FORSCHUNGSINSTITUT FÜR
GLÜCKSSPIEL UND WETTEN

Assessment Tool to Measure and Evaluate the Risk Potential of Gambling Products

AsTERiG

Research Insitute
for Gambling and Gaming

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[1] AsTERiG is developed by the Gambling Scientific Forum in the years 2006-2010. At the completion of this final version as well as in the composition of this survey the following scientists were involved: Prof. Dr. Reiner Clement, Bonn-Rhein-Sieg University; Prof. Dr. Jörg Ennuschat, University of Konstanz; Prof. Jörg Häfeli, Lucerne University of Applied Sciences and Arts; Prof. Dr. Gerhard Meyer, University of Bremen; Chantal Mörsen, Charité Berlin; Prof. Dr. Dr. Franz W. Peren, Bonn-Rhein-Sieg University; Prof. Dr. Wiltrud Terlau, Bonn-Rhein-Sieg University. All scientists of the Gambling Scientific Forum thank both German social lotteries, the Aktion Mensch and the ARD-Fernsehlotterie, which initiated the project and enabled the research financially. Franz W. Peren conducted the project scientifically.

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1. Introduction

Within an elementary decision of March 28th, 2006 the German Federal Constitutional Court implemented the following:[2] “According to the status quo of research it is certain, that gambling and bets can result in morbid addictive behaviour. ... However different gambling products exhibit different addictive potentials.” Up to now a specific identification of the addictive potential of a concrete gambling product was nearly impossible. This being said, the Wissenschaftliches Forum Glücksspiel (Gambling Scientific Forum) developed a globally applicable assessment tool to measure and evaluate the risk potential of gambling products.

2. Economic context

The gambling market is one of the most profitable branches of the economy all over the world. Currently the global gambling market is experiencing a change.[3] Especially in Asia and Eastern Europe the markets are still unsaturated to a large extend, so that particularly high growth rates are expected to occur in these markets. It can be noticed that gambling product providers come with an innovative spirit that by trend results in a significant growing differentiation of gambling products. In particular the internet is enhancing the global range of online gambling products.[4] Currently a growing number of countries of the European Union (EU) are preparing a controlled opening of their markets of online-gambling and thereby they are unlearning their hitherto existing retention.[5] Within the EU this dynamic of the gambling market, which mainly has been borne by online-offers, is subordinated to national public adjustments at the same time, to canalize the population’s potential gambling addiction and to narrow possible associated social consequential costs. From an economic point of view especially regulated, legal markets and unadjusted, illegal markets have to be distinguished.

[2] BVerfG, ZfWG 2006, 16 (26).
[3] An abstract can be found in the 5th edition of the Global Gambling Report; http://www.gbgc.com/publications/global-gambling-report.
[4] An abstract is shown in the Interactive Gambling Report; http://www.igamingbusiness.com/content/interactive-gambling-report.
[5] Beyond Italy and England France is the third European country that governs its online gambling market. Denmark also passed an analogical law and is going to open up its online gambling market presumably in January 2011.

3. Practical need for such measurement tool

Already in October 2006 the participating scientists of the Bonn-Rhine-Sieg University were instructed by the Aktion Mensch to develop an assessment tool to measure and evaluate the risk potential of gambling products.[6] In the beginning of 2007 the Aktion Mensch and the ARD TV-Lottery reformed the Wissenschaftliches Forum Glücksspiel, consisting of professionals of various disciplines (economics, law, medical sciences, psychology, sociology), with the objective of compiling a practicable and as clinical as possible assessment tool to measure and evaluate the risk potential of gambling products. The methodology has been published.[7]

Also within an international context the desire for classifying the degree of risk potential of gambling products is beyond controversy. Similar research activities from Great Britain,[8] Finland[9] and Sweden[10] are known. However the empirical base of these operations – if published - seems to be inadequate and the methodical procedure seems to be not traceable throughout all points.[11]

By dint of the assessment tool to measure and evaluate the risk potential of gambling products developed by the Wissenschaftliches Forum Glücksspiel legislator, judicature and administrative practice are provided with a valuable measurement tool. This measurement tool admits a quantitative, differentiated evaluation of gambling products, which is essential for any comparative comparison. Furthermore a general acceptance of this measurement tool would make a significant contribution to the provision of an entrepreneurial sensible and necessary planning reliability for suppliers of gambling products all over the world by developing new gambling products.

