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THE THEORY OF WELFARE ECONOMICS AND TAX REGULATIONS: AN EMPIRICAL EXAMPLE OF PIGOUVIAN TAXES

Abstract

The aim of this paper is to present the impact of the economic theories and empirical studies on the contemporary tax laws and regulations in numerous jurisdictions, based on a case study of the economic concept of Pigouvian taxes which stems from the neoclassical theory of welfare economics. The author presents the theoretical concept of the Pigouvian taxation and its econometric verification and tries to demonstrate that the empirical examples of the implementation of such fiscal instruments have proved to be effective based on the quantitative assessment. However, serious deficiencies in the methodology of empirical studies on this phenomenon can also be identified, which affects the possibility of assessing the potential practical implications of introducing such mechanisms. Nevertheless, as the author demonstrates by referring to the World Bank data, the discussed concept significantly influences contemporary tax law in many countries and is a source of inspiration for many tax jurisdictions. The analysis carried out in this paper indicates that not every implementation and post-hoc evaluation of economic theory implemented into tax systems can be effectively studied with the use of economic analysis of law; when analysing regulations introduced to influence the behaviour of individuals, it is also necessary to take into account the research in other disciplines, for example psychology and sociology, even if the inspiration for the regulations in question was well-grounded and developed in economic theories. For this reason, it can be argued

that economic analysis of law, also referred to as law and economics, although a valuable cognitive approach, should never be the only basis of analysis, even if a regulation in question has a strictly economic origin.

KEYWORDS

Pigouvian tax, tax law, economic analysis of law/law and economics, welfare economics, sugar tax

SŁOWA KLUCZOWE

podatek Pigou, prawo podatkowe, ekonomiczna analiza prawa, ekonomia dobrobytu, podatek od cukru

I. INTRODUCTION

The significant influence of economics on certain legal regulations, particularly in the field of tax law, is undeniable. The role of this field of study in shaping the economic reality in each period of history was discussed, although apparently overestimating it to some extent, by John M Keynes, who in his book *The General Theory of Employment, Interest and Money* claimed that it was not politicians and kings who ruled the world but economists' ideas.[1] Leaving aside the assessment whether the economists' ideas truly have such a powerful impact, a number of the concepts that economists have generated certainly continues to shape contemporary financial regulations.

When contributing to the development of regulations, however, economists not only have formulated the theory but also, starting with the emergence of econometrics, undertaken empirical verification of the economic environment, including the effectiveness of regulations and the economic analysis of law.[2] At the same time, the majority of concepts usually have their grounding in formal theories before being put into practice and subjected to subsequent verification. In reality, it appears that not only modern theories may be revived even many

[1] John M Keynes, *The General Theory of Employment, Interest and Money* (Macmillan 1936; *Ogólna teoria zatrudnienia, procentu i pieniądza*, Michał Kalecki and Stanisław Rączkowski trs, 3rd edn, Warszawa 2003) 350.

[2] Lewis Kornhauser, 'The Economic Analysis of Law', *The Stanford Encyclopedia of Philosophy* (January revised edn, 2022) <https://plato.stanford.edu/entries/legal-econanalysis> accessed 9 October 2023.

years after their introduction, but also theories that were developed centuries ago happen to significantly influence contemporary models governing economic phenomena, as is the case with the Pigouvian tax discussed in this paper.

