Article

Assessment of Economic Security of Households Based on a Scenario Analysis

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Abstract: The article proposes a method to assess the level of economic security, based on the analysis of scenarios of future events. These scenarios cover realistically possible combinations of future events, both positive and negative, allowing for an assessment of their financial implications. The empirical part of the paper contains the results of applying the proposed method to the Polish data. In the scenarios considered, changes in the situation of individuals in the labour market and changes in the level of income and expenditure are taken into account.

1. Introduction

The problem of security in the case of adverse events can be considered in a variety of contexts, from savings (especially precautionary savings—see Carroll and Samwick 1997; Carroll and Samwick 1998), through insurance (see Engen and Gruber 2001), the household life cycle (see Ando and Modigliani 1963; Browning and Crossley 2001) to analyses of poverty risk.

While characterising the situation of households, the issue of economic security often refers to the latter aspect: the issue of poverty. In attempting to define economic security and its measurement, the fundamental difference between these concepts should be emphasised. This concerns the distinction between the current level of consumption (or income) and the potential changes in its level. In the case of poverty analysis, a low level of consumption (or income) is crucial to classifying households as poor. Too low a level of consumption implies certain negative consequences, including a lack of opportunities to participate in social life, social exclusion, and in extreme cases, problems ensuring one's physical existence. In the context of economic security, what is essential is not the level of consumption, but its stability; that is, the ability to sustain it at least at the current level. In this sense, analysing economic security is a complement to an analysis of poverty, which generally does not take stability into account. This means that it is possible that poor households have a higher level of economic security (understood as the stability of consumption) than non-poor households. Although it has no direct impact on their current material condition, this may be reflected in their mental outlook. In particular, higher levels of wealth may entail a kind of addiction to one's social and financial position, and the mere threat of loss can greatly affect an individual's quality of life. As indicated by Hacker (2011), this is all the more crucial given that for most people, the potential for maintaining their current level of income is much more important than the potential for increasing

their income and the behavior of individuals is strongly affected not only by the assessment of the current situation, but also by the prospects for change in the current situation.[1]

Income stability has gained particular importance, among other aspects, in the context of the crisis caused by problems in the mortgage market, which began in 2008. This crisis affected, to a very large extent, non-poor households (which also do not have to become poor) and it showed actual economic instability among many of them.

Considerations concerning the stability of the economic situation may be focused on two main aspects. The first of these are factors that could potentially pose a threat to the economic security of the household (see, for example, Espinosa et al. 2014; Osberg and Sharpe 2014; Bossert and D'Ambrosio 2013). The second are the risk protection factors. In the case of the latter group, the conditions that are emphasised are those that are required for households (or individuals) to be safe from adverse events. These typically include assets such as economic (for example, income-generating work, savings or insurances), human, social and common capital (By a Thread 2007; Beeferman 2002; Morrone et al. 2011).

Such diversity of approaches to the issues of economic security is reflected in the methods of assessing the level of this phenomenon. The starting point in modelling is to identify a number of factors associated with the level of economic security. They can be objective (such as the size of assets and income level), as well as subjective (for example, satisfaction with one's own financial situation). In addition, these factors can be divided into those related to observed levels (retrospective approach) and the probability of future changes (prospective and forward-looking). Depending on the level of aggregation of data used for the analysis, they are divided into a micro- and a macro-level.

The most popular measures of economic security considered in the literature include those of Hacker et al. (2014) and Osberg and Sharpe (2014). Both measures are based on research conducted (and partly published) earlier by these teams.

The first one describes the percentage of people who have experienced unbuffered, large income losses (they did not have adequate assets to compensate for the decrease in income). In this sense, this index is a typical retrospective measure, illustrating the consequences of changes that have already occurred. In addition, it focuses exclusively on aspects related to income and assets, without directly addressing other issues, e.g., employment. Indexes with similar characteristics are used by Stanczyk (2019), which describes the economic security of young mothers by analysing changes in their income; Kopasker et al. (2018) in the context of the impact of economic security on mental health; or Dynan (2009), which particularly emphasises the importance of debt. This group also includes the works of Bossert and D'Ambrosio, who analyse the variability in wealth (Bossert and D'Ambrosio 2013) and resources (Bossert and D'Ambrosio 2016), and characterise the formal properties of measures (which are based on the Gini coefficient).

The construction of the second of the aforementioned indexes is completely different; it takes into account many areas of significant importance for the economic security level such as unemployment, old age, widowhood and healthcare costs (the analysis is usually conducted at the macro level using aggregated values for countries or regions). However, the method of aggregation raises serious doubts: individual sub-indexes are standardised and then added, even though they relate to completely different areas. A similar approach (however, taking into account also probabilities, is therefore future-oriented) is adopted by Rohde et al. (2015, 2016) and De la Cruz (2017). The related methodology is also proposed by the British Red Cross (2014) to assess the effects of disasters.

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[1] The area where economic security is particularly frequently associated with the risk of poverty, understood as the risk of a decline in consumption (income) below the poverty line, is research concerning vulnerability (see, for example, Ligon and Schechter 2003; Pritchett et al. 2000). However, the distinction between vulnerability and economic security is not strict. The issue of vulnerability is considered in ever broader contexts (see, for example, Dutta et al. 2011). In this way vulnerability and economic security, understood as stability, seem to be more and more similar. However, due to the way each of these concepts is understood in most texts, we will use the term economic security throughout the rest of this article.

As already mentioned, the main disadvantage of the methods belonging to the first group is that they focus only on income and wealth. This guarantees a coherent framework but significantly limits the scope of analysis. In the second approach, the range of factors taken into account is much broader, but the issue of aggregation of individual dimensions remains a significant problem.

The approach proposed in this article attempts to address these shortcomings. As in the case of measures from the first of the above-mentioned groups, the reference category, in which aggregation of various dimensions is carried out, will be income or assets (both of monetary character). However, similar to measures from the second group, a much wider range of potential events will be taken into account, namely those related, inter alia, to the health status or the labour market situation. However, they will be expressed in monetary terms (to avoid an aggregation problem).

In the analysis, a mixed approach will be applied; besides the retrospective data (concerning, for example, income or assets), prospective data will also be used, including the probabilities of specific events that significantly impact the economic security of the household.

