over time. Such a measure is also less sensitive to the imbalance of prevalence and turnover and measurement issues and more responsive to real changes in living conditions.

3.2 Housing integration

The need for indicators on housing conditions was already expressed in the recommendations of Atkinson *et al*. (2002). Consequently, housing was foreseen as a primary indicator. In 2009 the Indicator Subgroup (ISG) of the Social Protection Committee (SPC) discussed several options for possible indicators considering aspects of affordability, crowding and housing quality. The ISG concluded that in view of the presently available data, no reliable primary indicator can be established. A decision was made to instead include the following two secondary indicators in the social inclusion portfolio (1 & 2 below) and additional context information (3 & 4 below):

  ➢ Housing costs overburden rate (secondary indicator)
    Percentage of the population living in a household where total housing cost (net of housing allowances represent more than 40% of the total disposable household income (net of housing allowances)

  ➢ Overcrowding rate (secondary indicator)
    Percentage of people living in an overcrowded household

  ➢ Housing deprivation by item (context information)
    Percentage of the population deprived of each housing deprivation item, and by number of items

> ➤ Share of housing costs in total household income (context information)
> Median of the distribution among individuals of the share of housing costs (net of housing allowances) in total disposable income (net of housing allowances)

The available longitudinal data on the housing situation is restricted to essentially four aspects:

> ➤ shortage of space (measurable by number of rooms and persons living in one dwelling)
>
> ➤ burden of housing cost (measured as a subjective statement)
>
> ➤ Leaking roof, damp walls/floors/foundation or rot in windows frames or floor
>
> ➤ dwelling without indoor flushing toilet or without bath or shower.

In particular, the longitudinal data do not contain information on the actual amount of housing cost paid and the perceived problem of a dwelling which is too dark and has not enough light. Apart from the crowding rate, it will not be possible to construct a corresponding longitudinal indicator.[26]

Figure 3 shows positive and negative changes in the four selected housing dimensions. While the items 'indoor toilet/shower' and 'overcrowding' practically show only little dynamic, particular movement can be observed for 'leaking roof' and 'heavy housing cost'. For the latter, about twelve out of hundred persons are found to change their answer positively, whereas 11 perceived housing cost more burdensome than in 2006. The question on housing quality referred to as 'leaking roof' indicate that 8 per cent escaped from the faced problems in this dimension in the second year but not in the first year of interview.

**Figure 3: Gross change for housing items, 2006-2007**
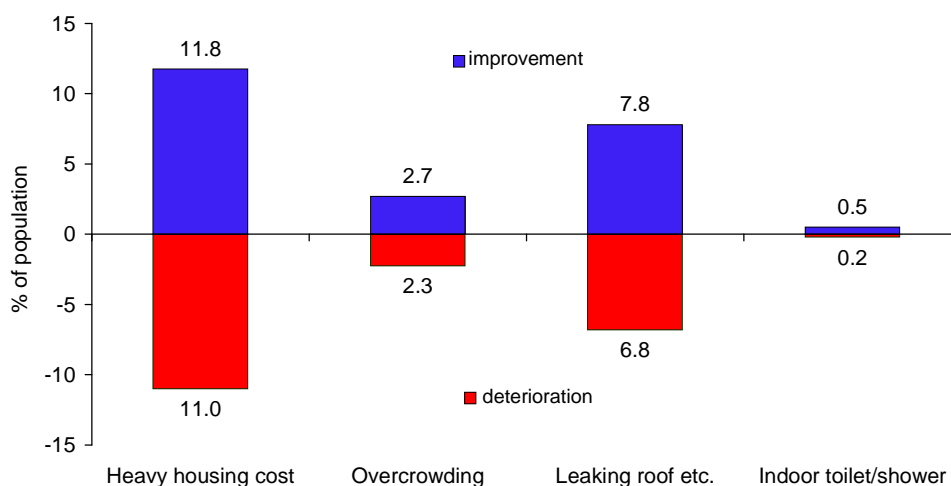
Source: EU-SILC Users' database

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[26] In fact it is not even possible to exactly reproduce the crowding indicator in the Users' database given that the variable which counts the number of rooms (hh030) is recoded to a maximum value of 6.

For most items the population which is persistently disadvantaged has approximately the same size as the population which experienced a transition. Only 'crowding' appears comparatively 'sticky'. While a leaking roof may be repaired or the burden of housing cost may be alleviated by increased incomes – and even amenities can often be built into an existing dwelling – 'crowding' will mostly occur when a child was born and improve by relocation. Consequently, figure 4 depicts a persistence rate for 'overcrowding' (15%) which is threefold of the total change (5%) in this variable. Figure 4: Persistence and total change for housing items

**Figure 4: Persistence and total change for housing items, 2006-2007**
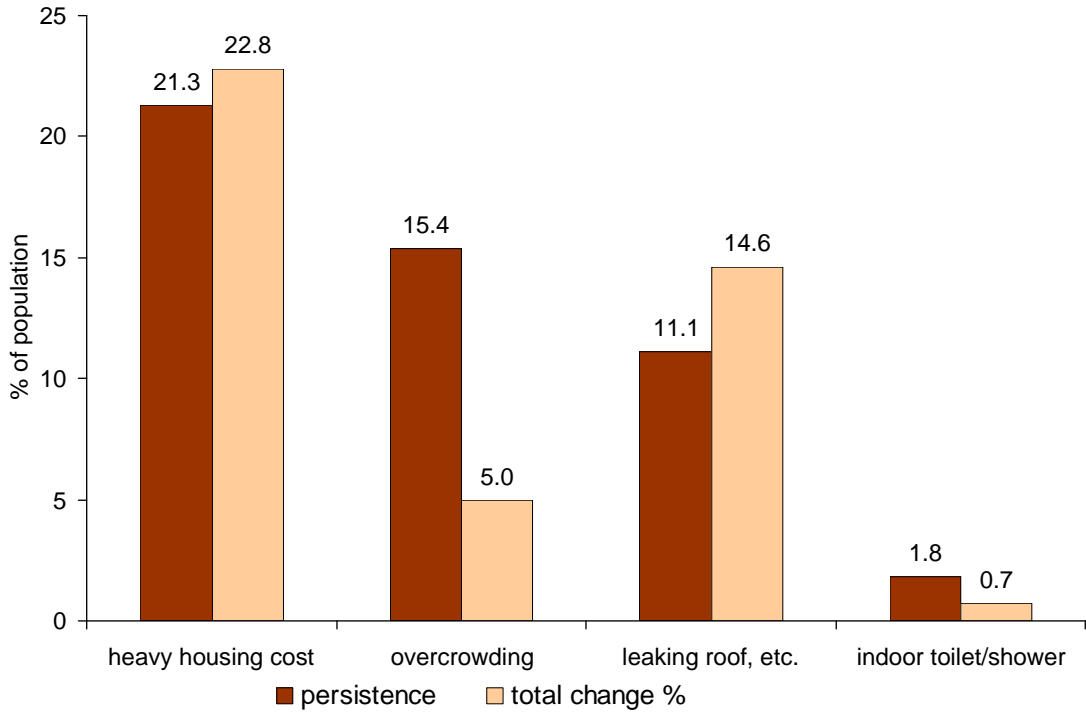
Source: EU-SILC Users' database

3.3 Health conditions

For the longitudinal analysis three variables on the subjective health condition of adults in the sample are available: general health, chronic illness and limitations in activities.[27]

Overall change suggests a slightly negative balance for all three items. Because we focus only on the extreme transitions, bad 'health' status shows less mobility than 'limitations' and 'chronic illness'. Across all three items health changes appear slightly more frequent among women than among men.

Figure 5a: Improving health conditions for men and women, 2006-2007
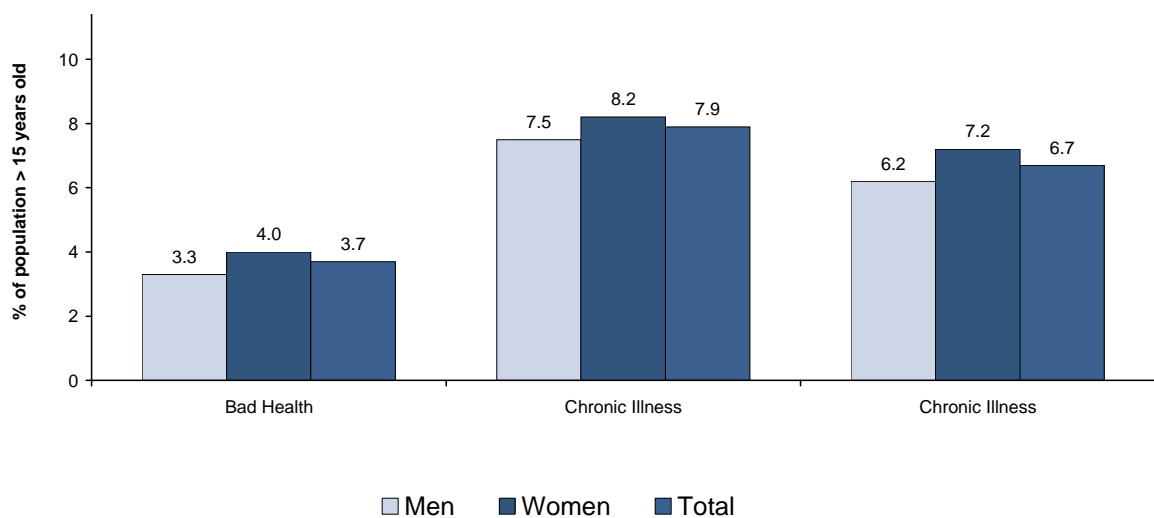
Source: EU-SILC Users' database

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[27] General health is a subjective measure that allows five response options (very good, good, fair, bad, very bad). For our purposes we recoded 'health' into a binary variable and examined transitions between the collapsed categories 'bad' and 'very bad' and less disadvantaged response categories. For 'limitations' we distinguish between categories corresponding to 'yes, strongly limited' as the disadvantaged group and those who state 'not limited', or 'yes, limited' as the less disadvantaged group.

