



Study Regarding the Factors Influencing the Price at PSI Annual Auction

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Abstract: Performance Sales International, short PSI offers the perfect setting for this elite horse auction, not only because it offers the most successful horses trained for dressage and jumping, but also for the accommodation services offered by adjacent hotel See-und Sport. Every year in December Ullrich Kasselmann and Paul Schockemöhle present their international clientele with an exclusive selection of quality young dressage and jumping horses destined for the top echelons of the sport. At PSI Auction, the annual performance sales that take place is presented to the international clients an exclusive number of young horses for training or jumping over obstacles, destined for the biggest international equestrian competitions. The purpose of this study is to see which of the 3 factors: horse's sex and year of birth, and the equestrian discipline influence the auction price for the horses analyzed. In this study were examined all the horses participating in the auctions in 2019y and 2020y, on Eurodressage, taking into account the economic aspect of the 3 factors: horse's sex and year of birth, and the equestrian discipline. The data were statistically processed using SPSS Version 21 for Windows (IBM, USA). Data were interpreted using Excel 2007 (Microsoft) and analyzed using SPSS Version 21 for Windows (IBM, USA). The alpha value was set at 0.05 for all statistics. Following the analysis of the results, regarding the year of birth (all participants in this study being young horses), the sex of the horses, and also the equestrian discipline, there were no significant differences between the analyzed variables: horse's sex, year of birth, and the equestrian discipline. In conclusion, the auctioned horses, whether they are mares, stallions, or gelding, whether the year of birth or breed, after being selected for participation in the auction, horses are sold at very high prices and will be capitalized according to the buyer's interest in the reproductive direction, as well as for sports, being trained for the biggest competitions in the world.

Keywords: Horses, Equestrian, Price, Auction

1. Introduction

Performance Sales International, the world-renowned auction, has been held annually for more than 40 years in early December. [13]

The Kasselmann family has been associated with the land they live on since the 12th century. [9]

The property was first a farm and was originally owned by the Count of Tecklenburg in the 16th and 17th centuries. In 1765 Frederick the Great allowed farmers to buy land from the authorities. The Kasselmann family took advantage of this opportunity, and the family members became free

farmers from that point on. [15]

The farm was not run only as a direct farm: hospitality has always been a key component of operations, and during the summer holidays the inhabitants of the city went to visit the farm, the concept is now widespread and known as "farm holidays". During the twentieth century, changes in agriculture also shifted Hof Kasselmann's goal to the only current focus: the sport of training. [14]

Performance Sales International was founded in 1980 when equestrian legends George Morris, Franck Chapot, and Paul Schockemöhle came together during the Baltimore World Cup final and conceived the idea of an innovative horse trading company. [11]

Businessmen have arrived in the United States to sell horses from the largest breeding areas in Europe. [7]

They chose young, promising, well-trained horses that could easily fit the American training and competition circuit. [1]. These horses will pass on quality genetic material to future generations.[2]

For example, for the Selle Français breed the parameters of genetic trend were studied from 1974 to 2002. If breeders keep the same structure (test of the stallion and mares on their own performance, they could add new criteria like conformation for example in the breeding value estimation and maintain the high genetic trend. [3]

The international clients, currently not only from the USA but from all over the world, are following with interest the annual PSI auction, meeting in Ankum, Germany. [10]

The horses for the upcoming PSI auction are identified and carefully selected months in advance in the stables with experienced staff in Kasselmann and Schockemöhle, the presentations of these horses being eagerly awaited by potential buyers.

Sport horses are used for traditional equestrian sporting events, dressage and jumping being the best know. [4]

A sport horse isn't a specific breed of horse, but is a type of horse that may include several breeds. Sport horses are used for traditional equestrian sporting events, such as show jumping, eventing, combined driving, and dressage. [6]

The annual international performance sales within PSI Auction take place in December, the international clientele being presented with an exclusive selection of young horses for training or jumping over obstacles, destined for the biggest international sports competitions.

