7.15 CASE STUDY

Your directors are interested in comparing three different type of food outlets so the testing which we shall study in the next chapter is more appropriate than the tests studied in this chapter which only consider one or two groups of data.

As there are obviously problems with normality, (results of case study 5.10), they would like you, at this stage, to carry out a Kolmogorov-smirnov test (SPSS or Minitab) to see which, if any, of the variables listed below are normally distributed. These are the ones we shall explore further in the next case study.

- Gross sales for all outlets together; gross sales for each type of outlet separately

- Market value of all outlets together; market value of each type of outlet separately

- Number of full-time employees for all outlets together; number of full-time employees for each type of outlet separately

- Number of part-time employees for all outlets together; number of part-time employees for each type of outlet separately

- Wages as % of sales for all outlets together; wages as % of sales for each type of outlet separately

- Advertising as % of sales for all outlets together; advertising as % of sales for each type of outlet separately

One-Sample Kolmogorov-Smirnov Test for Takeaways only		Gross sales (£'000)	Market value of business (£'000)	Wages as % of sales	Advertising as % of sales	Number of full-time employees	Number of part-time employees
N		104	99	101	99	106	105
Normal Parameters[a,b]	Mean	293.40	306.00	25.02	3.62	6.71	12.27
	Std. Deviation	303.006	466.724	10.911	3.437	10.710	12.181
Most Extreme Differences	Absolute	.226	.281	.156	.202	.266	.180
	Positive	.226	.281	.156	.202	.228	.180
	Negative	-.168	-.256	-.085	-.146	-.266	-.157
Kolmogorov-Smirnov Z		2.301	2.792	1.565	2.012	2.734	1.842
Asymp. Sig. (2-tailed)		.000	.000	.015	.001	.000	.002

[a] Test distribution is Normal.

[b] Calculated from data.

One-Sample Kolmogorov-Smirnov Test for Cafes only

		Gross sales (£'000)	Market value of business (£'000)	Wages as % of sales	Advertising as % of sales	Number of full-time employees	Number of part-time employees
N		73	71	66	66	72	71
Normal Parameters[a,b]	Mean	292.77	301.06	24.61	4.21	7.06	13.34
	Std. Deviation	257.077	210.267	11.793	3.971	9.530	12.333
Most Extreme Differences	Absolute	.169	.132	.202	.255	.239	.170
	Positive	.169	.132	.202	.255	.239	.170
	Negative	-.159	-.099	-.151	-.194	-.230	-.140
Kolmogorov-Smirnov Z		1.442	1.115	1.645	2.069	2.024	1.433
Asymp. Sig. (2-tailed)		.031	.166	.009	.000	.001	.033

[a.] Test distribution is Normal.

[b.] Calculated from data.

One-Sample Kolmogorov-Smirnov Test for Restaurants only

		Gross sales (£'000)	Market value of business (£'000)	Wages as % of sales	Advertising as % of sales	Number of full-time employees	Number of part-time employees
N		67	68	65	65	69	71
Normal Parameters[a,b]	Mean	250.90	220.35	25.75	4.12	8.70	12.90
	Std. Deviation	287.097	319.919	10.371	4.639	11.232	17.638
Most Extreme Differences	Absolute	.203	.245	.133	.271	.235	.232
	Positive	.203	.242	.069	.271	.235	.230
	Negative	-.199	-.245	-.133	-.187	-.219	-.232
Kolmogorov-Smirnov Z		1.659	2.024	1.069	2.186	1.951	1.957
Asymp. Sig. (2-tailed)		.008	.001	.203	.000	.001	.001

[a.] Test distribution is Normal.

[b.] Calculated from data.

The majority of this data is not normal so will need non-parametric testing in the next case study.