Public Choice Theory as a tool for explaining genesis and development of social insurance

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Abstract

The standard justification for the appearance of public social insurance in economic and financial theory is the imperfection and incompleteness of private insurance and risk markets. However, this approach is not complete, as it ignores other conditions that can be explained by public choice theory. Bringing them closer is the main goal of the article, which is further specified in the case study of social insurance for farmers in the Third Republic of Poland. The first part presents some of the most representative definitions of this theory and its central categories, namely: state/government failure and its forms; types, sources and consequences of ineffectiveness of politicians and public administration; the functioning of interest groups and the related rent-seeking, and the political economic cycle. Then a critique of public choice theory and attempts to defend it are presented. As a kind of partial summary of this part of the discussion, the case study entitled "Social insurance for farmers in the Third Republic of Poland" is analysed further. For comparison, the view of neoclassical economics on the emergence and development of social insurance is presented. On the other hand, the perspective of behavioural economics is ignored. The second part of the article is devoted to political and economic modelling, i.e. looking for solutions in the field of social insurance that simultaneously optimize political and economic and fiscal goals. First, the two rationale for the emergence and expansion of social security are discussed. Then this problem is presented in the convention of the expected utility hypothesis and the concept of generalizing it and alternative to it. It then moves on to the phenomenon of "populism in pensions" and the credibility of public and private pension systems. Finally, the problem of optimizing the combination of both these systems and their absolute and relative size is taken up. Although the work deals with social risks, it mainly focuses on the risk of old age.

Keywords: KRUS, political and economic modelling, public choice theory, social insurance.

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Introduction

Social security, including that of farmers, remains in numerous, most often very complex, interactions with various spheres of the economy, politics and life of citizens. As a result, in order to describe their appearance, functioning, development and reform, we need to refer to many theories: economic, financial, legal, social and political. However, there are still many issues (public vs. private savings; labour market relations with pensions; social security reforms; the impact of institutional characteristics) that require an interdisciplinary approach. Such a need nowadays results from many processes: the dominance of income from gainful employment; disagrarisation of economies and society; limited possibilities of financial social assistance provided by religious associations, local governments or private persons; underdevelopment of private insurers or a small number of newborn children, which reduces intra-family transfers.

Various schools of economics see social insurance mainly through the prism of meeting the future financial needs of the insured, when they lose the possibility of income or if the income is significantly reduced. The microeconomic basis of insurance and pension decisions strongly emphasizes the compulsion to pay contributions and the fact that deep subsidization of public insurance systems displaces (substitutes) other types of insurance. As a standard, microeconomics refers to the incompleteness and imperfection of private markets, which leads to the creation of the above-mentioned public systems. In turn, imperfections and incompleteness are derived from the asymmetry of information, which leads to negative selection and moral hazard. The expected utility theory also plays a fundamental role in neoclassical microeconomics. Macroeconomists, on the other hand, are mainly interested in the relationship between social security and savings, investments, growth and socio-economic development. Combining the achievements of micro- and macroeconomics is necessary to deal with the difficult problem of optimizing the size of the insurance system and measuring its effectiveness.

Neoclassical public finances also widely refer to the imperfections and incompleteness of private insurance markets against life (social) risks, while being oriented towards the needs and expectations of specific social groups, which also reflects their political power, or functions (an effective insurance system increases the overall effectiveness of the whole socio-economic system). These finances also strongly expose the determinants of the increase in this efficiency by reducing negative selection and moral hazard as well as transaction costs. Obviously, public finance pays a lot of attention to the social security relationship with debt and fiscal deficits, and

the effects of crowding out and stuffing them in. A separate, very important place is also occupied by the problem of these insurances becoming a public good.

Unique possibilities of analysing and modelling social security systems are offered by the theory of public choice, on which the following considerations are basically focused. However, it is particularly suitable for describing the emergence and functioning of autonomous systems, and in Poland these are retirement and disability insurance and health insurance for farmers, miners, uniformed services and the justice apparatus. For various reasons, their beneficiaries have high political power, and they are linked by low economic efficiency and the provision of public services. The "Polish Deal", which is still pending legislation, will immeasurably improve, for example, the position of farmers in relation to other entrepreneurs and full-time employees. Miners, in turn, can obtain job guarantees and very favourable pensions even until 2048. No economic or financial school alone is able to explain the duration of these special systems in our country. The public choice theory, with its conceptual apparatus (interest groups, median/middle voter, rent-seeking, political economic cycle, imperfection of government), is unrivalled in this respect. This is largely due to its interdisciplinary nature, although, like any other theory, it also has specific weaknesses. Their mitigation requires a broader use of the achievements of behavioural economics and finance, and, with time, also of experimental economics. It is necessary for the political and economic models constructed on its basis to have greater explanatory and predictive abilities.

Fundamentals of public choice theory

Public choice theory is also called public choice, rational choice theory, political economy or economic theory of politics. According to D.C. Mueller, one of the most outstanding contemporary representatives of this trend, this theory explains the most general principles of the distribution of goods carried out by the public sector and its effectiveness[1]. To achieve this goal, it is necessary to clarify the role of the state in terms of resource allocation and redistribution in both direct and representative democratic systems, in a positive and normative sense. J. Gruber identifies the above theory with the school of thought, which emphasizes the fact that governments do not have to act to maximize social welfare, because, like markets, they are often unreliable[2]. S.H. Rosen and T. Gayer equate public choice theory with

1. C.D. Mueller, *Public Choice III*, New York, Cambridge University Press, 2003.
2. J. Gruber, *Public Finance and Public Policy,* Fourth Edition, New York, Worth Publishers, 2013.

political economy, a discipline of science that applies the principles of economics to the analysis of political decision-making processes[3]. These two American public financiers, like Mueller, organize their further deliberations around the problems of direct and representative democracy, but they also strongly emphasize the reasons for the expansion of the public sector after the Second World War. J. Cullis and P. Jones use the term "collective decision making". They specify that this refers to the rules that are used to decide what goods and services should be secured by the state and what taxes should be levied to achieve this, bearing in mind the consequences of these decisions for individual welfare[4]. D. Brümmerhoff considers the essence of the public choice theory to analyse the state's decision-making processes, which reflect the relationship between the preferences of members of a given society and decisions made by public authorities[5]. Finally, A. Heywood – an outstanding British political scientist – believes that this theory is based on the claim of neoclassical economics that political issues are best described by the microeconomics of behaviour of individuals guided by rationality in pursuit of their goals[6] .The Swedish economist Knut Wicksell, the creator of the so-called Swedish school of economics, dominated by the philosophy of utilitarianism, is usually regarded as the forerunner of public choice theory. His research interests were very broad, which, inter alia, resulted from his comprehensive education. With regard to the theory of public choice, it should be noted that he treated governments as an instrument of the exchange of something for something, or more precisely, the equivalence of benefits with taxes and public expenditure. It is important to add here that Wicksell was part of the gradual "cleansing" of the nineteenth-century political economy of the influence of behaviouralism and becoming neoclassical economics in the strict sense[7] . Wickell's successors have increasingly focused on the role and characteristics of politicians, showing that they very often pursue their own, selfish goals – maximizing personal gain rather than social welfare. However, the real explosion of public choice theory took place only after the Second World War. Then, in 1948 to be precise, D. Black, also referred to as the "founding father" of this theory, began to publish unifying articles that later inspired A. Downs to create the concept of the median voter (1957). It was only in 1991 that P.J. Couglin succeeded in replacing it with the theory of

