

APPENDIX 1. Vega Baja region description

The analysed region is a mix area with two poles of attraction: the capital and the coast. The capital, Orihuela, is an administrative- centre and one of the most traditional cities in Alicante (and in the Mediterranean coast, since it was a pre-roman city). The coast concentrates varying population living long periods of the year with European and other foreign part-time residents, owning their house in high-quality environmental areas and first-coastal line. There are also large tourist flows. The rest of the territory (between both fields of study) is a rural area with dynamic fruit (and exporting) production and a very attractive environmental land closed to the coastal area.

The area covered by the analysis is called the 'Vega Baja del Segura' County which includes 27 towns located in both the costs and the inland where Orihuela city is (Fig. A). There are two natural parks in the county (around the Pedrera water reservoir and Torrevieja Salinas and Lagoon) and the whole county is surrounded by another two Natural Parks (Parque Natural del Hondo and the Salinas de Santa Pola) constituting a very rich environmental region in the East coast of Spain.

That region is break down in the north by the A-7 highway which acts as an artificial barrier. The extreme north locates a small part of resident being the majority living in the area between the highway and the cost. Most the inland is mountainous area (La Pedrera reservoir) determining most towns to be located around it and along the

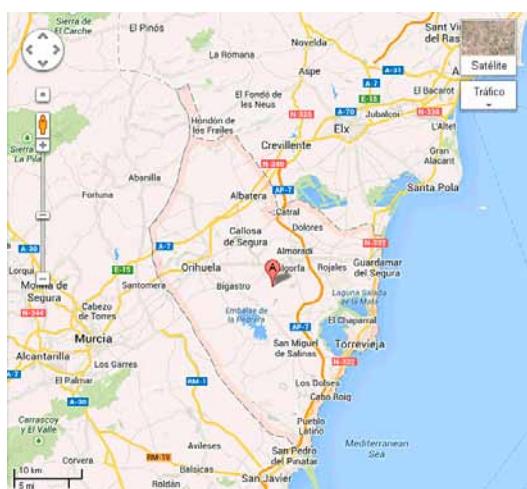


Fig. A. Vega Baja County map

Source: Google maps

coast. As a result, population is strongly concentrated along the coast and in Orihuela city with around 25 kilometres between each other. The coastal area is very long and contains well known towns conurbations like (from the North to the South) 'Guardamar del Segura', Torrevieja, Orihuela Costa and Pilar de la Horadada. So the inland is going to have dispersed and less populated urban pattern for the 24 towns located there.

The three differenced areas account by different population and economic activities characteristics. While Orihuela is the administrative centre, the coast attracts many foreign homeowners who live long time in a year, as well as tourism flows. There is an active housing market along the coast (and in the closer cast towns) of homeowner migrants from Centre, East and North of Europe, and Russia. Since all the coastal area is a well develop services' region, it strongly attracts foreign households who buy homes there. Therefore, that housing market is fully affected by foreign demand with social and income features coming far away from the local economic structure. That area is also an alternative housing market for local population who is capable to commute 25 kilometres to live out of the main town where they work. In the area of study, most of the smaller towns close to the coast (less than 20 thousands inhabitants) are fully dominate by foreign population as they are the Spanish ones with larger foreign registered people (Table I). Most of this population owns the house but, due to data protection, it is no possible to observe the nationality of homeowners. Only for main cities, the ownership rate can be shown indicating foreigners from developed European countries shows larger ownership rates than local or other foreigners, supporting previous evidence (Table II)¹.

¹ Due to a protection-data regulation, the Spanish statistics does not publish detailed information for those less-than-20,000 inhabitants-towns. The three towns overpassing that threshold are Orihuela city (interior), Torrevieja and Pilar de la Horadada (both coastal). Table 3 distinguishes between Spanish, foreigners 'A' group (from EMU countries plus Sweden, UK, Denmark, Iceland, Switzerland and smaller countries) and other foreigners. The second group is demonstrated to have larger income, being young retired and stay in Alicante an average of 10 month a year (Gibler, Taltavull 2010) although there is no available statistical information to support that the whole group is registered as residents. In Vega Baja, the presence of that owners is very relevant to explain the housing demand. Note that the ownership rates in Table 3 only refers to main houses while there is no detail about the nationality of those who owns the secondary homes.

