UNIVERSITY OF PANNONIA

Doctoral School of Management Sciences and Business Administration

Economic analysis of the horse sector and relevant topics for its sustainable development in the Equestrian Revolution

DOI:10.18136/PE.2016.622

Doctoral (PhD) Dissertation

written by

Zsuzsanna Mihók

Dissertation directors

Dr. Tibor Pupos

Dr. Rafael Castejón Montijano

2016

ECONOMIC ANALYSIS OF THE HORSE SECTOR AND RELEVANT TOPICS FOR ITS SUSTAINABLE DEVELOPMENT IN THE EQUESTRIAN REVOLUTION

Thesis for obtaining doctoral (PhD) degree

Written by Zsuzsanna Mihók

Submitted in the Doctoral School of Management Sciences and Business Administration of the University of Pannonia

Supervisors:

Dr. Tibor Pupos

I propose the thesis for acceptance (yes / no)

…….
(signature)

Dr. Rafael Castejón Montijano

I propose the thesis for acceptance (yes / no)

…….
(signature)

The candidate has achieved …….% at the comprehensive exam.

I propose the thesis for acceptance, as reviewer:

Name of the reviewer: …… yes / no

……
(signature)

Name of the reviewer: …… yes / no

……
(signature)

The candidate has achieved …….% at the public discussion.

Keszthely, 2016.

……..
Chairman of the Committee

Labelling of the PhD diploma: ……

……..
President of the UCDH

CONTENTS

Contents i
List of tables and figures iv
Abstract xi
Extracto xii
Kivonat xiii

1: INTRODUCTION 1
1.1 Preliminary observations 1
1.2 Personal statement of research interest 3
1.3 Importance of the study 4
2: OBJECTIVES AND HYPOTHESES 6
3: LITERATURE REVIEW 10
3.1 The history of man on horseback: some relevant changes in the roles of horses throughout history 10
3.1.1 The beginning 10
3.1.2 In warfare 10
3.1.3 Industrial Revolution 11
3.1.4 Equestrian Revolution 12
3.2 Horse industry 13
3.2.1 General observations 13
3.2.2 Microeconomic aspects 15
3.2.3 Macroeconomic aspects 17
3.2.4 Contribution of the horse industry to the economy 22
3.3 Countries, where demand for horses and horse-related activities seems to be high 24
3.4 Brief historical background of the Hungarian Horse Industry 29
3.4.1 Brief review of Hungarian Horse Breeding 29
3.4.2 Brief review of Hungarian Horse Racing 34
3.4.2.1 Flat racing 34
3.4.2.2 Harness racing 35
3.4.3 Brief review of Hungarian Equestrian 36
3.4.4 Some relevant traditional Hungarian horse-related spectacles 41
4: METHODOLOGY 43
4.1 General observations 43
4.2 Tools for the operational characterization of the horse industry 45
4.3 Tools for estimating the economic impacts of the horse industry on the economy 51

4.3.1 General considerations 51
4.3.2 Gross domestic product of the horse industry 52
4.3.3 Estimation of employment generated by the horse industry 57
4.4 Estimation of the economic impacts of the Hungarian Horse Industry; the principal factors of the estimation 60
4.5. Macroeconomic analyses of the environment necessary for the Equestrian Revolution 62
4.5.1 General observations 62
4.5.2 Selected indicators 63
4.5.3 Tools for the analysis 69
5. and 6. RESULTS AND DISCUSSION 71
5: OPERATIONAL CHARACTERIZATION AND ECONOMIC IMPACT ESTIMATION OF THE HUNGARIAN HORSE INDUSTRY IN 2013 71
5.1 General observations 71
5.2 Horse breeding 73
5.2.1 Operational characterization of Hungarian Horse Breeding 73
5.2.2 Comparison of equestrian results of Hungarian breeds with those of other breeds 77
5.2.3 Economic impacts generated by Hungarian Horse Breeding 77
5.3 Horse racing 80
5.3.1 Operational characterization of Hungarian Horse Racing 80
5.3.2 Comparison of Hungarian Horse Racing with that of other countries 81
5.3.3 Economic impacts generated by Hungarian Horse Racing 84
5.4 Equestrian 85
5.4.1 Operational characterization of Hungarian Equestrian 85
5.4.1.1 Athletes in the equestrian disciplines in 2013 87
5.4.1.2 Horses in the equestrian disciplines in 2013 91
5.4.2 Economic impacts generated by Hungarian Equestrian 94
5.4.3 Hungarian Pony Equestrian 99
5.5 Other sub-sectors and segments of the Hungarian Horse Industry in 2013 101
5.6 Total economic impacts generated by the Hungarian Horse Industry in 2013 103
6: MACROECONOMIC ANALYSIS OF THE ENVIRONMENT NECESSARY FOR THE EQUESTRIAN REVOLUTION 105
6.1 Value added, agriculture and service sector and urban population 105
6.2 Gross domestic product (GDP) 106
6.3 Disposable income 108
6.4 Human development index (HDI) and social progress index (SPI) 109
6.4.1 The role of the conditions measured by the HDI in horse racing or equestrian 109

6.4.2 The role of the conditions measured by the SPI in horse racing or equestrian 117
6.5 Relationship between human development (on the basis of the HDI) and the economic performance (on the basis of GDP per capita) in the horse sector 119
6.6 Travel and tourism competitiveness index (TTCI) 121
6.7 Hungary 123
6.7.1 Rankings of Hungary made by percentile rank on the basis of analyzed indicators in horse racing and equestrian 123
6.7.2 Values of economic indicators observed for Hungary 125
7: CONCLUSIONS 127
8. THESES 133
9. NEW AND NOVEL RESEARCH RESULTS 134
10. SUMMARY 135
REFERENCES 140
APPENDICES 148

LIST OF TABLES AND FIGURES

Chapter 2: ***OBJECTIVES AND HYPOTHESES***

Figure in the chapter

Figure 2.1: Process flowchart of the research

Chapter 3: ***LITERATURE REVIEW***

Tables in the chapter

Table 3.1: Sub-sectors of the horse industry

Table 3.2: Requirements of the environment in which equestrian activities are performed

Table 3.3: Classification of direct and indirect impacts generated by the horse industry

Table 3.4: Aspects from which the impacts generated by the horse industry derive

Table 3.5: The most important pieces of information on studies made on the economic importance of the horse industry

Table 3.6: Breeds in Hungary since the foundation of the first Hungarian Imperial and Royal Stud Farm

Table 3.7: Displacement of horses due to the reorganization of Hungarian Horse Breeding after the Second World War

Table 3.8: Organized stud-farms of Hungarian horse breeds since the change of regime in 1989/1990

Figure in the chapter

Figure 3.1: Microeconomic circular flow model of the horse industry in a closed economy

Chapter 4: ***METHODOLOGY***

Tables in the chapter

Table 4.1: Aggregate indicators and their possible benchmarks for the characterization of the horse industry at the sector level

Table 4.2: Aggregate indicators and their possible benchmarks for the characterization of the sub-sector of breeding

Table 4.3: Aggregate, generally applicable, indicators and their possible benchmarks for the characterization of sub-sectors other than breeding

Table 4.4: Aggregate indicators and their possible benchmarks for the characterization of the sub-sector of horse racing other than the generally applicable indicators

Table 4.5: Aggregate indicators and their possible benchmarks for the characterization of the sub-sector of equestrian other than the generally applicable indicators

Table 4.6: Aggregate indicators and their possible benchmarks for the characterization of the sub-sector of equine therapy other than the generally applicable indicators

Table 4.7: Aggregate indicators and their possible benchmarks for the characterization of the sub-sector of equestrian tourism other than the generally applicable indicators

Table 4.8: Aggregate indicators and their possible benchmarks for the characterization of the sub-sector of leisure riding / driving other than the generally applicable indicators

Table 4.9: Typical cost and expense categories, both direct and indirect, linked to horses and horse related activities in different sub-sectors and segments of the Hungarian Horse Industry

Figures in the chapter

Figure 4.1: Economic impacts generated by the horse industry on the economy

Figure 4.2: Proportion of participation of countries (%) on the basis of continents in horse racing and in equestrian in the left and the right hand side, respectively for 2010, 2011, 2012, and 2013

Chapter 5: ***OPERATIONAL CHARACTERIZATION AND ECONOMIC IMPACT ESTIMATION OF THE HUNGARIAN HORSE INDUSTRY IN 2013***

Tables in the chapter

Table 5.1: Distribution of horses registered by the Hungarian Central Statistical Office in 2013

Table 5.2: Ranking of countries based on the total number of horses per 1,000 inhabitants

Table 5.3: Number of breeders, broodmares, stallions and newborn foals registered in Hungary in 2013

Table 5.4: Hungarian state stud-farms, the number of their broodmares and the share of them of the total broodmares population in each of the breeds in Hungary in 2013

Table 5.5: Representation of the Hungarian traditional horse breeds in equestrian in comparison with all other breeds present in the equestrian disciplines in 2013 (%)

Table 5.6: Distribution of participation of each of the Hungarian traditional breeds in the equestrian disciplines in Hungary in 2013

Table 5.7: Cost and expense categories and specific information of the estimation of the impacts generated by Hungarian Horse Breeding in 2013

Table 5.8: Information on data used for the calculation of the economic impacts generated by the upkeep and nurturing of foals between 6 months and 3 years of age in Hungary in 2013

Table 5.9: The most important data on Hungarian Horse Racing in 2013

Table 5.10: Top 25% of countries ranked on the basis of percentile rank calculated by the number of different horses in horse racing and the rank of Hungary in 2013

Table 5.11: Top 25% of countries ranked on the basis of percentile rank calculated by the number of breed horses in horse racing and the rank of Hungary in 2013

Table 5.12: Top 25% of countries ranked on the basis of percentile rank calculated by the number of starts in horse racing and the rank of Hungary in 2013

Table 5.13: Top 25% of countries ranked on the basis of percentile rank calculated by the number of racecourses in horse racing and the rank of Hungary in 2013

Table 5.14: Top 25% of countries ranked on the basis of percentile rank calculated by betting turnover and the rank of Hungary in 2013

Table 5.15: Top 25% of countries on the basis of percentile rank calculated by prize money and the rank of Hungary in 2013

Table 5.16: Cost and expense categories of the estimation of impacts generated by Hungarian Horse Racing

Table 5.17: Number of registered athletes, horses, associations, trainers and judges in Hungarian Equestrian in 2013

Table 5.18: Share of equestrian disciplines in each of the counties of Hungary in 2013 based on the number of athletes (%)
Table 5.19: Top 25% of countries ranked on the basis of percentile rank calculated by the number of athletes per 100,000 inhabitants in all equestrian disciplines in 2013
Table 5.20: Top 25% of countries ranked on the basis of percentile rank calculated by the achieved results of the top six placed athletes at the World Equestrian Games between 1990 and 2014
Table 5.21: Distribution of horses on the basis of age categories among the equestrian disciplines in Hungary in 2013 (%)
Table 5.22: Distribution of gender of horses among the equestrian disciplines in Hungary in 2013 (%)
Table 5.23: Distribution of registered horses on the basis of breeds and / or origin among the equestrian disciplines in Hungary in 2013 (%)
Table 5.24: Top 25% of countries ranked on the basis of percentile rank calculated by the number of horses per 100,000 inhabitants in all equestrian disciplines in 2013
Table 5.25: Impact categories, source of information and note for the estimation of impacts generated by Hungarian Equestrian in 2013
Table 5.26: Economic impacts generated by Hungarian Equestrian in 2013
Table 5.27: Supplementary information on the calculation of economic impacts generated by Hungarian Pony Equestrian in 2013 apart from that presented in table 5.25
Table 5.28: Economic impacts generated by Hungarian Pony Equestrian in 2013
Table 5.29: Economic impacts generated by Hungarian Equestrian Tourism, Equine Therapy, horses participating in Agricultural and Ecological Programs, Leisure Riding, Horses without any specific use activity and Foals from mares other than registered and un-registered broodmares in 2013
Table 5.30: Supplementary information on the calculation of economic impacts presented in table 5.29
Table 5.31: Total economic impacts generated by the Hungarian Horse Industry in 2013 (in thousand euros)

Figures in the chapter

Figure 5.1: Distribution of breeds based on the number of breeders, broodmares, stallions and newborn foals registered in Hungary in 2013
Figure 5.2: Distribution of athletes and horses in the equestrian disciplines in Hungary in 2013
Figure 5.3: Distribution of male and female athletes in each of the equestrian disciplines in Hungary in 2013
Figure 5.4: Distribution of athletes on the basis of age categories in each of the equestrian disciplines in Hungary in 2013
Figure 5.5: Distribution of athletes in all equestrian disciplines among the counties in Hungary in 2013
Figure 5.6: Distribution of registered horses on the basis of breeds and / or origin in Hungarian Equestrian in 2013

Chapter 6: ***MACROECONOMIC ANALYSIS OF THE ENVIRONMENT NECESSARY FOR THE EQUESTRIAN REVOLUTION***

Tables in the chapter

Table 6.1: Percentage of coincidence among the top 25% of countries ranked by GDP per capita and the top 25% of countries ranked by indicators in horse racing (%)

Table 6.2: Percentage of coincidence among the top 25% of countries ranked by GDP per capita and the top 25% of countries ranked by indicators in equestrian (%)

Table 6.3: Percentage of coincidence among the top 25% of countries ranked by GDP per capita and the top 25% of countries ranked by indicators in each of the equestrian disciplines (%)

Table 6.4: Percentage of coincidence among countries with high and very high values of the HDI and countries, where horse racing disciplines were performed in the years included in the analysis (%)

Table 6.5: Percentage of coincidence among countries with high and very high values of the HDI and countries, where equestrian disciplines were practiced in the years included in the analysis on the basis of the number of horses and athletes (%)

Table 6.6: Percentage of coincidence among countries with high and very high values of the HDI and countries, where equestrian disciplines were practiced in the analyzed years on the basis of the number of events (%)

Table 6.7: Percentage of coincidence among countries with high and very high values of the HDI and the top ten countries ranked by the results achieved at the WEG, 2010 (%).

Table 6.8: Percentage of coincidence among the top 25% of countries ranked by the HDI and the top 25% of countries ranked by horse racing indicators (%)

Table 6.9: Percentage of coincidence among the top 25% of countries ranked by the HDI and the top 25% of countries ranked by equestrian indicators (%)

Table 6.10: Percentage of coincidence among the top 25% of countries ranked by the HDI and the top 25% of countries ranked by equestrian indicators in each of the disciplines (%)

Table 6.11: Percentage of coincidence among countries with above average values of the SPI and countries where horse racing disciplines were practiced in the years included in the analysis, and percentage of coincidence among the top 25% of countries ranked on the basis of percentile rank calculated by the SPI and horse racing indicators in 2013 (%)

Table 6.12: Percentage of coincidence among countries with above average values of the SPI and countries where equestrian disciplines were practiced in the years included in the analysis, and percentage of coincidence among the top 25% of countries ranked on the basis of percentile rank calculated by the SPI and equestrian indicators in 2013 (%)

Table 6.13: Distribution of countries per each of the horse racing indicators among the groups established by the HDI and GDP per capita (in %)

Table 6.14: Distribution of countries per each of the equestrian indicators among the groups established by the HDI and GDP per capita (in %)

Table 6.15: Percentage of coincidence among countries with above average values of the TTCI and countries where horse racing disciplines were practiced in the years included in the analysis (%)
Table 6.16: Percentage of coincidence among countries with above average values of the TTCI and countries where equestrian disciplines were practiced in the years included in the analysis (%)
Table 6.17: Percentage of coincidence among the top 25% of countries ranked on the basis of percentile rank calculated by the TTCI and horse racing indicators (%)
Table 6.18: Percentage of coincidence among the top 25% of countries ranked on the basis of percentile rank calculated by the TTCI and equestrian indicators (%)
Table 6.19: Percentile ranks of the rankings of Hungary on the basis of horse racing indicators (%)
Table 6.20: Percentile ranks of the rankings of Hungary on the basis of equestrian indicators (%)
Table 6.21: Percentile ranks of the rankings of Hungary on the basis of equestrian indicators in each of the disciplines (%)

Appendix 1 to chapter 3

Table 7.1: The most important pieces of information on studies made on the economic importance of the horse industry

Appendix 2 to chapter 4

Tables in Appendix 2

Table 8.1: Data source of the number of horses in different sub-sectors and segments of the Hungarian Horse Industry
Table 8.2: Data source of operational information and general level of spending in different sub-sectors and segments of the Hungarian Horse Industry
Table 8.3: Horse racing indicators and information on them important to the analysis
Table 8.4: Equestrian indicators and information on them important to the analysis
Table 8.5: Number of countries, where equestrian disciplines were practiced in the analyzed years on the basis of rounded adjusted indicators
Table 8.6: Number of countries per equestrian disciplines in the analyzed years
Table 8.7: Analyzed economic indicators in the macroeconomic analysis of the environment necessary for the Equestrian Revolution
Table 8.8: Economic indicators that proved to be relevant to the characterization of necessary environment for the horse sectors in the Equestrian Revolution
Table 8.9: Relevant economic indicators in the horse sector, the number of countries taken into consideration and obtained averages and other specified values per indicator and per analyzed year

Figure in Appendix 2

Figure 8.1: Number of countries, where horse racing disciplines were practiced in the analyzed years, on the basis of adjusted indicators

Appendix 3 to chapter 5

Table 9.1: Economic impacts generated by Hungarian Horse Racing in 2013 (in euros)

Table 9.2: Economic impacts generated by Hungarian Equestrian in 2013 (in euros)

Table 9.3: Economic impacts generated by Hungarian Pony Equestrian in 2013 (in euros)

Table 9.4: Economic impacts generated by Hungarian Equestrian Tourism, Equine Therapy and horses in Agricultural and Ecological Programs, Leisure activity, Without specific use category and Foals of mares without known origin in 2013 (in euros)

Appendix 4 to chapter 6

Table 10.1: Percentage of coincidence among countries with below average agriculture value added and countries, where horse racing disciplines were practiced in the years included in the analysis (%)

Table 10.2: Percentage of coincidence among countries with below average agriculture value added and countries, where equestrian disciplines were performed in the years included in the analysis (%)

Table 10.3: Percentage of coincidence among countries with above average service value added and countries, where horse racing disciplines were performed in the years included in the analysis (%)

Table 10.4: Percentage of coincidence among countries with above average service value added and countries, where equestrian disciplines were performed in the years included in the analysis (%)

Table 10.5: Percentage of coincidence among countries with above average urban population and countries, where horse racing disciplines were performed in the years included in the analysis (%)

Table 10.6: Percentage of coincidence among countries with above average urban population and countries, where equestrian disciplines were performed in the years included in the analysis (%)

Table 10.7: Percentage of coincidence among countries with above average GDP per capita and countries, where horse racing disciplines were performed in the years included in the analysis (%)

Table 10.8: Percentage of coincidence among countries with above average GDP per capita and countries, where equestrian disciplines were performed in the years included in the analysis (%)

Table 10.9: Percentage of countries obtained from the OECD database where horse racing disciplines were practiced in the analyzed year (%)

Table 10.10: Percentage of countries obtained from the OECD database where equestrian disciplines were practiced in the analyzed years (%)

Table 10.11: Percentage of coincidence among countries with above average disposable income per capita and countries where horse racing disciplines were practiced in the analyzed years (%)

Table 10.12: Percentage of coincidence among countries with above average disposable income per capita and countries where equestrian disciplines were practiced in the analyzed years (%)
Table 10.13: Percentage of coincidence among the top 25% of countries ranked on the basis of percentile rank calculated by disposable income per capita and horse racing indicators (%)
Table 10.14: Percentage of coincidence among the top 25% of countries ranked on the basis of percentile rank calculated by disposable income per capita and equestrian indicators (%)
Table 10.15: Percentage of coincidence among countries with high and very high values of the HDI and countries, where equestrian disciplines were performed in the years included in the analysis on the basis of the number of horses and athletes per 500,000 inhabitants (%)
Table 10.16: Values of analyzed economic indicators characteristic of Hungary in the analyzed years
Table 10.17: Countries, where horse racing disciplines were practiced in the analyzed years but no economic data were given in the databases specified below the table
Table 10.18: Countries, where equestrian disciplines were practiced in the analyzed years but no economic data were given in the databases specified below the table

ABSTRACT

The horse has been an ever-present ally of man throughout history. The roles that the horse has played in human life have always been shaped by the human needs. The most recent change in the horse's roles has taken place approximately since the sixties of the last century and has had so much importance that can be characterized by the expression of Equestrian Revolution. Nevertheless, the number of consumers who desire to satisfy their new needs through horse-related activities and that of those who respond to the demand are different in each of the countries, where the change has occurred in both the level of demand and the production structures of the horse industry in order to sustainably satisfy the new needs with a clear vision in mind for human development and wellbeing.

The core issue is to study the conditions which have taken place in the countries where the horse industry has developed significantly. In order to carry out the study, the countries, where horse racing or equestrian disciplines were practiced in the analyzed years were compared to all countries of the world ranked on the basis of economic indicators. Indicators from the sub-sectors of horse racing and equestrian were extracted from their international umbrella organizations, which permitted the classification of all countries.

In the dissertation, as a special reference, the economic impacts generated by the Hungarian Horse Sector in 2013 are estimated and an international comparative analysis is carried out on the basis of operational and financial indicators of the Hungarian Horse Industry and the horse sectors of other countries in order to emphasize the existing differences in equestrian demand among the countries with relevant traditional equestrian values even more.

The principal conclusion of the study is that the changes in equestrian demand has been driven by economic conditions, especially in those aspects which affect human development measured by the human development index. The changes which have occurred in the countries characterized by high and very high human development have generated effects on the equestrian demand which has also driven changes in the supply of horses and horse-related activities producing huge magnitude of economic impacts as a contribution to the economy at the national level.

EXTRACTO

El caballo ha sido compañero del hombre a lo largo de la historia. El papel que el caballo ha jugado en la vida del ser humano ha sido establecido en función de las necesidades del mismo, en relación a la forma que estos animales podían satisfacerlas. La transformación más reciente de uso del caballo ha tenido lugar a partir de los años sesenta del siglo pasado y ha sido de un calado tan importante, que se puede calificar con el término de Revolución Ecuestre. Sin embargo, las demandas que realizan los consumidores para satisfacer las nuevas necesidades ecuestres presentan una realidad diferente en los distintos países, tanto en relación con las necesidades relacionadas con el bienestar, como las relacionadas con las estructuras productivas del sector ecuestre para atenderlas de forma sostenible y con una clara visión del desarrollo humano y el bienestar.

La cuestión clave es estudiar las condiciones que han tenido lugar en los países donde las actividades ecuestres han experimentado un mayor desarrollo. Para ello, se han utilizado determinados indicadores económicos de los países y se han comparado con los indicadores de la actividad ecuestre de los países donde éstas se practicaron. Estos últimos, proceden de los organismos internacionales que disponen registros sobre las carreras de caballos y los deportes ecuestres, y permiten una comparación y clasificación de los países en función del ranking en el que están situados.

La tesis tiene, como referencia especial, la estimación de los impactos económicos generados por la industria del caballo en Hungría en 2013 y una comparación internacional basada en distintos indicadores ecuestres entre la industria del caballo en Hungría y la de otros países, para subrayar, aún más, las razones de las diferencias existentes entre la demanda del caballo y las actividades ecuestres de países con valores ecuestres tradicionales relevantes.

La conclusión fundamental es que los cambios de la demanda ecuestre han estado motivados por los cambios en las condiciones económicas, y especialmente en aquellas que afectan a los aspectos del desarrollo humano y que se miden con el índice de desarrollo humano. Los cambios que se han producido en los países con mayor nivel de desarrollo humano han afectado a la demanda del sector ecuestre y estos cambios en la demanda han propiciado también cambios en la oferta que han generado un mayor impacto económico del sector ecuestre sobre la actividad económica general.

KIVONAT

A ló az ember hű társa, szövetségese (volt mindig) a történelem folyamán. A ló szerepe mindig az emberi igények függvényében alakul(t). A lónak az emberiség életében betöltött szerepében bekövetkező legutóbbi változás megközelítőleg a múlt század hatvanas éveiben kezdett kibontakozni és a mai napig zajlik; jelentősége egyes országokban olyan nagy mértékű, hogy a Lovas Forradalom kifejezéssel lehet jellemezni. Mindazonáltal, az új lovas igények miatt generálódó kereslet minden országban eltérő, csakúgy mint a termelési szerkezetben végbemenő változások az igények fenntartható módon és az emberi fejlettségi és jóléti kérdések szem előtt tartásával történő kielégítése végett.

Az értekezésnek témát adó kutatás egyik fő iránya azon feltételek vizsgálata, amelyek azokban az országokban (voltak) jellemzőek, ahol a lóágazat fenntarthatóan és versenyképesen működik. A nemzetközi szövetségek (lóversenyzés és lovassport) által regisztrált országok kerültek összehasonlításra a világ összes, különböző gazdasági indikátorokkal jellemzett országával. Az értekezésben szerepel a magyar lóágazat által 2013-ban termelt gazdasági hatások becslése és a magyar lóágazat naturális és pénzügyi mutatók szerinti nemzetközi összehasonlító elemzése, amely még inkább kiemeli a jelentős lovas tradicionális értékekkel jellemezhető országok között a lovas keresletben tapasztalt különbségeket.

A kutatás fő következtetése, hogy a Lovas Forradalom által jellemzett korszakban tapasztalt keresletben bekövetkező változásokat gazdasági tényezők idézik (idézték) elő, főleg azok, amelyek az emberi fejlődésre gyakorolnak hatást. A magas és nagyon magas emberi fejlődési színvonallal (emberi fejlődési index alapján) jellemezhető országokban végbemenő változások jelentősen hatnak a lóágazatok keresleti oldalára, következésképpen pedig a kínálati oldal termelési szerkezeteire, jelentős nagyságrendű gazdasági hatás generálódását előidézve a nemzetgazdaságban.

1. INTRODUCTION

The present doctoral (PhD) dissertation is written about the ***horse industry***. In addition to the ***estimation of the economic impacts generated by the Hungarian Horse Industry in 2013***, it is intended to answer the question: ***what factors do influence equestrian demand and sustainability in the horse sector in the Equestrian Revolution***? In order to find a widely applicable reason by which the operation of the horse industry can be explained, economic analysis is carried out on the basis of macroeconomic indicators.

The dissertation begins with a comprehensive ***review of literature of horses' roles*** in societies throughout history followed by a ***presentation on the horse industry in the Equestrian Revolution***, a short ***characterization of the horse industries of countries, on which information was available***, a ***brief history of Hungarian Horse Breeding, Horse Racing and Equestrian*** and some references to ***Hungarian equestrian spectacles*** in order to provide firm foundations for the discussion of research objectives.

The core of the work is introduced by a ***critical review of a widely applied methodology to the estimation of economic impacts of the horse industry***. It is followed by a ***brief description*** on why ***macroeconomic considerations*** are important when the economics of the horse sector is discussed including a ***summary on both economic and equestrian indicators*** selected for the analysis. The dissertation is closed by the ***research conclusions and the research results***.

1.1 Preliminary observations

The horse has been an ever-present ally of man throughout history. The roles that the horse has played in human life have always been shaped by the human needs. Due to human development, ***the roles of the horse have changed from time to time***. In order to be able to satisfy their needs by means of horses, humans needed to find the best ways of breeding and preparing different types of horses required to obtain the best results they wished to achieve in various circumstances.

The most recent change in the horse's roles in human civilization has taken place since the sixties of the last century. This change has been motivated by ***preferences of consumers***, who demand horses in order to satisfy their expectations related to well-being by creating opportunities for ***self-realization***. This self-realization is not limited to either athletes in equestrian disciplines or jockeys and/or drivers in horse racing or participants in leisure riding

or in equestrian tourism, but it also extends to people, whose self-realization manifests in supplying various goods and services necessary for horses and horse-related activities. Apart from that, satisfaction can also be achieved through watching equestrian spectacles of any kind. In short, horses contribute to higher levels of physical, emotional and mental well-being of humans, while huge amounts of economic impacts are generated. The change, which has occurred in horses' roles and in all aspects related to horses' roles approximately since the sixties of the last century can be characterized by the expression of ***Equestrian Revolution*** (Castejón Montijano, 2009, pp. 1-11.).

By continuously having more specific demand for both horse breeds and activities with horses, the production of horses throughout the entire value-chain has each time been more specialized and successful from both equestrian and economic point of view, creating finally an economic sector, the ***horse industry***. In order to emphasize the roles of horses in the Equestrian Revolution, studies were made by some countries on the economic impacts generated by the horse sector.

In order ***to visualize the magnitude of economic potentials of the horse industry***, first a reference is being made to the United States, where, in 2005 9.2 million horses generated approximately 39 billion US dollars in direct economic impact (4,232 US dollars per horse) and 102 billion US dollars in total impact considering indirect and induced spending (11,087 US dollars per horse). The horse sector sustained approximately 1.4 million full-time equivalent jobs, with nearly 460,000 of these jobs created from direct spending within the industry (Deloitte, 2005, pp. 3-4).

Nevertheless, the United States is only an example where horses and horse-related activities have had high demand since the sixties of the past century. There are some countries where equestrian demand has been high besides the United States, for instance, in Australia, Sweden, Denmark, Ireland, Canada, Belgium, Norway, Netherlands, Spain, France, Germany, Finland, Great Britain (in the present dissertation, the name Great Britain and the United Kingdom are used in accordance with how it was referred to in the obtained study and/or statistics), Switzerland and Austria.

From the perspective of a more ***microeconomic level***, the following examples, chosen from outside the competition field, can be appreciated: the *SICAB*, a trade fair with morphological competition and spectacles organized exclusively for the Purebred Spanish Horse in Seville

each year, which was visited by 170.000 spectators in 2012 produced 52.6 million euros (Deloitte, 2013, pp. 199-202). The *April Fair in Seville*, celebrated each year, generated 7 million euros within one week in 2005, and the *pilgrimage of "El Rocío"*, also held each year, produced 17.1 million euros economic impacts within a week in 2005 derived from horse use either mounted or harnessed to a carriage (Moreno de los Ríos y Díaz et al., 2006, pp. 92-93; Moreno de los Ríos y Díaz, 2007, MR Consultores Turismo Ecuestre, 2007).

Due to the demand for a great variety of products and services, the horse industry presents ***important linkages with numerous sectors of the economy***. Perhaps these linkages served as motivating factors for the creation of ***commissions and agencies*** at the national level in some countries in order to be able to ***efficiently and adequately coordinate the interrelations between the horse industry and other economic sectors***, and to ***better exploit economic potentials and positive economic externalities***.

1.2 Personal statement of research interest

Hungary has not lacked horse-related commissions for the improvement and encouragement of horse breeding throughout history. ***Ad hoc commissions*** were created and national meetings were held in 1798 for the general improvement of horse breeding; in 1822 for boosting horse breeding and racing; in 1869 for the better organization of horse breeding; in 1881 and 1890 for encouraging the sale of horses; in 1901 for establishing regional horse breeding districts and developing regional types within the breeds; in 1973 for formulating the concept for improving horse breeding and use; in 2003 for preparing a National Equestrian Plan as a complex development program for the period between 2008 and 2013; and in 2012, when the government approved the "Kincsem – National Equestrian Plan" as a constituting part of the National Strategy Plan for Rural Development, 2012-2020.

Except for having established public stallion breeding farms and stallion depots, whose operation were considered successful, and breeding districts and regional types within the breeds, no measurements were taken or, simply, the already existing situation did not change in the long-term.

Despite the fact of having been aware of ***difficulties in the sustainability of horse breeding in Hungary*** throughout history, ***Hungary has been said to be a nation of horse breeding and equestrian culture***. In fact, when early history related to horses in Hungary is studied, it can be

verified as a nation with traditional horse breeding and equestrian values. On the other hand, I feel that the potentials in these traditional values have not been unlocked yet, although every responsible person would theoretically have the objective to do so. Due to family circumstances and own interests, I have had insights into the breeding of traditional Hungarian horses and equestrian disciplines since early childhood. The more experience I gained, especially at the international level, the more curious I became ***to reveal the reasons why some countries benefit from their traditional horse-related values in the Equestrian Revolution, while others do not***.

A ***scientific research*** was intended to ***develop*** about the Hungarian Horse Industry on the basis of objective qualitative and quantitative parameters, and rank it among countries, which have also been considered as nations of horse breeding and equestrian culture. I began with reading about the history of Hungarian Horse Breeding from the beginning of the 19th century on (by Széchenyi, 1828, Wesselényi, 1829, 1847; Kovács-Monostori, 1905), then the conclusions of mentioned works were compared with the "messages" of publications about the roles and the future of horses written in the recent past (Mihók, 2000, 2007, 2009; Tibay, 2002; Pántya-Radványi, 2004). Meanwhile, some meaningful periods and excellent results in breeding, racing and equestrian disciplines were born in mind. As a result, I became more and more determined to ***understand what actually goes on in the world of horses from economic point of view***.

1.3 Importance of the study

With respect to ***"economic references" to horse breeding and use***, works were already written from the beginning of the 1800s on (for instance, Széchenyi, 1828, Wesselényi, 1829, 1847; Kovács-Monostori, 1905; Castejón y Martinez de Arizala, 1926). All these works highlighted that 1) ***horse breeding is a profitable activity***, 2) ***without demand, horse breeding cannot be profitable***, 3) ***in order to achieve long-term profitability, horses must serve for a purpose***. The works took into account exclusively the horse-related aspects of horse breeding, preparation and use ("direct impacts"), based on which, it can be suspected that the scope of the "horse sector" was less expanded at that time than today.

Studies on economic impacts of the horse industry in the Equestrian Revolution have been made since the 1990s by some countries, where the latest transformation of horses' roles in human life has already been occurred and horse industries are suspected to be the most productive in the world. Some general messages of these studies and opportunities derived from them in order to carry out further researches and studies can be formulated as follows:

- ***Each of the horse industries is very different*** in nature and in capacity to generate economic impacts, which is motivated by preferences, partly, characteristic of cultures.
- ***The profile of each of the horse industries is significantly determined by horse-related traditional values*** (cultures). On the other hand, these traditional values seem to play a ***subordinated role*** in a sense that they are necessary but not sufficient prerequisites for sustainable operation of the horse sector.
- Existing ***databases should be improved*** and not existing databases shall be established.
- There has been ***no standard methodology used for the estimation of the economic importance of the horse industry***. Methods were applied provided by the economics to the estimation of economic impacts generated by a sector, in general, but ***they were not adjusted to specific characteristics in the horse industry***. In the present doctoral dissertation it is intended to reveal why it is a problem and to make recommendation for a "new" approach to the consideration of impacts.
- ***The Equestrian Revolution seems to depend on the level of quality of life and economic development of a country***. To find adequate methods to prove it, is partly the concern of the present research.
- ***There is a high need for scientific researches in the field of economics of the horse sector***. Facts must be established, theories must be developed and acquired information must be put in practice in order to assure sustainable development in the horse sector. New approaches, different from those, which were generally applied before the Equestrian Revolution, are needed to be found.

The ***contribution of the present research topic*** to the increase of knowledge ***is not limited to the horse industry itself. It covers major issues in the field of agro-economics, economic development and human development.***

2. OBJECTIVES AND HYPOTHESES

In Hungary, the economic impacts of the horse industry in the Equestrian Revolution have never been estimated. The ***methodology*** *for calculating the generated impacts* ***applied specifically to the horse sector has never been published before***. The ***phenomenon of the Equestrian Revolution*** has already been mentioned ***by Castejón Montijano*** (2009) at the *EAAP conference in Barcelona, Spain in 2009*, where ***he highlighted the most important tendencies that had manifested at the microeconomic level, but it has never been studied before***.

During the research, it was intended to

1) ***estimate the economic impacts generated by the Hungarian Horse Sector in 2013*** for which

   1 a) the ***operational characterization and international comparative analysis of the Sector*** provided the basis, as well as

   1 b) the ***evaluation of the methodology applied to quantify the economic impacts generated by the horse industry***.

2) to ***explain the observed differences of order of magnitude in equestrian demand between the Hungarian Horse Industry and those of other countries, and among the countries, in general***.

The most important ***questions*** in order to carry out the research of the present doctoral dissertation can be summarized as follows:

1. On the basis of ***what indicators*** can the horse industry be analyzed at the international level; how can the ***Hungarian Horse Industry be characterized*** on the basis of the selected indicators; and how can the Hungarian Horse Industry be ranked, on the basis of the indicators, among the countries with significant equestrian tradition?
2. How can the ***economic impacts of the horse industry*** be estimated?
3. By ***which factors*** can the differences in the economic impacts generated by the horse industries among the countries be explained? ***Which factors*** do determine the ***demand for horses and horse-related activities*** in equestrian countries, in which equestrian traditional values play important roles?

In reference to above formulated observations and research questions, the hypotheses of the present research are described as follows:

H1. The demand for horses and horse related activities has been generated by human development.

Although the culture-specific equestrian traditions, from qualitative perspectives, basically determine the opportunities for the demand for horses and horse-related activities, these can only have reason d'etre, if the macroeconomic environment enables the evolution of consumers' needs for self-realization. The needs for self-realization drive the demand for horses and horse-related activities. From quantitative perspectives, the quality of life represents a stricter requirement than horse-related traditional values in the sustainability and competitiveness of the horse industry.

H2. Application of methodology, by ignoring the characteristics of the horse sector, used for estimating the economic impacts generated by the horse industry does not enable the correct estimation of the complex impacts of the horse sector.

The experience obtained from the analysis and synthesis of the available studies shows that under the direct impacts, both direct and indirect impacts were estimated, thus no differentiation was made between the impacts, which strictly related to horses and horse-related activities and the impacts, which were generated by horses and horse-related activities, but were not strictly linked to them. These impacts are potentials for the national level economy, which can be unlocked by the horse industry, since the conditions by which the indirect impacts are generated are necessary for the operation of the horse industry. But, they had not been created for / because of the (exclusive) usage of the horse sector, which, in contrary, is true of the direct impacts.

H3. The qualitative and quantitative impacts of the horse industry are basically determined by the quality of relationship between human development and the economic performance.

If economic performance converts into human development, the macroeconomic environment enables the evolution of immaterial needs. The immaterial needs seem to be the driving forces behind the sustainability of the horse industry. The sustainable development of the horse industry supposes the generation of a great magnitude of economic impacts, which, at the same time, is also the interest of the macroeconomy. This potential and opportunity provide the basis for the representation and coordination of the horse industry at the national level, which can further enhance the competitiveness of the horse industry.

H4. Considering the entire Hungarian Horse Industry, the strategies that would serve the sustainable and competitive operation of the industry in the Equestrian Revolution in the long-term have not been able to formulate yet.

The positive changes in life conditions, which occurred in the most developed societies since the second half of the last century, did not occur in Hungary in the same rhythm and magnitude. Partly because of this reason and partly because of misconstrued responsibilities in the sub-sectors of the horse industry, new strategies that would meet the requirements of the Equestrian Revolution either in horse breeding or in horse use have not been established yet. However, formulating good and viable strategies, would be necessary for a sustainable and highly competitive horse sector, even if their long-term realization would only be possible with the significant improvement of the macroeconomic conditions.

In order to visualize the ***interrelations among the set objectives, research questions, hypotheses and applied methods*** a ***process flowchart*** is inserted below.

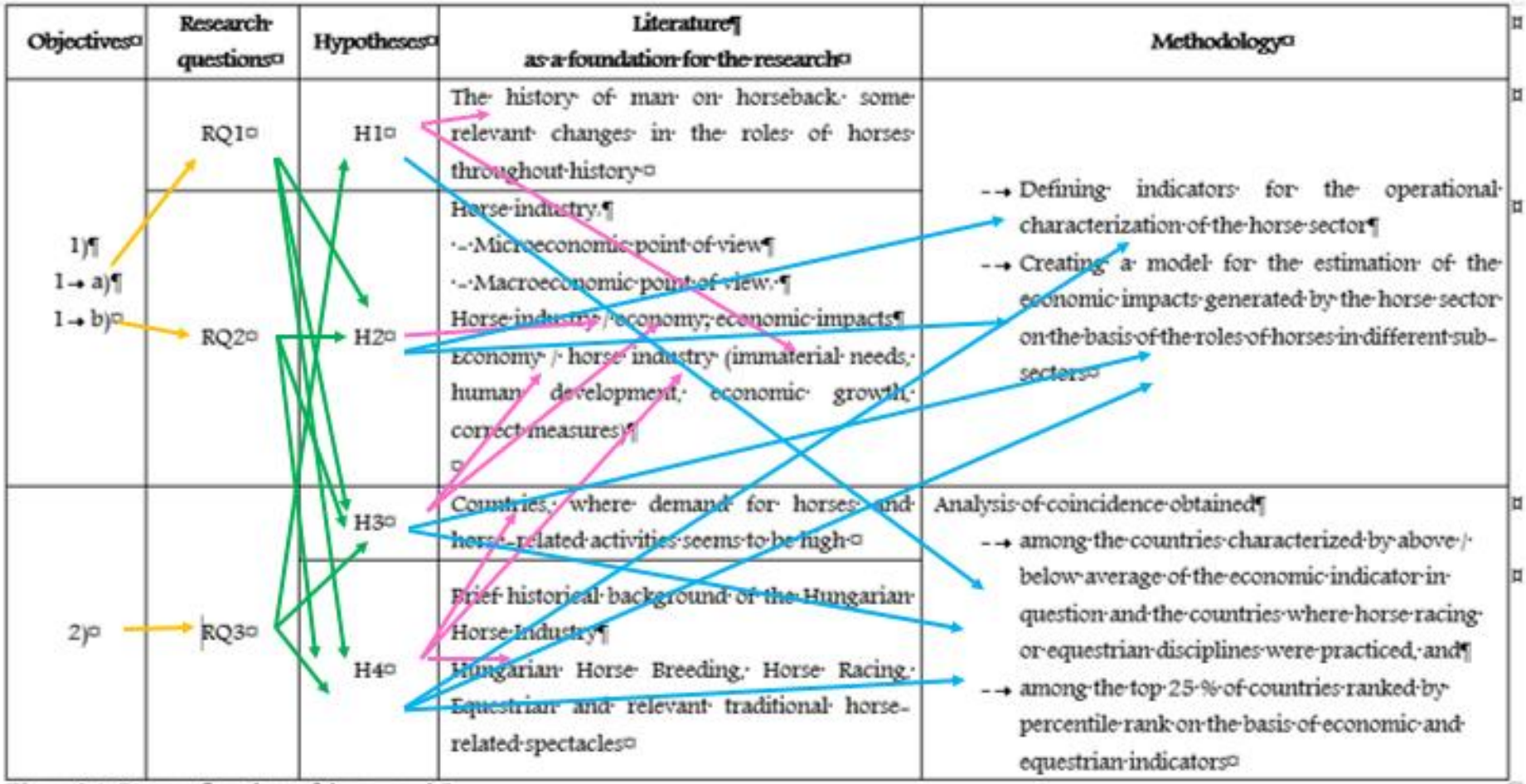


Figure 2.1: Process flowchart of the research

Source: own construction

3. LITERATURE REVIEW

3.1 The history of man on horseback: some relevant changes in the roles of horses throughout history

3.1.1 The beginning

The history of humans and horses is closely intertwined. It dates back to well before Christ, when horses were not yet domesticated. ***Before*** their ***domestication***, horses were ***hunted for hide*** for clothing, and ***for meat*** for food source. Possibly, equines were initially ***domesticated for providing meat and milk*** (Domecq y Díez, 1975, pp. 376-380).

Due to the changing needs of humans, the ***domestication of horses*** also occurred with the purpose ***to gain collaboration*** needed for improving life circumstances (Altamirano, 2006, pp. 22-27). In captivity, some techniques were developed for exploiting the energy of horses, first ***as pack-horse and for draught work in transportation***. ***Horseback-riding*** extended after the first millennium before Christ for exploring and courier service purposes (Agüera Carmona, 2008, p. 20.).

3.1.2 In warfare

Besides their use as a power source in peacetime (like hunting, transportation, trade and communication), horses were used in warfare by pulling ***chariots*** already in the 1800s BC contributing to the creation and prosperity of certain societies. The Battle of Adrianople in 378 AC introduced ***heavy cavalry***, while ***light cavalry*** began to be used with the invention of firearms in the end of the 14th century (Mihók-Pataki-Kalm-Ernst, 2001, p. 12.). Light cavalry ***changed the role of horses in warfare***. Equitation revived and horsemanship became a highly polished technical art that was indeed based on the theories of classical riding as presented by Xenophon, cavalry commander in the fourth century before Christ.

In order to furnish the court and the cavalry, and to educate and prepare both horses and cavalrymen for required tasks, ***studs and riding academies*** were built (Loch, 1986, pp. 77-96; Brem, 2011, p. 117). The first riding academy was a Spanish School funded by Frederico Grisone in Naples in 1532 thanks to Charles V, Holy Roman Emperor (as Charles I, ruler of the Spanish Empire). Charles V contributed to the development of the Spanish style in classical equitation and to the fame of the Spanish horse throughout Europe (Domecq y Díez, 1975, pp. 376-380; Gala, 1975, pp. 389-392; Loch, 1986, pp. 77-96; Mihók-Pataki-Kalm-Ernst, 2001, p. 13; Brem, 2011, p. 3, 9-17, 117). The riding academies in Vienna (1572), Paris (1592), Saumur

(1688), Versailles (1735), Saint Petersburg (1807), Wiener Neustadt (1808), Berlin (1817), Pinerolo (1823), Hanover (1867), Budapest (1872) and Tor di Quinto (1897) were set up later (Hecker-Győrffy-Villám-Szelestey-Jankovics, 2004, pp. 127-131; Brem, 2011; p. 117; Graphic, 1897).

In the beginning of the 16th century, the Royal Courts, especially the French Royal Court, employed ***riding master tutors***. This employment had a high rank and was normally performed by ***highly educated nobles***. For instance, the riding master tutor of Louis XIII of France was his sub-governor, Antoine de Pluvinel, who among other significant riding masters, contributed to the development of the philosophy of lightness in equitation. Francois Robichon de la Guériniére credited with the invention of the shoulder-in was the Equerry to Louis XIV of France. His theories on equitation played a primary role in the education of horses and riders at the French Military Riding Academy at Saumur and the Spanish Riding School in Vienna (Mihók-Pataki-Kalm-Ernst, 2001, p. 13; Karl, 2009, p. 151). In the Renaissance, equitation improved, as well; great renovations occurred in the education techniques. Horses were used in light cavalry (and so in warfare) in the Second World War for the last time.

3.1.3 Industrial Revolution

The Industrial Revolution, which began in the second half of the 18th century in Great Britain, meant an incredible increase of the production capacity but, because of the lack of an adequately developed road network and the few numbers of motor vehicles, the ***transport*** of both persons (in stagecoach, omnibus or barouches for rent) and goods (raw materials, coal, iron ore, salt, food) was based on ***animal drawn vehicles*** and on the pioneers of rail transport.

In ***agriculture***, horses were continuously used in the 18th century, but only at the end of the 19th and the beginning of the 20th century superseded the oxen, when the first modern draught horse breeds were created. The Industrial Revolution introduced important changes: the population began to exhibit unprecedented sustained growth that strained, first of all, food resources. To obtain higher average annual production yields than earlier, larger and stronger agricultural machines (like, plough, seed drill, mower and harvester) were needed requiring a high number of horses for their traction (in some cases, even 30 horses). Until 1950, horse-drawn agricultural machines could be found in many countries of Europe, although the steam engine offered obvious advantages for modern agricultural production versus animal traction based agricultural work. In addition to agricultural ***works*** that ***related to crop production***, horses were

also used for ***timber harvesting***, and, if environmental conditions justify, they are still used today for this work (e.g. in Sweden).

3.1.4 Equestrian Revolution

After mechanization, an historical period came to an end in the relationship between horses and humans, but ***a new age has begun approximately since the sixties of the last century in the most developed countries of the world***. This new age can be characterized by the expression of ***Equestrian Revolution***. The term itself does not only refer to a change in the horse's role in human life but, especially, it refers to ***a shift, in order of magnitude, from its roles in satisfying different material needs*** (physiological, physical and safety) ***to its roles in satisfying immaterial needs*** independently from the hierarchy of these needs. The Equestrian Revolution is a process, which, in the function of a specific date, is not universal. Although the "new balance" is more or less established in the most developed countries, the variety of horse-related activities being incorporated is expanding continuously. In countries other than the most developed ones, the Equestrian Revolution has begun or on its way.

The Equestrian Revolution is fed from the above described ***traditional equestrian values***. From equestrian perspectives, this is the reason why the ***Equestrian Revolution*** has not occurred in the same way in each of the countries. The development of "new" activities, which permits people to achieve the ***desired degree of wellness***, was ***encouraged by*** a multitude of ***parameters*** that must be ***associated with horse-related traditional values*** of each of the countries.

In Spain, for instance, where equestrian tradition is linked to countryside work with and around bulls, many activities, which enjoy exceptional popularity (like *la doma vaquera, el acoso y derribo, las romerías, las ferias*, etc.), are related to this tradition. Also in the United States, the tradition of cowboys developed new activities, like Reining and Western Dressage. On the other hand, for instance in Germany, the most popular equestrian activities are the equestrian disciplines, mainly the Olympic ones that are associated with traditional equestrian values of light cavalry.

Apart from specific traditional values, the ***influences of "modern societies" in racing, sport and cultural activities*** have also been incorporated in the horse industries, in addition to the development of "new services", like equine therapy and coaching. Nevertheless, no matter which values encourage horse-related activities in the Equestrian Revolution, the only

important factor is that the great multitude of demand for and supply of horses and horse-related activities have created "new" ***horse industries***.