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[6] Peren, F.W., Clement, R. & Terlau, W. (2006): Darstellung und Auswertung der herrschenden deutschen und europäischen Glücksspielforschung zum Thema „Spielsucht". Study on behalf of Aktion Mensch, Bonn.

[7] Peren, F.W., Clement, R. & Terlau, W. (2007): Concept of an assessment tool to measure and evaluate the addictive potential of gambling products. Lecture within a workshop of the Gambling Scientific Forum, Bonn. Becker, T., Beutel, M.E., Clement, R., Ennuschat, J., Grüsser-Sinopoli, S., Häfeli, J., Meyer, G. Mörsen, C., Peren, F.W., Reeckmann, M. & Terlau, W. (2008): Mess- und Bewertungsinstrumente zur Feststellung des Gefährdungspotenzials von Glücksspielprodukten, in: ZfWG, booklet 1, pp. 1 – 11; Clement, R., Ennuschat, J., Häfeli, J., Meyer, G. Mörsen, C., Peren, F.W. & Terlau, W. (2010): Mess- und Bewertungsinstrument zur Feststellung des Gefährdungspotentials von Glücksspielprodukten, in: ZfWG, booklet 5, pp. 305 - 311.

[8] GamGARD - Gaming Assessment Measure – Guidance about Responsible Design; http://www.gamgard.com.

[9] Product Evaluation Method for Reducing Potential Hazards (Finnland); http://www.veikkaus.fi

[10] Playscan; http://www.spelinstitutet.se.

[11] Cp. Peren, F.W. (2009): Assessment Tool to Measure and Evaluate the Risk potential of Gambling products – AsTERiG. Lecture at the Social Responsibility Seminar of EL European Lotteries Association, Barcelona.

4. Empiric methodology[12]

The measurement tool's empiric development is based upon two modules.[13] With the first module a survey of gambling addiction experts of research and provision took place within the framework of a Delphi study. The Delphi methodology is about a systematic, multi-level, and feedback-orientated procedure, in which in several runs interrogations of experts for problem solving solutions are surveyed, until a predefined stop criterion, e.g. firmness of consensus or steadiness of the responses, is achieved.[14] The interrogation of experts contains four phases of investigation. The main focus of the first two phases was on the collection of event features, which cause risk potential of gambling products significantly. Therefore the monitoring-team prepositioned a catalogue of all parameters listed in literature. Within the first collection phase the experts were asked to evaluate these parameters with reference to their risk potential with the help of a Likert-Scale. Furthermore the experts were asked to submit proposals for summarizations, eliminations, and extension of parameters, which should be the basis for the selection of 15 parameters (according to suitability for daily use and multinational instruments) within the second phase. The third collection phase affected the development of scales for the event features, which first of all were designed by the monitoring team, orientated on various material specifications of the parameters of particular gambling methods. The experts evaluated the characteristic value of particular scales on a Likert-Scale with reference to their risk potential and advised modifications on wording and context. In addition the experts brought twelve different gambling methods into order concerning their risk potential. The fourth collection phase contained the estimation of risk potential of parameters concerning different gambling products. Essential modifications of the specifications of certain parameters required a revaluation by the experts.

Within the second module, which is built-on the Delphi study, a standardized data ascertainment of ordinary gamblers as well as problematic and morbid gamblers, whose recruitment was arranged via in-patient facilities and support groups, restaurants and gambling locations, and via the internet, took place. The interview of gamblers conduced to empiric validation and test-theoretical coverage of the instrument. Against the background of the results of the Delphi study two questionnaires for the validation of identified parameters (questionnaire

[12] Chapter 4, "Empiric methodology" has been composed by Meyer, G., Häfeli, J., Mörsen, C. & Fiebig, M.
[13] Cp. Meyer, G. Häfeli, J., Mörsen, C. & Fiebig, M. (2010): Die Einschätzung des Gefährdungspotentials von Glücksspielen, in: Sucht, 2010, vol. 56, no. 6, pp. 405-414.
[14] Cp. Häder, M. & Häder, S. (2000): Die Delphi-Methode als Gegenstand methodischer Forschungen, in: M. Häder & S. Häder (Hrsg.), Die Delphi-Technik in den Sozialwissenschaften. Methodische Forschungen und innovative Anwendungen, pp. 11-31, Wiesbaden.