Table I. Foreign residents in % of total population registered in every Vega Baja's smaller town

Code and town name	Coastal	Foreign in % of total population
03113 Rojales	No	71,54
03118 San Fulgencio	No	70,98
03012 Algorfa	No	59,21
03120 San Miguel de Salinas	Yes	54,95
03034 Benijófar	No	49,36
03070 Formentera del Segura	Yes	37,90
03903 Montesinos, Los	Yes	37,32
03076 Guardamar del Segura	Yes	34,11
03061 Daya Nueva	No	31,43
03055 Catral	No	24,17
03080 Jacarilla	No	20,77
03015 Almoradí	No	20,60
03005 Albatera	No	18,31
03025 Benferri	No	17,07
03109 Rafal	No	17,06
03044 Bigastro	No	16,70
03049 Callosa de Segura	No	16,08
03064 Dolores	No	15,92
03058 Cox	No	14,88
03074 Granja de Rocamora	No	13,96
03111 Redován	No	12,92
03024 Benejúzar	No	10,23
03904 San Isidro	No	9,25

Source: INE (2011)

Table II. Housing stock and tenancy in Vega Baja main cities

Main houses. Tenancy type (in % of total number of main houses)													
		Ownership		Rent			Low price or free	Other	Total	Housing stock (number of houses)			
		Total	Buy/paid	Buy/pay pending	Inherit				Housing stock Total	Main houses	Secondary homes	Others	
Orihuela	Spanish	88.97	42.68	34.62	11.67	2.46	1.77	6.81	100	69485	31020	27575	10890
	Europeans	91.68	66.92	24.39	0.38	6.99	0.76	0.57	100				
	EMU+ (N,S,S,D)												
Torrevieja	Other foreign	33.33	8.10	23.81	1.43	58.57	6.19	1.90	100				
	Spanish	86.82	41.18	41.40	4.25	7.41	1.73	4.03	100	122325	39855	62585	19885
	Europeans	84.06	54.64	29.10	0.31	11.15	0.93	3.87	100				
Pilar de la Horadada	EMU+ (N,S,S,D)												
	Other foreign	44.07	8.76	34.46	0.85	49.72	2.54	3.67	100				
	Spanish	86.15	32.32	45.78	8.05	4.88	3.43	5.54	100	22660	8375	8070	6220
	Europeans	87.22	70.68	15.79	0.75	12.03	0.75	0.00	100				
	Other foreign	50.00	6.90	43.10	0.00	48.28	0.00	1.72	100				
	EMU+ (N,S,S,D)												

Source: INE (2011)

As they account by different socio-economic characteristics, the coastal housing markets should show different features than the city or inland, but their spatial proximity suggest that influences could exist. Consequently the 'Vega Baja' becomes a suitable laboratory to explore how house prices interact in the spatial framework and the existence of diffusion patterns and ripple effect.

REFERENCES

- INE. 2011. *Census 2011 data* [online]. Spanish Institute of Statistic. Available at: <http://www.ine.es>
- Gibler, K. M.; Taltavull, P. 2010. Using preferences for international retiree housing market segmentation, *Journal of Property Research* 27(3): 221–237. <http://dx.doi.org/10.1080/09599916.2010.518403>