3.2 Horse industry

3.2.1 General observations

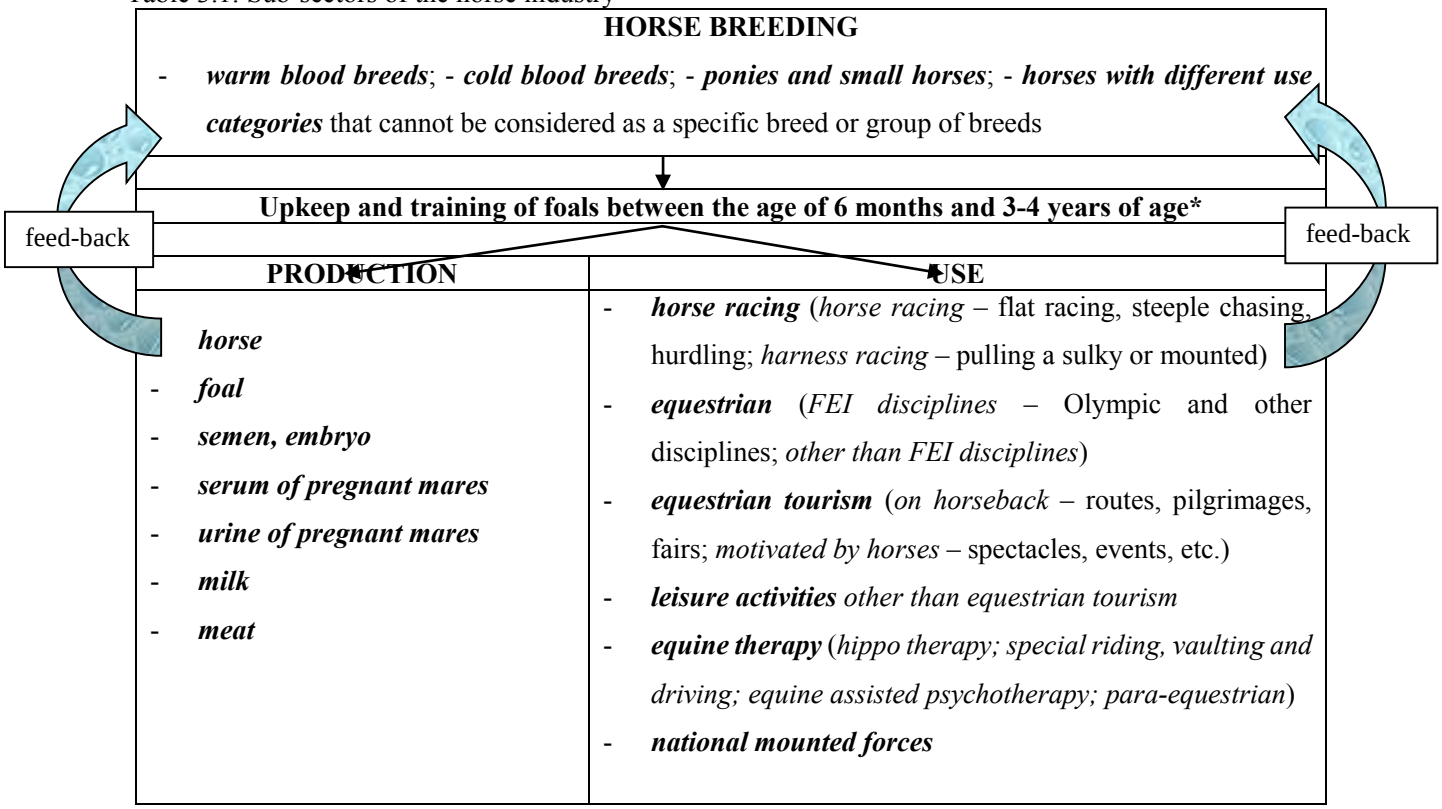
The ***horse industry*** is an economic sector that involves all aspects ***relating to horses and horse-related activities*** in order to permit the final consumers to satisfy their horse-related needs. Important segments of the horse industry are ***breeding***, ***upkeep*** and ***training*** of horses between the age of approximately 6 months and 3-4 years for a specific activity, and ***use***. Furthermore, a suitably ***constructed environment*** including human and economic capital is required that facilitates the production of horses throughout the entire value-chain. For this reason, there are two kinds of demand in the horse industry: on one hand, there is ***demand for horses and horse-related activities*** and, on the other hand, there is ***demand for goods and services linked to horses and horse-related activities***. The competitiveness and the economic potentials of the horse industry depend very much on whether the supply of required goods and services keeps up with the demand. From "***equinomics***" point of view, the real challenge is to take full advantage of the growing demand on both horses and horse-related activities and the goods and services that are linked to horses and horse-related activities. By satisfying this new demand, the potentials of the horse industry can be improved in many countries that can be supported by the ***globalization*** of many markets allowing the firms to increase their production using economies of scale and to enjoy comparative and competitive advantages. The differences in available resources, technological capacities and agro-ecological conditions provide opportunities for ***specialization***.

"**Equinomics**" refers to the expression "economics of the horse industry", which is necessary to study, because the choices made by consumers (both professionals and fans) in the horse sector, generate significant economic impacts. ***In order to analyze the horse industry***, a conceptual framework provided by ***economics*** must be adopted taking into consideration both microeconomic and macroeconomic points of view, being that the horse industry is an economic sector.

The horse industry can be divided into various ***sub-sectors*** whose unique features determine the required environment in which the sub-sectors themselves can operate. The general aspects of the sub-sectors and the requirements of the necessary environment are presented in table 3.1

and 3.2. Table 3.1 summarizes all sub-sectors, in which horses can play roles. Of course, not each of the sub-sectors has importance in each of the horse industries.

Table 3.1: Sub-sectors of the horse industry



Source: own construction. *Castejón y Martinez de Arizala (1926)

The horse industry is ***linked to each of the sectors of the economy***. "***Horse production" has*** a unique "***service-purpose***" ***feature***. This is the reason why the ***agribusiness*** concept can easily be applied to the horse industry, when it is analyzed, on the contrary to other sectors built on the production of farm animals in relation to which the agribusiness concept is rather a desired conceptual framework in many countries, even though highly justified. It is not sufficient to focus on breeding [production]; to construct a productive economy [sector], competencies must be developed throughout the entire value-chain (Porter, 2005; p. 30.).

Despite the reason d'etre of the agribusiness concept in the horse industry, it would be erroneous to confuse the agribusiness concept of "horse production" (which is driven by the immaterial needs of consumers) and that of a sector built on farm animal production (which is driven by the material needs of consumers). ***The parallel between the two concepts is not self-evident***.

Table 3.2: Requirements of the environment in which equestrian activities are performed

Aspects related to horses	***Feeding***	- forages; - concentrates; - vitamins and minerals; etc.
	Veterinary services	- obligatory tests, vaccinations; - necessary treatments; - X-rays for buying-selling of horses; - pregnancy diagnosis; - artificial insemination; - semen freezing; etc.
	Farrier services	
	Constructions	- stalls and their equipment; - outdoor riding arenas and their equipment; - indoor riding arenas and their equipment; - machines; etc.
	Tack	- maintenance - use
Aspects related to participants	***Clothing***	
Other aspects*	***Regulatory system***	- at the sub-sector level - at the sector level
	Education system	- at the sub-sector level - at the sector level

Source: own construction. *: under "other aspects", insurance and finance can also be mentioned; however, these aspects do not belong exclusively to the horse industry

3.2.2 Microeconomic aspects

The product of highest priority in the horse industry is the ***horse***. For this reason, ***the supply of horses*** is a cardinal issue throughout the entire value chain of the horse sector. Although horses are widely available, the supply of horses poses a major challenge. There often exist an ***imbalance*** between the demand for and the supply of horses deriving from the multitude of preferences in both sides.

The imbalance can be further exacerbated by ***information asymmetries*** respective to the characteristics, physical condition and level of education and preparation of horses, which can give rise to astounding reduction in biodiversity afflicting the sustainable development of the horse industry. Jez-Coudurier-Cressent-Méa (2013, p. 99) highlighted that the international availability of the semen of "role model horses" has made it easier for the represented breeds to spread. The performance heritability in Show Jumping horses is, however, only 25%, which means that only one-fourth of the variability is genetic and the larger part of that is due to environmental factors.

The ***individual agents*** of the horse industry can be placed along a spectrum of engagement from leisure through semi-professional to professional. Their roles depend on whether their intention is to achieve satisfaction, for which they are willing to pay or, their ambition is to realize benefit by reducing production costs as far as possible (Castejón Montijano, 2009, p. 2). Depending on their aspirations, participants demand different kinds of goods and services that can be production inputs, intermediate consumption or final consumption. If the agents are not individuals, they are organized to ***markets***, the structure of which depends principally on the sub-sector in question.

Considering the importance of the ***public sector*** in the horse industry at the micro-economic level, ***public infrastructure*** and ***regulation*** must be pointed out. The suitable infrastructure network (or the lack of it) can encourage the horse sector to generate economic impacts (or can put limitations on the capacity of the horse sector to generate economic impacts). Apart from these roles, if it is taken into account that one of the general objectives of the public sector is to ***improve conditions for human development by enhancing people's quality of life***, the public sector also plays important roles in the horse industry. This issue, however, leads discussions to the macroeconomic aspects of the horse sector.

In Figure 3.1 below, the ***microeconomic circular flow model of the horse industry*** is presented. It is worthwhile to see that the horse industry is not equal to the product market, marked as *products and services of the sub-sectors*, as many people suspect it.

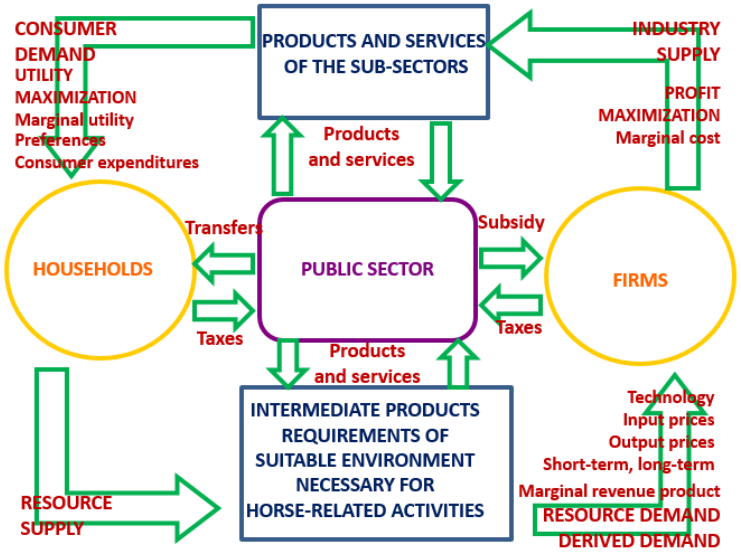


Figure 3.1: Microeconomic circular flow model of the horse industry in a closed economy

Source: own construction based on Samuelson-Nordhaus, 2009

3.2.3 Macroeconomic aspects

From macroeconomic point of view, the ***relationship between the horse industry and the economy must be analyzed from two directions***. On one hand, ***the impacts of the horse industry on the economy***, on the other hand, ***the effects of macroeconomic policies on the horse industry*** must be revealed in order to get a clear picture of the relationship between the horse sector and the economy. Although the relationship between the economy and the horse industry is not interdependent (because an economy can work without certain sectors), it is synergetic.

1) With respect to the ***horse sector / economy relationship***, *impacts* generated by the horse sector as contribution to the economy can be described and quantified. In order to do so, macroeconomic indicators like the ***gross domestic product as the sector's economic contribution to the economy*** or the ***number of jobs created by the sector*** can be taken into consideration in line with the economic impact estimation of other economic sectors. More details will be discussed in the chapters on Methodology and the Operational characterization and the economic impact estimation of the Hungarian Horse Industry in 2013.

2) Regarding the ***economy / horse industry relationship***, the ***effects of the economic performance on the horse sector*** can be analyzed by both ***traditional*** (for instance, gross domestic product, disposable income) and ***alternative economic indicators*** (for instance, human development index, social progress index, travel and tourism competitiveness index). Relevant information in detail for carrying out the analysis and obtained results will be provided in the chapters on Methodology and the Macroeconomic analysis of the environment necessary for the Equestrian Revolution. In this sub-chapter, the ***importance of the analysis*** is intended to reveal by showing ***how human preferences as motivating factors in horse-related demand is linked to the level of quality of life***.

As it was referred to, horses in the Equestrian Revolution are demanded by consumers, who intend to satisfy the most varied immaterial needs. For this reason, in order to efficiently analyze the horse industry from economic point of view, it is ***fundamental to take into considerations the conditions that permit the consumers the evolution of the desire for self-realization***.

Motivation can fundamentally be divided into ***intrinsic and extrinsic motivation***, or in other words, internal and external motivation, of which intrinsic motivation is stronger and drives actions in the longer-term than extrinsic motivation. However, extrinsic motivation can be an additional potential for the horse sector (for instance, teaching riding as an optional sport activity in the education system, from the primary education on).

Intrinsic motivation drives human activities in order to reach higher levels of personal satisfaction. It is ***innate but not automatic*** (White, 1959; de Charms, 1968; Deci-Vansteenkiste, 2004). In the fulfillment of needs, the ***environment*** plays important roles: the fulfillment of basic and safety needs is attributable to ***country-level conditions***, like natural, human, economic and social capital, which lie beyond individual control; while the satisfaction of higher level needs is explained more by ***individual conditions*** (Deci-Ryan, 1991 in Dienstbier, pp. 237-288; Tay-Diener; 2011, pp. 354-365). Apart from that, environmental conditions are important because intrinsic motivation of humans is very "sensitive". It can be influenced by both positive and negative factors. The autonomy, for instance, facilitates intrinsic motivation (Zuckerman-Porac-Lathin-Smith-Deci, 1978; Deci-Vansteenkiste, 2004), while restriction and unreasonable control (Amabile-DeJong-Lepper, 1976) or negative feed-back (Vallerand-Reid, 1984) affects intrinsic motivation negatively. The ***relationship between the satisfaction of needs and economic development*** not only seem to be evident, but it was also confirmed statistically by Hagerty (1999).

It is indispensable to mention that the ***basic level needs must be met in majority before the higher level needs appear*** (Maslow, 1943, 1954; Alderfer, 1969, 1972). The emerging sequence of the needs suggested by Maslow was disagreed by some authors (Rauschenberger-Schmitt-Hunter, 1980; Max-Neef et al., 1993), but the theory that there is an ordering in satisfying human needs was supported by others (Wicker-Brown-Wiehe-Hagen-Reed, 1993; Hagerty, 1999; Tay-Diener, 2011). In tendency, first the existence needs are met and then, those of the parentage and personal growth.

It is a real concern whether the provided environment enables people to live their lives intrinsically motivated and it is a real challenge to provide a suitable environment in order to permit people to live their lives intrinsically motivated. "*No one can guarantee human happiness, and the choices people make are their own concern. But the process of development should at least create a conducive environment for people, individually and collectively, to*

develop their full potential and to have a reasonable chance of leading productive and creative lives in accord with their needs and interests" (United Nations Development Program, 1990; p. 1).

Although the ***gross domestic product*** is the most widely applied measure to quantify all final goods and services produced in a determined period of time (normally, one year), it ***does not reflect well how products and services convert into options and opportunities for the consumers***. In other words, the relationship between economic performance and human development is not always harmonious (or automatic).

In reference to the United Nations Development Program (1990), "***human development*** *is a process of enlarging people's choices. In principle, these choices can be infinite and change over time. But at all levels of development, the three essential ones are for people to lead a long and healthy life, to acquire knowledge and to have access to resources needed for a decent standard of living. If these decent choices are not available, many other opportunities remain inaccessible*" (United Nations Development Program, 1990, p. 10).

"Improving the quality of our lives should be the ultimate target of public policies. But public policies can only deliver best fruit if they are based on reliable tools to measure the improvement they seek to produce in our lives" (Gurría, 2011), since *"nothing is more destructive than the gap between people's perceptions of their own day-to-day economic well-being and what politicians and statisticians are telling them about the economy."* (Sarközy, 2009).

"The welfare of a nation can scarcely be inferred from a measurement of national income" warned Simon Kuznets, creator of GDP, in his first report to the Congress in 1934 (Cobb-Halstead-Rowe, 1995). The Nobel Prize Laureate also stated (1962)*: "Distinctions must be kept in mind between quantity and quality of growth, between its costs and return, and between the short and the long-term…",* being that *"[GDP] counts the destruction of the redwood and the loss of our natural wonder in chaotic sprawl. It counts napalm and counts nuclear warheads and armored cars for the police to fight the riots in our cities. It counts Whitman's rifle and Speck's knife, and the television programs which glorify violence in order to sell toys to our children. Yet the gross national product does not allow for the health of our children, the quality of their education or the joy of their play. It does not include the beauty of our poetry or the*

strength of our marriages, the intelligence of our public debate or the integrity of our public officials. It measures neither our wit nor our courage, neither our wisdom nor our learning, neither our compassion nor our devotion to our country, it measures everything in short, except that which makes life worthwhile." said Kennedy in 1968 on the shortcomings of GDP (Forgeard-Jayawickreme-Kern-Seligman, 2011; Hall, 2010). Stiglitz (2009) expressed the same concerns in relation to GDP and proposed new, alternative economic indicators that, like Addison (2013) pointed out: "*maximize good growth and minimize bad growth"*. *"The appropriate choice of indicators is key to boost our understanding of the complexity of our diverse societies within the European Union, to better communicate on it, and to better respond to new policy needs…"* (Barroso, 2011). "*Equity, dignity, happiness, sustainability – these are all fundamental to our lives but absent in the GDP"* (Clark, 2012). *"As an economy grows, the concept of what it includes must grow as well. Economists must seek to measure more and different things"* highlighted Kuznets in 1962 (Cobb-Halstead-Rowe, 1995).

From the requirements and objectives of an indicator which is able to ***reflect people's choices and opportunities***, the ***human development index (HDI)*** was considered as adequate measure suitable ***for explaining changes in*** both ***equestrian demand*** in the horse sector among countries and give an answer by which it can be verified that horse-related activities in the Equestrian Revolution are not universal. In reference to Sen (2010), "*GDP is commodity centered, while the human development index is people centered*".

The ***disharmony between economic performance and human development*** is a well-known and classified phenomenon by the United Nations Development Program (1990, p. 3-4, 9-10, 14-15, 36, 42-43; 1996, pp. 1-10, 43-80), Ramirez-Ranis-Stewart (1998, pp. 2-3, 8, 14, 19-24), Boozer-Ranis-Stewart-Suri (2003, pp. 2, 4-7, 22), Ranis (2004, pp. 8-9; 11, 13, 15), Ranis-Stewart (2005, pp. 3, 6).

These authors recognized the phenomenon as lopsidedness and they speak about both "***economic growth lopsidedness***" and "***human development lopsidedness***" depending on the complex economic performance of a country arguing that there is a two-way relationship between economic growth and human development: one from economic growth to human development, which shows how economic growth contributes to human development and the other, from human development to economic growth, which reveals how human development contributes to economic growth. As a consequence of these arguments, and as they themselves

emphasized it, human development is not only a product of economic growth but also an input, a critical contribution to sustained progress in human development. Levels of economic growth and human development are mutually reinforcing, either leading toward an ***upward spiral of development,*** or a ***downward spiral of poverty trap***.

The connections, however, between economic growth and human development and, conversely, between human development and economic growth are not automatic. In the unstable state of "***human development lopsidedness****"*, there is strong human development but weak economic growth, while in that of "***economic growth lopsidedness****"*, there is weak human development and strong economic growth depending on whether there is sustained or disrupted human development or there are missed opportunities for human development. In a favorable case ("***virtuous cycle***"), good human development enhances economic growth, which in turn promotes human development. In an unfavorable case ("***vicious cycle***"), poor performance on human development tends to lead to poor economic growth which in turn depresses the already achieved levels of human development. A country can exclusively ***move from the*** "***vicious cycle***" ***toward the*** "***virtuous cycle***" ***through*** "***human development lopsidedness***", not directly, which means that economic growth itself will not be sustained unless preceded or accompanied by improvements in human development. Human development seems to be a necessary prerequisite for long-term sustainable growth.

3.2.4 Contribution of the horse industry to the economy

The horse industry generates multiple effects that can be grouped into direct, indirect and induced effects. ***Direct impacts*** are related to investments and expenditures that are directly linked to horses and horse-related activities; everything that is required specifically for the horse industry. ***Indirect impacts*** are indirectly related to horses and horse-related activities. These impacts consist of all types of expenditures that are generated during or in favor of horse-related activities; however, specifically for the horse or the horse-related activity itself they are not indispensable. ***Induced impacts*** are generated due to the multiplier effects of direct and indirect impacts. They have the widest scope and, for this reason, it is the most difficult to quantify them. It is especially so, if, apart from "general" induced impacts, horse-related activities provide the opportunity for improving infrastructures or regeneration of special zones (Castejón Montijano, 2010, p. 34.). In table 3.3, the classification of direct and indirect impacts can be seen in summarized form.

Table 3.3: Classification of direct and indirect impacts generated by the horse industry

Direct impacts	*linked to horses*	- all aspects related to horses (mentioned in table 1.2); - human resources
	linked to horse-related activities	- human resources (officials and staff) of horse-related events; - investment in facilities; - taxes, especially that of wagering; - prizes; - sponsorship; patronage; etc.
Indirect impacts	*linked to horses*	- insurance and financial services; etc.
	linked to horse-related activities	- transportation; - insurance; - catering; - accommodation; etc.

Source: own construction

In order to better understand ***how direct and indirect impacts are generated by the horse industry***, in table 3.4, information are provided on the ***aspects***, from which the impacts are produced. ***In a well operating horse industry, presented aspects coexist***. As it can be seen in the table, ***each aspects have multiple effects*** (economic, social and ecological), even if there weight within the aspects are different. The table does not mention policies at the sector and economy level but they also play roles in the horse industry.

Table 3.4: Aspects from which the impacts generated by the horse industry derive

Human resources - also many traditional crafts; - many of the jobs done are difficult to mechanize	- ***Provider of services***	- veterinary - farrier; etc.
	- ***Manufacture of products***	- tack; - carriages; - clothing; etc.
Constructed environment (investments) - linked to horses or horse-related activities - their availability can encourage the generation of economic impacts (or put limitations on the capacity of the horse industry to generate economic impacts)	- ***Directly*** facilitate production throughout the entire value-chain	- stalls; - outdoor riding arenas; - indoor riding arenas; etc.
	- ***Indirectly*** facilitate and complete horse-related activities	- infrastructure (roads, energy, water, transport, telecommunications, buildings, health, qualified staff)
Tradition - *identity and image of the country* - *economic potential* - can provide opportunities for exploiting *comparative and competitive advantages*	- ***Natural heritage*** - ***Cultural heritage*** - ***Socio-economic heritage*** - ***Architectural heritage***	- breeds; - horse-related activities; - traditional crafts; - historical buildings, like the former military riding academies
Ecological aspects	- ***Biological diversity*** (United Nations Conference on Environment and Development, Rio de Janeiro, 1992) - ***Source of the natural wealth****:* sustainable development and exploitation is necessary and possible by rational economic activities	- natural capital and immaterial traditional values; - ecological equilibrium; - economic activities, like equestrian tourism and horse-related leisure activities
Touristic aspects	- ***Tourism*** *on horseback and motivated by horses* - ***All horse-related activities***	- transport (of both horses and persons); - accommodation; - catering; - communications
Health	- ***Physical, mental and emotional***	- lower healthcare costs; - increase in labor productivity (challenges deriving from the ageing of the population)

Source: own construction

3.3 Countries, where demand for horses and horse-related activities seems to be high

According to available studies, the Equestrian Revolution has already taken place only in a relatively ***small group of countries*** that, from qualitative perspectives, ***belong to the most developed societies of the world***. Below, some relevant data from available studies on the economic contribution of horse industries are going to be summarized. The countries are presented ***in an order of ranking*** calculated on the basis of ***the number of horses per 1,000 inhabitants in the horse sector in question***. The presentation of countries begins with the country with the highest number of horses per 1,000 inhabitants.

In the *Introduction* it was referred that each of the horse industries is very different in nature. Partly because of this reason, data obtained from the studies cannot be presented on the basis of the same logic. In order to highlight the most important pieces of information that are similar to each other in nature, they are summarized in table 3.5. Apart from these data, short references are going to be given to the most interesting available information on the horse industries, separately, in text format.

Sweden

In order to be able to appreciate enough the importance of the Swedish Horse Industry, it is worthwhile to compare it with the company IKEA that generated 7 billion Swedish crowns as domestic turnover when the Swedish Horse Industry generated turnover in excess of 20 billion Swedish crowns. The most important sub-sector of the Swedish Horse Industry was horse racing representing approximately 55% of the generated impacts followed by equestrian tourism and leisure riding, which contributed by approximately 25% to the industry's entire output. It is also interesting that horse riding was the largest sport for disabled people in Sweden. Horses have been used for working as well, principally in logging work as a preferable alternative to mechanized logging. Logging horses were used to transport more than 1 million m^3 woods on annual basis (Swedish Horse Council Foundation, 2004).

Table 3.5: The most important pieces of information on studies made on the economic importance of the horse industry

Country	Number of horses	Economic importance	Employment
Australia	1,200,000 of which 300,000 are wild horses	GDP 6.3 billion Australian dollars.	42,000 persons
Sweden	360,000	Turnover in excess of 2.5 billion euros	11,000 jobs
United States	9,200,000	39 billion and 102 billion US dollars in direct and total economic impacts, respectively.	1.4 million full-time equivalent jobs.
Denmark	170,000	Turnover in excess of 21 billion Danish crowns.	18,000 jobs
Canada	963,500	9.3 billion and 19.6 billion Canadian dollars in direct and total impacts, respectively.	85,806 full-time equivalent jobs.
Ireland	128,500	708 million euros and 1.1 billion euros by the Sport Horse Industry and the Thoroughbred Industry, respectively.	25,417 direct full-time equivalent jobs.
Belgium	300,000	Added-value in excess of 265.2 million euros, plus 50 million euros from wagering.	3,550 full-time equivalent jobs.
Netherlands	400,000	Turnover in excess of 1,200 million euros.	jobs for 400,000 persons
Spain	723,496	3.4 million euros and 1.9 million euros direct and indirect economic impacts, respectively.	61,247 persons
Germany	1,200,000	Turnover in excess of 5 billion euros.	300,000 people employed totally.
France	950,000	Turnover in excess of 12.3 billion euros.	39,000 people in contact with horses; 7,200 horse-specialist veterinarian; 30,000 full-time equivalent jobs in other segments
Finland	75,500	Turnover in excess of 850 million euros.	Totally, 4,500 full-time and 9,000 part-time employments.
Great Britain	600,000-1,000,000	Gross output amounted to 3.4 billion British pounds.	50,000 people directly and approximately 200,000 people indirectly.
Switzerland	100,000	Turnover in excess of 1,785 million euros.	no information
Austria	93,000	Production value in excess of 1,19-1,26 billion euros; added value in excess of 634-674 million euros.	23.000-24.300 workplaces that corresponded to 14.500-15.400 full-time equivalent jobs

Source: own construction based on Gordon, 2001, Réseau REFErences, 2014; Deloitte, 2005; Clausen, 2014; Evans, 2010; Sport Horse Ireland, 2013 and Hodgett-O'Keffe, 2013; Policy Research Corporation, 2008 and Lejeune, 2010; Häggblom-Lathinen-Vihinen, 2006; Deloitte, 2013; Brade, 2013; Réseau REFErences, 2014; Réseau REFErences, 2014 and Häggblom-Lathinen-Vihinen, 2006; British Horse Industry Confederation, 2005 and Henley Centre, 2004; Lejeune, 2010 and Réseau REFErences, 2014; Schneider-Mahlberg, 2005.See more details in table 7.1, appendix 1.

United States

Of 9.2 million horses recreation, showing, racing and other activities were represented by 3.9 million, 2.7 million, 844,500 and 1.752 million horses. Approximately 1.96 million people owned horses and another 2 million people were involved as volunteers or through a family affiliation. recreation, showing, racing and other activities contributed to the total direct impacts by 31%, 28%, 28% and 14%, respectively. With respect to the direct jobs, the racing sub-sector proved to be the most job-intensive followed by recreation and showing (Deloitte, 2005).

Canada

In reference to the 2010 Canadian Horse Industry Profile Study, 963,500 horses (of which 744,000 horses were considered as mature horses used in different sub-sectors) owned by 226,500 households and kept on 145,000 premises. There were an estimated 855,000 people active in the horse industry, from which 556,000 lived in horse-owning households and an additional 350,400 used horses owned by others. The sport, racing, breeding and leisure sub-sectors contributed to the impacts generated by the horse industry by 36%, 34%, 19% and 11%, respectively.

Ireland

Breeding was the largest sub-sector (32%) within the Sport Horse Industry with 15,110 active breeders. With respect to the breeding purposes of broodmare owners, 31% of them bred for the Show Jumping market, 26% for the Eventing market, 19% for leisure purposes, 12% for showing, 5% for Dressage, and the remaining 7% for other purposes. The competition sector's contribution (Dressage, Show Jumping and Eventing) represented 19%, while that of the leisure sector (including hunting, showing, country shows, riding establishments) measured up to 17%. In the leisure sub-sector, one of the most popular activities was hunting. In 2011, 6,599 sport horses were exported, valued at more than 26 million euros. The net exports of sport horses amounted to 15.9 million euros (Sport Horse Ireland, 2013).

Within the entire Irish Horse Industry, the Thoroughbred Industry was the most important sub-sector. In 2012, Ireland bred the fourth highest number of foals in the world, accounting for 7.34% of world output following the United States, Australia, Argentina, and Japan. It was the largest producer of Thoroughbred foals in Europe with approximately 40% of the European foal crop. With respect to the number of mares, Ireland was the third largest producer, accounting for 8% of the world's output (Hodgett-O'Keffe, 2013).

Flanders (Belgium)

There were nearly 1,800 active companies in the horse sector, of which almost 16% worked in horse breeding, 32% in horse use including equestrian, racing and tourism and 52% in providing education and goods and services for different horse activities. The most impacts were generated under the last mentioned category linked to companies specialized in horsemeat (135 million euros production value), horse trade (130 million euros turnover), horse feed (40 million euros turnover), horse trailers and carriages (31.5 million euros turnover) and horse and rider-related products (32 million euros turnover) (Policy Research Corporation, 2008).

Spain

Of the total number of horses 30% belonged to purebred breeds, of which 85% was represented by the Purebred Spanish Horse. In breeding, 146,640 horses and 81,503 breed farms were registered generating total impacts in excess of nearly 543 million euros. There were 95,316 horses in the training phase for different kinds of use producing 462.6 million euros. The impacts generated by the use of horses amounted to 1.7 billion euros, of which the maintenance of horses represented the major contribution (more than 70%). With respect to horse industry-related products and services, the contribution of the veterinarians and the fodder industry was the most excelling with 41% and 35%, respectively. It is interesting to note that expenditures on insurance were higher than on transportation (Deloitte, 2013).

Germany

In Germany, the most popular use activities of horses are leisure and sport. The German Equestrian Federation is the largest equestrian federation of the world. Within the German Olympic Sports Confederation, the German Equestrian Federation was ranked the eighth with nearly 728,000 members in 2011 and 7,707 riding and carriage driving associations. German Horse Breeding is the global leader in the Olympic equestrian disciplines and carriage driving (Brade, 2013).

France

Cressent-Jez (2013, p. 57) in the study on the French Horse Industry pointed out that the French Equestrian Federation was the third largest sport federation in France [and the second in the world (Deloitte, 2011)] with 700,000 members. Riding was the most popular sport among women in France. One fifth of the riders was involved in competitions. The most popular equestrian disciplines were Show Jumping, Dressage, Eventing and Endurance, although

altogether 24 equestrian disciplines were practiced. France was considered the number one country of equestrian tourism; 12% of horses were registered in this sub-sector (Deloitte, 2011).

Horse racing was also a very important and popular sub-sector in France. In the studied year, there were approximately 30,000 registered race horses that raced in 18,000 races, of which 62% were dedicated to harness races and trotting races under saddle, 26% to flat races and 12% to steeplechase. The bets from horse racing measured up to 9.5 billion euros (Cressent-Jez, 2013, pp. 54, 58).

There were approximately 50,000 horses traded (both import and export) on an annual basis, of which 70% served recreational and teaching purposes, 25% amateur sport and 5% professional sport (Cressent-Jez, 2013, p. 60).

Finland

In reference to the Häggblom-Lathinen-Vihinen (2006), the Finnish Equine Sector has strongly been growing, especially since the beginning of the 1970s. Horses play very important roles in the development of rural areas and the biodiversity. In contrary to other agricultural sectors, which are still heavily subsidized, the horse industry is a market-driven sector.

Great Britain

The most important final consumption expenditure categories included the end consumer horse ownership spending (nearly 40%), horse racing events (almost 20%) and riding lessons (15%) (Henley Centre, 2004). Horses play special roles in rural areas but, of course, their importance is not confined to these. Horses also represent great potentials in the leisure economy, for which competitiveness is a key factor (British Horse Industry Confederation, 2004).

Switzerland

There has been a great change in the social status of the horse in Switzerland. An increasing feminization of the horse world has been experienced. Approximately 85% of the riders were women in the analyzed year. The number of horses has been continuously increasing. Approximately 70-80% of horses were used for riding and driving of which 80-90% was dedicated to leisure purposes (Haras National Confédération Suisse, 2009).

Austria

In absolute values, the tertiary sector was affected the most by the horse industry generating production value in excess of 930 million euros, added-value in excess of 532 million euros and 11,700 workplaces (10,400 full-time equivalent jobs). The branches of the economy most affected by the horse sector were culture, sport and entertainment; transportation; catering and accommodation and agricultural production (Schneider-Mahlberg, 2005)

Hungary

In Hungary in 2013, 74,000 horses generated 207.4 million euros in direct economic impacts and 49.7 million euros in indirect economic impacts. In relation to the direct economic impacts, the equestrian sub-sector (including ponies), with respect to the indirect economic impact, equestrian tourism contributed the most to the total impacts representing 38% and almost 81%, respectively. Considering the direct impacts, equestrian was followed by leisure riding, breeding and equestrian tourism and horse racing, by nearly the same proportion. With respect to the total impacts, equestrian produced the most impacts followed by equestrian tourism, leisure riding, breeding and racing; their contribution to the entire sector were 34%, 22%, 19%, 8% and 7%, respectively.

3.4 Brief historical background of the Hungarian Horse Industry

3.4.1 Brief review of Hungarian Horse Breeding

It is considered that organized horse breeding in Hungary began with the foundation of the ***Imperial and Royal Stud Farm at Mezőhegyes*** by Joseph II, Holy Roman Emperor in ***1785***. The purpose of establishment of the stud-farm was to breed horses of the best possible quality for the army in addition to other Imperial and Royal Studs, like Kladrub (1579), Lipica (1580) and Radautz (1792) within the Kingdom of Hungary. Because of the high demand from the army for horses, the number of horses was required to increase (Sz. Bozsik-Papp, 1985; Ernst-Fehér-Ócsag, 1988).

Apart from the initial goals, Mezőhegyes provided ***refuge*** for the ***Lipizzan horses*** rescued from Lipica from the troops of Napoleon between 1806 and 1815. From this Lipizzan horse population some individuals were retained at Mezőhegyes and formed the basis of the later Hungarian Lipizzan breed (Sz. Bozsik-Papp, 1985; Ernst-Fehér-Ócsag, 1988).

Three traditional Hungarian breeds, like ***Gidrán***, ***Nóniusz***, and ***Mezőhegyes halfbred*** (also called Furioso North Star) were formed on the basis of local mares and mainly Arabian and Spanish-Neapolitan stallions and their offspring. The Gidrán and the Mezőhegyes halfbred were principally dedicated to mounted horses in light cavalry, while the Nóniusz was preferably used for horse artillery purposes.

[Due to the victory of the Ottoman Empire in 1526 at Mohács against the forces of the Kingdom of Hungary led by Louis II of Hungary and Bohemia, Hungary was divided into three parts between the Ottoman Empire, the Habsburg Monarchy and the Principality of Transylvania. Since the rulers of Transylvania had good relationship with the Turks, there was a good deal of trade between them, thanks to which, many Arabian and Berber stallions arrived to Transylvania. Due to influences of the Habsburg Monarchy, Spanish-Neapolitan stallions arrived to the Imperial and Royal Stud-farms, substantially affecting the Hungarian Horse Breeding. (Ernst-Fehér-Ócsag, 1988)]

The Imperial and Royal Stud Farm at Bábolna, founded in ***1789***, was affiliated to the Imperial and Royal Stud Farm of Mezőhegyes. However, from 1807 on, it had its own headquarters. Under the captaincy of Fadlallah el Hedad Mihály, the stud farm was dedicated to breed exclusively ***Arabian horses*** (Ernst-Fehér-Ócsag, 1988; Hecker, 1994).

Thoroughbreds were introduced to the Kingdom of Hungary from the early 1800s on. Their breeding was encouraged even more by István Széchenyi inspired by his international experiences, gained especially in England. Gallop racing was introduced thanks to him. The original concept of importing Thoroughbreds was to improve the quality of horses (Wesselényi, 1829; Ernst-Fehér-Ócsag, 1988; Ernst, 1997; Szécsi, 2013).

[István Széchenyi, the great reformer, was one of the few people who encouraged the awakening of Hungarian national identity after 150 years of Ottoman and 300 years of Habsburg rule. The Hungarian Reform Era ended with the 1848-1849 Revolution and War of Independence that was defeated by the Austrian and Russian armies. The Austro-Hungarian Compromise of 1867 re-established the sovereignty of the Kingdom of Hungary, no longer subject to the Austrian Empire. Between Austria and Hungary only the unity was maintained through a single head of state (the Emperor of Austria and the King of Hungary), that influenced also the future life of the stud-farms].

Kázmér Batthyány, Minister of Foreign Affairs during the Revolution and the ensuing War of Independence of 1848-1849, had a property at ***Kisbér,*** on which a family stud-farm stood with several different types of mares. The Revolution and War of Independence failed and, as a consequence, the property was confiscated by the state, and the stud-farm became an Imperial and Royal Stud-farm in ***1853***. The first captain of the stud-farm, Franz von Ritter, intended to

establish ***Thoroughbred breeding*** there. According to upper orders received by Franz Joseph I of Austria, the objective was to breed the noblest horses possible at Kisbér, although, the already existing Imperial and Royal Stud-farms gave mares of secondary quality of each of the already existing breeds to the stud-farm at Kisbér. After 1867, the stud-farm officially became a State Stud-farm of the Kingdom of Hungary and, under the captaincy of Ferenc Kozma, the mares were consequently bred by Thoroughbred stallions, due to which, a new breed was formed, the ***Kisbér halfbred***. The mares were tested in flat racing and hunting. Two directions developed in horse breeding at Kisbér: on one hand, Thoroughbred breeding and, the other hand, Kisbér halfbred breeding (Ernst-Fehér-Ócsag, 1988; Ócsag, 1989; Bódai, 2000; Hecker, 2011).

Due to the introduction of horse racing and Thoroughbred breeding into Hungary, harness racing also began to develop. Perspectives for ***Trotter*** breeding were considered better than that of the Thoroughbred, because there were very fast halfbred carriage horses that formed the basis for the later Hungarian Trotter. The first Trotter stallion was imported in ***1882*** from the United States.

For the Hungarian horse breeds and the cradles of their development since the beginning of Hungarian Horse Breeding, see table 3.6 (Ernst-Fehér-Ócsag, 1988).

Table 3.6: Breeds in Hungary since the foundation of the first Hungarian Imperial and Royal Stud Farm

Stud-farm and year of foundation	**Hungarian breed**
Mezőhegyes (1785)	Gidrán (1855)
	Nóniusz (1860-1870)
	Mezőhegyes halfbred (1890) (Furioso North Star)
	Lipizzan (refuge between 1806 and 1815 from the Napoleonic Wars)
	Thoroughbred (until approx.1867)
	Hungarian Trotter (since 1882)
Bábolna (1789)	Purebred Arabian (first expeditions since 1816)
Kisbér (1853-1958)	Thoroughbred (since approx. 1864) Kisbér halfbred (1910)

Source: own construction based on Ernst-Fehér-Ócsag, 1988

In the Imperial and Royal Stud Farm at Mezőhegyes, Lipizzan horses lost their characteristics owing to the differences in agro-ecological conditions between the region of Lipica and that of Mezőhegyes. For this reason, Lipizzan horses were displaced to the Imperial and Royal Stud farm at Fogaras. (Anyway, the displacement of horses was "on the agenda", because measures were taken to find homes for each of the breeds.) Due to further physiological problems arisen at Fogaras, horses were displaced first to Bábolna (in 1915) and then, to ***Szilvásvárad*** (the yearlings from 1950 on, then finally the entire population in 1961), where agro-ecological conditions were similar to those of Lipica.

Both the ***First and the Second World War*** caused ***serious losses*** in the horse population that afflicted each of the breeds. After the Second World War, ***horse breeding was reorganized***. In fact, the entire agricultural production was reorganized to a socialist production system; farmers were forced to form part of production cooperatives with all their private properties including horses. For the horse population, which had served military purposes in an organized way, new homes were needed to be found (see table 3.7). After the reorganization, horse population was continuously decreasing. Although there have always been enthusiastic and committed breeders intending to sustain the genetic values of the traditional breeds, new breeding objectives and strategies for the use of horses have never been developed. [Except for military use, Hungarian Horse Breeding has actually never formulated strategies throughout history (Széchenyi, 1828; Wesselényi, 1829; Kovács-Monostori, 1905; Ernst-Fehér-Ócsag, 1988)].

The least affected breeds were the ***Arabian*** and the ***Lipizzan*** at Bábolna; they remained in their original place. Apart from these breeds, the ***Bábolna Arabian*** was formed there as a new breed which was recognized by the World Arabian Horse Organization in 1978 ***as Shagya-Arabian***.

"New age" horse breeding was perhaps the most represented by the introduction of Sport Horse breeding from the 1960s on. The home of the ***Hungarian Sport Horse*** breed became mainly Mezőhegyes and Rádiháza (Ernst-Fehér-Ócsag, 1988; Ernst, 2014).

Due to the ***change of regime in 1989/1990***, the production cooperatives broke up. New homes again needed to be found for the horses, although, since the change of regime, Hungarian Horse Breeding has been dominated by private breeders. See table 3.8.

Table 3.7: Displacement of horses due to the reorganization of the Hungarian Horse Breeding after the Second World War

Stud-farm	Breed	Displacement to
Mezőhegyes	Gidrán	Dalmand (1958), Borod (1975), Szántódpuszta (1984); Marócpuszta (1989)
	Nóniusz	Mezőhegyes retained some mares; Hortobágy(1890); Szentes
	Mezőhegyes halfbred (Furioso North Star)	Apajpuszta, Abádszalók, Orosháza, Szentes
	Hungarian Trotter	Pusztaberény, Rádiháza, Somogysárd
Bábolna	Purebred Arabian Shagya-Arabian (1978) (Bábolna Arabian)	in their original place
	Lipizzan	Szilvásvárad (from 1950 on, finally in 1961)
Kisbér	Thoroughbred	Alag (today, training center for race horses), Dióspuszta, Kerteskő, Apátipuszta, Szenttamás, Somogysárd, Sáripuszta, Orosháza
	Kisbér halfbred	Bábolna, Sárvár, Dalmand

Source: own construction based on Pál-Várady, 1980; Ernst-Fehér-Ócsag, 1988

In the beginning of the 1990s, ***horse breeders associations for each of the breeds*** and the ***Hungarian Horse Breeders' Federation as umbrella organization of the breed associations*** were formed to coordinate Hungarian Horse Breeding. More details are going to be presented in the chapter 5 on The operational characterization and economic impact estimation of the Hungarian Horse Industry in 2013.

Table 3.8: Organized stud-farms of Hungarian horse breeds since the change of regime in 1989/1990

Stud-farm	Hungarian breed
Mezőhegyes	Nóniusz Hungarian Trotter Hungarian Sport Horse
Bábolna	Purebred Arabian Shagya-Arabian (Bábolna Arabian) Thoroughbred
Hortobágy	Nóniusz Hungarian Sport Horse
Szilvásvárad	Lipizzan
Marócpuszta (under the headquarter of Szilvásvárad)	Gidrán
Aggtelek-Jósvafő	Hucul

Source: own construction based on the Hungarian Horse Breeders' Federation (2014)

3.4.2 Brief review of Hungarian Horse Racing

3.4.2.1 Flat racing

Modern flat racing was introduced to the Kingdom of Hungary by ***István Széchenyi***. He considered that the most effective way to improve horse breeding was to breed with horses which were tested in flat racing. The ***first modern horse race meeting*** was organized in ***1827*** in Pest. The ***first Studbook*** was published in ***1833***. In ***1842***, Széchenyi formed the ***Pest Horse Racing Association*** that worked as Hungarian Horse Racing Association from 1882 on. The ***first bookmaker*** appeared in ***1863*** on the racecourse of Pest, the ***totalisator*** was introduced ***8 years afterwards***. In ***1867***, the ***Austrian Jockey Club*** was founded that ***cooperated closely*** with the ***Pest Horse Racing Association*** and organized race meetings on the Vienna and Pest racecourses. In ***1890***, a ***training center*** was established for Thoroughbred racehorses at ***Alag***, which was considered the "Hungarian Newmarket" (Ernst, 1997; Hecker, 2011).

In addition to the initiations made by Széchenyi, ***Francis Cavaliero***, hippologist from England, who arrived as an English teacher in Hungary, played a crucial role in Hungarian flat racing and Thoroughbred breeding. He was ***commissioned by Franz von Ritter, captain of the Stud-farm at Kisbér***, to buy excellent Thoroughbreds from England for the Hungarian Thoroughbred breeding. Stallions bought for Kisbér, like Buccaneer, Cambuscan, Vernuil were also available for breeding to private breeders that boosted the private breeding of Thoroughbred racehorses. The most important outcome of private Thoroughbred breeding was the "Wonder Mare", ***Kincsem***, the most successful Thoroughbred racehorse ever that won ***54 races for 54 starts*** over four seasons. Other famous racehorse was the ***Epsom Derby and Grand Prix de Paris winner***, ***Kisbér,*** bred in the stud-farm at Kisbér (Hecker, 2011; Szécsi, 2013).

The ***First World War*** destroyed the majority of horses, and the cooperation between the Vienna racecourse and that of Pest ceased. Nevertheless, flat racing started again in 1921. The ***racecourse in Kőbánya (Pest)*** opened in ***1925*** (Kincsem Park from 1977 on), but few race meetings were held because of a temporal crisis which ended in the middle of the 1930s. In the 1940s, all agents of flat racing realized profit (Szécsi, 2013; Fehér, 2013 personal communication).

The ***Second World War*** ruined everything in relation to flat racing. However, breeding and racing were started again due to racehorse imports and intention. The 7th of July, ***1946*** is considered as the second birthday of Hungarian flat racing. Stallion lines and mare families had

regenerated very well and good results were achieved among others by Lubica, Roppant, Imi and Imperiál. The era is best represented by ***Imperiál*** (by Imi that won 10 races for 11 starts, one time second placed) born in 1960 at the stud-farm at Kisbér that won ***20 races for 25 starts***, two-times second placed and three times without placing (Hecker, 2011; Szécsi, 2013).

In ***1972***, the "***Hungarian Horse Racing Enterprise***" was established by six agricultural cooperatives, of which three were interested in gallop racing and three in harness racing. It introduced financial interests for both the breed and the racing parties. It worked until the change of regime, after which the National Horse Racing Ltd. was established. It bought the Australian TAB betting system which worked until 2013 (Ernst-Fehér-Ócsag, 1988; Hecker, 2011; Szécsi, 2013).

3.4.2.2 Harness racing

The ***pioneer of harness racing*** in the Kingdom of Hungary was considered the "***jukker***", a ***carriage type halfbred horse*** which at distances of more than 30 km was impossible to defeat (it was considered as ***Equus velox hungaricus*** by C. G. Wrangel (Hecker, 2011)). ***Harness racing*** was introduced to the Kingdom of Hungary thanks to ***Austrian influences.*** Although there were many enthusiastic drivers, Trotter breeding was initially not very welcomed among professionals who claimed structural problems of imported Trotter stallions. They argued that these stallions would not be able to improve the general level of horse breeding. But, before there would have been a course for harness racing, an ***association*** (a Share Company for the Improvement of Horse Breeding) was established in ***1877*** for coordinating harness racing. The ***first course*** was constructed in ***1883*** and the ***first race meeting*** (Hungarian Derby on 3000 m) was held in ***1884*** (Hecker, 2011).

After the ***First World War***, Hungarian harness racing was separated from that of Austria. After the war, the survived horse population was sufficient in number for a new beginning. In ***1933***, a ***new course*** was built, because the existed one proved to be narrow. Famous Trotters between the two World Wars were Baka, Allegro, Első, Elly, Darling II and Gondolat II.