Regardless of the method of analysis, some areas are often indicated as particularly important for the level of the economic security of households. The list of the most important events that can generate economic losses, both currently and in the future, is not unambiguously defined in the literature. As indicated earlier, there is also no single method for the assessment of economic security. It is possible to adopt an objective approach (see Osberg 1998; Sharpe and Osberg 2009) or a subjective one (see Dominitz and Manski 1997; Anders and Gascon 2007), and to use macroeconomic data (aggregated at the level of the whole population or groups of households; see Osberg and Sharpe 2014) or microeconomic data (at the household or individual level; see D'Ambrosio and Rohde 2014).

The method adopted in this article is the approach based on microeconomic data, which allows for a more accurate reflection of the specificity of each household's situation and the identification of household groups that are vulnerable in terms of specific risk factors.[2] Using microeconomic data and an objectivised approach (to ensure comparability and the ability to aggregate results obtained for individual households), a way to reflect the future economic situation of the household is to analyse the consequences of future events. An assessment of the level of economic security requires considering as many as possible scenarios of future events,[3] taking into account their impact on the economic situation of the household and the probability of their realisation.

The proposal of the method, allowing for such an evaluation of economic security, constitutes a core part of this article. This approach requires the identification of the scenarios of future events. Analysis of the various scenarios, including, in particular, an answer to the question of whether the occurrence of the given scenario will be a threat to the economic security of the household, is conducted in four steps. First, it is required to determine the characteristics of the household, considered as crucial from the point of view of the economic security of the household. This characteristic, referred to as the reference category, should best reflect the actual economic situation of the household, and should allow for an assessment of the consequences of future events in its values. Second, the level of the reference category should be determined, the exceeding of which will be seen by members (head) of the household as threatening economic security (significantly limiting the ability of its proper functioning). Third, one should distinguish the categories of events (a decrease of income, increase in expenses and job loss, broken down into specific or general sources), and create from them scenarios of possible future changes in the situation of the household. Fourth, it is necessary to define how changes in the situation, being the consequence of the realisation of some events or scenarios, will be aggregated. Because of the risks associated with the occurrence of future events (scenarios), this requires an assessment of the certainty equivalent. Depending on the available data, the basis for such comparisons can provide the expected value or other measures that take into account, inter alia, the utility function and the level of risk aversion (for a broad discussion on this issue see, for example, Kahneman and Tversky 2000). Due to the concept of the proposed method,

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[2] In the case of economic security assessment based on macroeconomic data (for example, unemployment rate and the risk of divorce, see the measure of Osberg and Sharpe 2014), the subject of the analysis is essentially the situation in the entire population.

[3] To simplify the analysis, it may be limited only to adverse events.

which is to provide objectivised information about the level of household economic security, functions taking into account the subjective perception of the probability do not apply here (see Kahneman and Tversky 1982).

This article contributes to the literature two-fold. First, in order to propose an internally coherent measure that, however, allows for the inclusion of many different areas relevant to economic security, the concept of a reference category was proposed. This category is intended to constitute a space where all considered events will be defined. In this article, income was used as the reference category but other possible solutions—for example, assets—can also be considered, especially if they are better suited to a specific situation.

Second, the article proposes a new framework for measuring economic security based on an analysis of future event scenarios. This solution gives a lot of freedom for the choice of the number and type of events that are said to affect the households' economic security level. The parameterisation of the proposed index does not require specific methods to estimate its parameters. The empirical part of the article presents only an example solution, adequate to the situation of Poland, which takes into account, inter alia, the available data and the specificity of the Polish social security system.

The remainder of this article is divided into three parts. In Section 2, we present the perception of economic security that will provide the basis for developing a method of measuring this phenomenon and the proposal of the measurement model that can assess economic security based on the analysis of possible future scenarios of changes in the economic situation of the household. Section 3 provides an example of the practical application of the proposed method for assessing the economic security of households in Poland in the period 2003–2011. The last section concludes the paper.

2. Methodology

2.1. The Concept of Economic Security

To start the proposition of the economic security index, we need to explain how the notion of economic security will be understood in this article. The first step in a description of the approach to economic security is to determine the single characteristic (referred to later as a reference category) that enables the assessment of the impact of various events on the level of the economic security of the household.

For this reference category, the approach proposed in this article uses the expected length of time for which the household, as the basic unit of consumption, is able to maintain its standard of living (consumption) at the declared, minimum level (covering basic expenses). This means that all events that may affect the situation of the household in the future will be evaluated in the context of their impact on the lengthening or shortening of this period. The length of time can be expressed as a percentage, indicating the part of the period of a predetermined length (for example a two-year period). In such a situation, the accepted values will belong to the interval from 0 to 1. The length of time may also be expressed as the expected number of months the household will earn an income of not less than the declared minimum income.

Maintaining a standard of living (consumption) that is at least at the fixed, minimum level, which is determined for each household, requires a steady income, regardless of its origin. In this sense, income will constitute an intermediate category. Within this intermediate category, it is possible to make direct comparisons among different factors, including both risk and safety factors. The actual influence of individual factors on the level of the household economic security depends on their impact on the level of income or consumption. Generally speaking, if they cause a reduction in income or an increase in expenses, they will be treated as risk factors. In the opposite situation, if they provide protection against risk, and will be referred to as safety factors. In fact, classifying each factor into one of these two groups can be much more complex and depends (among other things) on the horizon of the analysis.

Assessing economic security in this approach requires a determination of the level of minimum consumption (basic expenses) that will be considered as ensuring safety, which is a level that should allow households a standard of living that will not be considered as a threat to their economic security. This reflects the expenses of the goods that are recognised by consumers in a given group as being necessary to bear. An assessment of this level can be based on the analysis of the structure of consumption (separately for different groups of households). If such detailed information on consumption is not available in the data set, it may, however, also be based on declarations regarding the minimum income (for example, needed to "make ends meet"), which are made by households themselves.[4]

The primary source of financing this minimum consumption is the current income from a job or the equivalent (such as a pension and/or capital). The stability of this kind of income takes into account factors related to individual characteristics, as well as the overall economic situation. In the case of the loss of current income (or part of it), households can use income substitutes, such as:

- assets, both liquid (for example savings and items that can easily be sold) and illiquid (property that is difficult to sell);
- potential income resulting from family ties and social relations (the possibility of borrowing money or getting others' support);
- payments from insurance companies;
- allowances, benefits and other funding provided by the state or non-governmental institutions.

Depending on the situation of the household, insurance payments, donations, benefits and other transfers may be part of the current household income. Financing the current consumption by the sale of assets or by credit (loans) can denote problems with current liquidity and can consequently suggest a low level of economic security. However, differences between income sources do not in any way affect the general applicability of the discussion. Each source of income can be described in terms of the amount of income it provides and the probability of receiving this money once or continuously in a given period. Various types of income and their estimated probability can be linked to a specific individual in a household or to a household as a whole.

