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Factors influencing consumer behaviour in the beer market in the Czech Republic

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Electronic supplementary material

Supplementary Tables S1–S4

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Table S1. 2-sample test for equality of proportions without continuity correction (beer selection)

d*f* = 1 alternative hypothesis: two sided	*X*-squared	*P*-value	95% confidence interval	Sample estimates	Result of the test
Taste	6.111	0.01343	⟨–0.119237139; –0.006403887⟩	prop 1 = 0.02884615; prop 2 = 0.09166667	**Statistically meaningful difference between regions at α = 0.05**
Quality	6.5864	0.01028	⟨–0.116389849; –0.006637378⟩	prop 1 = 0.02030457; prop 2 = 0.08181818	The measured values are deeply imbalanced, impossible to decide
Price	0.23158	0.6304	⟨–0.16339236; 0.09894136⟩	prop 1 = 0.4890511; prop 2 = 0.5212766	Statistically no difference between regions
Promotion	0.52733	0.4677	⟨–0.04823159; 0.10290019⟩	prop 1 = 0.9119497; prop 2 = 0.8846154	Statistically no difference between regions
Recommendation	12.035	0.0005221	⟨–0.34360070; –0.09460493⟩	prop 1 = 0.2534247; prop 2 = 0.4725275	**Statistically meaningful difference between regions at α = 0.05**
Packaging design	0.37166	0.5421	⟨–0.06237349; 0.11747283⟩	prop 1 = 0.8675497; prop 2 = 0.8400000	Statistically no difference between regions
Discount action	0.20891	0.6476	⟨–0.14783483; 0.09180281⟩	prop 1 = 0.5757576; prop 2 = 0.6037736	Statistically no difference between regions
Brand	3.4437	0.06349	⟨–0.186975751; 0.008785177⟩	prop 1 = 0.1461988; prop 2 = 0.2352941	Statistically no difference between regions
Czech production	0.018372	0.8922	⟨–0.09895254; 0.11369872⟩	prop 1 = 0.2341772; prop 2 = 0.2268041	Statistically no difference between regions
Habit	4.0638	0.04381	⟨–0.223689409; –0.000414989⟩	prop 1 = 0.2111801; prop 2 = 0.3232323	**Statistically meaningful difference between regions at α = 0.05**

Source: Own processing in the R mathematical software

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Table S2. Kendall's rank correlation tau-b (beer selection)

