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**ENGLISH SPREADSHEET MODEL
OF ECONOMIC SPORT VALUE.
THEORETICAL AND PRACTICAL ASSUMPTIONS
OF APPLICATION IN POLAND¹**

**ANGIELSKI MODEL EKONOMICZNEJ WARTOŚCI
SPORTU W ARKUSZU KALKULACYJNYM.
TEORETYCZNE I PRAKTYCZNE ZAŁOŻENIA
ZASTOSOWANIA W POLSCE**

DOI: 10.5611/ie.2016.1.04

Summary: The paper presents an approach to the valuation of sports projects based on the spreadsheet model proposed by the Sport England institution. The authors show specific sport and social value factors in Poland. The research is based on a comparative analysis and case study of the English model. The main aim of the paper is to identify key value drivers and variables in order to prepare a reliable model for economic sport value in Poland. In order to achieve this goal, the paper elaborates a stakeholder analysis of sports organisations in non profit projects. The paper is developed in a wider theoretical concept of social value.

Keywords: value, economic value, social value, Sport England.

Streszczenie: Artykuł przedstawia podejście do wartości projektów sportowych, bazujące na modelu w arkuszu kalkulacyjnym zaproponowanym przez instytucję Sport England. Autorzy prezentują specyficzne czynniki sportowe i społeczne oddziałujące na wartość w Polsce. Badania opierają się na analizie porównawczej i studium przypadku modelu angielskiego. Głównym celem artykułu jest identyfikacja kluczowych czynników wartości oraz zmiennych wpływających na wartość, co ma służyć opracowaniu miarodajnego modelu ekonomicznej wartości sportu w Polsce. Aby go osiągnąć, przeprowadzono analizę interesariuszy organizacji sportowych w projektach *non profit*. Artykuł jest osadzony w szerszym teoretycznym nurcie koncepcji wartości społecznej.

Słowa kluczowe: wartość, wartość ekonomiczna, wartość społeczna, Sport England.

¹ Scientific study funded from the science budget in 2013-2016, under agreement No. MNiSzW 0014/RS2/2013/52. Registration project number: RSA2 024 52. Project title: *Platforma e-Akademicki Związek Sportowy (PeAZS) jako narzędzie monitorowania procesów szkoleniowych, organizacyjnych i finansowych instytucji.*

1. Introduction

The fields of sports and economy are directly correlated to each other. The quality and effectiveness of these relations shapes the image of the country on the international arena. The analysis of Polish realities should be conducted within the context of other countries, especially those which achieve better results, both in terms of sports and economy. Sports is a dynamic sector, one that is garnering more and more interest, as well as partaking in the economic growth of a country. It can help raise the standard of the infrastructure and contribute to the creation of new jobs, not just limited to ones directly related to sports and sports business (e.g. coach, instructor, physiotherapist, player, positions among training staff and administrative staff in sports organisations, in organisations and enterprises offering physical exercise courses, and in the business pertaining to the distribution of sports consumer products), but also those directly involved with physical activity.

Table 1. The effect of sports on the economy of chosen countries (in %)

Country	Share of sports in the gross value added*	Share of employment in the sports sector	Share of household consumption expenditure on sports
England (2010)	1.9	2.3	2.9
Germany (2008)	3.7	4.4	6.6
Netherlands (2006)	1.0	1.5	–
Austria (2005)	4.9	6.4	3.6
Switzerland (2008)	1.7	2.5	–
Poland (2006)	1.6	2.0	2.1

* Gross value added (GVA) is a productivity metric that measures the difference between output and intermediate consumption. Gross value added provides a dollar value for the amount of goods and services that have been produced, less the cost of all inputs and raw materials that are directly attributable to that production.

Source: [Ahlert 2013; Sport England 2013].

The table above illustrates the scope of the contribution of sports to the economic growth of chosen countries over the course of some years. The share of sports in creating the economy's gross value added ranges between 1.0% and 4.8%. One must also note the share of employment in the sports sector, ranging from 1.5% to 6.4%. Two countries of continental Europe in particular display high shares, namely Germany and Austria. The fact the share of sports in the economies of these countries reaches these high levels may be due to a high percentage of people participating in sport, health, and fitness clubs, or socio-cultural clubs that include some sports

element. As many as 61% of people declared membership in such clubs in Germany, 57% in Austria, but only 13% in Poland, whereas the EU average is 33% [Godlewski 2011].