An adequate assessment of the level of economic security is highly dependent on the extent of the risk (and safety) factors included in the analysis. The important aspect for the proper identification of these factors is the horizon of the analysis. In the short and medium term (2–5 years), basic safety and risk factors can be identified on the basis of the current situation and relatively simple forecasts. The most important are current income (mainly from work and/or social security) and liquid assets (especially savings, but also easily transferable items of property). In the slightly longer term, less liquid assets (primarily real estate) should also be included. This means that in terms of risk factors, the short- and medium-term future can be treated as an appropriately adjusted extrapolation of the present.

Assessing economic security in the long run is different. A particular type of risk associated with long-term analysis is the lack of sufficient funds after retirement. In this case, the overall economic and social situation is crucial. Individual characteristics (including decisions made in the past and their consequences) are of secondary importance. Assessing long-term economic security is possible only by assuming that the future will be a predictable consequence of the present. Extrapolations of this type are by nature burdened with a very high margin of error.

The differences between short-term and long-term analysis can be seen in the context of the current structure of expenditure. Some current expenses have the character of (broadly defined) investments, and reduce economic security in the short term. Incurred expenses of this type may, however, have a positive impact on economic security in the long run. Expenditure of this type includes:

- any expenditure associated with the support, upbringing and education of children;

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4   Declarations concerning minimum income reflect–in fact–the level of minimum consumption.

- working people paying for their own education, especially when such expenditure takes the form of periodic payments;
- expenses associated with the development of one's own business;
- additional expenses related to maintaining health, proper nutrition and other factors.

In the context of long-term economic security, expenditure of the first type, related to raising and educating children, may be crucial. The current demographic crisis observed in many developed countries may, in fact, lead to problems with the solvency of pension funds based on the principle of intergenerational solidarity.

2.2. Brief Description of the Procedure

The level of economic security is a feature of a household. Therefore, its basic assessment is made at a microeconomic level, while the estimate of the average level of security for the whole population requires the aggregation of individual values.

Calculating a value for an index of individual economic security of the household requires determining the level of expenditure deemed necessary to be incurred by the respondents in the current financial situation.

Next, there are defined scenarios of future events. These scenarios include events affecting both the level of expenditure (such events are related to the household as a whole) or the level of income (in this case they generally relate to individuals in the household[5]). Depending on the number of considered events, the total number of defined scenarios can be quite large, since it is the product of the number of possible outcomes of these events.[6]

The defined scenarios are divided in a further step into two groups. The first of these includes scenarios, for which the occurrence of considered events results in a level of a household's income (after taking into account its possible changes) that is sufficient for maintaining a predetermined, minimum standard of living (which is also modified by possible increases in expenditure described in a given scenario). The second group includes scenarios in which the occurrence of adverse events does not allow for maintaining a minimum standard of living (consumption) in the period under consideration. The estimated probabilities of the occurrence of individual adverse events and the whole scenarios allow for the calculation of the probability that a given household would manage to keep the declared level of consumption (which guarantees a minimum standard of living) throughout the period analysed.

The next step in assessing the level of household economic security is to determine the expected value of the level of missing income. To this end, for each of the considered scenarios in which the household income was insufficient to ensure the coverage of basic expenses, the difference between the level of these expenses and the income achieved is calculated. Previously estimated probabilities enable us to calculate the expected value of the income gap. In the proposed model, this expected value is calculated using nominal values. It is possible, however, to take into account individual preferences concerning income in the form of the utility function, or some other function that allows us to take into account the normative aspects of attitudes to inequality, or the size of the income gap in an analogous way as it is done in the measurement of welfare, poverty or inequality (see, for example, Atkinson 1970; Foster et al. 1984). Also, the aggregation of effects of adverse events can be made in some way other than a simple expected value. Using another method of aggregation, however, would require the adoption of additional assumptions concerning, for example, the risk

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[5] The household's income, which is not directly related to any of individuals in the household, will not be considered separately.

[6] A single event, for example illness, can result in several outcomes, depending on its intensity. A serious illness can cause average high costs at the level of $w1$, average moderate costs at the level of $w2$, and average slight costs at the level of $w3$, where $w1 > w2 > w3$ are some positive values. Moreover, considering the events that relate to individuals in the household, it is necessary to consider all possible situations, for example, the loss of a job (or income) of one person, all people in the household, or any subgroup of them.

aversion or impact of the context (see, for example, Pratt 1964). In all these cases, the definition of the income gap may be suitably modified.

Finally, the expected value of the income gap is compared with the level of household savings. On this basis, the level of economic security of the household is being assessed. Estimated in this way, the level of household economic security can be determined answering the following three questions. First, how big of a reduction in the current level of spending is possible for a given household (the difference between actual expenditure and their declared, minimum level)? Second, what is the aggregated value of the accumulated savings that could compensate for any income declines? Third, what is the range of adverse events considered (their probability and financial consequences)?

2.3. Formal Specification

The starting point in the procedure for the assessment of a household's economic security is the level of consumption (given in terms of expenditure or income), recognised as minimal. In each scenario, some events, from the set of all events considered in the analysis (for example illness, material losses, equipment failure or the consequences of mistakes), actually occur, and some not. Therefore, the original level of consumption is then adjusted by the amount of additional costs that the household will have to bear in the case of these (adverse) events.[7] For any household, the total level of expenditure is given by:

$$c_{hA} = b_h + \sum_{r=1}^{R} w_{rh} \alpha_{rhA} \tag{1}$$

where b_h denotes the basic expenses of the household h $(h = 1, ..., H)$ and w_{rh} denotes additional costs that the household will have to bear in the case of event r $(r = 1, ..., R)$. The value of the additional expenses is calculated as the difference between actual costs resulting from this event and any insurance payments (private or social). All possible scenarios of the future situation of household h, in terms of its expenditure level, are described by the vector $\boldsymbol{\alpha_{hA}} = (\alpha_{1hA}, ..., \alpha_{RhA})$, where A identifies the variant (scenario) of the future situation. $\alpha_{rhA} = 0$ means that in scenario A with event r will not occur for household h, and $\alpha_{rhA} = 1$ means that this event will occur. The set of all possible vectors $\boldsymbol{\alpha_{hA}}$ (scenarios) will be referred to as SA. If the simultaneous occurrence of several events involves a total cost that is different from the sum of the costs of these events, such a combination of events should be treated as a separate event. The probability of the occurrence of event r in the horizon of the analysis is equal to p_{rh} and may vary from household to household (depending on the characteristics of individual households).

