

Sorensen, Nils Karl

Conference Paper

The Significance of the Shoulder Season of Hotel Nights - Evidence from Denmark

50th Congress of the European Regional Science Association: "Sustainable Regional Growth and Development in the Creative Knowledge Economy", 19-23 August 2010, Jönköping, Sweden

Provided in Cooperation with:

European Regional Science Association (ERSA)

Suggested Citation: Sorensen, Nils Karl (2010) : The Significance of the Shoulder Season of Hotel Nights - Evidence from Denmark, 50th Congress of the European Regional Science Association: "Sustainable Regional Growth and Development in the Creative Knowledge Economy", 19-23 August 2010, Jönköping, Sweden, European Regional Science Association (ERSA), Louvain-la-Neuve

This Version is available at:

<http://hdl.handle.net/10419/118815>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

50th Congress of the European Regional Science Association

The Significance of the Shoulder Season of Hotel Nights - Evidence from Denmark in a Nordic Perspective

*Nils Karl Sørensen*¹,
University of Southern Denmark
e-mail: nks@sam.sdu.dk

Abstract

During the past decades, the role of the shoulder season has gained increasing attention. It is obvious that an expansion of the length of the high season with the shoulder season will have a positive effect on labor demand and income in a given region.

The purpose of this paper is to address the issue of the shoulder season in a time series framework. Departing from a discussion of the nature of types of seasonal variation, a test is set up in order to examine the impact of the shoulder season. The test examines the impact on the mean share of hotel nights in the shoulder season months in two different periods.

The method is applied on a monthly data set on hotel nights ranging for 37 years by regions of Denmark. A much-diversified picture is revealed. In general, the shoulder season of October has increased significance. For rural counties such as Storstroem, Ribe and North Jutland positive effects are observed for other months as well. However, we find for many other rural areas no significant effect.

In order to examine the validity of this approach, a discussion is provided with evidence for Norway and Finland. Here different pictures are revealed highlighting the significance of winter tourism relative to Denmark. The different implications on the economy are discussed, and issues are given on development.

Theme: Regional development
JEL Classification: R15
Key words: Seasonal patterns, Bays-Ballot plots, testing for equal mean shares

Theme T: Tourism and Regional Development

¹ Department of Border Region Studies, Alsion 2, DK-6400, Sønderborg, Denmark, Phone (+45) 6550 1229.

1. Introduction²

Decades ago, the holidays were different! Back in the beginning of the 1950ties when director Jacques Tati send monsieur Hulot on holidays in his movie *Les Vacances de Monsieur Hulot*, he went on holidays in a hotel for a week at the northern French seaside. In the beginning of the 1960ties, pop star Cliff Richard made the top charts with *Summer Holiday*, about going on holidays for *a week or two*. Today people have longer holidays, but people are also more inclined to separate their holidays into several sub-periods, giving them the opportunity for summer, fall, Easter and ski-holidays.

When people are on holidays, they consume various types of accommodation. This and related activities gives demand for local labor at the tourist destination, and consequently increased income. Changes in the preferences of the tourist will be reflected in the use of accommodation and labor demand at the destination. These activities is closely related to the number of tourist at the destination at a given time within a year.

Consequently, the seasonal fluctuations in tourism have implications at the economic level of activity at the destination. During the high season at a sea-resort or at a ski-resort, the level of activity is high and everything is fun. However, during the off-season nothing happens besides perhaps from new construction and repair. During this period, the demand for labor is low. Especially, in a rural district where the possibilities to find alternative job openings is limited this could be problem.

The period between the high season and the off-season is frequently refereed to as the shoulder season. Although many studies have paid attention to seasonality, the shoulder season has not been studied in detail. This period is an interesting segment for a holiday resort, because there is still something going on, and therefore it is possible to attract new types of tourists like for example conference tourists or retired persons looking for a quite, but still active place to be outside the period of the school vacation. An example of shoulder seasonal behaviour is the summer period in a ski-resort. Instead of skiing, tourists may be

² Earlier versions of this paper has been presented at the 18th Nordic Symposium on Tourism and Hospitality, Esbjerg, Denmark, October 22–24, 2009 and at the Symposia of the Danish Section of the Regional Science Association, Svaneke, Denmark, May 20–21, 2010.

interested in mountain walking or climbing. A special segment could be bicycling in the mountains.

In Denmark with sunny summers, but grey and windy winters, the shoulder season is a special problem. Typical periods of shoulder seasons are May, September, October, Easter holidays and Christmas. The present study focuses on hotel demand only by using statistics on hotel nights observed at the monthly frequency.

The paper is organized as follows. Section 2 presents a discussion of the nature of the seasonal pattern with special attention on the issue of the shoulder season taking its point of departure from a general definition of seasonality. Based on the definition, a discussion of stationary movements in data series is undertaken. It is concluded that non-transformed statistics is inappropriate in order to test for the impact of the shoulder season. On this basis a simple test is proposed in order to examine for the significance of the shoulder season.

Section 3 contains an application of the method. Monthly statistics on hotel nights divided by countries in Denmark is used in order to give special attention to the rural districts. The test outlined in Section 2 is applied in order to test for the impact of the shoulder season in time. In addition, some useful graphical tools are presented.

In Section 4, the discussion of the nature of seasonality is extended to a comparison between the evolution in Denmark and statistics for Norway and Finland. Different patterns of seasonality are observed and different options for economic development based on tourism is observed. In the final section, conclusions are drawn, and some issues relative to development are given.

2. The Seasonal Pattern and the Shoulder Season

The most widely used definition of seasonality in economics is given by Hylleberg (1986) as *the systematic; although not necessarily regular, movements caused by changes of the weather, the calendar, and timing of decisions ...* If seasonality is *systematic*, and also *not regular*, this should be reflected in the choice of model or approach used for analyzing seasonality.

Seasonality is observed in time, and naturally, the approach adopted for examination of the seasonal behaviour is undertaken in the time series perspective. However, many of the analyses undertaken in light of this definition have not agreed on the best model used to model seasonality.