The ***Second World War*** wreaked havoc, but the ***racecourse opened*** again in ***1945***. The losses in Trotter horse population were continuously covered by ***imports***, mainly from the ***United States***, but also from ***France*** and ***Denmark*** (like Skipper, Uniforme, Uli). In ***1947***, the Harness Racing Association (formed in 1943, then, in 1950, converted to a state owned "Horse Racing

Enterprise") bought the property at ***Pusztaberény***, where after a temporary period, during which injured Trotter horses were treated (this was the initial purpose of the installation), Trotter breeding began like in other stud-farms, such as ***Rádiháza***, ***Somogysárd*** and ***Mezőhegyes***. Famous Trotters of the era were Talent Scout, Let Him Roll, Ozark Hanover (imported stallions), Kabala, Zeusz, City and Cyrano (Ernst-Fehér-Ócsag, 1988; Ernst, 1997; Hecker, 2011; Szécsi, 2013).

Between ***1972 and 1991***, the "***Hungarian Horse Racing Enterprise***" worked as umbrella organization of horse racing uniting flat racing and harness racing (Szécsi, 2013; Fehér, 2013 personal communication).

In ***1991***, the ***National Horse Racing Ltd***. was established as a successor of the "Hungarian Horse Racing Enterprise". It became responsible for planning and organization of race meetings. Other agents, like that in breeding, training and racing, and organization of betting have all belonged to different interest groups and have worked separately preventing the sustainable development of the Hungarian Horse Racing Industry (Fehér, 2013, Kanics, 2013; Török, 2013; personal communications).

3.4.3 Brief review of Hungarian Equestrian

The review of history of Hungarian Equestrian must be begun with mentioning the ***Austrian Imperial Royal Army*** (*Zentrales Equitationinstitut*) established in ***1808*** in ***Wiener Neustadt*** by Archduke Charles of Austria, Duke of Teschen. In ***1850***, the institution was displaced to ***Vienna*** where, from ***1860*** on, it was named ***Central Cavalry School*** (*Zentral-Kavallerieschule*) and, from ***1875*** on, ***Imperial and Royal Military Equitation Institute*** (*k. k. Militär-Reitlehrinstitut*). In 1918, it closed (Ernst-Fehér-Ócsag, 1988; Hecker-Győrffy-Villám-Szelestey-Jankovics, 2004; Ernst, 2008).

In the ***Kingdom of Hungary***, the first ***order on the establishment of an educational institution***, which ***prepared the officer corps of the army,*** was enacted in ***1808***. The ***Ludovika Military Academy***, built for that purpose, was named after Maria Ludovika of Austria-Este, Empress of Austria, Queen consort of Hungary and Bohemia, third wife of Francis I, Emperor of Austria. The building of the Academy ***was constructed*** only in ***1836***, because the contributions for its construction were always spent. In addition, the Court did not agree that the official language

of officer education would be Hungarian. Although the Revolution and War of Independence of 1848-1849 made changes, the Austrian Imperial Army prohibited its functioning as an educational institute; it was repurposed to a military hospital. The Hungarian officer education was set up at the Academy only after the Austro-Hungarian Compromise of 1867. The Academy ***opened*** its doors for officer education in ***1872***. However, until 1897, the officers of the Academy were allowed to serve only in the Royal Hungarian Army; for the Common Army, officers were educated in "Common Institutes". ***From 1922 on until 1945,*** the Academy worked as educational institute of the highest rank: ***the initial education and training of officers*** were done at the ***Ludovika Military Academy*** (Ernst-Fehér-Ócsag, 1988; Hecker-Győrffy-Villám-Szelestey-Jankovics, 2004; Ernst, 2008; A Magyar Királyi Honvéd Ludovika Akadémia, 1808-1945; 2015).

In the beginning of the 1880s, military constructions began in Budapest: among others, the ***Cavalry Barrack of Franz Joseph I of Austria*** was constructed ***between 1884 and 1886***. Although the Imperial and Royal Military Equitation Institute in Vienna was closed in 1918, it served as a model for a Central Institute which was established in 1922 for ***advanced education and training of officers.*** This Institute was placed in the Cavalry Barrack in Budapest. From ***1924*** on, it was named ***Institute for the Education of Equitation Teachers*** (also called *Royal Hungarian Institute for the Education of Equitation and Driving Teachers*). The Cavalry Barrack seemed to be small for carrying out its tasks, for this reason, the Institute moved to ***Örkénytábor*** in ***1930***, where it operated ***until 1953*** (Ernst-Fehér-Ócsag, 1988; Hecker-Győrffy-Villám-Szelestey-Jankovics, 2004; Ernst, 2008).

The ***first public riding school*** was initiated by István Széchenyi and Miklós Wesselényi. It was constructed in ***1826 in Pest***, but it proved to be small. In ***1856***, the ***National Riding School Association*** was founded and in ***1858*** the first permanent ***National Riding School*** was built. It was seriously damaged in the Second World War in 1945 and was finally demolished in 1948 (Ernst-Fehér-Ócsag, 1988; Hecker-Győrffy-Villám-Szelestey-Jankovics, 2004).

In ***1881***, the ***Hungarian Tattersall Ltd***. was founded that regularly organized horse fairs on an area of wide extension, of which a part was asked for rent by the Budapest Harness Racing Association (founded in 1903) for constructing a new course. The Association received the area for the new course with the condition of restoring the already existing stables of the Hungarian Tattersall Ltd. and constructing a new indoor riding arena. In ***1932*** the stables were restored

and the ***indoor riding arena*** was built. Since this time, the National Riding School has been the center of Hungarian Equestrian. In 1950, the indoor arena was demolished, and in its place a new one was planned to be built in 1959 able to accommodate 6,000 spectators, but until today it has not been built (Ernst-Fehér-Ócsag, 1988; Hecker-Győrffy-Villám-Szelestey-Jankovics, 2004; Ernst, 2014).

Before and after the First World War, thanks to good equestrian education of officers, ***very good results were achieved in equestrian disciplines***. ***After the Second World War***, it was nearly ***impossible to continue with practicing equestrian***. The majority of officers became prisoners of war of the Soviets in 1945. Under the Soviet occupation, the Soviet leadership opposed the horse as it was ***the gem of the Austro-Hungarian Empire***, ***the symbol of the previous system***, ***that of the nobility and the culture***. The Soviets considered the horse as an unnecessary passion of gentlemen. Although equitation teachers were not rejected completely because their knowledge was necessary to some degree, they were considered as war criminals because they were employed by the Army of the Monarchy. Apart from some examples, these professionals were persecuted, and many of them gave up their horse-related jobs or left the country. For instance, Ágoston Endrődy emigrated to Great Britain, where as an Eventing trainer became team gold medalist at the Olympic Games in 1956 in Stockholm; Géza Halzsinszky-Krull emigrated to the Netherlands, where he gained reputation as Dressage trainer; Bertalan Némethy emigrated to the United States, where as a Show Jumping trainer he became Olympic team silver medalist in 1960 in Rome, Olympic team fourth placed and individual gold medalist in 1968 in Mexico, Olympic team silver medalist in 1972 in Munich, Olympic team gold medalist and individual gold and silver medalist in 1984 in Los Angeles; and Tibor Pettkó-Szandtner emigrated to Egypt, where he revived the Arabian stud-farm of King Farouk (Hecker, 2005; Ernst, 2008). The examples clearly prove that the ***environment*** principally determines how knowledge and skill ***can be unlocked or locked*** affecting the ***preservation*** and ***development*** or, on the contrary, ***the loss of immaterial traditional values***.

After the end of the Second World War, the most important goals of the Ministry of Interior was to secure and maintain public safety and public order. In order to do so, it organized the ***State Police*** in 1945, in which mounted forces worked, as well: not only policemen, but also border guards and military forces.

In the stud-farms and armed forces, ***only family members, relatives and their children*** were initially allowed to ride horses ***apart from employees***. However, there were not closed doors: ***very determined children were sometimes allowed to get in contact with horses*** or even ride on them (Ernst, 2014).

In the end of the 1940s, a decision was made on the ***creation of sport associations*** for the staff of the ***Ministry of Interior and its institutions***. As a result, equestrian associations of armed forces were created in the beginning of the 1950s. ***Armed forces*** were the first ones who ***took part in equestrian events after the Second World War***, and apart from them, ***pentathlon athletes***, who played crucial roles in initiating the competition. Officers practicing pentathlon recognized that their sport should be continued on civil basis. Since the horses of armed forces were used, ***close cooperation*** was established between the pentathlon athletes and the riders. In the end of the 1950s, the ***equestrian associations of the armed forces*** opened their doors to civilian riders. These associations also paid attention to the education of young riders who were intended to replace the older ones (Ernst, 2014).

The ***Hungarian Federation of Equestrian Associations*** was created in ***1924*** and became ***affiliated to the FEI (International Equestrian Federation) in 1927***. The Federation carried out its tasks until 1944. The Federation was reorganized in ***1952*** (National Social Equestrian Federation) and became affiliated to the FEI in ***1953*** again. After the National Federation was created, federations at county level were also established (Ernst-Fehér-Ócsag, 1988; Ernst, 2014, FEI, 2015).

Exceptional initiation was to build the Riding School of the ***Agricultural University*** at ***Gödöllő*** in 1955 in order to educate agricultural engineers and horse-related professionals. Later, riding school was built also by the Agricultural University at Mosonmagyaróvár and Hódmezővásárhely in 1962 and at Keszthely in 1969 (Ernst, 2014).

In the beginning of the 1960s, it was still nearly ***impossible to travel abroad***, however, difficulties decreased year by year, and cooperation became possible with at least the neighboring socialist countries. The ***first official international event*** in Hungary was held ***in 1962***, first among the neighboring social countries. Due to the ***political thaw***, more and more equitation teachers of former educational and training institute of Örkénytábor were employed for work around and with horses, although, distrust them was a general phenomenon. [After the

Second World War, only some equitation teachers from the former institute of Örkénytábor took part in educating Dressage riders; they mostly preferred Show Jumping.] (Ernst, 2014).

In the 1960s, due to reorganization of horse breeding, many equestrian associations and riding schools stopped working. On the other hand, ***leisure riding*** became more and more popular, especially in the urban areas. Furthermore, the political leadership was attracted to some degree to the sport: they admitted the "potentials" of good equestrian results in promoting "the advantages of the system". The country was confronted with a ***paradoxical situation***, in which many horses (approximately 600,000) were killed. For this reason, the 14th May, 1974, a ministerial decision was made on the protection of traditional Hungarian breeds (Koppány, 2002)). On the other hand, riding schools (approximately 30-40) were established all over the country using some rescued horses maintained and supported by public cooperatives. The operation of these riding schools was also encouraged by ***organized equestrian tourism*** from 1962 on. Abroad tourists, mainly from Western-Europe, travelled 200-300 km within 6-8 days on horseback or on horse-drawn carriages. Tourists also arrived to visit equestrian touristic spectacles (Horváth, 2002; Ernst, 2014).

Although committed horse-related professionals tried their best to achieve what they considered was possible, ***losses*** in both the number of horses and professionals were ***irrecoverable***. Apart from some exceptions, ***for the middle of the 1980s***, the Hungarian "Horse Industry" ***collapsed completely*** (Horváth, 2002). Until the end of the 1980s, there were no horse-related Hungarian professional publications (Hecker, 2005). The ***change in the political and economic system in the beginning of the 1990s*** boosted the "horse industry": many riding schools were established [according to a survey conducted in 1998, there were 600 riding schools (Horváth, 2002)], but as Prutkay formulated: "The world has 40-100 years of advantages ahead of Hungary" (2005).

Carriage driving

Carriage driving ***did not belong to equestrian disciplines either before or directly after the Second World War*** in Hungary. Good carriages had ***value*** both in providing service and in representation at the traditional horse breeding regions and in the stud-farms. The Hungarian Equestrian Federation did not deal with carriage driving; it did not even publish any news associated with it. Carriage driving ***was considered as a spectacle***, a good promotion for Hungarian horse export. Carriage driving became the ***business of breeders*** (Ernst, 2014).

Thanks to the presentation of traditional carriages at exhibitions, ***international interest was shown for the Hungarian style of harnessing horses to a carriage***, as well as the ***Hungarian harnesses and carriages***. Captains of the stud-farms who exhibited these carriages were ***invited*** with their carriages ***to international shows***; for the first time in 1959 to Leipzig then, in 1960 to Aachen. At the event, drivers had to drive their horses in single, pairs, and four-in-hand classes, altogether in 7 competitions. At first, the performances of drivers were ***classified in two groups based on the type of harness*** (collar and breast). Although there were competitions, in which Hungarian drivers had difficulties, their skill was unquestionable. Successes of Hungarian drivers began (Ernst-Fehér-Ócsag, 1988; Ernst, 2014).

The first carriage driving event in Hungary organized in line with the international specifications was held in 1963. Carriage driving became more and more popular, although events were always organized in the breaks of events of other equestrian disciplines. The ***first official carriage driving event*** (the Hungarian Derby) took place in ***1969*** (Ernst, 2014).

At the ***General Assembly of the FEI in 1968***, a decision was made on the ***necessity of standardized rules***, and from this arose the opportunity for organizing European and World Championships for four-in-hand drivers in 1970 and 1971, respectively. Later, the organization of the European Championship was only discussed. The ***first European Championship*** was held in ***Hungary*** in ***1971***, thanks to the FEI decision made taken into consideration the World Hunting Exhibition organized in Budapest in 1971 and the international successes of Hungarian drivers. The European Championship ended with Hungarian success in both individual (the first three placed drivers were Hungarian) and in team (the gold prize winner was the Hungarian team) classification (Várady, 1999; Ernst, 2014). During the years, ***carriage driving became a popular sport discipline in Hungary*** and, although, not dominant, is considered quite successful still today.

3.4.4 Some relevant traditional Hungarian horse-related spectacles

Horse-related programs have already been popular ***in the 19th century*** at ***agricultural exhibitions*** and ***breed animal fairs***, the history of which began in ***1881***. Nevertheless, the presentation and sale of horses was organized in 1929 for the first time, because the responsible association was not authorized to hold fairs for horses. Tradition was continued after the Second World War. Horse-related spectacles at exhibitions included ***presentation of different kind of horse-drawn carriages*** with both ***traditional folk carriages*** and those of ***representation style***.

In addition to the presentation of horse-drawn carriages (60 altogether), the ***Roman Quadriga***, ***tandem Show Jumping carousel***, ***equestrian falconry***, ***shows associated with stud-farms and grasslands of large area*** ("***puszta***") and the ***Bábolna Trumpeters*** formed parts of the spectacles. In relation to the stud-farms and the "puszta", the "***Koch-five-in-hand***" (also called "***Puszta five-in-hand***", "***Lénárd-five-in-hand***", "***Hungarian-post***") has been the most popular (Ernst, 2014).

The *Bábolna Trumpeters* has its origin in the 1930s, when Tibor Pettkó-Szandtner, captain of the Bábolna stud-farm with the help of a soldier musician organized a brass band from the war orphans brought to Bábolna (Hecker, 1994, p. 132).

The idea of the "Koch-five-in-hand" was born on the basis of a drawing made by the Austrian painter, Ludwig Koch in his book titled "*Equestrian Art in Pictures*" (*Reitkunst im Bilde*) published in 1923. Béla Lénárd decided to promote the idea: standing on the croups of two rear horses, drove its five-in-hand (two at the rear, three at the front) in gallop at the agricultural exhibition in 1958 for the first time. In later years, he did it with seven, eight, nine and eleven horses, as well. The "Koch-five-in-hand" was probably not only the idea of Ludwig Koch: probably it was a program of the circus of Renz then Wulff already between the 1870s and 1890s. The "innovation" of Béla Lénárd was that he drove his horses outdoor, in the "puszta", where the speed of horses was much higher than that was achievable in the circus ring. The spectacle constitutes a permanent part of horse-related shows in Hungary still today (Ernst, 2014).

Horse drawn carriages represented certain ***traditional horse breeding regions and stud-farms***. There has been a ***great variety*** in these traditional carriages, beginning with the way how horses are harnessed to a carriage through the ***horse breeds*** and the ***style of harnesses and carriages*** and ending with the ***clothing of drivers and grooms***. Some typical traditional Hungarian carriages are mentioned as follows: Hortobágy Nóniusz seven-in-hand driven from the left rear horse (3+ 4); Bábolna Lipizzan six-in-hand consisting of mares harnessed to mail coach in collar (2+4); Bábolna Arabian six-in-hand consisting of mares (2+4); Mezőhegyes Nóniusz five-in-hand consisting of stallions (2+3); five-in-hand of the city of Debrecen harnessed to landau carriage (2+3); Gyöngyös Lipizzan five-in-hand consisting of stallions (2+3); five-in-hand of the Brewery of Kőbánya harnessed to dray (Pataki, 2013).

4. METHODOLOGY

4.1 General observations

In order to obtain ***a clear overview of the characteristics*** of the horse industry, the measures should be relevant and useful and ***based on indicators. In this way*** the measured characteristics will be able to provide firm foundations for their continuous improvement (European Commission, 2014; p. 33.).

The ***operational characterization*** of the horse industry based on ***aggregate and specific indicators*** provides the basis ***for economic impact estimation and its evaluation*** besides presenting a true view of the operation of the horse sector. The indicators used for the characterization of the horse industry can be of both ***stock and flow type*** depending on the objective of the analysis; however, more general is to use indicators of stock type. Beyond this, they are ***non-economic and economic***, ***quantitative and qualitative*** and generally "***historic***" in contrary to predictive ones.

Although ***economics provides tools of great variety*** for the operational and economic characterization of various economic sectors, the ***specific characteristics of the concrete sector*** in question ***must be known well*** in order to be able ***to create indicators*** for measures of above described qualities and ***to correctly apply methodologies*** to estimating the economic impacts. These specific characteristics are the drivers for the economic impacts of an event, sport discipline, installation, etc. (Barajas Alonso - Salgado Barandela – Sánchez Fernández, 2012; pp. 442-448).

During the characterization of the horse sector including the economic impact estimation of the Hungarian Horse Industry, several problems were encountered that caused ***many inconveniences***. Nevertheless, the problems arisen to the horse sector were similar to problems arisen in terms of, for instance, the "sport sector". In reference to Barajas Alonso - Salgado Barandela – Sánchez Fernández (2012; pp. 452-456), problems encountered can be grouped as ***conceptual, statistical*** and ***methodological***. The authors explain these problems by the fact that the sport sector has grown more rapidly than basic precise theory would have been formulated and homogenous and solid database could have been established (p. 452).

It seems as if their general theory seemed to be the case in the horse sector, as well. The Equestrian Revolution is quite a new phenomenon covering many "new activities" that are

carried out with horses. Data have mostly been available on those horse-related activities that can be linked to the horses' roles before the Equestrian Revolution. This means that data have generally been available on ***horse breeding***, which has formed the basis for the production of horses; ***horse racing***, whose primary "mission" has been to test the performance of horses by which the quality of horses, in general, has been possible to improve through selection criteria, not only that of the racehorses, but also that of other breeds (because Thoroughbreds are used in the breeding of other breeds, as well); and, ***equestrian***, especially the Olympic disciplines that derive from the roles that horses played in light cavalry. Due to the formation of the FEI, a lucky situation occurred in terms of some equestrian disciplines besides the Olympic ones that were recognized by the FEI gradually (in 1970, 1982, 1983, 2000 and 2006). Thanks to the FEI database, information can be obtained on each of the FEI disciplines of each of the affiliated National Federations. It is not the case with tradition-specific (culture-specific) disciplines, on which no robust data has been accessible. ***Data from horse breeding, racing and equestrian have been and will be required; but at the same time, as horses' roles have transformed, new activities have arisen, on which data are necessary in order to develop useful researches.*** As examples, equine therapy, equestrian tourism and horse-related leisure activities can be mentioned.

Among conceptual problems, the one most generally referred to is the ***confusion and the inaccuracy of terminology*** that directly affects the quality of statistics and the process of making significant comparisons at the international level.

Methodological problems arise due to conceptual and statistical problems and, beyond these, due to the fact that chosen methodologies are often applied by making severe mistakes, especially by consultant companies and public entities (Crompton, 1995; p. 14; Crompton, 2006 in Barajas Alonso - Salgado Barandela – Sánchez Fernández, 2012; p. 457 and in Salgado Barandela – Barajas Alonso – Lera López – Sánchez Fernández, 2013; p. 41). Studying the most ***generally made mistakes***, they principally ***derive from disregarding specific characteristics of the analyzed topic***.

Problems encountered throughout data collection and procession and methodology specification ***did not impede the elaboration of the study***. In order to be able to develop a useful research, ***all difficulties were overcome*** by 1) ***finding indicators*** different from those that had been intended to include in the research, but represent well the horse sector and/or 2) ***finding***

alternative methods for data evaluation and analysis, and/or 3) ***slightly modifying the original research concept***.

4.2 Tools for the operational characterization of the horse industry

Describing the horse sector from equestrian point of view is the very first step of both ***assessing existing situation*** by ruling out human bias and ***formulating strategies***, an adequate tool for setting out a vision what and to what time the horse industry in general and the sub-sectors specifically aspire to achieve. It is a ***prerequisite of conscious operation supporting decision-making*** at all levels. As Ansoff (1965) referred to it: without planning the future, one will not have future.

The more successful the indicators are selected including the ***benchmarks***, the truer view of the horse industry can be obtained. Taking the general observations into account, in table 4.1 below, some ***aggregate indicators and possible benchmarks are defined*** that can be useful ***in the operational characterization of the horse industry at the sector level***. (In the present Ph.D. dissertation, considerations always refer to use activities and ignore the physical production abilities of horses, like meat, milk, serum and urine production, etc.)

The indicators presented in the table seem to be quite simple, but, several problems can arise with respect to them. In reference to the "***number of horses***", two "center" statistical databases are available but without complete and reliable data. The statistical database of the European Commission comprised data between 1988 and 1997; that of the FAO between 1960 and 2012 (checked in 2014), but there were huge differences between its statistics and the published horse counts in each of the available studies made on the economic importance of the horse industry (for instance, in the case of Australia, Canada, France, Germany, Great Britain, Spain and Sweden). Due to this fact, information can be obtained on horse industries of countries, where studies on the horse sector were published. About "emerging" horse industries, no reliable data is available at the time of writing the present dissertation.

It is also a difficulty with the horse counts in some countries that the ***number of wild horses*** is sometimes published together with the number of active horses. Besides that, there are ***many estimated values*** for the horse population, not only in terms of wild horses, but also in terms of equestrian tourism and leisure riding that, in fact, represent strategic areas in the horse sector due to their high potentials for generating economic impacts (Gordon, 2001; Evans, 2010;

Henley Centre, 2004; Swedish Horse Council Foundation, 2004. In the Hungarian Horse Industry the situation is the same). On the other hand, in countries with well-developed horse industry, quite reliable data from the sub-sector of equestrian tourism are available due to its recognized importance, thanks to which horses and participants active in this field are registered (Deloitte, 2011; p. 22).

In terms of the horse counts, it would be quite interesting to know the ***distribution of horses between urban and rural areas***. This data would provide more information on the horses' roles in rural development in some countries (Swedish Horse Council Foundation, 2004; Häggblom-Rantamäki-Lahtinen-Vihinen, 2006) against others.

Table 4.1: Aggregate indicators and their possible benchmarks for the characterization of the horse industry at the sector level

Aggregate indicator	**Used benchmark** ***Preferred benchmark***
at the sector level	
number of horses	per km^2 surface area or agricultural area *per 1,000 inhabitants*
number of active horses (without wild horses)	*per 1,000 inhabitants*
distribution of horses between urban and rural areas	*per 1,000 inhabitants*
number of sub-sectors	-
number of activities within the sub-sectors	-
number of breeds	-
number of institutions dealing with horse-related education in both theoretical and practical aspects	*per 1,000 inhabitants and level of quality*
number of teachers and/or professors responsible for horse-related theoretical education	*per 1,000 inhabitants and level of quality*
number of horse-related professions	*per level of quality*
number of participants taking part in different educations	*per 1,000 inhabitants and level of quality*

Source: own construction

The ***number of sub-sectors***, the ***number of activities within the sub-sectors*** and the ***number of horse-related professions*** provide information on the ***scope and the character of the entire horse industry***, which principally determine the preferred and used breeds, as well as, domestic production and / or exposure of the horse sector (or part of it) to foreign products and services. To avoid unnecessary exposure to other countries, ***good quality education*** is of quite a high value. Table 4.1 also contains indicators that refer to education.

Each of the sub-sectors has unique characteristics, for this reason, ***sub-sector specific indicators*** must also be defined. These indicators are presented separately, for each sub-sector (see table 4.4, 4.5, 4.6, 4.7, 4.8); however, those indicators that are applicable for each sub-sector are summarized together in table 4.3. Since the sub-sector of horse breeding differs from other sub-

sectors in which horses are used for practicing various activities, and indicators applied, in general, are neither adequate for characterizing it, indicators for the sub-sector of breeding will be shown separately, in table 4.2.

The ***applicability of presented indicators*** depends on the ***features of each of the sub-sectors*** of each of the countries. This means that not each of the indicators is applicable to each of the sub-sectors of each of the horse industries. And, probably more indicators could be defined for the characterization of the horse sector.

Table 4.2: Aggregate indicators and their possible benchmarks for the characterization of the sub-sector of breeding

Aggregate indicator	**Used benchmark** ***Preferred benchmark***
Breeding	
number of breed horses	*per 10,000 inhabitants, per breeder; per breed farm*
number and distribution of breeds	-
number and distribution of home breeds	-
number and distribution of breeds in genetic conservation projects	-
number and distribution of breed horses in genetic conservation projects	*per breed*
number and distribution of foreign breeds	-
number and distribution of horses bred in the country	*per 10,000 inhabitants*
number and distribution of state stud-farms	-
number and distribution of breed horses bred at state stud-farms	*per 10,000 inhabitants*
number of breed farms	*per breed*
number of breeders	*per breed; per 10,000 inhabitants*
number and distribution and average age of brood mares and stallions within each breed	-
number and distribution of broodmares and stallions tried in sport	*per breed and event level; per 10,000 inhabitants*
number and distribution of stallions in natural breeding and in artificial insemination	*per breed*
number and distribution of newly registered foals within each breed per year	-
number and distribution of imported and exported broodmares and stallions	*per breed; per 10,000 inhabitants*

Source: own construction

Conceptual problems referred to under the general observations of this chapter, also arose already in the beginnings, when study findings were found ***without taking the sub-sectors into account***; or considering several different areas of the horse sector together; or analyzing different areas with significant overlaps (for instance, Gordon, 2001; pp. 19-54; Henley Centre, 2004; pp. 24-29; Schneider-Mahlberg, 2005; pp. 1-46; Deloitte, 2005; pp. 3-43; Deloitte, 2013; pp. 17-316). These inconveniences are especially apparent when trying to ***compare*** various sub-

sectors of horse industries among countries, without which data do not really have information value. The general use and the actual content of basic terms, among them, the "***rider***" is also misleading. The content of it can vary between wide limits and the interpretation of it really matters depending on the sub-sector and the objective of the analysis. While the category "rider" can refer to professionals who ride several horses every day, it also indicates leisure riders to the extreme who ride horses one time monthly (British Horse Industry Confederation, 2005). Apart from differences in the time period, professionals earn money by riding horses, while leisure riders spend money by riding horses. In other words, saying that there are x riders in one country and y riders in another at the sector level, does not express too much and is rather misleading.

Although, in theory, specific indicators could be calculated from each of the aggregate indicators, obtained data cannot be considered as technical and cannot provide basis for comparisons, if the benchmark is not well-specified. Both aggregate and specific indicators ***should be applied specifically*** to sub-sectors, disciplines, types of activities, etc., ***to the more detailed and the more homogenous categories possible***, in order to ***achieve realistic information*** and to ***draw rational and useful consequences***.

Table 4.3: Aggregate, generally applicable indicators and their possible benchmarks for the characterization of sub-sectors other than breeding

Aggregate indicator	**Used benchmark** ***Preferred benchmark***
at the sub-sector level	
number and distribution of registered horses	*per sub-sector; per discipline/activity type, per level*
number and distribution of breeds	*per sub-sector; per discipline/activity type, per level*
number and distribution of home breeds	*per sub-sector; per discipline/activity type, per level*
number and distribution of foreign breeds	*per sub-sector; per discipline/activity type, per level*
number and distribution of horses bred in the country	*per sub-sector; per discipline/activity type, per level*
number and distribution of horses educated in the country	*per sub-sector; per discipline/activity type, per level*
number and distribution of imported and exported horses	*per sub-sector; per discipline/activity type, per level*
number of breeders	*per sub-sector; per discipline/activity type, per level*
number of owners	*per sub-sector; per discipline/activity type, per level*

Source: own construction

Table 4.4: Aggregate indicators and their possible benchmarks for the characterization of the sub-sector of horse racing other than the generally applicable indicators

Aggregate indicator	**Used benchmark** ***Preferred benchmark***
Horse racing	
number of jockeys	*per 10,000 inhabitants*
number of drivers	*per 10,000 inhabitants*
number of trainers	*per type of racing, per 10,000 inhabitants*
number of race stalls	*per type of racing, per 10,000 inhabitants*
number of racehorses	*per type of racing, per 10,000 inhabitants*
number of breed horses	*per type of racing, per 10,000 inhabitants*
number of race courses	*per 10,000 inhabitants*
number of race meetings	*per type of racing, per 10,000 inhabitants*
number of officials	*per type of racing, per "profession", per 10,000 inhabitants*
number of specialized veterinarians	*per 100 horses*
betting turnover	*per type of racing, per 10,000 inhabitants*
prize money	*per type of racing, per 10,000 inhabitants*
number of horses in the World Ranking among approx. the top 20 horses	*per 10,000 inhabitants*

Source: own construction

Table 4.5: Aggregate indicators and their possible benchmarks for the characterization of the sub-sector of equestrian other than the generally applicable indicators

Aggregate indicator	**Used benchmark** ***Preferred benchmark***
Equestrian	
number and distribution of registered athletes	*per discipline, per level, per 10,000 inhabitants*
number of registered athletes at the last Olympic Games; and those among the top 10 placed athletes	*per discipline*
number of registered athletes at the last WEG; and those among the top 10 placed athletes	*per discipline*
number and distribution of athletes training at home and in riding schools	*per discipline, per level, per 10,000 inhabitants*
number and distribution of registered associations	*per discipline, per 10,000 inhabitants*
number and distribution of organized events	*per discipline, per level, per 10,000 inhabitants*
number of registered trainers	*per discipline, per level, per 10,000 inhabitants*
number and distribution of officials	*per discipline, per level, per function (judge, technical delegate, course designer, stewards, event vets), per 10,000 inhabitants*
number of horse specialized veterinarians	*per discipline, per level, per 100 horses*

Source: own construction

Table 4.6: Aggregate indicators and their possible benchmarks for the characterization of the sub-sector of equine therapy other than the generally applicable indicators

Aggregate indicator	**Used benchmark** ***Preferred benchmark***
Equine therapy	
number of affected people	*per discipline, per 10,000 inhabitants*
number of therapists	*per discipline, per 10,000 inhabitants*
number of trainers	*per discipline, per 10,000 inhabitants*
number of athletes	*per discipline, per 10,000 inhabitants*
number of service provider riding schools (companies)	*per discipline, per 100 affected people*

Source: own construction

Table 4.7: Aggregate indicators and their possible benchmarks for the characterization of the sub-sector of equestrian tourism other than the generally applicable indicators

Aggregate indicator	**Used benchmark** ***Preferred benchmark***
Equestrian tourism on horseback	
number and distribution of participants	*per sub-sector, per 10,000 inhabitants*
number and distribution of riding schools (companies) providing such an activity	*per sub-sector, per 10,000 inhabitants*
number of kilometers available for equestrian tourism	*per 100 horses, per 10,000 inhabitants*
equestrian tourism route coverage of the country	-
number and distribution of kilometers of routes at different geographical regions	*per 100 horses, per 10,000 inhabitants*
number of places for catering and their availability as per season	*per 30-40 km, per level of quality*
number of places for accommodation and their availability as per season	*per 30-40 km, per level of quality*
number of places for accommodation for horses and their availability as per season (stipulating the maximum number of horses, availability and type of bedding, fodder, forage, and, of course, water all the time, etc.)	*per 30-40 km, per level of quality*
Equestrian tourism motivated by horses	
number and distribution of "tourists"	*per spectacle type; per 10,000 inhabitants*
number of types of spectacles	-
number and distribution of service providers	*per spectacle type, per 10,000 inhabitants*

Source: own construction

Table 4.8: Aggregate indicators and their possible benchmarks for the characterization of the sub-sector of leisure riding / driving other than the generally applicable indicators

Aggregate indicator	**Used benchmark** ***Preferred benchmark***
Leisure activities	
number and distribution of horses kept at home and in riding schools	*per 10,000 inhabitants*
number and distribution of activities	*per 100 horses, per 10,000 inhabitants*
number and distribution of participants	*per leisure activity, per 10,000 inhabitants*

Source: own construction

4.3 Tools for estimating the economic impacts of the horse industry on the economy

4.3.1 General considerations

The estimation of economic impacts of the horse industry on the economy provides a more macro view than the above presented indicators for the operational characterization of the horse industry. As macroeconomic indicators, ***gross domestic product*** and ***employment*** can be applied to the horse industry to express its economic importance. These are the most general indicators by which the importance of an economic sector can be estimated. Nevertheless, in some cases the government tax revenue from the operation of the horse industry was quantified, as well; especially that which derives from horse racing (Deloitte, 2005).

Besides gross domestic product and employment estimates, in some instances, ***input-output analysis*** of the horse industry was made *to highlight the interdependencies between the horse industry and other branches of the economy* (Deloitte, 2005; Schneider-Mahlberg, 2005; Rodríguez Alcaide - Pardo Sempere – Rodríguez Zapatero – Ruiz, 2005; Deloitte, 2013). However, for estimating the economic importance of a sector, it is not strictly necessary to use the data intensive Leontief model (which is quite complicated to compile even in the case of well-described sectors); especially not for the horse industry, in which substantial and reliable data are generally lacking. The same reasons explain why the ***satellite accounts*** based on the methodology of national accounts, as a complementary method to input-output analysis, used for the economic impact estimation of sport activities (Salgado Barandela – Barajas – Lera López – Sánchez Fernandez, 2013) and tourism (Cifras INE, 2002) is not applied (yet) to the horse industry.

As it has been seen in the general observations and will be seen below in this sub-chapter, ***the correct way of taking the characteristics of the horse industry into account determines whether an applied method serves the stipulated objectives of the analysis also in the medium and the long-term***.

There are no ideal methodologies having used yet. For this reason, it has not been feasible to apply standard methodology to the estimation of the horse industry's impacts (Henley Centre, 2004; p. 2). Apart from that, GDP falls short of accurately reflecting the sector's overall contribution (Evans, 2010; p. 66).

4.3.2 Gross domestic product of the horse industry

Adhering to the simplest method of estimating the economic impacts of the horse industry, there are three ways of calculating GDP: the sum of all incomes derived from economic activity (***income approach***), the sum of expenditures (***expenditure approach***), or, the sum of the products of various industries of the nation (***output or production approach***). As these methods use different sources of information, the process of triangulation enables to be more confident of the overall estimation (Henley Centre, 2004; pp. 17-18; Sport Horse Ireland, 2013; pp. 6-7). It is so, provided that data are available for all three methods of calculation, and time and cost constraints enable to calculate GDP on the basis of each of the three approaches.

Despite the difficulties detailed above, a method must be used for estimating the impacts generated by the horse sector. In all cases, where methodology was described in the available studies, the ***expenditure approach*** was applied, because it proved to be the most feasible to obtain (the most reliable) data by having been less affected by defensive attitudes of respondents (Gordon, 2001; p. 3; Henley Centre, 2004; p. 23; Deloitte, 2005; pp. 7-8; 17; 27; Evans, 2010; pp. 65-66; Deloitte, 2013; pp. 17-23; Sport Horse Ireland, 2013; p. 7).

Economic impacts can be taken into consideration in ***three different categories***, like direct, indirect and induced impacts. Inaccuracy was experienced in using these terminologies, and not only respective to the horse industry. In the present dissertation, ***arguments are based on the three categories of impacts from the perspective of economics of the horse sector***. ***Considerations and explanations are based on the characteristics of the horse industry***.

In agreement with Castejón Montijano (2010; p. 34), ***direct impacts*** are related to investments and expenditures that are directly linked to horses and horse-related activities; all that is required specifically for the horse industry. ***Indirect impacts*** are indirectly related to horses and horse-related activities; these impacts consist of all types of expenditures that are generated during or in favor of horse-related activities; however, specifically for the horse or the horse-related activity itself they are not indispensable. ***Induced impacts*** are generated due to the multiplier effects of direct and indirect impacts.
[The presented concept referring to what is generally regarded as direct, indirect and induced impacts is supported by PwC (2012), as well.]

In contrary to the definitions described above, ***studies*** made on the economic importance of the horse industry ***principally ignored the indirect impacts of the horse sector***. Although the indirect impacts of the horse sector are mentioned, in fact, they are referred to as induced impacts. The phenomenon is typical not only in the horse industry, but in other sectors, as well, for instance in the estimation of economic impacts of sport events (Méndez Rial – Sánchez Fernández – Barajas Alonso, 2012; p. 76; Salgado Barandela – Barajas Alonso – Lera López – Sánchez Fernández, 2013; p. 42) and tourism (Cifras, INE, 2012; p. 3). On the other hand, this fact does not verify that the characteristics of the horse industry should be ignored in the estimation of the generated economic impacts of the sector.

In reference to ***Deloitte*** (***2005***; p. 7), ***indirect effects*** are purchases made by industry suppliers and their suppliers to support the manufacturing and delivery of their respective products. For example, the supplier selling a saddle must purchase raw materials to make the saddle, the equipment to manufacture the saddle (or pay another supplier to manufacture the saddle), and support services to deliver and market the saddle, etc. Each of the businesses involved in the manufacturing and delivery of the saddle also must pay their respective suppliers, and so on. This spending effect is reflected in the indirect economic impacts.

In terms of the horse industry, the above definition as indirect impacts seems to be inaccurate. From the horse industry point of view, ***the saddle is a final product, which is directly required by the horse industry*** no matter from where the raw materials are bought or how many stages the production process or, more precise is to say, the value chain has. Of course, ***several industries (other than the horse industry) take part in the value chain of the saddle, in which impacts are generated that flow toward other economic sectors.*** These can be quantified ***as induced impacts***.

Deloitte (***2013***; p. 23) considers the ***indirect impacts*** as the effects of successive transactions, similarly as Deloitte (2005) quoted above. The study published in 2013 also claims that the indirect effect of intermediate consumption is estimated for each euro of expense or income that is generated in the economy. The concept of Deloitte, 2013 and that of Deloitte 2005 is the same: induced impacts were quantified as indirect impacts. This is the reason, why Deloitte, 2013, although wrote about the input-output analysis and the multipliers, did not even mention the induced impacts. In contrary to this, Deloitte, 2005 mentioned both indirect and induced

impacts, but in accord with the definition, induced impacts were considered as both indirect and induced impacts.

Deloitte*, *2005 (p. 8) defines the ***induced impacts*** as follows: purchases made by individuals employed by the horse industry or the industry's suppliers. For example, a small business owner providing recreational trail rides presumably spends a percentage of their earnings on food, clothing, entertainment, etc. As a result of the business owner's spending, workers in each of those other inter-related industries will be able to increase their production and consumption, and so on.

The difference between the indirect and the induced impacts by ***Deloitte***, 2005 ***must be*** the ***differentiation between the induced impacts generated along the value chain of a product*** [the study must have referred to them as the indirect impacts] and ***the induced impacts generated by the horse industry itself*** [the study must have referred to them as the induced impacts]. This must be the explanation of using two kinds of multipliers on the direct impacts in order to obtain the "indirect" and the "induced" impacts that, however, seems verified (p. 17).

From professional perspectives, it must still be noted that the ***induced impacts*** need to be calculated ***on both the direct and the indirect impacts.*** Deloitte, 2005, of course, even if did so, was not able to stipulate this condition, because indirect impacts were considered as induced impacts. Based on this fact, ***real direct and indirect impacts were probably presented by mixing them together***. This assumption is also supported by the fact that it seemed to have difficulties in differentiating the direct and indirect participants of the horse industry (p. 11). Deloitte, 2013 did the same: it quantified the indirect impacts together with the direct impacts; so real direct impacts and real indirect impacts were presented mixed.

In reference to ***Evans*** (2010; pp. 66-70), the application of direct and indirect impacts is also different from what would be verified in the horse industry based on its characteristics and potentials. The author claims: ***direct impacts*** are "initial impacts" which are the value of initial expenditures on products and services (cost of operations), while ***indirect impacts*** are those that represent the subsequent purchases of suppliers for materials and services to sustain the original expenditures (the cost of producing the products or providing the services that are purchased as direct expenditures). The concept of direct and indirect impacts does not become clearer, from

the point of view of the horse sector, with the introduction of definitions like "on-farm" and "off-farm expenditures" describing ***on-farm expenditures*** (feed and care, etc.) as direct expenditures and ***off-farm expenditures*** (show entry fees, association/club membership fees, transport and accommodation, etc.) as indirect expenditures. Apart from the questionable concept, the off-farm expenditures also include direct expenditures, like show entry fees, club membership fees, and veterinary and farrier services at the events. Evans, similarly to Deloitte, although, in different way, but in fact, also presented the direct and indirect impacts of the horse industry mixed.

In relation to the ***multiplier effect of expenditures***, ***Evans*** (2010; pp. 66-67) applies the theory that every dollar spent on keeping a horse or participating in horse-related activity circulates within the economy multiplying the effect of the original expenditures. Furthermore, the study explains that the ***induced impacts*** are generated by workers in the sector who spend additional incomes on consumer goods and services.

The multiplying effect, in fact, should not be limited to the "original expenditures", as it is stipulated in the study, and the induced impacts should not be limited to impacts generated by workers in the horse industry itself. ***The induced impacts*** represent ***each unit of income***, which is ***generated*** along the value chain of final products and services provided ***for*** the horse industry and ***by the horse industry***, both directly and indirectly, that ***is spent on goods and services outside the horse industry*** by which they encourage production at the level of the economy.

The ***total economic impact of operating expenditures*** is defined as the sum of direct, indirect, and induced impacts. Due to the above disagreement in the terminology and further confusing considerations that will be specified below, the calculation of the total economic impacts of the horse industry also seem to rely on vague grounds.

Deloitte (***2005***; p. 17) estimated the total impacts as the sum of the direct, indirect and induced impacts. However, ***the real magnitude of these impacts*** cannot be known, since direct impacts cover both direct and indirect impacts in fact; and the indirect and induced impacts cover induced impacts in fact, for the calculation of which two multipliers were applied to the direct effects as it has been said above.

Evans (2010; pp. 74-75) obtained the total contribution of the horse industry as the ***sum total of direct, indirect and induced impacts multiplied by the multiplier effect factor***, which was derived as the total sum of direct, indirect and induced impacts divided by the direct impacts. It is not clear, why the sum of direct, indirect and induced impacts had to be multiplied by the multiplier factor in order to obtain the total contribution of the horse industry to the economy. It seems as if the contribution of the horse sector to the economy would be overestimated, although, as discussed above, the induced impacts along the value chain of final products and services provided for the horse industry were supposedly not quantified. Perhaps, the application of an "overall multiplier" was intended to refer to the induced impacts generated along the value chain mentioned above that is, of course, not precise.

Deloitte (***2013***; p. 23) summed the ***direct impacts*** [in fact, the direct and indirect impacts] ***and the indirect impacts*** [supposedly, the induced impacts] together, but more detail cannot be given in effect to the method of summing, since "***transversal activities" were taken into consideration two times: on one hand, in the direct impacts*** of each of the created categories, like breeding, transformation, equestrian events, morphological events, horse racing, etc. ***and, on the other hand, as transversal activities***. Transversal activities included, for instance, horse feed, veterinarian and farrier services, installations, maintenance of horses at home and in clubs, licenses, transportation, equipment, security, etc., a very heterogenic and inconsistent category, from which the logic of estimation is not suspected.

Due to unsettled terminology and concepts in the application of methodology used for the operational and economic characterization of the horse industry, opinions are also divided in what is considered the ***GDP contribution of the industry*** to the economy. As ***Deloitte, 2005*** (p. 17) argues, the GDP contribution is the same as the direct effect. The study states that the direct spending, also referred to as GDP contribution, is generally relied upon more regularly by economists than total impacts, as direct spending represents the direct input into the economy prior to the application of any multipliers, which are more open to interpretation. ***It must be remembered, however, that Deloitte actually regarded both direct and indirect impacts as direct impacts.*** Although ***Deloitte, 2013*** (p. 23) considers the GDP contribution as the direct impacts of the industry, in agreement with Deloitte, 2005 [in fact, the direct and the indirect impacts together], it seems that the share of the horse industry's GDP from the national GDP was calculated on the basis of the total impacts (p. 23 and 33). Similarly to Deloitte (2005, 2013), ***Schneider-Mahlberg*** (2005) probably took into account the ***direct and indirect impacts***

together, since the input-output model was applied to estimate the horse industry's impact on the Austrian economy. Unfortunately, no information can be achieved from the study in reference to the categories of impacts. ***Gordon*** (2001; pp. 19-54), the ***Henley Centre*** (2004; pp. 24-29) and the ***Sport Horse Ireland*** (2013; pp. 16-43), similarly to above studies, considers the GDP contribution of the industry as the ***sum of the direct and the indirect impacts***. ***Evans*** (2010; pp. 65-76) calculated the horse industry's contribution to the national economy on the basis of the ***sum total of direct, indirect and induced impacts multiplied by the multiplier effect factor***.

The remark of Deloitte (2005; p. 17) on the importance of the direct effect as an economic indicator can be supported, supposing that it referred to the ***sum of the real direct and indirect impacts generated by the horse industry***.

Apart from estimating the GDP contribution of the horse industry, ***it is crucial to quantify the industry's direct, indirect and induced impacts for each of the homogenous categories possible*** (e.g. sub-sectors, disciplines), ***because the magnitude of indirect and induced impacts matters in negotiations directed to the representation of the horse industry at the economy level and the cooperation between the horse industry and the economy.***

4.3.3 Estimation of employment generated by the horse industry

The ***estimation of employment*** generated by the horse industry seems at least as problematic as that of the GDP. This can first be explained by typical features of the horse industry. For instance, 1) many jobs do not require full-time employment, 2) there are many participants working in the industry without having employment and 3) there are many volunteers, as well.

From these constraints, first the ***number of participants*** is quantified, and then, the employment of the horse industry is more accurately assessed on the ***full-time equivalent basis*** that converts part-time and seasonal working hours to full-time equivalents calculating 2,080 working hours per year (8 hours/day, 5 days/week, 52 weeks/year) (Swedish Horse Council Foundation, 2004; Deloitte, 2005; Schneider-Mahlberg, 2005; Häggblom-Rantamäki-Lahtinen-Vihinen, 2006; Sport Horse Ireland, 2013; Dornier, 2013; Jez-Coudurier-Cressent-Méa, 2013). As there is an exception to every rule, of course, not each of the horse industries estimates full-time equivalents (e.g. Gordon, 2001; British Horse Industry Confederation, 2005; Deloitte, 2013).

As in the case of the economic impacts, the employment can be estimated in ***three different categories*** as direct, indirect and induced employment. Of course, ***conceptual problems*** are general with respect to the employment, likewise in relation to the economic impacts. The difficulties begin with *who is considered a horse industry participant*.

For instance, ***Evans*** (2010; p. 36) notes that participants are those who are directly involved in using or caring for horses excluding large groups of individuals who do belong to the horse industry, like veterinarians, farriers, equine therapists, employees of horse-related industry associations, suppliers of equipment, etc. ***Deloitte*** (2005; p. 11) seems to use the definitions of participants and industry suppliers as synonyms. It claims that the group of industry suppliers including individuals as stable owners, trainers, veterinarians, rodeo stock contractors, horse transportation providers, jockeys, sulky drivers, rodeo cowboys and mounted police were considered as direct participants in one study; but they were taken into account as indirect participants in a later study.

What can justify that Deloitte considered participants as ***direct participants in one year*** (1996) and the same participants as ***indirect participants in another year*** (2005) when the same calculation approach was applied? The elimination of possible double-counting of direct expenditures, as a stipulated reason, is always a requirement and, basically, is independent of the differentiation between direct and indirect participants. In addition to this, the specification of examples does not exclusively contain industry suppliers, which confirms that the expressions "participants" and "industry suppliers" cannot be regarded always as synonyms. Apart from this, there are both direct and indirect participants included in the group of direct participants. On the other hand, what could motivate Evans (2010) to take ***some direct participants into account as direct participants***, while ***ignoring consideration of other direct participants as direct participants***?

Direct employment represents jobs provided by the industry itself, ***indirect employment*** represents jobs provided as a result of spending by industry suppliers and ***induced employment*** represents jobs provided as a result of spending by industry employees, stated ***Deloitte*** (2005; p. 22). The logic hidden in these definitions seems to be the same as in the definitions of the categories of impacts. For this reason, although not stipulated, the employment was probably calculated by each of the available studies in line with the considerations of the impacts.

Adhering to the content of definitions for direct, indirect and induced impacts made by the present doctoral dissertation, definitions for direct, indirect and induced employment generated by the horse industry are determined as follows:

Direct employment: represents ***employment*** that is ***directly linked to horses and horse-related activities***; all employment that is ***required specifically for the horse and the horse-related activities***. See considerations of the horse industry (sub-sectors and requirements of environment in which horse related activities are performed) in the Literature Review.

Indirect employment: represents ***employment*** that is ***not directly related to horses and horse-related activities***; all types of employment that are ***generated during or in favor of horse-related activities***; ***however, specifically for the horse or the horse-related activity itself they are not indispensable***.

Induced employment: represents ***employment*** generated by the multiplier effects of employment ***along the value chain of final products and services provided for the horse industry*** and by the multiplier effects of ***both the direct and indirect employment of the horse industry itself***.

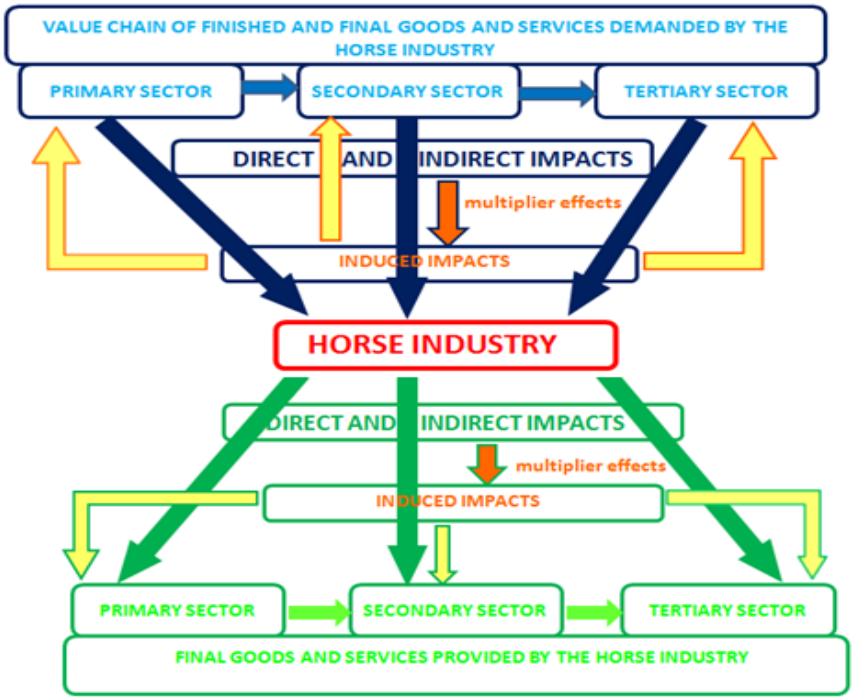


Figure 4.1: Economic impacts generated by the horse industry on the economy

Source: own construction

4.4 Estimation of the economic impacts of the Hungarian Horse Industry; the principal factors of the estimation

The economic impacts generated by the Hungarian Horse Industry were estimated by the sum of the ***direct and indirect economic impacts*** applying the ***expenditure approach*** to calculating GDP. This means that the total expenditures on finished or final goods and services were measured which were produced by the Hungarian Horse Industry in 2013. Due to the presented constraints in relation to the estimation of employment, the ***number of persons involved in the sub-sectors*** was quantified ***reliant upon their roles***, similarly to the study made by Gordon (2001). ***Key definitions*** important to the estimation of the economic impacts of the Hungarian Horse Sector were already discussed in the Literature Review. One more detail, to clarify, arisen from the overview of applied methodology is that since the ***horse industry*** includes all sub-sectors and the requirements of environment in which horse-related activities are performed, ***industry suppliers,*** which provide the necessary requirements of environment in which horse-related activities are performed, belong to the industry.

The methodology developed for estimating the economic impacts of the Hungarian Horse Industry used ***primary data collected from representatives and / or participants of sub-sectors*** through personal and / or e-mail communication. This eliminated the possibility of "producing unfavorable cost/benefit ratio" by working too much with the questionnaires and obtaining insufficient response rate and / or too much useless survey response.

Data were collected ***during the calendar year 2013 and the first half of 2014***; respondents were asked to report on ***operational and financial information***, like general level of spending. In order to estimate the economic impacts of the Hungarian Horse Industry, the ***methodology was developed on the basis of the horse and the horse-related activities*** avoiding the slightest opportunity for confusing which participants made the final expenditure on which required goods and services.

The ***number of horses*** in each of the sub-sectors was determined by data of different associations or federations, provided they were available. Then, by deducting available horse counts from the total horse population, the number of horses in the sub-sectors of leisure riding / driving and tourism was estimated. The same problem arose as in many other countries with respect to the general lack of transparent data. Table 8.1 provides information on the data source of the number of horses in different sub-sectors and segments of the industry. Table 8.2 presents

the source of operational information and general level of spending in different sub-sectors and segments of the horse industry.

As it is mentioned and summarized in table 8.2, operational and financial information was collected through personal and / or e-mail communication, with the exception of expenditures on equipment and clothing. These were calculated relied upon an average expenditure level obtained by the prices of each horse-related and rider- / driver-related purchase of equipment, clothing and tack in equipment/clothing shops (at least one per county).

Table 4.9 summarizes the typical cost and expense categories, both direct and indirect related to horses and horse-related activities in different sub-sectors and segments of the Hungarian Horse Industry. More details applied to the calculation will be presented specifically for each of the sub-sectors and segments in the chapter on *The operational characterization and economic impact estimation of the Hungarian Horse Industry in 2013*.

Table 4.9: Typical cost and expense categories, both direct and indirect, linked to horses and horse-related activities in different sub-sectors and segments of the Hungarian Horse Industry

Cost and expense category	**BR**	**F of BM**	**Aa EP**	**HR**	**E**	**ET**	**ETh**	**LA**	**wSA**	**F**
Initial investment of horse	x		x	x	x	x	x	x		
Equipment (of both horse and rider)	x	x	x	x	x	x	x	x	x	x
Amortization for above categories	x	x	x	x	x	x	x	x	x	x
Maintenance (incl. farrier services)	x	x	x	x	x	x	x	x	x	x
Veterinarian services	x	x	x	x	x	x	x	x	x	x
Training (both horse and rider)				x	x	x	x	x		
Horse and competitor related direct costs and expenses	x	x	x	x	x	x	x	x	x	x
Calendar registration fee					x					
License fee				x	x					
Entry fee (and starting fee)				x	x					
MCP				x	x					
Prize money				x	x					
Fee – event organization				x	x					
Investments on the assets of the show grounds				x	x					
Amortization of assets on the show grounds				x	x					
Sponsorship				x	x					
Event-related direct costs and expenses				x	x					
Transport	x			x	x	x				
Catering	x			x	x	x				
Accommodation					x					
Event-related indirect costs	x			x	x	x				

Source: own construction; BR: breeding; F of BM: foals of broodmares; AaEP: agricultural and ecological programs; HR: horse racing; E: equestrian including pony equestrian; ET: equestrian tourism; ET: equine therapy; LA: leisure activity; wSA: without specific activity; F: foals other than that of broodmares

4.5. Macroeconomic analysis of the environment necessary for the Equestrian Revolution

4.5.1 General observations

In the Literature Review it was referred that the horse industry can be analyzed from the point of view of ***how the general level of economy affects it***. Based on this fact, ***there must be a solid, well-explainable economic reason why the Equestrian Revolution occurred in countries where it occurred***. As a consequence, there must be a solid, easily explained economic reason, why the Equestrian Revolution has not taken place in many of the countries. ***At the same time***, the ***revealed reasons, from quantitative point of view, must explain the majority of differences experienced in equestrian demand among countries***. ***The traditional equestrian values seem to play a subordinated role in that***. If the hypotheses prove to be true, countries where horses play important roles in humans' lives in the Equestrian Revolution, must show similar tendencies with respect to the macroeconomic indicators.

Macroeconomic phenomena alone are not able to explain each subtle difference in equestrian demand among countries, because it is also influenced by equestrian tradition and assimilation difficulties, successes and failures of various activities. ***But***, ***from quantitative perspectives,*** they ***give a realistic economic approach by which the differences in demand*** for horses and horse-related activities can be explained.

In discussions of the ***sustainability and competitiveness of a horse industry, an adequate economic and social environment must first be determined, in which horse industries are able to operate.*** *Without providing an adequate macro environment, which lies within the authority of macroeconomic policies, there is no need to limit discussions to the sectorial management level*. Discussions at both macro and micro level are necessary, but only in relationship with each other. Without macro level considerations, no improvement can be foreseen at the micro level in the long-term.

This is the reason why instead of studying the structure of horse industries in different countries at the micro level, then carrying out SWOT analysis (designed to evaluate strength, weakness, opportunities and threats by identifying favorable and unfavorable internal and external factors, which have effects in achieving defined objective respective to decision-making) and developing problem and solution trees for the Hungarian Horse Industry, a ***systemic approach*** was applied ***at*** a more ***macro level***. While the analyses of horse industries were studied in

different countries, it soon became apparent that the structure of them is more or less the same: there is a head organization for each of the sub-sectors, and there may be an umbrella organization, which coordinates horse industry matters and represents interests of the horse industry as an economic sector with multiple linkages with other economic branches. ***As differences, the number of sub-sectors, their importance, and the quality of relationship between the sub-sectors can be highlighted***. All these specifications are based on need and logic, which are ***determined by country-specific characteristics, such as preferences and demand***, which, however, can be discussed in general terms, if we consider them from a more macroeconomic perspective.

In the analysis, a special reference will be given to the case of Hungary; nevertheless, the analysis will not be limited to it.

4.5.2 Selected indicators

Horse racing and equestrian

One of the most adequate ways of proving (or rejecting) the relating hypotheses, in the opinion of the author, would have been to analyze the ***number of horses at the sector and each of the sub-sectors level in each of the countries***, as well as, the ***generated economic impacts, both direct and indirect, at the sector and each of the sub-sectors level***. Unfortunately, on one hand, there would have been only few countries which could be included in the analysis, of which almost all of them with data referring to only one year; on the other hand, because of reasons detailed earlier in this chapter, neither the number of horses nor the generated economic impacts at any level obtained from available studies can be used for statistical analysis.

In order to overcome unforeseen obstacles, ***two sub-sectors***, ***horse racing and equestrian***, were decided to be analyzed, which were registered (the best) at the international level. By this measure, the research was not only limited to the few countries, in which studies on the generated economic impacts were carried out, but ***official information was obtained on each of the registered countries*** in horse racing and equestrian by the ***International Federation of Horse Racing Authorities*** (IFHA) and the ***International Equestrian Federation*** (FEI), respectively. The indicators were selected in a way of being able to well describe the sub-sectors themselves.

As it seems to be logical, sub-sectors from which no data are available at the international level, cannot be studied. However, ***revealed results obtained on*** the basis of indicators selected for describing ***the sub-sectors of horse racing and equestrian*** can be *used for the characterization of the horse sector*.

This can be so, because these two sub-sectors represent the ***tip of the iceberg*** in the horse industry, when it is considered from the point of view of the use categories, and ***have a direct relationship with each other and with other sub-sectors***, like equestrian tourism and leisure riding.

Racehorses, on one hand, are often and successfully used *in conscious breeding of horses intended for competing in equestrian disciplines* (and those horses, which prove to be insufficient for high level competition, will serve in lower level events or will be excellent for *leisure riding or equestrian tourism*). On the other hand, *horses retired from racecourses* can *compete in equestrian disciplines*, like Show Jumping, Eventing and Driving at both the high levels and lower levels.

Equestrian disciplines have a relationship with *leisure riding*, and in several cases, good results and role models in equestrian disciplines support leisure riding. All those, who do not compete but prefer to practice any of the equestrian disciplines, belong to the leisure category. *Equestrian tourism* on horseback is a recreation activity, as well, but no disciplines are practiced. However, riders from any of the disciplines or from leisure riding can participate.

The ***motivation for horses and horse-related activities***, independently from the sub-sectors, ***must be similar in every sub-sector***. As indicated earlier, horses are demanded for different activities because they satisfy immaterial needs. These ***immaterial needs are very different in nature and hierarchy***, ***like the nature and level of activities in which the presence and cooperation of horses are relied upon***.

It must be noted, as a technical information, that indicators on equestrian are limited only to the international level and to equestrian disciplines registered by the FEI, while, respective to horse racing, there is no differentiation at the national and the international level. The obtained results will reveal that there is no difference in order of magnitude between the two sub-sectors.

In order ***to avoid distortions*** derived from country-specific endowments when making comparisons among countries, ***indicators were adjusted by population*** (by 100,000 inhabitants or 1,000,000 inhabitants) as seemed to be necessary. (The principle of using the 100,000 inhabitants for horses and 1,000,000 people for events or racecourses was that an event must attract more people in order of magnitude than a horse does.) For this reason, *indicators can give results*, which are *higher than zero* but, in some cases, *also values that are equal to zero*. This is because *numbers were rounded to whole numbers*, taking into consideration that there is no half or one third… etc. horse, athlete, event, etc.

Indicators for the sub-sector of ***horse racing*** and information on them important to the analysis are provided in table 8.3, the number of countries included in the analysis (from all that registered by the IFHA) are summarized according to each of the adjusted indicators in figure 8.1. ***Indicators for*** the sub-sector of ***equestrian*** and information on them important to the analysis are provided in table 8.4, the number of countries included in the analysis (from all that registered by the FEI) are summarized according to each of the adjusted indicators in table 8.5, while those per each of the disciplines are presented in table 8.6.

As the numbers in figure 8.1 and table 8.5 reveal, ***equestrian disciplines were practiced in more countries than horse racing disciplines***, but *both sub-sectors were represented in Europe, America, Asia, Africa, Australia and New Zealand*.

Based on the ***number of different horses in horse racing*** and the ***number of horses in equestrian*** between 2010 and 2013, countries in ***Europe*** were dominant in both horse racing and equestrian (41%-43% and 54%-57%, respectively). They had more weight in equestrian than in horse racing between 2010 and 2013 in which its proportion slightly reduced in the analyzed period (see figure 4.2).

The role of ***American countries*** was more or less balanced between horse racing and equestrian (17%-20% and 19%-21%, respectively) with increasing tendency of participation in both sub-sectors. The weight of *South-American countries* in horse racing was a little more expressed than in equestrian, where that of *Central-American* countries seemed to be more widely apparent.

In the ***Asian countries*** horse racing was more popular than equestrian having represented 28%-30% of the total number of countries in horse racing and 16%-19% in equestrian. In both sub-sectors the proportional tendency of their participation seemed to be reducing.

The participation of ***African countries*** in horse racing and equestrian can be considered as balanced with 3-3 countries, having represented 6%-7% and 5%, respectively.

Australia and ***New Zealand*** were present in both sub-sectors having represented 2% and 2% by both countries in both sub-sectors. In fact, horses played significant roles in these countries. The importance of them is higher in horse racing than in equestrian, but they were relevant to equestrian, as well. On the basis of percentile ranks, Australia and New Zealand were ranked above the 95th percentile rank respective to all indicators in horse racing except for betting turnover in the case of New Zealand (between 68th and 76th percentile rank). Equestrian seems to have played more importance in New Zealand than in Australia. On the basis of the indicators in equestrian disciplines (horses, athletes and events), New Zealand were placed between 85th and 97th percentile rank, while Australia between 72nd and 84th percentile rank.

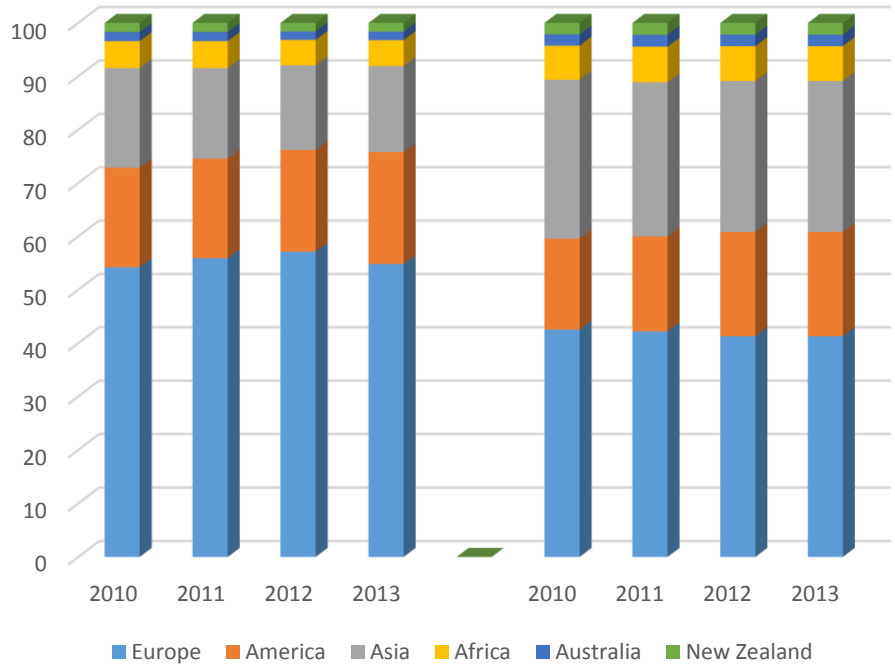


Figure 4.2: Proportion of participation of countries (%) on the basis of continents in horse racing and in equestrian in the left and the right hand side, respectively, for 2010, 2011, 2012, and 2013

Source: own construction based on own calculation on the basis of data obtained from the International Federation of Horse Racing Authorities and the International Equestrian Federation.

Economic indicators

In order to describe the necessary environment, in which horse industries are able to operate, economic indicators from the database of the ***World Bank*** and the ***Organization for Economic Cooperation and Development*** (OECD) and composed indexes by the ***United Nations Development Program*** (UNDP), the ***Social Progress Imperative*** and the ***World Economic Forum*** were selected. ***Indicators and information*** on them selected for the analysis are presented in table 8.7, while those that ***proved to be relevant to the horse sector*** are summarized in table 8.8.

The *number of countries per indicator* obtained from available databases and *average values* (arithmetic mean) used in the analysis per each of the indicators that proved to be relevant to the horse sector are presented in table 8.9. The table does not contain the *dimension of indicators*, which were specified in table 8.8. With respect to the *human development index (HDI)*, ratings were published together with world average, and the minimum value for low, medium, high and very high human development. From these values, table 8.9 presents *world average*, and *minimum value for high and very high human development* used in the present analysis.

The ***HDI*** is considered ***the most important alternative economic indicator of the research*** because of reasons detailed in the relevant sub-chapter of Literature Review ***on the importance of the evolution of immaterial needs to the demand for horses and horse related activities in the Equestrian Revolution***. As it can be seen in the relevant table, it was analyzed for the years 2005, 2008, 2010, 2011, 2012 and 2013; because, on one hand, data for these years were available at the time of carrying out the analysis and, on the other hand, reliable data were accessible from 2002 and 2010 on in horse racing and equestrian, respectively.

In accordance with the objective of having created these indicators, both ***the HDI and the SPI are intended to provide information on how economic performance converts into quality of life, how produced products and services convert into the options of consumers and what improvements are achieved*** in respect.

It is important to note that the author of the dissertation does not consider the HDI as equal to human development. The HDI created to assess how the economic performance converts into (a better) quality of life is considered as an indicator, a tool, an opportunity by which human

development can be measured. Although there are some other indicators intended to eliminate (at least moderate) the deficiency of GDP***, the author of the dissertation agrees with the concept of the HDI (and that of the SPI)*** against indicators that penalize the destruction of natural environment and crime but does not include the concept of measuring the quality of life at the level of people, important to economic considerations in the horse industry.

The ***HDI*** focuses on three essential elements of life, such as 1) ***longevity*** comprising of, for instance, life expectancy at birth, adequate nutrition and good health; 2) ***knowledge*** consisting of, among others, good quality education and outputs of higher levels of education; and 3) ***decent living standards*** covering resource management, income, presence of non-tradable goods and services and the distortions from exchange rates anomalies, tariffs and taxes.

The ***SPI*** was also included into the analysis in order to see *whether an indicator with similar purpose but different content proves to be also relevant to the horse sector*. Until completing the analysis, data were accessible only for 2013, this is why there is only one reference year respective to the indicator in the present doctoral dissertation. The ***SPI*** is based on three pillars, like 1) ***basic human needs*** consisting of nutrition and basic medical care, water and sanitation, shelter and personal safety; 2) ***foundations of well-being*** comprising of access to basic knowledge, access to information and communication, health and wellness and ecosystem sustainability; and 3) ***opportunity*** that encompasses personal rights, personal freedom and choice, tolerance and inclusion and access to advanced education. In total, the SPI classifies the countries on the basis of 52 indicators.

The ***travel and tourism competitiveness index (TTCI)*** by the *World Economic Forum* was also put under test. By the index, it was intended to highlight the importance of constructed environment to the horse sector by proving that the general level of natural, human, social and economic ***capital of a country affects the horse industry's operation*** by encouraging to unlock, or putting limitation on, the potentials of the horse sector to contribute to the wellness of people at a more micro and to the entire economy at a more macro level by generating economic impacts.

The TTCI is based on ***three broad categories of variables***, like 1) ***regulatory framework***, 2) ***business environment and infrastructure***, 3) and ***human, cultural and natural resources***, which facilitate or drive travel and tourism competitiveness. Each of the three sub-indexes is

composed of pillars that can be summarized as follows: 1) policy rules and regulations, 2) environmental sustainability, 3) safety and security; 4) health and hygiene, 5) prioritization of travel and tourism, 6) air transport infrastructure, 7) ground transport infrastructure, 8) tourism infrastructure, 9) ICT infrastructure, 10) price competitiveness in the travel and tourism industry, 11) human resources, 12) affinity for travel and tourism, 13) natural resources and 14) cultural resources. Each of the pillars is, in turn, made up of several variables (World Economic Forum, 2013).

Data on ***disposable income per capita*** were extracted from the *OECD database*, because no such indicator were found in that of the World Bank. For this reason, *there is a limitation on the number of countries included in the analysis,* 32 in total, which is generally less than the number of countries on the basis of rounded adjusted indicators in horse racing or equestrian. As a consequence, the analysis which looked for the levels of coincidence among countries with above average level disposable income per capita and countries, where horse racing or equestrian disciplines were practiced in the analyzed years, has a more subtle meaning in comparison with analyzing nearly 200 countries, in total.

4.5.3 Tools for the analysis

By the analysis, on one hand, the role of the quality of life in the horse sector (against financial conditions) was intended to prove and, the other hand, the role of the constructed environment, to which the above presented economic indicators were selected. In order to carry out the analysis, ***the simplest statistical method was preferred without any desire to specify the relationship between the variables***.

Being the most potent and providing the most pieces of information, the analysis was made by obtaining the ***levels of coincidence*** by determining the ***countries where horse racing or equestrian disciplines were practiced*** in the analyzed years on the basis of the selected indicators ***among countries ranked on the basis of the economic indicator*** in question ***below / above the average levels*** of the same indicator. The levels of coincidence were ***also obtained by determining the top 25% of countries*** ranked on the basis of ***percentile rank*** calculated by each of the ***horse racing or equestrian indicators among the top 25% of countries ranked*** on the basis of ***percentile rank*** calculated by ***each of the economic indicators that seemed to be relevant to the horse industry***. The ***range*** for percentile rank varies ***between 1 and 100***, where ***one*** is ***the lowest percentile rank*** (referring to the worst) and ***one hundred*** is ***the highest***

percentile rank (referring to the best) in the ranking made by each of the indicators. A tendency was considered ***at least at 75% of level of coincidence***.

As it was referred to above, the ***arithmetic mean*** was used (including all countries available in the database with data), where averages were required, ***because not much or less importance was intended to give to any of the countries***. The ***top 25% of countries*** meant countries ***ranked between the 100th and the 75th percentile ranks*** (including also the specified values themselves). Percentile rank was calculated for each of the registered countries in line with each of the specified indicators independently of whether the rounded adjusted indicator resulted in zero. This was the only way, of which data analysis enabled objective considerations from statistical point of view.

In order to see ***how the relationship between human development (on the basis of the HDI) and the economic performance (on the basis of the GDP per capita) is reflected*** in the group of countries, where horse racing or equestrian disciplines were practiced in the analyzed years, a ***classification of countries was made*** on the model of concept introduced by Ramirez-Ranis-Stewart (1998). ***The four groups of classification were as follows: countries characterized by*** "***virtuous cycles***", "***vicious cycles***", "***human development lopsidedness***" ***and*** "***economic growth lopsidednesss***". The classification of countries was made by the *average GDP per capita* (including all countries with the same importance) and the published *world average for the HDI*.

RESULTS AND DISCUSSION

5. OPERATIONAL CHARACTERIZATION AND ECONOMIC IMPACT ESTIMATION OF THE HUNGARIAN HORSE INDUSTRY IN 2013

5.1 General observations

In 2013, ***74,000 horses*** were registered by the Hungarian Central Statistical Office. Table 5.1 provides information on the distribution of horses among the sub-sectors of the industry. As it can be seen, ***the mature horses*** in the population were ***primarily in use for leisure purposes, breeding and equestrian***.

Table 5.1: Distribution of horses registered by the Hungarian Central Statistical Office in 2013

Subsector or segment	Number of horses	Distribution of mature horses in the sub-sectors (%)
Breeding	10,668	25
Foals of broodmares between 6 months and 3 years of age	(13,166) 9,450*	-
Racing	924	2
Equestrian (horses and ponies)	4,880 + 1,708	16
Tourism	5,000	12
Therapy	70	0 (0.15)
Agricultural and ecological programs**	1,000	2
Recreation (in clubs and at home)	8,846 + 4,423	32
Without specific use activity	4,423	11
Foals others than those of broodmares	(18,892) 11,575*	-
Total	74,000	100

Source: own construction

*: This is the final realistic estimation for the specified category after estimated mortality and sale to abroad; ** With respect to the estimated number of horses "participating" in agricultural and ecological programs, some overlaps are considered as probable, mainly with the sub-sector of breeding.

In order to be able to assess the ***magnitude of the Hungarian horse population***, the total number of horses was divided by 1,000 inhabitants and it was compared at the international level (see table 5.2). ***The highest number of horses per 1,000 inhabitants*** belonged to Iceland (the same number occurred in two different sources, so it must be correct, nevertheless, the number of wild horses is suspected to be included, as well), followed by Australia, Sweden, Denmark and the United States. Ireland, Canada, Belgium, Norway and the Netherlands had fewer horses than the aforementioned group of countries, but their horse population per 1,000

inhabitants was still above average in the analyzed year. There are only some countries with less than 10 horses per 1,000 people, among them, also Hungary.

Table 5.2: Ranking of countries based on the total number of horse per 1,000 inhabitants

Country	Number of horses per 1,000 inhabitants	Number of horses
Iceland*	253	77,158
Australia	43	900,000
Sweden*	39	360,000
Denmark	31	170,000
United States	31	9,222,800
Ireland	30	128,500
Canada	29	963,500
Belgium	28	300,000
Norway*	26	125,000
Netherlands	24	400,000
Spain	16	723,500
France	15	950,000
Germany	15	1,200,000
Finland*	14	75,500
Switzerland	13	100,000
Great Britain	13	800,000
Austria	11	93,000
Italy	11	647,200
Russian Federation*	10	1,378,500
Lithuania*	9	28,754
Czech Republic*	7	76,365
Hungary	7	74,000
Portugal*	5	56,014

Source: own construction based on own calculation from data obtained from Gordon, 2001; Clausen, 2014; Deloitte, 2005; Horse Sport Ireland, 2013; Hodgett-O'Keeffe, 2013; Evans, 2010; Lejeune, 2010; Häggblom-Rantamäki-Lahtinen-Vihinen, 2006; Deloitte, 2013; Jez-Coudurier-Cressent-Méa, 2013; Brade, 2013; Lejeune, 2010; Henley Centre, 2004; Schneider-Mahlberg, 2005; Ruffo Scaletta, 2012; Hungarian Central Statistical Office, 2013, respectively. *Réseau REFErences, 2014. With respect to Iceland, also Sigurðardóttir-Helgadóttir, 2015. Data on the number of population were extracted from the database of the World Bank.

With respect to ***the sub-sectors of the Hungarian Horse Industry***, principally the ***use activities*** were general ***in addition to breeding***, like horse racing, equestrian, equestrian tourism, leisure riding and equine therapy (and not the sub-sectors of production, like meat, milk, serum and urine of pregnant mares). More details on the use activities will be given below.

The ***foreign trade of horses*** was not significant in Hungary in 2013; neither had been it before. According to the Hungarian Statistical Office, there were 8 imported and 13 exported breed animals at a free-at-frontier price of 10,813 euros and 96,368 euros, respectively; 16 imported and 93 exported horses other than breed horses and horses for slaughter purposes at a free-at-frontier price of 19,124 euros and 176,589 euros, respectively; and 110 horses exported for

slaughter purposes at a free-at-frontier price of 80,342 euros. In summary, ***the foreign trade of horses, in terms of net export, amounted to 323,362 euros, in total***.

5.2 Horse breeding

5.2.1 Operational characterization of Hungarian Horse Breeding

There were 13 ***breeding associations*** affiliated to the Hungarian Horse Breeder's Federation in 2013, and this is the case today, as well (see table 5.3). Of the 13 associations, five dealt with the breeding of traditional Hungarian horses including the Lipizzan, which has a specific situation because of the Kingdom of Hungary (the five mentioned associations exclude that of the donkey, which is of traditional Hungarian breed). Other breeds, like the Hungarian Coldblood, the Hungarian Sport Horse and the Hungarian Trotter are not traditional. Their breeding was initially based on imported broodmares and / or stallions and the situation is partly so today. Among the pony and small horse breeds there is one Hungarian breed, the Hucul, which has the same situation as the Lipizzan. In Hungary, ***approximately 20 breeds*** were bred including the pony and small horse breeds, while in France, for instance, 63 breeds were bred, of which 26 had French origin (Cressent-Jez, 2013, p. 58). It is true, however, that per 1 million inhabitants, there were more breeds registered for Hungary (2.02) than for France (0.96).

Based on the counts, ***the most popular breeds*** were the Hungarian Sport Horse, the Coldblood, the Lipizzan, the Kisbér halfbred, the Arabian horse and the ponies. Their importance was different with respect to the number of breeders, broodmares, stallions and newborn foals. Figure 5.1 provides an overview of the distribution of breeds based on the above mentioned criteria.

In order ***to rank Hungary on the basis of the breed animal population at the international level***, the number of breed animals were divided by 1,000 inhabitants. According to the calculation based on data of ten countries, Hungary is ranked the last with one breed animal per 1,000 inhabitants. The highest number of breed animals per 1,000 inhabitants could be found in Ireland and Belgium (17-17) followed by Canada (12), Australia (9) and France (7).

Table 5.3: Number of breeders, broodmares, stallions and newborn foals registered in Hungary in 2013

Breed	Number of breeders	Number of broodmares	Number of stallions	Number of foals
Akhal-Teke	19	49	8	0
Arabian horses	123 (Shagya) 56 (Purebred)	537 (Shagya) 218+75 (Purebred and other Arabian)	50 (Shagya) 16 (Purebred)	117 (Shagya) 39+5 (Purebred and other Arabian)
Furioso-North Star	210	585	73	110
Thoroughbred	56	388	51	140
Coldblood	333	874	180	396
Kisbér halfbred and Gidrán	306	259 (Gidrán) 763 (Kisbér halfbred)	19 (Gidrán) 93 (Kisbér halfbred)	75 (Gidrán) 195 (Kisbér halfbred)
Lipizzan	342	738	93	292
Nóniusz	248	605	68	207
Ponies and Small horses	119 (Hucul) 132 (other breeds)	257 (Hucul) 229 (other breeds)	17 (Hucul) 53 (other breeds)	139 (Hucul) 82 (other breeds)
Quarter Horse	117	360	7	92
Hungarian Sport Horse	693	881	154	214
Trotter	54	241	35	83
Donkey	83	398	37	71
Total	**2,891**	**7,457**	**954**	**2,257**

Source: own construction based on data from the Hungarian Horse Breeder's Federation

There were five plus one ***state stud-farms*** in 2013, Mezőhegyes, Bábolna, Hortobágy, Szilvásvárad, its affiliate stud-farm, Marócpuszta, and Aggtelek-Jósvafő. (The stud-farm at Jósvafő is governed by the Aggtelek National Park, which means that it is although a state owned property, the responsible ministry is not the Ministry of Agriculture as in the case of the other state stud-farms.) Table 5.4 summarizes the Hungarian state stud-farms with their approximate number of broodmares and the share of broodmares of the total registered broodmare population. It is interesting to note that the Mezőhegyes halfbred (Furioso North Star) and the Kisbér halfbred, traditional Hungarian breeds, did not have state stud-farms in 2013.

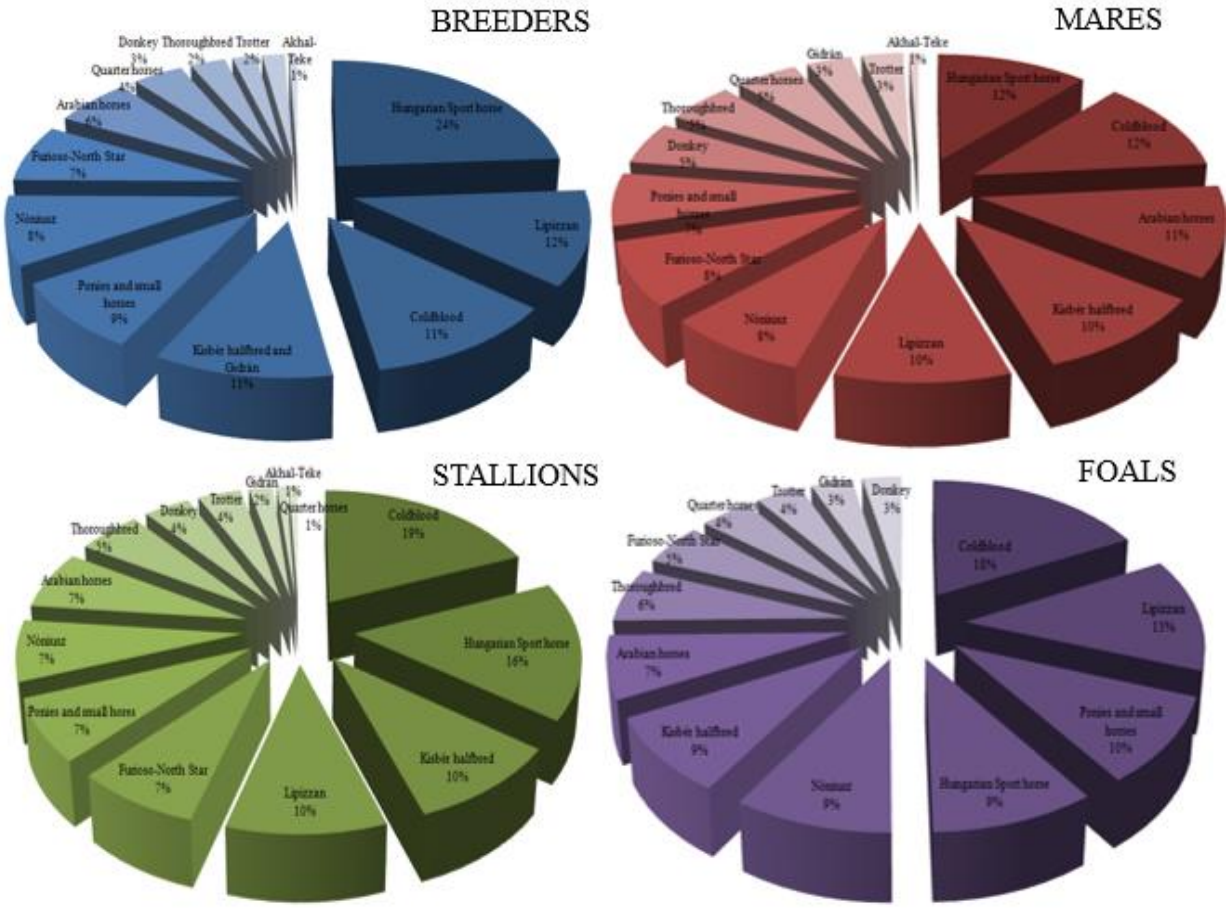


Figure 5.1: Distribution of breeds based on the number of breeders, broodmares, stallions and newborn foals registered in Hungary in 2013.

Source: own construction based on own calculation on the basis of data obtained from the Hungarian Horse Breeder's Federation.

The Hungarian traditional breeds were quite under-represented ***in equestrian*** in the analyzed year comparing them with all other breeds present in equestrian disciplines (see table 5.5). There could hardly be found examples representing more than 5% share: exceptions are the Bábolna Arabian (Shagya-Arabian) in Endurance, the Lipizzan in Driving, the Kisbér halfbred in Eventing and Vaulting and the Mezőhegyes halfbred (Furioso North Star) in Vaulting.

The ***distribution of participation of each of the Hungarian traditional breeds*** in the equestrian disciplines is presented in table 5.6. From the table it can be seen that the Lipizzan in Driving, the Bábolna-Arabian (Shagya-Arabian) in Endurance, the Gidrán, the Kisbér halfbred and the Mezőhegyes halfbred (Furioso North Star) in Show Jumping were used the most widely.

Table 5.4: Hungarian state stud-farms, the number of their broodmares and the share of them of the total broodmares population in each of the breeds in Hungary in 2013.

State stud-farm	Breed and number of broodmares within the breed	Share of broodmares bred in state stud-farm of the total number of broodmares
Mezőhegyes	Nóniusz, approx. 50 broodmares Hungarian Trotter, approx. 30 broodmares; Hungarian Sport Horse, approx. 30 broodmares	8% 12% 3%
Bábolna	Shagya-Arabian and Purebred Arabian, altogether approximately 100 broodmares Thoroughbred, approx. 25 broodmares	12% 6%
Hortobágy	Nóniusz, approx. 50 broodmares Hungarian Sport Horse, approx. 15 broodmares	8% 2%
Szilvásvárad	Lipizzan, approx. 50 broodmares	7%
Marócpuszta (Szilvásvárad)	Gidrán, approx. 35 broodmares	14%
Aggtelek-Jósvafő (National Park)	Hucul, approx. 80 broodmares	31%

Source: own construction based on data obtained from the Hungarian Horse Breeders' Federation

Table 5.5: Representation of the Hungarian traditional horse breeds in Hungarian Equestrian in comparison with all other breeds present in the equestrian disciplines in 2013 (%)

Breed	DRE	SJG	EVN	DRI	END	VLT	RNG
Furioso North Star	1.97	1.34	0.99	1.41	-	13.04	2.27
Gidrán	0.66	1.27	2.10	-	-	-	-
Nóniusz	0.22	-	0.12	0.18	-	-	-
Kisbér halfbred	4.39	4.49	5.93	4.04	2.05	8.70	2.27
Lipizzan	2.41	-	0.12	28.47	1.37	-	-
Shagya-Arabian	1.10	0,58	0.25		36.99	-	2.27

Source: own construction based on own calculation from data obtained from the Hungarian Equestrian Federation. Note: DRE: Dressage; SJG: Show Jumping; EVN: Eventing; DRI: Driving; END: Endurance; VLT: Vaulting, RNG: Reining

Table 5.6: Distribution of participation of each of the Hungarian traditional breeds in the equestrian disciplines in Hungary in 2013 (%)

Breed	DRE	SJG	EVN	DRI	END	VLT	RNG	Total
Furioso North Star	13.64	56.06	12.12	12.12	-	4.55	1.52	100
Gidrán	5.45	63.64	30.91	-	-	-	-	100
Nóniusz	33.33	-	33.33	33.33	-	-	-	100
Kisbér halfbred	9.05	56.11	21.72	10.41	1.36	0.90	0.45	100
Lipizzan	6.25	-	0.57	92.05	1.14	-	-	100
Shagya-Arabian	6.41	20.51	2.56	-	69.23	-	1	100

Source: own construction based on own calculation from data obtained from the Hungarian Equestrian Federation. See the note below table 5.5.

5.2.2 Comparison of equestrian results of Hungarian breeds with those of other breeds

The ***international equestrian successes of Hungarian breeds*** were studied on the basis of an indicator made by the ***top six placed horses' breeds at the World Equestrian Games between 2002 and 2014*** (before 2002, the breed of horses was not available in the result sheets). Of the 33 breeds represented, there were 4 breeds with Hungarian origin. These breeds were the *Bábolna Arabian (Shagya-Arabian), percentile rank: 78*; the *Hungarian Sport Horse, percentile rank 60*; the *Mezőhegyes halfbred (Furioso North Star), percentile rank 37*; and the *Lipizzan, percentile rank 2*; placed the first and the third in Endurance in 2006 and 2014, respectively, the first and the third in Vaulting in 2010 and 2006, respectively, and the sixth in Driving in 2006. Except for the achieved result of the Lipizzan breed, all these performances were achieved by foreign athletes, such as from the Slovak Republic, Spain and Qatar and Switzerland, respectively.

The ranking of the countries shows clearly that there is nothing to do with the centuries-old breeding history with respect to equestrian successes. The "theory" that the centuries-old breeds are not able to meet today's requirements in the equestrian disciplines is neither supported. There were both quite "young" (e.g. Belgian Warmblood, KWPN) and quite "old" breeds (e.g. Purebred Spanish Horse, Lipizzan) represented at the World Equestrian Games in the top six places. The ranking seems to support the already discussed research findings on the importance of environmental factors (75%) on the horses' performance.

5.2.3 Economic impacts generated by Hungarian Horse Breeding

The ***sub-sector*** of ***breeding*** of the Hungarian Horse Industry generated ***20,588,203 euros totally***, of which ***20,352,040 euros were in direct economic impacts*** and ***236,163 euros were in indirect economic impacts***. As was described in the chapter on Methodology (see table 4.9), the direct impacts were calculated on the basis of the initial investment of breed animals, horse equipment, amortization of breed animals (rate of substitution), amortization of equipment, maintenance and veterinarian services applied to the number of broodmares, stallions and newborn foals (until 6 months of age). The indirect impacts included transportation expenditures of horses, breeders and / or owners and officials and catering expenditures of breeders and / or owners and officials. These ***indirect impacts*** were calculated ***over the morphological shows*** and ***the stallions' performance testing events*** and did not include any of the agricultural exhibitions where, apart from horses, several other farm animal species were presented in addition to the most diverse products and services related to agriculture (in

Budapest, Bábolna, Debrecen, Hódmezővásárhely, Kaposvár and Szentlőrinc). At these agricultural exhibitions, a total of 178,000 spectators were estimated generating approximately 11,570,000 euros in indirect impacts calculated on the transportation (100 euros per two persons) and catering (15 euros/person) expenditures. Considering, however, that these impacts cannot be attributed to the sub-sector of breeding of the Hungarian Horse Industry, the final estimate on the impacts do not include these indirect impacts. On the other hand, the estimated impacts include both ***the direct and indirect impacts of the Hungarian Horse Breeders' Federation***. Table 5.7 provides information on the calculation. (The Hungarian Horse Breeders' Federation did not give authorization to publish the exact amount of impacts of the Federation, for this reason, the sub-totals of the estimation will not be published in the present dissertation).

Table 5.7: Cost and expense categories and specific information on the estimation of impacts generated by Hungarian Horse Breeding in 2013

Cost and expense category	Source of information	Note
Horse initial investment	Hungarian Horse Breeders' Federation	
Rate of substitution	Hungarian Horse Breeders' Federation	mares: 12,5% per year stallions: 16,5% per year
Horses maintenance (including farrier services)	Directors of state stud-farms	feed (10 kg hay/day; 2,5 kg oat/day; 0,25 kg vitamins, minerals), bedding (10 kg straw/day, groom (490 eur/horse/year) and farrier services (9 occasions, no shoeing). Together: 1,495 eur/horse/year
Horse equipment	Published prices of equipment necessary for breed animals; Directors of state stud-farms	own calculation stipulated in chapter 4 basic necessary equipment for keeping the horse in the stable, cleaning, leading and lounging. 935 eur/horse/year
Amortization of equipment		10 years
Veterinary costs	Directors of state stud-farms	300 euros/broodmare/year, 150 euros/stallion/year, 75 euros/foal/year
Direct impacts of the Federation	Hungarian Horse Breeders' Federation	
Indirect impacts of the Federation	Hungarian Horse Breeders' Federation	
Number of horses at breeding shows of each of the breeding associations	Hungarian Horse Breeders' Federation	
Number of participants		two participants per horse
Catering	Own estimation	20 euros per day
Transportation		300 km per horse

Source: own construction

In relation to the sub-sector of breeding, ***the economic impacts generated by the upkeep and nurturing of foals between 6 months and 3 years of age*** must be estimated, as well. The total

number of foals in this segment was calculated on the basis of the registered newborn foals presented in table 5.3. Details used for the calculation is summarized in table 5.8. The total impacts of the described segment were estimated at a value of ***5,793,645 euros***, which means ***direct economic impacts***.

There were ***3,716 foals with recognized pedigree but not registered by any of the breeding associations***. The impacts generated by these foals amounted to ***8,439,083 euros in direct impacts***. For more details, see table 5.8.

Table 5.8: Information on data used for the calculation of economic impacts generated by the upkeep and nurturing of foals between 6 months and 3 years of age in Hungary in 2013

Description	**Source of information**	**Note**
Number of foals	Hungarian Horse Breeders' Federation	*between 6 months and 1 year of age*: 70% of newborn foals *between 1 year and 2 years old age*: 70% of the 70% of newborn foals *between 2 years and 3 years of age*: 80% of the 70% of the 70% of newborn foals
Foal investment	Hungarian Horse Breeders' Federation	
Amortization of foals		40%
Foal maintenance (including farrier services)	Directors of state stud-farms; Hungarian Horse Breeders' Federation	*between 6 months and 1 year of age:* half of the annual costs on feed, bedding, hoof care and groom *between 1 year and 2 years of age*: half of the annual costs on feed and bedding and groom *between 2 years and 3 years of age*: half of the annual costs on feeding and bedding and groom during 6 months and annual costs on feeding, bedding, hoof care and groom during 6 months
Equipment	Published prices of equipment necessary for breed animals; Directors of state stud-farms	own calculation stipulated in chapter 4. As per in breeding, but half of the expenditures were applied to foals keeping at home
Amortization of equipment		40%
Veterinary costs	Directors of state stud-farms	75 euros/foal for 6 months between 6 months of age and 1 year; 85 euros/foal between 1 and 2 years of age; 100 euros/foal between 2 and 3 years of age

Source: own construction

5.3 Horse racing

5.3.1 Operational characterization of Hungarian Horse Racing

Horse racing in Hungary has been based on two breeds: the ***Thoroughbred*** and the ***Trotter***, in contrary to some other countries, where Purebred Arabians *(e.g. in the United Arab Emirates, Qatar, the Sultanete of Oman, the Syrian Republic, France, the United States, the Netherlands, Turkey, Great Britain, Russia, etc.)* and Quarter Horses *(e.g. in the United States)* also race (International Federation of Horse Racing Authorities, 2013; American Quarter Horse Association, 2015).

Horse racing in Hungary did not form an "industry" in 2013, in contrary to, for instance, that in Ireland, France, Australia or the United States. The ***four agents responsible for racehorse breeding, training and racing of horses, organization of race meetings and organization of bets operated in different interest groups***. There were two courses in use, one in Budapest, where race meetings were held, and at Alag which principally served as training center. The most important data on Hungarian Horse Racing are provided in table 5.9.

Table 5.9: The most important data on Hungarian Horse Racing in 2013

Description	Flat racing	Jump racing	Harness racing
Number of racehorses	463		461
Number of breeders	240		199
Number of jockeys /drivers	107 professional 43 amateur	12 professional	135 professional 107 amateur
Number of trainers	62	7	58
Number of stables	168		191
Number of race meetings	31		59
Number of races	311		486
Number of starts	2 722	18	4,704
Total prize money (EUR)	802,326	4 718	772,741
Owners' premium (EUR)	55,993	-	59,150
Breeders' premium (EUR)	55,993	-	59,150
Total betting turnover (EUR)	2,376,457		

Source: own construction based on the database of Hungarian Horse Racing, Magyarturf and the IFHA.

5.3.2 Comparison of Hungarian Horse Racing with that of other countries

In order to be able to compare data on Hungarian Horse Racing at the international level, information was collected on the ***number of different horses***, the ***number of breed horses***, the ***number of starts***, the ***number of racecourses***, ***betting turnover*** and ***prize money*** in 2013 from the database of the International Federation of Horse Racing Authorities. Data were adjusted by 100,000 inhabitants, with the exception of the number of racecourses, where the benchmark was 1 million people. The top 25% of countries per each of the specified indicators calculated on the basis of percentile rank and the rank of Hungary are presented in tables 5.10-5.15.

On the basis of the ***number of different horses registered in the disciplines of horse racing divided by 100,000 inhabitants***, New Zealand had the highest number of horses closely followed by Australia, then Sweden and Ireland and, behind them, Cyprus, Norway and Macao. In ***Hungary***, 9 racehorses per 100,000 inhabitants raced in 2013, by which it could be ranked in the 41st percentile rank.

Table 5.10: Top 25% of countries ranked on the basis of percentile rank calculated by the number of different horses in horse racing and the rank of Hungary in 2013

Country	Nº of different horses per 100,000 people	Percentile rank
New Zealand	199	100
Australia	183	99
Sweden	157	97
Ireland	155	95
Cyprus	106	93
Norway	105	90
Macao	102	88
Uruguay	75	86
France	46	84
Canada	41	82
Mauritius	37	80
Bahrain	30	78
United Kingdom	29	76
Hungary	9	41

Source: own construction based on own calculation from data obtained from the IFHA

Table 5.11: Top 25% of countries ranked on the basis of percentile rank calculated by the number of breed horses in horse racing and the rank of Hungary in 2013

Country	Nº of breed horses per 100,000 people	Percentile rank
Ireland	279	100
New Zealand	125	99
Australia	123	97
Uruguay	94	94
Sweden	56	92
Cyprus	54	90
United States	45	87
France	41	85
Norway	38	83
Argentina	35	80
Chile	14	78
Canada	14	76
Hungary	4	36

Source: own construction based on own calculation from data obtained from the IFHA

Table 5.12: Top 25% of countries ranked on the basis of percentile rank calculated by the number of starts in horse racing and the rank of Hungary in 2013

Country	Nº of starts per 100,000 people	Percentile rank
Australia	1,413	100
New Zealand	1,349	99
Sweden	1,143	97
Norway	967	95
Macao	953	92
Cyprus	858	90
Ireland	639	88
Canada	409	86
France	344	84
Chile	326	82
United States	222	79
Mauritius	215	77
Singapore	197	75
Hungary	75	51

Source: own construction based on own calculation from data obtained from the IFHA

Table 5.13: Top 25% of countries ranked on the basis of percentile rank calculated by the number of racecourses in horse racing and the rank of Hungary in 2013

Country	Nº of racecourses per 1,000,000 people	Percentile rank
Australia	21	100
New Zealand	14	99
Ireland	6	97
Serbia	4	95
France	4	92
Sweden	3	90
Norway	3	88
Macao	2	86
Czech Republic	1	84
Switzerland	1	82
United Kingdom	1	79
Cyprus	1	77
Canada	1	75
Hungary	0 (0.1011)	18

Source: own construction based on own calculation from data obtained from the IFHA

On the basis of the ***number of breed horses***, Ireland kept the highest number of horses per 100,000 inhabitants in breeding followed by New Zealand, Australia, Uruguay, Sweden, Cyprus, the United States and France. In Hungary, the number of breed horses amounted to 4 per 100,000 people. On the basis of this result, Hungary could be placed in the 36th percentile rank.

Based on the ***number of starts per 100,000 inhabitants***, Australia was the most excelling country in 2013, closely followed by New Zealand, then Sweden, Norway and Macao. There were 75 starts organized per 100,000 people in Hungary in 2013 by which it was placed in the 51st percentile rank. For comparison, in Australia, 1,413 starts were held per 100,000 people.

On the basis of the ***number of racecourses per 1,000,000 inhabitants***, again, Australia was the most excelling country, followed by New Zealand then Ireland, Serbia, France and Sweden. Per

1 million people, Hungary did not have at least one racecourse (only 0.1011), by which it can be placed in the 18th percentile rank.

Table 5.14: Top 25% of countries ranked on the basis of percentile rank calculated by betting turnover and the rank of Hungary in 2013

Country	Betting turnover per 100,000 people	Percentile rank
Hong Kong	132,678,495	100
Ireland	58,173,124	99
Australia	49,295,217	96
Macao	29,283,259	94
United Kingdom	19,453,496	91
Singapore	16,783,067	89
Japan	14,988,886	86
France	14,811,513	84
Sweden	14,292,195	81
Mauritius	10,992,555	79
New Zealand	8,938,319	76
Hungary	24,021	14

Source: own construction based on own calculation from data obtained from the IFHA

Table 5.15: Top 25% of countries on the basis of percentile rank calculated by prize money and the rank of Hungary in 2013

Country	Prize money per 100,000 people	Percentile rank
Macao	2,021,512	101
Australia	1,953,515	99
Hong Kong	1,157,592	97
New Zealand	1,064,648	95
Ireland	1,000,067	93
Sweden	979,188	91
Singapore	728,076	89
France	659,727	87
Norway	652,629	85
Cyprus	594,694	83
Qatar	510,297	81
Japan	449,537	79
Canada	401,095	77
Hungary	15,969	26

Source: own construction based on own calculation from data obtained from the database of the IFHA

In the ranking of ***betting turnover per 100,000 people***, Hong Kong was the first, followed by Ireland, Australia, Macao and the United Kingdom, etc. In Hungary, betting turnover amounted to 24,021 euros per benchmark (while that in Hong Kong was in excess of nearly 133 million euros per 100,000 inhabitants), by which it was placed in the 14th percentile rank.

On the basis of ***total prize money per 100,000 people***, Macao was ranked the first, followed by Australia, Hong Kong, New Zealand, Ireland and Sweden, etc. Hungary was ranked in the 26th percentile rank by sharing 15,969 euros of prize money, in total, per 100,000 inhabitants.

5.3.3 Economic impacts generated by Hungarian Horse Racing

By ***Hungarian Horse Racing 17,172,294 euros*** were generated ***in total in 2013***, of which ***17,013,958 euros were in direct economic impacts*** and ***158,336 euros were in indirect economic impacts***. Total ***betting turnover*** amounted to ***2,376,457 euros***, of which ***70%*** was returned ***to bettors*** and ***30% to cost management***. The share of the two racing disciplines of the generated direct impacts was 49% and 51%, and of the indirect impacts 36% and 64% between gallop racing and harness racing, respectively. The cost and expense categories of calculation and details on data used for the estimate are provided in table 5.16. For a more detailed estimate, see table 9.1, appendix 3.

Table 5.16: Cost and expense categories of the estimation of impacts generated by Hungarian Horse Racing

Cost and expense category	Source of information and / or Note
Registered number of racehorses	Database of the Hungarian Horse Racing sub-sector
Registered number of jockeys / drivers	Database of the Hungarian Horse Racing sub-sector
Horse investment	Executive vice-president of the Hungarian Trotter Breeders' Association; General Manager of the Hungarian Jockey Club*
Amortization of horses	Executive vice-president of the Hungarian Trotter Breeders' Association; General Manager of the Hungarian Jockey Club
Horse maintenance (including feeding, bedding, training, management, racing and farrier services)	Executive vice-president of the Hungarian Trotter Breeders' Association; General Manager of the Hungarian Jockey Club Information on farrier services obtained from farriers shoeing racehorses
Jockey / driver equipment	Published prices of equipment, own estimate after discussing what was necessary
Horse equipment	Published prices of equipment; own estimate after discussing what was necessary
Amortization of equipment	The same as the amortization of horses
Veterinary services	Executive vice-president of the Hungarian Trotter Breeders' Association; General manager of the Hungarian Jockey Club for 75% of racehorse population, average veterinary costs of given range, for 15% of racehorse population, 25% of the costs of given range, for 10% of racehorse population, 75% of the costs of given range
Amortization of racecourse	Executive vice-president of the Hungarian Trotter Breeders' Association; General Manager of the Hungarian Jockey Club In fact, the fee for using the racecourse was taken into account because there were no data on amortization.
Registration fee	Executive vice-president of the Hungarian Trotter Breeders' Association; General Manager of the Hungarian Jockey Club
Number of race meetings	Hungarian horse racing database
Number of starts	Database of the Hungarian Horse Racing sub-sector and the International Federation of Horse Racing Authorities
Entry fee	Executive vice-president of the Hungarian Trotter Breeders' Association; General Manager of the Hungarian Jockey Club
Start fee	Executive vice-president of the Hungarian Trotter Breeders' Association; General Manager of the Hungarian Jockey Club

Source: own construction; *The Hungarian Jockey Club organizes harness racing, as well.

Table 5.16 continued: Cost and expense categories of the estimation of impacts generated by Hungarian Horse Racing

Cost and expense category	Source of information and / or Note
Riding / driving fee	Executive vice-president of the Hungarian Trotter Breeders' Association; General Manager of the Hungarian Jockey Club
Showing fee	Executive vice-president of the Hungarian Trotter Breeders' Association; General Manager of the Hungarian Jockey Club. Only in the gallop discipline.
Doping test fee	From equestrian data on MCP
Prize money	Database of the Hungarian Horse Racing sub-sector and the International Federation of Horse Racing Authorities
Number of Officials and Staff at race meetings	Database of the Hungarian Horse Racing sub-sector
Fee for the Officials and Staff at race meetings	Executive vice-president of the Hungarian Trotter Breeders' Association; General Manager of the Hungarian Jockey Club
Sponsorship	Executive vice-president of the Hungarian Trotter Breeders' Association; General Manager of the Hungarian Jockey Club
Catering for Officials and Staff	15 eur / day
Catering for Participants	15 eur / day
Transportation of horses	Executive vice-president of the Hungarian Trotter Breeders' Association; General Manager of the Hungarian Jockey Club information on distance and price of transportation
Transportation of participants	It was supposed that participants arrived together with the racehorses

Source: own construction. See the note below the table at the previous page.

5.4 Equestrian

5.4.1 Operational characterization of Hungarian Equestrian

Equestrian in Hungary was comprised of the FEI disciplines in 2013 which were ***Show Jumping, Dressage, Eventing, Driving, Endurance, Vaulting*** and ***Reining***. In addition to these disciplines, the Hungarian Equestrian Federation registered ***Western***, as well. The number of registered athletes, horses, associations, trainers and judges at the national level in 2013 is provided in table 5.17. Figure 5.2 illustrates the share of athletes and horses in each of the equestrian disciplines *("Athletes" is the term officially used by the International Equestrian Federation in order to refer to competitors in each of the disciplines).*

Both the table and the figure show the dominance of Show Jumping followed by Driving based on the ***number of athletes***. Although more ***horses*** seem to be registered in Eventing than in Driving, alone the number of horses in Eventing in the table is misleading because it also contains horses that competed in other disciplines. The number of horses that competed exclusively in Eventing in 2013 was 133 (Hungarian Equestrian Federation, 2015, personal communication). The same stipulation must be true of the ***number of associations***. On the basis of the ***number of trainers***, Show Jumping had the highest share followed by Dressage,

Eventing, Vaulting and Driving. The small share of Driving must be explained by the more complex nature of this discipline in comparison with other disciplines. Based on the ***number of judges***, Driving dominated followed by Show Jumping. The high number of judges in Driving implies the general attraction to this activity, in addition to discipline-specific characteristics like the high demand for judges in the marathon competition.

Table 5.17: Number of registered athletes, horses, associations, trainers and judges in Hungarian Equestrian in 2013

Discipline	Number of athletes	Number of horses	Number of associations	Number of trainers	Number of judges
Show Jumping	1,534	2,764	316*	207	95
Dressage	367	456	117	52	21
Eventing	100	810*	316*	26	10
Driving	533	569	162	10	135
Endurance	75	146	28	3	4
Vaulting	93	23	6	12	6
Reining	34	44	17	7	0
Western	55	68	23	7	4
Total	2,791	4,880	481 (different)	324	275

Source: own construction based on the database of the Hungarian Equestrian Federation.

*The number of horses in Eventing contains horses, as well, that also compete in other disciplines, especially in Show Jumping

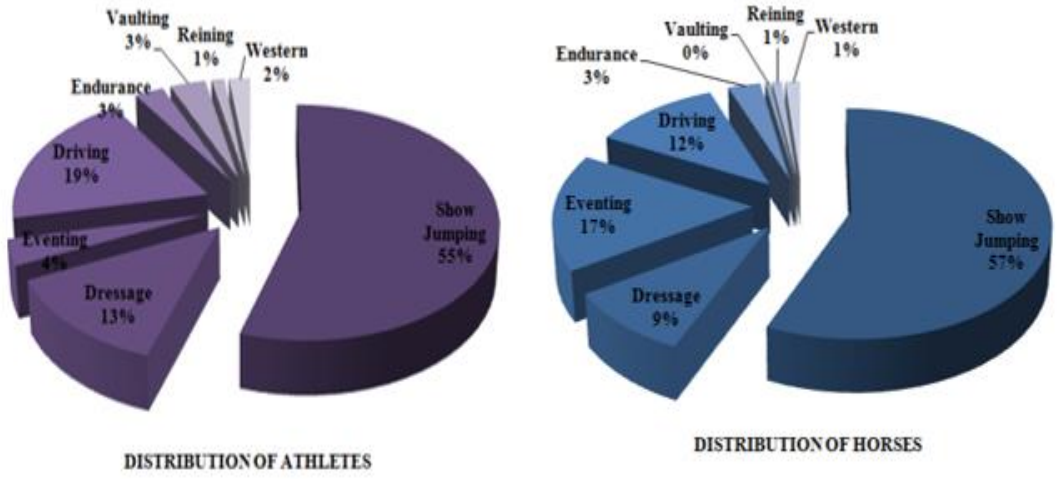


Figure 5.2: Distribution of athletes and horses in the equestrian disciplines in Hungary in 2013

Source: own construction based on calculation on the basis of the Hungarian Equestrian Federation

5.4.1.1 Athletes in the equestrian disciplines in 2013

Based on the ***gender***, ***female athletes*** dominated Hungarian Equestrian in 2013 (similarly to observations in other countries like France), from which only Driving was an exception (see figure 5.3). With respect to the ***age*** of athletes, the following consequences can be drawn: the highest number of athletes in the youngest age category competed in Vaulting; the highest number of athletes, other than in Vaulting and Driving, was born between 1990 and 1999 (in 2013, 14-23 years old athletes); in the oldest age category (between 1940 and 1949; in 2013, 64-73 years old athletes), athletes competed in Eventing, Driving and Endurance. For more details, see figure 5.4.

On the ***geographical distribution*** of equestrian disciplines, figure 5.5 provides information. As it can be seen, equestrian disciplines were practiced all over the country. The highest number of athletes was registered in the county of Pest followed by Bács-Kiskun and Győr-Moson-Sopron. The share of these three counties from the total number of athletes was 46%. The lowest number of athletes was registered in the county of Nógrád.

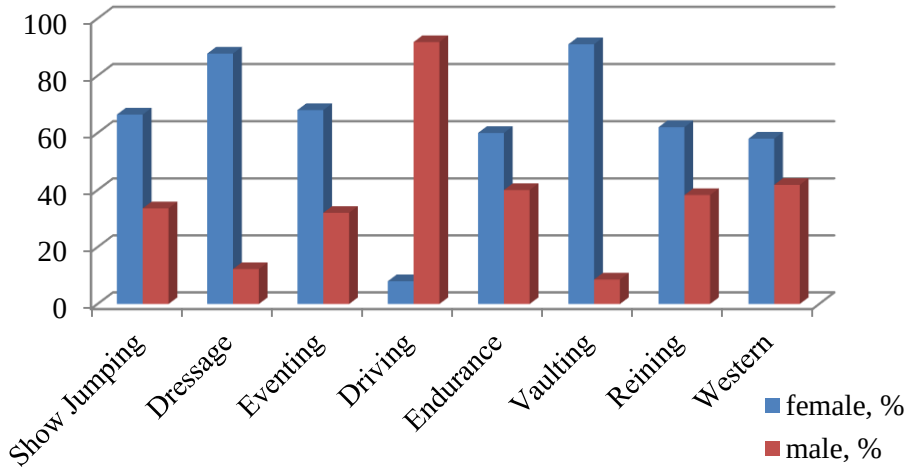


Figure 5.3: Distribution of male and female athletes in each of the equestrian disciplines in Hungary in 2013

Source: own construction based on data of the Hungarian Equestrian Federation

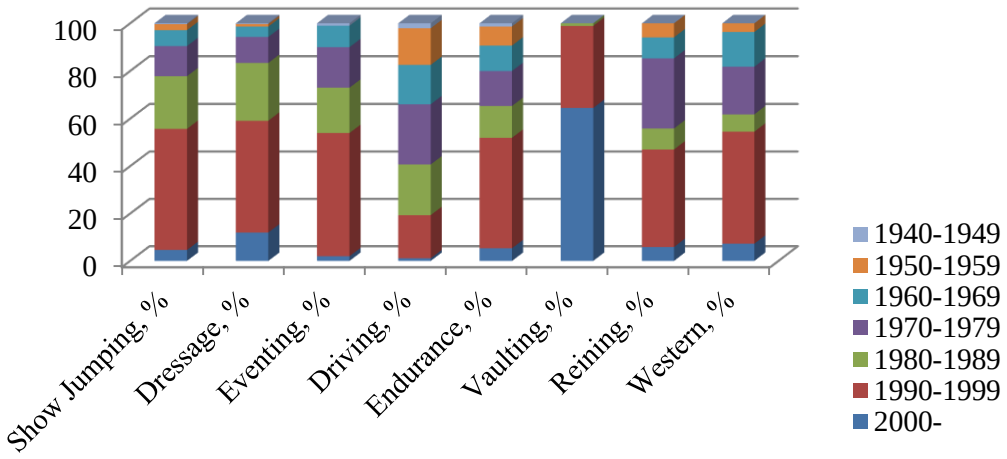


Figure 5.4: Distribution of athletes on the basis of age categories in each of the equestrian disciplines in Hungary in 2013

Source: own construction based on data of the Hungarian Equestrian Federation

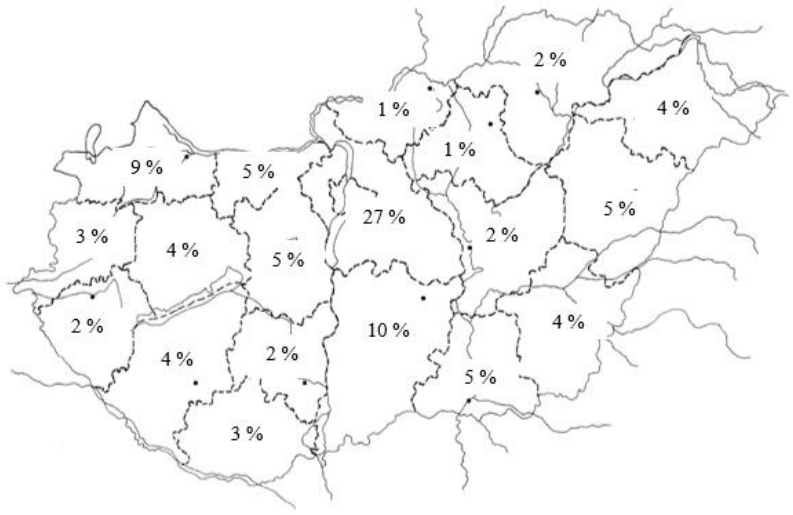


Figure 5.5: Distribution of athletes in all equestrian disciplines among the counties in Hungary in 2013

Source: own construction based on data of the Hungarian Equestrian Federation

Show Jumping was practiced in each of the counties, and with the exception of the county of Szabolcs-Szatmár-Bereg, its popularity was the highest among all disciplines. It was the most popular in the county of Nógrád and the least popular in the county of Somogy. ***Dressage*** was not practiced in two of the 19 counties, in Baranya and in Nógrád, but it was the most popular in the county of Somogy. ***Eventing*** represented the highest share in the county of Veszprém, but in the counties of Csongrád, Hajdú-Bihar, Nógrád, Szabolcs-Szatmár-Bereg, Jász-Nagykun-Szolnok and Tolna it was not practiced at all in 2013. ***Driving*** was popular in each of the counties, with the highest share in Szabolcs-Szatmár-Bereg and the lowest share in Veszprém. ***Vaulting*** was confined to three counties only, namely Bács-Kiskun, Pest and

Somogy. ***Endurance*** was practiced in 12 counties (63% of the counties), with the highest share in the county of Baranya. ***Reining*** and ***Western*** were practiced in less than the 50% of counties. Reining was represented the most in the county of Fejér, while Western was represented the most in the county of Tolna. For more details see table 5.18.

Table 5.18: Share of equestrian disciplines in each of the counties of Hungary in 2013 based on the number of athletes (%)

County	***SJG***	***DRE***	***EVN***	***DRI***	***END***	***VLT***	***RNG***	***WSN***	***Total***
Bács-Kiskun	46	6	9	25	1	5	1	6	10
Baranya	56	0	2	20	22	0	0	0	3
Békés	49	11	1	39	1	0	0	0	4
Borsod-Abaúj-Zemplén	64	25	3	8	0	0	0	0	2
Csongrád	71	13	0	15	0	0	1	1	5
Fejér	45	7	1	28	7	0	7	5	5
Győr-Moson-Sopron	59	10	7	21	2	0	0	1	9
Hajdú-Bihar	65	10	0	23	0	0	1	1	5
Heves	51	15	7	17	10	0	0	0	1
Jász-Nagykun-Szolnok	61	5	0	32	0	0	2	0	2
Komárom-Esztergom	65	10	1	10	9	0	0	5	5
Nógrád	81	0	0	19	0	0	0	0	1
Pest	56	21	2	8	1	9	2	2	27
Somogy	27	28	7	23	5	10	0	0	4
Szabolcs-Szatmár-Bereg	35	2	0	63	0	0	0	0	4
Tolna	39	2	0	33	14	0	4	8	2
Vas	69	6	1	25	0	0	0	0	3
Veszprém	56	19	13	6	2	0	3	2	4
Zala	58	20	9	12	2	0	0	0	2
Total	***55***	***13***	***4***	***19***	***3***	***3***	***1***	***2***	***100***

Source: own construction based on data from the Hungarian Equestrian Federation. Note: DRE: Dressage; SJG: Show Jumping; EVN: Eventing; DRI: Driving; END: Endurance; VLT: Vaulting, RNG: Reining; WSN: Western.

In order to be able to ***compare the importance of equestrian based on the number of athletes***, information was obtained on the number of athletes from the database of the International Equestrian Federation (Studies, which were made on the importance of the horse industry in some countries did not provide information on the number of athletes in equestrian disciplines). Similar, as in the case of horse racing, the table presents the top 25% of countries ranked on the basis of percentile rank calculated by the number of athletes per 100,000 inhabitants in all equestrian disciplines. See table 5.19.

Table 5.19: Top 25% of countries ranked on the basis of percentile rank calculated by the number of athletes per 100,000 inhabitants in all equestrian disciplines in 2013

National Federation	Number of athletes per 100,000 people	Percentile rank
Monaco	32	100
Bermuda	25	100
San Marino	16	99
Bahrain	13	98
Luxembourg	13	97
Norway	12	96
Belgium	11	95
Denmark	11	94
Ireland	11	94
Uruguay	11	93
Austria	10	92
Switzerland	10	91
New Zealand	9	90
Cayman Islands	9	89
Liechtenstein	8	88
France	8	88
United Arab Emirates	7	87
Sweden	7	86
Estonia	7	85
Qatar	6	84
Netherlands	6	83
Namibia	5	82
Finland	5	82
Australia	4	81
Slovenia	4	80
Germany	4	79
Slovak Republic	4	78
Sultanate of Oman	4	77
Hungary	4	76
Italy	4	76
Portugal	3	75

Source: own construction based on own calculation on the basis of data received from the FEI

As the table shows, Monaco had the highest number of athletes per 100,000 inhabitants followed by Bermuda, San Marino, Bahrain, Luxembourg, Norway, Belgium, etc. In contrary to horse racing, Hungary was placed among the top 25% of countries, at the 76th percentile rank.

In order to ***compare the importance of Hungarian Equestrian at the international level based on achieved results by athletes***, a similar indicator was used as for horse breeding but, for the

present case, on the basis of ***the top six placed athletes at the World Equestrian Games between 1990 and 2014.***

Obtained results in table 5.20 reveal that Germany is the most successful equestrian nation on the basis of the calculated indicator followed by the United States, the Netherlands, Great Britain, France, Switzerland, Sweden and New Zealand in the top 25% of the ranking. Based on the calculation, Hungary obtained 10 scores, by which it could be placed in the 35th percentile rank.

Table 5.20: Top 25% of countries ranked on the basis of percentile rank calculated by the achieved results of the top six placed athletes at the World Equestrian Games between 1990 and 2014

National Federation	Obtained score	Percentile rank
Germany	214	100
United States	161	98
Netherlands	114	94
Great Britain	84	91
France	83	87
Switzerland	48	83
Sweden	42	80
New Zealand	40	76
Hungary	10	35

Source: own construction based on own calculation from data obtained from the database of the FEI.

5.4.1.2 Horses in the equestrian disciplines in 2013

For the number of horses, see table 5.17, for the representation and distribution of breeds in the equestrian disciplines, see table 5.5 and 5.6.

With respect to the ***age*** of horses registered by the National Equestrian Federation, the highest number of horses, in general, competed between 7-10 years of age. The exception is Vaulting in which the highest number of competing horses was born between 1998 and 2002 (in 2013, 11-15 years of age). The fewest number of horses was registered in the oldest age category in general, but Eventing and Vaulting are exceptions to this statement; in these disciplines the fewest number of horses was registered in the youngest age category. For more information, see table 5.21.

Respective to the ***gender*** of horses, geldings had the highest share followed by mares and stallions, in general. Exceptions can be found in Show Jumping, in which discipline mares dominated followed by geldings and stallions; and Driving, where the share of stallions was higher than the share of mares. In Western, the share of geldings and mares was the same. See table 5.22.

Table 5.21: Distribution of horses on the basis of age categories among the equestrian disciplines in Hungary in 2013 (%)

Range of birth years	***SJG***	***DRE***	***EVN***	***DRI***	***END***	***VLT***	***RNG***	***WSN***	***Total***
2007-2009	29	24	4	13	35	0	25	25	***22***
2003-2006	42	36	44	50	40	26	45	43	***43***
1998-2002	23	29	41	31	19	39	23	22	***28***
1997-	6	11	12	6	6	35	7	10	***8***
Total	***100***	***100***	***100***	***100***	***100***	***100***	***100***	***100***	***100***

Source: own construction based on data from the Hungarian Equestrian Federation. For abbreviations, see table 5.5.

Table 5.22: Distribution of gender of horses among the equestrian disciplines in Hungary in 2013 (%)

Gender	***SJG***	***DRE***	***EVN***	***DRI***	***END***	***VLT***	***RNG***	***WSN***	***Total***
gelding	36	41	41	64	51	52	48	44	***41***
mare	43	36	40	17	29	35	41	44	***38***
stallion	21	24	19	20	20	13	11	12	***21***

Source: own construction based on data from the Hungarian Equestrian Federation. For abbreviations, see table 5.5.

In addition to information given on the roles of Hungarian traditional breeds in Hungarian Equestrian disciplines detailed in the sub-chapter written on Hungarian Horse Breeding, see figure 5.6 and table 5.23 for the ***distribution of all breeds*** present ***in all and in each of the Hungarian Equestrian disciplines*** in 2013.

As it can be seen in the figure, ***92% of all horses registered for equestrian disciplines*** can be divided into any of the following categories: ***imported horses, horses from public breeding, Hungarian Sport Horse, Kisbér halfbred, Lipizzan and horses without specific breeds***. The figure does not present the breeds, which were individually represented by less than 2%. Of these breeds, the Thoroughbred and the Shagya-Arabian were the most represented by 1.68% and 1.60%, respectively.

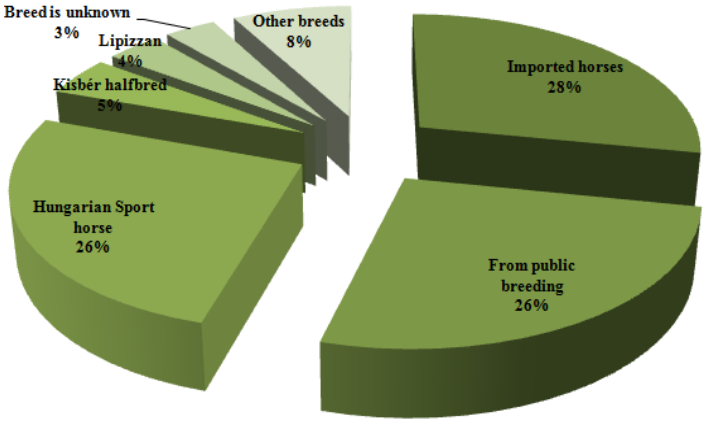


Figure 5.6: Distribution of registered horses on the basis of breeds and / or origin in Hungarian Equestrian in 2013

Source: own construction based on data from the Hungarian Equestrian Federation

Table 5.23: Distribution of registered horses on the basis of breeds and / or categories of origin among the equestrian disciplines in Hungary in 2013 (%)

Breed or category of origin	***SJG***	***DRE***	***EVN***	***DRI***	***END***	***VLT***	***RNG***	***WSN***	**TOTAL**
Imported horses	58	15	11	11	0	0	2	2	28
From public breeding	60	7	18	11	1	1	0	0	26
Hungarian Sport Horse	68	6	24	1	0	0	0	0	26
Kisbér halfbred	56	9	22	10	1	1	0	1	5
Lipizzan	0	6	1	92	1	0	0	0	4
Breed is not known	36	13	7	31	5	1	1	7	3
Thoroughbred	59	5	37	0	0	0	0	0	2
Shagya-Arabian	21	6	3	0	69	0	1	0	2
Other breeds									5
Total									100

Source: own construction based on data from the Hungarian Equestrian Federation

The importance of Hungarian Equestrian on the basis of the number of horses was taken into account ***per 100,000 inhabitants***, likewise on the basis of the number of athletes. Table 5.24 presents the top 25% of countries ranked on the basis of percentile rank calculated by the number of horses per 100,000 inhabitants in all equestrian disciplines. Hungary could be placed in the group of the top 25% of countries.

Table 5.24: Top 25% of countries ranked on the basis of percentile rank calculated by the number of horses per 100,000 inhabitants in all equestrian disciplines in 2013

National Federation	Number of horses per 100,000 people	Percentile rank
Monaco	67	100
Bermuda	49	100
United Arab Emirates	43	99
Belgium	33	98
Liechtenstein	32	97
Luxembourg	31	96
San Marino	29	95
Switzerland	26	94
Bahrain	24	93
Ireland	21	92
Norway	19	91
Denmark	19	90
Austria	18	89
Qatar	18	88
Uruguay	16	87
Netherlands	15	86
France	14	85
New Zealand	14	84
Sweden	13	83
Estonia	12	82
Germany	9	81
Finland	8	80
Hungary	8	79
Slovenia	7	78
Namibia	7	77
Portugal	6	76
Slovak Republic	6	75

Source: own construction based on own calculation on the basis of data received from the FEI.

5.4.2 Economic impacts generated by Hungarian Equestrian

The Hungarian Equestrian disciplines generated ***81,950,169 euros economic impacts***, of which ***73,775,632 euros were in direct impacts*** and ***8,174,537 euros were in indirect impacts***. The ***highest contribution*** to the ***total impacts*** and both the ***direct and indirect impacts*** was made by ***Show Jumping*** followed by ***Driving***. Regarding the total and the direct impacts, Show Jumping and Driving were followed by Eventing, Dressage, Endurance, Reining and Western together and Vaulting. In terms of the ***indirect impacts***, Show Jumping and Driving were followed by Dressage, Reining and Western together, Eventing, Endurance and Vaulting. The general popularity of Show Jumping and Driving were apparent in all three impact categories.

On the other hand, the share of ***Eventing*** from the indirect impacts decreased significantly in comparison with its share from the total and direct impacts in favor of Dressage. Regarding the indirect impacts, the share of ***Reining and Western*** together was also higher than the share of Eventing. It can be explained by the fact that there were notably more events organized in Dressage than in Eventing, and there were incomparably more athletes competing in Reining and Western than in Eventing. ***Endurance*** could be ranked the fifth on the basis of its contribution to the total and direct economic impacts and the sixth based on its share from the indirect impacts, despite that its share from the indirect impacts increased in comparison with its share from the total and direct impacts. Nevertheless, its share from the indirect impacts was very similar to that of Eventing. In each of the impact categories, ***Vaulting*** had the smallest share. It is also apparent from the numbers that ***the share of each of the disciplines from the indirect impacts was higher*** than that from the direct impacts. Exceptions are Eventing and Driving where the order of magnitude of direct impacts was quite high because of discipline-specific characteristics (horse equipment, athlete's equipment, and investment on show grounds). For details on source of information and note on calculation, see table 5.25. For the aggregate estimates, see table 5.26. For more detailed sub-totals, see table 9.2, appendix 3.

Table 5.25: Impact categories, source of information and note for the estimation of impacts generated by Hungarian Equestrian in 2013

Description of calculation category / Source of information and / or note
Number of registered horses
Hungarian Equestrian Federation
Horse investment
Information was collected from the Chefs of each of the disciplines except for Eventing, Vaulting and Dressage. On the price of the Dressage horse and the Eventing horse, one athlete each provided information. For a Vaulting horse, the price was estimated to be the same as that of the Reining horse. Average prices were given on horses of national and international level. The final price of the entire horse population in each of the disciplines was estimated as the sum of the price of the national and the international population.
Amortization of horses
Own estimation; 5 years.
Horse equipment
Tack and equipment were divided into obligatory and optional items for use both at home and at events. Optional tacks and equipment were calculated for 50% of the horses. Prices: published prices as stipulated in the chapter on Methodology.
Number of registered athletes
Hungarian Equestrian Federation
Athlete's equipment
As stipulated above for the "Horse equipment"
Amortization of equipment
See the amortization of horses

Source: own construction

Table 5.25 continued: Impact categories, source of information and note for the estimation of impacts generated by Hungarian Equestrian in 2013

Description of calculation category / Source of information and / or note
Horse maintenance
Information was collected from the Chefs of each of the disciplines except for Dressage, Eventing and Vaulting. As stipulated above, for these disciplines one athlete each provided information. Expenditure on maintenance includes expenditure on feed and bedding, groom and hoof care. Finally, as there were no big differences between received data, the same expenditures were used to each of the disciplines. However, in Endurance, Vaulting and Reining lower expenditures were estimated on groom. Groom: 2,020 eur/horse/year and 1,212 euros/horse/year. Feed: hay (10 kg/day; 395 euros/horse/year), oat (5 kg/day; 310 euros/horse/year), vitamins and minerals (0,5 kg/day; 125 euros/horse/year). Bedding: 50%-50% of straw and shavings (10 kg/ day, 6 kg/day, respectively. 490 euros/horse/year). Hoof care: 9 occasions per year; hoof care and shoeing (650 euros/horse/year).
Veterinary services
Data were obtained from available Chefs. For compulsory tests and vaccinations, 200 euros/horse/year were estimated. In addition to this amount, some treatments of less importance (superficial lesions, cooling, fomentation, etc.) were estimated in excess of approximately 400 euros/horse/year. In total, 600 euros per year was calculated for horses at the national level. For horses at the international level, 365 euros/horse/month were estimated in the Olympic disciplines and Driving, and 183 euros/horse/month in Endurance and 90 euros/horse/month in Vaulting.
Training (of both the horse and the rider)
Data were obtained from available Chefs and athletes and trainer specified above. In Endurance it was not general to train with trainers. Each of the athletes trained individually. However, 20 euros/athlete/month were estimated as symbolic training fee covering any kind of consultation. Training fees in other disciplines were estimated as follows: For Olympic disciplines at the national level: 4x/week, 20 euros/training; at the international level: 1,516 euros/month/athlete. For Driving at the national level: 3x/week, 34 euros/training; at the international level: 68 euros/training. For Reining and Western (only national level is calculated as the FEI did not register athletes in Reining in 2013): 3x/week, 13 euros/training. For Vaulting: at the national level, 25 euros/month; at the international level, 35 euros/month. In each of the cases, fee was multiplied by the number of athletes. The year was calculated by 52 weeks.
Horse and rider related impacts
Number of events
Event database of each of the disciplines of the Hungarian Equestrian Federation.
Number of event location
Own calculation based on obtained information on the number of events from the databases of each of the disciplines.
Investment on show ground
Investments were estimated on the show grounds of Show Jumping, Dressage, Eventing and Driving. Information on Show Jumping and Driving was collected from the Chefs of these disciplines. Information on Dressage was obtained from a financial plan on investment of dressage arena and judge boxes. Data on Eventing: in addition to information on Show Jumping and Dressage, information on the obstacles of the cross country course was obtained from a financial plan for constructing cross country obstacles.
Amortization of assets on the show ground
Information was obtained as stipulated above
Calendar registration fee
Hungarian Equestrian Federation
License fee
Hungarian Equestrian Federation
Number of entries
Event database of each of the disciplines of the Hungarian Equestrian Federation

Source: own construction

Table 5.25 continued: Impact categories, source of information and note for the estimation of impacts generated by Hungarian Equestrian in 2013

Description of calculation category / Source of information and / or note
Number of competitors
Own calculation from the number of entries, except for Show Jumping, with respect to which, data were received from the Hungarian Equestrian Federation
Entry fee
Schedule of each of the events downloaded from the event database of each of the disciplines of the Hungarian Equestrian Federation and that of the FEI
MCP
12,5 CHF was estimated for each of the entries. The entry fee of the events in Endurance contained the MCP fee. No MCP was calculated for Reining and Western since its international event was not an FEI one but the Middle-European Cup. In Driving, MCP was calculated for the number of horses competing at the relevant event.
Prize money
Schedule of each of the events downloaded from the event database of each of the disciplines of the Hungarian Equestrian Federation and that of the FEI.
Fee - event organization
National and international standards based on national and international practice and rules. Apart from those, fees were confirmed by Chefs, who were involved in event organization, as well. Categories taken into account: judge, technical delegate, assistant TD, course designer, assistant CD, chief steward, FEI veterinary commission, treating veterinarian, appeal committee; marathon course and cross country course staff, steward, farrier, secretary, show office, timer, speaker, ambulance service, security service.
Event related direct impacts
Sponsorship
10% of the event related direct impacts (because data received for the amount of sponsorship was either not public or the range of data received was too wide to apply an average.)
Total event related direct impacts
Transportation – event organization
With respect to events at the national level, 100 euros/person/event were estimated for each of the 1 day events and 150 euros/person/event were calculated for each of the events that took place for more than one day. At the international level, 300 euros/person/event were estimated for each of the foreign officials and 150 euros/person/event were calculated for each of the home workforce. No transportation costs were estimated for the farrier, the secretary, the ambulance and the security service that is normally local workforce.
Catering – event organization
At the national level, 15 euros/person were calculated for each of the 1 day events. With respect to events that took place for more than one day, 20 euros/official/days and 15 euros/workforce other than officials/day were estimated. At the international level, 25 euros/official/day and 15 euros/workforce other than officials/day were calculated. Number of days for the calculation: number of event days+1.
Accommodation – event organization
At the national level, 30 euros/official/night and 20 euros/workforce other than officials/night were estimated At the international level, 50 euros/official/night and 25 euros/workforce other than officials/night were estimated. Number of nights for the calculation = number of event days.

Source: own construction

Table 5.25 continued: Impact categories, source of information and note for the estimation of impacts generated by Hungarian Equestrian in 2013

Description of calculation category / Source of information and / or note
Transportation of horses
With respect to international events organized in Hungary: - if the event took place in the county of Pest (in the middle of the country), the distance was calculated as the half of the East-West extension of the country. - if the event took place in counties other than Pest, the participating athlete's location situated the furthest from the event location was taken into account. The cost of transportation was estimated as the entire distance between the two locations. Cost: average cost per km of the given range by horse transporters. With respect to national events: in Show Jumping, Driving and Vaulting, 100 euros per horse were estimated either because of the high number of events which implied short distances, or the relatively short distance to which events were confined. In each of the other disciplines, 200 euros per horse was calculated for each of the events. In Show Jumping, with respect to both national and international level events, transportation costs were estimated to the half of the number of entries taking into account that not each of the horses was transported separately. The same idea was used for Driving with respect to national level events. Note: athletes and their grooms were supposed to arrive together with their horses.
Catering - athletes
At the national level, 15 euros/athlete/day were estimated for each of the one day events and 15 euros/athlete/day for each of the events that took place for more than one day. The exception is Vaulting, in which discipline 10 euros/athlete/day were calculated. At the international level, 20 euros/athlete/day were estimated with the exception of Vaulting, in which 15 euros/athlete/day. Number of days for the calculation: number of event days+1 with respect to national events and number of event days+2 with respect to international events. The final total expenditures on catering in each of the disciplines were estimated two times (one person plus for each of the competing athletes).
Accommodation - athletes
At the national level, 30 euros/athlete/night were estimated with the exception of Vaulting, in which discipline 15 euros/athlete/night were calculated. Furthermore, accommodation was estimated only for half of the athletes in Vaulting as both the registered athletes and the organized events were confined only to three and two counties, respectively. At the international level, 30 euros/athlete/night were estimated with the exception of Vaulting, in which 20 euros/athlete/day. Number of nights for the calculation: number of event days with respect to national events and number of event days+1 with respect to international events. The final total expenditures on accommodation in each of the disciplines were estimated two times (one person plus for each of the competing athletes).
Indirect impacts
Total impacts (direct and indirect)

Source: own construction

Table 5.26: Economic impacts generated by Hungarian Equestrian in 2013

Description	DRE	SJG	EVN	DRI	VLT	END	RNG & WSN	Total
Horse and athlete related impacts, total (thousand EUR)	5,544	40,550	7,282	13,915	184	1,027	858	69,361
Distribution of horse and athlete related impacts (%)	7.99	58.46	10.50	20.06	0.27	1.48	1.24	100
Event related direct impacts, total (thousand EUR)	191	2,781	142	1,071	34	138	57	4,415
Distribution of event related direct impacts (%)	4.33	62.99	3.22	24.25	0.78	3.13	1.29	100
Direct impacts, total (thousand EUR)	*5,736*	*43,331*	*7,424*	*14,986*	*218*	*1,165*	*915*	*73,776*
Distribution of direct impacts (%)	7.77	58.73	10.06	20.31	0.30	1.58	1.24	100
Indirect impacts_event organization (thousand EUR)	56	354	32	222	11	48	17	739
Distribution of indirect impacts_event organization (%)	7.54	47.91	4.27	29.99	1.54	6.46	2.30	100
Indirect impacts_athletes, including the impacts of one plus person/athlete (thousand EUR)	788	4,868	195	842	110	164	394	7,361
Distribution of indirect impacts_athletes +1 plus person/athlete (%)	10.71	66.14	2.65	11.44	1.49	2.23	5.35	100
Indirect impacts, total (thousand EUR)	*850*	*5,258*	*230*	*1,086*	*122*	*216*	*412*	*8,175*
Distribution of indirect impacts (%)	10.39	64.32	2.81	13.29	1.49	2.65	5.05	100
Direct and indirect impacts, total (thousand EUR)	*6,585*	*48,589*	*7,654*	*16,072*	*340*	*1,382*	*1,328*	*81,950*
Distribution of direct and indirect impacts (%)	8.04	59.29	9.34	19.61	0.42	1.69	1.62	100,00

Source: own construction based on own calculation stipulated in table 5.25. Note: The table does not contain the amount of sponsorship neither in the direct impacts nor in the indirect impacts. For abbreviations, see the note below table 5.5.

5.4.3 Hungarian Pony Equestrian

The estimation of the economic impacts generated by ***equestrian practiced by ponies*** was based on the same logic that was used for the calculation of the economic impacts of equestrian disciplines practiced by horses. However, different databases were used and information was gathered from the Hungarian Pony Club Association, which works independently from the Hungarian Equestrian Federation.

Pony Equestrian in Hungary in 2013 generated ***5,337,796 euros economic impacts***, of which ***5,026,047 euros were in direct impacts*** and ***311,749 euros were in indirect impacts***. Some additional information on the calculation, in addition to information in table 5.25, is summarized in table 5.27. For estimated sub-totals, see table 5.28. For more detailed estimate, see table 9.3, appendix 3.

Table 5.27: Supplementary information on the calculation of economic impacts generated by Hungarian Pony Equestrian in 2013 apart from that presented in table 5.25

Description of cost and expense category / Note	
Equipment of pony and rider	
The expenditure on equipment of both rider and pony comprises of only characteristic items that differ from those that are general for horses and horse riding.	
Pony maintenance	
Half of the bedding, half of the hay, one third of the oat and one third of the vitamins and minerals of the portion of a horse were estimated. Hoof care: 270 eur/pony/year. Groom: 345 eur/pony/year	
Veterinary services	200 eur/pony/year
Training	2x/week, 15 eur/training; 1,560 eur/athlete/year
Investment on show ground	
There were 30 events, of which 19 were organized at different locations. Of these 19 event locations, there were 9, which were different from equestrian disciplines practiced by horses. For these 9 event locations, the half of the expenditure on investment on the dressage arena and judge boxes and show jumping obstacles were estimated than that applied to horses.	
Calendar registration fee, MCP, Prize money	In pony equestrian, these categories did not exist.
Fee – event organization	Judges, technical delegate and show office were taken into consideration on the basis of the event schedule.
Catering – event organization	Judges, technical delegate, show office and secretary were taken into consideration.
Transportation – event organization	100 euros/event/person were estimated with respect to judges, technical delegates and show office.
Transportation – ponies	100 euros/event/pony
Catering - athletes	10 euros/athlete/day for 1 day events and 15 euros/athlete/day for 3 day events (3 day+1).
Accommodation - athletes	25 euros/athlete/night for 3 nights.

Source: own construction

Table 5.28: Economic impacts generated by Hungarian Pony Equestrian in 2013

Description	Pony equestrian
Number of ponies (heads)	*1,708*
Number of athletes (heads)	*735*
Pony and athlete related impacts (thousand EUR)	4,960
Event related direct impacts (thousand EUR)	66
Direct impacts, total (thousand EUR)	*5,026*
Indirect impacts, event organization (thousand EUR)	12
Indirect impacts, athletes including the impacts of 1 plus person / athlete (thousand EUR)	299
Indirect impacts, total (EUR)	*312*
Direct and indirect impacts, total (EUR)	*5,338*

Source: own construction based on own calculation stipulated in table 5.27. Note: The table does not contain the amount of sponsorship neither in the direct impacts nor in the indirect impacts.

5.5 Other sub-sectors and segments of the Hungarian Horse Industry in 2013

Considering that there was very ***limited information available*** on equestrian tourism and leisure riding and there were some other areas with less economic importance (for instance, equine therapy, agricultural and ecological programs), ***estimated impacts are summarized together*** in table 5.29. Apart from equestrian tourism and agricultural and ecological programs, only direct impacts could be estimated. Supplementary information on the calculation, in addition to the logic presented in table 5.25, is provided in table 5.30. For the sub-totals see table 9.4.

Table 5.29: Economic impacts generated by Hungarian Equestrian Tourism, Equine Therapy, horses participating in Agricultural and Ecological Programs, Leisure Riding, Horses without any specific use activity and Foals from mares other than registered and un-registered broodmares in 2013

Description	EQ TRM	EQ TH	AGR &EC	LS_CL	LS_HM	WH_U	FOALS*
Number of horses (heads)	5,000	70	1,000	8,846	4,423	4,423	11,575
Horse and athlete related impacts (Direct impacts) (thousand EUR)	*17,398*	*413*	*980*	*41,415*	*7,631*	*2,735*	*6,394*
Indirect impacts (thousand EUR)	*40,400*	*0*	*441*	*0*	*0*	*0*	*0*
Direct and indirect impacts, total (thousand EUR)	*57,798*	*413*	*1,422*	*41,415*	*7,631*	*2,735*	*6,394*

Source: own construction based on own calculation by data stipulated in table 4.9 and information presented in table 5.30. * foals from mares other than broodmares. Abbreviations: EQ TRM: equestrian tourism, EQ TH: equine therapy; AGR & EC: agricultural and ecological programs; LS_CL: leisure activity in riding clubs; LS_HM: leisure activity at home; WH_U: without any special use activity.

Table 5.30: Supplementary information on the calculation of economic impacts presented in table 5.29

EQ TH	EQ TRM	AGR &EC	LS_CL	LS_HM	WH_U	FOALS
Horse investment						
Estimate by the Equine Therapy Association (ETA)	Estimate by the Hungarian Horse Breeders' Federation				No investment	
Horse equipment						
Basic necessary equipment as per in equestrian disciplines; special equipment was estimated by the ETA.	Basic necessary equipment as per in equestrian disciplines without any special equipment on education of horses.	Only basic equipment necessary for keeping the horse in the stable, cleaning and leading.	Equipment necessary in the stable are included in the boarding costs. Other basic equipment for cleaning and riding a horse.	Basic equipment necessary for keeping the horse in the stable, cleaning and riding.	Only basic equipment necessary for keeping the horse in the stable, cleaning and leading.	
Rider equipment						
not estimated as the number of patients is not known.	necessary equipment (less than in equestrian disciplines in general).	no estimate	necessary equipment for riding a horse (as in equestrian tourism).		no estimate	
Amortization of horse						
10 years					no amortization as no investment	
Amortization of horse equipment						
5 years						
Amortization of rider equipment						
no estimate	5 years	no estimate	5 years		no estimate	
Maintenance: in addition to what were specified in table 5.25						
bedding						
the same	the same	two third for 7 months, nothing for 5 months	in boarding costs	two third	one third	
hay						
the same	the same	two third for 7 months, nothing for 5 months	in boarding costs	two third	the half	one third
oat						
one third	the half	nothing	in boarding costs	one third	nothing	
vitamins and minerals						
the half	one third	nothing	nothing		nothing	
hoof care						
the same frequency; shoeing: half of the population	the same	the same frequency, no shoeing	the same frequency; shoeing: half of the population	the same frequency, no shoeing	only 6 occasions (not 9), no shoeing	

Source: own construction based on own calculation by data stipulated in table 4.9 and information presented in table 5.30. For the abbreviations, see the note below table 5.29.

Table 5.30 continued: Supplementary information on the calculation of economic impacts presented in table 5.29

EQ TH	EQ TRM	AGR &EC	LS_CL	LS_HM	WH_U	FOALS
groom						
345 eur/horse/year	345 eur/horse/year	no groom	in boarding costs	no groom	no groom	
Veterinary services						
200 eur/horse/year	200 eur/horse/year	100 eur/horse/year			50 eur/horse/year	
Training fee/salary						
3,260 eur/horse/year	345 eur/horse/year	no estimate	2x/week, 15 eur/training/rider	no estimate	no estimate	
Transportation						
no estimate	50 eur for 1,010,000 persons/2	no estimate				
Catering						
no estimate	15 eur for 1,010,000 persons	no estimate				
Subsidy						
no estimate		0,2-0,4 animal unit/ha; 40-305 eur/ha	no estimate			

Source: own construction with data stipulated in table 4.9 and information presented in table 5.25. For abbreviations see the note below table 5.29.

5.6 Total economic impacts generated by the Hungarian Horse Industry in 2013

The ***total economic impacts*** generated by the ***Hungarian Horse Industry*** in 2013 are presented in table 5.31. As it can be seen in the table, ***257,089,328 euros were generated in total in 2013***, of which ***207,367,318 euros were in direct economic impacts*** and ***49,722,010 euros were in indirect economic impacts***. Regarding the ***total impacts***, ***equestrian*** had the highest contribution followed by ***equestrian tourism*** and ***leisure riding***. With respect to the ***direct impacts***, ***equestrian disciplines*** played the most important roles followed by ***leisure riding*** and ***breeding*** with significant differences between each of them. Considering the ***indirect impacts***, the contribution of ***equestrian tourism*** was the highest, which is not surprising if the 1,010,000 equestrian tourists (Kincsem National Plan, 2012) are taken into account. With respect to the contribution of the sub-sectors to the total indirect impacts, the sub-sector of equestrian tourism was followed by the ***equestrian disciplines***.

The total economic impacts, ***323,362 euros in direct impacts*** must be added to that represents the value of the ***net export in 2013***. Together with the net export, the economic impacts of the Hungarian Horse Industry in 2013 amounted to ***257,412,690 euros, in total***, from which the ***direct impacts measured up to 207,690,680 euros***.

Table 5.31: Total economic impacts generated by the Hungarian Horse Industry in 2013 (in thousand euros)

Sub-sector/segment	Direct impacts	%	Indirect impacts	%	Total impacts	%
Breeding	20,352	9.81	236	0.47	20,588	8.01
Foals of registered and un-registered broodmares	14,233	6.86	0	0.00	14,233	5.54
Racing	17,014	8.20	158	0.32	17,172	6.68
Equestrian	73,776	35.58	8,175	16.44	81,950	31.88
Pony equestrian	5,026	2.42	312	0.63	5,338	2.08
Equine therapy	413	0.20	0	0.00	413	0.16
Equestrian tourism	17,398	8.39	40,400	81.25	57,798	22.48
Agricultural and ecological programs	980	0.47	441	0.89	1,422	0.55
Leisure riding	49,046	23.65	0	0.00	49,046	19.08
Without any specific use activity	2,735	1.32	0	0.00	2,735	1.06
Foals of mares other than broodmares	6,394	3.08	0	0.00	6,394	2.49
Total from the sub-sectors	207,367	100	49,722	100	257,089	100
Net export	323	-	-	-	323	-
Total (sub-sectors and net export)	207,690	-	49,722	-	257,412	

Source: own construction based on own calculation on the basis of data stipulated in table 4.9 and tables 5.7, 5.8, 5.16, 5.25, 5.27 and 5.30.

The ***impacts per inhabitant generated by the Hungarian Horse Industry in 2013 supposedly were the fewest among countries***, in which information on the generated economic impacts of their horse industries was available. The ***observed difference between Hungary and other countries***, and among countries, in general, must be explained by, on one hand, the ***lower level of spending*** (which, at the time of writing the present dissertation, cannot be studied in detail at the international level because of reasons detailed in the chapter on Methodology) but also the ***lower level of equestrian demand***.

RESULTS AND DISCUSSION

6 MACROECONOMIC ANALYSIS OF THE ENVIRONMENT NECESSARY FOR THE EQUESTRIAN REVOLUTION

Data obtained on the basis of adjusted indicators on horse racing and equestrian disciplines ***revealed that there are some countries, which are considered as having significant equestrian tradition; but***, based on the presented indicators they ***do not belong to those societies, where demand for horses and horse-related activities*** in horse racing and equestrian disciplines ***seems to be high***. This is the reason why ***traditional equestrian values*** are hypothesized to play a sub-ordinated role in the equestrian demand by considering it from quantitative perspectives, while ***the level of quality of life represents a stricter condition*** for equestrian demand.

6.1 Value added, agriculture and service sector and urban population

The countries, which could be characterized by at least one horse, start, athlete, racecourse, event, … etc. on the basis of rounded adjusted indicators in horse racing or equestrian disciplines, can be described as those, where ***value added of the agricultural sector*** is below average and ***value added of the service sector*** is above average. Apart from these indicators, which refer to the economic weight of sectors in GDP, ***urban population*** proved to be typically above average in the observed countries.

There was a bit higher range of coincidence among countries with ***below average agricultural value added*** and countries where equestrian disciplines were practiced (96.23% - 100%) than where horse racing disciplines were performed (93.48% - 100%). On the other hand, there was slightly higher range of coincidences among countries with ***above average service value added*** and countries where horse racing were practiced (78.26% – 95.45%) than where equestrian disciplines were performed (78.00% – 90.48%).

Percentages of coincidence for urban population revealed that there were ***high levels of coincidence among countries with above average level urban population*** and countries, where horse racing or equestrian was practiced in the analyzed years. It was also revealed, similarly, as in the case of value added of the agricultural and service sector that there is no difference in order of magnitude between the two sub-sectors, horse racing and equestrian. In favor of horse racing, a slightly higher range of coincidence was obtained (86.36% – 95.00%) than that for equestrian disciplines (83.87% – 91.49%). Tables 10.1, 10.2; 10.3, 10.4 and 10.5, 10.6 in

appendix 5 present obtained levels of coincidence for value added of the agricultural and service sector and urban population for each of the analyzed years.

6.2 Gross domestic product (GDP)

Although the high levels of ***GDP*** must play a role in the horse sector, the analysis, which intended to look for high levels of coincidence among countries with ***above average GDP per capita*** and countries where horse racing or equestrian disciplines were practiced in the analyzed years, could not confirm it. The only ***exception*** was the ***number of racecourses in horse racing***, where quite high levels of coincidence could be observed. Apart from the number of racecourses in horse racing, high levels of coincidence were revealed among countries with ***below average GDP per capita*** and countries where the rounded adjusted ***number of events in all equestrian disciplines did not reach at least one***.

Despite the generally low levels of coincidence among countries with above average GDP per capita and countries where horse racing or equestrian disciplines were practiced in the analyzed years, obtained results for both horse racing and equestrian indicators are provided in tables 10.7 and 10.8, respectively, in appendix 5, in order to visualize, on one hand, that ***GDP per capita itself is not a sufficient criterion for demand in the horse sector*** and, on the other hand, the ***difference between the general importance of above average GDP per capita and conditions measured by the HDI in the horse sector***. As the above mentioned tables show, levels of coincidence are limited to 52% – 69% and 61% – 73%, respective to horse racing and equestrian.

The ***judgment of importance of GDP per capita varies significantly***, when the levels of coincidence ***among the top 25% of countries ranked on the basis of percentile rank calculated by GDP per capita and the top 25% of countries ranked on the basis of percentile rank by each of the indicators describing horse racing or equestrian*** is looked for.

Obtained results summarized in tables 6.1, 6.2 and 6.3 show high levels of coincidence indicating that, on the basis of analyzed indicators, ***the world's leading horse racing or equestrian cultures could be found among those countries where the levels of GDP per capita were the highest in the world***.

There was a wider range of levels of coincidence respective to horse racing (75% – 100%) than to equestrian (80% – 92%), because prize money was also included in the evaluation of results. If it is omitted from the discussion, the maximum value of the range of levels of coincidence in horse racing reduces to around 92%, likewise in equestrian. The minimum level of coincidence was higher for countries, where equestrian disciplines were practiced in the analyzed years.

Table 6.1: Percentage of coincidence among the top 25% of countries ranked by GDP per capita and the top 25% of countries ranked by indicators in horse racing (%)

Indicator	2009	2010	2011	2012	2013
Betting turnover	90.00	90.91	90.00	90.91	90.91
Prize money	100	100	100	100	100
Number of different horses	83.33	84.62	84.62	84.62	92.31
Number of breed horses	(69.23)	76.92	83.33	75.00	91.67
Number of starts	75.00	84.62	84.62	92.31	92.31
Number of racecourses	84.62	84.62	92.31	92.31	92.31

Source: own construction based on own calculation on the basis of data obtained from the World Bank and the IFHA. For the benchmarks of the indicators, see table 8.3, appendix 2.

Regarding ***each of the equestrian disciplines***, only Endurance seemed to be less sensitive to the level of GDP per capita among the top 25% of countries ranked by the number of horses/athletes/events. There is a strange value, for Eventing which is, indeed, very atypical in the analysis. For this reason, it can be considered rather insignificant.

Table 6.2: Percentage of coincidence among the top 25% of countries ranked by GDP per capita and the top 25% of countries ranked by indicators in equestrian (%)

Indicator	2010	2011	2012	2013
Total number of horses in all equestrian disciplines per 100,000 inhabitants	85.19	92.31	88.00	91.67
Total number of athletes in all equestrian disciplines per 100,000 inhabitants	85.19	85.19	89.29	92.59
Total number of events in all equestrian disciplines per 1,000,000 inhabitants	80.95	85.71	84.21	89.47

Source: own construction based on own calculation on the basis of data obtained from the World Bank and the FEI.

Table 6.3: Percentage of coincidence among the top 25% of countries ranked by GDP per capita and the top 25% of countries ranked by each of the indicators in each of the equestrian disciplines (%)

Indicator	**2011**	**2012**	**2013**	**2011**	**2012**	**2013**	**2011**	**2012**	**2013**
Total number of h. and a. per 100,000 inhabitants and total number of e. per 1 million people									
	horses			**athletes**			**events**		
Show Jumping	91.30	91.30	86.96	88.00	92.00	84.00	88.89	93.75	94.12
Dressage	94.44	88.24	88.89	84.21	89.47	95.00	100	88.89	100
Eventing	100	92.31	100	93.75	92.86	100	(58.33)	81.82	83.33
Driving	87.50	88.89	88.89	88.89	90.00	90.00	83.33	83.33	83.33
Endurance	75.00	(70.59)	82.35	(73.68)	(72.73)	85.71	(69.23)	(69.23)	84.62
Vaulting	100	100	100	100	88.89	88.89	100	75.00	75.00
Reining	100	75.00	100	100	80.00	100	100	66.67	83.33
Para-equestrian	100	88.89	87.50	100	100	88.89	100	75.00	75.00

Source: own construction based on own calculation on the basis of data obtained from the World Bank and the FEI.

6.3 Disposable income

Respective to the role of disposable income per capita, first, ***the percentage of the countries involved in horse racing or equestrian was determined***.

Obtained percentages show that ***equestrian was more widely practiced*** in the analyzed years (93.75% - 100%) ***than horse racing*** (71.88% – 75.00% on the basis of the number of different horses, starts and racecourses). Findings are provided in tables 10.9 and 10.10, appendix 5 according to each of the indicators per year.

The percentage of coincidence among countries obtained from the OECD database ***with above average disposable income per capita*** and ***countries where horse racing or equestrian disciplines were practiced*** in the analyzed years show that, with the exception of betting turnover, indicators can be characterized by the same high levels of coincidence in the analyzed years. The levels of coincidence exceeded 90% in the last 4 analyzed years with respect to horse racing indicators and amounted to 100% respective to equestrian. See tables 10.11 and 10.12, appendix 5.

Despite the apparent importance of ***disposable income per capita*** in the horse sector, the earlier statement that "*as income per capita increases, equestrian demand grows*" did not seem to be verified.

The ***levels of coincidence were also observed among the top 25% of countries ranked on the basis of percentile rank calculated by disposable income per capita and the top 25% of countries ranked on the basis of percentile rank calculated by indicators describing horse racing or equestrian***. The analysis resulted in ***very low levels of coincidence***. The range of the levels *varied between 30% and 50% respective to horse racing* and *between 38.89% and 50% respective to equestrian*. See tables 10.13 and 10.14, appendix 5.

Although it seems quite logical that "*the more disposable income per capita, the more demand in the horse sector"* (from the point of view of the horse sector), the issue appears to be more complex. For this reason, the statement could be refined as: ***the more disposable income per capita, the less financial constraints for equestrian demand***. This more likely expresses a possibility for spending in the horse sector instead of an implicated condition for spending in it.

Unfortunately, financial data at the time of writing the present doctoral dissertation (except for betting turnover and prize money) is not available at the international level, on which a robust study including several years could be based. Apart from that, the levels of necessary spending in the horse sector principally depend on the sub-sectors and the activities within the sub-sectors. Only ***homogenous categories might be analyzed***. At the sector level such study would contain many distortions leading to unrealistic conclusions. ***The analysis of the present dissertation did not confirm the above citation***.

6.4 Human development index (HDI) and social progress index (SPI)

6.4.1 The role of the conditions measured by the HDI in horse racing or equestrian

As it was hypothesized, ***high and very high human development (on the basis of the HDI) plays fundamental roles in the generation of demand for horse-related activities***. ***Both in horse racing and equestrian high levels of coincidence*** were observed on the basis of each of the analyzed indicators. The ranges of the levels of coincidence ***among countries characterized by high and very high HDI and countries where horse racing or equestrian disciplines were practiced*** in the analyzed years varied between ***86.36% - 100%*** and ***86.79% - 94%***, respectively.

High and very high human development and horse racing

With respect to ***horse racing***, from the perspective of the sub-sector, the most important indicator must be the number of ***different horses***. All other indicators probably depend on it. The levels of coincidence among countries with high and very high values of the HDI and countries ranked on the basis of the adjusted number of different horses exceeded 90% (with the only exception in 2010). The same tendency seemed to be true of the number of ***breed horses***. The level of coincidence was observed at 100% among countries characterized by high and very high HDI and countries, which were characterized by at least one ***racecourse*** per 1 million inhabitants in each of the analyzed years. The number of ***starts*** must also be influenced by factors other than the number of different horses, as the levels of coincidence were observed at lower levels than those typically true of the number of different horses. Nevertheless, obtained levels of coincidence were still high (above 87%). The tendency of high levels of coincidence among countries with high and very high HDI and countries where horse racing disciplines were practiced was proved to be true of the financial indicators, ***prize money*** and ***betting turnover***, as well. However, respective to these two indicators, the levels of coincidence were the lowest among all horse racing indicators. The phenomenon is absolutely understandable, and can be explained by the fact that they do not serve as adequate measures for the demand for horse racing activities (from the horse racing point of view). Obtained results of the analysis are provided in table 6.4.

Table 6.4: Percentage of coincidence among countries with high and very high HDI and countries, where horse racing disciplines were performed in the years included in the analysis (%)

Indicator	2005	2008	2010	2011	2012	2013
Betting turnover	93.75	85.71	89.19	88.89	92.31	92.31
Prize money	90.70	86.36	87.76	89.58	91.84	91.67
Number of different horses	93.02	90.91	89.13	90.91	93.33	93.33
Number of breed horses	92.86	90.91	88.89	90.00	92.5	92.31
Number of starts	88.64	88.64	87.23	88.89	91.30	90.91
Number of racecourses	100	100	100	100	100	100

Source: own construction based on own calculation on the basis of the UNDP, 2014 and the IFHA. Look for specification on countries without economic data in table 10.17, appendix 5. For the benchmarks of the indicators, see table 8.3, appendix 2.

High and very high human development and equestrian

On the basis of horses and athletes

Table 6.5 presents the obtained levels of coincidence among countries characterized by high and very high HDI and countries, where ***equestrian disciplines*** were practiced and where there was at least one horse or athlete on the basis of the rounded adjusted indicator in the analyzed years. It is apparent in the table that the ***levels of coincidence are very high***. ***On the basis of the adjusted total number of horses***, the lowest level of coincidence was observed at 89.29% in 2013, in all other analyzed years, the levels of coincidence exceeded 90%. ***Respective to the adjusted total number of athletes***, there was also only one year when the observed level of coincidence remained below 90% (in 2010, 86.79%), in the other three analyzed years the levels of coincidence were observed above 90%.

Considering ***each of the equestrian disciplines on the basis of the number of horses***, it can be seen that except for Endurance (and Reining, Para-equestrian, and partly Vaulting), there is ***100%*** of coincidence among ***countries with high and very high values of the HDI*** and ***countries*** where ***Show Jumping, Dressage, Eventing, Driving*** and partly Vaulting were practiced and there was at least one horse per 100,000 inhabitants per Federation. "Partly" was written with respect to Vaulting, as there was only one year (in 2012) when, on the basis of the number of horses, at least one country had at least one registered Vaulting horse per 100,000 inhabitants. In ***Show Jumping***, there were two years, when coincidences were lower than 100%, but still higher than 95%. In ***Endurance***, coincidence was observed at the lowest levels among the disciplines, they varied between 88% and 92%, but this range is still very high.

Nevertheless, the ***numbers certainly reflect*** a kind of ***complexity and difficulty in the accessibility to and the assimilation of these disciplines*** among countries, which are primarily dependent on the successful maintenance of generations' long traditional values in these fields, sustainability and competitiveness.

Analyzing the levels of coincidence ***on the basis of the number of athletes*** per 100,000 inhabitants in the equestrian disciplines, the levels of coincidence were still higher than those observed on the basis of the number of horses. In ***Show Jumping***, there was only one year (2013), when the level of coincidence did not reach 100%, but it amounted to 97.5%. Respective to ***Endurance***, like on the basis of the number of horses, the levels of coincidence among countries characterized by high and very high HDI and countries where Endurance was

practiced oscillated between 85% and 91%. With respect to ***all other disciplines***, including Vaulting, coincidences were observed at ***100%*** in each of the presented years.

As it is apparent from table 6.5, there was ***not at least one horse per 100,000 inhabitants*** in ***Vaulting, Reining and Para-equestrian*** and ***one athlete per 100,000 inhabitants in Reining and Para-equestrian*** which clearly demonstrates that these disciplines are less widely practiced than the Olympic disciplines; Driving and Endurance. ***For this reason***, in order to still have an idea on the role of conditions measured by the HDI in Vaulting, Reining and Para-equestrian, the ***benchmark was increased to 500,000 inhabitants***. As per the obtained results, ***the levels of coincidence were observed at 100%*** respective to each of the disciplines.

Apart from the findings, it was interesting to see that ***not each of the disciplines reacted in the same way to the increase of the "benchmark window"*** that *could imply the differences in the levels of horses and athletes at the international level* (*, **, ***, ****, *****) among the disciplines.

In ***Driving and Vaulting***, some "dilution" was apparent in the level of HDI among the countries in question, but the levels of coincidence were still observed at 100%. In ***Endurance***, the increase of the benchmark resulted in ***more horses***, ***but*** this wider range ***did not mean any "dilution" in the level of HDI***. As it can be seen, the levels of human development in two analyzed years were even higher than observed per of 100,000 people. The ***levels of human development were clearly lower in Eventing and Show Jumping*** as a result of the increase of the benchmark and ***coincidence was also observed at lower levels*** than per 100,000 inhabitants. While in Eventing the levels of coincidence were still above 75%, those in Show Jumping varied between 54% and 67%. In ***Dressage***, ***some "dilutions" in the level of HDI*** could be observed in two years (in 2011 and 2013), ***but*** the levels of ***coincidence*** were still ***100%*** in two analyzed years (in 2011 and 2012).

The ***same tendencies*** were revealed ***on the basis of*** the number of ***athletes per 500,000 inhabitants as on the basis*** of the number of ***horses per 500,000 inhabitants***; with the exception of Vaulting, where the increase of the "benchmark window" resulted in lower levels of HDI, although the levels of coincidence still amounted to 100%. The phenomenon is understandable if the number of horses and the number of athletes characteristic of Vaulting are recalled (only one horse for several athletes). For the results see table 10.15 appendix 5.

Table 6.5: Percentage of coincidence among countries with high and very high HDI and countries, where equestrian disciplines were practiced in the years included in the analysis on the basis of the number of horses and athletes (%)

Indicator	2010 (0.723)	2011 (0.729)	2012 (0.733)	2013 (0.735)
Total number of horses in all equestrian disciplines per 100,000 inhabitants	90.74	92.45	91.23	89.29
Number of horses in each of the equestrian disciplines per 100,000 inhabitants				
Show Jumping	-	100 (0.743)	95.35 (0.626)	95.65 (0.628)
Dressage	-	100 (0.772)	100 (0.773)	100 (0.786)
Eventing	-	100 (0.836)	100 (0.787)	100 (0.790)
Driving	-	100 (0.817)	100 (0.817)	100 (0.818)
Endurance	-	88.46 (0.616)	92.00 (0.620)	88.00 (0.624)
Vaulting	-	-	100 (0.880)	-
Reining	-	-	-	-
Para-equestrian	-	-	-	-
Total number of athletes in all equestrian disciplines per 100,000 inhabitants	86.79	94.00	92.59	90.38
Number of athletes in each of the equestrian disciplines per 100,000 inhabitants				
Show Jumping	-	100 (0.744)	100 (0.761)	97.5 (0.676)
Dressage	-	100 (0.772)	100 (0.773)	100 (0.879)
Eventing	-	100 (0.879)	100 (0.787)	100 (0.790)
Driving	-	100 (0.817)	100 (0.817)	100 (0.818)
Endurance	-	85.00 (0.616)	90.48 (0.620)	90.48 (0.624)
Vaulting	-	100 (0.827)	100 (0.829)	100 (0.830)
Reining	-	-	-	-
Para-equestrian	-	-	-	-

Source: own construction based on own calculation on the basis of the UNDP, 2014 and the FEI. Look for specification on countries without economic data in table 10.18, appendix 5. In brackets below the reference years, the minimum score for high human development, while, next to the levels of coincidence, the lowest score for human development in the analyzed group of countries can be seen.

On the basis of organized events

The levels of coincidence obtained ***among countries characterized by high and very high HDI and countries where at least one international event in any of the equestrian disciplines were organized per 1 million people*** further confirm the importance of high and very high human development in equestrian.

On the basis of the total number of events in ***all equestrian disciplines***, the range of levels of coincidence *varied between 88.64% and 91.30%*, while on the basis of the number of events ***in each of the equestrian disciplines***, it *oscillated between 85.71% and 100%*. In ***Dressage, Driving, Vaulting*** and ***Reining***, the levels of coincidence amounted to ***100%***. In ***Eventing***, there was only one year (2011) when the level of coincidence was below 100%, but above 85%. In ***Show Jumping*** the levels of coincidence did not reach 100% in any of the analyzed years, but

in all of them it exceeded 95%. The lowest levels of coincidence, in general, were characteristic of ***Endurance***, in which discipline they varied between 86% and 93%. For observed levels of coincidence in each of the disciplines and analyzed years, see table 6.6.

Table 6.6: Percentage of coincidence among countries with high and very high HDI and countries, where equestrian disciplines were practiced in the analyzed years on the basis of the number of events (%)

Indicator	**2010 (0.723)**	**2011 (0.729)**	**2012 (0.733)**	**2013 (0.735)**
Total number of events in all equestrian disciplines per 1,000,000 inhabitants	90.91	89.13	91.30	88.64
Number of events in each of the equestrian disciplines per 1,000,000 inhabitants				
Show Jumping	-	96.55 (0.620)	96.43 (0.626)	96.43 (0.628)
Dressage	-	100 (0.817)	100 (0.785)	100 (0.786)
Eventing	-	85.71 (0.620)	100 (0.787)	100 (0.763)
Driving	-	100 (0.817)	100 (817)	100 (0.818)
Endurance	-	92.86 (0.616)	87.10 (0.620)	86.21 (0.624)
Vaulting	-	100 (0.879)	100 (0.817)	100 (0.818)
Reining	-	100 (0.896)	100 (0.916)	100 (0.822)
Para-equestrian	-	-	-	-

Source: own construction based on own calculation on the basis of the UNDP, 2014 and the FEI. Look for specification on countries without economic data in table 10.18, appendix 5.

On the basis of achieved results

In order to study the role of HDI in the achieved equestrian results, the top ten countries placed at the World Equestrian Games in 2010 were taken into consideration. The reason why the World Equestrian Games were selected to study the role of HDI in the achieved results is that this event represents the highest level of competition for all equestrian disciplines in contrary to the Olympic Games, where only three disciplines are incorporated in the programs. The reason for selecting 2010 was that this was the only year for which statistics on both horse racing and equestrian and the HDI were available. Obtained results of the analysis are presented in table 6.7.

In the table, the ***top 10 countries*** are referred to on the basis of both ***all equestrian disciplines*** and ***each of the equestrian disciplines*** (except for Para-equestrian. The results achieved in Para-equestrian was not studied, because there were more categories within the discipline itself than the number of all equestrian disciplines). The analysis included ***both the group of countries with high and very high values of the HDI and the group of countries exclusively with very high HDI***. This was verified by the fact that, on one hand, the levels of coincidence among countries characterized by high and very high HDI and countries, where each of the equestrian disciplines was practiced were observed at very high levels, and on the other hand, the top ten

countries could theoretically be ranked among the countries which were classified by very high HDI.

In summary, more than ***95% of the top 10 countries*** belonged to countries that were characterized by high and very high HDI regarding ***all equestrian disciplines***. ***Respective to each of the equestrian disciplines***, with the exception of Vaulting, each of the top 10 countries belonged to those with high and very high HDI. In Vaulting, the level of coincidence was observed at 90%.

Very high values of the HDI, however, did not seem to be an indispensable requirement for achieving excellent results in each of the equestrian disciplines, although, studying only one year can cause bias. The ***two extremes were Driving and Endurance***, with ***100% and 0%*** of level of coincidence, respectively. Apart from Endurance, the ***lowest level of coincidence*** (50%) was observed in ***Show Jumping*** and ***Vaulting***, but it was quite low in ***Reining***, as well (below 70%). In ***Dressage*** and ***Eventing***, the levels of coincidence exceeded 85%.

Table 6.7: Percentage of coincidence among countries with high and very high HDI and the top ten countries ranked by the results achieved at the WEG, 2010 (%)

Indicator	**2010** high and very high human development (0.723)	**2010** very high human development (0.885)
Top 10 ranked nations at the WEG in 2010 in all equestrian disciplines	95.45 (0.638)	-
Top 10 ranked nations at the World Equestrian Games in 2010 in each of the equestrian disciplines (except for Para-equestrian)		
Show Jumping	100 (0.739)	50.00
Dressage	100 (0.864)	87.50
Eventing	100 (0.877)	85.71
Driving	100 (0.895)	100
Endurance	100 (0.799)	0
Vaulting	90 (0.638)	50.00
Reining	100 (0.877)	66.67

Source: own construction based on own calculation on the basis of the UNDP, 2014 and the FEI. Note: In brackets below the reference years, the minimum score for high or very high human development can be seen, while apart from the reference years, the lowest level human development are presented respective to countries where the specified equestrian discipline was practiced.

The top 25% of countries ranked by the HDI and the top 25% of countries, where horse racing or equestrian disciplines were practiced

Tendencies observed respective to the role of the HDI in equestrian demand seemed to be confirmed by analyzing them among the top 25% of countries ranked on the basis of percentile rank calculated by the HDI and the top 25% of countries, where horse racing or equestrian disciplines were practiced. This ***analysis was intended to answer the question whether the best placed countries in horse racing or equestrian***, ***belonged to the best placed countries ranked by the HDI***. See tables 6.8, 6.9 and 6.10, which show that each of the levels of coincidence obtained in horse racing or equestrian was observed above 75%, typically between ***83% and 100%*** and ***88% and 96%***, respective to ***horse racing*** and ***equestrian***.

Table 6.8: Percentage of coincidence among the top 25% of countries ranked by the HDI and the top 25% of countries ranked by horse racing indicators (%)

Indicator	2005	2008	2010	2011	2012	2013
Betting turnover	100	100	90	88.89	100	90
Prize money	100	100	100	100	100	100
Number of different horses	83.33	83.33	83.33	83.33	83.33	91.67
Number of breed horses	83.33	76.92	92.31	83.33	83.33	100
Number of starts	90.91	90.91	91.67	91.67	91.67	91.67
Number of racecourses	91.67	100	91.67	91.67	91.67	91.67

Source: own construction based on own calculation on the basis of the UNDP, 2014 and the IFHA. Look for specification on countries without economic data in table 10.17, appendix 5. For the benchmarks of the indicators, see table 8.3, appendix 2.

Table 6.9: Percentage of coincidence among the top 25% of countries ranked by the HDI and the top 25% of countries ranked by equestrian indicators (%)

Indicator	2010	2011	2012	2013
Total number of horses in all equestrian disciplines per 100,000 inhabitants	92.00	95.83	91.67	95.85
Total number of athletes in all equestrian disciplines per 100,000 inhabitants	88.00	88.00	88.89	92.59
Total number of events in all equestrian disciplines per 1,000,000 inhabitants	90.00	90.00	89.47	94.74

Source: own construction based on own calculation on the basis of the UNDP, 2014 and the FEI. Look for specification on countries without economic data in table 10.18, appendix 5.

In ***each of the equestrian disciplines***, ***all levels of coincidence*** in all analyzed years typically varied between 83% and 100% with the exception of Endurance and Reining. The ***highest levels of coincidence*** (100%) could be observed for ***Driving*** and ***Vaulting***, which were true of each of the indicators and each of the analyzed years. In ***Show Jumping***, 100% of coincidence was

revealed on the basis of the number of horses and events, while, in ***Para-equestrian***, the same proved to be true of the number of horses and athletes. Also in ***Reining***, on the basis of each of the indicators, 100% of coincidence could be observed, although, only in two of the three analyzed years. In ***Eventing***, the levels of coincidence reached 100% on the basis of the number of horses and athletes in two and one analyzed years, respectively. With the exception of the number of events in 2011, the levels of coincidence did not reduce below 90%. The ***lowest levels of coincidence*** could be observed respective to ***Reining***, although, only for 2012 on the basis of the number of athletes and events. In ***Endurance***, in both 2011 and 2012, the levels of coincidence did not reach 75% respective to the number of horses and athletes, and the same was true of the year 2012 respective to the number of events. ***The levels of the HDI in the top 25% of countries on the basis of the number of horses, athletes and events seemed to be the lowest in Endurance***.

Table 6.10: Percentage of coincidence among the top 25% of countries ranked on the basis of percentile rank calculated by the HDI and the equestrian indicators in each of the disciplines (%)

Indicator	**2011**	**2012**	**2013**	**2011**	**2012**	**2013**	**2011**	**2012**	**2013**
Total number of h. and a. per 100,000 inhabitants and total number of events per 1 million people									
	horses			**athletes**			**events**		
Show Jumping	100	100	100	95.65	100	96	100	100	100
Dressage	93.75	87.50	87.50	83.33	83.33	94.44	100	100	100
Eventing	100	92.31	100	93.33	92.31	100	75.00	90.91	91.67
Driving	100	100	100	100	100	100	100	100	100
Endurance	(68.75)	(70.59)	82.35	(72.22)	(71.43)	80.95	76.92	(69.23)	76.92
Vaulting	100	100	100	100	100	100	100	100	100
Reining	100	75.00	100	100	(60.00)	100	100	(66.67)	100
Para-equestrian	100	100	100	100	100	100	100	75.00	75.00

Source: own construction based on own calculation on the basis of the UNDP, 2014 and the FEI. Look for specification on countries without economic data in table 10.18, appendix 5.

6.4.2 The role of the conditions measured by the SPI in horse racing or equestrian

High levels of coincidence were observed ***among countries characterized by above average SPI*** and countries where horse racing or equestrian were practiced. ***Even higher levels of coincidence*** were revealed ***among the top 25% of countries ranked on the basis of percentile rank calculated by the SPI and the top 25% of countries ranked on the basis of percentile rank calculated by each of the indicators describing horse racing or equestrian***. Obtained levels of coincidence are provided in tables 6.11 and 6.12, respectively.

Because statistics for only one year were available, detailed analysis will not be made. Nevertheless, ***the SPI also demonstrates that the level of quality of life expresses more about the demand for horses and horse-related activities than GDP per capita does***.

Table 6.11: Percentage of coincidence among countries with above average SPI and countries where horse racing was practiced in the years included in the analysis, and percentage of coincidence among the top 25% of countries ranked on the basis of percentile rank calculated by the SPI and each of the horse racing indicators, in 2013 (%).

Indicator	above average SPI	top 25%
Betting turnover	88.89	100
Prize money	88.10	100
Number of different horses	89.74	100
Number of breed horses	91.43	90.91
Number of starts	86.84	100
Number of racecourses	100	90.91

Source: own construction based on own calculation on the basis of the UNDP, 2014 and the IFHA. Look for specification on countries without economic data in table 10.17, appendix 5. For the benchmarks of the indicators, see table 8.3, appendix 2.

Table 6.12: Percentage of coincidence among countries with above average SPI and countries where equestrian was practiced in the years included in the analysis, and percentage of coincidence among the top 25% of countries ranked on the basis of percentile rank calculated by the SPI and each of the equestrian indicators, in 2013 (%).

Indicator	above average social progress index	top 25%
Total number of horses in all equestrian disciplines per 100,000 inhabitants	87.76	90.00
Total number of athletes in all equestrian disciplines per 100,000 inhabitants	89.13	86.96
Total number of events in all equestrian disciplines per 1,000,000 inhabitants	87.50	93.75

Source: own construction based on own calculation on the basis of the UNDP, 2014 and the FEI. Look for specification on countries without economic data in table 10.18, appendix 5.

6.5 Relationship between human development (on the basis of the HDI) and the economic performance (on the basis of the GDP per capita) in the horse sector

Findings on the classification of countries, where horse racing or equestrian disciplines were practiced in the analyzed years are summarized in tables 6.13 and 6.14 respective to horse racing and equestrian. The tables ***do not provide information*** on the group of countries ***characterized by above average GDP per capita and below average HDI ("economic growth lopsidedness")***, because there were ***no equestrian countries observed*** in this group.

Table 6.13: Distribution of countries per each of the horse racing indicators among the groups established by the HDI and GDP per capita (in %)

Indicator	Different horses	Starts	Breed horses	Racecourses	Prize money	Betting turnover
above average HDI - above average GDP per capita						
2005	58.14	56.82	59.52	81.82	55.81	53.13
2008	63.64	61.36	61.36	86.96	61.36	54.29
2010	63.04	61.70	60.00	82.61	59.18	54.05
2011	65.91	64.44	65.00	86.36	60.42	55.56
2012	68.89	67.39	65.00	90.48	63.27	61.54
2013	68.89	68.18	69.23	90.48	64.58	61.54
above average HDI - below average GDP per capita						
2005	37.21	34.09	33.33	18.18	34.88	40.63
2008	31.82	31.82	34.09	13.04	29.55	34.29
2010	32.61	31.91	35.56	17.39	34.69	40.54
2011	29.55	28.89	30.00	13.64	33.33	36.11
2012	26.67	26.09	30.00	9.52	30.61	30.77
2013	26.67	25.00	25.64	9.52	29.17	30.77
below average HDI - below average GDP per capita						
2005	4.65	9.09	7.14	-	9.30	6.25
2008	4.55	6.82	4.55	-	9.09	11.43
2010	4.35	6.38	4.44	-	6.12	5.41
2011	4.55	6.67	5.00	-	6.25	8.33
2012	4.44	6.52	5.00	-	6.12	7.69
2013	4.44	6.82	5.13	-	6.25	7.69

Source: own construction on the basis of the UNDP, 2014 and the IFHA. For the benchmarks of the indicators, see table 8.3, appendix 2.

The ***majority of countries***, where horse racing or equestrian were practiced in the analyzed years and there were at least one horse, start, racecourse, athlete, event, … etc. on the basis of the specified adjusted indicators, belonged to the group of countries which can be characterized by "***virtuous cycles***", where high human development and high GDP are mutually reinforcing.

Considering the indicators describing ***horse racing***, the tendency was the most apparent on the basis of the number of *racecourses* (above 80%), while it was the less apparent on the basis of *betting turnover* (53% - 62%). (The betting turnover is, however, not a measure of equestrian

demand in the horse sector. It can be related more with the gaming industry.) Disregarding from the financial indicators and the number of racecourses, the distribution of countries in the group of "virtuous cycles" typically ***varied between 57% and 70%***. In 2012 and 2013, the distribution of countries in this group exceeded 65%.

Table 6.14: Distribution of countries per each of the equestrian indicators among the groups established by the HDI and GDP per capita (in %)

Indicator	Horses	Athletes	Events
above average HDI - above average GDP per capita			
2010	62.96	60.38	63.64
2011	62.26	64.00	60.87
2012	61.40	70.37	67.39
2013	65.45	72.55	72.73
above average HDI - below average GDP per capita			
2010	29.63	28.30	27.27
2011	32.08	30.00	32.61
2012	31.58	24.07	26.09
2013	25.45	19.61	20.45
below average HDI - below average GDP per capita			
2010	7.41	11.32	9.09
2011	5.66	6.00	6.52
2012	7.02	5.56	6.52
2013	9.09	7.84	6.82

Source: own construction on the basis of the UNDP, 2014 and the FEI. For the benchmarks of the indicators, see table 8.4, appendix 2.

Regarding the indicators selected from the sub-sector of ***equestrian***, not much difference in order of magnitude could be observed among them. The distribution of countries in the group, which was featured by ***above average values of the HDI and above average levels of GDP per capita*** oscillated between ***60% and 73%***.

The ***second largest group of countries*** represents those countries, in which the ***level of HDI*** was ***above average*** while the ***level of GDP per capita*** was ***below average ("human development lopsidedness")***. This finding could be observed on the basis of each of the indicators obtained from the sub-sector of both horse racing and equestrian. In horse racing, the distribution of countries was observed between 9% and 37%, while in equestrian between 19% and 33%.

The range of distribution of countries ***together in the first and the second group***, representing the countries with above average HDI, varied ***above 90%***.

The group of countries characterized by ***below average HDI and below average GDP per capita*** provide information on the fact that, ***although, horse-related activities are demanded in these less developed countries, they do not reach the order of magnitude of equestrian demand characteristic of countries with above average HDI***. The sustainability of the horse sector of countries in the group characterized by "vicious cycles" is necessarily doubtful from economic point of view.

In ***horse racing***, the distribution of countries, disregarding from the financial indicators, varied between ***4% and 9%***, while in ***equestrian*** between **5% and 9%.**

6.6 Travel and tourism competitiveness index (TTCI)

Travel and tourism competitiveness is not only ***linked to the quality of life*** through which it plays important roles in the horse sector, but also travel and tourism competitiveness ***affects the capacity of the horse sector*** in generating indirect (and, based on them, induced) impacts. By affecting the capacity of the horse industry to generate economic impacts, it covers issues related to ***rural development***. The ***importance of constructed environment*** in the horse sector seemed able to be analyzed adequately by the ***TTCI***.

High levels of coincidence were revealed ***above average values of the TTCI and countries where horse racing or equestrian disciplines were practiced***; the ranges varied between ***86% and 96%*** and ***87% and 94%***, respectively. On the basis of indicators referred to ***each of the equestrian disciplines***, the levels of coincidence were observed at still higher levels (***84% – 100%***).

Studying the obtained levels of coincidence ***among the top 25% of countries ranked on the basis of percentile rank calculated by the TTCI and each of the indicators in horse racing or equestrian***, the levels of coincidence typically oscillated between ***75% and 100%*** and ***80.95% and 92.86%***, respectively. These high levels of coincidence do confirm the importance of constructed environment in the horse sector. Obtained levels of coincidence per each of the analyzed indicators and years can be seen in tables 6.15, 6.16 and 6.17, 6.18.

Table 6.15: Percentage of coincidence among countries with above average TTCI and countries where horse racing disciplines were practiced in the years included in the analysis (%)

Indicator	2009	2011	2013
Betting turnover	94.12	88.89	89.74
Prize money	86.92	89.58	89.36
Number of different horses	90.24	90.91	88.64
Number of breed horses	88.10	90.00	89.47
Number of starts	88.37	88.89	90.70
Number of racecourses	90.91	95.45	95.24

Source: own construction based on own calculation on the basis of data obtained from the World Economic Forum, 2009, 2011, 2013 and the IFHA. Look for specification on countries without economic data in table 10.17, appendix 5. For the benchmarks of the indicators, see table 8.3, appendix 2.

Table 6.16: Percentage of coincidence among countries with above average TTCI and countries where equestrian disciplines were practiced in the years included in the analysis (%)

Indicator	2011	2013
Total number of horses in all equestrian disciplines per 100,000 inhabitants	90.20	87.27
Number of horses in each of the equestrian disciplines per 100,000 inhabitants		
Show Jumping	97.50	91.11
Dressage	100	100
Eventing	100	100
Driving	100	100
Endurance	92.31	92.00
Vaulting	-	-
Reining	-	-
Total number of athletes in all equestrian disciplines per 100,000 inhabitants	93.75	90.20
Number of athletes in each of the equestrian disciplines per 100,000 inhabitants		
Show Jumping	100	94.87
Dressage	100	100
Eventing	100	100
Driving	100	100
Endurance	90.00	90.48
Vaulting	100	100
Reining	-	-
Total number of events in all equestrian disciplines per 1,000,000 inhabitants	88.89	93.02
Number of events in each of the equestrian disciplines per 1,000,000 inhabitants		
Show Jumping	93.10	96.43
Dressage	100	100
Eventing	84.62	100
Driving	100	100
Endurance	96.43	92.86
Vaulting	100	100
Reining	100	100

Source: own construction based on own calculation on the basis of the World Economic Forum, 2011, 2013 and the FEI. Look for specification on countries without economic data in table 10.18, appendix 5.

Table 6.17: Percentage of coincidence among the top 25% of countries ranked on the basis of percentile rank calculated by the TTCI and the top 25% of countries ranked on the basis of percentile rank calculated by each of the horse racing indicators (%)

Indicator	2009	2011	2013
Betting turnover	88.89	88.89	90.00
Prize money	100	100	100
Number of different horses	81.82	81.82	81.82
Number of breed horses	66.67	80.00	75.00
Number of starts	72.73	83.33	83.33
Number of racecourses	75.00	83.33	91.67

Source: own construction based on own calculation on the basis of the World Economic Forum, 2009 2011, 2013 and the IFHA. Look for specification on countries without economic data in table 10.17, appendix 5. For the benchmarks of the indicators, see table 8.3, appendix 2.

Table 6.18: Percentage of coincidence among the top 25% of countries ranked on the basis of percentile rank calculated by the TTCI and the top 25% of countries ranked on the basis of percentile rank calculated by each of the equestrian indicators (%)

Indicator	2011	2013
Total number of horses in all equestrian disciplines per 100,000 inhabitants	80.95	95.24
Total number of athletes in all equestrian disciplines per 100,000 inhabitants	86.36	82.61
Total number of events in all equestrian disciplines per 1,000,000 inhabitants	88.89	92.86

Source: own construction based on own calculation on the basis of the World Economic Forum, 2011, 2013 and from the FEI. Look for specification on countries without economic data in table 10.18, appendix 5.

6.7 Hungary

6.7.1 Rankings of Hungary made by percentile rank on the basis of analyzed indicators in horse racing and equestrian

On the basis of data obtained from the IFHA and the FEI revealed that ***Hungary could be found among countries where horse racing and equestrian disciplines were practiced in the analyzed years***. The importance of these sub-sectors was different. The rankings of Hungary among the registered countries made by percentile rank are summarized in tables 6.19 to 6.21.

Obtained results in the tables reveal that Hungary's rankings were ***more favorable in equestrian*** than in horse racing. While, on the basis of the total number of horses/athletes/events in all equestrian disciplines, the percentile ranks of Hungary varied between 76 and 81, based on horse racing indicators, the percentile ranks oscillated between 14 and 55.

Table 6.19: Percentile ranks of the rankings of Hungary on the basis of horse racing indicators (%)

Indicator	2009	2010	2011	2012	2013
Betting turnover	21	14	18	14	14
Prize money	36	29	23	23	26
Number of different horses	43	39	45	37	41
Number of breed horses	41	39	42	40	36
Number of starts	57	55	51	50	51
Number of racecourses	18	18	18	16	18

Source: own construction based on own calculation on the basis of data obtained from the IFHA. For the benchmarks of the indicators, see table 8.3, appendix 2.

Table 6.20: Percentile ranks of the rankings of Hungary on the basis of equestrian indicators (%)

Indicator	2010	2011	2012	2013
Total number of horses in all equestrian disciplines per 100,000 inhabitants	81	79	80	79
Total number of athletes in all equestrian disciplines per 100,000 inhabitants	78	76	80	76
Total number of events in all equestrian disciplines per 1,000,000 inhabitants	78	81	80	78

Source: own construction based on own calculation on the basis of data obtained from the FEI.

Table 6.21: Percentile ranks of the rankings of Hungary on the basis of equestrian indicators in each of the disciplines (%)

Indicator	2011	2012	2013	2011	2012	2013	2011	2012	2013
Total number of h. and a. per 100,000 inhabitants and the number of events per 1 million people									
	horses			athletes			events		
Show Jumping	78	79	78	80	81	79	70	67	70
Dressage	64	65	71	72	64	72	59	89	51
Eventing	61	56	54	64	61	63	90	88	51
Driving	100	98	100	98	99	99	98	100	93
Endurance	48	48	50	54	53	60	61	45	67
Vaulting	55	74	74	67	78	77	-	78	96
Reining	50	-	-	57	-	-	-	-	-
Para-equestrian	-	-	-	-	-	-	-	-	-

Source: own construction based on own calculation on the basis of data obtained from the FEI.

Respective to the ***number of horses and athletes in each of the equestrian disciplines***, ***the best rankings*** were achieved by Hungary ***in Driving*** followed by Show Jumping, Dressage, Vaulting, Eventing, and Endurance. In Reining, the ranking could be made only in one analyzed year, while in Para-equestrian no horse and athlete was registered in 2011, 2012 and 2013.

Respective to the ***number of events***, disharmony is apparent comparing it with the number of horses or athletes in each of the disciplines, except for Driving. Apart from that, disharmony is present among the years, as well, within the same disciplines. It seems as if the organization of international events in Hungary had not followed the international level national demand.

6.7.2 Values of economic indicators observed for Hungary

Characteristic economic values obtained for Hungary are provided in table 10.16, appendix 5, in which ***data observed in disharmony*** with revealed tendencies are indicated ***in red***. It can be seen in the table that although ***high values of the HDI and above average levels of the SPI*** were characteristic in each of the analyzed years, ***disposable income per capita and GDP per capita*** which, in fact, should convert into high level quality of life, ***remained below average level*** in each of the analyzed years, by studying it at the world level. Apart from the mentioned indicators, ***harmonized index of consumer prices*** (HICP) was observed above average in three of the five studied years. ***Household and government final consumption expenditure (HFCE, GFCE)*** amounted to values much higher than obtained averages. Nevertheless, clear tendencies were revealed for HICP, HFCE and GFCE among other countries (where horse racing or equestrian disciplines were practiced), where these indicators were characterized by below average levels. (They were not detailed before, as they do not seem to have direct roles in the horse sector. ***Foreign direct investment***, similarly as HICP, HFCE and GFCE do not seem to have a relationship with the horse sector, but a clear tendency was apparent below average value. In respect. below average values were characteristic of Hungary, as well, but below average values represent negative values in three of the five years, which was not characteristic of any of other countries where horse racing or equestrian was practiced. Besides all these indicators, ***gross savings*** were observed below average, except for 2013 and ***gross capital formation*** was revealed at below average levels, which must necessarily be the consequence of high consumption expenditures. Among the analyzed countries no tendency was revealed either respective to gross savings or gross capital formation.

Hungary belonged to the group of countries that was featured by ***above average values of the HDI and below average values of GDP per capita at the world level***. Considering both analyzed sub-sectors, it seems to match well with observed rankings on the basis of horse racing and equestrian indicators. ***Hungary is a country, where horse racing and equestrian disciplines were practiced in the analyzed years and on the basis of the indicators, disregarding some exceptions, it could be characterized by at least one horse, start, athlete, event, … etc. per benchmark***.

On the other hand, ***more specific classification*** can be done in order to see why the quality of life demonstrated by the above average level HDI itself proves to be insufficient for Hungary

to have higher demand for horses and horse-related activities. ***The disadvantages of the country are quite apparent when it is compared only to the developed countries***.

By classifying ***Hungary among the developed countries*** (between 2009 and 2013), either among countries of OECD high income category (32 countries) or among countries which were identified as those with very high HDI in 2013 (49 countries) by the UNDP (2014), it can be seen that Hungary belonged to the group of countries which were characterized by ***below average levels of the HDI and below average levels of GDP per capita***.

The future success of the Hungarian Horse Sector will basically depend on adequate long-term strategies. The first decision must be made on: ***among which group of countries the Hungarian Horse Industry is intended to be well positioned***, in the first place, on the basis of demand. After denoting the long-term objective, all decisions and measures must be subordinated in order to achieve the goal. Apart from that, ***an efficient way must be found to represent the interests of the horse sector at the economy level***, because of the synergetic relationship between the horse sector and the economy presented throughout the present doctoral dissertation and, also, because of the exposure of the horse sector to requirements, whose ***satisfaction*** lies beyond the competence of the horse sector itself; it belongs to the ***competence of the macroeconomic policies***.

The authors, cited in relation to the classification of countries using the HDI and GDP, observed that the strength of linkages between economic growth and human development varies according to the structure of economy and distribution of assets. Those ***between human development and economic growth are dependent upon savings, investment rates, and the quality of social capital***. And, in both ways of the relationship, the ***policy choices*** made play crucial roles.

It seems as if the conditions failed in Hungary that would be necessary for the feed-back from human development to economic growth that, in turn, would further improve human development. Regarding the position of Hungary among developed countries, human development seems to be the key factor to enable a ***move from the "vicious cycle" toward the "virtuous cycle" through "human development lopsidedness"***.

7. CONCLUSIONS

The conclusions of the research relevant to prove each of the hypotheses are going to be referred to.