Studies on the social worth continue to attract more attention from scholars, which is connected to the development of the third sector of the economy, but not just that. A significant portion of third sector organisations in Poland are sports organisations [Perechuda 2015]. Studies on enterprise value management increasingly often note that the effects of an enterprise's activity are not only in its financial results. Companies also create social values for their employees and their environment, which cannot be easily accounted in their financial results [Auerswald 2009; Acs et al. 2010]. As a result, both in business and in non-profit sport, there is a problem of appraising the social benefits. Concerning sport in Poland, it is worth noting that sports projects, especially involving common sports, are largely financed from public funds [Perechuda 2015]. In consequence, they create an array of social and public benefits, which require to be managed and controlled. An answer to the need for effective management of sports projects is the model of economic sport value designed for the English institution engaged in sports, "Sport England". This model corresponds with the idea of measuring social value, known as the social return on investment, except it focuses solely on sports projects.

The main goal of this study is to identify key value drivers and variables affecting the value in order to design a reliable model of economic sport value in Poland. In order to attain this goal, the functioning of the model of economic sport value in England has been analysed, and an attempt was made to classify the conditions which a similar model in Poland should meet. The study focuses on the analysis of sports projects from the non-profit area. This area was chosen because existing methods of appraisal can be used to evaluate the effectiveness of commercial projects, and such methods are described in detail in professional literature dealing with the topics of value based management and assessment of business investment projects. The identification of the conditions necessary to build the Polish model was performed by trying to answer the following research questions:

- What are the possible standpoints of the analyses? Adopting a specific standpoint will allow to adjust given assumptions to the method applied.
- What are the key stakeholder groups of non-profit sports projects?
- What categories of results can be identified for sports projects?
- What categories of expenditure can be analysed?
- Is the spreadsheet tool sufficient to assess value of sports projects? What kind of limitations does spreadsheet model consist?

The methods employed in this paper are largely based on the analysis of a pre-existing model, supported by research of literature on the given topic from Poland and other countries. A stakeholder analysis has been performed.

The research corresponds with the theory of value appraisal and the theories of value management. Moreover, the research includes theories of non-market methods

of appraisal, as the examined sport activity is a non-profit one. However, this paper is not an analysis of existing methods or an attempt to adjust them to this field, but rather an analysis of the English model and an attempt to search for the conditions required to devise a similar model for Poland.

2. Social value and sport value

The discussion on the importance of economic valuation is an input into the decision-making process in particular, aiding the assessment of policy choices or trade-offs concerning various management options.

The aim of measuring social value is to increase social equality and the quality of life of people, and supporting a balanced growth. This takes into account a wider concept of social value. The methods of measurement should fulfill the requirement of non-market valuation methods, i.e. they should concern a case dealing directly with the policy goals of a given institution. These methods are strictly related to two aspects: social and public. An institution undertaking a given venture requires information regarding the benefits coming from the actions taken in order to fulfill its goals [Zielińska 2013].

Enterprises create a wide range of types of impacts, only some of which are measured using financial accounting. Social value analysis is a method for understanding environmental, social and public value being created by organizations or projects. It is a wider methodology than simply financial value that accrues to the business stakeholders or only shareholders. The social value methodology can be used by investors, foundations managers and policy makers in order to inform of their capital allocation strategies and decisions, and by managers to inform of their projections, strategic planning and performance assessment [*A Framework for Approaches to SROI...*]. Specifically, SROI Analysis builds on other approaches to understanding non-financial value by quantifying, and including monetary values of, some indicators of the added value. These are then converted to net present value and divided by the amount of monetary investment to arrive at the “social return on investment.” There are a number of issues that need to be taken into account in understanding the additional monetized value itself, and the SROI number cannot be viewed or understood in isolation from the process by which it is calculated. The method is transparent and based on cost benefit analysis [Chandoevewit, Thampanishvong, Rojjananukulpong 2014].

With the “White Paper on Sport” which the EU Commission introduced in 2007, it was recommended for the first time at a European level that because of the high degree of social importance of sport, its economic importance should be adequately and consistently included in the national accounting system [Commission of the European... 2007].