As John K Galbraith rightly pointed out, particular economic concepts are the product of a specific time and place.[3] Such is the theory of welfare economics based on which the concept of Pigouvian taxation has been developed. Welfare economics is rooted in the neoclassical twentieth century economics. It draws on the work of such economists as Alfred Marshall, Arthur C Pigou, John Hicks, and Paul Samuelson, who built upon classical economic foundations and introduced new concepts and methodologies for analysing the well-being of individuals and society.[4] Welfare economics tries to explain how individuals satisfy their needs, in economic terms, hence in the language of mathematical equations. For the sake of this theory, William S Jevons expounded an original utility theory of value. According to this author, people satisfy their needs by consuming goods. Neoclassical economics was deeply rooted in the classical economic framework that sought to find the optimal allocation of resources (market equilibrium) based on the assumption that choices of the market players are rational. Neoclassical economics expanded on this model by adding individual preferences for consumption (depicted by the utility functions) that a person seeks to optimise to obtain the most utility (pleasure) possible. The higher the utility level the higher the welfare (well-being) of an individual. By aggregating welfare levels of each individual in the country or population one can obtain the count for the social welfare.[5] As already mentioned, welfare economics does not have a single inventor; on the contrary, it has been developed and refined by several generations of economists. Among the founders of this theory, a prominent place is held by the British economist Arthur C Pigou, working at the turn of the nineteenth century.

The studies of Pigou published in 1912 and 1920 are considered canonical works on welfare economics, in which this term was introduced. In his studies, he focused on the measure of well-being as the aggregated satisfaction (utility) obtained by the whole population from the income earned, i.e. the social utility. He argued that a priority objective of socio-economic policy should be to maximise economic well-being. This goal could be achieved by equalisation of the marginal social net product generated in various branches of economy. The marginal social net product was considered the stream of benefits that results from the marginal increase in socially available resources over a year. According to Pigou, increasing the marginal social net product could be fostered by shifting

[3] John K Galbraith, *Economics in Perspective: A Critical History* (Princeton University Press 2017) 57.

[4] Mirosław Bochenek, *Historia rozwoju ekonomii: Od keynesizmu do syntezy neoklasycznej*, vol 5 (1st edn, Wydawnictwo Naukowe Uniwersytetu Mikołaja Kopernika 2016) 139.

[5] Yew-Kwang Ng, 'Welfare Economics', *International Encyclopedia of the Social & Behavioral Sciences* (2nd edn, 2015) 497, 497–503.

part of the income from wealthy social groups to poorer individuals. The instruments that could be used for achieving this goal consisted of a variety of fiscal, social and income policy tools. Among these, Pigou suggested special corrective taxes, known as Pigouvian taxes, which were aimed at supporting the efficiency of allocated resources, at the same time increasing government revenues.[6] This tax is discussed in section II of this paper.

II. PIGOUVIAN TAXES AS A THEORETICAL CONCEPT

A Pigouvian tax is imposed on any activity or goods that generate negative externalities borne by the society. Its main objective is to correct the market inefficiencies, disequilibrium that has appeared due to the occurrence of such externality and can be interpreted as a deadweight loss (loss in welfare) that the society faces as a result of such inefficiency.[7] The deadweight loss occurs in two cases. Firstly, when market inefficiency is caused by the situation when the price of any product is not optimal from the economic point of view, i.e. the supply does not meet the demand.[8] Secondly, such loss may result from the ineffective allocation of resources, including public resources, which can be a side effect of the abovementioned externalities.[9]

How then to define the externalities that constitute a key conceptual category from the perspective of the Pigouvian taxes in question?

In the literature, externalities are regarded as side effects of an entity's activities, the (positive or negative) consequences of which are borne by a wider public, irrespective of their will. These effects arise when an economic actor carries out activities that have an impact on other actors, which are not adequately compensated, i.e. for example, included in the product price. Individuals bear the costs of such damaging behaviour, which globally contributes to social welfare losses for entire communities.[10] Empirical and most prominent examples of negative externalities are environmental pollution and costs of the public health services

[6] Arthur C Pigou*, Wealth and Welfare* (London 1912) 3; idem, *The Economics of Welfare* (London 1920) 23; idem, *The Economics of Stationary States* (London 1935) 19.

[7] ibid.

[8] Joseph E Stiglitz, *The Economics of the Public Sector* (3rd edn, New York 2000; *Ekonomia sektora publicznego*, Ryszard Rapacki tr, Warszawa 2004) 131–32.

[9] Peter Lorenzi, 'Sin Taxes' (2004) 41 Society 59, 59–60.