		Taste	Quality	Price	Promotion	Recommendation	Packaging design	Discount action	Brand	Czech production	Habit
Taste		X	z = 6.9254, *P*-value = 4.348e–12	z = 0.51295, *P*-value = 0.608	z = –0.37573, *P*-value = 0.7071	z = 3.2772, *P*-value = 0.001048	z = 0.26994, *P*-value = 0.7872	z = 0.50471, *P*-value = 0.6138	z = 2.7704, *P*-value = 0.005599	z = 1.5752, *P*-value = 0.1152	z = 1.5781, p-value = 0.1145
	tau		0.4488703	0.03131308	–0.02343057	0.2016578	0.01678143	0.03044305	0.1718272	0.09615869	0.09697255
Quality		z = 6.3786, *P*-value = 1.787e–10	X	z = –0.34456, *P*-value = 0.7304	z = –0.89486, *P*-value = 0.3709	z = 3.0467, *P*-value = 0.002314	z = 0.099952, *P*-value = 0.9204	z = -1.502, *P*-value = 0.1331	z = 3.2547, *P*-value = 0.001135	z = 2.8634, *P*-value = 0.004191	z = 0.90881, p-value = 0.3635
	tau	0.5076072		–0.02073	–0.05499674	0.1847669	0.006123963	–0.08929096	0.1989504	0.1722757	0.05503913
Price		z = 1.1433, *P*-value = 0.2529	z = 0.65022, *P*-value = 0.5155	X	z = 1.6758, *P*-value = 0.09378	z = -1.5137, *P*-value = 0.1301	z = 1.2773, *P*-value = 0.2015	z = 6.7481, *P*-value = 1.498e–11	z = 1.7783, *P*-value = 0.07535	z = 1.0657, *P*-value = 0.2865	z = 3.0322, p-value = 0.002428
	tau	0.08691106	0.04870029		0.09700817	–0.08646896	0.07371506	0.3778738	0.1023911	0.06039678	0.1729702
Promotion		z = –0.2006, *P*-value = 0.841	z = –0.68607, *P*-value = 0.4927	z = 4.4019, *P*-value = 1.073e–05	X	z = 2.8688, *P*-value = 0.00412	z = 7.4918, *P*-value = 6.795e–14	z = 1.451, *P*-value = 0.1468	z = 0.29564, *P*-value = 0.7675	z = –0.049257, *P*-value = 0.9607	z = 2.0756, p-value = 0.03793
	tau	–0.01575539	–0.05308908	0.3253948		0.1673976	0.4416432	0.08299967	0.01738793	–0.00285144	0.120946
Recommendation		z = 2.9036, *P*-value = 0.003689	z = 2.1558, *P*-value = 0.0311	z = 1.4118, *P*-value = 0.158	z = 5.5928, *P*-value = 2.234e–08	X	z = 4.2792, *P*-value = 1.876e–05	z = -1.4272, *P*-value = 0.1535	z = –0.0075256, *P*-value = 0.994	z = 0.91475, *P*-value = 0.3603	z = 3.2498, p-value = 0.001155
	tau	0.2217846	0.1622379	0.1015018	0.4154189		0.2489241	–0.08055652	–0.0004367567	0.05225343	0.1868661
Packaging design		z = 1.3915, *P*-value = 0.1641	z = 0.028733, *P*-value = 0.9771	z = 3.5796, *P*-value = 0.0003441	z = 7.3539, *P*-value = 1.925e–13	z = 5.642, *P*-value = 1.681e–08	X	z = 2.4714, *P*-value = 0.01346	z = 0.66995, *P*-value = 0.5029	z = 0, *P*-value = 1	z = 0.89507, p-value = 0.3707
	tau	0.1085211	0.002207824	0.2627609	0.557701	0.4161426		0.1409281	0.03928066	0	0.05199575
Discount action		z = 1.0131, *P*-value = 0.311	z = –0.28698, *P*-value = 0.7741	z = 7.7453, *P*-value = 9.533e–15	z = 3.8863, *P*-value = 0.0001018	z = 1.9162, *P*-value = 0.05534	z = 4.0848, *P*-value = 4.412e–05	X	z = 2.1428, *P*-value = 0.03213	z = 1.7386, *P*-value = 0.0821	z = 2.203, p-value = 0.0276
	tau	0.07729433	–0.02157259	0.5562221	0.2883285	0.1382709	0.3009349		0.1219073	0.09735992	0.1241745

Table S2. to be continued

	Taste	Quality	Price	Promotion	Recommendation	Packaging design	Discount action	Brand	Czech production	Habit
Brand	z = 4.709, *P*-value = 2.49e–06	z = 4.5182, *P*-value = 6.237e–06	z = 1.0132, *P*-value = 0.3109	z = 0.62152, *P*-value = 0.5343	z = 0.99576, *P*-value = 0.3194	z = 1.0151, *P*-value = 0.3101	z = 2.7874, *P*-value = 0.005314	X	z = 6.1933, *P*-value = 5.891e–10	z = 4.8507, p-value = 1.231e–06
tau	0.3635153	0.3436511	0.07362335	0.04665586	0.0727001	0.07566932	0.2032691		0.3565916	0.2811281
Czech production	z = 3.0563, *P*-value = 0.002241	z = 4.688, *P*-value = 2.759e–06	z = 3.2727, *P*-value = 0.001065	z = 1.686, *P*-value = 0.09179	z = 2.0458, *P*-value = 0.04077	z = 0.61459, *P*-value = 0.5388	z = 2.5936, *P*-value = 0.009498	z = 4.7516, *P*-value = 2.019e–06	X	z = 7.137, p-value = 9.541e–13
tau	0.2359584	0.3565981	0.2378212	0.1265765	0.14938	0.04581757	0.1891558	0.3506305		0.4071304
Habit	z = 3.5596, *P*-value = 0.0003714	z = 2.5335, *P*-value = 0.01129	z = 3.1952, *P*-value = 0.001397	z = 2.1218, *P*-value = 0.03386	z = 3.1727, *P*-value = 0.00151	z = 1.1186, *P*-value = 0.2633	z = 3.4266, *P*-value = 0.0006113	z = 4.7515, *P*-value = 2.019e–06	z = 5.0154, *P*-value = 5.291e–07	X
tau	0.27222	0.1908938	0.2300027	0.1577875	0.2294752	0.08260506	0.2475513	0.347323	0.3666474	