Beaulieu and Miron (1993) claimed that the best univariate representation of most time series is a difference stationary process around a deterministic seasonal pattern represented by seasonal dummy variables. The approach neglect, that seasonality may not be *regular*, because the coefficient of the dummies refers to a constant (or regular) pattern.

Alternatively, a model that allows for a varying and changing seasonal pattern is a model with seasonal unit roots. This model was developed by Hylleberg, Engle, Granger and Yoo (1990), and has been labeled the HEGY-approach. Hylleberg, Sørensen and Jørgensen (1993) discussed this approach using monthly collected time series data.

Sørensen (1999, 2001) examined the seasonal behaviour in a tourism economics perspective on monthly data on hotel nights for Denmark by county and nationality. This is the dataset also used for the present analysis in an extended form. His conclusion was that a varying and changing seasonal component was a common phenomenon in many time series for hotel nights for Denmark. If this is the case then it is likely that the shoulder season has an impact. Therefore, in the present case the HEGY-approach outperforms the dummy-variable approach. Finally, Sørensen (1999, 2001) advocated for the use of some graphical measures as graphs of the transformations used for the HEGY-test, and Bays-Ballot plots, see Section 3 below.

Sørensen (2003) again applied the present data set with the aim of developing the best forecasting model for hotel nights. Three different models were examined, namely the dummy-variable model, the HEGY-model, and finally the Error Correction Model (ECM) proposed in the monthly case also by Hylleberg, Engle, Granger and Yoo (1990). Surprisingly, the dummy-variable approach performed best. However, all models were poor, and a simple autoregressive model turned in many cases out to be the most optimal.

The conclusion to be drawn from this discussion is that a time series model along the lines just outlined is not suitable for the present analysis. One route to follow could be to use some of the transformed data from the HEGY-test. These data could then be divided into

relevant sub-periods and examined for equal mean. If the mean has improved, then the effect of the shoulder season has increased. Set up in this way, the test to be undertaken is a one-sided test for equal mean.

However, in order to undertake the HEGY-test, eight transformations of the examined time series have to be examined, see for example Sørensen (1999). This implies some limitations. For example we have jointly to examine the “3 and the 9 month” together etc. This may not be efficient because Easter not always will be in March etc.

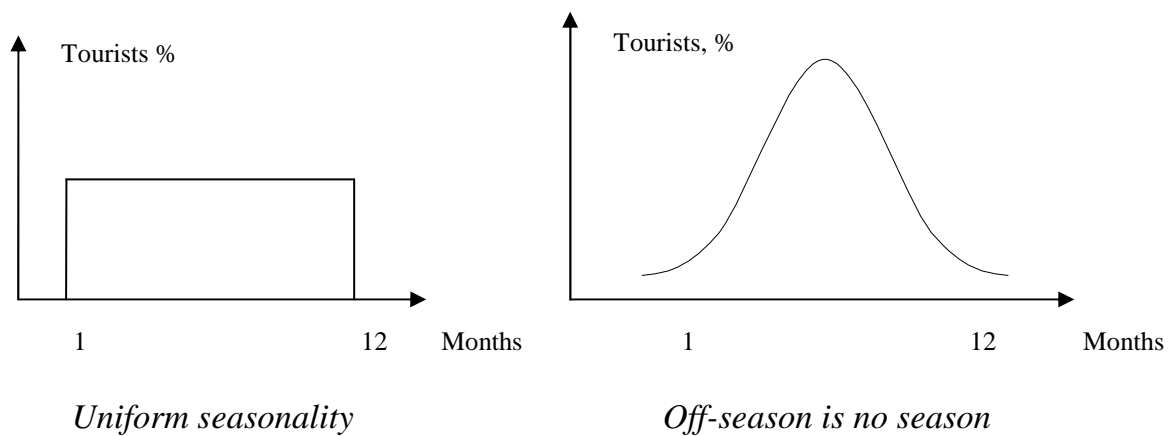
A more flexible approach is needed, taking into consideration all months during a year. In addition, we need to get rid of the problem of trending. If for example the trend in the observed time series is positive, then the mean in the latter period will be larger than in the former period. Then, the significance of the shoulder season has increased in absolute terms, but not necessarily in relative terms. An increasing number of tourists will be present in the shoulder season, but this will also be the case in the high season etc. The relative utilization of hotel capacity in the shoulder season will therefore be quite constant and the overall effect limited.

In order to deal with these problems we introduce the use of Bays-Ballot plots. This plot displays a series against the number of months in a given year; see also Sørensen (1999) and Hylleberg (1992). However, compared to these sources we provide a percentage transformation of our time series such that each year sum to 100 percent. This is undertaken in order to eliminate trending. Figure 1 shows two extreme examples of Bays-Ballot plots related to the case of seasonality. In the left panel, a uniform distribution of tourist visitors is shown, whereas the right panel is a bell-shaped distribution of tourist visitors to the considered destination.

What is the implication of these curvatures in a tourism context? The uniform distribution of tourists says that in this context the destination is equally popular (or reverse) throughout the year. In some way this is a highly desirable curvature for a tourist destination, because there will always be tourists regardless of for example climatic variations. In this case the shoulder season is not present. Observe the shape of the uniform distribution. It is very flat, and the variation around the mean is very high. The bell-shaped distribution of tourists, displayed in the right panel of Figure 1, says that in this context the destination is popular

during the summer and not during the winter³. Here the off-season is no season! This could be a typical Danish seaside resort in western Jutland. With regard to the shoulder season it is located around the turning points of the curvature i.e. around month 4-5 (April-May) and 9-10 (September-October). Observe the shape of the bell-shaped distribution. Compared to the uniform distribution it is steeper, and the variation around the mean is smaller. As displayed, the bell-shaped curvature is symmetric, but this does not need to be the case.

Figure 1: *Bays-Ballot Plots of Types of Seasonality*



In descriptive statistics, the shape of a distribution is given by the four moments: mean, standard deviation, skewness and kurtosis. Whereas the first two measures are known to most researchers, the two latter may need a few comments. Mathematically the measures are defined as:

Skewness:
$$SK = \frac{\sum_{i=1}^n (x_i - \bar{x})^3 / n}{s^3} \quad i = 1, 2, \dots, n$$

Kurtosis:
$$KU = \frac{\sum_{i=1}^n (x_i - \bar{x})^4 / n}{s^4} \quad i = 1, 2, \dots, n$$

³ If this were a ski-resort, the pattern would be reverse, see also the results in Section 4.