"parameters") and for the developed scales (questionnaire "scales") were drawn up. With the questionnaire "parameters" the gamblers were asked to estimate the risk potential of the parameters analogical to the fourth stage of the Delphi study and generate an order of twelve gambling products. With the questionnaire "scales" specifications of the parameters concerning their risk potential were interrogated on a Likert-scale.

The final choice of relevant parameters for the ascertainment of risk potentials of gambling products, the determination of weight, and the evaluation of characteristic value took place by merging the experts' and the gamblers' estimations to a general sample (with corresponding weight of the partial samples) and by statistical analysis techniques like ordinal logistic regression.

5. Empiric results[15]

The experts' estimation caused a reduction of the original list of parameters from 61 to 27 parameters. The analysis of frequency in consideration of the greatest mismatch between two parameters resulted in an amount of 14 parameters, which in the experts' point of view bear an essential meaning referring to the specification of risk potential

With a separate examination accomplished parallel to the Delphi study Beutel and Mörsen (2009)[16] reviewed empirically the results of a literature-analysis[17], which resulted in twelve relevant event features, by interviewing gambling suppliers as well as pleasure and morbid players. Ten parameters which found empirical confirmation were also part of the experts' selection. Furthermore the parameters "Jackpot" and "Marketing", which were zeroed out within the Delphi study, proved to be significant. This result caused an extension of the list by these two parameters as well as an additional estimation of their risk potential and their particular characteristic value done by the experts of the Delphi study within the conception of the second module.

The result of the players' interview as well as the statistical analysis of the general sample is a list of ten parameters:

[15] Chapter 5, "Empiric results", has been composed by Meyer, G., Häfeli, J., Mörsen, C. & Fiebig, M.
[16] Beutel, M. & Mörsen, C. (2009): Ergebnisse der Validierungsstudie. Vortrag auf dem Workshop des Wissenschaftlichen Forums Glücksspiel, Bonn.
[17] Cp. Peren, F.W., Clement, R. & Terlau, W. (2006): Darstellung und Auswertung der herrschenden deutschen und europäischen Glücksspielforschung zum Thema "Spielsucht". Study on behalf of Aktion Mensch, Bonn.

Parameter	Definition
Event frequency	Unit of time between stake, gambling result and next stake opportunity
Interval of payback	Period of time between gambling result and payback of profits
Jackpot	Profit amount which is the result of continuous summation of stake rates of all gamblers in case of undue payback of profits
Continuity of playing	Period of time in which the gamble can be proceeded continuously (without any break) or a seamless change between different gambles is possible
Chance of winning	Chance of realizing a profit (inclusive all profits underneath the stake amount)
Availability	Convenience with which gamblers can force their way to gambling
Multiple playing-/ stake opportunities	Opportunity to raise several stakes at the same time or to take part in several gambling at the same time
Variable stake amount	Extent of which gamblers can choose their stake amount by themselves
Sensory product design	Auditory and visual effects during gambling and gambling presentation
Almost profits	Results when a gambler supposes to have almost won (to miss the profit narrowly)

Chart 1: Parameters to evaluate the risk potential of gambling products

The calculation of the risk potential of gambling products is made up of the ten parameters and their different weight. The highest weight was achieved by the parameter ‘event frequency’ with an amount of 3, whilst ‘continuity of playing’ achieved the lowest weight with an amount of 1. The scales of parameters were basically confirmed by the results of the interview of gamblers respectively by the general sample. The number of specifications of the parameters ranges from 2 till 8. Therefore the parameter ‘almost profits’ comes with two specifications (“unintentionally created, occurring by chance”, 1 point, “intentionally created by supplier/ producer, occurring more frequently than random”, 4 points), while the parameter ‘event frequency’ comes with 8 specifications (“more than 6 days”, 0 points, “more than 24 hours up to 6 days”, 1 point, “more than 4 hours up to 24 hours”, 1.5 points, “more than 30 minutes up to 4 hours”, 2 points, “more than 3 minutes up to 30 minutes”, 2.5 points, “more than 1 minute up to 3 minutes”, 3 points, “15 seconds up to 1 minutes”, 3.5 points, “less than 15 seconds”, 4 points). In table 2 all parameters of the measurement tool have been defined and the scaling of the parameters is shown.

