

LIQUOR LICENSING ENFORCEMENT AND ASSAULTS ON LICENSED PREMISES

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On October 30 2008, the NSW Premier announced the imposition of licence restrictions on 48 of the licensed premises previously identified as sites where violence frequently occurred. The restrictions included mandatory 2am lock outs, cessation of alcohol service 30 minutes before closing time, drink purchase limits after midnight and ten minute alcohol sale 'time outs' every hour after midnight. The present report details the results of an evaluation of the effect of these restrictions. The report finds that the incidence of assault on the 48 licensed premises upon which restrictions were imposed has declined, but the decline was not restricted to these premises. A general decline in the number of assaults on licensed premises occurred across the top 100 licensed premises listed on the BOCSAR website. The precise cause of the decline is unclear but likely influences include adverse publicity and increased enforcement activity by NSW Police and the Office of Liquor, Gaming and Racing (OLGR).

Keywords: Licensed premises, assault, alcohol, restrictions, adverse publicity, time series

INTRODUCTION

On March 11, 2008, following a number of requests from the public and the media, the NSW Bureau of Crime Statistics and Research (BOCSAR) published a ranked list of the top 100¹ licensed premises for assaults occurring between January and September 2007. Three days later, in response to public disturbance complaint lodged by NSW Police with the former Liquor Administration Board in July 2007, the Board imposed unprecedented restrictions on a number of licensed premises operating in the Newcastle CBD. The restrictions included a 1.00AM lockout and 3.00AM closure, limits on the sale of certain types of alcohol beverages and a requirement to cease selling alcohol 30 minutes before closing. These events were the subject of extensive publicity.

They were also followed by vigorous enforcement action. In April 2008, OLGR took enforcement action against the "top 25" licensed premises for assault identified by BOCSAR. The action initiated by OLGR followed changes to the *Liquor Act 2007* introduced in December

2007, that were designed to encourage improved standards and behaviour at high-risk licensed premises. During May 2008, OLGR increased its compliance operations, auditing 23 premises across NSW relating to violent incidents and actions taken to reduce assaults (Silmalis, 2008). In July 2008, changes to the Liquor Act 2007 granted powers to the Director of the Office of Liquor, Gaming and Racing to vary or revoke existing liquor licenses, allowing the Director to more effectively deal with problematic premises. Around the same time, NSW Police established the Alcohol and Licensing Enforcement Command, a unit of 30 staff with an operational focus on reducing alcohol-related crime and anti-social behaviour.

On October 30 2008, the NSW Premier, Nathan Rees, announced the imposition of licence restrictions on the top 48 licensed premises on BOCSAR's top 100 list.² The restrictions placed on the top 48 list came into force on December 1 2008 and included:

- Mandatory 2am lock outs
- Cessation of alcohol service 30 minutes before closing time

- Plastic or polycarbonate glasses for beer service after midnight
- No 'shots' and drink purchase limits after midnight
- Ten minute alcohol sale time outs every hour after midnight

About three months after the introduction of these licensing conditions, reports appeared in the *Sydney Morning Herald* and *The Daily Telegraph* (Benson 2009; Clennell 2009) stating that alcohol related assaults on top 48 premises had significantly reduced. Both papers reported that the number of assaults recorded by police between December 2008 and January 2009 was half what it had been between December 2007 and January 2008. They also reported that there had been no glassing³ attacks since the new restrictions came into effect. The purpose of this brief is to provide an assessment of whether assaults on licensed premises have fallen, whether the fall can be attributed to the imposition of restrictions on the top 48 listed premises and whether the incidence of glassing attacks has fallen since the imposition of restrictions.

RESEARCH QUESTIONS

In examining whether assaults on licensed premises have fallen, three issues need to be addressed. The first is whether the fall in the number of recorded incidents of assault on the listed premises could have come about by chance. The second is whether the fall in recorded assaults is indicative of a decline in the actual incidence of assaults or a change in the willingness of staff at licensed premises to report them to police. The third is whether the decline in the incidence of assaults on licensed premises is attributable to the introduction of restrictions on the top 48 premises.

The first issue is important because the recorded rate of assault varies markedly from month to month. The fact that the number of recorded assaults after the introduction of restrictions on the top 48 licensed premises was lower than over a comparable period for the previous year is not strong evidence that the restrictions have reduced the rate of assault. Random variation in the number of assaults over time is entirely to be expected and may be responsible for the reported lower rates of assaults since the imposition of restrictions.