APPENDIX 2. Variables and basic statistics

Table III. Variables and basic statistics

A – Variables and basic statistics

Description	Variable name	Code/units	Nº obs	Mean	Median	St dev	Vari- ance	Asymme- try	Kurto- sis	Min	Max
Year	Year	num	22387	2009	2.008	1.50	2.26	0.58	-0.82	2007	2012
Asking price	Asking price	euros	22387	11.75	11.76	0.34	0.12	0.13	1.76	10.13	13.97
Population total (log)	Ipop_tot	num	22387	10.48	11.23	1.21	1.48	-0.79	0.08	1.79	13.83
Type of urban area	T_urban area	1 = urban dependent; 2 = independent town; 3 = County capital; 4 = province capital	22387	2.00	0.49	0.24	0.06	1.39	1.00	4.00	4
Econ activ	Ecoac	1 = Agricultural; 2 = Industry; 3 = Tourism; 4 = Services; 5 = Multiple	22387	2.84	3.00	1.42	2.01	0.11	-1.01	1.00	5.00
Urban use (1st, 2nd reside, business ...)	Urb_use	1 = 1st residence; 2 = 1st and 2nd; 3 = 2nd residence	22387	1.98	2.00	0.99	0.97	0.04	-1.97	1.00	3.00
Retail facilities gen	Q_retail	1 = Bad; 2 = Basic; 3 = Normal; 4 = Good; 5 = Very good	22387	3.53	3.00	0.70	0.49	0.67	-0.22	2.00	6.00
School facilities	Q_school	0 = No exist; 1 = Only in town; 2 = Scarce; 3 = Limited; 4 = Sufficient; 5 = All type-Good	22387	3.88	4.00	0.54	0.29	-4.45	20.32	0.00	5.00
Religion network	Q_religion	0 = No exist; 1 = Only in town; 2 = Scarce; 3 = Limited; 4 = Sufficient; 5 = All type-Good	22387	3.88	4.00	0.55	0.30	-4.33	19.24	1.00	5.00
Health facilities	Q_health	0 = No exist; 1 = Only in town; 2 = Scarce; 3 = Limited; 4 = Sufficient; 5 = All type-Good	22387	3.91	4.00	0.44	0.19	-4.84	26.82	1.00	5.00
bus	bus	0 = No exist; 1 = Only in town; 2 = Scarce; 3 = Limited; 4 = Sufficient; 5 = All type-Good	22387	4.14	4.00	0.92	0.85	-1.53	3.34	0.00	5.00
Train	Train	0 = No exist; 1 = Only in town; 2 = Scarce; 3 = Limited; 4 = Sufficient; 5 = All type-Good	22387	0.46	0.00	0.84	0.70	1.29	-0.32	0.00	2.00
Population growth	Pop_%	0 = Negative; 1 = Stable; 2 = Positive	22387	1.94	2.00	0.25	0.06	-4.39	20.01	0.00	2.00
N of houses in building (log)	LN_houses	num	22387	2.55	2.71	1.18	1.40	-0.53	-0.07	0.00	5.46
Age (log)	lAge	num	22387	1.33	1.39	1.19	1.41	0.23	-1.33	0.00	4.83
Size m ² (logs)	lsize	num	22387	4.49	4.55	0.32	0.10	-0.41	3.18	5.63	16
Storeys N(log)	lstoreys	num	22387	1.55	1.61	0.45	0.20	-0.37	-0.27	0.00	3.09
Building type	t_build	1 = building block; 2 = Open building; 3 = Open building with urbanization (garden, facilities)	22387	1.54	1.00	0.88	0.77	1.02	-0.92	1.00	3.00
Lift N.(log)	llift	num	22387	-2.53	0.00	4.97	24.72	-1.24	-0.43	-11.51	2.89
Retail facilities neigh	Q_retail_N	1 = Bad; 2 = Basic; 3 = Normal; 4 = Good; 5 = Very good	22387	3.54	3.00	0.70	0.49	0.72	-0.06	2.00	6.00