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The international dressage rules state that the object of dressage is the harmonious development of the physique and ability of the horse. [5]

Newport of Rhode Island was the winner of the first edition of the PSI Auction, which has now reached its 42nd edition. [8]

When the demand for this auction concept appeared in Europe, after only 2 years, Performance Sales International settled in Germany, finding that this country is perfect. Thus, the auction center in Ankum is a location preserved to this day. [12]

2. Materials and Methods

1. Analyzed horses - for this research, there were 70 sport horses examined, sold in the annual PSI auction for 2019 and 2020 [9]. The distribution of horses for the three variables considered (sex, year, and discipline) is presented in table 1.

Table 1. The distribution of horses regarding the sex, year, and discipline.

Disciplină	Sex			An	
	s	m	g	2019	2020
Dressage	15	16	11	21	21
Jumping	11	7	10	7	21

s: Stallions, m: mare și g: Gelding.

2. Statistical analysis - the data were statistically processed using SPSS Version 21 for Windows (IBM, USA), the following analyzes being performed:

1. Independent T-Test;
2. Unidirectional ANOVA;
3. Descriptive statistics regarding the distribution of variables, average, median, graphs, etc.

Data were interpreted using Excel 2007 (Microsoft) and analyzed using SPSS Version 21 for Windows (IBM, USA).

The purpose of the statistical analysis was to explore any differences in the price obtained at the PSI auction for sport horses differentiated according to year, sex, and discipline. The Alpha value was set at 0.05 for all statistical tests.

3. Results and Discussions

The selling price obtained in the PSI auction, for the 70 horses studied ranged between 30000 and 1300000 euro, with an average of 339821.43 euro in 2019 and between 72000 and 1600000 euro, with an average of 346857.14 euro in 2020 and between 30000 and 1300000 euro. (Figure 1)

The results show that the selling price obtained in the PSI auction, for the 42 horses studied varies between 72000 and 1600000 euro, with an average of 346857.14 euro in 2020. (Figure 2)

The results show that for:

1. Gender variable: - 32.9% of horses are mares, 37.1% are stallions and 30% are geldings
2. Variable year: - 40% for 2019 and 60% for 2020
3. Discipline variable: - 60% of horses compete in training and 40% compete in show jumping

1. Factor sex

For the sex variable, the results of the statistical analysis show that the selling price obtained in the PSI auction for the 70 horses studied does not show a statistically significant difference for the level of significance 0.05 ($F=0.204$, $p=0.816$).

Thus, in the descriptive statistics for mean, the values are close: for mares=369739.13 euro, for stallions=345192.31 euro, for geldings=314476.19 euro. (table 2)

We can say that there are no statistically significant differences between mares, stallions and geldings.

Given the rigorous selection procedure and the criteria that future PSI participants must meet, there are no statistically significant differences in terms of sex.