The second issue – whether staff have become less willing to report assaults – is important because the imposition of trading restrictions created a strong incentive for owners, managers and staff not to report assaults to police. Before we can safely conclude that assaults have declined on licensed premises, we need to test whether there has been any change in the willingness of licensed premises to report assaults to police.

Standard statistical tests can be used to test whether the fall in assaults could have come about by chance. If the fall in assaults has occurred because hotel premises staff became less willing to report assaults, we would expect a decline in the proportion of reported assaults emanating from staff after the imposition of restrictions. Since it is easier to hide less serious assaults, we might also expect to see a sharper decline in the number of common (less serious) assaults recorded on licensed premises than in the number of aggravated assaults⁴ reported to police.

There are three ways of examining the contribution of Government restrictions to any fall in the number of assaults. The

first is to see whether the fall coincided with the introduction of restrictions. The second is to see whether the fall is restricted to the top 48 premises on which restrictions were imposed. The third is to see whether there was a reduction in the proportion of assaults that occur after midnight when most of the special licensing conditions (see above) come into effect.

The questions we seek to answer in this brief, then, are as follows:

1. Has there been a significant (recent) fall in the incidence of assaults on licensed premises? If there has:
2. Is the fall apparent on all licensed premises, just those premises that were subject to Government restrictions, or just those premises that were listed in the top 100 on BOCSAR's website?
3. Did the fall in assaults coincide with the introduction of restrictions on the top 48 premises or did it begin in March 2008 (when the top 100 licensed premises were listed on the BOCSAR website, increased liquor licensing enforcement activity began and trading restrictions were imposed on a number of licensed premises in Newcastle)
4. Has there been a significant fall in the proportion of assaults recorded after midnight compared with the fall in recorded assaults before midnight?
5. Has there been a significant fall in the incidence of glassing attacks since the introduction of restrictions
6. Has there been a bigger fall in the incidence of common assault compared with aggravated assault occurring on licensed premises?
7. Has there been a change in the proportion of assaults reported by licensed premises staff?

METHOD

Time series analysis was used to investigate the question of whether there was a significant fall in the number of assaults occurring on licensed premises and the timing of this decline (see Appendix for details). In the present case, this involved the construction of a statistical model that expressed the monthly number of assaults as a function of a set of variables designed to measure:

- i. Any general trend;
- ii. Any change in trend around March 2008; and/or
- iii. Any change in the number of assaults after the imposition of restrictions on licensed premises

The model included controls for 'weekend time'⁵ and month of year. It is important to control for 'weekend time' because assaults are generally higher on Fridays, Saturdays and Sundays and the number of Fridays, Saturdays and Sundays varies from month to month. Controls for the month⁶ of year were included because assaults are generally more common in the warmer months than in the cooler months.

The same general approach was adopted to test for changes in the incidence of common assaults versus aggravated assaults, and the effect of the introduction of the mandatory lock out. Separate models were also constructed for assaults occurring before and after midnight to assess the impact of the restrictions applying from midnight to closing. These models were then used to obtain estimates of the average monthly fall in common assault compared with aggravated assault and assaults occurring before midnight compared with those after midnight.

To address whether there was a change in the proportion of assaults reported by licensed premises staff, a random sample of police reports was extracted from the NSW Police Force Computerised Operational Policing System (COPS). A random sample of 395 reports was drawn from top 100 licensed premises and another sample of 291 reports was drawn from unranked licensed premises. The two samples, totalling 686 reports, were drawn from all police reports regarding assaults occurring on licensed premises between January 2008 and June 2009. The number of incidents in each three-month period between January 2008 and June 2009 was tabulated. The narratives associated with each incident were then examined to determine who reported the assault to police. Incidents were classified into one of seven reporting categories:

- The licensee and/or manager of the licensed premises
- A staff member from the licensed premises (including bar staff, security,

receptionists from clubs, and hired musical acts such as DJs)

- The victim of the assault (except where the victim was a member of staff)
- A witness to the assault
- A member of the public not involved in the assault (i.e. a concerned family member)
- A police officer who was present at the time of the assault
- Any other person (including ambulance officers, hospital staff or the perpetrator of the assault)⁷

The relative frequency of incidents reported to police in each of these categories was then examined to see whether the proportion emanating from licensed premises staff in the first and second quarter of 2009 following the imposition of restrictions was significantly lower than in the four quarters preceding the imposition of restrictions.