W. Andreff [2011] noticed there are three methodological tools of national economic accounting that have been used to measure the economic significance of

sport: national income, national expenditure, input – output table and the satellite account technique.

A satellite account for Poland has been prepared and its results published in 2011. Those are the most extensive studies on the economic aspect of sport in Poland to date. The calculation of the Sport Satellite Account for Poland was based on the official statistics for the year 2006, obtained from the Central Statistical Office in Poland. The results of the Sport Satellite Account show that the sports sector is an important part of the Polish economy. Participating in sports directly influences our physical, psychological, and social wellbeing. Combined with the accompanying production and services, sport contributes to the wellbeing of the whole society through the creation of jobs and stimulation of demand [Liberda 2011].

The Satellite Account is a suitable measure of the share of sport in the economy of a country. It does not, however, show how much the domestic economy gains from the sport sector, nor does it take into account substitution effects. And most of all, it is a measure in the macroeconomic view.

In addition, various professional and scholarly publications tackling the problem of value related to advertising equivalents and the marketing value of sports have been emerging in Poland [Raport Think Thank 2013; Pentagon Research; Deloitte 2012; Wyszynski 2014]. These papers are not limited to the macro perspective, but delve into the level of individual projects and sport events. Unfortunately, these sort of approaches do not allow to reliably appraise the value of a sports project in the non-profit sphere. They are approaches assessing the value for the advertising market, not the value created for key stakeholders, which should be viewed rather as an utility value, than a transaction value. The signs of another problem of the development of the theory of valuation can be noted here. Both business practice and research papers marginalise the concepts of utility valuation, placing more emphasis on appraising transaction value. As a result, the problem of sports activity effect assessment in the non-profit sphere is still of great interest, both from the scientific and practical points of view.

The Sport England institution, which is occupied with promoting and implementing sport projects aimed to create an active society, has devised a model used to measure projects that are implemented, which allows to include their effects in terms of utility on both micro and macro scales. This model enables one to answer what the economic and social value of the implemented sport projects is. The model has been made available on the institution's website, thus allowing potential authors of sports projects in England to perform an economic verification of them in advance.

3. Sport England spreadsheet model

First of all, the authors present the characteristics of the English spreadsheet sport value model. In most cases, the value of activity is reported as the Gross Value Added (GVA) of the sports-related activity. GVA is the sum of wages paid to employees and

profits generated by businesses operating in the sports sector within the local area [Andreff (ed.) 2011; Ahlert 2013, *The Economic Impact...* 2012].

A second measure used is the number of jobs that are supported. Employment is an important part of economic activity, and presenting the jobs that are supported through the demand for sports goods provides another indication of its scale.

The value of the health benefits are measured in a different way. The estimates are based on research carried out for DCMS [2010] and combine monetary values for improving health; an estimate of the savings that health services will make because people who participate in sport are less likely to suffer from diseases and are also likely to live longer in good health.

Finally, the value of volunteering is based on the time that volunteers contribute. Volunteering does create added value, but because it is not paid, it is difficult to determine how much it is worth. The model uses a notional wage per hour to calculate the value.

The wider expenditure of participants (with other businesses such as restaurants, tourism, transport etc.) is also valued slightly differently. This figure is shown just as the total value of their spending (or sales by businesses).



Fig. 1. Sports economy elements

Source: [Sport England 2015].

SPORT ENGLAND

Local Model WIDER RELEASE

These buttons brings up the descriptions and drop down menu of geographies

This model estimates the economic value of sport in your local area.

Select your local area type: **Local authority**

Select your local area:

There are then three levels that can be used. The first two levels can be used to estimate the overall economic value of sport in your local area (for the year 2012).

Select the level you require:

- Snapshot
- Refined Snapshot
- Impact Assessment

Level 1 makes an initial, snapshot for 2012, estimate of the overall contribution that sport makes to the economy of your local area. The model uses a consistent methodology suitable for any local area and supported by the available local area data and assumptions that are included in the model.

Level 2 gives you the option to estimate the overall economic value of sport in your local area using more detailed local area data and assumptions that better reflect your local area.

Level 3 gives you the option to estimate the additional impact of a sport investment. You need to consider and input what will be the effects of the investment (for example on participation or wider spending). The model will then estimate the economic impacts.