[10] Otto A Davis and Andrew B Whinston, *On Externalities, Information and the Government-Assisted Invisible Hand* (1966) 33(131) Economica 303, 310; Artur Bartoszewicz and Katarzyna Obłąkowska, 'Rynek i spożycie napojów alkoholowych w Polsce: podstawowe dane dla polityki społeczno-gospodarczej' (2021) 15 Zeszyty Naukowe Polskiego Towarzystwa Ekonomicznego w Zielonej Górze 61, 77–78.

that a community bears due to the excessive consumption of goods considered harmful, such as tobacco, alcohol or sugary drinks.

By identifying the contribution of individuals to the collective disadvantage of others, economic studies have undertaken an analysis of the problem of how such a loss could be mitigated. Various solutions are proposed in the literature that emphasize the importance of developing an appropriate legal framework, including licensing systems for harmful activities, quantitative restrictions on the production of selected goods, concessions or penalties and, above all, fiscal policy instruments, i.e. the discussed sin taxes or Pigouvian taxes imposed on citizens.[11] The primary justification for the taxation of harmful activities is that, according to economists, it can be a method of recouping social losses caused by citizens who choose to consume such goods. This compensation is done in two ways: firstly, by reducing the level of consumption of such goods (which reduces social costs), and secondly, by increasing the government revenue from the tax, which allows the costs to be covered by the persons who undertake the 'harmful' activity. The Pigouvian tax rate should reflect the value of the social loss incurred, which is calculated mathematically by means of equating the marginal abatement costs of the harmful agent with the marginal external costs of its occurrence.[12]

Apart from the Pigouvian taxes, one can also distinguish another similar taxation that aims at correcting market failures resulting from the socially undesirable, harmful consumer behaviour, which is referred to as sin taxes.[13] A sin tax is imposed on goods that cause negative externalities in the case of their consumption. Hence, unlike the Pigouvian tax, its model assumption is the desire to 'punish' the consumers by increasing the price of the harmful goods consumed and to discourage the end users from continuing to consume excessive amounts of such products. This is an example of the stimulatory function of taxation.[14] In the case of Pigouvian taxes, on the other hand, it is not the 'punitive' but the 'compensatory' aspect that plays a key role. The major purpose of introducing the Pigouvian tax is not to 'punish' the manufacturer but to obtain funds to finance the increased public needs arising in connection with their activities. The literature indicates that both Pigouvian taxes and sin taxes are subtypes of excise taxes due to their selective nature.[15] Importantly, the division between Pigouvian taxes and sin taxes is not disjunctive. Empirical examples of levies that exhibit characteristics of both

[11] Steffen Kallbekken, 'Public Acceptability of Incentive-Based Mechanisms', *Encyclopedia of Energy, Natural Resource, and Environmental Economics* (1st edn, Elsevier 2013) 306, 306–07.

[12] William J Baumol, 'On Taxation and the Control of Externalities' (1972) 62(3) The American Economic Review 307, 307–22.

[13] Lorenzi (n 9) 59–60.

[14] Ryszard Mastalski, *Prawo podatkowe* (Studia Prawnicze, 11th edn, CH Beck 2019) 35–42.

[15] Thomas A Barthold, 'Issues in the Design of Environmental Excise Taxes' (1994) 8(1) The Journal of Economic Perspectives 133, 135; Richard M Bird, 'Tobacco and Alcohol Excise Taxes for Improving Public Health and Revenue Outcomes: Marrying Sin and Virtue?' (2015) World Bank Policy Research Working Paper WPS7500, 2 <http://documents.worldbank.org/curated/

Pigouvian and sin taxes can be found in the tax systems of numerous countries. Such example is a sugar tax if its normative design assumes the transfer of fiscal revenue to health-promoting activities. Common to both types of taxation is their ultimate objective, which is to minimise public costs incurred as a result of consumption of harmful goods.