RESULTS

We begin with the question of whether there was a fall in assaults, when it began and which licensed premises were affected. Figure 1 shows the monthly counts of assaults for the top 48 premises, the top 100 premises and unranked licensed premises. The first vertical line (around March 2008) shows the point where the first list of the top 100 premises was published on the BOCSAR website and where the enforcement activity described in the introduction began to occur. The second vertical line shows the point where the NSW Government imposed restrictions on the top 48 premises.

Apart from a sharp dip immediately after the imposition of restrictions, the number of recorded assaults on unranked licensed premises appears relatively stable. The same is not true of the trend in recorded assaults for the top 48 and top 100 licensed premises. Both show a steadily increasing trend from March 2006 to December 2007. From this point on, both show a downward trend. The period following the imposition of Government restrictions is comparatively short but there is no obvious sign of acceleration after the introduction of restrictions on the top 48 licensed premises.

Figure 1: Assaults on licensed premises (January 2004 - June 2009)

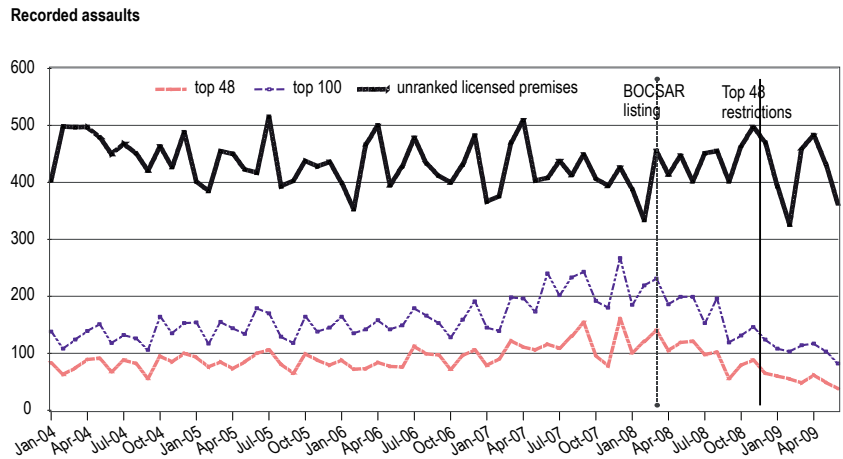


Table 1: Recorded assaults for top 48, top 100 and other licensed premises using monthly data January 2004 to June 2009

Variable	Top 48 licensed premises		Top 100 licensed premises		Other licensed premises	
	Coef.	P-value	Coef.	P-value	Coef.	P-value
Underlying trend	0.89	0.00	1.74	0.00	-0.93	0.00
Trend change since Mar 08	-5.92	0.00	-9.59	0.00	6.45	0.01
Weekend time	18.69	0.00	27.54	0.00	19.16	0.06
Level change from Dec 08	3.31	0.88	4.64	0.84	-60.55	0.02
constant	66.38	0.00	109.64	0.00	476.69	0.00

(full results appear in Appendix)

Table 1 shows the results of the time series analysis. The two variables of interest for our purposes are the variable measuring the trend change in March 2008 and the variable measuring the level change when the Government restrictions came into effect (Dec 2008). Inspection of the p-values and coefficients in the first (top 48) panel shows that the March 2008 change is significant and negative for the 48 licensed premises, indicating a significant fall in assaults for these 48 premises around this time. The same is true of the top 100 panel. There is, however, no significant level change in December 2008 for either the top 48 premises or the top 100 premises. This suggests that the imposition of restrictions exerted no additional downward pressure on the number of assaults occurring on the top 48 and top 100 licensed premises.

In other words, the downward trend in assaults on the top 48 and top 100 licensed premises that began in March 2008, did not accelerate when restrictions were imposed in December 2008. It is important to note at this juncture that separate analyses for premises ranked outside the top 48 but in the top 100 were carried out and were found to closely reflect the top 48 results. The pattern for the top 100 licensed premises, therefore, is not being driven solely by the results for the top 48.

There are three other points worthy of note about Table 1. Firstly, the level change in March is significant and positive for unranked premises, suggesting that, far from falling, assaults on unranked licensed premises (other licensed premises in the table) actually increased after March 2008. Whether this is a result

of hotel patrons moving to other premises or some other effect is impossible to say. Secondly, the December 2008 level change variable is significant and negative for unranked premises: indicating a statistically significant fall in the number of recorded assaults on unranked licensed premises (other licensed premises in the table) immediately after the imposition of restrictions. Whether this is a response to the restrictions imposed on other licensed premises is also difficult to say.