3. H.S. Rosen, T. Gayer, *Public Finance*, Ninth Edition, New York, McGrow-Hill. International Edition, 2010.
4. J. Cullis, P. Jones, *Public Finance & Public Choice. Analytical Persepectives*, Third Edition, Oxford, New York, Oxford University Press, 2009.
5. D. Brümmerhoff, *Finanzwissenschaft*, 10 Auflage, München, Oldenburg Verlag, 2011.
6. A. Heywood, *Politologia*, Warszawa, Wydawnictwo Naukowe PWN, 2010.
7. E. Kiryluk-Dryjska, *Formalizacja decyzji wyboru publicznego. Zastosowanie do alokacji środków strukturalnych wspólnej polityki rolnej w Polsce*, Warszawa, Wydawnictwo Naukowe PWN, 2014.

probabilistic voting/selection. In the 1950s, K.J. Arrow's publication on social choice under conditions of differentiated values/individual preferences, in which, inter alia, he formulated the famous theorem of impossibility. The next decade of the 20th century saw intense work by J.M. Buchanan, M. Olson and G. Tullock, with J.M. Buchanan even receiving the Nobel Prize in Economics in 1986. Two schools of public choice theory gradually developed: one in Chicago and one in Virginia. The former is unequivocally embedded in traditional neoclassical microeconomics and maintains that due to the non-linearity of social loss, politics can be effective, rendering any additional steering measures redundant[8]. Against this background, the Virginia school appears to be an even more libertarian approach, as its representatives (J.M. Buchanan and G. Tullock) did not allow for any altruistic behaviour or for politicians to be guided by the common interest.

The post-2000 public choice theory includes a period of a specific struggle of an expressive interest[9] with the irrationality of democracy. The above interests, i.e. gaining applause, should be opposed in elections to instrumental interests, i.e. financial and non-financial benefits. This is because it allows the voting paradoxes to be overcome. Otherwise, we will be doomed to the irrationality of decisions made in democratic elections. As argued by B. Caplan, democracy has a built-in mechanism for supporting irrational beliefs and the same policies, i.e. protectionist and interventionist. Such views are opposed, among others, by D. Wittman who in his model of electoral behaviour argues that candidates have certain socio-political, ideological, and even religious preferences. Although these people primarily want to win, they are often also guided by the common good. In this context, the challenge for economists is to choose the right language to advocate for specific solutions.

Contemporary public choice theory is, in fact, a synthesis of the achievements of many scientific disciplines: economics, political science, sociology, psychology, law, decision-making theory and game theory. As can be seen, it is thoroughly interdisciplinary, and its rejoining of economics with political science may even be considered a paradox, but is in fact normal. As a side note, however, it should be added that "The Journal of Economic Literature", the creator of the JEL classification, places it in microeconomics with the designation D "Analysis of Collective Decision-Making". Today it also has a well-established methodology that includes: methodological

8. *Słownik politologii*, Warszawa, Wydawnictwo Naukowe PWN, 2008; J. Oppenheimer, *Principles of Politics. A rational choice theory guide to politics and social justice*, New York, Cambridge University Press, 2012.

9. *Public management and governance*, second edition, ed. T. Bovaird and E. Löffler, London, New York, Routledge, 2009; *Public Management and Performance. Research Directions*, ed. R.M. Walker, G.A. Boyne, G.A. Brever, New York, Cambridge University Press, 2012.

individualism, rationality, utility maximization, extensive use of models, and subjectivism[10]. The set of methods used includes: formal models, quantitative methods, tools for socio-psychological research, experiments and elements of game theory.

Central to public choice theory is the concept of government unreliability. As we remember, J. Gruber even equated the two. In general, the above-mentioned unreliability is nothing more than a type of economic inefficiency caused by public intervention, even if in the absence of market failure[11]. This term was introduced in 1964 by R. Coase in his article entitled "The Regulated Industries: Discussion" in American Economic Review (Vol. 54, No. 2). It should be noted that this unreliability need not occur when a given policy/intervention creates both gains and losses. However, this is the case when an effective mechanism for compensating losses by the policy beneficiaries is successfully implemented.

M. Fritsch distinguishes two types of government unreliability:

1) policy-induced when it produces undesirable outcomes for society as a whole;

2) the source of which is the ineffective functioning of the state administration which is inconsistent with social goals[12].

As a remedy, this German economist sees good education of politicians and bureaucrats, supporting them with expert knowledge, stigmatizing and punishing unprofessional and unethical, not to mention criminal, attitudes and behaviour. In a broader plan, however, the more effective solution seems to be limiting the role of the state, its reasonable decentralization, implementation of transparent systems and paths of political and administrative career, as well as incentive, settlement and accountability systems. Undoubtedly, more importance should also be attached to the procedures of direct democracy.

State failure can manifest itself in two forms:

1. The so-called regulatory capture, where the regulator more or less adopts the point of view of regulated entities. Rent-seeking, which is a category directly dependent on the size of government spending and little determined by the level of income of the society, the robustness of the law, transparency and free media, as well as the so-called rational ignorance voting are the two main mechanisms leading to this bondage.
2. Regulatory arbitrage. This is nothing more than obtaining a more favourable position in relation to the regulator in relation to the existing standards and regulations[13].

10. E. Kiryluk-Dryjska, op. cit.
11. B.Ch. Blankart, *Öffentliche Finanzen in der Demokratie. Eine Einführung in die Finanzwissenschaft*, 8. Auflage, München, Vahlen, 2011; M. Fritsch, *Marktversagen und Wirtschaftspolitik*, 9. Auflage, München, Vahlen, 2014.
12. Ibidem.
13. J. Oppenheimer, op. cit.

The unreliability we are interested in here can occur on both the demand and supply side. In the first case, it is the result of flawed mechanisms of revealing social preferences and paradoxes of election and decision-making procedures in the public sphere. In the latter case, the cause of supply-side unreliability is the prevalence of the agency theory problem. Consequently, these two types of failure have the effect of crowding out private investment by public expenditure. Transaction costs in the economy are also rising.