The model measures economic value as follows:

Gross Value Added (GVA): This is a measure of output. It shows the value added contributed by a sector, which is principally wages plus profits.

Jobs: This is a measure of employment. It shows the number of jobs contributed by a sector. Within the model every job, whether full- or part-time, is treated equally in the calculations.

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Fig. 2. Starting page

Source: [Sport England 2015].

ADDITIONAL IMPACT ASSESSMENT: RESULTS

	Additional GVA	Additional jobs	
<u>Construction</u>	£0	0	Refine this input
Participation			
<u>Sports services</u>	£0	0	Refine this input
<u>Sportswear and equipment</u>	£0	0	Refine this input
<u>Total participation</u>	£0	0	
Non-Participation			
<u>Spectator sports</u>	£0	0	Refine this input
Wider impacts			
<u>Health</u>	£0		Refine this input
<u>Volunteering</u>	£0		Refine this input
<u>Wider Spending</u>	£0		Refine this input

Fig. 3. Impact assessment

Source: [Sport England 2015].

The model is essentially a spreadsheet that uses information provided by the user to calculate estimates of employment and GVA. The more information the user can provide the better the estimates will be. The model is set up to provide a simple estimate of the value of sport project using data for each local authority drawn from national employment surveys, the Active People Survey and data from the national studies.

The model is basically built within three submodels, functions (Fig. 2): Snapshot, Refined Snapshot and Impact Assessment. Impact Assessment function is the most interesting for evaluating specific sport project ideas. The first and second functions are used to estimate static sport impact on the whole local area in an economic sense. In this research it is called macro perspective. Therefore, in the further parts of this paper only micro-perspective (impact assessment) is analyzed.

Impact assessment is designed to allow the user to make changes to a number of variables to see how the values change. The most important part of this is how these changes in levels of participation can be calculated. There are also important conceptual differences with interpreting the impact assessment part of the model with the snapshot results in the other sections. This aims to show the difference between scenarios, rather than the overall value.

It is important to remember that the model cannot forecast the scale of change, it can only show how the changes will impact the values in the model.

The English model has some limitations. It does not show the amount of money that people spend on sport. It is mostly about the outcomes of sports businesses based in the local area, for example, jobs in an enterprise making sports equipment can be supported by consumers from anywhere in the world. The jobs in gyms or fitness clubs can also be supported by non-sports spending – for instance from renting out facilities for social functions – but are calculated as being related to sports. The wider effects and impacts cannot be added to the jobs and GVA estimates. Although they are also presented as monetary value, they are not the same as GVA [Sport England 2015].

4. Assumptions to apply in Poland

Framework of the model are able to be realized in Poland. First of all, it should be specified what exactly one wants to measure and what kind of effects should be included. From the macro perspective it can be assumed that the effect of sports could be a value added. In value based management theory, in order to value something it should be answered for whom the value is being estimated [Dudycz 2005]. In order to answer this question one must turn to stakeholder theory.

Stakeholder thinking [Freeman, Wicks, Parmar 2004] is essentially about “managing potential conflict stemming from divergent interests” [Frooman 1999, p. 193]. However, the *analysis* step goes beyond a simple mapping of a stakeholder network and identifying their often conflicting stakes. If an integrated co-creation

of social and economic value is to be achieved, sport organizations and their stakeholders need to focus on “an effort to clarify systematically” [Castro-Martinez, Jackson 2014, pp. 5-6] the available alternatives to the decision-maker, including the “*relevant sources of obligation*” that the nature of each of these relationships entails [Castro-Martinez, Jackson 2014, pp. 5-6].

In order to analyse stakeholders, the perspective of local sports projects has been adopted, which in this paper is referred to as micro perspective. The table below presents a classification of stakeholders with their expenditures and expected benefits from sport projects. An analysis of stakeholders starts with specifying what a stakeholder is. A stakeholder is a unit, that feels a change resulting from a given venture. This change can be either positive or negative for the stakeholder. To perform the analysis, a specific sport project was chosen, one that is important for the given region. This project is the organisation of The World Games 2017 sport event in Wrocław. The main organizer of the project is the city of Wrocław, with support from the Ministry of Sport and Tourism and the Polish Olympic Committee [TWG 2017].