Pigouvian taxes, as a theoretical concept of neoclassical economics, quickly aroused the interest of public institutions. Attempts have, therefore, been made to introduce them into national tax legislation.[16] The evaluation of effectiveness of the adopted regulations has been performed by econometric, quantitative, empirical studies.[17] These studies frequently show that incorporating Pigouvian taxes into tax law systems may be highly effective as they lead to a decline in demand for goods that cause negative externalities, and thus result in the successive fall in supply as well as in the improvement in production processes that transform the detrimental factor into a more socially beneficial. It has been also proven that such taxes may increase tax revenues that are used to combat the negative side effects of a harmful product. On the other hand, there are studies that question the effectiveness of such tax measures.[18]

However, the general positive econometric assessment of the introduced regulations has prompted some countries to implement similar provisions in their legal systems. These regulations are usually subjected to a post-hoc analysis to assess their effectiveness, which contributes to the regular research in this field and the increasing popularity of imposing such taxes in those countries where the regulations have not been adopted. At this point, it should be noted that the economic analysis of the introduced regulations is a controversial issue, as considerable methodological criticism of these studies can be found in the literature. First and foremost, it is argued that most models designed for the final assessment of the price elasticity of demand, i.e. an indicator of the effectiveness of decline in demand in the event a policy is introduced, use an erroneous assumption of the static nature of demand, which has flaws that affect the validity and reliability of

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en/577831467986372982/Tobacco-and-alcohol-excise-taxes-for-improving-public-health-and-revenue-outcomes-marrying-sin-and-virtue> accessed 9 October 2023.

[16] The most popular are the carbon taxes and sugar taxes. See section III for an example of such regulations.

[17] See e.g.: J Wyatt Koma and others, 'Sugary Drink Consumption among Children by Supplemental Nutrition Assistance Program Status' (2020) 58(1) American Journal of Preventive Medicine 69, 69–78; Matthew Harding and Michael Lovenheim, 'The Effect of Prices on Nutrition: Comparing the Impact of Product- and Nutrient-Specific Taxes' (2017) 53 Journal of Health Economics 53, 53–71; Emily Y Wang, 'The Impact of Soda Taxes on Consumer Welfare: Implications of Storability and Taste Heterogeneity' (2015) 46(2) The RAND Journal of Economics 409, 411.

[18] Tatiana Andreyeva, Michael W Long and Kelly D Brownell, 'The Impact of Food Prices on Consumption: A Systematic Review of Research on the Price Elasticity of Demand for Food' (2010) 100(2) American Journal of Public Health 216, 216–22.

the obtained results.[19] For example, in the study by Tatiana Andreyeva, Michael W Long and Kelly D Brownell,[20] in which the authors analysed the issue of taxation of sweetened beverages, it is indicated that the main disadvantage of using the most popular methodology of the static nature of demand elasticity to predict consumer behaviour, in connection with the introduction of fiscal policy, is that sweetened beverages can be stored and do not have to be sold immediately, and that their price can be reduced through appropriate discounts and special offers. This example can be readily transferred to similar harmful goods. Furthermore, they argue that selected groups of consumers may demonstrate strong preferences for their dietary choices due to unobservable reasons (e.g. psychological conditions), which affects the relative stability of the choice of products they consume.[21] At the same time, the results of studies that used a dynamic method of analysing demand (taking into account beverage stock and public fixed preferences) indicate that static models of price elasticity of demand can overestimate this elasticity by as much as 60.8%, which also overestimates the potential fall in demand for selected products by 57.9%.[22] This fact has considerable implications for assessing the potential effectiveness of the use of fiscal regulations, such as taxes and fees, to influence the demand structure. Therefore, referring to the results of empirical studies as a basis for justifying the introduction of a given fiscal regulation may be subject to certain, in some cases significant, misestimation, of which the legislator should be aware. Thus, the ultimate behavioural effect obtained from the introduction of Pigouvian taxes can never be fully determined.