W. Niskanen first described the ineffectiveness of politicians and administration in a systemic way in his theory of bureaucracy, also known as the budget maximization model[14]. He formulated its outline as early as 1968, and presented its mature form in a book published in 1971 entitled "Bureaucracy and Representative Government". Interestingly, Niskanen was inspired by C.N. Parkinson's famous 1955 paper, the content of which he summarised in the slogan "the work expands to fill the time available for its completion". This is followed by a steady increase in the number of officials. Niskanen concluded that bureaucrats, however, prefer to maximize the budget they are allocated, as this increases their power of influence, prestige and personal benefits. If the entire state administration acts in this way, public spending must constantly increase and society suffers additional losses as a result. Hence the emergence of the term Leviathan to refer to the state. Niskanen's views became part of the American New Right's political agenda. Critics of his theory, however, believe that it relies too heavily on the assumption of extreme selfishness on the part of the administration, some of which may, after all, be working towards strengthening the position of the government/state and valuing a friendly environment at work more than simple budget maximization[15]. We must also not overlook the fact that there are two other competing models of bureaucracy, i.e. Weberian and conservative, which are not as harsh on bureaucracy as Niskanen's theory.

Rent seeking is another important component of standard public choice theory. The conditions for its emergence were formulated by G. Tullock in 1967 when he studied the behaviour of monopolies and the receipt of monopoly rents by them. However, A. Krueger (1974) is assumed to be the author of the term itself. Of course, it occurs both in democratic systems and in autocracies, as it is a derivative of the coexistence of the state and the market. However, in less developed countries, often governed by authoritarian regimes, the possibilities of obtaining rent, including political one, are much greater. The source of economic rents is such manipulation of the political and economic environment by means of lobbying, the activities of interest groups,

14. B.Ch. Blankart, op. cit.
15. A. Heywood, op. cit.

open and political bribery and corruption, as well as the belief that some newly created value can be appropriated without contributing to its multiplication. Such practices are in contradiction with behaviour based on seeking to maximize profit, although, on the other hand, the resulting rent becomes its integral component. They are reinforced by the so-called Tullock's paradox, which states that obtaining a rent generally comes at a low cost. On the other hand, the political and economic environment conducive to the pursuit is dominated by over-regulation of the economy, orders and bans, as well as monopolies and wide interventionism. Rent seeking is definitely assessed negatively. It is blamed for deforming the allocation of resources, synonymous with reducing economic efficiency, increasing the cost of delivering public goods, weakening the incentives for innovation, and exacerbating inequalities in the distribution of income and wealth. However, it is sometimes it is argued that the concept itself does not make a clear distinction between rent seeking and the maximising profits. Others add that this pursuit is a legitimate activity, prevents the emergence of speculative bubbles and improves the quality of policymakers' control[16].

Another concept that needs to be introduced here is the functioning of interest groups, also known as advocacy, pressure or lobbying groups. They can be inspired by political, religious, moral, health, environmental and economic motives, expressed explicitly or covertly, through various channels and instruments of influence. However, further considerations will be limited to economic interests only. The key issue here is the D.J. Stewart's 1958 identification of sectoral groups, i.e. those representing the needs of a certain industry, and ideological groups – those oriented towards general social problems. These views were further developed by M. Olson in the works of 1965 and 1982. In his opinion to him, sectoral groups, especially in highly concentrated industries, have great opportunities to achieve their goals. Their chances increase immeasurably when they manage to convey the message that the sector's activity generates significant public goods. The group can then even be small in number, which may well be desirable, as it prevents "free riding". The assessment of the f interest group activities is not straightforward[17]. Positive effects include: (1) the opportunity to express views and preferences that somehow escape the existing parties and channels of political influence, (2) the possibility of stimulating debates and discussions, (3) expanding political participation and stimulating bottom-up initiatives, (4) offering mechanisms of control and accountability of governments to foster greater socio-political stability. However, there are also downsides to their actions: they privilege the rich and deepen the existing divisions and make

16. C.D. Mueller, op. cit.
17. A. Heywood, op. cit.

political processes less transparent. However, through the previously characterized rent-seeking, these groups may, overall, reduce social welfare.

The political business cycle is the last component of the standard theory of public choice. We owe it to W. Nordhaus, who laid out its essence in an article entitled "The Political Business Cycle" published in "Review of Economic Studies" in 1975. He was inspired by the short and long run Philips curve. Accordingly, in the graphical form of the model, on the abscissa we have changes in the unemployment rate and on the ordinate axis – the inflation rate[18]. If parliamentary elections are approaching, public authorities may be tempted, on the one hand, to loosen monetary and fiscal policies in order to reduce inflation and unemployment, and on the other hand, to increase incomes. These actions are expected to increase the chances of the current ruling party being re-elected. After the elections, the macroeconomic policy course can be tightened in order to curb a possible increase in inflation. Empirical econometric analyses, however, gave an ambiguous confirmation of the validity of the Nordhaus concept, at least in longer periods. Such "manipulation" of the policy mix increases fluctuations in the economic situation. The maintenance of a lenient monetary and fiscal policy by most countries in the wake of the 2008/2009 crisis, and now as a package of anti-covid measures, with generally low inflation and low unemployment, may suggest that the above cycle should be treated as a hypothesis rather than a well-established theory.

Public choice theory, like any other theory, is subject to criticism. E. Kiryluk-Dryjska[19] did it very well. First, the author mentions the controversy around the rationality of the behaviour of political and economic actors, which opened the way to the emergence of the concept of limited rationality and being guided by the achievement of satisfactory results in place of the principle of profit maximization or utility. Behavioural economics tries to fill the gap in this area to some extent. Secondly, it also criticizes the assumption of methodological individualism, and consequently the fascination with mathematical and econometric modelling. Political scientists also have many reservations, but this may be due to the threat to their position caused by the expansion of public choice theory and a very wide range of problems studied in it with the use of advanced quantitative methods that most political scientists simply do not know. Already in 1962, M.J. Buchanan and G. Tullock responded quite accurately to the critics in their book The Calculus of Consent. Therefore, let us quote its fragment: "... even if the model (with the assumption of focusing on the self-interest of the individual) turns out to be useful in explaining some important elements of the policy, it does not mean that the individual acts in accordance with the adopted

18. J. Cullis, P. Jones, op. cit.
19. E. Kiryluk-Dryjska, op. cit.

behavioural assumptions, or that any individual always functions like that. Public choice theory can explain only a part of collective action. However, as long as a small part of the behaviour of all individuals is in fact motivated by utility maximization, and as long as the individual's identification with the group does not exceed the alignment point of individual utility functions, a model of policy functioning based on the assumption of methodological individualism should have some positive value".