This procedure applies to events (mostly adverse) whose consequences influence household expenditure (for example expenses for the medical treatment of household members in the case of illness, the cost of repairing broken equipment or to cover other losses). A different situation occurs when an event q $(q = 1, ..., Q)$ affects the level of income of a particular person in the household such as a job loss, wage reduction or loss of benefits. In that case, vector $\boldsymbol{\beta_{hB}} = (\beta_{11hB}, ..., \beta_{QM_hhB})$ will denote the possible scenarios of the future situation of the household h. Vector $\boldsymbol{\beta_{hB}}$ describes whether event q occurs or not. The values of index B identify the specific scenario and consequently indicate whether event q occurs for person m $(m = 1, ..., M_h)$ in household h. The set of all possible vectors $\boldsymbol{\beta_{hB}}$ is denoted as SB. As before, $\beta_{qmhB} = 0$ means that in scenario B, event q will not occur for person m in household h, and $\beta_{qmhB} = 1$ means that this event will occur. The probability of event q is equal to p_{qmh} and the reduction in income resulting from the occurrence of this event is d_{qmh}.

In the case of events that affect both the level of expenditure and the income of one or more persons in the household, some scenarios of future events are dependent on each other. In these cases, some combinations of scenarios A and B will not be considered, and SAB will denote the set of all possible combinations of scenarios A and B. An example of such a situation may be illness of one

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[7]   The assumption that future events are adverse can be easily waived by introducing the possibility of declaring negative changes in the level of expenditure; the same applies to changes in the level of individual income.

person in the household, which results in an increase in the healthcare costs (related to the costs of medical treatment and the purchase of medicine), as well as a decrease in the income level of this person as a consequence of the illness. In this case, scenarios assuming a decrease in income and no changes in the level of consumption will not be considered, nor will those assuming an increase in consumption without changes in the level of income.

In the case of a joint occurrence of events affecting the level of personal income (denoted by q) and events affecting the level of household consumption (denoted by r), future scenarios are identified in which household income will be sufficient to cover basic expenses:

$$
I_{hAB} = \begin{cases} 1 & \text{if } \sum_{m=1}^{M_h} \left(y_{mh} - \sum_{i=1}^{Q} d_{qmh}\beta_{qmhB} \right) \geq c_{hA} \\ 0 & \text{if } \sum_{m=1}^{M_h} \left(y_{mh} - \sum_{i=1}^{Q} d_{qmh}\beta_{qmhB} \right) < c_{hA} \end{cases} \tag{2}
$$

where y_{mh} denotes the current income of person m in household h. $I_{hAB} = 1$ denotes that the total income of the members of household h is sufficient to cover the basic expenses of this household in the case of a joint occurrence of events from scenarios A (in terms of possible changes in the level of household consumption) and B (in terms of possible changes in the income of all members of the household).

Assuming the independence of the events in the scenarios under consideration (any interdependence can be eliminated by creating a new event that includes the combined occurrence of other events), the probability of the joint occurrence of scenarios A and B is given by:

$$
p_{hAB} = \prod_{r=1}^{R} \left[p_{rh}{}^{\alpha_{rhA}} (1 - p_{rh})^{(1-\alpha_{rhA})} \right] \cdot \prod_{m=1}^{M_h} \prod_{q=1}^{Q} \left[p_{qmh}{}^{\beta_{qmhB}} (1 - p_{qmh})^{(1-\beta_{qmhB})} \right] \tag{3}
$$

The probability of maintaining the total income of all household members at the level guaranteeing the possibility of covering basic expenses is equal to:

$$
p_h = \sum_{AB \in SAB} I_{hAB} p_{hAB} \tag{4}
$$

where AB denotes the joint occurrence of scenarios A and B. If scenarios exist in which the total household income is insufficient to cover basic expenses ($I_{hAB} = 0$), probability p_h is less than 1. In such cases, the missing income of household h indicates the expected value of income that should be earned in each scenario (where $I_{hAB} = 0$) to finance basic expenses. The value of the missing income is given by:

$$
MI_h = \sum_{AB \in SAB} \left\{ \left[c_{hA} - \sum_{m=1}^{M_h} \left(y_{mh} - \sum_{i=1}^{Q} d_{qmh}\beta_{qmhB} \right) \right] \cdot (1 - I_{hAB}) p_{hAB} \right\} \tag{5}
$$

Based on this information, it is possible to determine the security level of the household according to the formula:

$$
ES_h = \begin{cases} 1 & \text{if } S_h \geq MI_h \\ p_h + (1 - p_h)\dfrac{S_h}{MI_h} & \text{if } S_h < MI_h \end{cases} \tag{6}
$$

where S_h denotes the value of assets that could supplement the current household income. The index ES can take values between 0 and 1. Multiplying this value by the length of the horizon of the analysis, we obtain the expected length of the period for which the household will be able to cover basic expenses.

The higher the value of ES, the greater the economic security; that is, the household is able to finance its consumption (expenditure) for a longer period using current income or assets as a supplement for current income. A value of 0, indicating a complete lack of economic security, occurs only when the basic expenses exceed the amount of income in each of the scenarios considered and the household does not have any assets that could supplement current income. A value equal to the length of the horizon of analysis ($ES = 1$) indicates that the expected value of the total income of the household members is at least equal to the expected value of expenditure. This does not mean,

however, that the household will be able to finance their spending in every situation (including worst-case scenarios). To do so, the current household income increased by the value of the household's assets would have to be higher than the maximum possible level of expenditure in all the scenarios considered:

$$S_h + \min_{AB \in SAB} \sum_{m=1}^{M_h} \left(y_{mh} - \sum_{i=1}^{Q} d_{qmh} \beta_{qmhB} \right) \geq \max_{AB \in SAB} c_{hA} \tag{7}$$

The additivity of the proposed index allows for the average level of economic security in a given population to be assessed. By calculating the average value of *ES* for all households in a given group (national, social or occupational), the average length of the period is obtained.

The design of this index allows for many different risk factors to be taken into account, including those that affect both household consumption and the income of individuals. In cases where there is a large number of possible scenarios, it is possible to determine the expected impact of some events in a simplified form. Numerous rare events with similar financial consequences can be treated as a single event (assuming their independence). In this case, the probability of such a compound event would be equal to the sum of the probabilities of individual events, while the change in income or expenses would be equal to the average change resulting from these events. Such a procedure yields a similar assessment of the level of economic security, but can significantly reduce the number of scenarios to be analysed.