Parameter	Definition	Scale							
Event frequency	Unit of time between stake, gambling result and next stake opportunity	more than 6 days	more than 24 hours up to 6 days	more than 4 hours up to 24 hours	more than 30 minutes up to 4 hours	more than 3 minutes up to 30 minutes	more than 1 minute up to 3 minutes	15 seconds up to 1 minute	less than 15 seconds
		0	1	1.5	2	2.5	3	3.5	4
Interval of payback	Period of time between gambling result and payback of profits	more than 6 days	more than 24 hours up to 6 days	more than 4 hours up to 24 hours	more than 30 minutes up to 4 hours	more than 3 minutes up to 30 minutes	more than 1 minute up to 3 minutes	15 seconds up to 1 minute	less than 15 seconds
		0.5	1	1.5	2	2.5	3	3.5	4
Jackpot	Profit amount which is the result of continuous summation of stake rates of all gamblers in case of undue payback of profits	non-existent	0 Euro till 99 Euro	100 Euro till 999 Euro	1.000 Euro till 9.999 Euro	10.000 Euro till 99.999 Euro	100.000 Euro till 999.999 Euro	1 Mio. till 50 Mio. Euro	more than 50 Mio. Euro
		0	1	1.5	2	2.5	3	3.5	4
Continuity of playing	Period of time in which the gamble can be proceeded continuously (without any break) or a seamless change between different gambles is possible	0 till 5 minutes of continuous gambling	more than 5 minutes up to 15 minutes of continuous gambling	more than 15 minutes up to 30 minutes of continuous gambling	more than 30 minutes up to 1 hour of continuous gambling	more than 1 hour up to 3 hours of continuous gambling	more than 3 hours of continuous gambling		
		0	1	2	3	3.5	4		
Chance of winning	Chance of realizing a profit (inclusive all profits underneath the stake amount)	0% till 4%	more than 4% up to 24%	more than 24% up to 49%	more than 49%				
		1	2	3	4				
Availability	Convenience with which gamblers can force their way to gambling	Gambling opportunities within a radius of more than 100 km	Gambling opportunities within a radius from 10 to 100 km	local Gambling opportunities within a radius of up to 10 km	Gambling opportunities within the private residence / place of work				
		1	2	3	3.5				
Multiple playing-/ stake opportunities	Opportunity to raise several stakes at the same time or to take part in several gambling at the same time	one gambling opportunity and one stake opportunity	one gambling opportunity and multiple stake opportunities	multiple gambling opportunities and multiple stake opportunities					
		2	3	4					
Variable stake amount	Extent of which gamblers can choose their stake amount by themselves	fixed stake amount	variable stake, limited stake amount	unlimited stake amount					
		2	3	4					
Sensory product design	Auditory and visual effects during gambling and gambling presentation	non-existent	auditory or visual effects exist	auditory and visual effects exist					
		0	2	3					
Almost profits	Results when a gambler supposes to have almost won (to miss the profit narrowly)	un-intentionally created, occurring by chance	intentionally created by supplier/ producer, occurring more frequently than random						
		1	4						

Chart 2: Definition and scale of parameters[18]

[18] Cp. Meyer, G. Häfeli, J., Mörsen, C. & Fiebig, M. (2010): Die Einschätzung des Gefährdungspotentials von Glücksspielen, in: Sucht, 2010, vol. 56, no. 6, pp. 405-414.