The third point is that the weekend time variable is significant for the top 48, the top 100 and weakly significant for unranked licensed premises. The positive coefficient tells us that the effect of additional weekend time in any month results in an increase in recorded assaults. This is not surprising. What is surprising is the scale of the difference between the top 100 and the unranked licensed premises. Comparison of the coefficients indicates that for months that have more than a total of 13 Fridays, Saturdays and Sundays, licensed premises within the top 100 experienced an additional 28 recorded assaults a month, whereas unranked premises only experienced 19 additional recorded assaults. In other words, the number of recorded assaults rises much more sharply on weekends for the top 100 licensed premises than on the much greater combined number of licensed premises outside the top 100 list.

The next question of interest is whether the restrictions after midnight imposed on the top 48 premises influenced the incidence of assault. Figure 2 shows the trend in the number of assaults reported to have occurred on the top 48 licensed premises before midnight and between midnight and 5.00 am. If the restrictions after midnight had helped reduce the number of assaults, the decline in recorded assaults for 'after-midnight' (i.e. midnight to 5.00am) series should be steeper than for the 'before-midnight' series for the last seven months shown on the graph. There is a substantial drop in the after-midnight series in September 2008. It is not immediately obvious, however, that the overall fall in after-midnight series is steeper than the fall in the before-midnight series.

Table 2 shows the results of tests conducted to see whether the assaults did decline more rapidly during the after-midnight period following the imposition of restrictions. The models in Table 2 show

Figure 2: Recorded assaults for top 48 by time of day and month (January 2004 - June 2009)

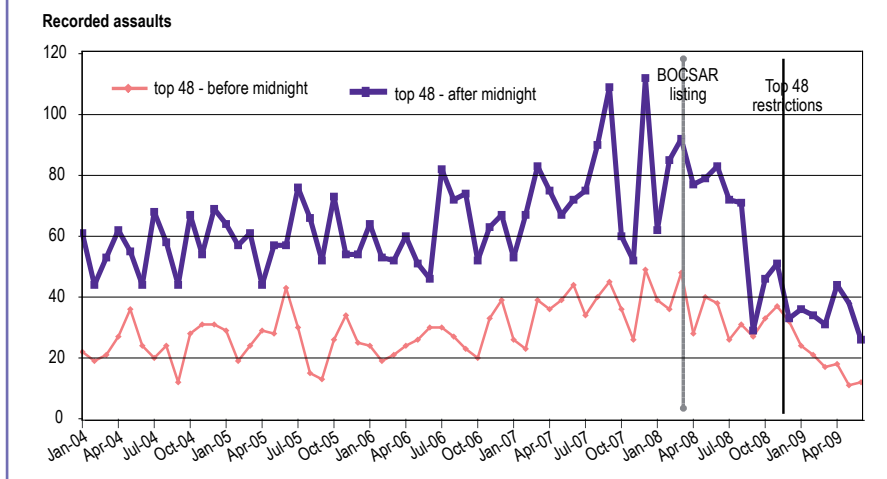


Table 2: Recorded assaults for top 48 before midnight and from midnight to 5:00am (January 2004 - June 2009)

Variable	Top 48			
	Before midnight		Midnight to 5:00am	
	Coef.	P-value	Coef.	P-value
Underlying trend	0.35	0.01	0.55	0.00
Trend change since March 2008	-2.05	0.00	-4.03	0.00
Weekend time	4.03	0.04	13.40	0.00
Level change from Dec 2008	-0.30	0.96	3.42	0.80
constant	23.73	0.00	43.79	0.00

(full results in Appendix)

a strong decline in assaults since March 2008. The trend change coefficient (-2.05) for the before-midnight series indicates an average monthly decline of 7.2 percent, while the trend change coefficient for the after-midnight series suggests a 6.6 percent decline. Thus, although a substantial drop in the after-midnight series occurred in September 2008 (see Figure 2) the models were unable to detect any extra drop in level attributable to the introduction of the restrictions after midnight in December 2008.

We turn now to the question of whether assaults where a glass/bottle was used as a weapon fell after the imposition of the Government restrictions. Because the number of incidents involved is small, this series could not be modelled in the way assaults in general have been modelled. However inspection of the data across all licensed premises indicated a larger proportional fall in assaults where a

glass/bottle was used when compared to all other assaults. This fall started during the second half of 2008, and was strongest for the top 48 licensed premises (see Figure 3). Chi-Square tests for the seven months of data since the legislation was introduced (when compared to the same seven months for the previous year) indicate that the significant decline across all NSW licensed premises resulted primarily from a significant reduction for the top 48 ($\chi^2 = 24.04$, $df=1$, p -value < 0.001).