2.4. Data

Described in Sections 2.2 and 2.3, the method of economic security level assessment, which constitutes the essence of proposed approach, in practical applications requires a number of parameters. In this sense, an estimation of the level of economic security for a specific population depends, in practice, on the available data, in terms of both their scope and structure. Reference to practice also involves the necessity to adopt a series of assumptions, as it is also given in the next part of this analysis. It is worth emphasising at this point that the assumptions and simplifications described further—including, for example, ways of estimating probabilities—are necessary in a specific, practical application. They are not, however, an intrinsic component of the presented approach and they are dependent on the scope of analysis (for example, the set of events) with respect to a particular population and the data available for this population.

The considered scenarios of future events will include three groups of events. The first one is related to possible changes to the situation of the household members in the labour market. The second group includes the risks associated with a decrease in income not directly related to the loss of jobs, including, for example, a change of work, the risk of the employer's financial problems or the need to reduce the amount of additional work performed. The third of these groups includes the possibility of the occurrence of events involving the need for bearing additional expenditure.

The events of the first and second groups would belong to those affecting the level of income earned by individuals in the household (denoted by *q* in Equation (2)), while the events of the third group will impact the level of expenditure of the household as a whole (denoted by *r* in Equation (1)).

The data used to assess the level of economic security of households in Poland came from the Social Diagnosis study (see the Council for Social Monitoring 2000–2011), which is the most extensive independent research on the situation of Poles and Polish households. In the Social Diagnosis study, respondents were asked about issues related to the material situation of their households (such as income, material status, savings, loans), economic activity, their health situation and their personal opinions on several current problems. The first round of this study took place in 2000; in the data for that year, however, there is no information on individual income, which is required to estimate the level of economic security. Therefore, in the empirical part of this article, only the subsequent rounds of Social Diagnosis are considered: the years 2003, 2005, 2007, 2009 and 2011. The sample sizes increased over time between 2005 and 2011, including 3961 households in 2003, 3851 in 2005, 5532 in 2007, 12,381 in 2009 and 12,386 in 2011. This sample size, along with the sampling method used in official surveys conducted by the Central Statistical Office, ensures the high quality of the data collected in this study.

Social Diagnosis is a panel study. In each subsequent round, the study included all the consenting households from the previous rounds (approximately two thirds of the households in the previous round).[8] These panel sub-samples were used to assess changes in income, expenditure and position in the labour market. However, in the models estimated in the next section, the data is treated as a series of cross-sections.

Due to the availability of relevant data, an evaluation of economic security was performed for a two-year horizon. A two-year analysis horizon means that risk factors characteristic for longer periods (such as the stability of the state system, the stability of public finances and social security) will not be directly considered. Due to the short horizon of the analysis, we will consider as safety factors the current household income and savings as the most liquid asset.

The point of reference allowing for an assessment of whether the household will be able to finance the basic needs in the various scenarios of future events will be the level of expenditure considered by the households' members as being basic. Since the category of basic expenses is not uniquely defined and its assessment is quite complicated, information available in the Social Diagnosis study could be used as a proxy. Respondents to the Social Diagnosis study are asked to declare a minimum income that they perceive as necessary to make ends meet. This hypothetical minimum income depends on the households' financial situation and reflects the concept of basic expenses.[9]

3. Results

3.1. Changes in an Individual's Position in the Labour Market

The first of these groups of events relates to changes in employment. Evaluation of the consequences of changes in the status of an individual in the labour market is widely analysed in the literature. Areas that are evaluated include the consequences of job loss (or reduction in the number of hours worked) for the level of income and consumption (see Stephens 2004), economic security (see Berloffa and Modena 2014; Nickell et al. 2002; Clark and Postel-Vinay 2009), a subjective sense of job stability (see Campbell et al. 2007) and, finally, the state of health (Stronks et al. 1997). In this way, the description of the effects of changes in the status on the labour market may reflect a sometimes very complex interaction mechanism; for example, a forced reduction in labour supply may be associated with the deterioration of mental health, which, in turn, will affect the ability to perform work even more negatively.

In the proposed approach, due to the nature of the assessment of the level of economic security, the effects of changes in status on the labour market will therefore be reduced to changes in the level of income. However, the method of assessing changes in the position of an individual in the labour market is not the essence of the proposed approach, so it can be adjusted to the situation in the local labour market and the available data.

While employed individuals can keep a job or lose it, people currently living on benefits may remain in the same situation or improve their situation by finding a job. For people whose main source of income is a pension, it is assumed that their income remains unchanged[10] in the period under analysis (the probability of maintaining individual income at the same level was set to 1).[11]

The data on the basis of which the economic security of households in Poland will be assessed allows for the use of logistic regression to describe the situation in the labour market.[12] The

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[8]   There are weights published for each household, making it possible to assess the impact of this method of construction of the sample on the final results. These weights were taken into account in the assessment of the level of economic security.

[9]   Alternatively, basic expenses can be estimated on the basis of the analysis of the consumption structure.

[10]   All monetary values are expressed later in constant prices from the beginning of the analysed, two-year period.

[11]   To better reflect the situation of this group of people, average life expectancy should be taken into account, and, in the long run, the risk of the insolvency of the social security system as well.

[12]   On the usage of logistic regression for the assessment of probabilities of shifts in the labour market status, see, for example, Vera-Toscano et al. 2004.

probability of having a job (income) was determined on the basis of an estimation of the parameters of the logistic regression function, which is given by:

$$ln\left(\frac{p_{mh}}{1 - p_{mh}}\right) = \hat{\beta}_0 + \hat{\beta}_1 x_{1,mh} + \hat{\beta}_2 x_{2,mh} + \hat{\beta}_3 x_{3,mh} \tag{8}$$

where p_{mh} is the probability that person m in household h will be working full-time at the end of the two-year period. Values $\hat{\beta}_i$ denote estimates of unknown parameters and $x_{i,mh}$ represent the values of variable X_i for person m in household h at the beginning of the period. In the final model, three variables were incorporated: X_1 is full-time work (1 for persons working full time and 0 for others), X_2 is the employer's sector (1 for state-owned or municipal institutions and 0 for private companies), and X_3 is the respondent's health status (1 if health never interferes with daily activities and 0 otherwise). Other explanatory variables considered, including the respondents' subjective assessment of the stability of their sources of income (1 if the respondent never felt that the source of income was unstable and 0 otherwise) and a subjective assessment of their financial situation (1 if financial problems never hindered their lives and 0 otherwise), proved to be insignificant. The dependent variable adopted was whether a given respondent was working full-time (1 for working full time and 0 otherwise) in the next round of the study (two years later). Even though the model uses data from different periods, panel data methods are not used here; the two-year period is treated as a single observation.