Figure 5b: Deteriorating health conditions for men and women, 2006-2007
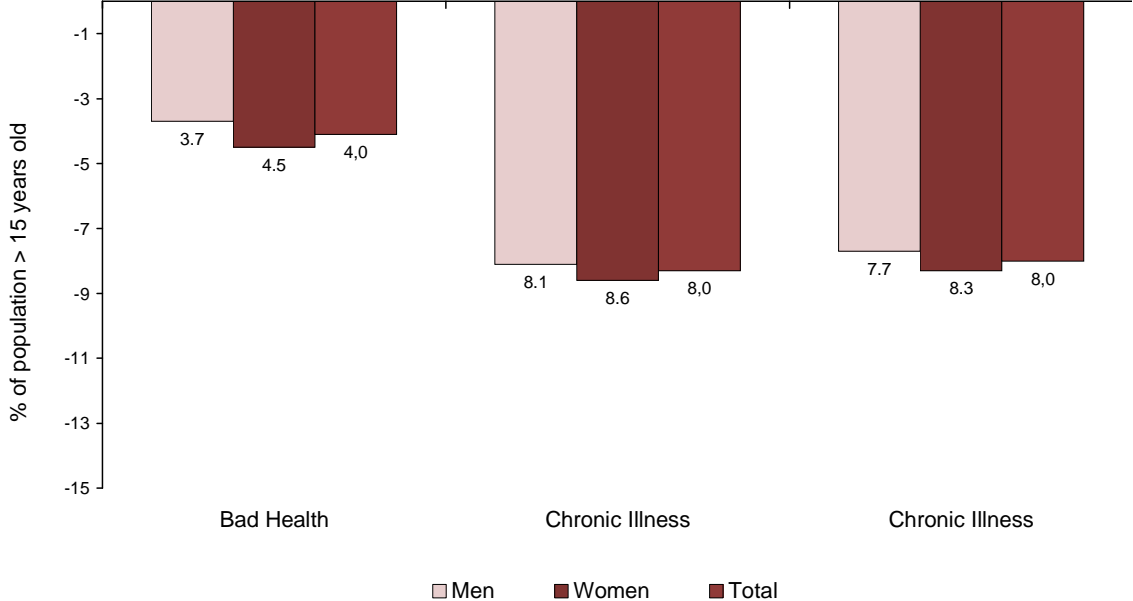
Source: EU-SILC Users' database

Disparities between countries can be especially observed in 'limitations' in daily activities. Improvements vary from roughly 5 per cent in Poland to 13 per cent in Finland, while deteriorations vary from 5 per cent in Iceland and the Czech Republic to 11 per cent in Slovenia, Spain and Finland. While in the majority of the countries exits and entries are approximately balanced, two countries feature asymmetric changes: about 12 per cent of Iceland's population gets out of disadvantage, while only 5 per cent of the population were not disadvantaged in 2006 but report strong limitations in 2007. The opposite seems to be true in the case of Italy: six out of hundred state improvements, but nine of hundred report worsened limitations.
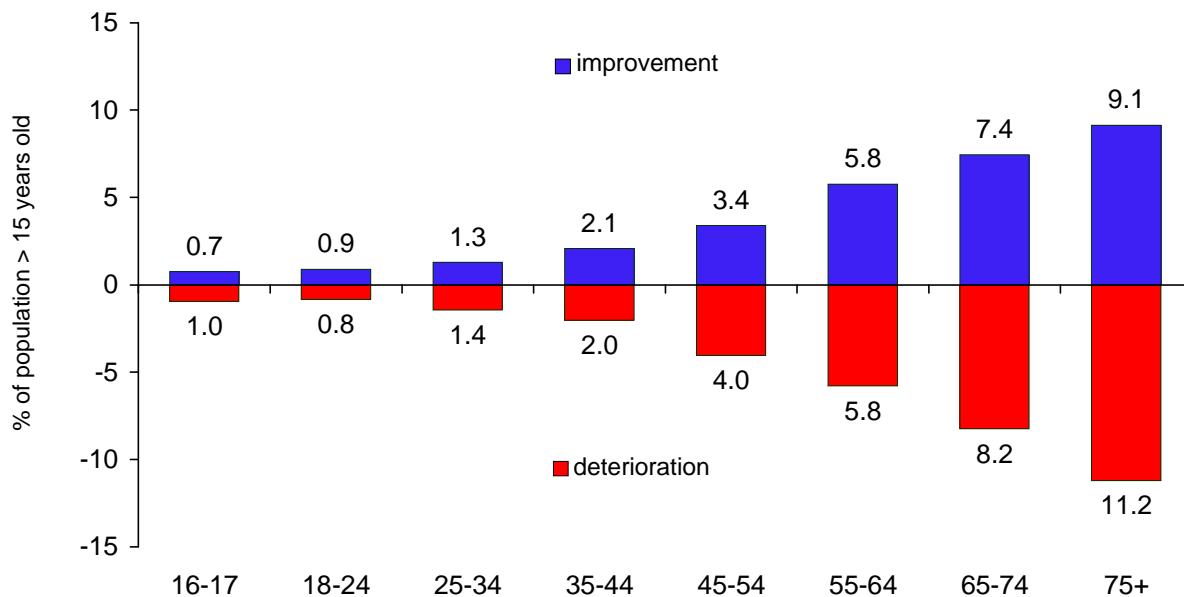
Figure 6: Percentage of the population improving on health conditions by countries, 2006-2007

Source: EU-SILC Users' database

It may not be very surprising to see that older ages show higher rates of worsening health conditions, but it will be interesting to note that improvements are not infrequent either. The higher incidence of health problems in old age is mainly a consequence of persisting disadvantage. About a half of the persons older than 75 reports a chronic illness in both years, while this holds only for about 5 per cent of the population between 18 and 24. The age gradient of persistent health disadvantage is even more pronounced when we look at the numbers reporting bad 'health' or 'limitations'.

## Figure 7: Gross change in health conditions by age groups, 2006-2007

Source: EU-SILC Users' database

Reading note: The bars above the horizontal axis represent the percentage of the population which has improved on the health item, while bars below the axis represent deterioration rates

Figure 8: Persistence of disadvantaged health conditions by age groups, 2006-2007
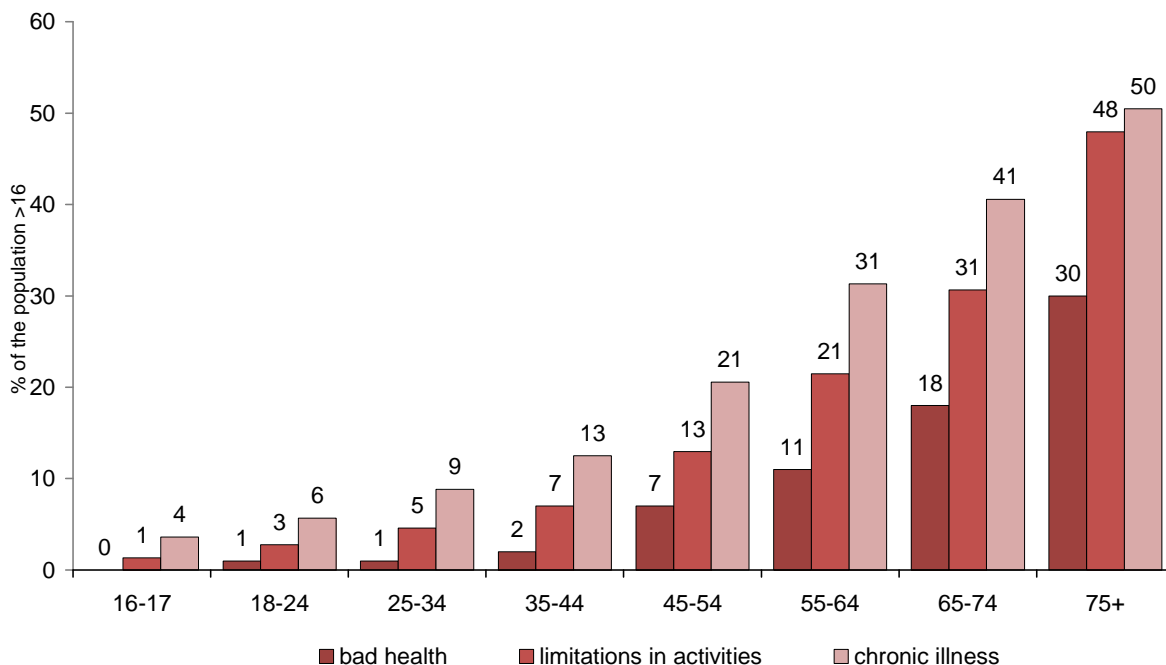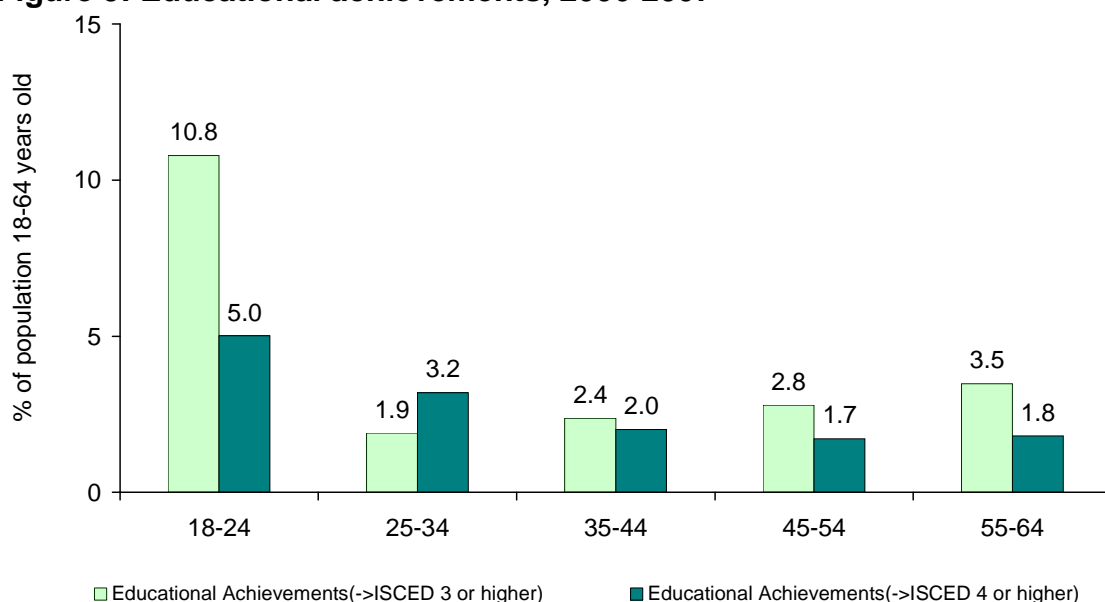

Source: EU-SILC Users' database

3.4 Education

EU-SILC data provide extremely limited information on education. This appears even aggravated in the longitudinal dataset where the information is essentially limited to two variables. One of these is the 'Highest ISCED Level attained' of adults (Variable PE040) for which a reliable comparative measurement is particularly difficult. Following the description of SILC user database variables, 'educational attainment of a person is the highest level of an educational programme the person has successfully completed. […] Persons, who have not completed their studies, should be coded according to the highest level they have completed'. The coding of the original variable is as follows:

    0 = pre-primary education

    1 = primary education

    2 = lower secondary education

    3 = (upper) secondary education

    4 = post-secondary non tertiary education

    5 = first[28] or second[29] stage of tertiary education.

Figure 9 shows changes of educational levels in different age groups. We distinguish two different variables: 'Educational Achievements (> ISCED 3 or higher)' refers to persons who completed secondary education in 2007. Variable 'ISCED > 4' includes attaining a higher education level in 2007.

Figure 9: Educational achievements, 2006-2007

Source: EU-SILC Users' database

[28] not leading directly to an advanced research qualification
[29] leading to an advanced research qualification

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accounting for gross change in Europeans living conditions ■eurostat

Strong differences in changes of educational level can be seen between different age groups. Not unexpectedly, educational achievements are most frequent in the age group between 18 and 24 years, whereas findings for older age groups appear implausibly high, probably indicating the presence of misclassifications which are difficult to detect ex-post.

3.5 Employment

In EU-SILC employment dynamics are mostly reflected in changes of the 'self-defined current economic status'.[30] Activation here refers to either: (i) persons taking up work in 2007 or (ii) changing from part-time to full-time employment. Conversely, deactivation denotes changes in the opposite direction. In total, 7 per cent of the population between 18 and 64 has either taken up work or increased working hours in 2007. With 5 percent most of this activation is due to people who (re-) enter the labour market, while about 2 per cent changed from part-time to full-time employment. In total, 6 per cent reduced their work (2%) or left the labour market (4%).