The final question of concern is whether there is any evidence of a decline in the willingness of staff on licensed premises to report assaults to police. The first test of this is whether there has been a bigger decline in the incidence of common assault compared with aggravated assault occurring on licensed premises. Figure 4 plots the monthly counts of common assault and aggravated assault

for the top 48 licensed premises. As before, the first vertical line shows the point where the top 100 list appeared on the BOCSAR website and the second vertical line represents the Government's introduction of restrictions.

Figure 4 suggests that the reported incidents for both types of assault rose around the time when the top 100 list appeared on the BOCSAR website, then both categories of assault fell together.

Table 3 shows the results of the time series analysis. The results for aggravated and common assault in the top 48 premises are very similar. Looking at the coefficients it can be seen that, from March 2008, the number of aggravated assaults recorded at the top 48 premises fell by an average of 2.8 assaults per month, whilst the incidence of common assaults fell by 3.1 assaults per month. Neither shows any significant change [from this trend] after December 2008. When we express the fall in the number of assaults as a percentage of the mean of the assault series, the average monthly declines at the top 48 premises become 8.4 percent for aggravated assault and 5.9 percent for common assault.

The results for the top 100 premises show similar falls for aggravated and common assault. After March 2008, aggravated assaults fell by 4.3 assaults per month and common assaults fell by around 5.6 per month. Again, when we express the fall in the number of assaults as a percentage of the mean of the assault series, the declines (for the top 100 premises) are 7.2 percent for aggravated and 6.2 percent for common assault. For the four months of observations since the December 2008 restrictions were imposed, the models found no extra drop in the number of assaults for aggravated and common assaults occurring in the top 48 and top 100 premises.

A second and more direct test of whether staff members on licensed premises have become less willing to report assaults to police is to see whether the proportion of assaults reported by licensed premises staff has declined. Table 4 provides a

breakdown of the source of police reports of assaults occurring on the top 100 licensed premises by the quarter in which the assault was recorded. We examine the top 100 premises because, although

Figure 3: Assaults where glass/bottle used as a weapon, occurring on top 48 licensed premises January 2004 to June 2009

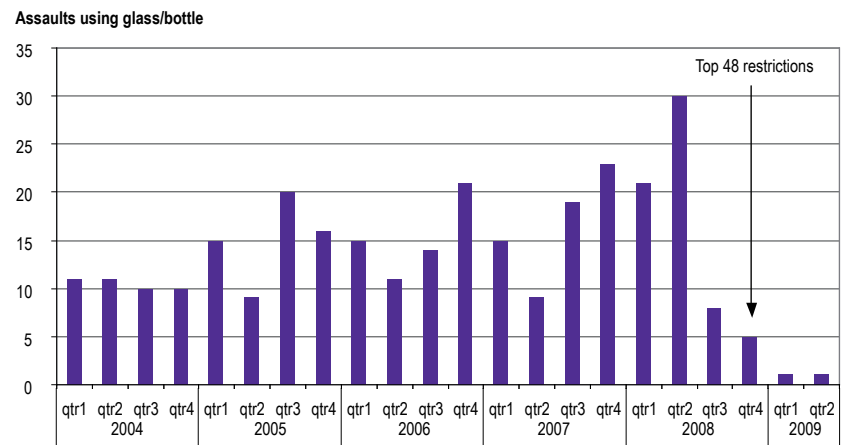


Figure 4: Assaults on licensed premises by assault type and month (January 2004 - June 2009)

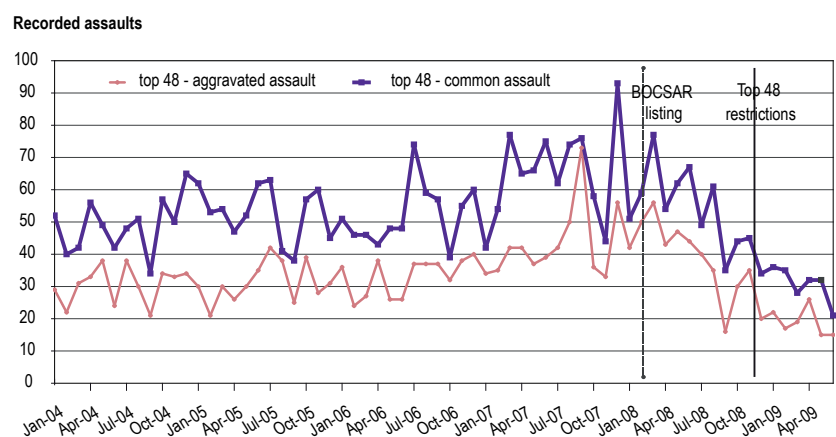


Table 3: Recorded assaults for top 48 and top 100, by assault type and month (January 2004 - June 2009)