Besides the explanatory variables approved for the final model, other sets of variables were considered as well. A similar level of fit was obtained when variables describing the sector (public or private) of the employer and health status were replaced by non-work-related variables like the respondent's education and gender. However, adding these variables to the existing model did not improve the fit. For this reason, only variables directly related to work were analysed.

During the selection of the explanatory variables, it was very interesting to note the lack of statistical significance of variables describing the respondents' subjective perception of their own economic situation, in terms of both the stability of their income sources (in this case work, because the analysis concerned only households declaring work as the main source of income), and the stability of their financial situation (a negative assessment could provide an incentive to look for work by people currently not working). Despite the fact that one's subjective assessment of one's own situation strongly influences decisions, it does not appear to be a plausible predictor of the future situation of individuals or households.

This lack of dependence may be a consequence of the specific situation on the Polish labour market, where there is great uncertainty due to the still high unemployment rate. This uncertainty may, however, lead to distortions in the correct assessment of the situation.

The results of the estimation of the model yielded by Equation (8) for subsequent periods are presented in Table 1. The estimation of the parameters was done on the basis of the panel sub-sample from the Social Diagnosis study using the maximum likelihood method in the IBM SPSS 22 software package.

Table 1. Estimates of the parameters of logistic regressions.

Parameter	Estimates for the Period			
	2003–2005	**2005–2007**	**2007–2009**	**2009–2011**
$\hat{\beta}_1$ (full-time work)	3.06 (0.07)	2.77 (0.07)	3.44 (0.07)	3.71 (0.05)
$\hat{\beta}_2$ (employer's sector)	0.81 (0.11)	0.96 (0.12)	1.12 (0.13)	0.97 (0.09)
$\hat{\beta}_3$ (health)	0.50 (0.07)	0.72 (0.07)	0.96 (0.07)	0.76 (0.05)
$\hat{\beta}_0$	−2.13 (0.05)	−1.72 (0.05)	−2.00 (0.05)	−2.00 (0.04)
Number of observations	7710	6724	8092	17,280
Nagelkerke's pseudo-R^2	0.53	0.48	0.61	0.64
Percentages of correct classifications	84.6%	81.6%	85.9%	87.3%

Note: Standard errors are given in parentheses.

Due to the lack of data about the situation in 2013, the parameters obtained for 2009–2011 were used to estimate the level of economic security in 2011. The situation of the labour market in Poland, which is the main factor affecting the value of the estimated parameters of the model, did not change appreciably between 2009 and 2011, although the economic downturn during this period led to a slight rise in unemployment.

The logistic regression model allowed us to calculate the probability of a given person having full-time work at the end of a two-year period on the basis of information about their current situation according to the formula:

$$p_{mh} = \frac{\exp(\hat{\beta}_0 + \hat{\beta}_1 x_{1,mh} + \hat{\beta}_2 x_{2,mh} + \hat{\beta}_3 x_{3,mh})}{1 + \exp(\hat{\beta}_0 + \hat{\beta}_1 x_{1,mh} + \hat{\beta}_2 x_{2,mh} + \hat{\beta}_3 x_{3,mh})} \tag{9}$$

The calculated probabilities permitted an assessment of the impact of two types of events on the level of household economic security. The first was the loss of full-time work: an adverse event $q = 1$, where $x_{1,mh} = 1$ and $p_{1mh} = 1 - p_{mh}$. The second was finding full-time work, a favourable event $q = 2$, where $x_{1,mh} = 0$ and $p_{2mh} = p_{mh}$.

Given information on the income earned by each of its members and the probabilities of continuing, losing or gaining full-time work, identifying the scenarios in which the household will be able to cover its expenditures requires changes in the level of income d_{qmh} to be determined. On the basis of the panel data analysis for the two-year periods, it was found that a lack of change in an individual's position in the labour market (working full-time at both the beginning and end of the period, or no full-time work at both the beginning and end of the period) implied that that person's income remained at approximately the same level. In subsequent periods, there were small differences (a few percent) in the groups of both the employed and the unemployed.

Significant differences were observed in the level of income in cases where a job was found or lost. The values obtained differ significantly from period to period, so in the further analysis it was assumed that finding full-time work doubled the current income and that losing full-time work resulted in a reduction of income by half. This means that $d_{1mh} = 0.5 y_{mh}$ and $d_{2mh} = -y_{mh}$. These values were a proxy for the average change observed.

3.2. Changes in Income Level

The second type of event that could have an adverse impact on the economic security of the household are changes in the level of income earned. As in the case of changes in the situation in the labour market, any event affecting the level of income concerns individuals in the household. Households (as a whole) are affected by these changes indirectly by reducing the overall amount of income at its disposal.

Table 2. Range of adverse changes in the level of income.

| | Adverse Event | | | |
| | Adverse Event I: Individual's Income Decline Not Exceeding 50% of Its Initial Value | | Adverse Event II: Individual's Income Decline Exceeding 50% of Its Initial Value | |
Period	Average Income Decline (%)	Share of Individuals (Probability Estimate)	Average Income Decline (%)	Share of Individuals (Probability Estimate)
	Individual's position in the labour market: full-time job at the beginning and at the end of the period			
2003–2005	20	0.238	69	0.054
2005–2007	22	0.203	66	0.046
2007–2009	22	0.146	63	0.016
2009–2011	21	0.221	71	0.046
	Individual's position in the labour market: no job at the beginning of the period and full-time job at the end of the period			
2003–2005	24 *	0.088	80 *	0.027
2005–2007	22 *	0.094	80 *	0.029
2007–2009	23 *	0.092	60 *	0.005
2009–2011	21 *	0.134	77 *	0.042
	Individual's position in the labour market: no job at the beginning and at the end of the period			
2003–2005	16	0.140	85	0.058
2005–2007	17	0.158	75	0.067
2007–2009	17	0.107	84	0.039
2009–2011	19	0.120	79	0.058

* Getting a job in the period analysed is associated, on average, with an increase in income. However, in the case of the occurrence of adverse events involving the income decrease, this decrease (expressed as a percentage change) refers to the level at the beginning of the period (before starting work). Note: sample size for each period was: 2003–2005 = 7710; 2005–2007 = 6724; 2007–2009 = 8092; 2009–2011 = 17280.