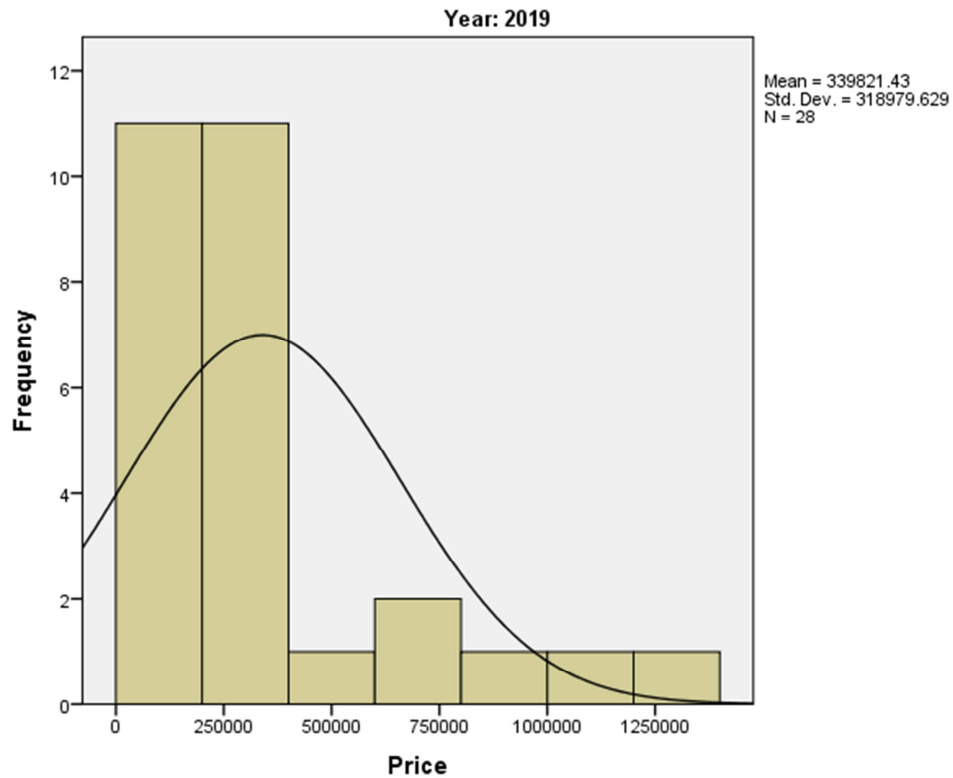


Figure 1. The usual distribution of price for the studied population in PSI auction (2019).

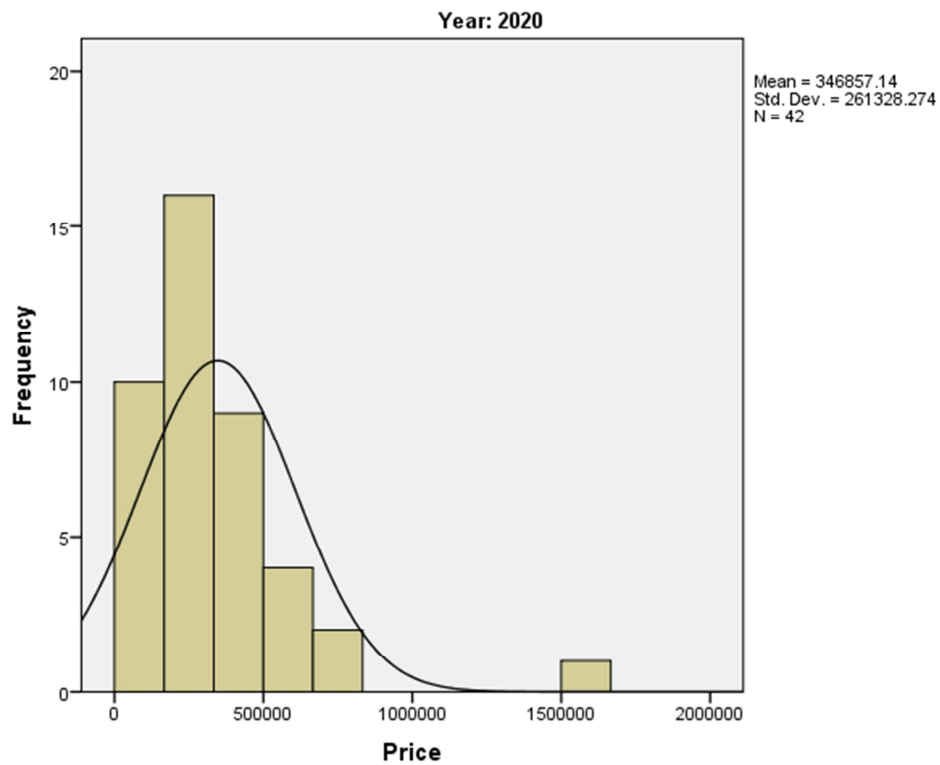


Figure 2. The usual distribution of price for the studied population in PSI auction (2020).

Table 2. Statistic data of variable sex of horses (euro).

Sex of the studied horse	N	\bar{x}	s	$\pm S \bar{x}$	Min.	Max.
Mare	23	369739.13	350223.723	73026.694	72000	1600000
Stallion	26	345192.31	260178.250	51025.153	86000	1300000
Gelding	21	314476.19	237031.141	51724.436	30000	955000
TOTAL	70	344042.86	283559.642	33891.860	30000	1600000

Figure 3 indicates the results regarding the price obtained at PSI auction for the 70 studied horses after the sex criteria. It can be seen that the price drops from 369739.13 euro

(mares) to 314476.19 euro (geldings), the stallions being in between (314476.19 euro).