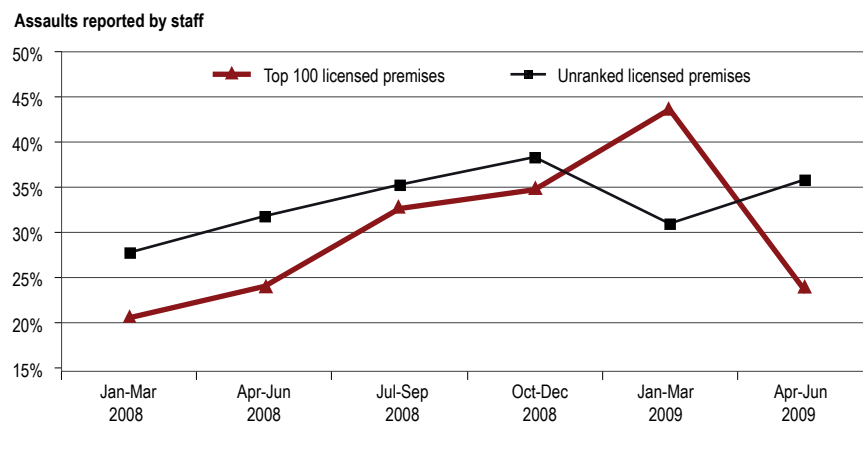
Variable	Top 48 licensed premises				Top 100 licensed premises			
	Aggravated assault		Common assault		Aggravated assault		Common assault	
	Coef.	P-value	Coef.	P-value	Coef.	P-value	Coef.	P-value
Underlying trend	0.38	0.02	0.38	0.00	0.80	0.00	0.79	0.00
Trend change since March 2008	-2.83	0.00	-3.09	0.00	-4.32	0.00	-5.61	0.00
Weekend time	5.42	0.02	11.86	0.00	7.83	0.01	16.16	0.00
Level change from Dec 2008	4.54	0.64	-0.05	1.00	-0.02	1.00	6.51	0.71
constant	23.51	0.00	42.53	0.00	38.97	0.00	67.59	0.00

(full results in Appendix)

Table 4: Reporting of assaults occurring on top 100 premises between January 2008 and June 2009

<i>Individual</i>	<i>Jan-Mar 2008 (Percent of quarter)</i>	<i>Apr-Jun 2008 (Percent of quarter)</i>	<i>Jul-Sep 2008 (Percent of quarter)</i>	<i>Oct-Dec 2008 (Percent of quarter)</i>	<i>Jan-Mar 2009 (Percent of quarter)</i>	<i>Apr-Jun 2009 (Percent of quarter)</i>	<i>% of reporters (Total No.)</i>
Licensee/Manager	1.6	0.0	6.7	11.3	10.1	10.4	6.8 (27)
Premise Staff	11.3	20.0	18.3	14.5	20.3	9.0	15.7 (62)
Assault Victim	33.9	30.8	33.3	16.1	26.6	38.8	29.9 (118)
Witness	0.0	6.2	6.7	8.1	3.8	10.4	5.8 (23)
Member of the Public	3.2	3.2	0.0	4.8	1.3	1.5	2.3 (9)
Police Officers	6.5	15.4	8.3	9.7	5.1	11.9	9.4 (37)
Other	6.5	7.7	3.3	9.7	2.5	1.5	5.1 (20)
Unknown Reporter	37.1	16.9	23.3	25.8	30.4	16.4	25.1 (99)
Total reports per quarter	62	65	60	62	79	67	395

Figure 5: Reporting of assault by licensed premises staff for top 100 and unranked licensed premises



restrictions were only placed on the top 48, the decline in assault occurred across the top 100 licensed premises. All 100, moreover, were the subject of intense adverse publicity.

It can be seen from the final column that victims of assault are responsible for reporting 29.9 percent of assaults. Premises staff reported 15.7 percent of assaults while the licensee or manager of the licensed premises reported 6.8 percent of assaults. In total, staff members associated with the licensed premise reported, on average, 22.5 percent of all assaults occurring on licensed premises between January 2008 and June 2009. Note, however, that in 25.1 percent of police reports, there was insufficient information to accurately determine how the assault came to the attention of police.