Case study: farmers' social insurance in the Third Republic of Poland

Farmers' social insurance appeared in the late Polish People's Republic, when in 1977 an appropriate law was passed, which was to achieve specific social, economic (production) and structural goals. It happened at a time when the role of the Polish United Workers' Party (PZPR) in the alliance with the United People's Party (ZSL) was clearly weakening. Almost before the suspension of the martial law in Poland (December 31, 1982), another act on the social insurance of individual farmers was passed (December 14, 1982). It gave protection to farmers' households. In 1989 it was amended, which resulted in a drastic – up to 90% – increase in the share of the state budget in financing retirement and disability pensions for farmers. The entire system was, in a sense, closed with the adoption of a relevant act on December 20, 1990, which entered into force at the beginning of 1991. It was under this act that the Agricultural Social Insurance Fund (KRUS) began to operate. These regulations were introduced when the governments were headed by T. Mazowiecki and J.K. Bielecki. From today's perspective, it can be said that they were centrists and liberals. Additionally, the beginnings of the transformation were very difficult for Poland. There was a very high inflation, GDP dropped drastically with a simultaneous increase in unemployment, there was also a huge pressure on public finances and the zloty exchange rate. Nevertheless, it was decided to create an autonomous social insurance system for farmers. This was mainly due to an increase in social risk in agriculture and rural areas, but it was certainly also a desire to win votes from voters in this sector and these areas. There is therefore an unequivocal reference to political economy.

The Krusow system functioned without major changes throughout the decade of the 1990s. Let us explain at once that from October 1993 to October 1997, the government was ruled by the coalition of the Democratic Left Alliance with the Polish People's Party (SLD-PSL), and therefore very favourable to farmers. Also the government of J. Buzek (October 31, 1997–19 October 2001), despite the fundamental change in employee insurance, left the agricultural system essentially intact.

The problem appeared in the summer of 2001, when J. Bauc – Finance Minister in the government of Solidarity and Freedom Union (AWS-UW), led by J. Buzek, announced his famous "budget hole". According to him, the budget for 2002 was supposed to lack PLN 88 billion, which would constitute as much as 58% of the planned revenues. Following this, J. Bauc proposed a program of radical cuts in public expenditure, including pension and disability pensions, and new taxes. The AWS-UW government was not ready for such challenges. J. Bauc was dismissed on August 28, 2001, which did not save the AWS-UW government from election defeat.

The governments of L. Miller and M. Belka had to face the "Bauc's hole". This task was undertaken by Deputy Prime Minister J. Hausner, who proposed the "Program for Ordering and Limiting Public Expenses". It was formally adopted on January 27, 2004. In its third part, i.e. "Plan for reducing social expenditure", changes were also envisaged in the KRUS system, which assumed a drastic increase in contributions paid by farmers, but without a corresponding change in the benefits they received. Initially, annual savings in the agricultural system were to amount to PLN 1.2 billion, to ultimately reach PLN 5 billion. The second goal of changes in the Krusów system was a radical limitation of the influence of agricultural unions and organizations, as serious pathologies had occurred in this area. It is therefore an unequivocal reference to rent-seeking by agricultural interest groups.

Hausner's plan had its opponents even in the parties forming L. Miller's government (the coalition of the Democratic Left Alliance, the Polish People's Party and the Labuor Union, SLD-PSL-UP). His successor, M. Belka, ruled for the first time only for two weeks in April 2004, because the cabinet collapsed due to failure to receive the vote of confidence. Belka's second government was in fact a minority government (SLD) and there was no chance of adopting the Hausner plan, which consequently resigned in March 2005. The rulership of power after M. Belka was taken over by the coalition of Law and Justice (PiS), Self-Defense of the Republic of Poland and the League of Polish Families (LPR), which faced a very good macroeconomic situation and did not have to or even planned to introduce major changes in the KRUS system.

In November 2007, the government was taken over by a coalition of the Civic Platform and the Polish People's Party (PO-PSL). Some changes to the act on social insurance for farmers were made on April 24, 2009. They consisted in a slight differentiation of insurance premiums depending on the acreage of agricultural land. However, only approx. 20.4 thousand were covered by higher contributions households, i.e. less than 1.3% of payers.

Since October 16, 2015, Poland has been governed by the United Right (ZP) as an alliance of Law and Justice, Solidarity Poland and the Agreement. The macroeconomic boom was very conducive to the outbreak of the Covid-19 pandemic,

additionally strengthened by measures sealing the tax system. The ZP does not hide its social priority. Farmers, rural residents and retirees and pensioners are an important part of its electorate. The ZP, like all Polish political parties, focuses mainly on the centre of the political scene, so it refers to the concept of the median (middle) voter. The pro-agricultural and pro-rural orientation of the ZP government can also be seen in the provisions of the New Deal. Most of the retirees and disability pensioners receiving benefits from KRUS will not be PIT payers. There is no mention that the rules of paying the health insurance premium by farmers will change, as opposed to non-agricultural entrepreneurs. The excise tax refund for agricultural fuels will increase. The above document mentions the preparation of the agricultural code, which will regulate the position of small and large farms. Perhaps, following earlier announcements, some of the latter will be transferred to ZUS.

As a member of the European Union (EU), Poland must annually submit various types of reports and plans concerning, inter alia, the expected fiscal situation. Every year, the European Commission (EC) formulates recommendations for our country. Each time they relate to the farmers' social insurance system, and generally boil down to reducing its subsidization by the national budget. The author of the article has already prepared a report for the Ministry of Agriculture and Rural Development on the financial condition of the KRUS system three times. Most recently, this happened in November 2018. Its conclusions are used by the Ministry of Agriculture and Rural Development, and it is this institution that finally gives the answer to the European Commission. The latter loosened the fiscal indicators for the Community following the outbreak of the Covid-19 epidemic. This means that probably the latest recommendations will not suggest a reduction in subsidies for KRUS. Unfortunately, the condition of our public finances deteriorated drastically in 2020. In fact, we should start consolidating them now. These decisions are postponed. It may even happen that by 2023, when parliamentary elections are likely to take place, they will not be held. After all, all political actors remember that "elections are won in the countryside".

Our presence in the EU is also a necessity to apply the mechanisms included in the Common Agricultural Policy (CAP), the legal basis of which is created by the European Parliament (EP). In general, the European Commission and the EP prefer small and medium-sized farms in the CAP for 2023–2027. This means political support for the KRUS system. However, there is a problem with the category of "active farmer", which has appeared on the EU's political agenda for many years. If a regulation was actually introduced stating that only farmers engaged in agricultural production would receive subsidies from the first and second pillar of the CAP, the position of small farmers and non-farmers in the KRUS system might become more

complicated. This shows that the tools of public choice theory should also be applied to the entire national agricultural policy, including tax, insurance and transfer policy in the agricultural sector and in the countryside. However, a separate issue is the political economy of the CAP at the level of the entire EU, which, however, is not mentioned in the article.

Social insurance on the basis of neoclassical economy

Social security is an institution that emerged when the state achieved an appropriate level of development and the behaviour of the rulers began to be subordinated to the desire to gain support from citizens, as well as care for reputation. It did not mean, however, that this change could be explained with only one concept, on the contrary, gradually developed two groups of theories oriented at:

1) needs, i.e. responses to the expectations of specific groups of people and/or reactions to the political power at their disposal;
2) functions, i.e. assuming that the insurance will increase the efficiency of the entire economic system[20].