Nevertheless, Pigouvian taxes are an example of a particular kind of economic incentive that stimulates the implementation of certain legislation, which is subsequently further analysed using economic tools. Namely, the theoretical concept of Pigouvian taxation, which originates in neoclassical welfare economic theory, has resulted in the development of empirical research on the effectiveness of regulations, which in turn has led to the intensification of legislative processes in some other countries and the related comparative empirical studies. It is worth noting that although economics is a social science, the research methods, as well as the theory of Pigouvian tax and welfare economics, are deeply rooted in mathematics and have also been proven using methods familiar to mathematicians, in simple terms, calculations made by differentiating previously described and defined functions in systems of equations. Therefore, their initial implementation in legal systems was, so to speak, an independent economic experiment that made it possible to study the behavioural effects of such tax solutions. Following successful verification, a significant number of states started to adopt these policies.

[19] Wang (n 17) 411.
[20] Andreyeva, Long and Brownell (n 18) 216–22.
[21] ibid.
[22] Wang (n 17) 411.

III. PIGOUVIAN TAXES AS A CONTEMPORARY LEGAL PHENOMENON: AN EMPIRICAL EXAMPLE OF SUGAR TAXES

As indicated, various types of taxes, which can be identified with the theoretical Pigouvian tax model, have now been implemented into legal systems in numerous countries. The most effective method of demonstrating the scale of this phenomenon is to present data on one of such solutions. This paper presents a descriptive case study on sugar taxes, i.e. fiscal instruments which are increasingly applied in many jurisdictions. Incidentally, it is worth noting that these levies, which from an economic point of view fulfil all the tax characteristics, function under various names, most often either as 'taxes' or 'fees', depending on the individual interpretation of the tax definition in a given jurisdiction. Since 2021, this solution has also been implemented in Poland, under the name of 'sugar fee'.[23] This paper presents the general legal framework of such taxes that can be identified in modern jurisdictions. It aims to give a general overview of how such taxes are designed.

Sugar taxes meet, from a formal point of view, the requirements for both recognition as sin taxes and Pigouvian taxes. This peculiar duality is expressed in the purpose for which the taxes have been introduced. Namely, in the literature one can identify a significant problem of both social and economic nature which concerns developed societies: this is the increasing incidence of diseases of civilization, such as obesity and diabetes.[24] These conditions negatively affect the well-being of both individuals and society as a whole, contributing to personal tragedies and significant obstacles to the national economic development.[25] Hence, countries look for effective instruments to persuade citizens to undertake health-promoting actions, especially as regards proper nutrition.[26] Studies indicate that one of the major contributors to the incidence of this kind of diseases is a poor diet, including, in particular, excessive sugar consumption.[27] It is also reported that sugar-sweetened beverages (SSBs), which are often consumed without concern for the amount of sugar they contain, are a significant source of

[23] Public Health Act of 11 September 2015 (Ustawa z dnia 11 września 2015 r. o zdrowiu publicznym) [2022] JoL [Journal of Laws] 1608.

[24] WHO, 'Obesity and Overweight' (2021) <https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight> accessed 9 October 2023.

[25] WHO, 'Health Taxes: A Primer' (2016), 1–4 <https://www.who.int/publications-detail-redirect/WHO-UHC-HGF-PolicyBrief-19.7> accessed 9 October 2023; Ian Kudel, Joanna C Huang and Rahul Ganguly, 'Impact of Obesity on Work Productivity in Different US Occupations: Analysis of the National Health and Wellness Survey 2014 to 2015 (2018) 60(1) Journal of Occupational and Environmental Medicine 6, 6–7.

[26] Lorenzi (n 9) 59–65.