Red field – we do not reject tau, there is no correlation; green field – we reject the tau hypothesis 0 against alternative tau is not 0 – there is a possible relationship; white field – we cannot decide; yellow field – strong correlation; blue field – dividing field in the table; values above X – South-Moravian Region; values under X – Vysočina Region

Source: Own processing in mathematical software R

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Table S3. 2-sample test for the equality of proportions without continuity correction (restaurant facilities selection)

d*f* = 1 alternative hypothesis: two sided	*X*-squared	*P*-value	95% confidence interval	Sample estimates	Result of the test
Price of beer	2.4408	0.1182	⟨–0.23065590; 0.02458086⟩	prop 1 = 0.5273973; prop 2 = 0.6304348	Statistically no difference between regions
Number of beers on tap	1.4515	0.2283	⟨–0.17540490; 0.03987377⟩	prop 1 = 0.7179487; prop 2 = 0.7857143	Statistically no difference between regions
Personnel	0.066376	0.7967	⟨–0.09149183; 0.07039854⟩	prop 1 = 0.1283422; prop 2 = 0.1388889	Statistically no difference between regions
Quality of beer	6.1226	0.01335	⟨–0.113771515; –0.005276104⟩	prop 1 = 0.02083333; prop 2 = 0.08035714	The measured values are deeply imbalanced, impossible to decide
Favourite brand of beer	6.7447	0.009403	⟨–0.19610051; –0.02155448⟩	prop 1 = 0.08928571; prop 2 = 0.19811321	**Statistically meaningful difference between regions at α = 0.05**
Environment	6.6944	0.009672	⟨–0.109875264; –0.005985892⟩	prop 1 = 0.01546392; prop 2 = 0.07339450	The measured values are deeply imbalanced, impossible to decide
Regional beer	0.42738	0.5133	⟨–0.08753637; 0.17513891⟩	prop 1 = 0.5492958; prop 2 = 0.5054945	Statistically no difference between regions
Variation of the beer offer	0.091804	0.7619	⟨–0.1395673; 0.1020351⟩	prop 1 = 0.6938776; prop 2 = 0.7126437	Statistically no difference between regions
Constant offer of beers	7.0002	0.00815	⟨0.03706235; 0.29228770⟩	prop 1 = 0.8085106; prop 2 = 0.6438356	**Statistically meaningful difference between regions at α = 0.05**
Distance from home	1.5222	0.2173	⟨–0.18046963; 0.04293824⟩	prop 1 = 0.2215569; prop 2 = 0.2903226	Statistically no difference between regions
Accompanying program	0.013803	0.9065	⟨–0.09491747; 0.10696567⟩	prop 1 = 0.8253012; prop 2 = 0.8192771	Statistically no difference between regions
Quality food	15.308	9.134e–05	⟨–0.31564416; –0.09796162⟩	prop 1 = 0.1437126; prop 2 = 0.3505155	**Statistically meaningful difference between regions at α = 0.05**

Source: Own processing in the R mathematical software

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Table S4. Kendall's rank correlation tau-b (restaurant facilities selection)