Where x_i is observation i , n is the number of observations, \bar{x} is the sample mean, and s is the sample standard deviation. The interpretation of the skewness SK is that it is an expression for how much the distribution is away from the "normal" i.e. the bell-shaped distribution in Figure 1. If $SK > 0$, data are skewed to the right, if $SK = 0$ data are symmetric, and if $SK < 0$ data are skewed to the left. The interpretation of the kurtosis KU is that it is a measure of the "concentration" of the distribution". If KU is small, we have a "flat" distribution as shown in the left panel in Figure 1, and if KU is large then we have a concentrated data set as shown in the right panel in Figure 1⁴.

To sum up in a tourism perspective, if KU is low then the seasonal component is low, and all months within a year will be equally attractive (or unattractive). In this case it is not relevant to examine for the impact of the shoulder season, because it is not visible (all periods are high (or low) seasons. If the distribution is non-symmetric then the shoulder season will have some impact.

Having identified the curvature of the statistics on tourist arrivals by use of the descriptive statistics above, and the Bays-Ballot plots we can continue with a more formal test on the impact of the shoulder season. This test is performed on the transformed data in order to avoid the presence of a trend. Further, data should be divided into two periods called 1 (the base period) and 2 (the post period), and then compared for the sample mean⁵ μ . A simple test for equality is undertaken by stating the hypotheses:

$$\begin{array}{ll} H_0: \mu_1 \geq \mu_2 & \text{(no effect of the shoulder season in the post period)} \\ H_1: \mu_1 < \mu_2 & \text{(effect of the shoulder season in the post period)} \end{array}$$

The tester is then:

⁴ Many standard statistical packages calculate $(KU - 3)$. In this case, KU may take a negative value for a very flat data set.

⁵ Two points should be noticed. First, as an alternative an ANOVA analysis could be considered if data are divided into more than two sub-periods. This could be relevant for our database in the present case ranging over more than 35 years. However, if data for example are divided into three sub periods the number of degrees of freedom will be very limited, and the outcome of the test will be uncertain. Second, there is no rule on how to divide data into sub periods. A choice of different periods could likely give different results.

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{s_p^2 \left(\frac{1}{n_1} + \frac{1}{n_2} \right)}} \quad \text{and} \quad s_p^2 = \frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2}$$

Where s_p^2 is the pooled variance. The tester will be t-distributed with degrees of freedom equal to $df = (n_1 + n_2 - 2)$. Now we continue with the empirical investigation.

3. Is the Shoulder Season Significant?

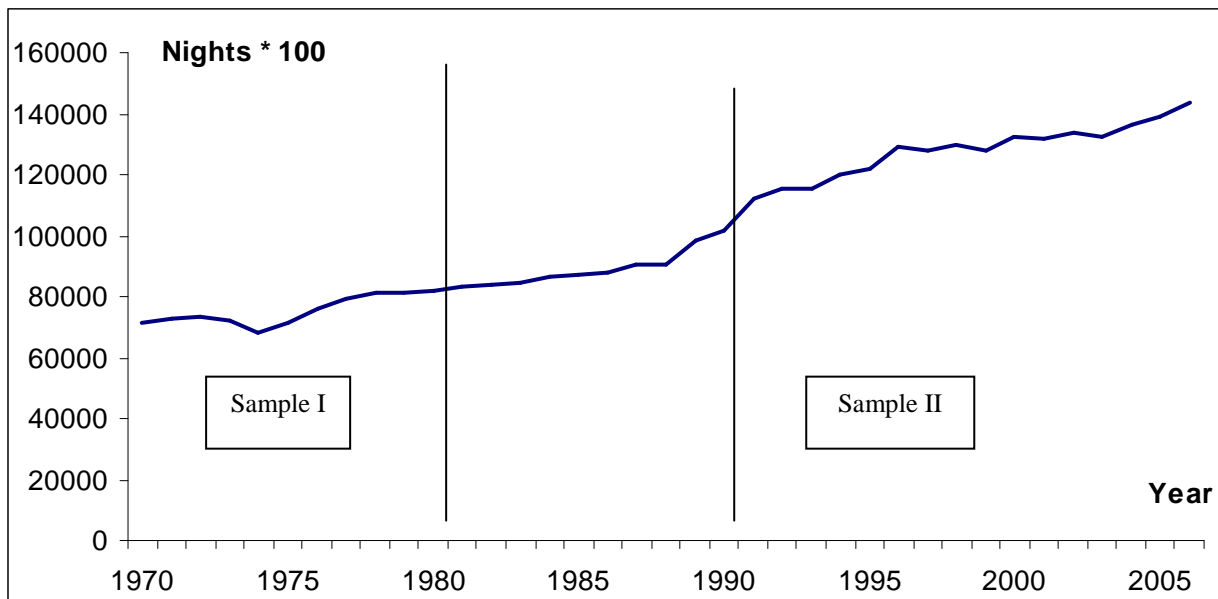
For the present analysis, a databank is set up covering monthly series by Danish countries ranging from 1970.1 to 2006.12 by use of the regular publications on hotel nights supplied by Statistics Denmark. All series contain 444 observations or 37 full years. The 14 countries were formed as administrative units in 1970, and were after 2006 regrouped into five regions by a new political reform. Our statistics cannot be updated after this date. A map with the geographical location of the countries can be found in the Appendix.

Empirical investigations of the impact of the shoulder season seem to be very rare in tourism economics. Lundtorp, Rassing and Wanhill (2001) provide the only study known to this author. The study was undertaken for the Danish island of Bornholm. This island is located quite isolated in the Eastern Sea, and forms the smallest county of Denmark. Their study is based on a very detailed questionnaire given to visitors coming to Bornholm by ferry or airplane. The seasonality Bornholm experiences, is a very common form of seasonality looking very much like the picture in the right panel of Figure 1⁶. The main season covers July and August, the shoulder season consists of May, June and September, and the rest of the year is the off-season. They find a very stable pattern where everything is closed down during the off-season. Further, the impact of the shoulder season is limited. They conclude that the potential for further development of the shoulder season as well as the off-season is limited. Sørensen (1999) find for Bornholm the most regular seasonal pattern for all countries of Denmark. This underlines the strength of their results.