To determine if a change in the proportion of assaults reported by premises staff

had occurred, an analysis was conducted comparing the rate of reporting for all premises staff, versus the rate of reporting of all non-staff. In conducting this analysis, the 25.1 percent of police reports that did not identify the reporter were excluded. Note that the term 'premises staff' in this analysis includes licensees, managers, and all other premises staff.

Figure 5 shows the proportion of reported assaults emanating from premises staff across the six observed quarters starting January 2008 and ending June 2009 for both the top 100 sample and the unranked sample. The last two quarters shown in the figure are after the introduction of the restrictions.

Although there appears to be a steep fall in the percentage of assault reports emanating from licensed premises staff employed in the top 100 licensed premises in the final quarter (April-June

2009) the percentage of premises staff reporting assaults really only returns to the level it occupied in the January-March quarter 2008. The change across the six quarters was not statistically significant for the top 100 sample ($\chi^2 = 9.122$, $df = 5$, $p\text{-value} = 0.104$) or for the sample taken from the unranked licensed premises ($\chi^2 = 1.343$, $df = 5$, $p\text{-value} = 0.930$). There is no reason to believe, then, that the observed decline in recorded assaults during 2008 was due to a decrease in reporting of assaults by staff working in licensed premises.

CONCLUSION

The questions we sought to answer in this brief were as follows:

1. Has there been a significant (recent) fall in the incidence of assaults on licensed premises? If there has:
2. Is the fall apparent on all licensed premises, just those premises that were subject to Government restrictions, or just those premises that were listed in the top 100 on BOCSAR's website?
3. Did the fall in assaults coincide with the introduction of restrictions on the top 48 premises or did it begin in March 2008 (when the top 100 licensed premises were listed on the BOCSAR website, increased liquor licensing enforcement activity began, restrictions were imposed on a number of licensed premises in Newcastle).
4. Has there been a significant fall in the proportion of assaults recorded after midnight compared with the fall in recorded assaults before midnight?

5. Has there been a significant fall in the incidence of glassing attacks since the introduction of restrictions
6. Has there been a bigger fall in the incidence of common assault compared with aggravated assault occurring on licensed premises?
7. Has there been a change in the proportion of assaults reported by licensed premises staff?

The results do show a significant decline in the recorded incidence of assaults and glassing attacks on licensed premises. The decline in assaults, however, was not restricted to the 48 licensed premises on which restrictions were imposed. Nor did it coincide with the imposition of restrictions on the top 48 licensed premises. The decline in assaults on licensed premises appears to have started around March 2008 and was evident across all of the 100 premises listed on the BOCSAR website. There is no evidence that the decline in assaults on the top 48 licensed premises accelerated after the imposition of restrictions after midnight. There was no difference in the rate at which common and aggravated assault declined. There is no reason to believe that the fall in assaults on licensed premises came about because staff on licensed premises became less willing to report assaults to police.

The question arises as to why the imposition of trading restrictions on the top 48 licensed premises exerted no measurable effect. There are three possibilities. The first is that the restrictions themselves (mandatory 2am lock outs, cessation of alcohol service 30 minutes before closing time, plastic or polycarbonate glasses for beer service after midnight, no 'shots' and drink purchase limits after midnight, ten minute alcohol sale time outs every hour after midnight) were inherently incapable of producing a reduction in assaults.

The second is that effects of the restrictions were 'swamped' by the combined effects of increased publicity surrounding the BOCSAR listing of the 'top 100' licensed premises and increased enforcement activity by OGLR and the NSW Police after March 2008. Because strong downward trends were present before the restrictions came into effect, the models would have had difficulty

picking any acceleration of the downward trend, particularly if the effects of the restrictions were small or delayed.

The third is that the owners and managers of licensed premises anticipated or feared the imposition of restrictions and took precautionary measures that helped reduce the incidence of assault before the restrictions came into effect. Such anticipatory behaviour might have been expected given the extensive publicity given to the trading restrictions imposed on a number of Newcastle licensed premises by the former Liquor Administration Board. The last two of these explanations are obviously not mutually exclusive.

It is impossible to determine which of these explanations is correct. It would seem likely, however, that some combination of adverse publicity and more vigorous liquor licensing enforcement played a key role in bringing down the incidence of assault on licensed premises. The only way to tell whether the restrictions themselves would have produced a reduction in assault in the absence of adverse publicity/increased liquor licensing enforcement would be to conduct an experiment in which the restrictions are imposed without any attendant publicity or increased liquor licensing enforcement. This is clearly impossible.