The reasons for changes in the level of income can be very diverse and can be inferred only indirectly based on available data. Therefore, analysis of these events will be carried out not in terms of causes, but the consequences for the level of income. On the basis of panel data for each two-year period, individuals were identified whose income decreased during this period. These people were then divided into two subgroups. The first one included people for whom the income decrease did not exceed 50% of the income at the beginning of the period. The second comprised people whose income decrease exceeded 50%. For each of these groups, there was an average estimated decrease of income (expressed as a percentage of its initial value), along with a percentage of individuals affected by the drop in income. This latter value was adopted as an estimate of the probability of occurrence of a change in the level of income.

The described calculations were carried out separately for people who:

- worked full-time, both at the beginning and at the end of the analysed period;
- did not work at the beginning of the period, but worked full-time at the end;
- did not work full-time at the beginning nor the end of the period.

The decrease in income was not estimated for people who lost their jobs during the period. The average level of income loss in such a case was taken into account during the analysis of changes in the labour market.

The values in Table 2 were calculated for panel subsamples; that is, for all households who took part in the survey at the beginning and the end of the period.

The data in Table 2 allows for a definition of the following two events. The first one ($q = 3$) denotes a decrease of income not exceeding 50% of its initial value. The second ($q = 4$) denotes a decrease of income in excess of 50% of its initial value. Income changes corresponding to these events and their probabilities depend on the year of the analysis and the status of the person in the labour market. For example, for an individual employed both in 2009 and 2011, they take the following values $p_{3mh} = 0.221$, $d_{3mh} = 0.21y_{mh}$, $p_{4mh} = 0.046$ and $d_{4mh} = 0.71y_{mh}$.

3.3. Changes in Expenditure Level

The last of the considered groups of events are changes in the level of expenditure. Additional costs may result from various reasons such as the need to pay for health care or finance the repair of damaged property items. The most frequently considered (next to the position in the labour market) in the context of economic security, however, is the issue of health care (see Hacker 2006; Hacker et al. 2014; Osberg and Sharpe 2014). Because of the universal nature of health insurance in Poland, spending borne directly by households does not include the total cost of treatment but only some additional amount paid by patients. Nevertheless, regardless of the health insurance system, health problems are usually the primary source of considerable unexpected expenses.

Data on health-related expenditure, which is available in the Social Diagnosis, refers to a period of three months (respondents were asked to specify an amount of expenditure incurred in the last three months preceding the survey). In order to estimate the additional expenses related to health care on this basis, the following assumptions were made:

- Increased spending on health care appears once during the 24-month period.
- The 3-month period, to which the declared expenditure relates to, includes all the costs that are a consequence of the illness.
- Costs must be incurred during the period of the illness, but the means to finance them may come from loans and borrowing (non-interest), which must be given back in the period under analysis (two years). This means that additional costs will be evenly spread over the 24-month period.
- The likelihood of additional costs is assumed to be eight times higher than the incidence of the expenditure of a given range (declared expenses include three months within the considered 24-month period). Such a transformation assumes the equal intensity of possible health problems throughout the period. Large medical expenses, however, are usually associated with illnesses that are not seasonal in nature (such as influenza).

Households that had suffered additional costs in healthcare at the beginning or at the end of the analysed period were divided into three groups, distinguished from the point of view of the level of these costs. The first group included households for which these costs ranged from 3000 PLN to 5000 PLN, the second from 5000 to 10,000 PLN, and the third–over 10,000 PLN (in the period analysed, the currency exchange rate was usually close to 4 PLN per 1 EUR). Expenditure of less than 3000 PLN was treated as current. Similarly, as in the case of a drop in income, for each of these groups, we estimated the average amount of expenditure and the corresponding probabilities of this change (it was assumed in the analysis that within the two-year period, it was possible that at most one such event could occur). The estimated results are shown in Table 3.

The data in Table 3 describe three adverse events that could affect the level of household expenditure (these events, in contrast to those earlier, are defined at the household level rather than the individual level). The first of them ($r = 1$) denotes incurring an expenditure of between 3000 and 5000 PLN, the second ($r = 2$) denotes expenditure between 5000 and 10,000 PLN, and the third ($r = 3$) denotes expenditure of more than 10,000 PLN. Corresponding values of w_{rh} (see Equation (1)) and p_{rh} (see Equation (3)) depend on the period. For the period 2009–2011, they are as follows: $w_{1h} = 3502$, $p_{1h} = 0.13$, $w_{2h} = 6154$, $p_{2h} = 0.045$, $w_{3h} = 14,836$ and $p_{3h} = 0.011$.

Table 3. The range of extra, healthcare-related expenditure.

	Adverse Event					
	Adverse Event I: Household's Additional Expenses between 3000 PLN and 5000 PLN		Adverse Event II: Household's Additional Expenses between 5000 PLN and 10,000 PLN		Adverse Event III: Household's Additional Expenses above 10,000 PLN	
Period	Average Amount (PLN)	Probability Estimate	Average Amount (PLN)	Probability Estimate	Average Amount (PLN)	Probability Estimate
2003–2005	3511	0.050	6436	0.015	12,302	0.001
2005–2007	3562	0.055	6202	0.019	13,563	0.003
2007–2009	3468	0.119	6079	0.040	13,404	0.011
2009–2011	3502	0.130	6154	0.045	14,836	0.011

Note: The sample size for each period was: 2003–2005 = 3881; 2005–2007 = 5532; 2007–2009 = 12,381; 2009–2011 = 12,387.

3.4. Economic Security Level

The collected information allowed for determining both the probability p_h (see Equation (4)) of being able to cover household expenses at the pre-set level c_h and the amount of missing income MI_h (see Equation (5)) for each individual household.

The final step in the estimation of economic security was to determine the level of liquid assets, which may periodically supplement current income. Due to the length of the analysis horizon and the lack of the possibility of precisely assessing the value of fixed assets on the basis of the available data, the only liquid assets considered were savings. In the Social Diagnosis study, the amount of savings is declared in brackets in relation to the monthly household income. In the further analysis, the value of savings for a given household is calculated as a product of current income and the number of months equal to the mean of the limits of the stated interval. For the first interval (savings lower than the monthly income), the multiplier was set at 0.5; for the second interval (between one and three months' income), it was set at 2; for the third (between three and six months' income), it was set at 4.5; and for the fourth (between six and 12 months' income), it was set at 9. For the highest interval (savings higher than annual income), the multiplier was set at 18, twice the previous value.[13]

As indicated before, our evaluation of economic security was performed for a two-year horizon. For this time period, it was possible to present the results as the expected number of months for which a household will be able to cover its basic expenses at the current level, or alternatively as a value between 0 and 1, indicating the portion of the analysis horizon during which a household will be able to cover its basic expenses at the current level. Throughout the rest of this section, the results are presented using the latter method, since most of the economic security indexes proposed in the literature express results in this way (see, for example, Osberg and Sharpe 2014).