⁶ We shall, however, also show that it is the most extreme seasonal pattern in Denmark, see later in the present section.

Figure 2 shows the annual total evolution of the hotel nights in Denmark over the period ranging from 1970 to 2006. Data has been aggregated for all countries. The purpose of the illustration is to highlight the problem of trending in analyzing the effects of the shoulder season.

Figure 2: *Hotel Nights in Denmark 1970 to 2006*



Source: *Own calculations on Statistics Denmark*

During the period, the number of hotel nights increased from about 7.1 millions in 1970 to about 14.3 millions in 2006. The period from 1970 to about 1987 has characterized by low growth. Then from 1987 to the mid 1990ties, growth in hotel nights was high. From then on growth has been on a lower level.

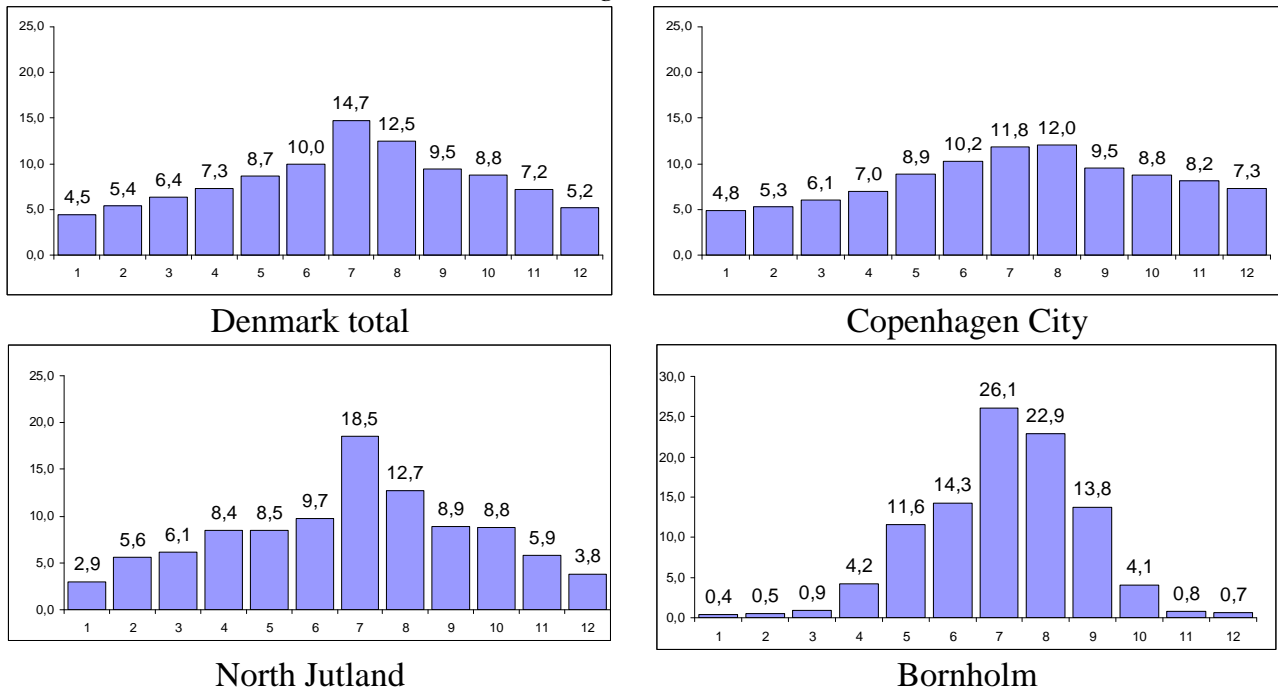
The two vertical lines in Figure 1 divide the evolution of hotel nights in Denmark into 3 periods. The first period from 1970 to 1980 is called *sample I*. This period is used as the reference period in order to examine for the impact of the shoulder season whereas the period from 1990 to 2006 is called *sample II*. This is the impact or post period.

For the present study, we have defined April, May, September and October as the shoulder season⁷. Figure 3 gives Bays-Ballots plots of hotel nights for 2006 in percentage distribution

⁷ It could be argued that June also should be included as shoulder season. In Denmark, the school vacation has normally started around June 20 and lasted for 7 weeks until around August 10. Then one could argue that August is shoulder season as well. However, in many European nations especially around the Mediterranean area, August is the main holiday month. Further, the Danish school vacation is under change. Since the mid 1990ties, a 6-week summer vacation

for Denmark total, Copenhagen city and the two countries of Bornholm and North Jutland respectively.

Figure 3: *Bays-Ballot Plots of Hotel Nights 2006 for Denmark total, Copenhagen city, Bornholm, and Northern Jutland. Percentage distribution.*



Source: Own calculations on Statistics Denmark

First, observe that in all cases the most important months are June, July and August. The pattern for Copenhagen City is more flat or uniform than for North Jutland and Bornholm, where the distribution is more bell-shaped. Especially for the latter the season is heavily concentrated around the high season. On Bornholm, the off-season is really the off-season as stressed by Lundtorp, Rassing and Wanhill (2001). From November to March, a little more than 3 percent of the hotel nights are found. In addition, the shoulder season in April and October has little significance. Contrary in Copenhagen City where the minimum is reached in January, where 4.8 percent of the hotel nights take place. For North Jutland as well as for Bornholm the high season is much more significant than for Copenhagen City.

has been introduced. The 7th week has then been moved to week number 7 or 8 in February as the “winter” or “ski” holiday, although Denmark is not a winter sport nation of any significance.

These observations indicate that the shoulder season has a much higher potential in Copenhagen City where attractions such as The Little Mermaid and Amalienborg is interesting throughout the year.