To measure the risk potential of gambling first of all the particular specification of each parameter has to be defined and the according points have to be multiplied by the parameter's weight. The sum of these products adds up to the total value of gambling (cp. chart 3). The addition of weights of the ten parameters results in a total value of 15.7, which is fixed for each gambling product being evaluated. To warrant an objective rating of individual products an exact definition of particular parameters within the framework of the code of practice for the use of the measurement tool is required. If multiplying the resulting individual points by the general weights of parameters, the result is an amount of points which can achieve a specification of maximum 60.65 points or rather a score of maximum round about 3.863 (60.65 : 15,7).

Parameters of risk potential	**Weight**	**Points (0 – 4,0)**	**Specification**
Event frequency	3.0	0 – 4.0	0 – 12.0
Multiple playing and stake opportunity	2.0	2.0 – 4.0	4.0 - 8.0
Chance of winning	1.7	1.0 – 4.0	1.7 - 6.8
Sensory product design	1.5	0 – 3.0	0 - 4.5
Variable stake amount	1.4	2.0 – 4.0	2.8 - 5.6
Availability	1.3	1.0 - 3.5	1.3 - 4.55
Jackpot	1.3	0 - 4.0	0 - 5.2
Interval of payback	1.3	0.5 - 4.0	0.65 - 5.2
Almost profits	1.2	1.0 - 4.0	1.2 - 4.8
Continuity of playing	1.0	0 - 4.0	0 - 4.0
Total value	**15.7**		**11.65 - 60.65**

Chart 3: approach: multiplication of general weights with individual points

If classifying the total points into five categories of equal amplitude for example[19], the result is a mapping of five categories of risk as shown in chart 4 or rather five categories of risk potential as displayed in the right column.

[19] Alternatively it would be possible to develop the classification heterogeneous by dint of a cluster analysis that changes maybe in the course of time. This option has been tested by the authors acceptably. The practical approach falls to current conditions and is orientated to a large extent to the valid code of practice.

sum of points	Score	Character	risk potential
< 21,45	< 1,366	A	very low
21,46 – 31,25	1,367 – 1,990	B	low
31,26 – 41,05	1,991 – 2,615	C	moderate
41,06 – 50,85	2,616 – 3,239	D	high
50,86 – 60,65	3,240 – 3,863	E	very high

Chart 4: characters of gambling products

6. Quality parameters[20]

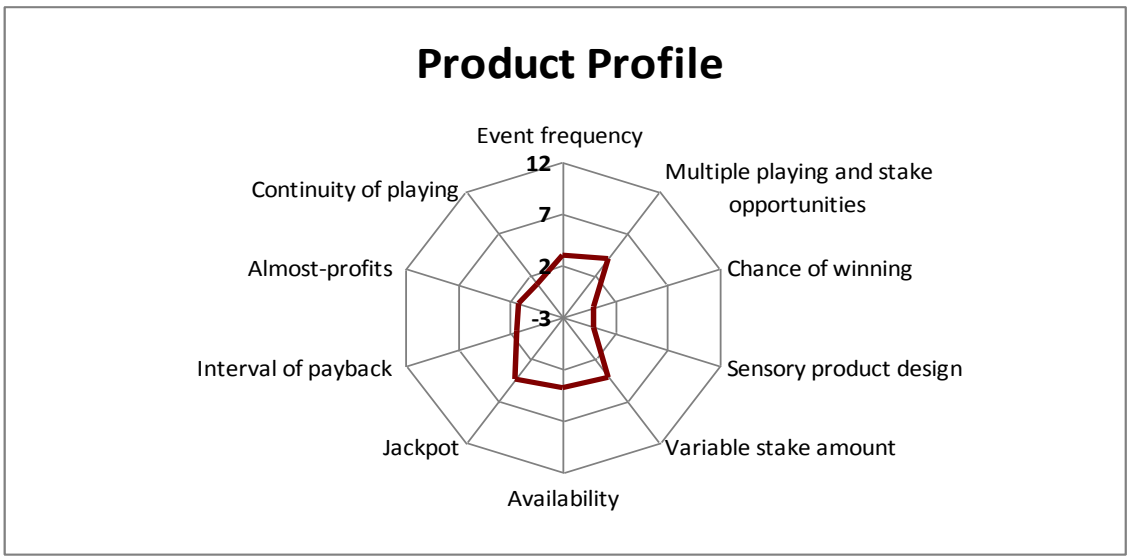
The test-theoretical survey provided explicit indication that the measurement tool is reliable and valid.[21] Parameters of reliability argue for great homogeneity and interior consistency of the measurement tool. Structure analysis using factor analysis recommended an one-dimensional instrument measuring the risk potential of gambling products in terms of a standardized constructs. The analysis of the parameter validity showed an intense positive correlation between the measurement tool and external empiric parameters like general information about problematic forms of gambling provided by clients from mental institutions[22], prevalence ratios of problematic and pathological gambling behaviour corresponding to various forms of gambling[23] and estimation of risk potential of gambling products[24]. Correspondences with regards to content with the Anglo-Saxon measurement tool[25] give proof of the content-logical validity. An empirical verification of objectiveness is yet to come.