Table 2. Stakeholders analysis of expenditure and results

Stakeholders of TWG 2017	Expenditure	Results
1. Local community	time	regional pride, social integration, utilizing new infrastructure, health improvement, negative effects of increased traffic
2. The unemployed of the given region	time	experience gain, remuneration
3. The employed of the given region	time	experience gain, remuneration
4. Construction companies	time, money, non-monetary assets	increase of completed commissions, contracts
5. Tourist companies	time, money, non-monetary assets	increase of sales
6. Other local companies	time, money, non-monetary assets	increase of sales
7. National authority	time, money, non-monetary assets – infrastructure	infrastructure renewal, promotion of the country’s image, lower healthcare expenses,
8. Local authority	time, money, non-monetary assets – infrastructure	negation, decrease or shift of negative social phenomena such as unemployment, crime, addictions. Promotion of the region’s image
9. Tourists	time, money	recreation, active leisure

Source: own elaboration.

As the analysis shows, the perspective of the local authority both directly and indirectly accumulates the benefits gained by all the other stakeholder groups. What is more, in the examined project, but also in many local non-profit sport projects, the local authority is the main party financing and paying for the project's realization [Perechuda 2015]. Therefore, the perspective assumed by the Sport England institution in their model corresponds with the expectations of stakeholders in Poland. The next table analyses whether the English model directly or indirectly includes the indicated stakeholders and what is the approach to measurement.

Table 3. Approach to value benefits of chosen stakeholder group in English model.

Stakeholders of TWG 2017	Are they included in the Sport England model? How? How is it measured?
1. Local community	YES – through jobs, improved health, – measure of benefits
2. The unemployed of the given region	YES – through the opportunity to gain experience as a volunteer, through social activation by doing sports – measure of benefits
3. The employed of the given region	YES – only by sports participation and improving their health condition which results in a longer life – measure of benefits (employment)
4. Construction companies	YES – through construction investments – measure of expenses
5. Tourist companies	YES – through tourist expenses during the project – measure of expenses
6. Companies of other branches of business	YES – through GVA and employment – measurement through indirect benefits
7. National authority	NO – no central perspective
8. Local authority	YES – GVA, healthcare expenses, employment level – measure of benefits and measure of expenses
9. Tourists	YES – through expenses of tourists, but there is no measure of the benefits they receive.

Source: own elaboration.

By analysing the English model and comparing its assumptions to the example project realized by local authorities, the key value drivers of sports projects can be identified. The value drivers are the measurable benefits arising from the stakeholder analysis:

- GVA,
- employment,
- lifespan,
- healthcare costs,
- sports visitors,
- sports participants,
- turnover of local enterprises,

- construction expenditure,
- tourist expenditure.

5. Conclusions

Applying the model in Poland would allow to limit investments that are inefficient from the social standpoint. It would also facilitate clear and reliable criteria of assessment for sports projects, and could even become an incentive to submit offers by authors who hitherto were unable to verify their own ideas.

Major practical and theoretical conclusions:

- Spreadsheet calculation is, despite some limitation, a sufficient tool for sports valuation.
- Constant sports activity should be differentiated in the model from one-off big sports projects or events.
- In the future Polish model, the difference between regions should be included and it should be possible to modify them. This issue shows how complicated it is to build a standardized model for Poland. The model must be based on a wide range of statistical data collected by state institutions and by the creators of the model. Probably there would be an obligation to realize some previous research concerning value of different social goods and services using non-market valuation methods.
- For one-off sport projects there is no need to build a model for the whole state. Creating an individual model for one particular big project ensures a better understanding of the project and provides a deeper input and outcome analysis. Moreover, it shows the net value of the project more clearly.
- Having a basis for a one-off analysis of a sport project in one particular region will make it easier to build one standardized local model that can be used in other projects in this area.
- The English model primarily shows the gross effects of sport projects and sports activity. In order to compare projects, the model could be built in a way that would show the wider net effects. In this case, SROI methodology can be added.
- The English model corresponds with the idea of measuring utility value from the perspective of the local authority, i.e. the stakeholder, who covers a significant portion of the costs of realizing sports projects. However, by design the model also makes use of data calculated on the basis of comparative values, which conform to a transactional approach. An example of this is the valuation of the working hour of a volunteer on the basis of the valuation of an hour of comparable payable work. The assumed perspective appears valid for measuring the effects of sports projects in an objectified manner.