Table 1: Index on the Shoulder Season on Hotel Nights by Country 1970.1 to 2006.12

County	Index of mean 1990-2006 to base 1970				Full period		
	April	May	September	October	CV	SK	KU
Denmark total	203	180	169	204	0.50	1.00	0.64
Copenhagen city	132	111	106	126	0.36	0.61	-0.61
Copenhagen	147	123	128	179	0.41	0.77	0.19
Frederiksborg	124	124	125	134	0,43	0.82	0.01
Roskilde	256	230	190	217	0,47	0.83	0.27
West Zealand	158	148	164	179	0,44	0.68	0.26
Storstroem	523	402	387	544	0,79	1.23	1.03
Bornholm	524	447	301	381	1,19	1.04	2.19
Funen	181	180	174	182	0,44	0.81	0.35
South Jutland	203	176	196	231	0,60	1.25	1.18
Ribe	306	295	259	353	0,60	1.24	1.23
Vejle	204	246	195	217	0,52	1.18	1.60
Ringkoebing	263	234	209	272	0,55	1.15	0.97
Aarhus	159	158	149	160	0,45	1.30	1.30
Viborg	241	234	218	254	0,61	1.53	2.67
North Jutland	450	349	327	397	0,70	1.45	2.28

Note: A map with the location of the countries can be found in the appendix. CV is the coefficient of variation defined as the standard deviation divided by the mean. SK is skewness and KU is kurtosis. See definitions in the text.

Source: Own calculations based on Statistics Denmark

Table 1 confirms some of the findings from Figure 3. The first part of the table brings an index serving as an indicator of the increase in the months of the shoulder season. It is formed as an index where the mean number of hotel nights is related to the initial observation in 1970 for the relevant month. The mean is used in order to neglect extreme observations.

We observe that in general there has been an increase in the number of hotel nights. This is especially true for North Jutland, Storstroem, Ribe and the county of Bornholm. However, as shown in Figure 3 the number of hotels nights in the shoulder season on Bornholm is low compared to the other counties.

The right part of the table brings some descriptive statistics calculated for the full period namely the coefficient of variation, skewness and kurtosis. In general, July is the most important month so skewness is positive. The most flat distribution is found for Copenhagen

City, the Metropolitan area and the countries of Zealand. Copenhagen is an interesting tourism destination throughout the year especially for foreign tourists. In addition, it is an important conference destination. Kurtosis is large for Bornholm, Viborg and North Jutland. This is typical summer destinations counties. The counties of the western part of Denmark and Bornholm also have the largest coefficient of variation indicating a large variation relative to the mean. This is an indicator of a strong seasonal pattern.

Table 2: Results of Tests for the Impact of the Shoulder Season for Percentage Shares

County	April			May			September			October		
	mean share %		t-test	mean share %		t-test	mean share %		t-test	mean share %		t-test
	70 - 80	90 - 06		70 - 80	90 - 06		70 - 80	90 - 06		70 - 80	90 - 06	
Denmark total	6.53	7.03	4.57*	8.97	8.94	0.24	9.42	9.10	3.41*	7.15	8.39	11.00*
Copenhagen city	7.14	7.18	0.27	10.03	9.32	4.37*	10.25	9.41	7.31*	7.68	8.25	4.76*
Copenhagen	7.43	6.72	2.81*	10.26	9.13	3.50*	9.96	9.33	3.80*	8.14	7.84	1.12
Frederiksborg	7.21	7.09	0.60	8.84	9.42	2.59*	8.35	9.86	4.24*	6.70	8.39	9.12*
Roskilde	7.17	7.22	0.22	9.83	9.27	1.98*	9.88	9.93	0.14	7.72	8.00	1.48
West Zealand	6.54	7.60	3.27*	8.52	8.88	1.40	8.88	9.86	4.76*	7.64	8.64	4.30*
Storstroem	6.90	7.60	2.19*	8.81	8.43	1.28	8.83	12.53	10.53*	7.27	9.60	12.34*
Bornholm	1.27	3.26	8.32*	6.46	11.84	6.73*	11.14	9.60	4.41*	2.05	3.29	4.14*
Funen	6.93	7.18	1.50	8.79	9.00	1.04	8.99	9.55	1.80*	7.74	8.73	5.41*
South Jutland	6.83	7.07	0.95	8.31	8.52	0.74	8.73	8.74	0.01	7.39	9.45	5.66*
Ribe	6.29	7.15	2.75*	7.98	8.79	2.97*	8.40	9.23	4.98*	7.26	9.40	7.13*
Vejle	6.79	6.66	0.76	8.36	8.51	0.81	9.53	9.23	1.76*	7.77	8.27	3.33*
Ringkoebing	6.73	7.07	1.38	7.76	7.70	0.25	8.73	8.47	0.82	7.23	9.15	8.86*
Aarhus	6.98	6.93	0.38	8.75	8.46	1.80*	9.23	9.00	1.55	7.90	8.47	3.35*
Viborg	6.73	7.03	1.09	7.87	7.75	0.49	8.59	8.57	0.23	7.41	8.91	7.96*
North Jutland	6.16	7.74	6.23*	7.71	8.68	7.95*	7.60	8.17	3.35*	6.69	8.62	9.82*

Note: A map with the location of the countries can be found in the appendix. In all cases degrees of freedom is equal to 26. The t-test brings the numeric value. A * indicates significance at the 5 % level or lower. Detailed results are available on request from the author.

Source: Own calculations based on Statistics Denmark

Table 2 brings results of one-sided t-tests conducted along the lines given in the previous section⁸. Compared to the 1970ties evidence is found of shoulder seasons of increasing relative significance. A reverse pattern is found in a few cases. For example for the county

⁸ Notice that the test is calculated under the assumption that the variances in the two samples are equal. This may not always be the case. However, the outcome of a t-test assuming unequal variances is very frequently the same. There are two reasons for this. First, with the small sample sizes in the present case, the test for equal variances allows a quite large tolerance among the variances. Second, the correction for degree of freedom is not very large.

of Copenhagen in April and September⁹. For Bornholm, such a decrease is also found for September. The increase of the relative importance of the shoulder season implies a more efficient utilization of hotel facilities, and a more stable demand for labor.