		Price of beer	Number of beers on tap	Personnel	Quality of beer	Favorite brand of beer	Environment	Regional beer	Variation in the beer offer	Constant offer of beers	Distance from home	Accompanying program	Quality food
Price of beer		X	z = 4.3664, *P*-value = 1.263e–05	z = 2.7406, *P*-value = 0.006132	z =2.8804, *P*-value = 0.003971	z = 2.8049, *P*-value = 0.005033	z = 1.8616, *P*-value = 0.06266	z = 0.63029, *P*-value = 0.5285	z = 0.78924, *P*-value = 0.43	z = 1.1277, *P*-value = 0.2594	z = 4.3734, *P*-value = 1.223e–05	z = 0.72531, *P*-value = 0.4683	z = –0.98922, *P*-value = 0.3226
	tau		0.2455473	0.1574676	0.170763	0.1611948	0.110791	0.03526124	0.04427524	0.06404617	0.246998	0.04129627	–0.05635189
Number of beers on tap		z = 4.0902, *P*-value = 4.309e–05	X	z = 4.5401, *P*-value = 5.622e–06	z = 3.0976, *P*-value = 0.001951	z = 3.2222, *P*-value = 0.001272	z = 0.68039, *P*-value = 0.4963	z = 5.2696, *P*-value = 1.367e–07	z = 7.0665, *P*-value = 1.589e–12	z = 6.2596, *P*-value = 3.859e–10	z = –0.43037, *P*-value = 0.6669	z = 3.9263, *P*-value = 8.628e–05	z = 1.2462, *P*-value = 0.2127
	tau	0.2997757		0.263295	0.1853533	0.1869081	0.04087165	0.2975549	0.4001168	0.3588175	–0.0245329	0.2256325	0.0716523
Personnel		z = 1.4119, *P*-value = 0.158	z = 1.9249, *P*-value = 0.05424	X	z = 7.0727, *P*-value = 1.52e–12	z = 1.6759, *P*-value = 0.09375	z = 5.6562, *P*-value = 1.548e–08	z = 0.85789, *P*-value = 0.391	z = 2.2509, *P*-value = 0.02439	z = 2.0842, *P*-value = 0.03714	z = 2.7252, *P*-value = 0.006426	z = 2.7257, *P*-value = 0.006417	z = 2.7571, *P*-value = 0.005832
	tau	0.1052702	0.1446632		0.4324212	0.09932706	0.3471622	0.04949457	0.130221	0.122071	0.1587256	0.1600417	0.1619714
Quality of beer		z = 1.3654, *P*-value = 0.1721	z = 2.6624, *P*-value = 0.00776	z = 8.3626, *P*-value < 2.2e–16	X	z = 5.6156, *P*-value = 1.959e–08	z = 4.7758, *P*-value = 1.79e–06	z = 3.4144, *P*-value = 0.0006392	z = 2.7495, *P*-value = 0.005969	z = 2.3216, *P*-value = 0.02026	z = 1.6206, *P*-value = 0.1051	z = 0.946, *P*-value = 0.3441	z = 0.019032, *P*-value = 0.9848
	tau	0.1033227	0.2030624	0.6488986		0.3434154	0.3024663	0.2032547	0.1641219	0.1402961	0.0973914	0.05731352	0.001153665
Favorite brand of beer		z = 1.3511, *P*-value = 0.1767	z = 1.4296, *P*-value = 0.1528	z = 3.8334, *P*-value = 0.0001264	z = 5.5672, *P*-value = 2.589e–08	X	z = 3.3407, *P*-value = 0.0008357	z = 2.7868, *P*-value = 0.005323	z = 0.83616, *P*-value = 0.4031	z = 1.9825, *P*-value = 0.04742	z = 2.039, *P*-value = 0.04145	z = –1.3896, *P*-value = 0.1647	z = –0.76009, *P*-value = 0.4472
	tau	0.09939738	0.106008	0.2891861	0.4262435		0.2050896	0.1608156	0.04838457	0.1161384	0.1187869	–0.0816098	–0.04466339
Environment		z = 2.1008, *P*-value = 0.03565	z = 1.134, *P*-value = 0.2568	z = 7.0103, *P*-value = 2.377e–12	z = 5.408, *P*-value = 6.375e–08	z = 3.2253, *P*-value = 0.001258	X	z = 0.073639, *P*-value = 0.9413	z = 0.22219, *P*-value = 0.8242	z = –1.9293, *P*-value = 0.05369	z = 2.7198, *P*-value = 0.006532	z = 1.5585, *P*-value = 0.1191	z = 4.7629, *P*-value = 1.908e–06
	tau	0.1590159	0.0865157	0.5441193	0.4260105	0.2470071		0.004400662	0.01331453	–0.1170452	0.1640858	0.09478645	0.289838
Regional beer		z = 1.1769, *P*-value = 0.2392	z = 4.0242, *P*-value = 5.718e–05	z = 3.391, *P*-value = 0.0006965	z = 3.6643, *P*-value = 0.0002481	z = 4.1766, *P*-value = 2.959e–05	z = 1.5436, *P*-value = 0.1227	X	z = 9.4413, *P*-value < 2.2e–16	z = 6.2529, *P*-value = 4.03e–10	z = –0.78582, *P*-value = 0.432	z = 4.2402, *P*-value = 2.234e–05	z = 0.28771, *P*-value = 0.7736
	tau	0.08500715	0.2929704	0.2511466	0.2754302	0.3052299	0.116059		0.5318223	0.3565775	–0.04456378	0.2424121	0.01645746