Figure 10: Employment transitions between 2006 and 2007
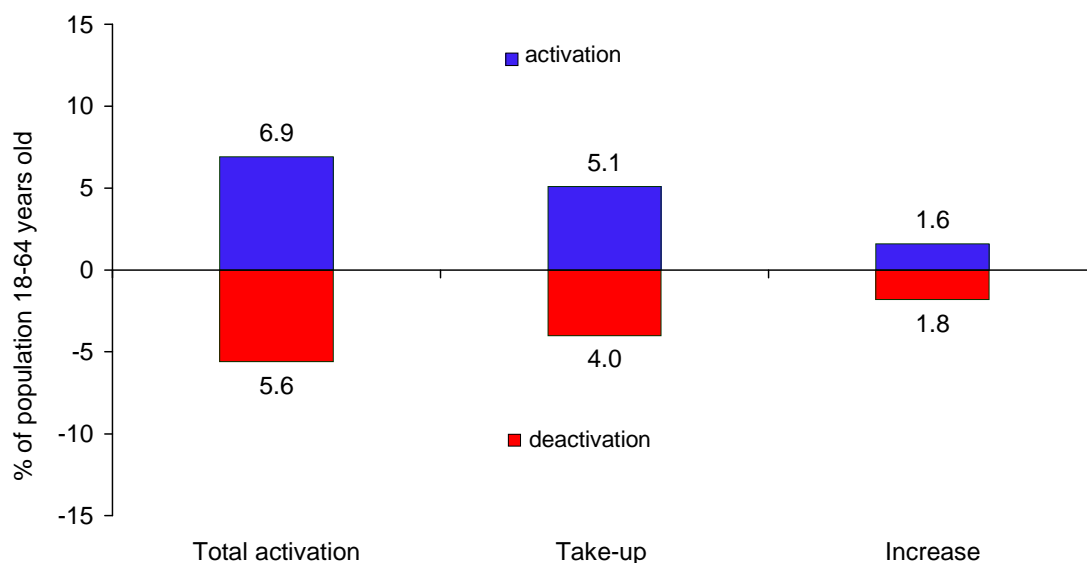
Source: EU-SILC Users' database

Reading note: The bars above the horizontal axis represent the percentage of the population which has improved on the employability, while bars below the axis represent deterioration rates

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[30] Two problems are noteworthy for the longitudinal analysis: this variable captures the person's self-perceived main activity at the time of the interview. In case of more than one parallel activity inconsistent answers over years may be more frequent, without however indicating a true change of the activity. The second problem lies in the fact that it is unknown how long the 'current status' already persists, for example in the case of seasonal employment or phases of transitory unemployment.

The highest rate of activation can be found with 24 per cent in the group 18-24. 13 per cent take up an employment, 11 per cent change from part-time to full-time work. Around 63 per cent of these were pupils, students, trainees or made unpaid work experience 2006. Also the group 25-34 exhibits a relatively high dynamic into employment (9%). Both younger age groups exhibit also a high exit rate out of employment. For 47 per cent of the exits the destination is unemployment. 28 per cent left employment to fulfil domestic tasks and care responsibilities. In total 53 per cent of the exits from employment are experienced by women. Among those who changed from fulltime employment to part-time employment, 68 per cent are female. Among those who took over domestic or care tasks even 93 per cent are women. Conversely, 64 per cent of those becoming unemployed are men.

Figure 11: Take up or termination of employment by age groups, 2006-2007
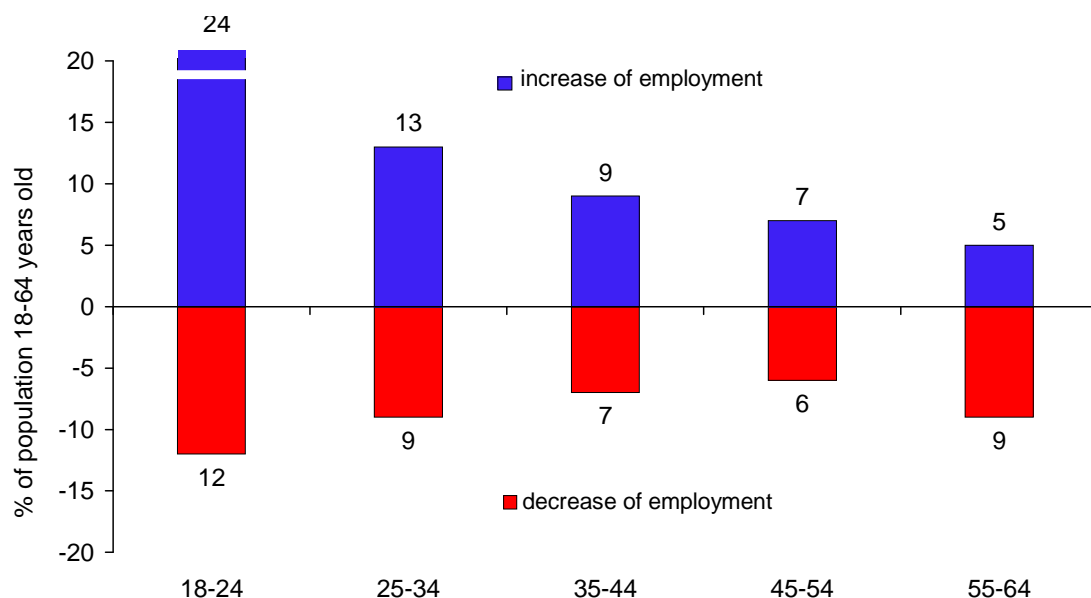

Source: EU-SILC Users' database

Reading note: The bars above the horizontal axis represent the percentage of the population which has improved on the employment situation, while bars below the axis represent deterioration rates

The shifts from part-time to full-time work and from full-time to part-time employment can be seen from the following figure. Again, the most dynamic share can be observed in the age group 18-24. About 6 per cent changed from part-time work to a full employment while only 4 per cent moved in the opposite direction. Among the age group 55-64 3 per cent switched to part-time employment, while 2 per cent changed from part-time to full time employment.

Figure 12: Transitions between part time and full time employment, 2006-2007
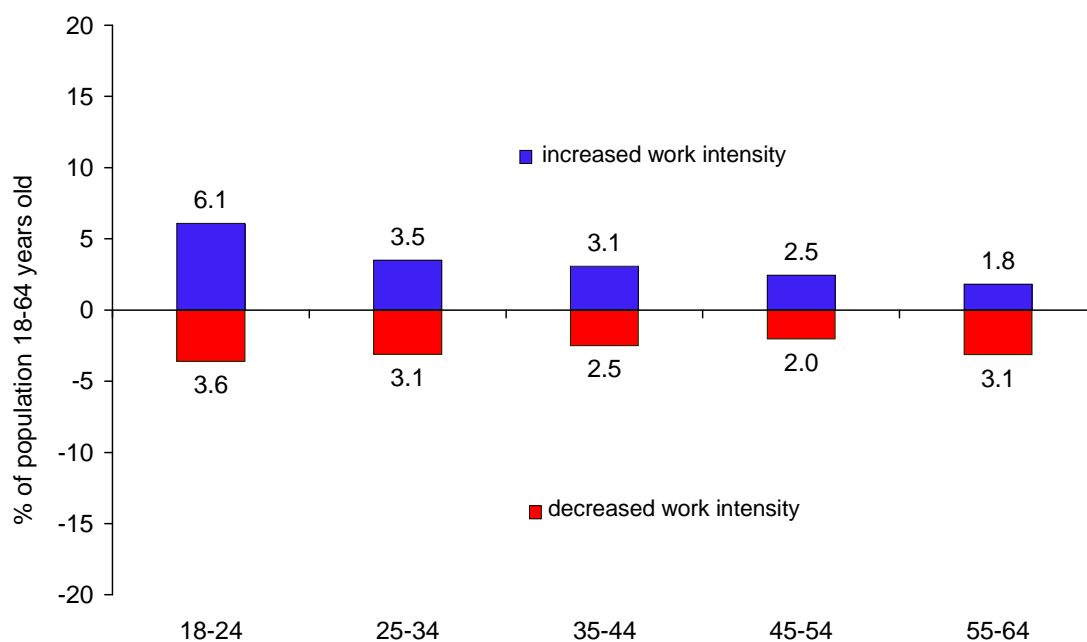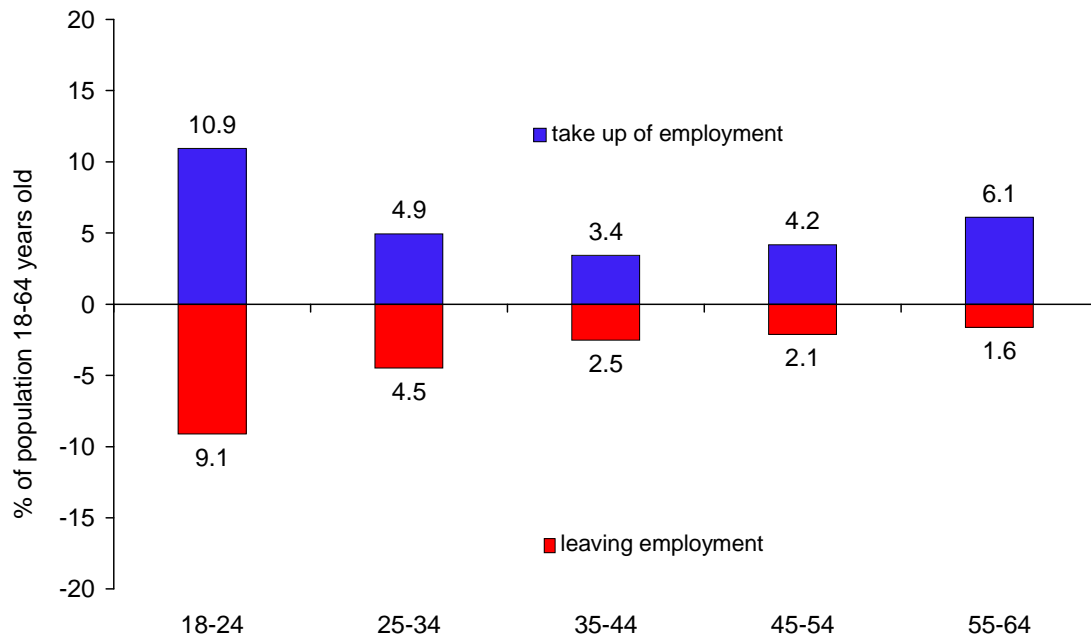

Source*:* EU-SILC Users' database.
Reading note: The bars above the horizontal axis represent the percentage of the population which has intensified work engagement, while bars below the axis represent reduction rates

Transitions between work and unemployment merit special attention. Mostly young people are concerned. Between 2006 and 2007 roughly 11 per cent of persons in the age group 18 to 24 left the ranks of the unemployed while 9 per cent entered it. This yields a remarkable positive net balance reflecting the relatively favourable labour market prospects in 2007.

About 65 per cent of the unemployed in 2006 were employed in 2007 (74% for the age group between 18 and 24) while only 4 per cent entered retirement (30% in the age group 55-64).

On the other hand, 48 per cent of the people who became unemployed in 2007, were fully employed before and a further 11 per cent worked part time. 16 per cent were in education or training (around 50 per cent of age group 18-24) and 13 per cent were involved in domestic or care tasks in 2006. Between countries, absolute differences in unemployment dynamics are relatively modest compared to other forms of disadvantage. Apparently, economic and labour market developments depend more on European and global events than on the national labour market policies and economies.

Figure 13: Transitions into and from unemployment, 2006-2007

Source: EU-SILC Users' database.

Reading note: The bars above the horizontal axis represent the percentage of the population which has left unemployment, while bars below the axis represent entry rates into unemployment

Concomitant changes

In real life, change usually implies a broader alteration of living conditions, not a single variable which takes a different value. Indeed, our analysis reveals that changes often occur simultaneously across different variables. These associations cannot necessarily be interpreted in a causal way. At best, they may give an illustration of the impact of, say unemployment on the aggravation of deprivation and other forms of disadvantage. In the following, we present a few exemplary situations to illustrate the concomitance of change in everyday life. These examples are necessarily selective. In a later section the observed relationships will be evaluated more systematically by a multivariate statistical model, which – among other factors – will also take into account country differences.