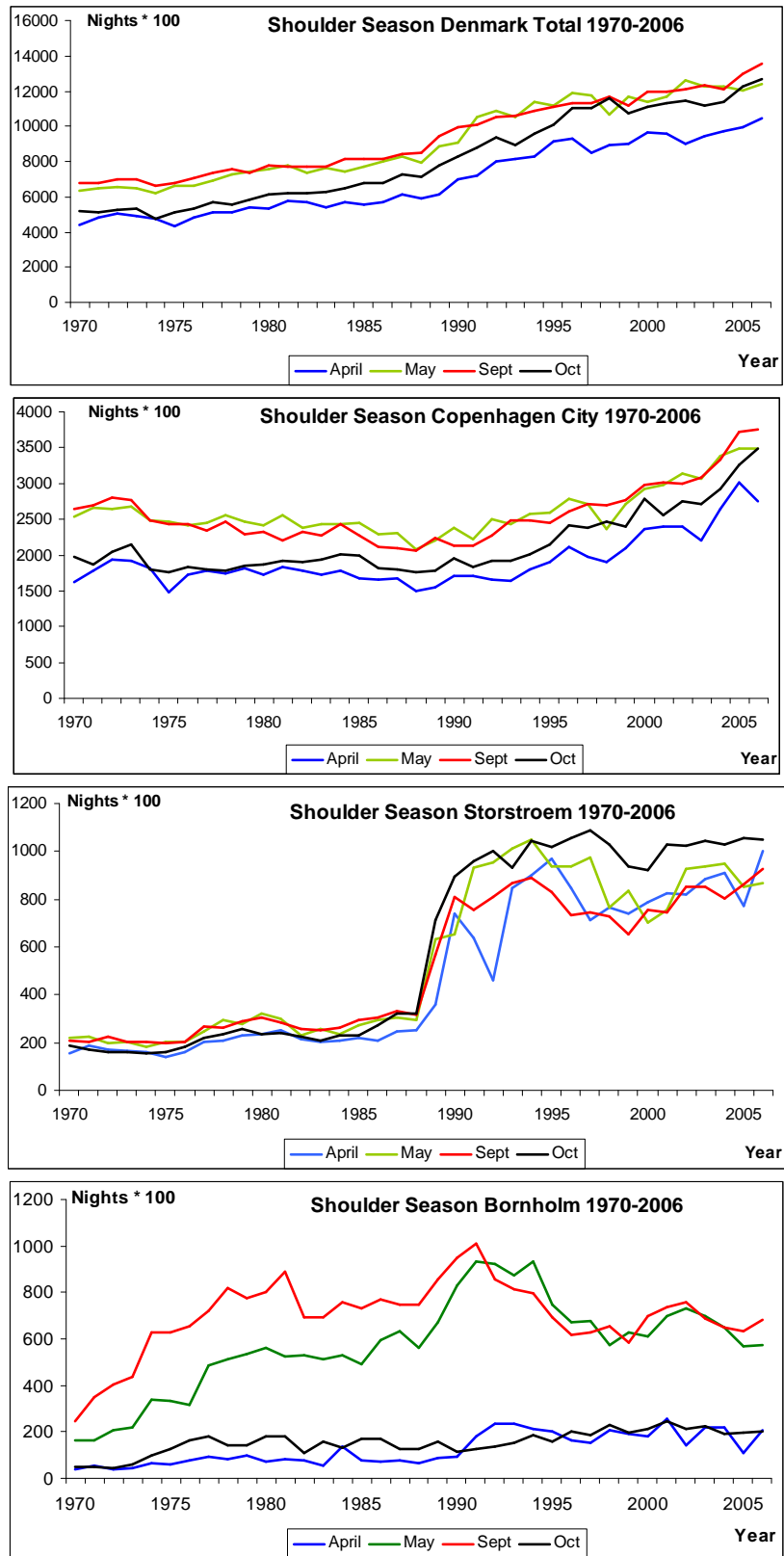
For Denmark aggregated, the share of hotel nights has been increasing in April and October, whereas it has been decreasing for September. For May, no effect is found. Moving to the regional perspective, and the rural districts the most interesting results are found for the counties of Storstroem and Northern Jutland where the shoulder season in general has been of increasing significance. With regard to Storstroem, the effect may to a large extent be due to the location of the resort “Lalandia” established in 1988. In addition, in Ribe and Ringkoebing facilities of this kind are planned and to some extent already established¹⁰.

These findings are further analyzed in Figure 4. Here the months of the shoulder season is plotted for the full period considered. Four areas are selected; Denmark total, Copenhagen city, Storstroem and Bornholm. Besides, from the total of Denmark, the selection has been undertaken on order to display some interesting countries. In general, the plots support the findings from Figure 3. At the aggregated level, it is observed that in absolute terms the number of hotel nights has been increasing over the full period, although not significantly for May, as found in Table 2. For Copenhagen city, the shoulder season was stagnating until 1990, and then it has been increasing. This increase has not been significant for May and September. The two diagrams for Storstroem and Bornholm respectively are highly interesting. Notice that the vertical axes are similar. The establishment of the “Lalandia” park in the Storstroem County had a very significant impact on the number of hotel nights. Especially in the October holiday, this facility has been popular. It is evident that the geographical more isolated location of the island of Bornholm makes it very difficult to expand the length of the season.

⁹ This is not the inner Copenhagen, but the areas around it.

¹⁰ In Ringkoebing County, for example *Sealand West* (established 2005) and in Ribe County, *Lalandia Billund* (established 2009). However, it is not possible to measure the effect of *Sealand West* with the present data set.

Figure 4: *Plots of the Shoulder Season, Selected Countries, 1970–2006*



Source: Own calculations based on Statistics Denmark

4. Different Seasonal Patterns, Different Possibilities?

An implication of the increased impact of the shoulder season in some of the Danish regions is a more stable demand for labor in the tourism industry. A high, stable flow of tourists throughout the year is the preference for any destination. How can such a situation be achieved? In order to examine this problem a comparison is undertaken with two other Scandinavian nations; namely Norway and Finland¹¹. For both nations statistics excellent statistics is available ranging from the mid 1980ties at the monthly frequency and divided by regions.