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Description	Variable name	Code/units	Nº obs	Mean	Median	St dev	Variance	Asymmetry	Kurtosis	Min	Max
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Income category	Income	1 = Very Low; 2 = Low; 3 = Aver-	22387	4.05	4.00	0.28	0.08	3.91	31.80	2.00	7.00
house orientation	Orient	age; 5 = Avera-High; 6 = High; 7 = Very High 1 = North; 2 = West; 3 = North-West; 4 = North-East; 5 = South-West; 6 = East; 7 = South; 8 = South-West	22387	4.44	5.00	2.51	6.32	-0.13	-1.54	1.00	8.00
Views	Views	0 = Degraded area; 1 = Narrow street; 2 = Street or Avenue; 3 = 2nd Sea line; 4 = Square, Avenue with green areas; 5 = 1st Sea line; 6 = Exceptional 1 = Bad; 2 = Basic; 3 = Normal; 4 = Good; 5 = Very good	22387	2.35	2.00	0.83	0.69	2.25	4.62	0.00	6.00
Construction qual-	Q_const	0 = No exist; 1 = Green areas (GA0); 2 = GA0 + swimmingpool (GA1); 3 = GA1 + 1 Sport ground (GA2); 4 = GA2 + other sport ground or social club	22387	0.63	0.00	0.98	0.96	1.14	0.05	0.00	4.00
Urb Quality	Q_urb	1 = 1st residence; 2 = 2nd residence or 1st ex- ceptional	22387	1.52	2.00	0.50	0.25	-0.09	-1.99	1.00	2.00
Type of residency (main use)	t_Resid	Num	22387	0.84	0.69	0.60	0.36	-10.98	226.14	-11.51	2.20
Exterior rooms Nº (log)	Lp_ext	Num	22387	0.89	1.10	0.32	0.10	-0.82	2.03	0.00	3.50
Bedroom N(log)	Lbedroom	Num	22387	0.40	0.69	0.35	0.12	-0.21	-1.42	0.00	3.00
Bath N(log)	Lbath	Num	22387	-0.78	-0.75	0.11	0.01	-0.45	-1.26	-1.02	-0.65
longitude	longitude	Num	22387	38.04	38.06	0.08	0.01	-0.12	-0.88	37.85	38.18
latitude	latitude	Num									31
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B – Number of observations by municipality and year											
City/town	code	2007	2008	2009	2010	2011	2012	Total			
Guardamar del Segura	3140	199	506	309	84	169	48	1315			
Dolores	3150	158	99	88	0	41	5	391			
Catral	3158	73	147	80	36	69	13	418			
Daya Nueva	3159	6	20	7	0	12	0	45			
Almoradí	3160	251	168	160	24	160	50	813			
Algiorfa	3169	35	32	46	36	6	12	167			
Rojales	3170	83	155	68	36	47	24	413			
San Fulgencio y Daya Vieja	3177	40	88	55	0	0	6	189			
Benijofar	3178	24	50	26	12	31	0	143			
Formentera del Segura	3179	34	61	25	0	31	0	151			
									(Continued)		

City/town	code	2007	2008	2009	2010	2011	2012	Total
(Continued)								
Torrevieja	3180	1335	2165	1419	756	1521	441	7637
Los Montesinos	3187	82	71	43	12	49	10	267
Pilar de la Horadada	3190	58	215	126	86	86	11	582
San Miguel de Salinas	3193	37	78	42	0	6	0	163
Orihuela city	3300	730	1382	751	326	379	160	3728
Orihuela coastal area	3189	334	462	349	116	314	117	1692
Jacarilla	3310	32	28	18	0	6	0	84
Benferri	3316	11	6	6	12	5	0	40
Albatera	3340	309	302	138	14	106	25	894
Granja de Rocamora	3348	3	14	18	0	5	11	51
San Isidro	3349	72	155	6	0	31	12	276
Cox	3350	40	61	30	0	54	6	191
Callosa de Segura	3360	138	404	166	14	253	42	1017
Rafal	3369	90	124	119	32	133	54	552
Redován	3370	156	159	92	48	41	12	508
Bigastro	3380	85	203	84	12	71	24	479
Benejúzar	3390	55	70	7	0	30	19	181
Total		4470	7225	4278	1656	3656	1102	22387