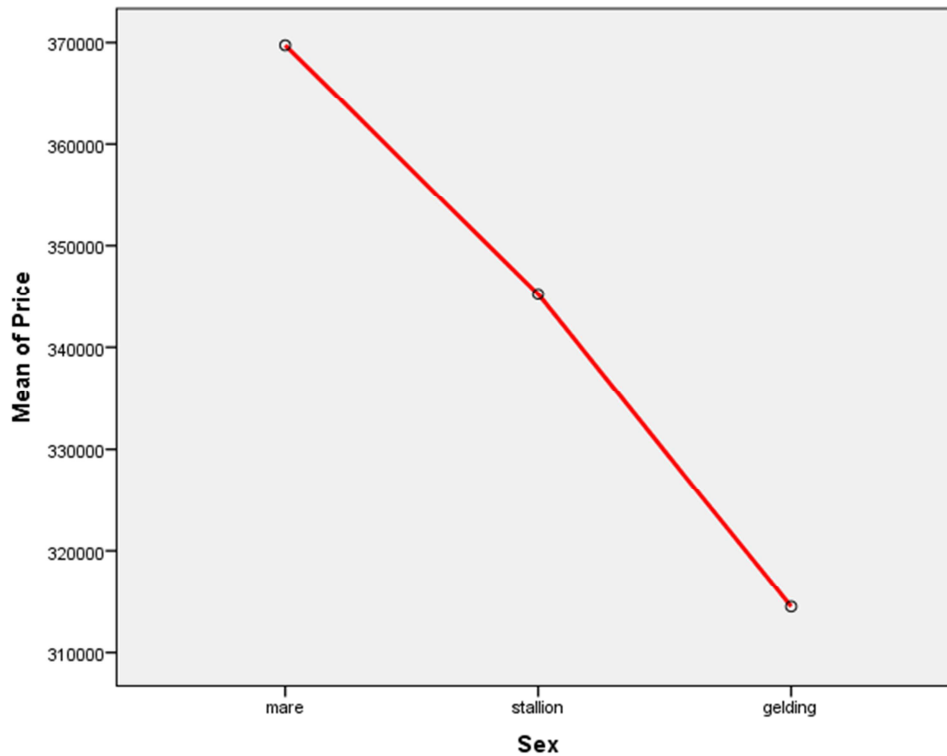


Figure 3. Mean of price of variable sex (euro).

2. Year factor:

For the year variable, the results of the statistical analysis show that regarding the sale price obtained in the PSI auction for the 70 horses studied, there are no statistically significant differences for the significance level of 0.05 ($t=-0.101$,

$p=0.920$). We can say that no there are statistically significant differences between the two years studied. Also the identified mean was 339821.43 euro for 2019y and 346858.14 euro for 2020y. (table 3)

Table 3. Statistical data for the year factor.

Sex of the studied horse	N	\bar{x}	s	$\pm S \bar{x}$
2019	28	339821.43	318979.629	60281.484
2020	42	346857.14	261328.274	40323.828

The distribution of percent for variable year, is presented in table 4 where 32.9% of the total was represented by mares, 37.1% by stallions and 30% by geldings; it was observed that the lower values of bootstrap for percent were: 21.4% for mares, 25.7% for stallions and 18.6% for geldings. On the

other hand, the upper values were: 44.6% for mares, 48.6% for stallions, and 40% for geldings. This means that for mares it can be stated with confidence of 95% that variation ranged between 21.4-44.3 for mares, 25.7-48.6 for stallions and 18.6-40 for geldings. (table 4)

Table 4. The percent of sex for variable year.

Sex of the studied horse	N	Percent	Bias	Std. Error	Bootstrap for percent*	
					Lower	Upper
Mare	23	32.9	-.2	5.5	21.4	44.3
Stallion	26	37.1	.2	5.6	25.7	48.6
Gelding	21	30	-.1	5.4	18.6	40.0
TOTAL	70	100	0	.0	100.0	100.0

*Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

In table 5 it is represented the distribution of percent for 2019 and 2020, where the first year had a frequency of 28%

and the second one a frequency of 42%, indicating lower values of 28.6% for 2019 and 48.6% for 2020, and upper values of 51.4% for 2019 and 71.4% for 2020. It can be stated with confidence of 95% that variation ranged between 28.6-51.4 for 2019y and 48.6-71.4 for 2020y.

Table 5. The percent for 2019 and 2020.