3.6 Changes in employment activation and deprivation shifts in lifestyle dimensions

Ultimately, production depends on labour. Hence, an active inclusion strategy which aims to bring people closer to the labour market can contribute to growth. This will ideally also improve the incomes of the disadvantaged and make their social security more sustainable. But even if 'work pays' and incomes are improved, this may not yet be reflected in an overall improvement of living conditions. For example, a lone parent who takes up work may face additional cost for childcare or a long-term-unemployed person may have increased mobility cost, that are not necessarily compensated by additional earnings. This is neglected in 'making work pay indicators' which are derived from the simulated income gains of average workers in model families. The longitudinal analysis of EU SLC data can provide more empirical evidence as to what extent employment is actually reflected in an improvement of living conditions more generally. The relevance of employment may be illustrated by answering questions such as: 'Does lifestyle deprivation improve when people take up or increase work?' On the other hand, we may guess the effectiveness of social protection provided jointly by family resources, income support and public services by ascertaining how strongly living conditions deteriorate when somebody loses his or her job? While no statements on directed causality are intended, we find some evidence along these lines.

The following figures compared different situations in which people take up or leave employment:

The analysis is limited to persons between 18 and 64 years and focuses on those lifestyle dimensions which were found to show a high degree of change.

Figure 14: Deprivation shifts when taking up or leaving work, 2006-2007
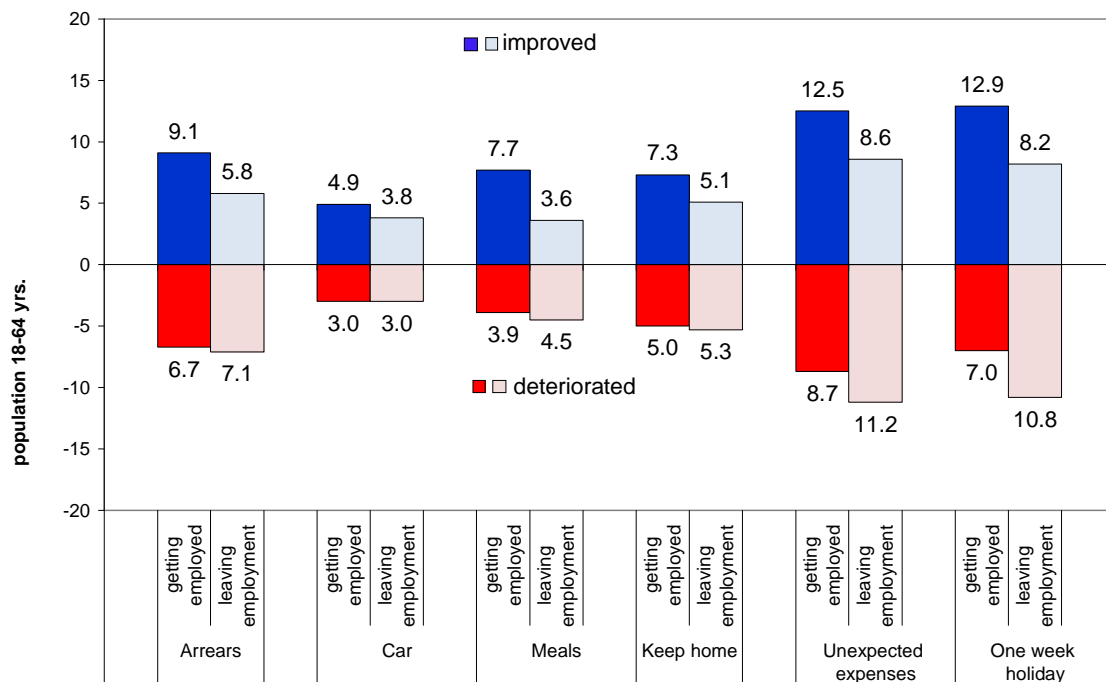
Source: EU-SILC Users' database.

Reading note: The bars above the horizontal axis represent the percentage of the population which has improved on the particular deprivation item, while bars below the axis represent deterioration rates. In this graph, for each item, the left bar always represents changes for working age individuals who took up work while the right bar refers to individuals who left employment

All figures suggest that positive activation promotes exits from deprivation, while a reduced employment activity tend to be accompanied by higher deterioration rates in certain dimensions. People who took up work in 2007, experienced improvements more frequently than persons of working age (18 - 64) who left work. For example, 13 per cent of those who took up work attained a position where they could afford one week of holiday per year compared to only 8 per cent of the people leaving work. On the other hand among the same groups of people we find about 7 and 11 per cent who formerly had this position and now claimed they could no longer afford a holiday. Hence, it would be justified to say that activation will usually improve not only income but also living conditions more generally. Nonetheless, for a significant number of people activation alone does not automatically guarantee protection against deteriorated living conditions.

3.7 Changes in health activation and deprivation shifts in lifestyle dimensions

The ability to participate in the labour market and to prevent material and social deprivation depends on the physical and psychological condition of a person. The relevance of health can be illustrated by examining concomitant changes in lifestyles. The key issue is: 'Does activation and lifestyle deprivation improve, when people state that their general health status has improved?'

The comparison of peopling 'getting (physically or psychologically) better' with those getting worse gives a clear result. In all dimensions positive changes are more frequent among persons whose health condition has improved than for those whose reported health got worse. A couple of items indicate change for between 11 and 18 per cent of the population 'getting better'. These include the ability to keep home warm, to afford a holiday, to pay unexpected expenses and to make ends meet. Even the affordability of food improves with 10 per cent. About 9 per cent changed their answers on questions concerning the affordability of a computer and if they have arrears. On the other hand, negative changes are more frequent among people whose health got worse. Both groups, however, show high dynamics in both directions. This might be ascribed to the fact that we don't know how long each individual status already persists. Persons, who feel slightly better at the point of the interview, might still spend a huge amount of their income on medication, such as people who just got worse. This might explain higher dynamics in 'make ends meet'.

Figure 15: Deprivation shifts when changing health status, 2006-2007
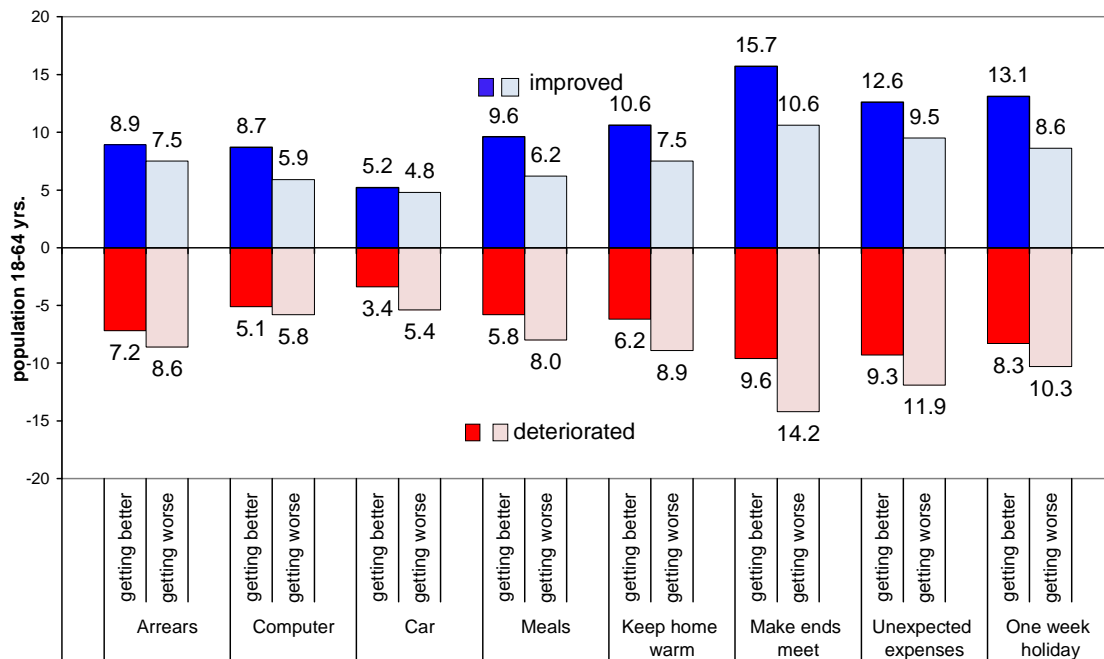
Source: EU-SILC Users' database.

Reading note: The bars above the horizontal axis represent the percentage of the population which has improved on the particular deprivation item, while bars below the axis represent deterioration rates. In this graph, for each item, the left bar always represents changes for working age individuals who improved health status while the right bar refers to individuals who deteriorated their health status

'Getting worse' or 'getting better' in health dimensions (including also the limitations of daily activities) is frequently accompanied by simultaneous changes of deprivation. While no statements about direct influences can be made, the analysis of concomitances gives some evidence of the potential of health status as a constraint for activation. Especially negative changes in health go along with increased exits of employment: 9 persons out of one hundred whose health status has deteriorated from one year to the next have left employment; only 4 per cent got employed. Therefore negative employment balances can be observed for people whose health depreciates.

3.8 Changes in education activation and deprivation shifts in lifestyle dimensions

In the following, we compare the share of population that completed an educational level in 2007 with the share of people whose educational level remained below ISCED 3 in both years. Focusing on our first variable (educational achievement), positive changes in most items do not differ significantly between both groups. Even more people with lower formal education get a computer (7%) than the other group (4%). The picture looks very similar also when higher educational achievements are considered, indicating that returns to education are hardly noticeable in a short term comparison.

Figure 16: Deprivation shifts when completing educational level, 2006-2007
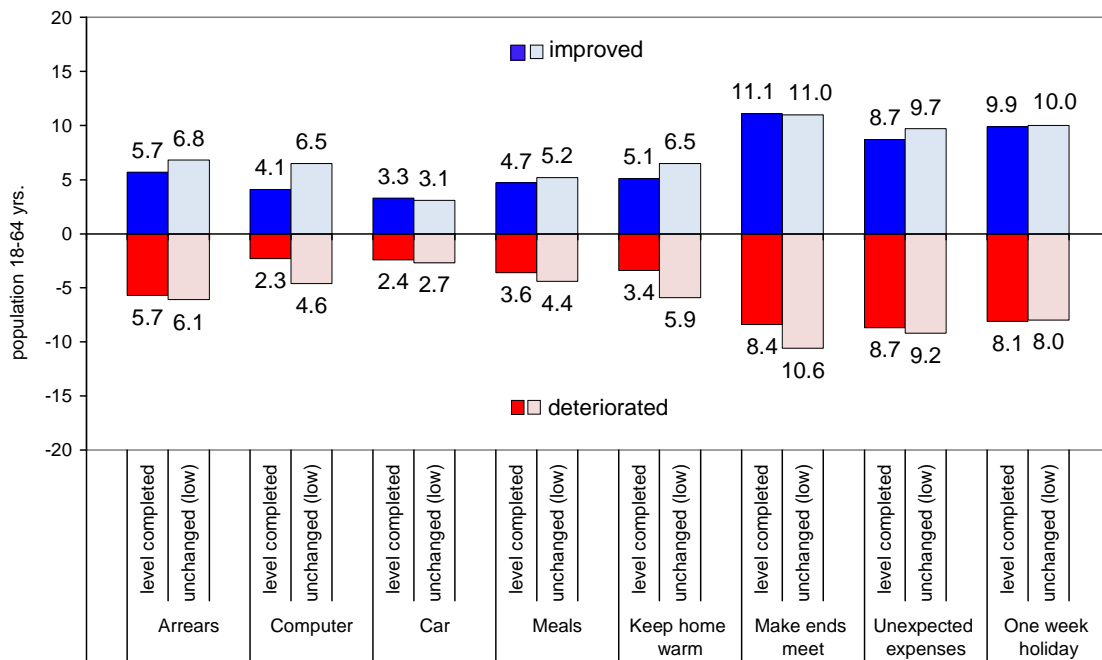

Source: EU-SILC Users' database.