APPENDIX 3. Hedonic model

Table V. Hedonic model. Housing price by characteristics in three main region

Total	2007	2008	2009	2010	2011	2012	2007	2008	2009	2010	2011	2012	2007	2008	2009	2010	2011	2012
	Orinuela city						Coastal area						Interior area					
Variable name	β	β	β	β	β	β	β	β	β	β	β	β	β	β	β	β	β	
c	-1.98*	-2.27***	-5.76***	-10.3***	-9.35***	-7.22***	-7.35***	-5.03***	-7.67***	-5.69***	-7.22***	-12.36***	11.85***	15.66***	33.0***	17.85***	13.26***	
Ecoac	0.06	-0.15***	0.05***	-0.05	0.08***	-0.03	-0.08***	0.07***	0.05***	0.19***	0.11***	-0.03	0.03	0.08**	-0.11***	-0.11	-0.20***	0.00
Bus	0.14***	-0.15***	0.19***	-0.40***	0.12**	-0.05	0.01	0.08*	0.07*	0.17***	-0.04	-0.05	-0.16***	0.05	-0.34***	0.17***	-0.07	0.53***
Q_const	0.02	-0.02	0.05	-0.07	0.09**	0.03	-0.04	0.03	0.06*	0.10	0.04	0.03	0.05	0.03	-0.11***	-0.04	-0.09*	0.16*
Q_urb	0.10***	0.18***	0.13**	0.09**	0.05*	0.06**	-0.06*	-0.06	-0.23***	-0.24***	0.11***	0.06**	-0.03	-0.08	0.19***	0.23***	-0.10*	0.01
Urb_use	0.00	0.16***	-0.02	-0.15*	-0.12***	1.29***	0.65***	0.57***	0.35***	1.02***	0.84***	1.29***	-0.91***	-1.16***	-0.79***	-1.59***	-1.02***	-1.63***
Pop_%	-0.49***	-0.86***	0.05	-0.46**	0.16	-0.14**	-0.03	0.23***	-0.14**	0.03	0.16**	-0.14**	0.47***	0.48***	-0.04	0.16	-0.31*	-0.34
Q_retail_N	0.13***	-0.02	0.19***	0.13**	0.07	-0.04	-0.20***	-0.04	-0.05*	-0.25***	-0.07**	-0.04	0.04	0.10**	-0.01	0.15***	0.02	0.2***
Q_health	-0.29***	0.77***	-1.31***	-0.13	-0.23	0.24*	0.20	-0.87***	0.01	1.26***	0.12	0.24*	0.14	0.14	1.25***	-1.12***	0.34*	1.59***
Q_retail	0.00	0.13***	0.23***	0.10**	0.06*	0.17***	0.02	0.05	0.01	0.06	-0.20***	-0.14***	-0.14***	-0.18***	-0.12**	-0.08*	0.26***	0.26***
Q_school	-0.20***	-0.72***	0.31***	-0.05	-0.40***	0.03	0.20*	0.37**	0.37***	-2.27***	0.62***	0.03	-0.03	0.27	-0.92***	2.37***	-0.50***	-0.55***
Q_relig	-0.07	-0.19**	0.28***	0.03	0.12	0.03	-0.31***	0.54***	0.00	2.62***	-0.73***	0.03	0.40***	-0.38***	-0.27***	-2.68***	0.68***	-0.47***
Q_roads	0.96	0.22***	0.17***	0.27***	0.13***	-0.04*	-0.31**	-0.08***	-0.04***	-0.07***	-0.08***	-0.04*	-0.58	-0.08***	-0.02	-0.13***	-0.02	-0.08**
Ilift	0.03***	-0.01	-0.01	0.00	0.00	0.01	0.01*	0.00	0.02	0.00	0.00	0.00	-0.03***	-0.02**	0.02*	-0.01	0.01	0.00
Age	0.08***	-0.03*	-0.05	-0.03	-0.07**	0.00	-0.02	-0.01	0.01	0.11	0.09***	0.00	-0.12***	-0.03	-0.01	-0.16***	-0.08***	-0.08
Lbath	0.14	0.19*	-0.01	0.11	-0.18**	-0.32*	0.13	0.13	0.01	-0.07	0.10	-0.32*	-0.27***	-0.23***	0.00	0.01	0.14	0.30
Lbed	0.74***	-0.03	0.02	-0.28**	-0.19	0.02	0.73***	0.56***	0.13	0.07	0.40**	0.02	-1.30***	-0.50***	-0.28	0.15	-0.17	-0.03
Lp_ext	0.02	0.06	0.20***	-0.05	-0.02	0.02	-0.09**	-0.04	0.03	0.05	-0.02	0.02	0.09**	0.04	-0.13**	0.15	0.07***	0.02