[27] WHO, 'Taxes on Sugary Drinks: Why do it? (2017), 1–4 <https://apps.who.int/iris/bitstream/handle/10665/260253/WHO-NMH-PND-16.5Rev.1-eng.pdf> accessed 9 October 2023.

risk, especially among children and adolescents. Hence, it can be concluded that sweetened beverages constitute harmful goods that negatively affect the society's well-being. This finding creates an incentive to the development of public policies aimed at combating such negative phenomena as excessive sugar consumption. Thus, in various international debates their participants have repeatedly raised the question of the potential for taxes to be used as instruments of fiscal nature that, on the one hand, reduce the level of demand for goods containing unhealthy ingredients and, on the other hand, provide a source of budgetary revenue that can be used to support education and health-promoting activities. A tax that would be both a sin tax (including the punitive element in the form of a higher price) and a Pigouvian tax (incorporating the specific allocation method of tax revenue for health-promoting activities and education) has been proposed as a solution to this problem.

The World Health Organization (WHO) holds a distinctive leadership position in promoting and creating such instruments in various jurisdictions.[28] In its recommendations, the WHO urges its member states to implement such models of sugar taxes so that the tax rate would depend on the amount of sugar added, for example, in a sweetened beverage. The organization has adopted a standpoint that the legitimacy of introducing solutions aimed at reducing the consumption of excess sugar should not be undermined in view of the negative impact of this substance on human health.[29] Furthermore, it takes the view that – given the argument that some section of the population will not give up the consumption of harmful goods on their own, despite their knowledge of the detrimental effects of excessive sugar intake – regulatory measures of fiscal nature are needed to influence citizens' behaviour or, at the very least, to mitigate the social damage associated with excessive exposure to substances harmful to health.

The arguments presented by the WHO seem to appeal to its member states. This is clearly indicated by data on the number of implementations of such solutions worldwide. The most reliable and frequently updated database of sugar taxes in force is maintained by the World Bank.[30] According to the February 2023 data, already 121 tax jurisdictions in the world have implemented solutions corresponding to taxes imposed on sugar-sweetened beverages; it is worth noting that this database includes not only taxes selectively imposed on sugar-sweetened beverages but also levies that are variously designed to make SSB consumption less

[28] WHO, *Global Action Plan for Prevention and Control of Non-communicable Diseases 2013–2020* (WHO 2013) <http://apps.who.int/iris/bitstream/handle/10665/94384/9789241506236_eng.pdf;jsessionid=C017212026651DEB1EE0D9BA9E1DE965?sequence=1> accessed 9 October 2023; WHO, *Taxes on Sugar-Sweetened Beverages as a Public Health Strategy: The Experience of Mexico* (WHO 2015) <https://iris.paho.org/bitstream/handle/10665.2/18391/9789275118719_eng.pdf?sequence=1&isAllowed=y> accessed 9 October 2023.

[29] WHO, *Global Action Plan* (n 28) 19–31.

[30] World Bank Group, 'Global SSB Tax Database' (last updated 2023) <https://ssbtax.worldbank.org> accessed 9 October 2023.

attractive (e.g. through increased rates of value-added taxes). According to the World Bank estimates, currently 52% of the world population is burdened by such taxes.[31] At the same time, a relatively small number of European WHO member states make use of such instruments, as only 10 of 53 European WHO member states included a tax on sweetened beverages in their tax systems by 2022. It is noteworthy that several countries imposed identical taxes on other high-calorie products than beverages, for example sweets, but have subsequently withdrawn these measures.[32] At the same time, taxes on sweetened beverages remain a relatively stable solution. In practice, levies on sweetened beverages in most countries are characterized by a fairly similar design, especially with regard to the object of taxation. Still, tax rates on sweetened beverages can be determined in various ways. A frequent solution is to use three thresholds for the sugar content per 100 ml of the finished product: 5, 6 and 8 grams. The sugar content influences the differentiation of rates, which increase to some extent along with this factor.[33] In most cases, the regulations on sugar taxes came into force between 2014 and 2021; this indicates that the idea of taxing sweetened beverages is still an international phenomenon.