[20] Chapter 6, “Quality parameters”, has been composed by Meyer, G., Häfeli, J., Mörsen, C. & Fiebig, M.
[21] Cp. Meyer, G., Häfeli, J., Mörsen, C. & Fiebig, M. (2010): *Die empirische Entwicklung eines Bewertungsinstruments zur Einschätzung des Gefährdungspotentials von Glücksspielen*. Sucht, eingereicht.
[22] Meyer, G. & Hayer, T. (2005): *Das Gefährdungspotenzial von Lotterien und Sportwetten. Eine Untersuchung von Spielern aus Versorgungseinrichtungen*. Düsseldorf: Ministerium für Arbeit, Gesundheit und Soziales des Landes Nordrhein-Westfalen.
[23] Cp. BZgA (2008): Bundeszentrale für gesundheitliche Aufklärung, BZgA (2008): *Glücksspielverhalten und problematisches Glücksspielen in Deutschland 2007. Ergebnisse einer Repräsentativbefragung*. www.bzga.de/studien [viewed 05.01.2009].
[24] Beutel, M. & Mörsen, C. (2009): Ergebnisse der Validierungsstudie. Vortrag auf dem Workshop des Wissenschaftlichen Forums Glücksspiel, Bonn.
[25] Griffiths, M.D., Wood, R.T.A & Parke, J. (2008): GAM-GaRD: *A new social responsibility tool*. http://www.ncpgambling.org/files/members/NCPG_Fall08-newsVol11_I3_.pdf [viewed 29.01.2009].

7. Case study

The different meaning of parameters referring to the risk potential of gambling products can be visualized sensibly by dint of a scorecard. Scorecards are suitable for quantitative assessments during analysis of potentials and risks, for the estimation of product- and performance-ideas and further problems.[26] Below the assessment of the risk potential of the gambling product "Lotto 6 aus 49", which is offered on Wednesdays and Saturdays in Germany, will be demonstrated and visualized exemplary.