Figure 5, build up in a way similar to Figure 3 brings some Bays–Ballot plots for both countries for 2009. Evidence from Norway is shown in the left panel, whereas evidence from Finland is shown in the right panel. The two first diagrams show the seasonal pattern for the total, and for the Metropolitan areas. Next two cases are illustrated for each country. The criteria for the selection, has not been the importance of the area, but rather if an interesting, seasonal pattern is observed.

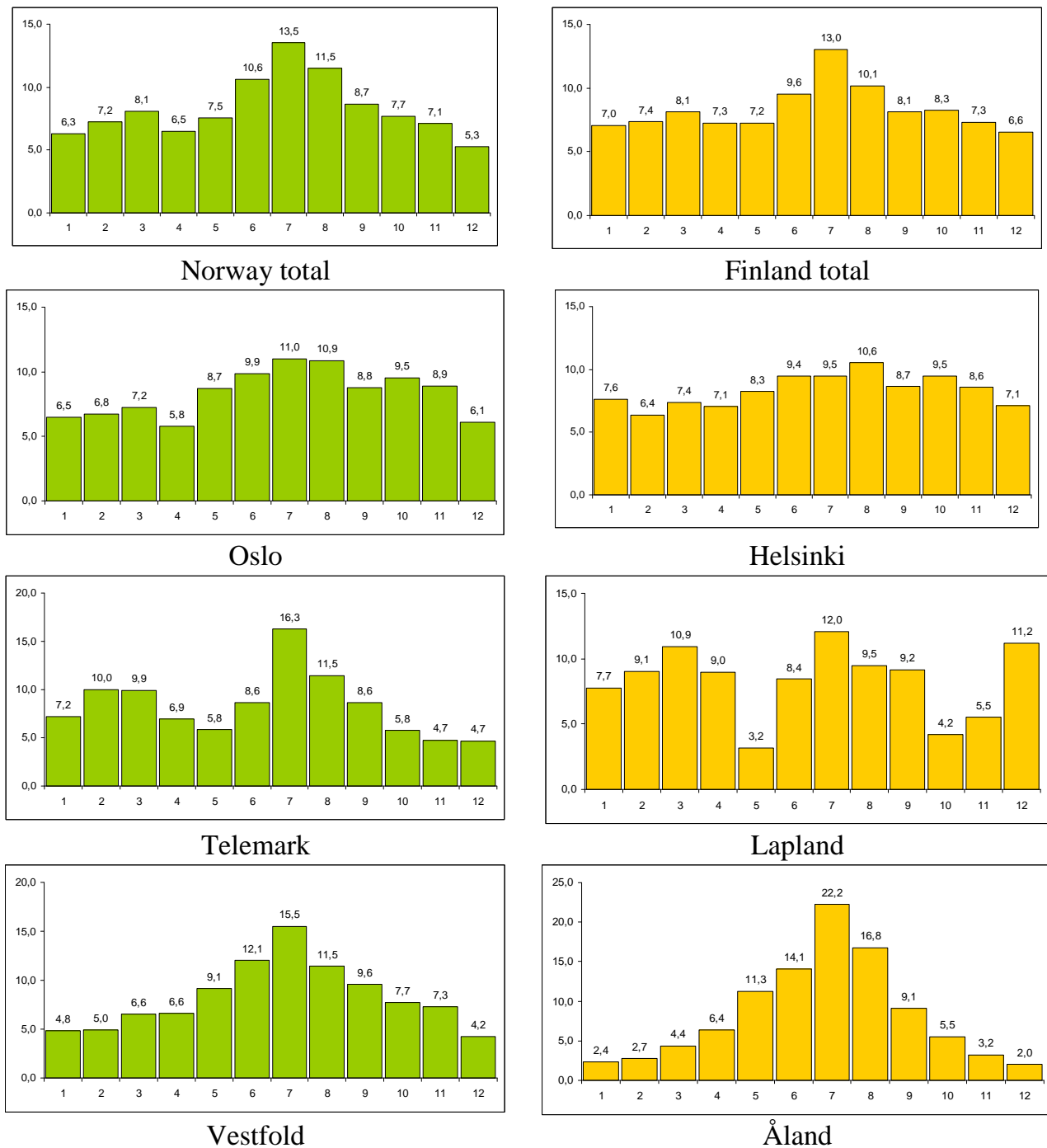
Moving first to the totals, the most important months are July and August. This is also the case for Denmark. However, the impact of the winter season is visible for Norway as well as for Finland. Especially, the period from January to March has a higher amount of tourist nights. This should result in a more flat distribution of hotel nights by month.

Table 3 build up in a way similar to Table 1 confirms the results¹². In general, the coefficient of variation is lower for the statistics from Norway and Finland than for Denmark. Also for Oslo and Helsinki flat patterns are observed as seen form the kurtosis. However, both cities have succeeded more than Copenhagen in increasing the impact of the shoulder season especially for the months April and October. This is observed from the indices in the left panel of Table 3.

¹¹ The analysis is not undertaken for Sweden. Monthly statistics on hotel nights (or arrivals) is available, but there is no free access to these data from Statistics Sweden.

¹² Notice that the period considered in Table 5 ranges from 2000.1 to present except for Denmark ending in 2006.12..

Figure 5: *Bays-Ballot Plots of Hotel Nights 2009 for Norway and Finland. Total and Selected Regions. Percentage distribution.*



Source: Own calculations on Statistics Norway and Statistics Finland.