It should be added that the first group corresponds to the logic of the democratic system and moral philosophy, i.e. it is also important to help those who have experienced some adversity through no fault of their own. In the case of the second group, in the foreground is the issue of caring for social cohesion, and consequently social stability and consolidating the power held. This trend includes the recognition of social insurance as a tool for correcting the imperfections of the private insurance market, which is unable to offer cheap and safe products that protect against life risks.

As is well known, the imperfections of the private market stem from the asymmetry of information and its derivatives in the form of negative selection and gambling, as well as the so-called substantive goods. The former is a situation in which the insurer has problems with distinguishing between "good" and "bad" risks, which may lead him to include all potential clients in the second group. A very common reaction of the state is then the introduction of compulsory insurance. You can then get the so-called combined market equilibrium, but not Pareto-optimal, as it means subsidizing more risky people by less risky individuals.

20. H. Grossekettler, *Social Insurance* [in:] *Handbook of Public Finance*, ed. J.G. Backhaus, R.E. Wagner, New York, Springer, 2005.

Moral hazard occurs after an individual is covered by social insurance. This can encourage more risky behaviour and sometimes even fraud. These threats are compounded when the policyholder does not have the appropriate tools to monitor policyholders. However, their implementation is connected with incurring certain transaction costs.

Social insurance may generate the so-called a merit goods. This concept was introduced to economics and public finances by R. Musgrave in the late 1950s. It arises from the belief that there are certain ideas about the existence of specific basic needs that should be satisfied in the case of every member of society so that it retains some coherence. Sometimes they are equated with positive externalities. Accordingly, in a free market economy, the supply of the above-mentioned goods may be insufficient because:

– their consumers do not sufficiently distinguish between private and public benefits related to them,
– most units are short-sighted and only maximize short-term utility.

In the case of social insurance, the premise for the appearance of substantive goods is that people tend to underestimate certain risks that materialize only in the distant future. As a result, they could become interested in insurance too late in age to accumulate adequate capital for their retirement. At this point, the government can and should get involved by introducing compulsory social security.

Grossekettler sees three other reasons for the emergence of social security:

1. Some married couples are childless or have crippled and handicapped children, which preclude receiving family support when they get older.
2. Some people come from pathological or very poor families, and some of them fall into various addictions in their adult life and cannot independently accumulate capital for retirement purposes and various life risks.
3. One must take into account the possibility of the prisoner's dilemma. In this case, it comes down to the fact that it would be better for everyone if the richer people voluntarily supported those fellow citizens who did not succeed in life (not because of their fault). Unfortunately, such common behavior should not be expected in real societies. Hence, there is a state compulsory participation in social insurance. This, however, leads to another dilemma – the Good Samaritan. According to it, some people, knowing that they will receive help when needed, may behave invisibly. In the broader framework, however, social security should be seen as a factor that can encourage people to experiment, be creative and innovate, and to strengthen human capital. These are the undoubted advantages of this type of insurance, which can make a positive contribution to the acceleration of economic growth and socio-economic development.

Examples of political and economic modelling

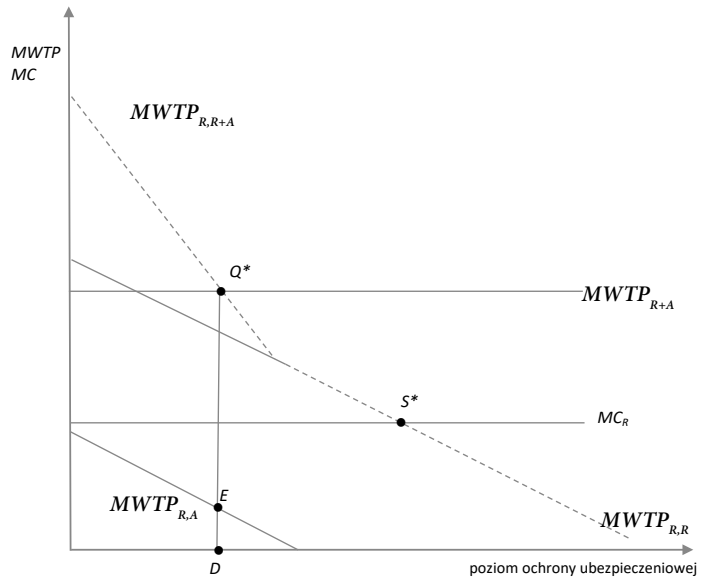
This part focuses on social security issues. There are two broad ways to explain the emergence of these insurances and their expansion as: (1) an instrument to increase the efficiency of institutions by regulating insurance markets to mitigate their failure, referring to consumer time preferences, altruistic motivations and negative selection considered together with transaction costs; (2) tools to increase the influence, income and prestige of politicians and bureaucrats due to the redistributive component they contain[21].

The first justification is based on the observation that most people have an exaggerated time preference in their consumption decisions, i.e. they use high discount rates for long-term benefits and costs. The result is that they prefer current consumption over future, deferred consumption. As a result, their willingness to voluntarily purchase protection in the form of private life and/or health policies or long-term care is low on average. Therefore, it is difficult to expect that such people will change their time preferences, i.e. that they will be ready to value future benefits higher than short-term ones, when they will have to make political decisions aimed at creating legal and institutional safeguards in the sphere of various life risks. An alternative, theoretically speaking, for social insurance could be intergenerational agreements within families, in which parents incur certain expenses for the upbringing and education of their children, expecting to look after them in their old age in return. In this context, it is necessary to try to rely on public authorities that have the tools to reduce time preferences.

Altruistic motivations for the discourse on the causes of the emergence of social insurance were introduced by J.A. Culyer in his book The Political Economy of Social Policy published in 1980. The argumentation used by him will be presented on the basis of its discussion by Zweifel and Eisen. Imagine that the rich individual R feels a negative externality because A is poor. To counter this, unit R is prepared to pay a premium to offer A some insurance. However, as shown in Figure 1, the marginal propensity to pay R to A, i.e. $MWTP_{R,A}$ is decreasing. However, it is different in the case of self-protection of R, i.e. $MWTP_{R,R}$. Let us note at once that the support of a poor person can be equated with the appearance of the public good, even when R did not contribute anything voluntarily for this purpose. This is what the compulsory tax-financed public social security system is based on. However, if R is altruistic, there is a chance that there will be a social optimum at Q^* instead of a private optimum S^* in which the poor person would not get any protection.

21. H.S. Rosen, T. Gayer, op. cit.

Figure 1. Poor people's insurance as a process of creating a public good



Source: Own study based on P. Zweifel, R. Eisen, Insurance Economics, Springer-Verlag, Berlin, Heilderberg 2012.

In point Q^* the marginal costs of additional insurance of both persons MC_{R+A} from the aggregate marginal willingness to pay, $MWTP_{R, R+A}$, will be covered. On the other hand, the level of protection of R's person will drop. This circumstance and the possibility of the "free riding" effect make it very difficult to imagine altruism as a widespread solution. This is a strong argument for the introduction of compulsory social insurance. In this case, the *R* unit, in order to obtain the individual optimum at S^* point, would have to buy additional protection on the private market.

It must not be forgotten that all social insurance, including retirement insurance, is a sub-discipline of insurance science. The latter is mainly practiced in the convention of the von Neumann-Morgenstern hypothesis and theories referred to collectively as non-expected utility. An example of the latter approach may be Hindriks's work, additionally embedded in the mainstream of public policy, called the policy of public supply of private goods[22].

22. J. Hindriks, *Public versus private insurance with dual theory: A political economy argument*, "The Geneva Papers on Risk and Insurance Theory" 2001, Vol. 26, No. 2.

Hindriks starts by recalling the simple fact that in the Organization for Economic Cooperation (OECD) 50–80% of retirement benefits come from public systems, and therefore compulsory (compulsory, offering the same contracts to all participants). Private insurance, on the other hand, is voluntary, and the contracts used in it differ in the degree of coverage, which implies differentiated premiums. Like other insurance, both types of retirement products are subject to negative selection, moral hazard, and the agency problem. While Hindriks deals only with negative selection, he believes that the other two phenomena will not fundamentally change his findings, although a separate analysis would undoubtedly be needed. In the introduction, Hindriks also lists two reasons for the compulsory/universality of public pension insurance: (1) they are a protection against negative selection, which would consist in the fact that the so-called good risks, i.e. people with low risk, would withdraw from the system if its costs increased, so as not to subsidize people with high risk (the so-called bad risk); (2) are supposed to protect against the problem of Good Samaritan, i.e. a phenomenon in which some people treat the state as the ultimate guarantor of their pensions – therefore they come to the conclusion that it makes no sense to pay contributions, and thus they increase their current consumption and standard of living.

Hindriks's research plan boiled down to integrating in one structure two theories of equilibrium of a competitive insurance market in the conditions of incomplete information M.D. Rotschild and E.J. Stiglitz from 1976 and the theory of dual choice in risk conditions by M. Yaarie from 1987, the essence of which is the assumption that risk aversion does not have to mean a decrease in the marginal utility of income. As can be seen, Hindriks combined the expected utility perspective with the non-expected utility theory. It first established a political balance where individuals can choose either a public or private retirement pension. It shows that for a large family of risk distributions in the population, the majority will prefer the public system, the more likely it will be, the greater the risk aversion. This means that it is not necessary to refer to the redistributive argument, i.e. subsidizing people with lower incomes and contributions by more affluent people. In phase two, Hindriks focused on the supplementation of public pensions with private products. It turned out that it is politically impossible, as this supplementation will lead to a decrease in the share of the pure public component or vice versa. However, such a combination would be achievable if the public system led to serious distortions of motivations, and the loss of social welfare due to the compulsory taxation of the labour factor as its primary source of financing increased rapidly. In this context, the analysis conducted only in the convention of the theory of expected utility usually results in a political balance when the public and private systems are combined.

The theory of public choice in relation to social insurance is based on the directly formulated thesis that they appeared and are characterized by a large expansion in most countries of the world, because they are the result of specifically understood state regulations. The latter, in turn, are a derivative of the suitability of these types of insurance for the systemic redistribution of income and assets, which is often not very transparent to contribution payers, and the incorporation of certain altruistic aspects into them, which are substantiated by politicians' reference to the solidarity of contribution payers. As a consequence, as public choice theory emphasizes bluntly, such insurance is an excellent instrument for gaining and maintaining political power, influence and financial benefits of professional politicians and administration, both public and employed in the insurance institutions themselves[23].

A concept widely used in public choice theory to explain and model political decisions in a democracy is the concept of the median, i.e. middle voter. Zweifel and Eisen concretize political decisions in relation to social and private insurance using an article by Ph. De Donder and J. Hindriks in the 2003 issue of the Journal of Public Economics. The two above-mentioned researchers, instead of the expected utility, used the dual decision theory under risk E.M. Yaari in 1987, in which this Canadian economist of risk aversion does not measure by concavity of the utility function but by using a weighted probability density function, p, i.e. as $\varphi(p)$. This allowed De Donder and Hindriks to express the utility of acquiring private insurance, V^P, depending on the individual's predetermined assets:

$$V^P = \varphi(p)(W - P - k \cdot 1) + (1 - \varphi(p))(W - P) = W - P - \varphi(p)(1 - k),$$

where $\varphi(p) = (1+A)p$, and $A > \varphi$ means risk aversion independent of W, k – deductible, normalized to 1, P – net insurance premium.

The V^P function represents the weighted average utility of an individual in both states of nature. Normalization of franchise causes the loss to be constant and moral hazard is excluded. Of course, the adopted assumptions imply the necessity to pay the premium also in the event of not incurring losses. It is clear that for $k = 0$ the individual obtains full protection, even if the premium rate is higher than the actuarial correct one, i.e. equal to the probability p.

Social security can also offer full protection $[(1-k)=1]$ as it assumes no moral hazard and negative selection. However, the individual premium established in

23. W.M. Crain, *Cost and output in the legislative firm*, "Journal of Legal Studies" 1979, Vol. 8, No. 3; A.W. Niskanen, *Bureaucracy and Representative Government*, Chicago, Aldine, 1971; F. Schneider, *The influence of political institutions on social security policies* [in:] *Essays in Social Security Economics*, ed. J.M. Schulenburg, Berlin, Springer, 1986; P.H. Van Dalen, H.O. Swank, *Government spending cycles: ideological or opportunistic*?, "Public Choice" 1996, Vol. 89.

them is in the relation in which the property of the individual remains to the average property $\bar{W}$, which is to reflect the redistributive aspect contained in these contracts. Hence, the usefulness of this insurance is:

$$V^S = W - \left(W / \bar{W}\right)\bar{P}.$$

In order to be able to compare the two types of insurance, De Donder and Hindriks assumed that individuals can choose private contracts themselves, guided by the criterion of G.J. Mailatha from 1987. It consists in equating to zero $dV^P/d\hat{p} = 0$ dla $\hat{p} \to p$. In words, they should be understood as follows: the entity cannot benefit from communicating its risk profile arbitrarily close to the actual one. As a consequence, an optimal coverage, k^*, depending on p and A, can be determined if an asset W^0 is defined in which the utilities of the two insurances are the same. Hence we have:

$$W^0 - \left(1 + A\right)p + Ap\left(p / \bar{\bar{p}}\right)^{1/A} = W^0 - \left(W^0 / \bar{W}\right)\bar{P}.$$

In the above formula there is a new symbol $\bar{\bar{p}}$, denoting the maximum probability of loss in a given population. It is a component of the optimal benefit function (last term on the left-hand side of the equation) that an entity with the loss probability p related to can $\bar{\bar{p}}$ obtain after entering into a private contract. These benefits grow with risk aversion. On the other hand, the weighted function $\varphi(\cdot)$ also leads to an increase in the premium paid, term $-(1+A)p$. Solving the above equation with respect to W^0, we obtain the following expression for the indifference of both types of insurance:

$$\frac{W^0}{\bar{W}} = \left[1 + A - A\left(\frac{p}{\bar{\bar{p}}}\right)^{1/A}\right]\frac{p}{\bar{p}} = [1 + \varphi(A, p)]\frac{p}{\bar{p}}$$

Wherein: $\varphi\left(A, p\right) = A\left[1 - \left(p / \bar{\bar{p}}\right)^{1/A}\right]$.

It turns out that for a unit with an average loss probability $\bar{p}$, and for $\varphi(\cdot) > 0$, $W^0/\bar{W}$, must be higher from unity. Such a person will vote in favour of social security, although he has above-average wealth. On the other hand, the median voter, also known as the key or the foreground voter, but with assets smaller than the average, will support this type of protection in elections rather than a private one, if the probability of loss will correspond to the value $\bar{p}$ or even be slightly lower. We can see, therefore, that the quotient $p/\bar{\bar{p}}$ is of fundamental importance for making political decisions, implying the desirability of offering social and private insurance separately, although on the other hand it favours the former, especially by the less wealthy,

mainly due to their redistributive component. However, this political balance is not stable. It is enough, for example, that the administrative costs of the social insurance system will increase significantly – which will reduce the benefits of contributions, and therefore the proportion of payers to beneficiaries will worsen – to increase the interest in private insurance, especially when it is favoured and the institutions providing services operate in a stable and transparent legal and regulatory environment.

PAYG (Pay as you go) pension systems, i.e. redistributive or pay-as-you go, are exposed to political risk due to the fact that politicians usually operate with a four- or five-year horizon, while a perspective of at least 30–40 years is needed here . These systems require systematic monitoring and correction of basic parameters. However, factors of a political nature (majority voting in democratic procedures) make it seriously difficult, thus moving them away from the social optimum, which is the result of, inter alia, solvency and stability, birth rate, population aging rate and productivity development in a given country[24].

Political risk leads to the phenomenon described, following Valdés-Prieto (2000), as "populism in pensions". It involves competition between politicians who promise voters subsidies and benefits, but in such a way that they have difficulty recognizing that they themselves will eventually pay for it in the form of higher taxes and pension contributions, rising inflation and falling economic growth[25]. In the pension system itself, this populism manifests itself in higher taxes, the source of which is the increase in minimum benefits, their excessive indexing and the expansion of the circle of beneficiaries without a proportional increase in the income base. While politicians are gaining fleeting gains from this, the entire system is exposed to structural financial imbalances. The threat of this form of populism grows in conditions of weakness in democracy. It would seem that it should be lower in funded pension systems. Experience with our OFE shows, however, that it may be an illusion. To be realistic, we should not think that the capital pension plans implemented in our country since mid-2019 will be excluded from the influence of politicians or even populism in the future. So far, their success is very modest.

All pension systems, public and private, must also face the problem of their credibility. In this case, it is about keeping an explicit or implicit promise that the commitments made in the future will be honoured, i.e. the payers will receive the announced benefits[26]. Of course, no one can give absolute guarantees, because it is

24. C. Videl-Melia, M. del Carmen Boado-Penas, O. Settergran, *Automatic Balance Mechanisms in Pay-As-You-Go Pension Systems*, "The Geneva Papers on Risk and Insurance" 2009, Vol. 34, No. 2.
25. S. Valdés-Prieto, *The financial stability of notional account pensions*. "Scandinavian Journal of Economics" 2000, Vol. 102, No. 3.
26. T. Besley, A. Prat, *Credible pensio*ns, "Fiscal Studies" 2005, Vol. 26, No. 1.

the future state of the economy and public finances that will ultimately determine benefits. However, it should be remembered at all times that the constant "tampering" with pensions creates reputational risk and makes it difficult to obtain social approval for their real reform.

An interesting instrument for adjusting the PAYG system to changes in socio-economic and demographic conditions, creating an institutional framework to increase its credibility and depoliticization may be the automatic balance mechanism (ABM). His philosophy was presented in 1982 by the American actuary R.J. Myers, and the practical implementation took place in Finland, Japan, Canada, Germany and Sweden[27]. ABM is a set of predefined by law measures and categories and rules that are automatically implemented, so without discretionary interference by politicians, in order to ensure actuarial stability and solvency, and to make the PAYG system resistant to the common aging processes. As a result, the planning horizon is extended and a higher intergenerational equity is achieved. This solution is appropriate for countries with an established democracy, where politicians are able to curb their populism, and if not, they are quite effectively forced to do so by solid institutions, transparency of governance rules, including ongoing information to citizens about the actuarial condition of the pension system.

The absolute size of the social insurance system and its relation to private insurance is also optimized with the use of tools belonging to the theory of public choice. You can use the concept of a benevolent dictator acting on behalf of some representation of citizens, or appeal to the majority of voters supporting the government elected in democratic procedures[28]. In the first case, Zweifel follows the approach proposed by A. Petretto in 1999. This is a three step procedure. First, you need to define the security level $\alpha(0 < \alpha < 1)$. In the second step, those interested in a specific insurance should declare the scope of using private insurance. Finally, potential policyholders need to identify how they intend to finance the residual risk, which in turn implies their labour supply.

Generalizing the approach, Petretto, Zweifel and Eisen use the following optimization procedure. Firstly, the government sets a uniform level of the parameter α to maximize utility for citizens, and consequently introduces the same rate of labour taxation, t security costs. Secondly, citizens choose to vary their use of private insurance $1 - k_i$, with k_i representing their share of the cost of protection. In the last step, citizens declare the amounts they can spend on private insurance. Hence,

27. J.R. Myers, *Investment Policies and Procedures of the Social Security Trust Funds*, "Social Security Bulletin" 1982, Vol. 45, No. 1.
28. Ibidem.

we have the following formula for determining the optimal risk coverage by private insurers, k_i^*:

$$\frac{1-k_i^*}{k_i^*} = \frac{u'\left[Loss\right]_i - \overline{u}_i'\left(1+\lambda\right)}{\overline{u}_i\left(1+\lambda\right)} \cdot \frac{1}{e_i},$$

where: λ – cost mark-up on actuarial correct premium; – flexibility (in absolute terms) of losses assumed by insurers in relation to the net costs borne by the insured; u – utility.