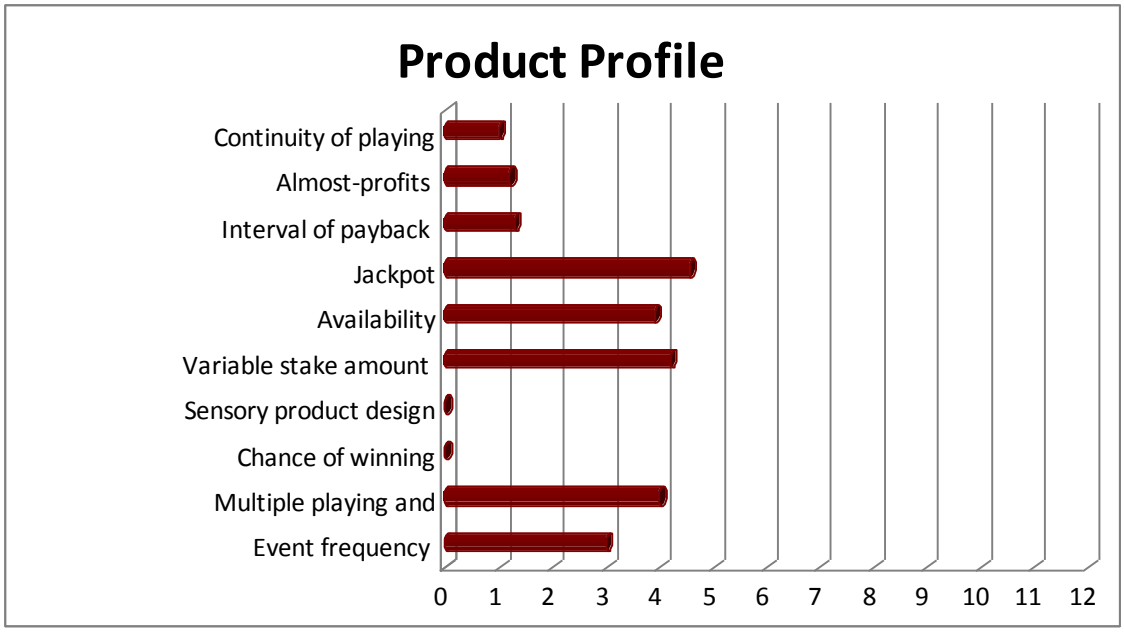
In Figure 1 the corresponding radar chart is shown. It illustrates dimension and form of the expanse within the graphic product-profile and relativists them to the total possible expanse of the total radar chart. Amplitudes of certain parameters become apparent. When analysing the way of specifications precisely and comparing them with each other it is recommended to use a bar chart in addition to the radar chart as shown in Figure 2 for "Lotto 6 aus 49" for exemplary. In this example it becomes apparent that in particular the parameters "Jackpot", "Variable stake amount", "Multiple playing and stake opportunities" as well as "Availability" are playing an important role referring to risk potential of addiction. On the other hand "Sensory product design" and "Chance of winning" don't seem to initialize any risk potential at all.



Score	1.47
Risk potential	low (B)

Fig. 1: Radar chart showing the risk potential of "Lotto 6 aus 49"

[26] Cp. e.g. with reference to companies' site decisions Peren, F.W., Clement, R. (1998): Globale Standortanalyse, in: Harvard Businessmanager, 6, pp. 70 – 77, Reineke, R.D., Bock, F. (Hrsg.): Gabler Lexikon Unternehmensberatung, Wiesbaden 2007 sowie Gabler Wirtschaftslexikon (2009): *Peren-Clement-Index*. http://wirtschaftslexikon.gabler.de/Definition/peren-clement-index.html [viewed 15.11.2009].



Score	1.47
Risk potential	low (B)

Fig. 2: Bar chart showing the risk potential of "Lotto 6 aus 49"

8. Forecast

All gambling products do not have the same risk potential. Gambling products are characterized by situational and structural parameters, which, combined, result in more or less distinct risk potential. Structural parameters are well identifiable by means of empirical examinations on players respectively by estimations of experts. Thus they can be measured and assessed with an appropriate measurement tool.

The present assessment tool measures the possible dimension of risk potential of gambling products on the basis of scores. Thus a comparison of risk potentials between different gambling products is possible as well. Furthermore the measurement tool indicates in which domains risk potentials of particular gambling products can be found concretely. Thereby it becomes an essential tool for legislation, legal practice as well as administrative practice as it affords the possibility of a concrete and comparative identification of risk potentials of particular gambling products. In practice always concrete gambling products but no product groups (e.g. lotteries, slot machines) or even vendors should be assessed.

The structure analysis of particular parameters and their significance to generate possible addiction potentials for the respective gambling products permits a specific

configuration of products at less risk and offering these to customers. An indication of the classification of the risk potential of gambling products could be placed on vouchers or in gambling locations for example. A visual display would make traceable parameters available to the individual responsible decision maker to estimate the risk potential of gambling products. The customer would be able to assess the risk potential of gambling products independently. By dint of such measurement tools not only existing gambling products but also new ones can be assessed concerning their risk potential.[27]

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[27] Cp. Peren, F.W., Clement, R. & Terlau, W. (2010): *Die volkswirtschaftlichen Kosten einer Monopolisierung von Sportwetten in der Bundesrepublik Deutschland Die volkswirtschaftlichen Auswirkungen des Glücksspielstaatsvertrages für den deutschen Sportwettenmarkt*, Wirtschaftswissenschaftliches Gutachten, Bonn.

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