Reading note: The bars above the horizontal axis represent the percentage of the population which has improved on the particular deprivation item, while bars below the axis represent deterioration rates. In this graph, for each item, the left bar always represents changes for working age individuals who achieved a higher education level while the right bar refers to individuals whose educational level remained unchanged

While it appears impossible to detect a short term relationship between educational achievements, the latter remain an important determinant for activation. Without minimum qualifications it is difficult not only to find adequate jobs, but also to keep them. This can be easily shown by comparing the main economic status of people who completed secondary education. 73 per cent of this group stated to be employed in 2007, 5 per cent named unemployment as current economic status. Only 52 per cent of people, who had no secondary education in 2007 stated to be in work. 8 per cent declared to be unemployed. It can be said that higher levels of education, generally lead to higher participation in the labour market in the long run. 83 per cent of the people, who had a post-secondary or tertiary education in 2007, stated to be employed. 3 per cent were unemployed.

Figure 17: Economic activity by level of education, 2006-2007

Economic activity by level of education
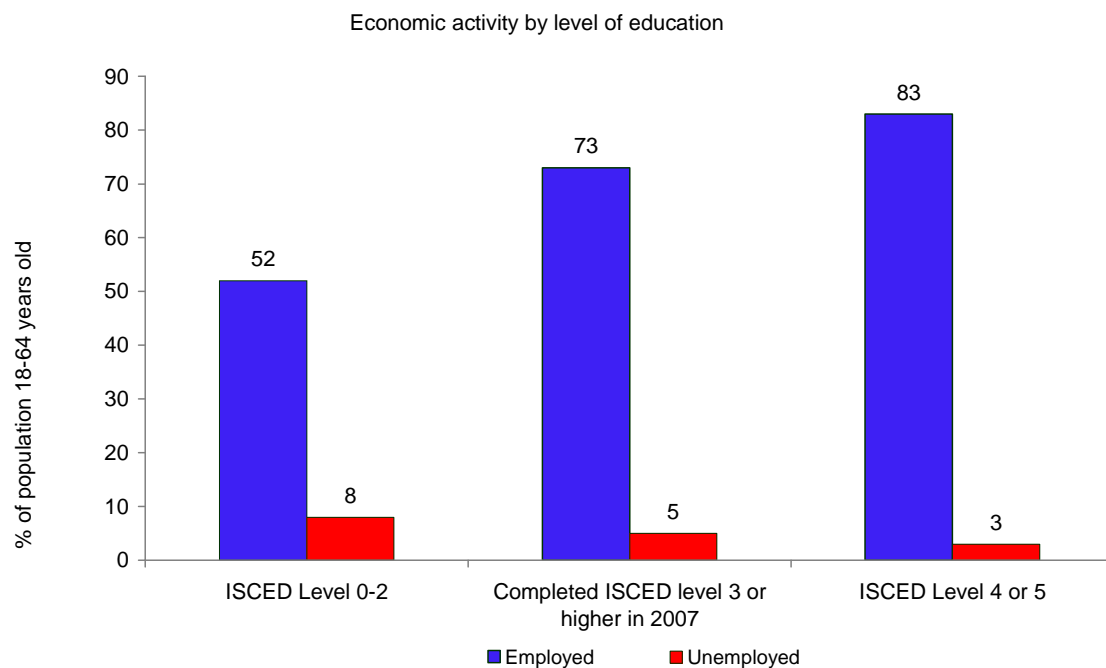
Source: EU-SILC Users' database

The high rate of people with secondary or tertiary education in employment corresponds to rates for work-take up increasing with education. Labour market entries are more frequent for those who completed secondary or tertiary education than on average: 9 per cent of those who completed secondary education got into employment in 2007, more than 13 per cent of post-secondary or tertiary degree holders and only 6.5 per cent of the average population aged between 18 and 64. The completion of an educational level therefore results in higher entry rates into labour market, while exit rates stay on average. This clearly indicates the importance of getting people into higher qualifications for activation as can also be seen also in Table 2.

Table 4: Entries into employment, 2007

	Average	Educational level completed	High level completed
Entries into employment	6.5	9.0	13.4
Entries into full-employment	6.6	8.6	12.4
Entries into part-time employment	3.4	4.4	4.8

Source: EU-SILC Users' database

4. Winners and losers in a model of multiple change

Once the empirical significance of change is recognised, questions arise on what drives it and whether there are groups who particularly benefit or fall victims to change. This paper showed a number of characteristics which tend to go together with change and it was demonstrated that many changes occur concomitantly. Notwithstanding the significance of these associations, it is impossible to identify driving factors upon the sole inspection of relationships between two characteristics or their trajectories over time. Usually, a phenomenon is related to several other, often interrelated phenomena. For example all activation resources such as health, education and employment must be understood as mutually related determinants of material deprivation. Employment prospects appear to depend strongly on health and education but the latter may independently exert influence on deprivation, for example by determining pay levels or health expenses.

An indication of the genuine contribution of any single factor and possibly dominant patterns can be obtained from multivariate regression analysis. The regression method typically assumes that the variation of a certain characteristic can be decomposed and attributed to partial (linear) relationships with predictor variables. Hence a model needs to be formulated, specifying the characteristics which are thought to contribute to the outcome. For convenience we restrict the analysis to material deprivation only and disregard possible feedback relationships. Thus, for example we postulate that resources of activation such as health, education and employment have all significance for multiple changes in material deprivation. The main results from this analysis are estimates on the difference a certain characteristic makes when all other characteristics would remain the same.[31]

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[31] This is known as the *ceteribus paribus* clause, which is typically referred to in experimental designs. Although survey research rarely provides such hypothetical counterfactuals, multivariate analysis has become a popular tool of scrutinizing hypothesised relationships.

In the initial step, we formulate a model for net multiple change in material deprivation. Overall, between the years 2006 and 2007 change produced a positive balance of multiple improvements. More people could improve their material living conditions than had experienced a deterioration of their livelihood. The excess amounted to a net improvement for about 2 percent of the population, or 6 million citizens.[32] In our model we operationalise net improvement as the mean value of a variable which takes a value of +1 in the case of multiple improvements and -1 in the case of multiple deteriorations. If no changes occur or the difference between improvements and deteriorations does not exceed one item, net change takes a value of 0. As no further distinction concerning the number of item changes is allowed, a large number of persons experiencing disadvantage cannot be compensated by a small number of major improvements. Hence a positive sign of the resulting average measure indicates that the count of individuals who experienced improvements is larger than the count of individuals who experienced deterioration. Its value represents the net percentage point difference over time and can be referred to as net multiple improvement.

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[32] Unlike in the previous descriptive accounts, the following multivariate analysis uses a slightly adjusted variant of the longitudinal weights provided in the EU-SILC Users' database. The weights are adjusted such that the contribution of each country data file is proportionate to the respective sample size. This strategy gives more importance to the relationships observed within data from the smaller countries and thus gives a more precise estimation of these relationships. The Annex contains the same table calculated upon data weighted by RB062 without this adjustment, the overall difference is however rather modest.

Table 5: OLS Regression models for change (weights RB062 rescaled to national sample size)

		predictors of net change		predictors of gross change		predictors of multiple improvement		predictors of multiple deterioration	
		static	dynamic	static	dynamic	static	dynamic	static	dynamic
Country	AT	0.01**	0.01**	-0.01***	-0.02***	**0.07***	**0.06****	0.01***	0.02***
	BE	0.03***	0.03***	-0.03***	-0.03***	0.01	0.00	0.03***	0.03***
	CY	0.00	0.00	**0.05***	**0.05***	**-0.12***	**-0.12***	-0.05***	-0.05***
	CZ	0.03***	0.03***	-0.02***	-0.02***	**-0.07***	**-0.08***	0.02***	0.02***
	EE	0.04***	0.04***	0.02***	0.01**	0.03	0.02	0.01**	0.01**
	ES	0.03***	0.03***	0.01**	0.01	**0.11***	**0.10***	0.01**	0.01***
	FI	0.02***	0.02***	-0.04***	-0.04***	-0.02	-0.04**	0.03***	0.03***
	FR	0.02***	0.02***	-0.01***	-0.02***	0.03	0.02	0.02***	0.02***
	HU	-0.02**	-0.02**	**0.10***	**0.09***	**-0.07***	**-0.07***	**-0.10***	**-0.10***
	IS	0.01**	0.01**	-0.05***	-0.05***	-0.04	**-0.06****	0.03***	0.03***
	LT	**0.13***	**0.12***	**0.12***	**0.12***	0.05**	0.03	-0.03***	-0.03***
	LU	0.00	0.00	**-0.07***	**-0.07***	0.02	0.02	0.04***	0.04***
	LV	**0.08***	**0.07***	**0.12***	**0.12***	-0.01	-0.03*	**-0.05***	**-0.06***
	NL	0.01**	0.01**	**-0.07***	**-0.06***	0.01	0.00	0.05***	0.04***
	NO	0.04***	0.04***	-0.03***	-0.03***	**0.18***	**0.18***	0.04***	0.04***
	PL	**0.06***	**0.06***	**0.05***	**0.05***	**-0.06***	**-0.07***	-0.02***	-0.02***
	PT	-0.01**	-0.02***	-0.03***	-0.03***	**-0.11***	**-0.11***	0.00	0.00
	SE	0.01**	0.01	**-0.06***	**-0.05***	**0.11***	**0.07****	0.04***	0.03***
	SI	-0.00	0.00	0.01	0.01	0.03**	0.01	-0.00	-0.01
	SK	**0.11***	**0.10***	**0.10***	**0.10***	0.04**	0.04**	-0.02***	-0.02***
	UK	0.01**	0.01**	-0.00	-0.01	0.03	0.02	0.01**	0.01***
Sex	males	-0.00	-0.00	-0.00**	-0.00	-0.00	-0.00	0.00	0.00
Age	18-24	0.01	0.01	0.02***	0.02***	0.04	0.02	-0.00**	-0.01**
	25-34	0.00	0.00	0.02***	0.02***	0.01	-0.00	-0.01***	-0.01***
	35-54	0.00	0.00	0.01***	0.01***	0.01	0.01	-0.00**	-0.00**
	55-64	-0.00	0.00**	-0.01***	-0.01***	0.01	0.01**	0.01***	0.01***
Householdtype	One person Household	0.01**	0.01**	0.02***	0.02***	0.01	0.02**	-0.01**	-0.01**
	2 adults, both under 65, no children	0.00	0.00	-0.01***	-0.01	0.02	0.03**	0.01**	0.00
	2 adults, at least 1 over 64, no children	0.00	0.00	0.01	0.01	0.03	0.04**	-0.01	-0.01
	Single parent household	0.01	0.01	-0.00	0.00**	-0.05***	-0.04***	-0.00	-0.01**
	2 adults, one child	0.00	0.00	-0.02***	-0.01***	0.03	0.03	0.01***	0.01***
	2 adults, two children	0.00	0.00	-0.04***	-0.03***	0.04**	0.04**	0.02***	0.02**
	2 adults, three or more children	-0.00	-0.00	-0.03***	-0.02	0.00	0.01	0.01	0.01
	other households with children	0.01	0.01	-0.02**	-0.01	0.02	0.02	0.01**	0.01**
Level of education	Education level unknown	0.01	0.02	-0.01	-0.01	-0.02	-0.02	0.01**	0.02**
	ISCED 0-1	-0.00	0.00	0.02***	0.02***	**-0.05***	-0.05***	-0.02**	-0.01***
	ISCED 2	-0.00	-0.00	0.01***	0.01***	-0.03***	-0.04***	-0.01***	-0.01***
	ISCED 4-5	0.00	-0.00	-0.01***	-0.01***	**0.05***	0.04***	0.01***	0.01***
General health	Bad or very bad health	-0.00	-0.00	-0.02***	-0.02***	0.02***	0.03***	0.01***	0.01***
Activity status	activity status unknown	-0.01	-0.01	-0.02	-0.04	0.03	0.03	0.02	0.03
	unemployed	0.01	-0.01**	0.03***	0.03***	-0.05***	**-0.07***	-0.03***	-0.03***
	retired	-0.01	-0.01***	-0.01***	-0.01	-0.03**	-0.04***	-0.00	-0.00
	other inactive	-0.01***	-0.02***	-0.00	-0.01	-0.04***	**-0.05***	-0.00**	-0.01***
Income quintile	bottom quintile	0.05***	0.04***	**0.11***	**0.11***	**-0.14***	**-0.15***	**-0.05***	**-0.06***
	2nd quintile	0.03***	0.02***	**0.08***	**0.09***	**-0.12***	**-0.13***	-0.04***	-0.04***
	3rd quintile	0.01***	0.01**	**0.06***	**0.07***	**-0.10***	**-0.10***	-0.03***	-0.04***
	4th quintile	0.01***	0.01**	0.04***	0.04***	**-0.05***	**-0.06***	-0.01***	-0.02***
Household composition	Houshold members moved out		-0.02***		0.04***		0.02		-0.04***
	Houshold members moved in		0.02		**0.07***		**0.10***		-0.04***
	Houshold members were born		-0.01		-0.01		-0.02**		0.00
	Houshold members died		-0.01		0.02		0.01		-0.01
Health	health change unknown		-0.00		-0.02**		**0.08***		0.01**
	health deteriorated		**-0.05***		0.05***		**-0.06***		**-0.06***
	health improved		0.03***		**0.05***		0.05***		-0.01
Employment	emloyment change unknown		-0.01		0.04**		-0.01		-0.03**
	left employment		-0.04***		0.03***		-0.05**		-0.04***
	entered employment		0.04***		0.03***		**0.09***		0.01**
Education	improved to ISCED 3		0.01		-0.01		**0.06****		0.01
	improved to ISCED 4-5		-0.01		-0.01**		0.01		0.01
Income	Equivalized income reduced (> 1 stdev.)		-0.03***		0.03***		**-0.09***		-0.03***
	Equivalized income increased (> 1 stdev.)		0.03***		-0.01**		**0.23***		0.03***
	Constant	-0.02***	-0.01**	0.07***	0.06***	0.39***	0.39***	-0.05***	-0.04***
	R2	0.011	0.014	0.047	0.051	0.037	0.053	0.029	0.035
	Number of observations (in 1.000)	190				35		155	