Literature

- Acs Z.J., Boardman, M.C., McNeely, C.L., 2010, *The Social Value of Productive Entrepreneurship*, GMU School of Public Policy Research Paper No. 2011-08, <http://ssrn.com/abstract=1725947>.
- A Framework for Approaches to SROI Analysis 2005*, <http://www.thesroinetwork.org/>.
- Ahlert G., 2013, *The German Sport Satellite Accounts (SSA)*, Gesellschaft für Wirtschaftliche Struktur-forschung mbH, Osnabrück.
- Andreff W. (ed.), 2011, *Contemporary Issues in Sports Economics: Participation and Professional Team Sports*, Edward Elgar Publishing.
- Auerswald P.E., 2009, *Creating social value*, Stanford Social Innovation Review, Spring, <http://ssrn.com/abstract=1376425>.
- Castro-Martinez M.P., Jackson P.R., 2014, *Collaborative value co-creation in community sports trusts at football clubs*, Corporate Governance – An International Review, Forthcoming, <http://ssrn.com/abstract=2540364>.
- Chandoevvit W., Thampanishvong K., Rojjananukulpong R., 2014, *Social Return on Investment: Health Promotion Programs*, <http://ssrn.com/abstract=2497017>, 10.04.2015.
- Commission of the European Communities, *White Paper on Sport*, COM(2007)391 final, Brussels.
- DCMS, *Understanding the Value of Engagement in Culture and Sport, Technical Report 2010*, Department for Culture, Media & Sport, <https://www.gov.uk/government/publications/case-programme-understanding-the-drivers-impacts-and-value-of-engagement-in-culture-and-sport>, 1.05.2016.
- Deloitte, 2012, *Sponsoring – podstawowy instrument marketingu sportowego*.
- Dudycz T., 2005, *Zarządzanie wartością przedsiębiorstwa*, PWE, Warszawa.
- Freeman R.E., Harrison J.S., Wicks A.C., Parmar B.L., De Colle S., 2010, *Stakeholder Theory: The State of the Art*, Cambridge, Cambridge University Press.
- Freeman R.E., Wicks A.C., Parmar B., 2004, *Stakeholder theory and “the corporate objective revisited”*, Organization Science, 15(3), pp. 364-369.
- Frooman J., 1999, *Stakeholder influence strategies*, Academy of Management Review, vol. 24, no. 2, pp. 191-205.
- Godlewski P., 2011, *Globalny i lokalny wymiar współczesnego sportu*, Zeszyty Naukowe Uniwersytetu Szczecińskiego nr 689, Ekonomiczne Problemy Usług nr 78, Wydawnictwo Naukowe Uniwersytetu Szczecińskiego, Szczecin.
- Liberda Z.B., 2011, *Sport Satellite Account for Poland*, Proceedings 58th World Statistical Congress, 2011, Dublin.
- Pentagon Research, pentagon-research.com, 16.04.2015.
- Perechuda I., 2015, *Znaczenie sportu w gospodarce narodowej*, [w:] J. Dobosz (red.), *Wybrane zachowania zdrowotne Polaków w perspektywie sportu powszechnego i zdrowia: analiza problemu*, Fundacja Rozwoju Kultury Fizycznej, Warszawa.
- Raport Think Tank, 2013, *sport – biznes – efektywność*, <http://mttp.pl/co-robimy/publikacje/raporty/raport-thinktank-sport>, 16.04.2015.
- Sport England, 2013, *Economic value of sport in England*, London.
- Sport England, 2015, *Economic Value of Sport Local Model*, London.
- The Economic Impact of the London 2012 Olympic and Paralympic Games*, 2012, Oxford Economics, www.oxfordeconomics.com/economic-impact/valuing-social-impact, 1.04.2015.
- TWG, 2017, <http://theworldgames2017.com/>, 16.04.2015.
- Wyszyński A., 2014, *Sponsoring jako źródło przychodów klubów sportowych*, Marketing i Rynek, nr 11/2014, PWE.
- Zielińska A., 2013, *Gospodarowanie na obszarach przyrodniczo cennych w Polsce w kontekście rozwoju zrównoważonego*, Wydawnictwo Uniwersytetu Ekonomicznego we Wrocławiu, Wrocław.

Recenzenci współpracujący z czasopismem w roku 2016

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