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Table S4. to be continued

		Price of beer	Number of beers on tap	Personnel	Quality of beer	Favorite brand of beer	Environment	Regional beer	Variation in the beer offer	Constant offer of beers	Distance from home	Accompanying program	Quality food
Variation in the beer offer		z = 0.26639, *P*-value = 0.7899	z = 6.1945, *P*-value = 5.846e–10	z = 2.6491, *P*-value = 0.008071	z = 2.7498, *P*-value = 0.005964	z = 2.0365, *P*-value = 0.0417	z = 1.2131, *P*-value = 0.2251	z = 7.4942, *P*-value = 6.672e–14	X	z = 7.7698, *P*-value = 7.861e–15	z = 0.16436, *P*-value = 0.8694	z = 5.0035, *P*-value = 5.631e–07	z = 1.7486, *P*-value = 0.08037
	tau	0.01943852	0.4556002	0.1982134	0.2088112	0.1503551	0.09214637	0.5432122		0.4443034	0.009346491	0.2868379	0.1002947
Constant offer of beers		z = 1.9236, *P*-value = 0.05441	z = 4.9051, *P*-value = 9.34e–07	z = 1.8479, *P*-value = 0.06462	z = 2.9162, *P*-value = 0.003544	z = 4.6367, *P*-value = 3.54e–06	z = 1.7642, *P*-value = 0.07769	z = 5.0108, *P*-value = 5.421e–07	z = 7.1881, *P*-value = 6.571e–13	X	z = 0.3643, *P*-value = 0.7156	z = 5.4432, *P*-value = 5.234e–08	z = –0.85593, *P*-value = 0.392
	tau	0.1414137	0.3634611	0.1393012	0.2231068	0.3448886	0.135012	0.3659218	0.5303017		0.02097251	0.3159074	–0.04970221
Distance from home		z = 3.5233, *P*-value = 0.0004262	z = 0.49147, *P*-value = 0.6231	z = 3.7028, *P*-value = 0.0002133	z = 2.8194, *P*-value = 0.004811	z = 2.4832, *P*-value = 0.01302	z = 3.1621, *P*-value = 0.001566	z = 1.646, *P*-value = 0.09977	z = 1.0314, *P*-value = 0.3023	z = 2.9972, *P*-value = 0.002725	X	z = –0.26016, *P*-value = 0.7947	z = 0.54941, *P*-value = 0.5827
	tau	0.2570023	0.03613398	0.2769514	0.2140224	0.1832639	0.2401027	0.1192648	0.07550257	0.2210363		–0.0150155	0.03172633
Accompanying program		z = 1.0994, *P*-value = 0.2716	z = 3.7902, *P*-value = 0.0001505	z = 0.66538, *P*-value = 0.5058	z = 1.7438, *P*-value = 0.08119	z = 2.412, *P*-value = 0.01586	z = 0.98165, *P*-value = 0.3263	z = 4.305, *P*-value = 1.67e–05	z = 6.156, *P*-value = 7.462e–10	z = 5.2207, *P*-value = 1.782e–07	z = 2.2977, *P*-value = 0.02158	X	z = 3.478, *P*-value = 0.0005052
	tau	0.08150489	0.2832115	0.05058031	0.1345363	0.1809185	0.07575498	0.3170165	0.4579695	0.3913028	0.1708728		0.2024703
Quality food		z = 0.49184, *P*-value = 0.6228	z = 2.4961, *P*-value = 0.01256	z = 5.1167, *P*-value = 3.109e–07	z = 4.7278, *P*-value = 2.269e–06	z = 2.5823, *P*-value = 0.009815	z = 5.5082, *P*-value = 3.626e–08	z = 2.6319, *P*-value = 0.008492	z = 2.3636, *P*-value = 0.0181	z = 3.6091, *P*-value = 0.0003073	z = 2.1693, *P*-value = 0.03006	z = 3.3971, *P*-value = 0.000681	X
	tau	0.03563498	0.1822809	0.3801305	0.3564715	0.1892959	0.4154204	0.1894185	0.1718494	0.2643723	0.1576697	0.250933	

Red field – we do not reject tau, there is no correlation; green field – we reject the tau hypothesis 0 against alternative tau is not 0, there is a possible relationship; white field – we cannot decide; yellow field – strong correlation; blue field – dividing field in the table; values above X – South-Moravian Region; values under X - Vysočina Region

Source: Own processing in the R mathematical software