Source: EU-SILC Users' database

NB: 1) *** p<0.01, ** p<0.05, * p<0.1; values >.05 or < -.05 in bold; 2) reference group: IT, female, 45-54 yrs, >2 adults/0 children, ISCED 3, average- very good health, employed, top quintile, no changes on household, health, employment, education and income. 3) coefficients represent the predicted percentage point difference from the reference group for net and gross change . Predicted change rates for the reference group appear as constant

A basic variant of the model can be specified using only characteristics of one single year as predictors of net change and assuming that these factors are additive. This includes age, sex, household type, income group and country, as well as activation resources in education, employment and health. As the latter are mostly relevant to the working age population we limit the analysis to individuals aged between 18 and 64 years. The parameters obtained from ordinary least squares (OLS) regression are constructed such that they represent those weights for each characteristic which predict the empirical data as closely as possible. Despite the considerable number of predictors, the model fits only poorly to the empirical data. In terms of variance, only about 1% of the observed differences can be explained.[33] This largely results from the fact that empirically only 3 values are possible while the model predicts interval scaled values in the specified range. Therefore, individual values are practically unpredictable whereas averages may be reasonably estimated. Nonetheless, net change must be understood as largely determined by unobserved circumstances rather than the estimated model parameters.

The reference group for this and all subsequent models was defined on the basis of the most prevalent characteristic on each variable considered. This is not necessarily identical to the most prevalent combination of characteristics. More concretely, the model depicts differences from the estimates for an employed woman, aged 45-54 with middle education level (ISCED 3) who lives in Italy together with at least two other adults without children in a household which belongs to the top income quintile.

4.1 A model of net change

The reference group is represented in the constant term of our model. The negative sign implies an estimated negative net balance of deprivation shifts and an increase of deprivation by about 2 percentage points (pp). The parameters for each characteristic reflect the implied percentage point differences against this reference situation. For example for women sharing the same characteristics, but living in Hungary, the parameter indicates that the net deterioration will even be exceeded by another 2 pp. In total, the model suggests that between 2006 and 2007 the number of disadvantaged individuals in Hungary increased by 4 pp. On the other hand the model suggests that the situation in Lithuania (+11) or Slovakia (+9) has markedly improved.

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[33] It is a general phenomenon that the amount of explained variance tends to increase for very small samples and diminishes when the sample size is very large, as is the case here. This hardly changes if an ordered logistic regression model is applied which is statistically more appropriate for ordinal data. Given the straightforward interpretation in terms of percentage point differences we present the parameters obtained from an OLS model. The illustrative value comes at a price though. Careful readers may notice that with certain combinations of characteristics predictions out of range are possible, especially in the linear probability models for dichotomous outcomes which are presented later.

Thus, change exhibits large variation across countries, which does not only depend on structural differences in terms of age, health, employment or education. The model implies that the country of residence is the best single predictor of net change among the variables considered here. The predicted net change is fairly consistent with GDP growth. Hungary, Portugal and Italy are the only countries for which the net balance in multiple deprivations was negative in 2007. At the same time these countries had real growth rates below 2% in that period, the lowest figures among the EU-27. On the other hand, the three countries with the most marked change rates (Latvia, Lithuania and Slovakia) had experienced extraordinary growth of about 10%. But while growth at best depicts which economies took most benefit from change, the multiple improvement measure is sensitive to distribution and may indicate also where policies have been most successful in fostering social inclusion. The geographic patterning of change is illustrated by the map of the estimated net change.

Figure 18: Country comparison of estimated net multiple improvements in the reference group, 2006-2007

Source: EU-SILC Users' database

Despite the vast sample size many demographic characteristics such as age and sex appear statistically insignificant for net change. This does not mean that these variables could not be relevant to specific countries. For example, it is possible that women or the elderly have been facing particular disadvantage in some countries. But upon the results it would not appear appropriate to assume that across all countries, the situation of women or elderly did generally deteriorate or improve beyond those changes which are related to education, health and employment.

On the other hand, household composition appears to be of relevance beyond country patterns. Net multiple improvement appears to be significantly higher for single person households than for the reference group. Consequently, they were also significantly better off than families with 3 or more children, who are estimated (insignificantly) worse off than the reference group. No significant difference was revealed concerning education level and general health. The model suggests that between 2006 and 2007 in particular the bottom income positions took benefit from change. Compared to the reference group of women in the top income quintile, a group with similar characteristics but placed in the bottom quintile would improve its net balance by 5 percentage points (pp).

Including information on changing life circumstances considerably improves the prediction. The country differences still appear dominant but with longitudinal predictors the importance of the activity status comes out more markedly. Other things equal, the unemployed and retired now appear significantly disadvantaged against the employed, and the situation of inactive persons, mostly housekeeping women appears even more adverse than in the first model. Concerning household situation the model predicts net change significantly worse when household members (and thus at least potential earners) move out of the household, than when the household remains unchanged or members move in.

Perhaps the most striking result from the dynamic perspective is the importance of changes in the health status. When the health condition deteriorates, the net balance of multiple changes in material deprivation is lower by 5 percentage points (pp) than when there is no change in health condition. On the other hand, improved health status is reflected by a net balance which is increased by 3 pp, yielding a total difference of 8 pp between those who had deteriorated health and improved health. Hence, health changes have an equivalent predicting power like employment transitions. A take up of employment is associated with a rate of net multiple improvements of 4 pp while leaving employment is reflected in net deterioration of the same magnitude. In other words, employment take up is mostly associated with multiple improvement and only very rarely to a deterioration of material deprivation. Again, educational achievements appear not significantly reflected in net multiple improvements. Finally, changes in the income situation of the household appear significantly related to multiple changes in deprivation. An income loss amounting to more than one standard deviation is reflected in a multiple net change which is 3 pp below the reference group.

4.2 A model of gross change

As was argued at length in the introductory part of this paper, figures of net change may hide important aspects of the process which brings it about. Total turnover or gross change in material deprivation reveals the responsiveness or resilience to changes in circumstances. Overall gross change affects about 12 percent of the longitudinal population, aged 18-64. If the same variables as used to predict net change are introduced into a linear probability model to predict gross change, the amount of explained variance is more than fourfold compared to the initial model. Put differently, it appears easier to predict vulnerabilities (and resilience) than to determine the net balance of improvements and deterioration. Again this is a clear sign that the longitudinal study of gross change will bring more insight into structural effects than a mere cross-sectional perspective.

In the dynamic variant of the model, the reference group is predicted with a gross change of 6 percent, as is indicated by the constant term. Country patterns show noticeable differences compared to the previous model of net change. For example, Cyprus has about the same rate of net change but its gross change is about 5 percentage points (pp) higher than in Italy. Finland, which showed a better positive balance than Italy, exhibits much less gross change. Even more markedly, Hungary, which had a negative net balance, also appears as one of the countries with the largest estimated turnover, 9 pp above the reference value. In other words, circumstances are moving a lot in Hungary – in both directions. In such a context it cannot be expected that improvements from one year to the next will provide lasting protection against vulnerability. On the other hand, in 2007 Iceland was, together with Luxembourg, the Netherlands and Sweden among those countries which were least responsive to change. Their predicted gross change is close to nil for the defined reference group and all further changes appear attributable to the differences in the other predictors for these countries. Again far above average is gross change in Lithuania, Latvia and Slovakia, whereby the estimated gross change is practically identical to the total turnover in these countries. Again, the geographic patterning of change is illustrated by a map of the estimated gross change.

Figure 19: Country comparison of estimated gross multiple changes in the reference group (%), 2006-2007

gross multiple changes in the reference group

< 2
2 - 3
4 - 7
8 - 11
12 - 18

0   250   500 km

Q: STATISTIK AUSTRIA.

Source: EU-SILC Users' database

Unlike in the first model, most socio-demographic characteristics prove to be significantly related to gross change. For example, net change did not reveal any significant age gradient, but now the youngest age groups appear significantly more affected (+2 %) by gross change than the oldest age group. At the same time gross change appears to be somewhat more frequent among single person households than families. Also education appears highly relevant for gross change. Individuals with a bad health are predicted to experience change less often than healthy citizens (-2%). For the unemployed the model predicts 3 percentage points more gross change than for the employed, suggesting a high responsiveness for the former group.

Again, the income position appears to be an important factor. The model implies that the bottom positions are kept a lot more in motion than the top positions. For example, the Italian reference group for which gross changes was predicted to amount to 6 percent, would be predicted to increase to as much as 17% if it were falling into the bottom income quintile instead of the top quintile. This finding clearly contradicts a view that dynamics would imply a more egalitarian and less serious form of disadvantage. The income differential is not even matched by the estimated responsiveness to changes in household composition.

If members move in or out this is reflected in an estimated change of 4 to 7 percentage points (pp) in gross change. Again, health changes appear as strong predictors of gross multiple changes, yielding a difference of 5 pp between those who improved or deteriorated their health condition and those who did not change their general health. In terms of gross change health responsiveness even exceeds responsiveness to changes in activity status. Entering or leaving employment implies an increase in gross change of 3 pp. While no significant effect on the net balance could be detected, higher educational achievements are found to significantly reduce gross multiple change (-1%). Finally, those who reduce their income have a rate of gross multiple changes which is 3 pp above the reference group. Interestingly, however, the same increase in income reduces the rate of gross multiple change.