IV. CONCLUSIONS

Economic concepts influence and will continue to influence public policy, including new regulations of fiscal nature. The example of the Pigouvian theoretical concept of taxation provides a vivid illustration of a situation in which the disciplines of law and economics merge and intertwine. In this case, the models of neoclassical economics encourage the emergence of laws aimed at providing appropriate instruments that would help the developed concepts come to fruition. Subsequently, the introduced regulations are subjected to economic verification, or precisely econometric verification, based on the assumptions of the economic analysis of law. When developing instruments of fiscal nature, it is therefore impossible to formulate provisions without first having an economic concept of how they should be shaped, and it is also impossible to maintain the status quo of such regulations without subjecting their effectiveness to cyclical, quantitative evaluation.

[31] ibid.

[32] Laura Cornelsen and others, 'Why Fat Taxes won't Make us Thin' (2015) 37(1) Journal of Public Health 18, 18–23.

[33] WHO, *WHO Manual on Sugar-Sweetened Beverage Taxation Policies to Promote Healthy Diets* (WHO 2022) 60.

However, in the case of legislative processes that lead to the implementation of solutions of economic nature, it is worth bearing in mind the sources based on which the potential effectiveness of the instruments in question should be assessed. A prominent example is the Pigouvian tax discussed in this paper, which is primarily and practically aimed at producing the desired behavioural effect. Indeed, the basis for the development of this framework of tax legislation are relatively historical mathematical, neoclassical models of the 19th and 20th centuries that are characterized by strict assumptions, the most specific of which is the rationality of consumers. Another source is empirical verification carried out using non-dynamic econometric models. Consequently, the economic analysis of law in the case of this type of fiscal instrument may not be an effective method to properly analyse the effects of the implemented regulations, which has been pointed out in this paper. Certainly, in such cases, the observation of external events and comparison of statistical data, for example, changes in turnover or in the amount of tax revenue, may help in a more reliable and consistent interpretation of the effectiveness of fiscal policies, although this will not allow one to examine the direct impact of these policies on the analysed phenomena. The conclusion that can be drawn is that there are economic assumptions which, if implemented in legal systems, cannot be effectively subjected to the economic analysis of law. At first glance, this conclusion may appear somewhat ambiguous. Indeed, it seems that regulations that find their justification in economic theory should allow the most reliable verification of their implementation.

However, it appears that there are numerous phenomena of economic nature for which economic thought has not yet found the most reliable verification. For example, to verify the effectiveness of an imposed tax, one would like to determine whether the tax has truly had a significant impact on the decline in demand for the taxed product or whether other factors, for example non-fiscal determinants, have had a stronger influence on this trend. To answer this question, it is necessary to study not only the economic indicators but also the behavioural effect of a regulation. As is the case with the described sugar taxes on SSBs, the economic empirical evidence has proven the policy effectiveness: the decline in demand together with the increase of the government revenue due to the implementation of these taxes that was additionally spent on the health-promoting activities. However, the main issue, i.e. the social problem connected with the excessive consumption of sugar in the overall population, remained unresolved.[34] Therefore, the major goal of the implemented regulation, in fact, was not achieved, despite the proper, from the theoretical point of view, design of the respective fiscal instrument. Such phenomenon can be explained only by the behavioural nature of the consumption decisions made by individuals. Every person exhibits specific preferences for a particular lifestyle, including dietary habits, that are influenced by numerous

[34] Cornelsen and others (n 32) 18–23.

factors, not only those specifically regulated by law and based on mathematical and theoretical assumptions. An attempt to calculate them mathematically may prove to be an oversimplification in the description of realities in which general and abstract legal rules are intended to operate. Phenomena of a behavioural and non-obvious nature must, therefore, be interpreted in a broader context than in a strictly economic sense in order to explain them correctly. Therefore, when analysing regulations introduced to influence the behaviour of individuals, it is also necessary to take into account the output of other disciplines, for example psychology and sociology, even if the inspiration for the regulations in question is well grounded in and drawn from economic theories. For this reason, it can be argued that the economic analysis of law, although itself a valuable cognitive method, should never be the only component of the analysis of a regulation, even if it has a strictly economic basis.

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