Year	N	Bias	Std. Error	Bootstrap for percent*	
				Lower	Upper
2019	28	-2	5.8	28.6	51.4
2020	42	-2	5.8	48.6	71.4
TOTAL	70	0	.0	100.0	100.0

*Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

The distribution of equestrian sports like dressage and jumping are presented in table 6 where the lower values of bootstrap are 48.6% in dressage, and 30% in jumping; the upper values were 70% for the first discipline, and 51.4% for the second one. So it can be stated with confidence of 95% that variation ranged between from 48.6-70 for dressage discipline and from 30-51.4 for jumping. (table 6)

Table 6. The percent for dressage and jumping.

Year	N	Bias	Std. Error	Bootstrap for percent*	
				Min.	Max.
Dressage	42	-.3	5.6	48.6	70.0
Jumping	28	.3	5.6	30.0	51.4
TOTAL	70	0	.0	100.0	100.0

*Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

3. Equestrian Discipline Factor:

For this factor, the results of the statistical analysis show that the results regarding the sale price obtained in the PSI auction for the 70 horses do not show statistically significant differences for the significance level of 0.05 ($t=-0.077$, $p=0.939$). We can say that there are no statistically significant differences between the two disciplines. Also the mean for dressage was 341904.76 euro and 347250.00 euro for jumping. (table 7)

From the research conducted, we did not find previous studies similar to the one presented in this material.

Table 7. Statistical data for the equestrian discipline factor:

Sex of the studied horse	N	\bar{x}	s	$\pm S \bar{x}$
Dressage	42	341904.76	277627.388	42838.836
Jumping	28	347250.00	297357.700	56195.323

4. Conclusions

In conclusion, we can say that the annual PSI auctions have carried out over time, in the 42 editions, very rigorous selections of the participating horses.

Thus, the top specimens, which promise the best sports performances, are carefully selected in the selection centers, in Kassmann and Schockemöhle, months before the auction.

Following the analysis of the results of the horses in the

PSI auctions in 2019 and 2020, there were no significant differences between the years, all participants in this study being young horses.

The results obtained from the statistical analysis show that the selling price obtained in the PSI auction for the horses studied does not show statistically significant differences for the level of significance 0.05 ($t=-0.101$, $p=0.920$). We can say that there are no statistically significant differences between the two years studied, 2019 and 2020.

Following the analysis of the results of the horses from the PSI auctions in 2019 and 2020, there were no significant differences for the sex of the participating horses that would influence their sale price in the auction. Thus, for the sex variable, the results of the analysis vary between 72000 euro and 160000 euro, with an average of 346857.14 euro for 2020. The results of data processing show that the selling price obtained in the PSI auction for the 70 horses studied does not present a statistically significant difference for significance level 0.05 ($F=0.204$, $p=0.816$).

Following the analysis of the results of the horses participating in the PSI auctions in 2019 and 2020, there were no significant differences in their discipline, training, or jumping that would influence the sale price in the auction. The results of the statistical analysis show that the selling price obtained in the PSI auction for the subjects studied does not show statistically significant differences for the level of significance 0.05 ($t=-0.077$, $p=0.939$).

Thus, in the descriptive statistics for the mean for factor sex, the values are close: for mares=369739.13 euro, for stallions=345192.31 euro, for geldings=314476.19 euro.

Also we can state that there are no statistically significant differences between the two years studied regarding the factor year. Also the identified mean was 339821.43 euro for 2019y and 346858.14 euro for 2020y. This means that for mares it can be stated with confidence of 95% that variation ranged between 21.4-44.3 for mares, 25.7-48.6 for stallions and 18.6-40 for geldings.

These horses, whether they are mares, stallions, or geldings, regardless of the year, or breed, are sold at very high prices and will be used according to the interest of the buyer both on the reproductive line, those active in terms of reproduction, as well as on the sports line, being trained for the biggest competitions in the world.

We can say that there are no statistically significant differences between the two disciplines. Also the mean for dressage was 341904.76 euro and 347250.00 euro for jumping.

During the auction, horses with high-performance genealogical bloodlines are presented for sale, which have been very carefully selected in advance by the sales team.

We can conclude that in the PSI auctions the most promising horses are chosen and carefully selected both for the eventuality of reproduction and for sports competitions, and precisely this analysis and rigorous selection can be the reasons why there are no significant differences in their selling prices.

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