Estimates of economic security obtained for each household on the basis of the Equation (6) can be aggregated, allowing for an assessment of the average level for the entire sample. The mean values for the subsequent periods are presented in Table 4.

The results indicate a relatively low level of economic security in Poland. Interpreting the level of economic security as the expected length of time for which a household is able to cover its basic expenses, the length of this period ranged from just over 11 months (0.462 × 24) in 2003 to more than 14 months (0.590 × 24) in 2011.

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[13] Unfortunately, the exact distribution of savings is not known, therefore some simplifying assumptions need to be made.

Table 4. The average level of economic security in Poland.

Year	2003	2005	2007	2009	2011
Mean	0.462	0.523	0.513	0.529	0.590
Median	0.468	0.598	0.618	0.597	0.688
Sample size	3635	3494	5038	11,022	11,144

The general economic situation, which improved significantly between 2003 and 2011, had a positive impact on economic security. A significant increase in the level of economic security in the years 2003–2005 was associated with rapid growth during this period, accompanied by a significant decrease in unemployment and an increase in wages. The second period of rapid increase in the level of economic security, between 2009 and 2011, had another source. In this period, Poland maintained positive economic growth (despite the problems in the world economy), but not as fast as in earlier years. The rise in real wages observed in this period was accompanied by a much slower (than in previous periods) increase in income declared as a minimum, allowing the household to make ends meet. This had a direct impact on the estimated level of economic security in this period. It should be emphasised that if a similar relationship will also be observed in subsequent periods, this will mean that the average Polish household would exceed the wealth level, above which it will be able to create financial reserves (especially savings, which are currently at a very low level in Poland).

The results showing changes in the level of economic security, at the same time show that this phenomenon is not directly related to economic growth, unemployment and wage growth, although all of these factors have a definite influence on its level in the long term.

The analysis of changes in the distribution of the economic security of households is shown in Table 5. The group of households that are characterised by a complete lack of economic security, that is, those for which the declared minimum income exceeded the actual income, decreased significantly during the period. At the same time the proportion of households having a very high level of security grew constantly (which was also suggested by the relation between the mean and median in consecutive periods). Both of these phenomena should be assessed as clearly positive for the security level of households in Poland.

The mobility analysis indicates that the percentage of households permanently deprived of economic security was much lower than the percentage of households with a security level below 0.2 (see Tables 5 and 6). It was also lower than the share of steadily secure households. It is also worth emphasising that the proportion of households whose economic security fell from the highest level (above 0.75) to the lowest (less than 0.25) within one period has declined since 2005.

The increasing proportion of households with a permanently high level of economic security should be regarded as an unequivocally positive phenomenon. This results from the better situation in the labour market than at the beginning of this century, but also, to some extent, from an increase in savings.

Table 5. Distribution of economic security in Poland.

Economic Security Index	Share of Households (%)				
	2003	2005	2007	2009	2011
0.0–0.1	36	27	34	32	25
0.1–0.2	3	6	5	3	3
0.2–0.3	3	3	2	1	1
0.3–0.4	4	3	1	2	3
0.4–0.5	7	3	2	4	4
0.5–0.6	7	7	5	8	10
0.6–0.7	9	10	9	6	7
0.7–0.8	6	9	6	5	6
0.8–0.9	5	5	5	7	7
0.9–1.0	20	26	31	31	35
Sample size	3635	3494	5038	11,022	11,144

Table 6. The mobility of households' economic security in Poland.

Share of Households (%)			
	Economic Security Level in 2005		
	0.00–0.25	0.25–0.75	0.75–1.00
Economic security level in 2003			
0.00–0.25	**21**	12	9
0.25–0.75	8	11	9
0.75–1.00	6	7	**16**
	Economic security level in 2007		
	0.00–0.25	0.25–0.75	0.75–1.00
Economic security level in 2005			
0.00–0.25	**22**	7	7
0.25–0.75	12	8	10
0.75–1.00	8	6	**21**
	Economic security level in 2009		
	0.00–0.25	0.25–0.75	0.75–1.00
Economic security level in 2007			
0.00–0.25	**23**	9	10
0.25–0.75	6	7	7
0.75–1.00	6	7	**26**
	Economic security level in 2011		
	0.00–0.25	0.25–0.75	0.75–1.00
Economic security level in 2009			
0.00–0.25	**17**	9	9
0.25–0.75	5	10	9
0.75–1.00	4	8	**28**

Note: The sample size for each period was: 2003–2005 = 2709; 2005–2007 = 2404; 2007–2009 = 3255; 2009–2011 = 7202.

4. Discussion and Conclusions

The method of defining economic security and its measurement proposed in the article allows for the assessment of the level of economic security both in a micro-scale, taking into account the specificity of households, as well as aggregation on a population scale. The method used, based on scenario analysis, allows for the inclusion of various areas and their integration in a consistent manner within the adopted reference category. At the same time, it enables significant adaptations to the conditions of a given country or region to take into account specific risk factors, important for economic security.

The concept of economic security considered in this article reflects, to a large extent, the stability of the economic situation of households as a category that is separate from poverty. A low standard of living among poor households does not necessarily mean that their situation is relatively unstable. As suggested by the results of changes in the level of benefits (among individuals who declared them as the primary source of income for both the beginning and the end of the period), various types of benefits can be a stable source of income, thus ensuring a relatively high level of economic security, which may be one of the causes of persistent poverty. Due to a low income and a lack of savings, poor households are more vulnerable to the consequences of adverse events (poverty may also imply the inability to borrow money from friends, family or banks), but the high stability of benefits may denote some economic security, even if the income obtained is low.

The analysis presented in the empirical part revealed that *ES* values only partially reflect the general condition of the economy and the situation of the labour market. Nevertheless, an increase in the average level of economic security in Poland was observed in the whole period, with a slight decline between 2005 and 2007. In addition, the increase in the level of economic security was accompanied by a significant decrease in mobility in the upper part of the distribution; in subsequent periods, an increasing number of households were economically secure for two consecutive periods.

The empirical part of this article dealt with a short period and selected risk factors. The proposed concept of economic security, however, allows the analysis to be broadened to encompass additional

areas, such as those related to material losses or changes in the family situation. Another very interesting field for further research is the issue of long-term economic security by taking into account the stability of the pension system.

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