Table 3: Selected Descriptive Statistics, Hotel Nights, Denmark¹, Norway and Finland², Total and Selected Regions. 2000.1–2009.12

	Index relative to 2000				Full period, all months		
	April	May	September	October	CV	SK	KU
Denmark total	108	109	114	114	0.39	0.88	0.18
Copenhagen city	117	120	126	126	0.29	0.35	-0.69
Storstroem	127	123	123	113	0.42	0.89	0.48
Bornholm	113	94	98	97	1.09	0.31	1.40
Norway total	138	110	112	124	0.31	0.91	-0.10
Oslo	166	90	121	136	0.25	0.19	-0.88
Telemark	142	117	84	80	0.39	1.00	0.52
Vestfold	177	125	153	141	0.41	0.96	0.20
Finland total	131	109	112	122	0.24	1.28	0.61
Greater Helsinki	131	92	118	132	0.19	0.23	-0.56
Lapland	128	258	111	119	0.36	0.06	-0.58
Åland	63	42	88	109	0.79	0.83	1.65

Notes: 1) For Denmark only for the period 2000.1–2006.12. 2) For Finland all categories of hotels.

CV is the coefficient of variation defined as the standard deviation divided by the mean. SK is skewness and KU is kurtosis. See definitions in the text.

Source: Own calculations based on Statistics Denmark, Statistics Norway and Statistics Finland

For the more rural areas, interesting results are found. Consider first Telemark in Norway and Lapland in Finland. During the winter, these areas are snowy, and during the summer time, hiking is an option. This imply that the season can be expanded, and this result in a more constant flow of tourists. This is visible from the relevant panels in Figure 5, as well as from the statistics in Table 3. Compared to Denmark, the coefficients of variation are low as well as kurtosis. If winter tourism is found, the months defined as the shoulder seasons are not likely to be the same as for the Danish regions. For example April may serve as the end of the winter season, and not as the beginning of the summer season. In Lapland for example, May and October are the no-season months, as observed from Figure 5. This is to a lesser degree also true for Telemark.

Finally, observe the pattern for Vestfold and Åland. For the former located in western Norway the possibilities are very likely to be as for the western regions of Denmark. Compared to Table 1, the growth rate of the shoulder season has been more moderate. Åland is in a situation similar to that of Bornholm, even with a more stagnating market as a tourism destination.

5. Conclusion

This paper provides a simple statistical framework in order to examine for the relative impact of the shoulder season in a given area¹³. The methods used are descriptive statistical measures, graphs and a test for equal mean shares between two samples.

The method is applied on a monthly time series data set for hotel nights in Denmark divided by countries¹⁴. Data ranges for 37 years. Our findings thoroughly confirm the results put forward in Sørensen (1999) namely that a varying and changing seasonal component is a common phenomenon. For many areas, we observe an increased impact of the shoulder season defined as the months April, May, September and October. Especially October has become increasingly significant though the past decade relative to the 1970ties for all Danish counties. The most interesting effects are observed for North Jutland and in Storstroem. In the latter especially the impact of the holiday resort “Lalandia” is visible.

For Bornholm, we find a decreasing impact for September, but an increasing effect for October. This is more positive than the finding by Lundtorp, Rassing and Wanhill (2001). Bornholm suffers in general for low activity outside the high season.

The Danish evidence is put into a Nordic perspective by a discussion with statistics presented for Norway and Finland. For the capitals Oslo and Helsinki, quite similar patterns to Copenhagen are found.

Moving to the rural areas the picture is very different. If a given region, has options to establish ski-resorts then the possibilities are much different, and tourism can serve as a tool for development giving a stable demand for local labor for most of the year. If such nature given activities are not possible, then the establishment of holiday resorts such as “Lalandia” is the best tool for increasing the length of the season. This leaves islands such as Bornholm and the Ålands in a very difficult situation. The transport facilities are frequently a limitation that is time consuming, and with a lower frequency in the shoulder a no-season. This makes it difficult to obtain a stable demand for labor in the tourism sector throughout

¹³ A future paper will deal with the issue of the shoulder season related to visitors to Denmark divided by nationality. Future work will also analyze this issue in a more international perspective.

¹⁴ It is of course a limitation that the analysis is conducted for hotel nights only. This limitation is due to statistics available.

the year. An option for development could be to focus on special segments as for example retired people or similar.

Finally, what would *Monsieur Hulot* have done if he went to Denmark today during the shoulder season? It would be likely that he would have separated his holidays into several sub holidays. Yes – but he would also go to for example Norway!

In Denmark, especially the shoulder season in October would have been interesting for him. Where would he go? Properly to a location in the counties of North Jutland or Storstroem countries. For the rural districts, this is good news. The results show that for Denmark seasonality is a fact – and therefore complicated to change only in the long run. During the winter he would not take on holidays in Denmark – instead, he would go to Norway or similar for a ski tour like most Danes are doing!

References

- Beaulieu, Joseph, and Jeff A. Miron (1993): Seasonal Unit Roots and Deterministic Seasonals in Aggregate U.S. Data. NBER Technical Paper.
- Hylleberg, Svend (1986). *Seasonality in Regression*. Academic Press.
- Hylleberg, Svend (1992). *Modelling Seasonality*. Oxford University Press.
- Hylleberg, Svend, Robert F. Engle, Clive W.J. Granger, and Sam Yoo (1990): Seasonal Integration and Cointegration. *Journal of Econometrics* 44, pp. 215–238.
- Hylleberg, Svend, Nils Karl Sørensen, and Clara Jørgensen (1993): Seasonality in Macroeconomic Time Series. *Empirical Economics* 18, pp. 321–335.
- Lundtorp, Svend, Charlotte Rassing and Stephen Wanhill (2001): *Off-Season is No Season: The Case of Bornholm*. Chapter 6 in Baum, Tom and Svend Lundtorp (2001) (editors): *Seasonality in Tourism*. Pergamon Press.
- Sørensen, Nils Karl (2001, 1999): Modelling the Seasonality of Hotel Nights in Denmark by Country and Nationality, *Tourism Economics* 5, pp. 9–23, and Chapter 5 in Baum, Tom and Svend Lundtorp (2001) (editors): *Seasonality in Tourism*. Pergamon Press.
- Sørensen, Nils Karl (2003): Modelling and Monthly Seasonal Forecasting of Hotel Nights in Denmark, pp 35–50 in Kærgaard, Niels (2003) (editor): *Symposium for anvendt statistik*. KVL Press.

Appendix

Counties of Denmark 1970 - 2006:

