Abstract booklet of the doctoral (PhD) dissertation

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

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2016
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1. Importance and objectives of the research, hypotheses

**Importance of the research**

*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 of the research and research questions

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 most important questions in order to carry out the research were 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?
The research hypotheses were formulated as follows:

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

The hypothesis was proved by the analysis and synthesis of relating literature and the quantitative analysis of data extracted from various reports and databases.

**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 hypothesis was proved by the analysis and synthesis of relating literature; and the estimation of the economic impacts generated by the Hungarian Horse Industry in 2013 for which primary and secondary data were used.

**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.**

The hypothesis was proved by the analysis and synthesis of relating literature and the quantitative analysis of data extracted from various reports and databases.

**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 hypothesis was proved by the analysis and synthesis of relating literature and the quantitative analysis of primary and secondary data.
2. Applied methodology to the research

In the doctoral (PhD) dissertation, 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, and 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.

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

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

Selected indicators

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. For the selected indicators, see table 1.

Table 1: Economic indicators that proved to be relevant to the characterization of necessary environment for the horse sector

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Dimension</th>
<th>Source of statistics</th>
<th>Referred period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture, value added</td>
<td>% of GDP</td>
<td>World Bank</td>
<td>2009-2013</td>
</tr>
<tr>
<td>Services, value added</td>
<td>% of GDP</td>
<td>World Bank</td>
<td>2009-2013</td>
</tr>
<tr>
<td>Urban population</td>
<td>%</td>
<td>World Bank</td>
<td>2009-2013</td>
</tr>
<tr>
<td>Gross domestic product per capita</td>
<td>USD</td>
<td>World Bank</td>
<td>2009-2013</td>
</tr>
<tr>
<td>Disposable income per capita</td>
<td>USD</td>
<td>OECD</td>
<td>2009-2013</td>
</tr>
<tr>
<td>Social progress index</td>
<td>ratings</td>
<td>Social Progress Imperative</td>
<td>2013</td>
</tr>
</tbody>
</table>


Indicators from the sub-sectors of horse racing and equestrian

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. For the selected indicators, see table 2 and 3.

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.).

Table 2: Horse racing indicators and important information on them included in the analysis

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Indicator based on benchmark</th>
<th>Dimension</th>
<th>Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Betting turnover</td>
<td>Betting turnover per 100,000 inhabitants</td>
<td>euros</td>
<td>2005 - 2013</td>
</tr>
<tr>
<td>Prize money</td>
<td>Prize money per 100,000 inhabitants</td>
<td>euros</td>
<td>2005 - 2013</td>
</tr>
<tr>
<td>Number of different horses</td>
<td>Number of different horses per 100,000 inhabitants</td>
<td>number of horses</td>
<td>2005 - 2013</td>
</tr>
<tr>
<td>Number of breed horses</td>
<td>Number of breed horses per 100,000 inhabitants</td>
<td>number of horses</td>
<td>2005 - 2013</td>
</tr>
<tr>
<td>Number of starts</td>
<td>Number of starts per 100,000 inhabitants</td>
<td>number of starts</td>
<td>2005 - 2013</td>
</tr>
<tr>
<td>Number of racecourses</td>
<td>Number of racecourses per 1,000,000 inhabitants</td>
<td>number of racecourses</td>
<td>2005 - 2013</td>
</tr>
</tbody>
</table>

Source: own construction on the basis of information obtained from the IFHA.

Table 3: Equestrian indicators and important information on them included in the analysis

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Indicator based on benchmark</th>
<th>Dimension</th>
<th>Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of horses in all and in each of the equestrian disciplines</td>
<td>Number of horses per 100,000 inhabitants</td>
<td>number of horses</td>
<td>2010 - 2013</td>
</tr>
<tr>
<td>Total number of athletes in all and in each of the equestrian disciplines</td>
<td>Number of athletes per 100,000 inhabitants</td>
<td>number of athletes</td>
<td>2010 - 2013</td>
</tr>
<tr>
<td>Total number of events in all and in each of the equestrian disciplines</td>
<td>Number of events per 1,000,000 inhabitants</td>
<td>number of events</td>
<td>2010 - 2013</td>
</tr>
</tbody>
</table>

Source: own construction on the basis of information obtained from the FEI. FEI disciplines are Show Jumping, Dressage, Eventing, Driving, Endurance, Vaulting, Reining and Para-equestrian.

Analysis

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. Where averages were required for the analysis, the arithmetic mean was used (including all countries available in the database with data), because not much or less importance was intended to give to any of the countries.

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 the countries was made.
3. Conclusions of the research, theses

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).

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 characterized by **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 76\(^{th}\) percentile rank and **on the basis of the number of horses**, in the 79\(^{th}\) percentile rank. **On the basis of the achieved results** at the World Equestrian Games between 1990 and 2014, Hungary was placed in the 35\(^{th}\) percentile rank.

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) 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.
**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).*
4. 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 the 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.
5. Publications related to the topic of the dissertation

Revised article in international scientific journal:

Revised article in domestic scientific journal:

Publication in national, not revised, professional journal:

Revised publication in national scientific and/or professional literature (book translations):


Presentation