4.3 The propensity for multiple improvement

To gain further insight into the actual pathways which lead out of and into disadvantage, we can model probabilities of improvement and deterioration separately. The difference to the previous model of gross change is that the model is applied only to the population to which change can possibly happen. For example, those who are already free from disadvantage can not experience multiple improvements.

To remain as consistent as possible with the established indicator of material deprivation we restrict the exit model which predicts the propensity of multiple improvements to the population which exhibited three or more characteristics of deprivation in 2006. Overall, about one out of four (27%) in this population experienced multiple improvement. Using the same variables as before to model exit propensities, the explained variance remains of a similar magnitude. The model constant indicates a predicted chance for improvement of 39% for the Italian reference group described earlier. Across countries, the best opportunities for improvement are predicted for Austria (+6%), Spain (+10%), Norway (+18%) and Sweden (+7%). On the other extreme disadvantage appears most 'sticky' in Cyprus (-12%), the Czech Republic (-8%) Hungary (-7%), Iceland (-6%) and Portugal (-11%). The map gives an overview of these marked differentials in the estimated probabilities for multiple improvement.

Figure 20: Country comparison of estimated probabilities for multiple improvements in the reference group, (%), 2006-2007
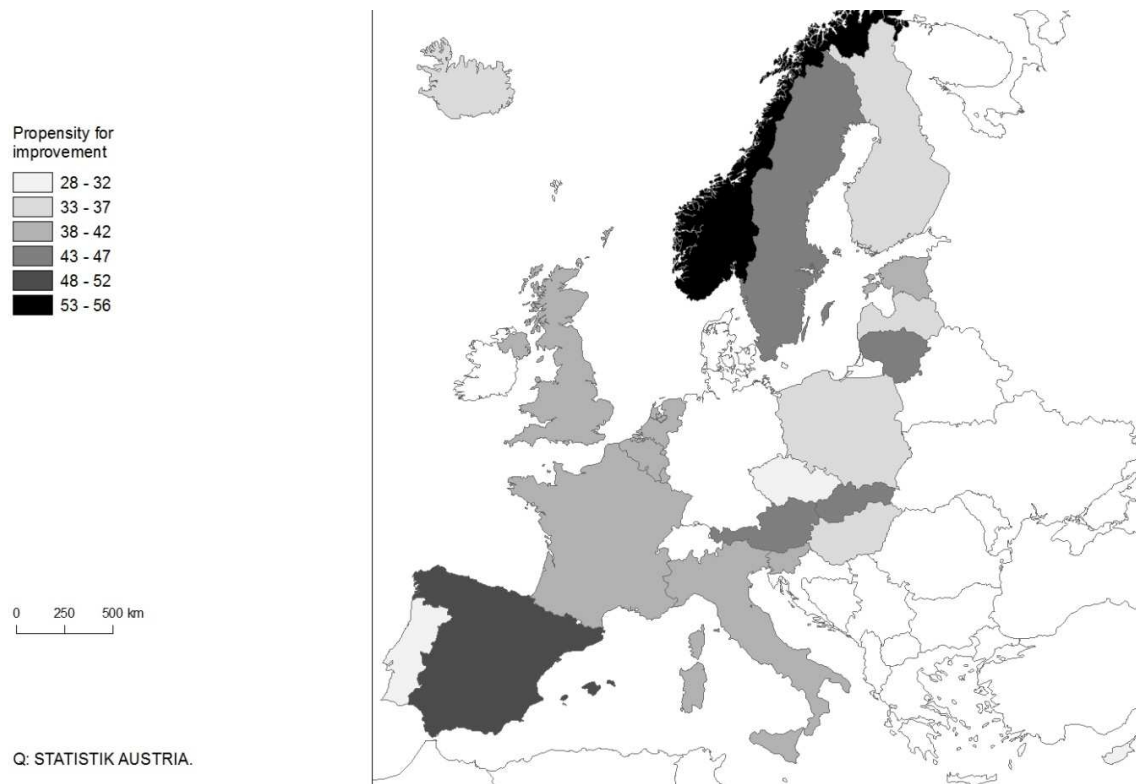
Source: EU-SILC Users' database

NB: Only individuals who were identified as disadvantaged by the material deprivation indicator in 2006 are considered

With a predicted exit rate of 4 percentage points (pp) below the reference group, single parents have the lowest propensity for multiple improvements among all household types considered here. While education did not show a significant relationship with net change, it is clearly a determinant for the chance of improvement. The higher the completed education level, the higher will also be the probability of escaping from disadvantage. On the other hand poor health as well as economic inactivity and unemployment prove as serious hindrances for multiple improvements. Once more, lack of income turns out as a particularly strong hindrance to improvement (-15%). One of the most important predictors for improvement is when other household members move in. Such individuals have an exit probability which is 10% above that of the reference group. Conversely, the birth of a child in the household seriously reduces prospects for improvement (-2%). Improved health appears as an important pathway out of disadvantage while its deterioration makes prospects significantly worse. The picture is similar for employment. Educational achievements appear most successful when they lead to a middle level (ISCED 3) yielding a rate of multiple improvement which is 6 pp above the reference group. It appears important to note here that all three aspects of activation resources represent independent pathways to improvement and are effective across all countries. Beyond that, health changes appear to even outweigh employment changes. Consequently, active inclusion is necessarily involves fostering mental and physical health beyond employability.

Independently of the staring position in the income distribution, income gains do massively enhance the rate of multiple improvements. Compared to the unchanged reference group, those individuals who increased their income by 1 standard deviation increase their exit probability by 23 percentage points (pp).

4.4 The propensity for multiple deterioration

Finally, we take a glance on the propensity to experience a deterioration of living conditions. This time the model is restricted to the population which was not identified under the material deprivation indicator, i.e. those individuals who were not affected by disadvantage or showed less than 3 characteristics of material deprivation. Compared to the previous models a prediction of deteriorated living standards appears somewhat more difficult as is indicated by a slightly lower value for the explained variance. Overall, about 5% of the non deprived population experienced a multiple deterioration between 2006 and 2007. The value of the specified reference is somewhat below this average as is indicated by the constant term. Hungary (+10) and Latvia (+6%) are those countries where the risk of multiple deterioration is highest while for Luxembourg, the Netherlands and Norway the estimated deterioration rate of the reference group is even beyond the possible range taking a negative value. Country differences in the estimated probabilities for multiple deterioration are presented in figure 22.

Figure 21: Country comparison of estimated probabilities for multiple deterioration in the reference group , (%), 2006-2007
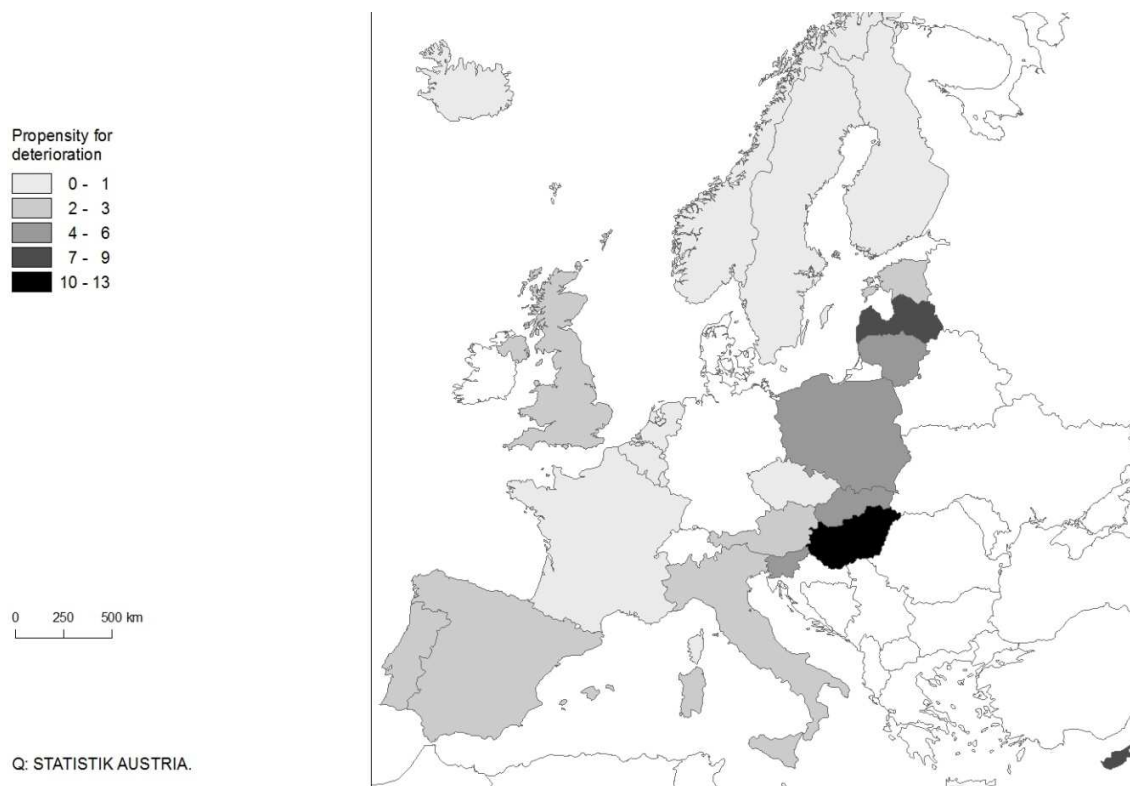
Source: EU-SILC Users' database

NB: Only individuals who were not identified as disadvantaged by the material deprivation indicator in 2006 are considered

Given the low overall propensity for multiple deterioration, only few predictors discriminate by more than 3 percentage points (pp). The unemployed and the bottom income group have deterioration rates which exceed that of the reference group by 3-5 pp. Effects of similar magnitude are associated with the move-in of household members (+ 4%) or deteriorated health conditions (+6%) while the impact of leaving employment is estimated slightly lower (+ 4%).

5. Concluding remarks

In this paper we have argued for a change in perspective in analyzing living conditions and deprivation. In our view, only longitudinal observation can truly give insight into the dynamic processes behind the snapshot we gain from cross sections. The latter underestimate social problems by concealing turnover. The analysis of panel gives evidence on the sequence of events leading to disadvantage or its alleviation. In future analysis this may help to identify latent disadvantage which is characterized by an oscillation of recurrent disadvantage. The social inclusion indicators are the main results of EU-SILC but they do not yet exploit the full analytic potential of EU-SILC. The mainly static design of the present indicators might provoke misinterpretations of the results gained from the data. If disadvantage is a recurrent phenomenon, the oscillation of precarious living conditions remains latent and can not be identified from a purely cross-sectional perspective.

Our analysis gave some examples how the analytic potential of EU-SILC data for longitudinal analysis may be exploited. We argued that its measure of annual income is not an ideal variable for such analysis, notably because of measurement problems, inconsistent reference periods of income and non-income data and the incomplete representation of resources by income. A more direct approach is favourable to capture the dynamics of living conditions instead of arbitrary income gains.

In particular, we recommend using those nine characteristics on the basis of which the common inclusion indicator of material deprivation is constructed. The affordability of these lifestyle characteristics resembles what might be called a pan-European minimum standard of living conditions. Further, we suggest aiming to explain changes in these material deprivation items by pan-European driving forces.