Istoreys	0.07	-0.03	0.29***	0.12	-0.09	0.35***	0.16***	0.26***	-0.13**	0.22*	0.23***	0.35***	-0.31***	-0.37***	-0.22***	-0.22***	-0.18**	-0.27**
lpop_dev	0.20***	0.21***	0.25***	0.71***	0.20***	0.14**	0.35***	0.30***	0.16***	0.36***	0.17***	0.14***	-0.68***	-0.75***	-0.47***	-1.33***	-0.46***	-0.46***
lpop_tot	-0.82***	-0.04	0.04	0.25	0.34	0.70***	-0.89***	-0.54***	-0.06	0.31	-0.34	0.70***	1.63***	0.65***	0.53	-0.76*	-0.03	-0.76
lsize	-0.30	0.20	-0.12	0.62***	0.21	0.20	0.38***	0.05	0.65***	0.20	0.36***	0.20	0.41*	0.19	-0.05	0.11	0.06	0.98***
LN_houses	-0.10***	-0.02	-0.01	-0.02	0.00	0.01	0.00	-0.01	-0.01	-0.07**	-0.03	-0.06**	0.01	0.09***	0.02	0.03	0.05	0.05
Orient	0.01	-0.02**	-0.01	0.00	0.00	0.02	-0.01	0.01	0.00	0.02	0.02*	0.02	0.00	0.01	0.02**	-0.03**	-0.01	-0.01
Income	0.01	0.05	-0.11	0.11	0.14	0.20	0.27***	-0.06	-0.01	0.62***	0.20**	0.20	-0.20	0.12	0.13	-0.61***	-0.36***	0.00
T_Urban area	1.85***	1.49***	1.99***	1.25***	2.54***	-0.23***	0.12***	0.04	0.24***	-0.29**	0.07	-0.23***	-2.00***	-1.55***	-1.55***	-1.98***	-0.92***	-2.47***
t_Resid	-0.16**	0.08*	-0.26***	-0.01	0.02	0.62***	0.78***	0.07	0.68***	0.56***	0.56***	0.62***	-0.92***	-0.41***	-1.17***	-0.98***	-1.02***	-1.16***
t_build	0.08	-0.05	-0.11	0.01	0.03	-0.02	0.10**	0.14***	0.22***	0.32***	-0.12***	-0.02	-0.17***	-0.12*	-0.10	-0.33***	0.07	0.02
Train	0.88***	0.49***	0.92***	1.17***	0.50***	0.10***	-0.20***	-0.03*	-0.12***	0.12*	-0.16***	0.10***	-0.54***	-0.40***	-0.58***	-1.14***	-0.25***	-0.39***
Views	0.01	-0.02	0.11***	-0.09*	0.02	0.02	0.12***	0.04*	0.00	0.02	0.08***	0.02	0.10***	-0.01	-0.04	0.11**	-0.06	0.00
W*Pi-j	0.68***	0.65***	0.57***	0.39***	0.61***	0.71***	0.79***	0.85***	0.89***	0.71***	0.77***	0.71***	0.67***	0.67***	0.71***	0.39***	0.64***	0.44***
Lambda	0.67***	0.21***	-0.07	0.86***	0.21**	0.08	0.30***	-0.41***	-0.81***	0.47***	-0.52***	0.08	0.46***	0.31***	-0.23***	0.69***	0.10	0.61***
Ad R ²	0.92	0.89	0.88	0.91	0.89	0.98	0.96	0.93	0.93	0.95	0.98	0.93	0.91	0.91	0.91	0.94	0.94	0.94
Instrumented	W*P*ORIH2						W*P*COSTA2						W*P*INT2					
Instruments	W*ECOACT, W*BUS, W*Q_CONST, W*Q_URB, W*URB_USE, W*POP%, W*Q_RETAIL, W*Q_HEALTH, W*Q_ROADS, W*LLIFT, W*Q_SCHOOL, W*Q_RELIG, W*L_SIZE, W*L_STOREYS, W*L_POP_DEV, W*L_POP_EXT, W*L_ORIENT, W*L_HOUSES, W*L_SIZE, W*URB_ANA, W*T_RESID, W*T_BUILD, W*T_TRAIN, W*VIEWS						W*LBED, W*LBED, W*T_BUILD, W*T_TRAIN, W*T_VIEWS						W*Q_INCOME, W*T_URBAN_AREA, W*T_LBATH, W*T_LBATH, W*T_LBATH, W*T_LBATH, W*T_LBATH, W*T_LBATH					
D.F.	4438	0.85	0.86	0.86	0.85	0.96	0.92	0.89	0.91	0.93	0.91	0.96	0.89	0.85	0.86	0.87	0.92	0.91
Σe^2	0.85	0.85	0.86	0.86	0.85	0.96	0.92	0.89	0.91	0.93	0.91	0.96	0.89	0.85	0.86	0.87	0.92	0.91
D.F.	4438	7193	4247	1625	3624	1070	4438	7193	4247	1625	3624	1070	4438	7193	4247	1625	3624	1070

***, p-value<0,01
**, p-value<0,05