Conclusions of the research that support ***hypothesis 1*** can be summarized as follows:

1) The macroeconomic analysis revealed that ***countries***, where horse sectors operate, can generally be ***characterized by below average of value added of the agricultural sector*** (93%-100%), ***above average of value added of the service sector*** (78%-96%) ***and above average urban population*** (83%-95%) that are consequences of a developed economic environment. In brackets, the levels of coincidence obtained in the analysis in both horse racing and equestrian are shown.
2) ***Above average GDP per capita alone did not seem to be a prerequisite*** for the operation of the horse sectors (52%-73% of coincidence).
3) Regarding the countries obtained from the OECD database in order to study the ***role of disposable income per capita***, both horse racing (72%-75%) and equestrian (93%-100%) were widely practiced. High levels of coincidence were revealed among countries with above average level disposable income per capita and countries where horse racing (76%-94%) or equestrian disciplines (100%) were practiced. ***Despite this result, very low levels of coincidence were observed among the top 25%*** of countries ranked on the basis of percentile rank calculated by disposable income per capita and each of the indicators selected for describing horse racing (30%-50%) and equestrian (39%-50%).
4) The analysis ***did not seem to confirm the earlier statement*** that "*as income per capita increases, equestrian demand grows". The recommendation is to refine the earlier statement as follows:* ***the more disposable income per capita, the less financial constraints for equestrian demand****. This* ***more likely expresses a possibility for spending*** *in the horse sector instead of an implicated condition for spending in it.*
5) ***High levels of coincidence*** were observed on one hand, ***among countries with high and very high values of the HDI and countries, where horse racing*** (86%-100%, including the financial indicators) ***or equestrian disciplines were practiced*** (on the basis of both aggregate indicators – all disciplines and indicators per each discipline, 86%-94%; 75%-100%, respectively) and, on the other hand, ***among the top 25% of countries ranked on the basis of percentile rank calculated by the HDI and each of the horse racing*** (83%-100%, including the financial indicators) ***or equestrian indicators*** (88%-96%). Tested by the ***top ten results achieved at the World Equestrian Games in 2010***,

the importance of high and very high values of the HDI was also confirmed (90%-100%).

Conclusions of the research that support ***hypothesis 2*** can be summarized as follows:

1) ***By showing both direct and indirect impacts as direct impacts, no differentiation is made*** between the impacts which strictly related to horses and horse-related activities and the impacts which are generated by horses and horse-related activities, but are not strictly linked to them.
2) ***These indirect impacts of the horse sector can only be generated by the horse industry, thus, they must be considered as potentials for the economy***. The conditions on which the economic impacts can be generated are necessary for the operation of the horse sector, ***but they had not been created for / because of the (exclusive) usage of the horse sector***.
3) ***Considering indirect impacts as direct impacts*** expresses a magnitude of impacts, which are produced by the horse industry, but *prevents appreciation of the horse industry's real potentials in the economy.* The attitude ***counteracts with some of the basic goals of studying the economics of the horse sector***. These goals are to show, recognize and acknowledge the synergetic relationship between the horse sector and the economy and to unlock potentials for the benefit of the sustainable development of both the horse sector and the economy.
4) Further problems which arise from regarding indirect impacts together with direct impacts as direct impacts is that ***important characteristics of the capacity of the horse sector to contribute to the economy remain uncovered***. Those ***impacts remain hidden*** that ***would enable the macroeconomic policies to be interested in the horse sector***.
5) By ignoring indirect impacts as what they actually are, there is high risk for the horse industry becoming a separate "economic sector" by suffering losses in interests of the macroeconomy. 1) This ***can endanger the sustainable development, growth and competitiveness of the horse industry***, 2) It ***can put limitations on important potentials for the national-level economic growth and development***, and 3) It can ***jeopardize human development***, which i) is necessary for the horse industry as a prerequisite for its long-term operation (in turn, horse-related activities also contribute to it) and ii) is an ultimate target of every macroeconomic policy. In short, ***instead of enabling an upward spiral of development***, ***a downward spiral of poverty trap is being established***,

of course, referring to the potentials of developed countries and not in comparison to the less developed countries of the world.

6) Apart from the problems regarding the direct and indirect impacts, where input-output analysis was applied, ***induced impacts*** were also quantified, ***more often,*** supposedly, ***only over the impacts generated by goods and services produced by the horse sector itself*** but ***not over the goods and services that are provided for the horse industry***.

The recommendation is to quantify the economic impacts generated by the horse industry in separate impact categories (by taking into account the horse industry characteristics) in order to allow that important interrelations between the horse sector and the economy be revealed and permit the appearance of parties that theoretically would be interested in the horse sector.

Conclusions of the research that support ***hypothesis 3*** can be summarized as follows:

1) As it was mentioned earlier, ***above average GDP per capita alone did not seem to be a prerequisite*** for the operation of the horse sector. But, ***analyzing the top 25%*** of countries ranked on the basis of percentile rank calculated by GDP per capita and by each of the indicators selected for describing horse racing or equestrian, ***high levels of coincidence were observed***, which do show that GDP per capita, in certain circumstances, play important roles in the horse sector (level of coincidence: 75%-92% for horse racing and 80%-92% for equestrian). High levels of GDP per capita are considered to be necessary but not sufficient conditions for the generation of equestrian demand.

2) The ***classification of countries*** using the HDI and the GDP per capita reflected the importance of human development (on the basis of the HDI) and that of a mutually reinforcing relationship between human development and the economic performance. ***The majority of countries*** (57%-73%) ***was classified into the group*** which was featured by ***above average values of the HDI and GDP per capita***. The ***second largest group*** (9%-37%) proved to be that with ***above average values of the HDI and below average GDP per capita***. The two groups together (above average levels of the HDI) represented around 90 %, and even higher percentages, of all countries where horse racing or equestrian disciplines were practiced. The minority of countries (4%-9%) belonged to the group of "vicious cycles" (below average values of the HDI and below average levels of GDP per capita), which shows that although there exist countries among the less developed ones, where horses and horse-related activities are demanded, the sustainability of these sectors are

doubtful. There was no country observed in the group that was characterized by below average levels of the HDI and above average values of the GDP per capita.

High levels of GDP per capita are considered to be necessary but not sufficient conditions for the generation of equestrian demand on the basis of the first and the second consequences.

3) ***The economic performance must convert into human development enabling the evolution of immaterial needs***. If there is demand in the horse sector, economic impacts are generated not only at the horse sector level, but also at the economy level. Both the horse industry and the macroeconomy must be interested in the sustainable development of the horse industry. This potential and opportunity ***provide the basis for the representation and the coordination of the horse sector at the economy level***, which further enhances the competitiveness of the horse industry. In order to make the macroeconomic policies interested in the horse sector, it is crucial to estimate the generated economic impacts of the horse industry correctly (thesis 2). Also, because of reasons specified below:
4) ***The importance of the constructed environment to the horse sector is considered to be proved by the high levels of coincidence*** revealed both 1) among countries with above average values of the TTCI and countries where horse racing (86%-96%) or equestrian disciplines (87%-94%) were practiced and 2) among the top 25 % of countries ranked on the basis of percentile rank calculated by the TTCI and each of the indicators selected to describe horse racing (75%-100%) or equestrian (81%-93%).

Recommendation: It is worthwhile to remember that horses played crucial roles in the army during many centuries. For this reason, the public policies considered the affairs related to horse breeding and horse and rider education as priority. Since horses have served for the satisfaction of immaterial needs, the public policies of many countries seem to disregard horse-related affairs. However, the public policies do not have any special reason to drift apart from the horse sector, because of reasons discussed above. It would be ***important to the horse industries to understand the roles of the public policies in the horse industries and the roles of human development in the horse-related activities in the Equestrian Revolution*** *in order to transform the production structures with the objective of being able to satisfy the new demands.*

Conclusions of the research that support ***hypothesis 4*** can be summarized as follows:

1) ***Hungary*** belonged to the group of countries, where horses and horse-related activities were demanded in the analyzed years on the basis of indicators both in horse racing and in equestrian. Its rankings obtained on the basis of percentile rank were more favorable in equestrian than in horse racing. Its disadvantages with respect to the demand for horses and horse-related activities (and as a consequence, the capacity of the industry to generate economic impacts) are unquestionable.

Respective to the ***horse population at the sector level***, Hungary had seven horses per 1,000 inhabitants in 2013 by which it was placed the 22nd out of 23 countries. Considering the ***breeding sub-sector***, approximately 20 *breeds* were registered by the Hungarian Horse Breeders' Federation (out of which 7 can be considered as having traditional Hungarian origin), while in France, for instance, 63 breeds were registered, out of which 26 had French origin. It is true, however, that respective to the number of breeds per 1 million people, Hungary had more breeds (2) than France (1). In reference to the *number of breed animals* (per 1,000 inhabitants), Hungary could be placed the last (by one breed animal) out of ten countries on which information was available in respect. (In Ireland and Belgium, for instance, 17 breed animal was registered for 1,000 people.) Based on the participation of Hungarian breeds at the World Equestrian Games between 2002 and 2014, four Hungarian breeds (Bábolna (Shagya) Arabian, Hungarian Sport Horse, Mezőhegyes halfbred (Furioso North Star), Lipizzan) were present out of 32 breeds among the top six placed horse breeds at the 78., 60., 37. and 2. percentile ranks, respectively. Except for the Lipizzan breed, all results were achieved by foreign athletes.

Respective to ***horse racing***, 9 *different horses* were registered for Hungary (percentile rank: 41), while 199 for New Zealand. Four *breed horses* served for breeding racehorses in Hungary (percentile rank: 36), while 279 in Ireland. Horses raced in 75 *starts* in Hungary (percentile rank: 51), while in Australia in 1.413 starts. There was no *racecourse* per 1 million people in Hungary (percentile rank: 18), while there were 21 in Australia. Betting turnover amounted to 24.021 euros in Hungary (percentile rank: 14), while nearly 133 million euros in Hong Kong. Prize money was shared in excess of 16 thousand euros in Hungary (percentile rank: 26), while 2 million euros in Macao. (Reference year: 2013; benchmark: 100,000 people except for the racecourse, respective to which: 1 million people.).

Considering the ***FEI equestrian disciplines***, on the basis of both the number of horses and athletes respective to all equestrian disciplines, Hungary could be placed among the top

25% of registered countries: *on the basis of the number athletes*, in the 76th percentile rank and *on the basis of the number of horses*, in the 79th percentile rank. *On the basis of the achieved results* at the World Equestrian Games between 1990 and 2014, Hungary was placed in the 35th percentile rank.

2) From economic points of view, in Hungary, the characteristic values of the ***HDI and the SPI*** were observed at ***above average level***, while ***disposable income per capita and GDP per capita*** were ***below average level*** in each of the analyzed years. In the classification of countries made by the HDI and GDP per capita, ***Hungary belonged to the group of "human development lopsidedness" at the world level***, which represented the lesser group of countries in which the values of the HDI were above average level.
3) By ***making the classification among developed countries***, Hungary was classified into the ***group of "vicious cycles"*** in which low level (below average) values of the HDI and GDP per capita, by mutually undermining each other, result in a poverty trap.
4) These ***disadvantages*** partly explain the phenomenon why horses and horse-related activities demanded for achieving self-realization in the Equestrian Revolution is less characteristic of Hungary.
5) In fact, ***the macro-environment has not yet permitted Hungary to have that level of quality of life, in which immaterial needs develop in high magnitude, driver of demand*** in the Equestrian Revolution.
6) This is the reason why the ***production structures throughout the entire value chain has not yet been adapted*** completely to the new challenges. ***If the attitude toward the "new" roles of horses does not change, no sustainable development of the sector can be waited for.*** Horses, as has always been the case, must be bred for a special purpose and then being able to be used for that purpose.

Recommendation: For Hungary, it is crucial ***to make a decision as to which group of countries its horse industry is intended to be well positioned.*** *The decision must be made, first, on the basis of equestrian demand; it may be only national or both national and international. After that, an efficient way must be found to* ***represent the interests of the horse sector at the economy level****. The situation does not seem to be easy, since the macroeconomic environment cannot be omitted from the considerations. Without the macroeconomic development it seems to be less probable for the horse sector of Hungary to be well positioned among the developed countries in the long-term.*

8. THESES

Thesis 1

The analysis and synthesis of literature written on the roles of horses played in human life provided a firm basis for further analyses and, in the same time, verified the quantitative analysis of data obtained from reports and databases that proved that ***the demand for horses and horses-related activities has been generated by human development***.

Hypothesis 1 is considered as having been proved, thus serves as thesis (1).

Thesis 2

The analysis and synthesis of relating literature written on the methodology for estimating the economic impacts generated by the horse industry and the estimation of the economic impacts generated by the Hungarian Horse Industry in 2013 proved that **the application of methodology, by ignoring the characteristics of the horse sector, used for estimating the economic impacts generated by the horse industry does not enable the correct estimation of the complex impacts of the horse sector.**

Hypothesis 2 is considered as having been proved, thus serves as thesis (2).

Thesis 3

The analysis and synthesis of literature written on the economic prerequisites of the evolution of immaterial needs and the quality of relationship between economic growth and human development, furthermore, the operational characterization and the economic impact estimation of the Hungarian Horse Industry and the classification of equestrian countries using the HDI and GDP per capita proved that the **qualitative and quantitative impacts of the horse industry are fundamentally determined by the quality of relationship between human development and the economic performance**.

Hypothesis 3 is considered as having been proved, thus serves as thesis (3).

Thesis 4

The analysis and synthesis of literature written on the traditional equestrian values of Hungary, the economic prerequisites of the evolution of immaterial needs and the quality of relationship between economic growth and human development, furthermore, the operational characterization and the international comparative analysis of the Hungarian Horse Industry, the estimation of the economic impacts generated by the Hungarian Horse Industry in 2013, the

macroeconomic analysis of countries with equestrian demand and the classification of Hungary among the groups of countries with equestrian demand made by using the HDI and GDP per capita proved that **considering the entire Hungarian Horse Industry, the strategies that would serve the sustainable and competitive operation of the industry in the Equestrian Revolution in the long-term, have not been able to formulate yet.**

Hypothesis 4 is considered as having been proved, thus serves as thesis (4).

9. NEW AND NOVEL RESEARCH RESULTS

1) The criteria of the micro- and macroeconomic evaluation of the horse industry were developed in respect of the expectations of the Equestrian Revolution in the 21st century.

2) The calculation model of the horse sector was established on the basis of the horse and horse-related activities.

3) On the basis of the model, the direct and indirect economic impacts generated by the Hungarian Horse Sector in 2013 were estimated in EUR.

4) The factors were revealed that verify the differences in equestrian demand among countries, from quantitative point of view.

Well supported answers to further important technical questions can be obtained by establishing generally lacking databases (especially for equestrian disciplines other than those registered by the FEI, equestrian tourism and leisure riding), improving existing databases with functionality in mind and by carrying out further equinomics researches in all possible areas, from which one possible area is considered as the *roles of traditional equestrian values in equestrian demand* or, another one, could be *the role and ecological-social-economic importance of the equestrian leisure sector*.

10. SUMMARY

Importance of the study

The horse has been an ally of man throughout history that ***has contributed to the development of the quality of life of man***. Since its domestication, horses have played various roles in human life that have been formed in the function of the human needs. The most recent ***change in the horse's roles*** has begun to occur since the sixties of the 20th century and has had so much importance, especially from economic and social point of view that it can be characterized by the expression of ***Equestrian Revolution***. The term itself does not only refer to a change in the horse's role in human life but, especially, it refers to a ***shift, in order of magnitude, from its roles in satisfying different material needs*** (physiological, physical and safety) ***to its roles in satisfying immaterial needs independently from the hierarchy of these needs***. And, ***while horses contribute to the physical, mental and emotional wellness of people, huge amounts of economic impacts are generated*** which, on one hand, is indispensable for the ***sustainable development of the horse sector*** but, on the other hand, manifests in the ***contribution of the sector to the economy***.

The Equestrian Revolution is a process, which, in the function of a specific date, is ***not universal***. Apart from that, where it occurs at the same time period, ***the intensity of the changes is not equal***. The question can arise: *where the Hungarian Horse Sector can be placed in the transformation process and what kind of an economic impact producing capacity the Hungarian Horse Sector can be characterized of.*

In Hungary, the economic impacts of the horse industry either in the Equestrian Revolution or before that have never been estimated. The ***methodology*** *for calculating the generated impacts* ***applied specifically to the horse sector has never been published before***. The ***phenomenon of the Equestrian Revolution*** has already been mentioned ***by Castejón Montijano*** (2009) at the *EAAP conference in Barcelona, Spain in 2009,* where ***he highlighted the most important tendencies that had manifested at the microeconomic level and the possible impacts of these tendencies on the economy but it has never been studied before***.

Objectives and Hypotheses

During the research, I intended to

1) ***estimate the economic impacts generated by the Hungarian Horse Sector in 2013*** for which
   1 a) the ***operational characterization and international comparative analysis of the Sector*** provided the basis, as well as
   1 b) the ***evaluation of the methodology applied to quantify the economic impacts generated by the horse industry***.
2) to ***explain the observed differences of order of magnitude in equestrian demand between the Hungarian Horse Industry and those of other countries, and among the countries, in general***.

The ***research hypotheses*** were formulated as follows:

H1. The demand for horses and horse related activities has been generated by human development.

H2. Application of methodology, by ignoring the characteristics of the horse sector, used for estimating the economic impacts generated by the horse industry does not enable the correct estimation of the complex impacts of the horse sector.

H3. The qualitative and quantitative impacts of the horse industry are basically determined by the quality of relationship between human development and the economic performance.

H4. Considering the entire Hungarian Horse Industry, the strategies that would serve the sustainable and competitive operation of the industry in the Equestrian Revolution in the long-term have not been able to formulate yet.

Structure of the doctoral (PhD) dissertation)

Besides the Introduction and the Objectives and Hypotheses, the doctoral (PhD) dissertation, disregarding formal sections, is comprised of 4 main chapters, the Literature Review; the used Methodology; the Results and Discussion and the Conclusions.

Four main topics are discussed in the *Literature Review*, 1) The history of man on horseback: some relevant changes in the roles of horses throughout history; 2) The horse industry; 3) Countries, where demand for horses and horse-related activities seems to be high and 4) Brief historical background of the Hungarian Horse Industry.

The chapter on *Methodology* are divided into two sub-chapters in accordance with the research objectives. In the first sub-chapter, 1) in order to be able to characterize the Hungarian Horse Sector, 76 indicators, in total, are defined in 8 different groups, as basis for the estimation of the economic impacts generated by the Hungarian Horse Industry in 2013, and 2) the internationally applied methodology to the estimation of the economic impacts of the horse sector is critically evaluated, then, a new approach is described to the consideration of impacts highlighting the importance of the characteristics of the horse industry. In the second sub-chapter, the importance of a macroeconomic analysis of the environment necessary for the Equestrian Revolution is demonstrated and economic and equestrian indicators are defined to the analysis, as well as the tools for carrying out the analysis.

The *Results and Discussion* are arranged in two chapters: 1) The operational characterization and the economic impact estimation of the Hungarian Horse Sector in 2013 and 2) Macroeconomic analysis of the environment necessary for the Equestrian Revolution.

The *Conclusions* of the research are drawn in accordance to the hypotheses, considered of all as having been proved, thus they serve as theses.

Methodology

1) Operational characterization and economic impact estimation of the Hungarian Horse Sector in 2013

Of the three ways of calculation of the economic impacts generated by the horse sector, the ***expenditure approach*** was applied in majority, because it proved to be the most feasible to obtain (the most reliable) data for this method by being less affected by defensive attitudes of respondents. Apart from the method of calculation, both the ***economic impacts and employment*** can be taken into consideration ***in three different categories.*** These are ***direct, indirect and induced impacts/employment***.

The ***economic impacts generated by the Hungarian Horse Industry in 2013*** were estimated by the ***sum of the direct and indirect economic impacts*** applying the ***expenditure approach*** to calculating the sector's GDP. The ***methodology*** was developed ***on the basis of the horse and horse-related activities***. ***Primary data*** were collected from representatives and / or participants of the sub-sectors through ***personal and/or e-mail communication*** during the calendar year ***2013*** and the ***first half of 2014***. Respondents were asked to report on ***operational and financial information***.

2) Macroeconomic analysis of the environment necessary for the Equestrian Revolution

In order to describe the necessary environment, in which horse industries are able to operate, economic indicators from the database of the ***World Bank*** and the ***Organization for Economic Cooperation and Development*** (OECD) and composed indexes by the ***United Nations Development Program*** (UNDP), the ***Social Progress Imperative*** and the ***World Economic Forum*** were selected.

From the point of view of the horse sector, two sub-sectors were analyzed, ***horse racing and equestrian***, which were registered (the best) at the international level by the ***International Federation of Horse Racing Authorities*** (IFHA) and the ***International Equestrian Federation*** (FEI), respectively.

By the analysis, on one hand, the role of the quality of life (against financial conditions) in the horse sector was intended to prove and, the other hand, the role of the constructed environment. In order to carry out the analysis, ***the simplest statistical method was preferred without any desire to specify the relationship between the variables***.

Being the most potent and providing the most pieces of information, the analysis was made by obtaining the ***levels of coincidence*** by determining the ***countries where horse racing or equestrian disciplines were practiced*** in the analyzed years on the basis of the selected indicators ***among countries ranked on the basis of the economic indicator*** in question ***below / above the average levels*** of the same indicator. The levels of coincidence were ***also obtained by determining the top 25% of countries*** ranked on the basis of ***percentile rank*** calculated by each of the ***horse racing or equestrian indicators among the top***

25% of countries ranked on the basis of ***percentile rank*** calculated by ***each of the economic indicators that seemed to be relevant to the horse industry***. A tendency was considered ***at least at 75% of level of coincidence***.

In order to see ***how the relationship between human development (on the basis of the HDI) and the economic performance (on the basis of the GDP per capita) is reflected*** in the group of countries, where horse racing or equestrian disciplines were practiced in the analyzed years, a ***classification of countries was made.***

Results

1) Operational characterization and economic impact estimation of the Hungarian Horse Sector in 2013

In the Hungarian Horse Industry, ***74,000 horses generated 257.1 million euros in total***, of which ***207.4 million euros were in direct impacts*** and ***49.7 million euros were in indirect impacts***. Considering the total contribution of each of the sub-sectors, *equestrian generated the most impacts* in excess of 34%, despite the fact that the distribution of mature horses in equestrian disciplines was only 16%. *Equestrian was followed by equestrian tourism, leisure riding, breeding and horse racing*. In these sub-sectors, 12%, 32%, 25% and 2% of mature horses contributed to the total economic impacts of the sector by 22%, 19%, 8 % and 7%, respectively. Approximately *11% of mature horses* could be classified into a group "*without specific use activity*" that contributed to the total generated impacts *by 1%*. The number clearly shows that, on one hand, in order to produce impacts, horses must be linked to activities and, on the other hand, there seems to be still quite high potentials in the present horse sector (reference year: 2013). Apart from the economic impacts generated by the operation of the horse sector, the ***value of the net export*** (323,362 euros) must also be added to the impacts as direct impacts. ***Altogether***, the direct impacts of the sector amounted to ***207.7 million euros***, while the ***total impacts***, ***257.4 million euros***.

2) Macroeconomic analysis of the environment necessary for the Equestrian Revolution

The analysis proved ***the importance of a high and very high level of quality of life in the equestrian demand*** on the basis of both the HDI, the SPI and high level of GDP per capita if it was accompanied by high and very high levels of the HDI. Apart from the quality of life, ***the importance of the constructed environment*** to the horse sector was verified, as well. ***The analysis proved that the lack of a high level quality of life, in which people are enabled to realize themselves, cannot be substituted, from the perspective of the equestrian demand, by e.g above average of GDP per capita or high and very high levels of disposable income per capita***. The high level of disposable income per capita more likely represents a possibility for spending in the horse sector and not the condition of it.

Hungary belonged to the group of countries, where ***horses and horse-related activities were demanded*** in the analyzed years on the basis of indicators both in horse racing and in equestrian. *Its advantages in comparison with numerous countries of the world are appearent on the basis of both horse racing and equestrian indicators and economic indicators, but, its disadvantages with respect to the demand for horses and horse-related activities (and as a consequence, the capacity of the industry to generate economic impacts) are also unquestionable.* ***These disadvantages can be well explained by macroeconomic reasons necessary to take into consideration in the Equestrian Revolution***.

Theses

By drawing the consequences from the results obtained in the research, all hypotheses are considered as proved, thus they serve as ***theses***.

T1. The demand for horses and horse related activities has been generated by human development.

T2. Application of methodology, by ignoring the characteristics of the horse sector, used for estimating the economic impacts generated by the horse industry does not enable the correct estimation of the complex impacts of the horse sector.

T3. The qualitative and quantitative impacts of the horse industry are basically determined by the quality of relationship between human development and the economic performance.

T4. Considering the entire Hungarian Horse Industry, the strategies that would serve the sustainable and competitive operation of the industry in the Equestrian Revolution in the long-term have not been able to formulate yet.

REFERENCES

1. Addison, T. (2013): *Time has come for new indicators besides GDP*. The Nation.

http://www.nationmultimedia.com/business/Time-has-come-for-new-indicators-besides-GDP-30208912.html (18/12/2014)

2. Agüera Carmona, E. (2008): *Domesticación y origen de la doma y manejo del caballo*. Solemne Acto de Apertura del Curso Académico 2008-2009 de las Universidades Andaluzas.

https://www.uco.es/organizacion/secretariageneral/images/doc/memoria/2007/0/Ap_0_2.pdf (15/11/2014)

3. Alderfer C. P. (1969): An Empirical Test of a New Theory of Human Needs. Organizational Behaviour and Human Performance, volume 4, edition 2, pp. 142–175.

4. Alderfer C. P. (1972): Existence, Relatedness, and Growth: Human Needs in Organizational Settings. New York: Free Press

5. Altamirano, J. C. (2006): Las rutas del caballo en Andalucía. Escandón Impresores, Sevilla.

6. Amabile, T. M. - DeJong, W. - Lepper, M. R. (1976): Effects of externally imposed deadlines on subsequent intrinsic motivation. Journal of Personality and Social Psychology, volume 34, pp. 92–98.

7. American Quarter Horse Association. (2015): Database. https://aqha.com/racing (25/08/2015)

8. Ansoff, H. I. (1965): Corporate strategy. New York: McGraw Hill.

9. Barajas Alonso, Á. A. - Salgado Barandela, J. - Sánchez Fernández, P. (2012): Problemática de los estudios de impacto económico de eventos deportivos. Estudios de Economía Aplicada. Volume 30-2. pp. 441-462.

10. Barroso, J. M. (2011): Beyond GDP. Measuring progress, true wealth and the well-being of nations. http://ec.europa.eu/environment/beyond_gdp/key_quotes_en.html. (18/12/2014)

11. Bódai, J. (2000): A kisbéri és a magyar királyi ménesbirtok története. Publi-City Publisher, Budapest.

12. Boozer, M. -Ranis, G. - Stewart, F. - Suri, T. (2003): Paths to success: The relationship between human development and economic growth. Center Discussion Paper 874. http://ssrn.com/abstract=487469 (22/09/2015)

13. Brade, W. (2013): Die deutsche Reitpferdezucht - aktueller Stand und wirtschaftliche Bedeutung. Zeitschrift für Agrarpolitik und Landwirtschaft. http://buel.bmel.de/index.php/buel/article/view/Brade/brade-html (15/08/2014)

14. Brem, G. (2011): Der Lipizzaner im Spiegel der Wissenschaft. Verlag der österreichischen Akademie der Wissenscahften, Vienna.

15. British Horse Industry Confederation - DEFRA. (2005): Strategy for the Horse Industry in England and Wales. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69260/pb11323-en-horse-industry-strategy-051128.pdf (04/02/2014)

16. Castejón Montijano, R. (2009): Economic impact of the horse industry: a special reference to Spain. pp. 1-11. http://www.eaap.org/Previous_Annual_Meetings/2009Barcelona/Papers/46_Castejon,.pdf (03/04/2013)

17. Castejón Montijano, R. (2010): Olimpiadas y Economía: Una revisión. Cuenta y Razón. Volume. 16. pp. 33-43.

18. Castejón y Martinez de Arizala, R. (1926): Cría y Recría del Potro. Catecismos del Agricultura y del Ganadero, Imprenta de Antonio Marzo – San Hermensgildo – Madrid

19. de Charms, R. (1968). Personal causation. New York: Academic Press

20. Cifras INE. (2012): El impacto económico del Turismo. La nueva cuenta satélite del Turismo en España perfecciona su medición económica. Boletín informativo del Instituto Nacional de Estadística. Cuenta Satélite del Turismo. 2/2002.

http://www.ine.es/ss/Satellite?L=es_ES&c=INECifrasINE_C&cid=1259925130772&p=1254735116567&pagename=ProductosYServicios%2FPYSLayout (27/06/2015)

21. Clark, H. (2012): Beyond GDP – Measuring the Future We Want. http://www.undp.org/content/undp/en/home/presscenter/speeches/2012/06/20/helen-clark-beyond-gdp-measuring-the-future-we-want.html (18/12/2014)

22. Cobb, C. - Halstead T. - Rowe J. (1995): "If the GDP is up, why is America down?" *The Atlantic* October. pp. 1-22. http://www.theatlantic.com/past/politics/ecbig/gdp.htm (01/04/2015)

23. Cressent, M. – Jez, C. (2013): The French horse industry at present. In Cledwyn, T. The French Horse Industry: Scenarios 2030. Advances in animal biosciences. Cambridge University Press. ISBN 978-0-906562-69-7 Volume 4 special issue 2.

24. Crompton, J. (1995): Economic Impact Analysis of Sports Facilities and Events: Eleven Sources of Misapplication. Journal of Sport Management 9(1), 14-35. http://journals.humankinetics.com/jsm-back-issues/JSMVolume9Issue1January (27/06/2015)

25. Crompton, J. (2006): in Barajas Alonso, Á. A. - Salgado Barandela, J. - Sánchez Fernández, P. (2012). Problemática de los estudios de impacto económico de eventos deportivos. Estudios de Economía Aplicada. Volume 30-2. pp. 441-462.

26. Deci, E. - Ryan, R. (1991): A motivational approach to self: Integration in personality. In R. Dienstbier (Ed.), Nebraska symposium on motivation: Volume. 38. Perspectives on motivation (pp. 237–288). Lincoln: University of Nebraska Press.

27. Deci, E. L. - Vansteenkiste, M. (2004): Self-determination theory and basic need satisfaction: Understanding human development in positive psychology. Richerche di Psicologia, Volume 27, Number I, pp. 23-40.

28. Deloitte – American Horse Council Foundation. (2005): The economic impact of the Horse Industry on the United States. American Horse Council Foundation. Cornell University. pp. 3-43.

29. Deloitte. (2011): Análisis de la estructura de la industria ecuestre en Francia. Federació Catalana d'Hípica. Barcelona.

30. Deloitte. (2013): Estudio del impacto del sector ecuestre en España. Real Federación Hípica Española. Madrid.

31. Domecq y Díez, A. (1975): in Girón Tena, F. El caballo en España. San Sebastian Publicaciones del Ministerio de Información y Turismo.

32. Dornier, X. (x): Estimated economic indicators of the French horse industry. Presentation poster.

33. Ernst J (1997): Százhetven év versenyben, tenyésztésben. Dinasztia Publisher, Budapest, edited by Váczi Ernő.

34. Ernst, J. (2008): 100 év a magyar lovassport történetéből 1872-1914. Volume I. Cartaphilus Kiadó Kft.

35. Ernst, J. (2014): 100 év a magyar lovassport történetéből 1920-1944. Volume II. Bioenergetic Kiadó Kft.

36. Ernst, J.-Fehér, D.-Ócsag, I. (1988): Magyar Lovaskönyv. Natura Corvina Publisher.

37. European Commission. (2014): Métodos propuestos para la medición del impacto social. http://ec.europa.eu/social/main.jsp?catId=738&langId=es&pubId=7735 (27/06/2015)

38. Evans, V. (2010): Canadian horse industry profile study. Strategic Equine Inc. http://www.strategicequine.ca/. pp. 1-110. (11/10/2011)

39. FEI. (2006): FEI results at the World Equestrian Games, 2006. http://history.fei.org/sites/default/files/WEG_2006_Endurance_Results.pdf (24/02/2016)

40. Forgeard, M. J. C. - Jayawickreme E. - Kern M. L., Seligman M. E. P. (2011): Doing the right thing: Measuring wellbeing for public policy. International Journal of Wellbeing 1(1), 79-106. doi:10.5502/ijw.v1i1.15.

41. Gala, A. (1975): in Girón Tena, F. El caballo en España. San Sebastian Publicaciones del Ministerio de Información y Turismo.

42. Gordon, J. (2001): The horse industry. Contributing to the Australian economy. RIRDC publication. http://www.horsecouncil.org.au/ahic/index.cfm/topics/surveys/the-horse-industry-contributing-to-the-australian-economy/. pp. 1-54. (03/08/2010)

43. Graphic. (1897): 1897 Military Riding School Tor di Quinto Wynne Foley. Graphic. Illustrated weekly newspaper. January, 30, 1897.

44. Gurría, A. (2013): Introductory Remarks on Measuring Progress. First Session. http://www.oecd.org/about/secretary-general/yourbetterlifeindex.htm (18/12/2014)

45. Hagerty, M. R. (1999): Testing Maslow's Hierarchy of Needs: National Quality of Life Across Time. Social Indicators Research. 46 (3) pp. 249-271.

46. Hall, J. (2010): Measuring what matters to make a difference. Symposium 151. Journal of Future Studies, 15 (2), pp. 151-154.

47. Häggblom, M., Rantamäki-Lahtinen, L., Vihinen, H. (2006): Equine sector comparison between the Netherlands, Sweden and Finland. Equine Life. MTT Agrifood Research Finland. Life04ENV/FI/000299. http://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=home.showFile&rep=file&fil=EquineLIFE_Sector_Comparison.pdf. (12/05/2014)

48. Harasnational, Confédération Suisse. (2009): The "Swiss equine research network": from the horse to the scientist and back, EAAP, Barcelona. http://www.horse-web.net/Barcelona09_sessions_file/presentations/Burger_Network_2009k.pdf (10/08/2014)

49. Hecker, W. (1994): A bábolnai arab ménes. Agroinform Publisher, Budapest.

50. Hecker, W. (2005): Akadályverseny. Magyar lovassport: messze még az élmezőny. In Magyar Nemzet, Archívum, 2005. http://mno.hu/migr_1834/akadalyverseny-551414 (20/06/2015)

51. Hecker, W. (2011): Híres versenylovak. IAT Kiadó és a Studia Germanica Kft. Budapest, edited by Brenyó József

52. Hecker, W - Győrffy-Villám, A. - Szelestey, L. - Jankovics, M. (2004): Lovas Nemzet. A magyarság és a ló évezredeken átívelő barátságáról. Helikon Publisher.

53. Henley Centre. (2004): A report of research on the horse industry in Great Britain. British Horse Industry Confederation. http://www.bhic.co.uk/downloads/henley-report.pdf. pp. 24-27. (04/02/2014)

54. Hodgett, A., O'Keeffe, N. (2013): Analysis of the economic impact of the Irish Thoroughbred Industry. http://www.itba.info/wp-content/uploads/2013/07/Dukes-Report-II-October-2013-Update.pdf. pp. 1-18. (09/10/2014)

55. Horváth, Á. (2002): In Tibay, Gy. A magyar lótenyésztés az EU csatlakozás tükrében. Presentations of a National Conference. Szent István Egyetem, GTK Vezető és Továbbképző Intézet kiadványa.

56. International Equestrian Federation (FEI). Database. https://data.fei.org/Default.aspx (2014, 2015)

57. International Federation of Horse Racing Authorities (IFHA). (2013). Database. http://www.horseracingintfed.com/default.asp?section=Resources&area=4 (25/08/2015)

58. Jez, C. - Coudurier, B. - Creesent, M. - Méa, F. (2013). Factors driving change in the French Horse Industry to 2030. The French Horse Industry: Scenarios 2030. Advances in animal biosciences. Cambridge University Press. ISBN 978-0-906562-69-7 Volume 4 special issue 2. pp. 66-105

59. Karl, P. (2009): Irrwege der modernen Dressur. Die Suche nach der klassischen Alternative. Cadmos Verlag. Hungarian translation, published in 2011 by the Mezőgazda Publisher.

60. Koppány, G. (2002): Génmegőrzés. Régi háziállatfajták értéke. In Jávor, A. – Mihók, S. Génmegőrzés: Kutatási eredmények régi háziállatfajták értékéről. Debreceni Egyetem, Agrártudományi Centrum Állattenyésztési Tanszék Kiadványa. pp. 215-219. ISBN: 9634726968

61. Kovácsy, B. - Monostori, K. (1905): A ló és tenyésztése. Patria Irodalmi Vállalat és Nyomdai Részvénytársaság.

62. Kuznets, S. (1962): In Cobb, C. - Halstead T. - Rowe J. (1995): "If the GDP is up, why is America down?" *The Atlantic* October. pp. 1-22. http://www.theatlantic.com/past/politics/ecbig/gdp.htm (01/04/2015)

63. Lejeune, A. L. (2010): Analyse du potentiel de marché de l'élevage de chevaux de sport en Belgique et approche marketing. Doctoral dissertation.

64. Loch, S. (1986): The Royal Horse of Europe. The story of the Andalusian and Lusitano. BAS Printers Limited, J. A. Allen & Co Ltd. London.

65. X. (x). Magyar Királyi Honvéd Ludovika Akadémia, 1808-1945. http://www.honvedelem.hu/container/files/attachments/27687/02_ludovika_elso_fejezet.pdf (05/05/2015)

66. Maslow, A. H. (1943): A Theory of Human Motivation. Physiological Review, 50. pp. 370-396.

67. Maslow, A. H. (1954): Motivación y personalidad. División de Harper and Row, Publishers, Inc.

68. Max-Neef M. - Elizalde A. - Hopenhayn M. (1993): Desarrollo a escala humana – Conceptos, aplicaciones y algunas reflexiones. Editorial Nordan-Comunidad. http://www.academia.edu/7609491/Max_Neef-Desarrollo_a_escala_humana (04/01/2015)

69. Méndez Rial, B. – Sánchez Fernández, P. – Barajas Alonso, Á. A. (2012): Impacto de eventos deportivos: el caso del Campeonato de España de Natación Pontevedra 2011. Revista Internacional de Derecho y Gestión del Deporte pp. 72-91

70. Mihók, S. (2000): Kincsünk a magyar ló. Debreceni Egyetem, ATC, Állattenyésztés- és Takarmányozástani Tanszék Kiadványa

71. Mihók, S. (2007): A ló jövője, a ló jövőjéért, Debreceni Egyetem, ATC kiadványa, szaktanácsadási füzetek 10

72. Mihók, S. (2009): Ágazati helyzetelemzés, kitörési lehetőségek a lótenyésztésben. In Jávor, A. Debreceni álláspont. 273-300p.

73. Mihók S.-Pataki B.-Kalm, E.-Ernst J. (2001): Gazdasági állataink – Fajtatan: Ló és Szamár, Mezőgazda Publisher

74. Moreno de los Ríos y Díaz, R. (2007): Futuro del Sector Equino en España. Participación del Sector Equino en el Desarrollo Rural y otras Actividades Culturales y de Ocio. Presentation at Toledo.

75. Moreno de los Ríos y Díaz, R. - Garcías Espías, J. - Miscá Carballido, J. A. - MR. Consultores Turismo Ecuestre S. A. (2006): Impacto económico del caballo en Andalucía. Junta de Andalucía.

76. MR Consultores Turismo Ecuestre. (2007): Impacto económico del caballo en Andalucía. Congreso Internacional de Turismo Ecuestre. Jerez de la Frontera.

77. Ócsag, I. (1989): A kisbéri félvér. Mezőgazdasági Publisher, Budapest

78. Organization of Economic Cooperation and Development (OECD). (2013): Database. https://data.oecd.org/hha/household-disposable-income.htm (20/11/2015)

79. Pál, J. – Várady, J. (1980): Magyar lótenyésztés 1945-1980. Idegenforg. Prop. és Kiad. Váll. OLF kiadványa.

80. Pántya, J. - Radványi, R. (2004): A ló mint a vidékfejlesztés motorja. Az Országgyűlés Nemzeti Lovasprogramot előkészítő Eseti Bizottsága kiadványa

81. Pataki, B. (2013): Magyar népi fogatok - Pásztorélet, szekerek, kocsik, fogatolási módok. Mezőgazda Publisher.

82. Policy Research Corporation. (2008): Vlaamse Paardenhouderij. De paardensector als economische en maatschappelijke actor in Vlaanderen. Een analyse van het economisch en sociaal-maatschappelijk profiel en belang van de Vlaamse paardenhouderij. pp. 1-83. Personal communication.

83. Porter, M. (2005): in Ramirez Castellanos, E. (2013). La competividad de los agronegocios en Colombia: una reflexión académica. Magazin Empresarial. 9 (22). Pp. 29-34.

84. Prutkay, Z. (2005): Akadályverseny. Magyar lovassport: messze még az élmezőny. In Magyar Nemzet, Archívum, 2005. Available on http://mno.hu/migr_1834/akadalyverseny-551414 (20/06/2015)

85. PwC. (2012): Estudios de Impacto Económico. Cómo valorar la repercusión y el retorno de iniciativas e inversiones públicas. www.pwc.es/es_ES/es/.../brochure-estudios (27/06/2015)

86. Ramirez, A. - Ranis, G. - Stewart, F. (1998): Economic Growth and Human Development. QEH Working Paper Series - QEHWPS18. http://www3.qeh.ox.ac.uk/pdf/qehwp/qehwps18.pdf (22/09/2015)

87. Ranis, G. (2004): Human Development and Economic Growth. Center Discussion Paper No. 887. http://www.econ.yale.edu/growth_pdf/cdp887.pdf (22/09/2015)

88. Ranis, G. - Stewart, F. (2005): Dynamic Links between the Economy and Human Development. DESA Working Paper No. 8. ST/ESA/2005/DWP/8. Available on http://www.un.org/esa/desa/papers/2005/wp8_2005.pdf (22/09/2015)

89. Rauchenberger, J. - Schmitt, N. - Hunter, J. E. (1980): A test of the need hierarchy concept by a Markov model of change in need strength. Administrative Science Quarterly, 25, pp. 654-670. doi:10.2307/2392286

90. Réseau REFErences. (2014): Key figures of the horse industry in Europe. Observatoire économique et social du cheval, IFCE (France)

91. Rodríguez Alcaide, J. J. - Pardo Sempere, L. - Rodríguez Zapatero, M. - Ruiz, D. E. M. (2005): Valoración económica de la producción y utilización del caballo en Andalucía (España). Archivos de Zootécnia, Volume 54, pp. 157-163.

92. Ruffo Scaletta, F. (2012): Adapting to changing environment. General Assembly and 46th Intenrational Conference IFHA, Paris, 08/10/2012. www.horseracingintfed.com/Pdfs/RUFFO_SCALETTA.ppt (23/08/2014)

93. Salgado Barandela, J. – Barajas Alonso, Á. A. – Lera López, F. – Sánchez Fernández, P. (2013): Impacto económico de eventos deportivos: modelo y praxis. Revista Intercontinental de Gestão Desportiva. Volume 3, Number 1, ISSN 2237-3373. pp. 38-50.

94. Samuelson, P. A. – Nordhaus, W. D. (2009): Economics. 19th edition. Publisher: McGraw-Hill Education. ISBN-13: 978-0073511290

95. Sárközy, N. (2009): Beyond GDP: Measuring progress, true wealth and the well-being of nations. http://ec.europa.eu/environment/beyond_gdp (18/12/2014)

96. Schneider, H. W. -Mahlberg, B. (2005): Die volkswirtschaftliche Bedeutung der Pferdewirtschaft in Österreich Makroökonomische Studie. http://pferdaustria.info/download/text/151/Endversion.pdf. pp. 1-58. (23/10/2010)

97. Sen, A. (2010): Interview on the 20th anniversary of the human development index. http://ec.europa.eu/environment/beyond_gdp/key_quotes_en.html (20/02/2015)

98. Sigurðardóttir, I. – Helgadóttir, G. (2015): The new equine economy of Iceland. In Vial, C. – Evans, R. The new equine economy in the 21st century. pp. 225-236. EAAP publication, No. 136. Wageningen Academic Publishers. ISBN: 978-90-8686-279-5

99. Social Progress Imperative (2014). Social Progress Index. http://www.socialprogressimperative.org/data/spi/countries (29/12/2014)

100. Sport Horse Ireland. (2013): Economic contribution of the Sport Horse Industry to the Irish Economy. National Development Plan. http://www.euroequestrian.eu/wp-content/uploads/2013/09/Economic-Contribution-of-the-Sport-Horse-Industry-to-the-Irish-Economy4.pdf. pp. 1-49. (09/10/2014)

101 Stiglitz, J. - Sen, A., - Fitoussi, J.-P. (2009): Report by the Commission on the Measurement of Economic Performance and Social Progress. http://www.stiglitz-senfitoussi.fr/documents/rapport_anglais.pdf. pp. 7-287. (09/01/2015)

102. Sz. Bozsik, N. -Papp, T. (1985): Mezőhegyes lótenyésztésének története 1785-től 1980-ig. Mezőhegyesi Mezőgazdasági Kombinát, Mezőhegyes.

103. Széchenyi, I. (1828): Lovakrul. Budapest.

104. Szécsi, R. (2013): Study on Hungarian Horse Racing. Manual.

105. Swedish Horse Council Foundation (2004). The horse in Sweden. Swedish Horse Council Foundation. pp. 1-28.

106. Tay, L. - Diener, E. (2011): Needs and Subjective Well-Being Around the World. Journal of Personality and Social Psychology. Volume 101, Number 2, pp. 354-365.

107. Tibay, Gy. (2002): A magyar lótenyésztés az EU csatlakozás tükrében. Országos konferencia előadásai. Szent István Egyetem, GTK Vezető és Továbbképző Intézet kiadványa.

108. United Nations Development Program (UNDP). (1990): Human Development Report. http://hdr.undp.org/sites/default/files/hdr_1990_es_completo_nostats.pdf. p. 19. (09/01/2015)

109. United Nations Development Program (UNDP). (1996): Human Development Report. http://hdr.undp.org/sites/default/files/reports/257/hdr_1996_en_complete_nostats.pdf (09/01/2015)

110. United Nations Development Program (UNDP). (2014): Human Development Report. http://hdr.undp.org/sites/default/files/hdr14-report-en-1.pdf. pp. 164-167. (04/01/2015)

111. Vallerand, R. J. - Reid, G. (1984): On the causal effects of perceived competence on intrinsic motivation: A test of cognitive evaluation theory. Journal of Sport Psychology, 6, pp. 94– 102.

112. Várady, J. (1999). Aranyúton. A magyar fogathajtás története. Dé & Pé Sajtóiroda, Budapest.

113. Wesselényi, M. (1829): A 'régi híres ménesek egyike' megszűnésének okairól. Petrózai Trattner J. M. és Károlyi István Könyvnyomtató Inézetében. Budapest.

114. Wesselényi, M. (1847): Teendők a lótenyésztés körül. Kolozsvár.

115. White, R. W. (1959): Motivation reconsidered. Psychological Review, 66, 297–333.

116. Wicker, F. W. - Brown, G. - Wiehe, J. A. - Hagen, A. S. - Reed, J. L. (1993): On Reconsidering Maslow: An Examination of the Deprivation/Domination Proposition. Journal of Research in Personality. Volume 27, Issue 2, June, 1993, pp. 118-133.

117. World Bank. (2013): Database http://data.worldbank.org/indicator (06/11/2015)

118. World Economic Forum. (2009): Travel and Tourism Competitiveness Report. http://www3.weforum.org/docs/WEF_GCR_TravelTourism_Report_2009.pdf (06/01/2016)

119. World Economic Forum. (2011): Travel and Tourism Competitiveness Report. http://www3.weforum.org/docs/WEF_TravelTourismCompetitiveness_Report_2011.pdf (06/01/2016)

120. World Economic Forum. (2013): Travel and Tourism Competitiveness Report. http://static.hosteltur.com/web/uploads/2013/03/WEF_Competitividad_turystica_2013.pdf. pp. 30-32. (05/03/2014)

121. Zuckerman, M. - Porac, J. - Lathin, D. - Smith, R. - Deci, E. L. (1978): On the importance of self-determination for intrinsically motivated behavior. Personality and Social Psychology Bulletin, 4, pp. 443–446.

References for Personal communication:

122. Clausen, E. F. (2014). Personal communication.

123. Fehér, D. (2013). Personal communication. Director of the Hungarian Horse Racing Enterprise between 1971 and 1991.

124. Hungarian Equestrian Federation (2015). Personal communication.

125. Kanics, Á. (2013). Personal communication. President of the Thoroughbred Racehorse Breeders' Association.

126. Török, L. (2013). Personal communication. Secretary of the Trotter Breeders' Association.

For the estimation of the economic impacts generated by the Hungarian Horse Industry in 2013

1. Chef d'Equipe of Driving (2013). Personal communication.

2. Chef d'Equipe of Endurance (2013). Personal communication.

3. Chef d'Equipe of Show Jumping (2013). Personal communication.

4. Database of Dressage of Hungarian Equestrian. (2013). http://www.nevezesdijlovas.hu/ (10/08/2015)

5. Database of Driving of Hungarian Equestrian. (2013). http://nevezes.fogatsport.hu/ (08/08/2015)

6. Database of Endurance of Hungarian Equestrian. (2013). http://nevezes.tavlovasok.hu/ (13/08/2015)

7. Database of Eventing of Hungarian Equestrian. (2013). http://nevezes.eventing.hu/ (12/08/2015)

8. Database of Reining and Western of Hungarian Equestrian. (2013). http://nevezeswestern.hu/ (14/08/2015)

9. Database of Vaulting of Hungarian Equestrian. (2013). http://nevezes.lovastorna.hu/ (15/08/2015)

10. Hentsey lovasbolt. (2013). Personal communication. Horse-, rider-, driver related purchase of equipment, clothing and tack.