Our analysis focused on individual transitions between disadvantaged and more advantaged living conditions. For the longitudinal analysis we have concentrated on transitions between 2006 and 2007. Emphasis has been put on the proportion of individuals across Europe, whose situation has improved or deteriorated from one year to the next. Beside the question how many Europeans experience such transition from year to year, we were also interested in asking which of these changes occur concomitantly.

With reference to lifestyle dimensions, least change was observed in the possession of household appliances which are widely available, such as a colour TV, a telephone or a washing machine. A couple of items indicated change for between 4 and 10 per cent of the population. These included arrears, the affordability of food (meat, chicken or fish every second day), a computer or a car. More than 15 percent of the population changed their answers on questions on the affordability of a holiday, unexpected expenses or making ends meet.

A consequence of the imbalanced turnover rates is that the observed change of the material deprivation indicator reflects the development of some items over proportionally. The underlying problem appears aggravated from a longitudinal perspective. For the further development of indicators on material deprivation, we therefore suggest to establish a more balanced set of items on the EU-27 level. Items that exhibit only very low turnover (and prevalence) should possibly be excluded. These items cannot meet the criterion of responsiveness to changes in the standard of living of people and policy interventions. As has been said, in some countries (like the Baltic States), items such as telephone appear of greater relevance in understanding living condition. To duly acknowledge their importance it would be necessary to include questions which are more tailored to national requirements in national (tertiary) social inclusion indicators.

In analogy to the cross-sectional indicator, we have proposed to count the number of items on which change is experienced. The difference of improvements and deteriorations for each person provides a straightforward measure of qualitative change. In order to consider only improvements which are not singular but in accordance with the improvement on other items, we defined multiple improvement as a situation where the number of improvements outweighs the number of deteriorated items by at least 2. Therefore, qualitative change can be referred to as multiple improvement.

In summary, multiple change appears to better account for transitions in material deprivation than the comparison of the material deprivation indicator over time. Such a measure is also less sensitive to the imbalance of prevalence, turnover and measurement issues and more responsive to real changes in living conditions. In real life, however, change usually implies a broader alteration of living conditions. Indeed, our analysis has revealed that changes often occur simultaneously across different variables. These associations cannot necessarily be interpreted in a causal way, but may give an illustration of the impact of, say unemployment on the aggravation of deprivation and other forms of disadvantage.

We therefore evaluated the observed relationship more systematically by a multivariate statistical model. In this analysis we have estimated the differences a predictor makes while holding other factors constant. Our model for net multiple improvement confirmed that dynamics of activation resources are highly significant. The country of residence remained the strongest predictor among the variables considered. Overall, the model could fit the data only poorly. Net change therefore must be interpreted as mainly determined by unobserved influences rather than the estimated model parameters. Somewhat better results were achieved with gross change models which captures the overall responsiveness to structural factors. Compared to net changes, country patterns showed a rather different picture in this analysis and gross change appeared more responsive to socio-economic predictors. The models in this chapter can be taken as generic examples of how particular hypothesis on the social inclusion process may be tested. Such models can be expanded in various ways. For example, it is possible to test for particular interaction effects, for example on the country level. This may also be useful in quantifying the impact of certain interventions and establish relationships between different targets set for common and national inclusion strategies. Similar models could also used to predict the specific propensities for improvement or deterioration within certain groups. As yet, our analysis was based only on preliminary data from only two subsequent waves. On the basis of longer periods of observation it should be possible to identify more fully the sequence of events leading to disadvantage or its alleviation. This should also give way to the application of methodologically more advanced structural equation models which allow for more comprehensive hypothesis testing. Moreover it should be a priority for further longitudinal analysis to scrutinise recurrent patterns and assess the extent of oscillation of precarious positions by latent class analysis.

In order to achieve a more balanced set of deprivation items and limit the possible extent of measurement error, we recommend replacing dichotomous response categories for those variables which exhibit the greatest gross change, notably the question on unexpected expenses and holiday. Respondents should be allowed to articulate a more differentiated response pattern, which could be reclassified after data collection.

While detailed income information may be less important for an annual, longitudinal data collection, it may be necessary also to expand the scope of non-monetary variables, notably on education activities, citizenship, housing cost and activity calendar, in the EU-SILC user's database. This holds in particular, for those countries which follow the integrated design. Here, full use of the already available information should be made, by making accessible to users all variables collected for the cross-sectional component.

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Appendix

Table: A1 OLS Regression models (weights RB062 without adjustment)

		predictors of net change		predictors of gross change		predictors of multiple improvement		predictors of multiple deterioration	
		static	dynamic	static	dynamic	static	dynamic	static	dynamic
Country	AT	0,01**	0,01**	-0,01***	-0,02***	**0,07***	**0,06**	-0,01***	-0,01***
	BE	0,03***	0,03***	-0,03***	-0,03***	0,00	-0,00	-0,03***	-0,03***
	CY	0,00	0,00	**0,05***	0,05***	**-0,12***	**-0,12***	0,05***	0,04***
	CZ	0,03***	0,03***	-0,02***	-0,02***	**-0,07***	**-0,08***	-0,03***	-0,02***
	EE	0,04***	0,04***	0,01**	0,01**	0,03	0,02	-0,01**	-0,01**
	ES	0,03***	0,03***	0,01**	0,01	**0,11***	**0,10***	-0,01**	-0,01***
	FI	0,02***	0,02***	**-0,05***	-0,04***	-0,03	**-0,05**	-0,04***	-0,03***
	FR	0,02***	0,02***	-0,01***	-0,02***	0,02	0,01	-0,02***	-0,02***
	HU	-0,02**	-0,01**	**0,10***	**0,09***	**-0,07***	**-0,07***	**0,10***	**0,10***
	IS	0,01**	0,01**	**-0,05***	**-0,05***	-0,04	**-0,07**	-0,04***	-0,03***
	LT	**0,12***	**0,12***	**0,12***	**0,12***	0,04**	0,03	0,02***	0,03***
	LU	0,00	0,00	**-0,07***	**-0,07***	0,02	0,02	-0,04***	-0,04***
	LV	**0,08***	**0,07***	**0,12***	**0,12***	-0,01	-0,03*	**0,05***	**0,06***
	NL	0,01**	0,01**	**-0,08***	**-0,07***	0,01	-0,01	-0,05***	-0,04***
	NO	0,04***	0,04***	-0,03***	-0,03***	**0,17***	**0,16***	-0,04***	-0,04***
	PL	**0,06***	**0,07***	0,05***	0,05***	**-0,06***	**-0,07***	0,02***	0,02***
	PT	-0,01**	-0,02**	-0,03***	-0,03***	**-0,10***	**-0,10***	-0,00	-0,00
	SE	0,01**	0,01	**-0,06***	**-0,06***	**0,10***	**0,06**	-0,04***	-0,03***
	SI	0,00	-0,00	-0,00	0,01	0,04**	-0,00	-0,00	0,00
	SK	**0,11***	**0,11***	**0,10***	**0,10***	0,04**	0,04**	0,02***	0,02***
	UK	0,01**	0,01**	-0,00	-0,01	0,03	0,02	-0,01**	-0,01***
Sex	males	-0,00	-0,00	-0,00**	-0,00	-0,00	-0,01	-0,00	0,00
Age	18-24	0,00	0,00	0,02***	0,02***	0,02	0,00	0,01***	0,01**
	25-34	-0,00	-0,00	0,03***	0,03***	0,00	-0,01	0,02***	0,02***
	35-54	0,00	0,00	0,01***	0,01***	0,01	0,01	0,01**	0,01**
	55-64	0,00	0,01**	-0,02***	-0,02***	0,02	0,02**	-0,01***	-0,02***
Householdtype	One person Household	0,01**	0,01**	0,03***	0,03***	0,03	0,03**	0,01**	0,01**
	2 adults, both under 65, no children	0,00	-0,00	-0,01***	-0,00	0,02	0,03**	-0,01**	0,00
	2 adults, at least 1 over 64, no	0,01	0,01	0,00	0,00	0,03	0,04**	-0,00	-0,00
	Single parent household	0,01	0,01	0,01	0,02**	**-0,07***	**-0,06***	0,01	0,02**
	2 adults, one child	0,01	0,00	-0,02***	-0,02***	0,00	0,01	-0,02***	-0,01***
	2 adults, two children	-0,00	-0,01	-0,03***	-0,02***	0,03**	0,04**	-0,02***	-0,01**
	2 adults, three or more children	-0,01	-0,01	-0,02***	-0,01	0,02	0,02	-0,01	-0,00
	other households with children	0,01	0,01	-0,01**	-0,01	0,02	0,02	-0,01**	-0,01**
Education	Education level unknown	0,01	0,02	-0,01	-0,01	-0,02	-0,02	-0,01**	-0,02**
	ISCED 0-1	-0,00	0,00	0,02***	0,02***	**-0,05***	-0,05***	0,02***	0,01***
	ISCED 2	-0,00	-0,00	0,01***	0,01***	-0,03***	-0,04***	0,01***	0,01***
	ISCED 4-5	0,00	-0,00	-0,01***	-0,01***	**0,05***	0,04***	-0,01***	-0,01***
General health	Bad or very bad health	-0,00	-0,00	-0,02***	-0,02***	0,02***	0,03***	-0,01***	-0,01***
Activity status	activity status unknown	-0,01	-0,01	-0,00	-0,00	0,01	0,00	-0,01	-0,01
	unemployed	0,00	-0,01**	0,05***	0,04***	-0,05***	**-0,07***	0,04***	0,05***
	retired	-0,01	-0,01***	-0,01**	-0,01	-0,04**	-0,05***	-0,00	0,00
	other inactive	-0,01***	-0,02***	-0,00	-0,00	-0,04***	**-0,05***	0,01**	0,01***
income quintile	bottom quintile	0,04***	0,04***	**0,11***	**0,11***	**-0,13***	**-0,15***	0,05***	**0,05***
	2nd quintile	0,03***	0,02***	**0,09***	**0,09***	**-0,11***	**-0,13***	0,04***	0,04***
	3rd quintile	0,01***	0,01**	**0,06***	**0,07***	**-0,08***	**-0,10***	0,03***	0,04***
	4th quintile	0,01***	0,01***	0,03***	0,04***	**-0,06***	**-0,07***	0,01***	0,02***
	Houshold members moved out		-0,02***		0,04***		0,01		0,04***
	Houshold members moved in		0,01		**0,08***		**0,11***		0,05***
	Houshold members were born		-0,01		-0,01		-0,05**		-0,00
	Houshold members died		0,00		0,02		0,03		0,00
	health change unknown		-0,00		-0,02**		**0,08***		-0,01**
	health deteriorated		**-0,05***		0,05***		**-0,06***		**0,06***
	health improved		0,03***		**0,05***		0,05***		0,01
	emloyment change unknown		-0,02		0,02**		**-0,05**		0,02**
	left employment		-0,04***		0,03***		-0,04**		0,04***
	entered emploment		0,04***		0,02***		**0,10***		-0,01**
	improved to ISCED 3		0,01		-0,01		**0,06**		-0,01
	improved to ISCED 4-5		-0,01		-0,01**		0,01		-0,01
	Equivalized income reduced (> 1		-0,03***		0,04***		**-0,12***		0,03***
	Equivalized income increased (> 1		0,02***		-0,01**		**0,21***		-0,02***
	Constant	-0,02***	-0,01**	0,07***	0,06***	0,39***	0,40***	0,05***	0,03***
	R2	0,008	0,011	0,041	0,047	0,036	0,052	0,025	0,032
	Number of observations (in 1.000)	190				35		155	
	Longitudinal population (in million)	230				38		192	

note: *** p<0.01, ** p<0.05, * p<0.1; values >.05 or < -.05 in bold;

reference group: IT, female, 45-54 yrs, >2 adults/0 children, ISCED 3, average- very good health, employed, top quintile, no changes on household, health, employment, education and income.

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