We can see that the optimal level of protection provided by the private sector is all the higher:

- the greater the risk aversion of the individual i, because then the marginal utility of income in the event of loss, $u'[Loss]$, is higher than the weighted average utility in states of nature with and without losses $\overline{u}_i'$;
- the lower the λ mark-up, that is the insurance price;
- the lower the *ex post* moral hazard, which reflects the flexibility of e_i;

In turn, the optimal level of the parameter α results from the following condition:

$$\sum_i^n Cov\left(u_i'\left[Loss\right]_i, NetLoss_i\right) + n\left[\overline{u}'\left[Loss\right] \cdot Cov\left(\overline{u}_i' / \overline{u}', \overline{NetLoss_i} / \overline{NetLoss}\right) - 1\right] \overline{NetLoss}$$

$$= \sum_i^n u_i'\left[Loss\right]\left[\left(1-\alpha^*\right)\left(1-k_i^*\right) + \alpha^*\right] \frac{\partial \overline{NetLoss}_i}{\partial \alpha} \cdot$$

Its marginal impact is the result of the interaction of two categories:

1. Profit from the division of social risk – the first term on the left side of the formula. It is high for the group n of units under consideration if there is a significant covariance between the marginal utility of their property in the event of a loss and the amount of net loss that they have to finance themselves, because private insurance offers only partial protection. It follows that then we are dealing with high risk aversion and the effect of crowding out private insurance by the social.
2. Profit from social redistribution – the second component. It is represented by the covariance between the individual average marginal utility and the relative net loss of the individual i. If this covariance is high, i.e. when an individual is negatively affected by recording a higher than average net loss, while at the same time having above average income utility, there are strong incentives to expect redistribution through social security.

In order to achieve the optimum now, it is necessary to enter a marginal cost. It consists of three multiplicative components (part of the formula for the optimal α value after the "=" sign):

– a term $\overline{\partial NETLOSS}/\partial\alpha$ that measures the response of the expected net loss to the expansion of social security, and in fact the amount of the moral hazard generated in this way;
– expressions in square brackets. It shows how both types of insurance work as enhancers;
– $u_i'[LOSS]$ i.e. the transformation of the two above-mentioned effects into usability.

Of course, at the optimum point the marginal benefits must equal the marginal costs. On the other hand, the optimal division of labour between social and private insurance must take into account both the formula for the optimal coverage by the private sector and the optimal value of the α parameter.

When analysing the above division of labour in more depth, Zweifel and Eisen refer to the work of R. Chetty and E. Saez from 2009[29]. It is also embedded in the logic of public choice theory. In line with this, we are here again a gracious dictator who seeks to maximize the expected utility of citizens. Both types of insurance are financed from the taxation of the labour factor: the rate of τ in the case of social insurance and t_k set by the employer, who may additionally monitor the income of groups of *k* units, i.e. W_k. The maximum rate τ is determined on the basis of the following equation:

$$\frac{\tau}{1-\tau} = -\frac{1}{e_{\overline{W},1-\tau}} \frac{\overline{Cov}\left(\overline{u}_k', \overline{W}_k\right)}{\overline{u}' \cdot \overline{W}} + \frac{1}{e_{\overline{W},1-\tau}} \cdot \sum_k s_k \left(t_k^* - r_k\right) e_k \left(t_*^k - t_k\right) \cdot \frac{\overline{u}_k' \cdot \overline{W}_k}{\overline{u}' \cdot \overline{W}} \cdot$$

In detail, we are now dealing with three effects:

1. Moral gambling. It results from the interaction of flexibility $e_{\overline{w}}, 1-\tau$, which informs about the impact of post-tax income of employees on average income in both states of nature (occurrence of a loss or no loss), and elasticity of ek. The latter informs about the reaction $\overline{W}$ to the entire income of the employee after tax, i.e. $(1-\tau)(1-t_k)$.
2. Negative selection. It is reflected in the difference $(t_k^* - t_k)$, t_k^* denoting the lack of self-selection, and t_k being its presence. Generally speaking, it is positive and therefore privileges social insurance.
3. Pushing out private insurance by social.

It is given by the parameter $r_k > 0$, which is the elasticity of changes $(1 - t_k)$ with respect to change $(1 - \tau)$. It is a kind of fiscal externality. The larger the r_k, the smaller the size of social insurance should be in *ceteris paribus* conditions. In other words, the crowding out effect reduces the social benefits of their expansion.

29. R. Chetty, E. Saez, *Teaching the tax code: Earnings Responses to an experiment with EITC recipients*, Working Paper, Washington D.C., NBER, 2009.

The interpretation of the remaining components of the original Chetty-Saez equation is interesting. The term $\overline{Cov}$ denotes the smoothing of consumption over time as a consequence of both types of insurance. The quotient $\overline{u}'_k/u$ measures the mean utility in both natural states for each k-th group against the mean utility in the entire population. It is high when relative incomes $(\overline{W}_k/W)$ are low, resulting in a negative covariance s_k, and finally it is the share of the k-th group in the entire population.

Chetty and Saez also provide the following formula for the relationship of the burden of the labour factor from financing social and private insurance, denoting it by $\hat{t}$:

$$\hat{t} = -\frac{\tau}{1-\tau} + \frac{1-\hat{r}}{e_{\overline{W},1-\tau}} \cdot \frac{-\overline{Cov}(u', W)}{\overline{W}},$$

which can also be regarded as an optimal stuffing effect. Thus, we see that a higher value of τ means a lower value $\hat{t}$, under ceteris paribus conditions. Although private insurance also contributes to the smoothing of consumption over time, as reported by the mean covariance of marginal utility, u', and income W, they are limited in this measure by the average weighted crowding out effect, $\hat{r}$.

Summary

The emergence of public social insurance is supposed to be a reaction to the imperfections and incompleteness of private insurance markets. This is the standard translation of economic theory and financial theory. However, public choice theory goes much further in presenting the concept of state/government failure. It shows how irrational behaviour, rent-seeking, the political economic cycle, rational ignorance and the crowding out of private investment by public expenditure, including supporting social insurance, can occur in democratic systems. The emergence of the latter is explained by this theory as an instrument of gaining and consolidating political power by teams very often focused on achieving their selfish goals at the expense of the common good. Thus, embedded in public social insurance is political risk that can undermine its financial stability and credibility. This is the perfect breeding ground for any populism and undermining the democratic system. As the most general remedy, this theory also recommends the need for mixed public-private insurance systems. The various redistributive mechanisms built into this social insurance are, however, very conducive to the emergence and consolidation of paternalistic-clientelistic relationships and systems. This problem was brought closer using a case study – the evolution of farmers' social insurance in the Third Republic of Poland. Public choice theory at this point offers tools that enable the

search for political and economic balance. Such an extension of the perspective allows the modelling to more accurately reflect the actually occurring phenomena and processes. Consequently, practical recommendations resulting from it may be more useful than formulated solely on the basis of economic equilibrium. In a broader context, this shows the need to apply an interdisciplinary approach to analysing social security systems. In this context, it is very advisable, and in fact even necessary, to include the achievements of economics and behavioural finance in the conceptual framework and analytical tools of these systems.

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received: 18.03.2021
accepted: 27.05.2021