11. Horse-, rider-, driver related purchase of equipment, clothing and tack. (2013). http://www.aranypatkoszeged.hu. (09/04/2013).

12. Horse-, rider-, driver related purchase of equipment, clothing and tack. (2013). https://www.delifarm.hu. (03/04/2013).

13. Horse-, rider-, driver related purchase of equipment, clothing and tack. (2013). http://www.horze.hu. (10/04/2013).

14. Horse-, rider-, driver related purchase of equipment, clothing and tack. (2013). http://www.imaginelovas.hu. (04/04/2013).

15. Horse-, rider-, driver related purchase of equipment, clothing and tack. (2013). http://klp.hu/termek_lista_csoport. (06/04/2013).

16. Horse-, rider-, driver related purchase of equipment, clothing and tack. (2013). http://kovacslovas.hu. (02/04/2013).

17. Horse-, rider-, driver related purchase of equipment, clothing and tack. (2013). http://www.lovasbolt.com. (07/04/2013).

18. Horse-, rider-, driver related purchase of equipment, clothing and tack. (2013). http://www.lovasvilag.hu. (05/04/2013).

19. Horse-, rider-, driver related purchase of equipment, clothing and tack. (2013). http://www.nagylovas.hu. (01/04/2013).

20. Horse-, rider-, driver related purchase of equipment, clothing and tack. (2013). http://www.solealovascentrum.hu. (08/04/2013).

21. Hungarian Central Statistical Office (2013). Personal communication.

22. Hungarian Equestrian Federation (2013). Personal communication.

23. Hungarian Equine Therapy Association (2013). Personal communication.

24. Hungarian Horse Breeders' Federation. (2013-2015). Personal communication.

25. Hungarian Horse Racing database. (2013). http://www.magyarturf.hu/ (28/01/2014)

26. Hungarian Pony Club Association (2013). Personal communication.

27. Hungarian Pony Club Association (2013). http://nevezes.poniklub.hu/ (28/06/2015)

28. Hungarian Quarter Breeders' Association (2013). Personal communication.

29. Kanics, Á. (2013). Personal communication. President of the Thoroughbred Racehorse Breeders' Association.

30. Kincsem National Equestrian Plan. (2012). Közigazgatási és Igazságügyi Minisztérium. http://www.lovasszovetseg.hu/fajlok/Kincsem_program_egyeztetesre.pdf (01/04/2013)

31. Magyarturf. (2013). http://195.228.135.95/php/index.php (29-30/01/2014)

32. Szécsi, R. (2014). Personal communication. Executive vice-president of the Hungarian Trotter Breeders' Association; General Manager of the Hungarian Jockey Club.

33. Széll, L. (2013). Personal communication. Horse-, rider-, driver related purchase of equipment, clothing and tack.

34. Táltos lovasbolt. (2013). Personal communication. Horse-, rider-, driver related purchase of equipment, clothing and tack.

35. Török, L. (2013). Personal communication. Secretary of the Trotter Breeders' Association.

36. Vaulting trainer (2013). Personal communication.

APPENDIX 1

Table 7.1: The most important pieces of information on studies on the economic importance of the horse industry

Country	Method of calculation	Economic importance	Employment
Australia	Final consumption expenditure on animal-, event- and business-related expenditures; direct and indirect impacts together	GDP 6.3 billion Australian dollars: 3.1 billion, 2.4 billion and 0.8 billion dollars, respectively.	42,000 persons
Sweden	No information.	Turnover in excess of 2.5 billion euros	11,000 jobs
United States	Input-output analysis; direct, indirect and induced economic impacts.	39 billion and 102 billion US dollars in direct and total economic impacts, respectively	1.4 million full-time equivalent jobs, of which 460,000 created directly
Denmark	No information	Turnover in excess of 21 billion Danish crowns	18,000 jobs
Canada	Final consumption expenditure; direct, indirect and induced impacts	9.3 billion and 19.6 billion Canadian dollars direct and total impacts, respectively.	on-farm activities: 76,000 full-time equivalent jobs, off-farm activities: 9,806 full-time equivalent jobs
Ireland	Final consumption expenditure; direct and indirect impacts together	1.8 billion euros, of which 708 million euros by the Sport horse industry and 1.1 billion euros by the Thoroughbred industry.	25,417 full-time equivalents created directly, of which 14,000 in the Thoroughbred industry
Belgium	No information. Categories: breeders, users and occupation, education	265.2 million euros added-value; 6.2 million, 62 million and 147 million euros respectively. Plus 50 million euros from wagering.	3,550 full-time equivalent jobs; 410, 1.200 and 1.940 respectively
Netherlands	No information.	Turnover in excess of 1,200 million euros.	jobs for 400,000 persons
Spain	Input-output analysis; direct and indirect impacts.	3.4 million euros and 1.9 million euros direct and indirect economic impacts, respectively.	61,247 persons
Germany	No information.	Turnover in excess of 5 billion euros.	300,000 people employed permanently directly or indirectly.
France	No information.	Turnover in excess of 12.3 billion euros.	39,000 people in contact with horses; 7,200 horse-specialist veterinarian; 30,000 full-time equivalent jobs in other segments
Finland	No information.	Turnover in excess of 850 million euros.	directly: 3,500 full-time and 6,000 part-time employments indirectly: 1,000 full-time and 3,000 part-time employment

Source: own construction based on Gordon, 2001, Réseau REFErences, 2014; Deloitte, 2005; Clausen, 2014; Evans, 2010; Sport Horse Ireland, 2013; Hodgett-O'Keffe, 2013; Policy Research Corporation, 2008 and Lejeune, 2010; Häggblom-Lathinen-Vihinen, 2006; Réseau REFErences, 2014; Réseau REFErences, 2014 and Häggblom-Lathinen-Vihinen, 2006; Deloitte, 2013; Brade, 2013, respectively.

Table 7.1 continued: The most important pieces of information on studies on the economic importance of the horse industry

Country	Method of calculation	Economic importance	Employment
Great Britain	Final consumption expenditure; direct and indirect expenditures together.	Gross output amounted to 3,4 British pounds.	50,000 people directly and approximately 200,000 people indirectly
Switzerland	No information.	Turnover in excess of 1,785 million euros.	No information.
Austria	Input-output analysis without information on direct and indirect impacts and the sub-sectors	production value in excess of 1,19-1,26 billion euros; added value in excess of 634-674 million euros	23.000-24.300 workplaces that corresponded to 14.500-15.400 full-time equivalent jobs

Source: own construction based on; British Horse Industry Confederation, 2005 and Henley Centre, 2004; Lejeune, 2010 and Réseau REFErences, 2014; Schneider-Mahlberg, 2005, respectively.

APPENDIX 2: SUPPLEMENTARY INFORMATION USED FOR THE ANALYSIS

Table 8.1: Data source of the number of horses in different sub-sectors and segments of the Hungarian Horse Industry

Sub-sector or segment of the Hungarian Horse Industry	Source of data on horse population
Breeding	Hungarian Horse Breeders' Federation
Foals between 6 months of age and beginning of use in some activity (from breed population, registered and not registered by the Federation)	Estimates of the Hungarian Horse Breeders' Federation
Horse racing	Horse racing database
Equestrian and pony equestrian	Hungarian Equestrian Federation and Pony Club Association
Equestrian tourism	Kincsem National Equestrian Plan, 2012 (data refers to 2011)
Equine therapy	Estimate of the Equine Therapy Association
Agricultural and ecological programs	Estimate of the Hungarian Horse Breeders' Federation
Leisure activities in riding schools and at home	Own estimates
Without specific activity	Own estimates
Foals other than that of breed animals between 6 months of age and beginning of use in some activity	Estimate of the Hungarian Horse Breeders' Federation

Source: own construction

Table 8.2: Data source of operational information and general level of spending in different sub-sectors and segments of the Hungarian Horse Industry

Sub-sector or segment of the Hungarian Horse Industry	Source of data
Breeding	Stud-farm managers, Hungarian Horse Breeders' Federation
Foals between 6 months of age and beginning of use in some activity (breed population in and out of the Federation)	Estimates of the Hungarian Horse Breeders' Federation
Agricultural and ecological programs	Hungarian Horse Breeders' Federation
Horse racing	
Flat racing	President of the Thoroughbred Racehorse Breeders' Association; Secretary of the Trotter Breeders' Association
Harness racing	President and Secretary of the Trotter Racehorse Association
Equestrian (other than the Equestrian Federation and the FEI database)	
Dressage	Own estimates (due to ignorance of request of the Chef d'Equipe)
Show Jumping	Chef d'Equipe
Eventing	Eventing steward and own estimates taking into account the information of the Chef d'Equipe of the Show Jumping discipline
Driving	Chef d'Equipe and competitors
Endurance	Chef d'Equipe
Vaulting	Vaulting trainer and own estimates (due to lack of data from the Chef d'Equipe despite initial offer for giving information)
Reining and Western	President of the Quarter horse Breeders' Association
Pony equestrian	President of the Pony Club and a competitor
Equestrian tourism	Own estimates (due to ignorance of request from the President of the Equestrian Tourism Association)
Equine therapy	President of the Equine Therapy Association
Leisure activities in riding schools and at home	Own estimates taking into account information received from riding school managers
Without specific activity	Own estimates
Foals other than that of breed animals between 6 months of age and beginning of use in some activity	Own estimates

Source: own construction

Table 8.3: Horse racing indicators and information on them important to the analysis

Indicator	Indicator based on benchmark	Dimension	Period
Betting turnover	Betting turnover per 100,000 inhabitants	euros	2005, 2008 - 2013
Prize money	Prize money per 100,000 inhabitants	euros	2005, 2008 - 2013
Number of different horses	Number of different horses per 100,000 inhabitants	number of horses	2005, 2008 - 2013
Number of breed horses	Number of breed horses per 100,000 inhabitants	number of horses	2005, 2008 - 2013
Number of starts	Number of starts per 100,000 inhabitants	number of starts	2005, 2008 - 2013
Number of racecourses	Number of racecourses per 1,000,000 inhabitants	number of racecourses	2005, 2008 - 2013

Source: own construction respective to data obtained from the database of the IFHA.

Table 8.4: Equestrian indicators and information on them important to the analysis

Indicator	Indicator based on benchmark	Dimension	Period
Total number of horses in all equestrian disciplines	Total number of horses in disciplines per 100,000 inhabitants	number of horses	2010 - 2013
Number of horses in each of the equestrian disciplines	Number of horses per discipline per 100,000 inhabitants	number of horses	2011- 2013
Total number of athletes in all equestrian disciplines	Total number of athletes in disciplines per 100,000 inhabitants	number of athletes	2010 - 2013
Number of athletes in each of the equestrian disciplines	Number of athletes per discipline per 100,000 inhabitants	number of athletes	2011- 2013
Total number of events in all equestrian disciplines	Total number of events in disciplines per 1,000,000 inhabitants	number of events	2010 - 2013
Number of events in each of the equestrian disciplines	Number of events in disciplines per 1,000,000 inhabitants	number of events	2011- 2013

Source: own construction on the basis of data obtained from the database of the FEI. Note: Equestrian disciplines are: Show Jumping, Dressage, Eventing, Driving, Endurance, Vaulting, Reining, and Para-equestrian.

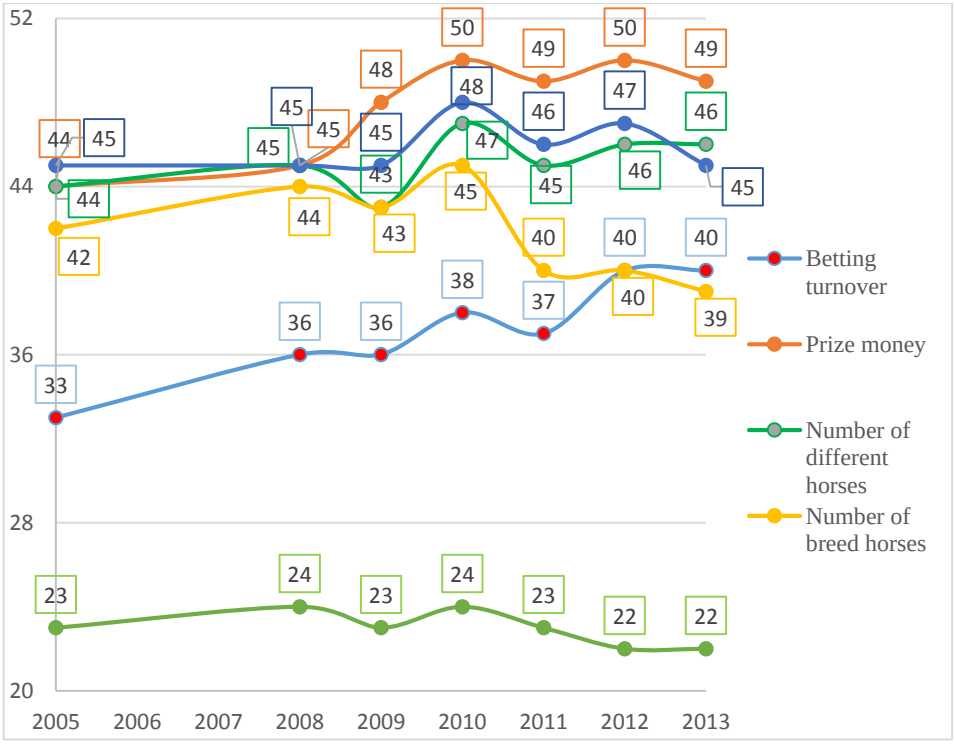


Figure 8.1: Number of countries, where horse racing disciplines were practiced in the analyzed years, on the basis of adjusted indicators. Note: The total number of registered countries was 65 in each of the years. The figure contains the number of those countries where the adjusted indicator resulted in at least one different horse, breed horse, start, racecourse, betting turnover and prize money

Source: own construction based on own calculation on the basis of data obtained from the IFHA.

Table 8.5: Number of countries, where equestrian disciplines were practiced in the analyzed years on the basis of rounded adjusted indicators

Indicator	2010	2011	2012	2013
Total number of horses in all disciplines per 100,000 inhabitants	59	59	63	62
Total number of athletes in all disciplines per 100,000 inhabitants	59	56	60	58
Total number of events in all equestrian disciplines per 1,000,000 inhabitants	46	47	47	47

Source: own construction based on own calculation from data of the FEI. Note: The total number of registered countries was 101, 102, 102, and 102 for horses; 106, 106, 117 and 117 for athletes; and 80, 77, 76 and 79 for events for 2010, 2011, 2012 and 2013, respectively.

Table 8.6: Number of countries per equestrian discipline in the analyzed years.

Indicator	2010	2011	2012	2013
Number of horses in each of the equestrian disciplines per 100,000 inhabitants				
Show Jumping	-	45	47	50
Dressage	-	20	18	16
Eventing	-	16	18	19
Driving	-	12	11	11
Endurance	-	26	25	26
Vaulting	-	0	1	0
Reining	-	0	0	0
Para-equestrian (dressage and driving)	-	2	2	1
Number of horses in each of the equestrian disciplines per 500,000 inhabitants (above those per 100,000 inhabitants)				
Dressage	-	17	16	24
Eventing	-	20	17	18
Driving	-	9	12	11
Endurance	-	16	16	18
Vaulting	-	7	7	9
Reining	-	7	2	7
Para-equestrian (dressage and driving)	-	10	8	6
Number of athletes in each of the equestrian disciplines per 100,000 inhabitants				
Show Jumping	-	43	41	46
Dressage	-	17	16	12
Eventing	-	15	17	16
Driving	-	4	4	4
Endurance	-	21	22	23
Vaulting	-	4	4	4
Reining	-	0	0	0
Para-equestrian (dressage and driving)	-	2	2	2
Number of athletes in each of the equestrian disciplines per 500,000 inhabitants (above those per 100,000 inhabitants)				
Dressage	-	18	20	29
Eventing	-	17	14	17
Driving	-	13	11	13
Endurance	-	23	23	25
Vaulting	-	8	7	9
Reining	-	5	1	4
Para-equestrian (dressage and driving)	-	8	5	4

Source: own construction based on own calculation from data received from the FEI. Note: Total number of countries registered by the FEI for the total number of horses in all disciplines was 101, 102, 102 and 102 respective to the analyzed years, while for the total number of athletes in all disciplines 106, 106, 117 and 117 respective to each of the specified years in the table. The table contains the number of those countries where the rounded adjusted indicator resulted in at least one horse or athlete.

Table 8.6 continued: Number of countries per equestrian disciplines in the analyzed years.

Indicator	2010	2011	2012	2013
Number of events in each of the equestrian disciplines per 1,000,000 inhabitants				
Show Jumping	-	30	29	31
Dressage	-	15	15	14
Eventing	-	14	12	14
Driving	-	8	5	5
Endurance	-	28	31	29
Vaulting	-	1	2	5
Reining	-	1	1	3
Para-dressage	-	0	0	0

Source: own construction based on own calculation from data received from the FEI. Note: Total number of events registered by the FEI in all disciplines was 80, 77, 76 and 79 respective to the analyzed years specified in the table. The table contains the number of those countries where the rounded adjusted indicator resulted in at least one event.

Table 8.7: Analyzed economic indicators in the analysis of the environment necessary for the Eq. Revolution

Indicator	Dimension	Source of statistics	Referred period
Human development index	ratings	United Nations Development Program	2005, 2008, 2010-2013
Social progress index	ratings	Social Progress Imperative	2013
Gross domestic product per capita	USD	World Bank	2009-2013
Disposable income per capita	USD	OECD	2009-2013
Travel and tourism competitiveness index	ratings	World Economic Forum	2009, 2011, 2013
Gini index	%	World Bank	2009-2013
Harmonized index of consumer prices	%	World Bank	2009-2013
Agriculture, value added	% of GDP	World Bank	2009-2013
Industry, value added	% of GDP	World Bank	2009-2013
Services, value added	% of GDP	World Bank	2009-2013
Urban population	%	World Bank	2009-2013
Employment (to population ratio)	%	World Bank	2009-2013
Household final consumption expenditure (adjusted by population)	USD	World Bank	2009-2013
Government final consumption expenditure (adjusted by population)	USD	World Bank	2009-2013
Exports of goods and services	% of GDP	World Bank	2009-2013
Imports of goods and services	% of GDP	World Bank	2009-2013
Gross savings	% of GDP	World Bank	2009-2013
Gross capital formation	% of GDP	World Bank	2009-2013
Foreign direct investment (adjusted by population)	USD	World Bank	2009-2013
Research and development expenditure	% of GDP	World Bank	2008-2012

Source: own construction based on the UNDP, 2014; the Social Progress Imperative, 2014; the World Economic Forum, and database of the World Bank and the OECD

Table 8.8: Economic indicators that proved to be relevant to the characterization of necessary environment for the horse sectors in the Equestrian Revolution

Indicator	Dimension	Source of statistics	Referred period
Agriculture, value added	% of GDP	World Bank	2009-2013
Services, value added	% of GDP	World Bank	2009-2013
Urban population	%	World Bank	2009-2013
Gross domestic product per capita	USD	World Bank	2009-2013
Disposable income per capita	USD	OECD	2009-2013
Human development index	ratings	United Nations Development Program	2005, 2008, 2010, 2011, 2012, 2013
Social progress index	ratings	Social Progress Imperative	2013
Travel and tourism competitiveness index	ratings	World Economic Forum	2009, 2011, 2013

Source: own construction on the basis of World Bank and OECD statistics, UNDP, 2014; Social Progress Imperative, 2014; World Economic Forum, 2009, 2011, 2013.

Table 8.9: Relevant economic indicators in the horse sector, the number of countries taken into consideration and obtained averages and other specified values per indicator and per analyzed year

Indicator	2005	2008	2009	2010	2011	2012	2013
Agriculture, value added	-	-	176	175	173	167	157
(Nº of countries, average)	-	-	12.6021	12.2321	12.4026	12.3764	12.4643
Services, value added (Nº of	-	-	177	176	173	167	159
countries, average)	-	-	59.4566	59.0381	58.4917	58.6574	58.9298
Urban population (Nº of	-	-	214	214	214	214	214
countries, average)	-	-	57.1800	57.4580	57.7390	58.0210	58.3030
GDP per capita (Nº of	-	-	198	197	197	196	195
countries, average)	-	-	13,719	14,412	15,992	15,031	14,800
Disposable income per	-	-	32	32	32	32	32
capita (Nº of countries, average)	-	-	32,010	32,746	33,003	33,004	33,196
Human Development Index	174	175	-	187	187	187	187
(Nº of countries, world	0.667	0.685	-	0.693	0.698	0.700	0.702
average, high human	0.682	0.710	-	0.723	0.729	0.733	0.735
development, and very high human development)	0.870	0.879	-	0.885	0.887	0.889	0.890
Social Progress Index (Nº	-	-	-	-	-	-	132
of countries, average)	-	-	-	-	-	-	63.67
Travel and Tourism	-	-	133	-	139	-	140
Competitiveness Index (Nº	-	-	4.08	-	4.09	-	4.09
of countries, average)							

Source: own construction on the basis of World Bank, OECD, UNDP, World Economic Forum statistics.

Note: For dimensions of indicators see table 8.8.

APPENDIX 4

Table 9.1: Economic impacts generated by Hungarian Horse Racing in 2013 (in euros)

Cost and expense categories	***Gallop***	***Trotting***	***Total***
Amortization of horses	1,429,435	419,233	
Maintenance of horses	2,218,941	2,041,675	
Amortization of Jockey / Driver equipment	104,112	114,708	
Amortization of Horse equipment	821,971	2,130,589	
Veterinary services	752,190	748,941	
Amortization of the racecourse	467,803	465,782	
Jockey / Driver related impacts	***5,794,452***	***5,920,928***	***11,715,380***
Jockey / Driver related impacts per horse	12,515	12,844	
Registration fee	9,260	9,220	
Entry fee	310	649	
Starting fee	27,400	77,616	
Doping fee	310	590	
Riding / Driving fee at the race	46,580	79,968	
Showing fee	19,180	0	
Prize money	***807,044***	***772,741***	***1,579,785***
Fee - Judges	8,000	12,850	
Fee - Veterinary services	3,100	5,900	
Fee - Farrier services	1,550	2,950	
Fee - Supplementary requirements	15,655	29,795	
Sponsorship	3,367,911		
Event related direct impacts	***938,389***	***992,279***	***1,930,668***
Event related direct impacts per horse	2,027	2,152	
Total direct impacts			***17,013,958***
Catering - Judges	2.400	3.855	
Catering - Veterinarians	465	885	
Catering - Farriers	465	885	
Catering - Supplementary requirements	12.555	23.895	
Indirect impacts generated by event organization	***15.885***	***29.520***	***45.405***
Event related indirect impacts generated by event organization per horse	34	64	
Catering - Participants	41,100	70,560	
Transportation of horses	504	767	
Indirect impacts generated by participants	***41,604***	***71,327***	***112,931***
Event related indirect impacts generated by participants per horse	90	155	
Total indirect impacts	***57,489***	***100,847***	***158,336***
Total impacts	***6,790,330***	***7,014,054***	***17,172,294***

Source: own construction based on own calculation from data specified in table 5.16 in the chapter on the Operational characterization and the economic impact estimation of the Hungarian Horse Industry about the Economic impacts generated by Hungarian Horse Racing.

Table 9.2: Economic impacts generated by Hungarian Equestrian in 2013 (in euros)

Cost and expense categories	***Dressage***	***Show Jumping***	***Eventing***	***Driving***	***Vaulting***	***Endurance***	***Reining and Western***	***Total***
Amortization of horse	709,800	10,784,261	1,417,460	1,530,625	29,638	225,924	86,755	14,784,463
Amortization of Horse equipment	549,936	3,514,150	1,194,264	3,713,522	24,619	163,754	140,403	9,300,647
Amortization of Athlete equipment	112,669	485,664	37,300	616,255	7,105	21,015	27,181	1,307,189
Total amortization	1,372,405	14,784,075	2,649,024	5,860,402	61,362	410,692	254,339	25,392,299
Maintenance of Horse	1,819,440	11,028,360	3,231,900	2,270,310	73,186	464,572	356,384	19,244,152
Veterinary services	390,780	3,079,680	591,840	1,430,040	20,235	133,710	67,200	5,713,485
Training (Horse and / or Athlete)	1,961,712	11,657,472	808,896	4,354,584	29,460	18,000	180,492	19,010,616
Horse and athlete related impacts	***5,544,337***	***40,549,587***	***7,281,660***	***13,915,336***	***184,243***	***1,026,974***	***858,415***	***69,360,552***
Total calendar fee	3,495	16,534	1,450	14,411	1,970	2,966	101	40,927
Total license fee	33,206	227,021	31,756	90,876	5,449	13,261	5,813	407,382
Total entry fee	30,679	1,379,002	20,689	91,055	7,494	30,382	23,644	1,582,946
MCP	2,786	26,004	518	8,299	945	0	0	38,551
Total prize money	16,322	385,221	8,700	82,233	0	20,000	0	512,476
Fee - Event organization	70,324	429,496	43,710	257,206	15,260	59,166	22,188	897,350
Total amortization on show grounds	16,983	65,038	22,611	429,445	0	0	0	534,077
Event related direct impacts	***173,796***	***2,528,315***	***129,434***	***973,525***	***31,118***	***125,775***	***51,746***	***4,013,709***
Sponsorship (10% of event related direct impacts)	17,380	252,832	12,943	97,352	3,112	12,577	5,175	401,371
Total event related direct impacts	***191,176***	***2,781,147***	***142,377***	***1,070,877***	***34,230***	***138,352***	***56,921***	***4,415,080***
Total direct impacts	***5,735,512***	***43,330,734***	***7,424,037***	***14,986,213***	***218,473***	***1,165,327***	***915,336***	***73,775,632***

Source: own construction based on own calculation from data specified in table 5.25 in the chapter on the Operational characterization and the economic impact estimation of the Hungarian Horse Industry about the Economic impacts generated by Hungarian Equestrian in 2013.

Table 9.2 continued: Economic impacts generated by Hungarian Equestrian in 2013 (in euros)

Cost and expense categories	***Dressage***	***Show Jumping***	***Eventing***	***Driving***	***Vaulting***	***Endurance***	***Reining and Western***	***Total***
Catering - Event organization	16,245	96,140	13,950	60,825	3,480	11,435	5,290	207,365
Accommodation - Event organization	8,795	55,690	5,735	25,805	2,300	10,545	3,450	112,320
Transportation - Event organization	30,700	202,350	11,850	135,100	5,600	25,800	8,250	419,650
Indirect impacts generated by Event organization	***55,740***	***354,180***	***31,535***	***221,730***	***11,380***	***47,780***	***16,990***	***739,335***
Sponsorship (10% of event related indirect impacts)	5,574	35,418	3,154	22,173	1,138	4,778	1,699	73,934
Total transportation of Horses	618,019	2,689,850	110,180	467,740	70,320	90,800	279,300	4,326,209
Total catering - Athletes	39,495	498,940	18,030	126,740	13,675	17,615	25,255	739,750
Total accommodation - Athletes	45,630	590,340	24,450	60,540	5,940	18,900	31,980	777,780
Indirect impacts generated by Athletes	***788,269***	***4,868,410***	***195,140***	***842,300***	***109,550***	***163,830***	***393,770***	***7,361,269***
Total indirect impacts	***849,583***	***5,258,008***	***229,829***	***1,086,203***	***122,068***	***216,388***	***412,459***	***8,174,537***
Total impacts	***6,585,095***	***48,588,742***	***7,653,866***	***16,072,416***	***340,541***	***1,381,715***	***1,327,795***	***81,950,169***

Source: own construction based on own calculation from data specified in table 5.25 in the chapter on the Operational characterization and the economic impact estimation of the Hungarian Horse Industry about the Economic impacts generated by Hungarian Equestrian in 2013.

Table 9.3: Economic impacts generated by Hungarian Pony Equestrian in 2013 (in euros)

Cost and expense categories	***Pony equestrian***
Amortization of Pony	751,819
Amortization of Pony equipment	535,287
Amortization of Athlete equipment	138,768
Total amortization	1,425,874
Maintenance of Pony	2,046,184
Veterinary services	341,600
Training (Pony and / or Athlete)	1,146,600
Pony and Athlete related impacts	***4,960,258***
Total license fee	13,230
Total entry fee	35,346
Fee - Event organization	5,040
Total amortization on show grounds	6,192
Event related direct impacts	***59,808***
Sponsorship (10% of event related direct impacts)	5,981
Total event related direct impacts	***65,789***
Total direct impacts	***5,026,047***
Catering - Event organization	1,890
Accommodation - Event organization	600
Transportation - Event organization	9,200
Indirect impacts generated by Event organization	***11,690***
Sponsorship (10% event related indirect impacts)	1,169
Transportation of Ponies	145,700
Total catering - Athletes	96,940
Total accommodation - Athletes	56,250
Indirect impacts generated by Athletes	***298,890***
Total indirect impacts	***311,749***
Total impacts	***5,337,796***

Source: own construction based on own calculation from data specified in table 5.27 in the chapter on the Operational characterization and the economic impact estimation of the Hungarian Horse Industry about Pony Equestrian.

Table 9.4: Economic impacts generated by Hungarian Equestrian Tourism, Equine Therapy and horses in Agricultural and Ecological Programs, Leisure activity, Without specific use category and Foals of mares without known origin in 2013 (in euros)

Cost and expense categories	***Equestrian tourism***	***Equine therapy***	***Agricultural and Ecological programs***	***Leisure activity***		***Without specific use***	***Foals of mares without known origin***
				in riding clubs	***at home***		
Amortization of Horses	1,010,373	16,503	202,075	1,787,552	744,813	0	0
Amortization of Horse equipment	1,373,000	28,526	106,400	1,801,046	1,277,362	470,607	1,231,580
Amortization of Athlete equipment	1,912,000	0	0	1,691,355	845,678	0	0
Total amortization	4,295,373	45,029	308,475	5,279,953	2,867,853	470,607	1,231,580
Maintenance of horse	10,385,000	125,930	572,000	21,450,626	4,321,271	2,043,426	4,583,700
Veterinary services	1,000,000	14,000	100,000	884,600	442,300	221,150	578,750
Training (both Horse and Athlete)	1,717,634	227,895	0	13,799,760	0	0	0
Horse and athlete related impacts	***17,398,008***	***412,854***	***980,475***	***41,414,939***	***7,631,424***	***2,735,183***	***6,394,030***
Transportation	25,250,000	-	-	-	-	-	-
Catering	15,150,000	-	-	-	-	-	-
Indirect impacts	***40,400,000***	-	-	-	-	-	-
Direct and indirect impacts	***57,798,008***	-	-	-	-	-	-
Subsidy	-	-	441,225	-	-	-	-
Indirect impacts	-	-	***441,225***	-	-	-	-
Direct and indirect impacts	-	-	***1,421,700***	-	-	-	-

Source: own construction based on own calculation from data specified in table 5.30 in addition to table 5.25 in the chapter on the Operational characterization and the economic impact estimation of the Hungarian Horse Industry about the Economic impacts generated by sub-sectors and segments specified in the head of the table in 2013.

APPENDIX 5

Table 10.1: Percentage of coincidence among countries with below average agriculture value added and countries, where horse racing disciplines were practiced in the years included in the analysis (%).

Indicator	2009	2010	2011	2012	2013
Betting turnover	94.44	94.74	94.44	94.74	94.12
Prize money	95.74	93.75	95.65	95.65	95.12
Number of different horses	97.62	95.56	97.62	97.62	97.44
Number of breed horses	97.62	95.35	97.30	97.30	96.88
Number of starts	94.87	95.35	95.35	93.48	95.45
Number of racecourses	100	100	100	100	100

Source: own construction based on own calculation from data of the World Bank and the IFHA. Look for specification on countries without economic data in table 10.17, appendix 4. For the benchmarks of the indicators, see table 8.3, appendix 2.

Table 10.2: Percentage of coincidence among countries with below average agriculture value added and countries, where equestrian disciplines were performed in the years included in the analysis (%).

Indicator	2010	2011	2012	2013
Total number of horses in all equestrian disciplines per 100,000 inhabitants	98.11	100	100	100
Total number of athletes in all equestrian disciplines per 100,000 inhabitants	96.23	100	100	97.83
Total number of events in all equestrian disciplines per 1,000,000 inhabitants	100	100	100	100

Source: own construction based on own calculation from data of the World Bank and the FEI. Look for specification on countries without economic data in table 10.18, appendix 4.

Table 10.3: Percentage of coincidence among countries with above average service value added and countries, where horse racing disciplines were performed in the years included in the analysis (%).

Indicator	2009	2010	2011	2012	2013
Betting turnover	86.11	84.21	83.33	86.49	88.24
Prize money	82.98	79.17	80.43	82.22	82.93
Number of different horses	85.71	80.00	80.95	82.93	84.62
Number of breed horses	85.71	81.40	81.08	86.11	84.38
Number of starts	82.05	80.95	79.07	78.26	84.09
Number of racecourses	83.33	89.47	90.00	95.45	90.91

Source: own construction based on own calculation from data of the World Bank and the IFHA. Look for specification on countries without economic data table 10.17, appendix 4. For the benchmarks of the indicators, see table 8.3, appendix 2.

Table 10.4: Percentage of coincidence among countries with above average service value added and countries, where equestrian disciplines were performed in the years included in the analysis (%).

Indicator	2010	2011	2012	2013
Total number of horses in all equestrian disciplines per 100,000 inhabitants	80.77	78.00	83.33	82.00
Total number of athletes in all equestrian disciplines per 100,000 inhabitants	84.62	81.25	86.00	80.43
Total number of events in all equestrian disciplines per 1,000,000 inhabitants	90.48	81.40	85.71	85.37

Source: own construction based on own calculation from data of the World Bank and the FEI. Look for specification on countries without economic data in table 10.18, appendix 4.

Table 10.5: Percentage of coincidence among countries with above average urban population and countries, where horse racing disciplines were performed in the years included in the analysis (%)

Indicator	2009	2010	2011	2012	2013
Betting turnover	88.89	89.47	91.89	92.50	92.50
Prize money	89.58	90.00	91.84	92.00	91.84
Number of different horses	90.70	91.49	93.33	93.48	93.48
Number of breed horses	90.70	93.33	95.00	95.00	94.87
Number of starts	88.89	89.58	91.30	91.49	91.11
Number of racecourses	86.96	87.50	86.96	86.36	86.36

Source: own construction based on own calculation from data of the World Bank and the IFHA. Look for specification on countries without economic data in table 10.17, appendix 4. For the benchmarks of the indicators, see table 8.3, appendix 2.

Table 10.6: Percentage of coincidence among countries with above average urban population and countries, where equestrian disciplines were performed in the years included in the analysis (%).

Indicator	2010	2011	2012	2013
Total number of horses in all equestrian disciplines per 100,000 inhabitants	89.83	84.75	87.30	83.87
Total number of athletes in all equestrian disciplines per 100,000 inhabitants	86.44	87.50	88.33	89.66
Total number of events in all equestrian disciplines per 1,000,000 inhabitants	91.30	89.36	89.36	91.49

Source: own construction based on own calculation from data of the World Bank and the FEI. Look for specification on countries without economic data in table 10.18, appendix 4.

Table 10.7: Percentage of coincidence among countries with above average GDP per capita and countries, where horse racing disciplines were performed in the years included in the analysis (%).

Indicator	2009	2010	2011	2012	2013
Betting turnover	(52.78)	(55.26)	(56.76)	(62.50)	(62.50)
Prize money	(58.33)	(60.00)	(61.22)	(64.00)	(65.31)
Number of different horses	(62.79)	(63.83)	(66.67)	(69.57)	(69.57)
Number of breed horses	(62.79)	(60.00)	(65.00)	(65.00)	(69.23)
Number of starts	(60.00)	(62.50)	(65.22)	(68.09)	(68.89)
Number of racecourses	82.61	83.33	86.96	90.91	90.91

Source: own construction based on own calculation from data from the World Bank and the IFHA. Look for specification on countries without economic data in table 10.17, appendix 4. For the benchmarks of the indicators, see table 8.3, appendix 2.

Table 10.8: Percentage of coincidence among countries with above average GDP per capita and countries, where equestrian disciplines were performed in the years included in the analysis (%).

Indicator	2010	2011	2012	2013
Total number of horses in all equestrian disciplines per 100,000 inhabitants	(71.93)	(64.29)	(62.71)	(66.67)
Total number of athletes in all equestrian disciplines per 100,000 inhabitants	(62.50)	(66.04)	(71.43)	(73.58)
Total number of events in all equestrian disciplines per 1,000,000 inhabitants	(65.22) 81.82	(61.70) 76.67	(67.39) 75.86	(73.33) 83.87

Source: own construction based on own calculation from data from the World Bank and the FEI. Look for specification on countries without economic data in table 10.18, appendix 4.

Table 10.9: Percentage of countries obtained from the OECD database where horse racing disciplines were practiced in the analyzed year (%).

Indicator	2009	2010	2011	2012	2013
Betting turnover	59.38	62.50	65.63	71.88	71.88
Prize money	75.00	75.00	78.13	78.13	75.00
Number of different horses	71.88	71.88	75.00	75.00	75.00
Number of breed horses	81.25	75.00	71.88	78.13	71.88
Number of starts	71.88	71.88	75.00	75.00	75.00
Number of racecourses	71.88	71.88	75.00	75.00	75.00

Source: own construction based on own calculation from data from the OECD and the IFHA. For the benchmarks of the indicators, see table 8.3, appendix 2.

Table 10.10: Percentage of countries obtained from the OECD database where equestrian disciplines were practiced in the analyzed years (%).

Indicator	2010	2011	2012	2013
Total number of horses in all equestrian disciplines per 100,000 inhabitants	100	100	100	100
Total number of athletes in all equestrian disciplines per 100,000 inhabitants	100	100	100	100
Total number of events in all equestrian disciplines per 1,000,000 inhabitants	100	100	96.88	93.75

Source: own construction based on own calculation from data from the OECD and the FEI.

Table 10.11: Percentage of coincidence among countries with above average disposable income per capita and countries where horse racing disciplines were practiced in the analyzed years (%).

Indicator	2009	2010	2011	2012	2013
Betting turnover	(64.71)	76.47	76.47	81.25	81.25
Prize money	88.24	94.12	94.12	93.75	93.75
Number of different horses	88.24	94.12	94.12	93.75	93.75
Number of breed horses	88.24	94.12	94.12	93.75	93.75
Number of starts	88.24	94.12	94.12	93.75	93.75
Number of racecourses	88.24	94.12	94.12	93.75	93.75

Source: own construction based on own calculation from data from the OECD and the IFHA. For the benchmarks of the indicators, see table 8.3, appendix 2.

Table 10.12: Percentage of coincidence among countries with above average disposable income per capita and countries where equestrian disciplines were practiced in the analyzed years (%).

Indicator	2010	2011	2012	2013
Total number of horses in all equestrian disciplines per 100,000 inhabitants	100	100	100	100
Total number of athletes in all equestrian disciplines per 100,000 inhabitants	100	100	100	100
Total number of events in all equestrian disciplines per 1,000,000 inhabitants	100	100	100	100

Source: own construction based on own calculation from data from the OECD and the FEI.

Table 10.13: Percentage of coincidence among the top 25% of countries ranked on the basis of percentile rank calculated by disposable income per capita and by indicators in horse racing (%).

Indicator	2009	2010	2011	2012	2013
Betting turnover	(50.00)	(42.86)	(50.00)	(42.86)	(28.57)
Prize money	(50.00)	(44.44)	(37.50)	(37.50)	(37.50)
Number of different horses	(37.50)	(37.50)	(37.50)	(37.50)	(37.50)
Number of breed horses	(50.00)	(37.50)	(42.86)	(50.00)	(44.44)
Number of starts	(37.50)	(40.00)	(40.00)	(44.44)	(44.44)
Number of racecourses	(40.00)	(40.00)	(30.00)	(36.36)	(40.00)

Source: own construction based on own calculation from data from the OECD and the IFHA. For the benchmarks of the indicators, see table 8.3, appendix 2.

Table 10.14: Percentage of coincidence among the top 25% of countries ranked on the basis of percentile rank calculated by disposable income per capita and indicators in equestrian (%).

Indicator	2010	2011	2012	2013
Total number of horses in all equestrian disciplines per 100,000 inhabitants	(38.89)	(44.44)	(43.75)	(41.18)
Total number of athletes in all equestrian disciplines per 100,000 inhabitants	(50.00)	(50.00)	(42.11)	(42.11)
Total number of events in all equestrian disciplines per 1,000,000 inhabitants	(53.33)	(42.86)	(42.86)	(42.86)

Source: own construction based on own calculation from data from the OECD and from the FEI.

Table 10.15: Percentage of coincidence among countries with high and very high values of the HDI and countries, where equestrian disciplines were performed in the years included in the analysis on the basis of the number of horses and athletes per 500,000 inhabitants (%).

Indicator	2011 (0.729)	2012 (0.733)	2013 (0.735)
Number of horses in each of the equestrian disciplines per 500,000 inhabitants (above those per 100,000 inhabitants)			
Show Jumping	(65.63 (0.612))	(67.84 (0.614))	(54.84 (0.617))
Dressage	100 (0.730)	100 (0.777)	86.96 (0.617)
Eventing	80.00 (0.620)	82.35 (0.626)	77.78 (0.628)
Driving	100 (0.812)	100 (0.782)	100 (0.785)
Endurance	100 (0.740)	81.25 (0.626)	88.89 (0.711)
Vaulting	100 (0.827)	100 (0.817)	100 (0.818)
Reining	100 (0.879)	100 (0.915)	100 (0.822)
Para-equestrian	100 (0.861)	100 (0.808)	100 (0.881)
Number of athletes in each of the equestrian disciplines per 500,000 inhabitants (above those per 100,000 inhabitants)			
Show Jumping	76.67 (0.612)	(68.75 (0.614))	(60.61 (0.617))
Dressage	100 (0.758)	100 (0.776)	82.14 (0.617)
Eventing	100 (0.774)	85.71 (0.654)	87.50 (0.658)
Driving	100 (0.812)	100 (0.822)	100 (0.822)
Endurance	100 (0.750)	82.61 0.626)	88.00 (0.683)
Vaulting	100 (0.817)	100 (0.817)	100 (0.818)
Reining	100 (0.879)	100 (0.915)	100 (0.879)
Para-equestrian	100 (0.879)	100 (0.880)	100 (0.899)

Source: own construction based on own calculation on the basis of the UNDP, 2014 and the FEI. Look for specification on countries without economic data in table 10.18, appendix 4. In brackets, below the reference years, the lowest score for high human development, while, next to the levels of coincidence, the lowest score for human development in the analyzed group of countries can be seen.

Table 10.16: Values of analyzed economic indicators characteristic of Hungary in the analyzed years.

Hungary	2005	2008	2009	2010	2011	2012	2013
HDI	0.805 above average	0.814 above average	-	0.817 above average	0.817 above average	0.817 above average	0.818 above average
SPI	-	-	-	-	-	-	73.87 above average
Value added, agriculture			3.52 below average	3.55 below average	4.65 below average	4.54 below average	4.37 below average
Value added, service	-	-	66.73 above average	66.05 above average	65.26 above average	65.03 above average	65.41 above average
Urban population			68.37 above average	68.86 above average	69.35 above average	69.83 above average	70.31 above average
HICP	-	-	4.21 above average	4.88 above average	3.96 below average	5.71 above average	1.73 below average
GDP	-	-	12,907 below average	12,958 below average	13.983 below average	12.784 below average	13.487 below average
Disposable income	-	-	20,308 below average	20,468 below average	20,592 below average	20,225 below average	21,095 below average
Travel and Tourism Competitiveness Index	-	-	4.45 above average	-	4.54 above average	-	4.51 above average
Household final consumption expenditure	-	-	1,151,633 above average	1,122,368 above average	1,134,925 above average	1,118,962 above average	1,121,060 above average
Government final consumption expenditure	-	-	491,458 above average	489,830 above average	491,317 above average	487,381 above average	504,534 above average
Gross savings	-	-	19.4986 below average	20.9329 below average	21.2189 below average	20.9443 below average	23.8868 above average
Gross capital formation	-	-	20.2751 below average	20.6379 below average	20.4483 below average	19.2091 below average	19.8243 below average
Foreign direct investment	-	-	-296.04 below average	-2,093.35 below average	1,053.60 below average	1,072.07 below average	-415.67 below average

Source: own construction on the basis of own calculation from data of the World Bank, OECD, UNDP, 2014 and Social Progress Imperative, 2014. For the dimension of indicators, see table 8.8 in appendix 2.

Table 10.17: Countries, where horse racing disciplines were practiced in the analyzed years but no economic data were given in the databases specified below the table.

Indicator	2009	2010	2011	2012	2013
Value added, agriculture	BHR, ISR, QAT	BHR, ISR, QAT	BHR, CAN, ISR, QAT,	BHR, CAN, ISR, NZL, QAT,	BHR, CAN, ISR, MAC, NZL, PAN, PER, QAT, VEN
Value added, services	BHR, ISR, QAT	BHR, ISR, QAT	BHR, CAN, ISR, QAT, VEN	BHR, CAN, ISR, NZL, QAT, VEN	BHR, CAN, ISR, MAC, NZL, PAN, PER, QAT, VEN
HICP	ARG, CHL	ARG	ARG, LBN	ARG, LBN	ARG
Household final consumption expenditure	QAT, SAU, TCD, TUN	DZA, QAT, TCD, TUN	DZA, QAT, TCD, TUN	DZA, QAT, TCD, TUN	BHR, DZA, OMN, QAT, ROU, TCD, TUN
Government final consumption expenditure	QAT, SAU, TCD, TUN	DZA, QAT, TCD, TUN	DZA, QAT, TCD, TUN	DZA, QAT, TCD, TUN	BHR, DZA, OMN, PAN, QAT, ROU, TCD, TUN
Human development index	-	MAC	MAC	MAC	MAC
Social progress index	-	-	-	-	BHR, CYP, HKG, MAC, OMN, QAT, SGP
Travel and tourism competitiveness index	LBN, MAC	-	MAC	-	MAC, TUN

Source: own construction on the basis of the World Bank, the UNDP, 2014, the Social Progress Imperative, 2014 and the World Economic Forum, 2009, 2011, 2013.

Table 10.18: Countries, where equestrian disciplines were practiced in the analyzed years but no economic data were given in the databases specified below the table.

Indicator	2010	2011	2012	2013
Value added, agriculture	BHR, ISR, LIE, MCO, QAT, VIR	BHR, CAN, ISR, LIE, MCO, QAT, SMR, VIR	BHR, CAN, LIE, MCO, NZL, QAT, SMR, VIR	BHR, BMU, BRB, CAN, CYM, LIE, MCO, NZL, QAT, SMR, VIR
Value added, services	BHR, CYM, ISR, LIE, MCO, QAT, VIR	BHR, CAN, CYM, ISR, LIE, MCO, QAT, SMR, VIR	BHR, CAN, CYM, LIE, MCO, NZL, QAT, SMR, VIR	BHR, BMU, BRB, CAN, CYM, LIE, MCO, NZL, PAN QAT, SMR, VIR
HICP	ARG, BMU, CYM, LIE, MCO, PRI, VIR	ARG, BMU, CYM, LIE, MCO, PRI, VIR	ARG, BMU, CYM, LIE, MCO, PRI, VIR	ARG, BMU, CYM, LIE, MCO, PRI, VIR
Household final consumption expenditure	BMU, CYM, LIE, MCO, QAT, VIR	ATG, BMU, BRB, CYM, LIE, MCO, QAT, SMR, VIR	ATG, BMU, CYM, LIE, MCO, QAT, SMR, TUN, VIR	AZE, BHR, BMU, BRB, CYM, LIE, MCO, OMN, QAT, ROU, SMR, VIR
Government final consumption expenditure	BMU, CYM, LIE, MCO, QAT, VIR	ATG, BMU, BRB, CYM, LIE, MCO, QAT, SMR, VIR	ATG, BMU, CYM, LIE, MCO, QAT, SMR, TUN, VIR	AZE, BHR, BMU, BRB, CYM, LIE, MCO, OMN, PAN, QAT, ROU, SMR, VIR
Foreign direct investment	LIE, MCO, PRI, VIR	LIE, MCO, PRI, SMR, VIR	LIE, MCO, PRI, SMR, VIR	LIE, MCO, PRI, SMR, VIR
GDP	CYM, VIR	CYM, SMR, VIR	CYM, MCO, SMR, VIR	CYM, LIE, MCO, SMR, VIR
Human development index	BMU, CYM, MCO, PRI, VIR	BMU, CYM, MCO, PRI, SMR, VIR	BMU, CYM, MCO, PRI, SMR, VIR	BMU, CYM, MCO, PRI, SMR, VIR
Social progress index	-	-	-	BHR, BMU, BRB, CYM, LIE, LUX, MCO, OMN, PRI, QAT, SMR, VIR
Travel and tourism competitiveness index	-	ATG, BLR, BMU, CYM, LIE, MCO, SMR, VIR	-	BLR, BMU, CYM, LIE, MCO, SMR, VIR

Source: own construction on the basis of the World Bank, the UNDP, 2014, the Social Progress Imperative, 2014 and the World Economic Forum, 2009, 2011, 2013.