There is one final point worth noting. The current policy of placing restrictions on licensed premises where large numbers of assaults are recorded places a heavy reliance on the accuracy and reliability of police figures as a guide to trends in the incidence of assaults on licensed premises. This study found no statistically significant fall in the willingness of staff on licensed premises to report assaults to police. Figure 5, however, did show a decline in the percentage of assaults reported by licensed premises in the top 100 in the April to June quarter of 2009. If this trend continues it will call into question the reliability of police figures as a guide to trends in assault on licensed premises. This would be a matter of concern. BOCSAR will conduct a further investigation of this issue in early 2010. Further research is also being conducted on the precise location of assaults said to have occurred on licensed premises.

NOTES

1. As some premises had the same number of assaults the top 100 list actually contained 109 licensed premises.
2. The Star City Casino was not included in the list of premises on which restrictions were imposed.
3. Glassing attacks refer to the use of a drinking glass or bottle as a weapon during the commission of an assault.
4. Aggravated assault included incidents of assault recorded by NSW Police as involving actual bodily harm or grievous bodily harm.
5. Weekend time is a variable that assumes a value of one for any month with more than 13 days total for Fridays, Saturdays and Sundays and 0 otherwise. This variable has been found to be a good predictor of assault levels along with month, which controls for the seasonal factors as well as variation in month length.
6. It is important to note that the correlation between weekend time and months is generally very close to zero apart from Feb (-0.22), December (0.28) and July (0.16). Obviously there is some association with length of month, but we can be reasonably satisfied that they are measuring different characteristics.
7. A small number of incidents were classified as having an unknown informant because there was not enough information contained within the police report to definitively determine to which category the individual belonged, or when there was no reference to who reported the assault to police.

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APPENDIX

The data used in this analysis was obtained from the Computerised Operational Policing System (COPS) of the NSW Police Force. The main recorded assault series were obtained for the months January 2004 to March 2009 and are summarised below. The top 48 licensed premises is a subset of the top 100 licensed premises and the series were derived from the list published on October 10, 2008 for assaults occurring between July 2007 and June 2008.

The model used to examine the contribution of Government restrictions to any fall in the number of assaults is shown Equation 1.

In this equation, y_t represents the number of assaults in month t , Itr is the listing of licensed premises on the BOCSAR website in April 2008; W measures weekend time, L is the legislation dummy variable, M indexes the month and e_t is white noise. The coefficients β_0 , β_1 and β_2 measure the size of any effect that Itr , W and L have on the number of assaults. For reasons explained in the brief, the equation shown above was first fitted to the trend in the number of assaults on the 48 licensed premises, the trend in the number of assaults on the top 100 premises listed on the BOCSAR website and the trend in assaults on all other licensed premises in NSW.

Tables A2-A4 contain the results from the models. Since the data is in levels it is important to control for the presence of any linear trends, no matter how subtle, since we need to take account of any temporal upward or downward movement and subsequent change in trend for the period following the March 2008 published list to March 2009, and the period since the legislative change from December 2008 to March 2009. The weekend time dummy was found to be a significant predictor of the level of assaults for all three models and was found to be important covariate in

Table A1: Monthly statistics for recorded assault counts on licensed premises January 2004 to June 2009

Variable - licensed premises series	Monthly observations	Mean	Standard Deviation	Min	Max
Top 48 licensed premises	66	89.6	24.03	38	161
Top 100 licensed premises	66	156.5	38.51	82	267
Unranked (Other)	66	432.7	42.66	326	515
All	66	589.2	59.13	429	705

Equation 1: Recorded assaults at licensed premises

$$y_t = \alpha_0 + \alpha_1 t + \beta_0 Itr + \beta_1 W + \beta_2 L + \sum_{i=1}^{11} \gamma_i M_i + \rho_1 \mu_{t-4} + \rho_2 \mu_{t-12} + e_t$$

stabilising the residuals. Likelihood ratio tests were used to reach the final form for the models reported in the tables. The observed change in the assault series (following the March 2008 BOCSAR listing) was found to best fit a linear trend for the last 12 months of the data. The introduction of the restrictions was found to best fit a change in level variable for the last four months of the series. This was done in order to separate any significant change in level, present from when the restrictions were enacted, from the change in trend after March 2008.

Phillips-Perron unit root tests were performed on all the assault series used in models and returned a MacKinnon approximate p-value for $Z(t) < 0.01$ for all series. Since the presence of unit roots could be rejected for all the series, the analysis was conducted in levels. Maximum likelihood estimation was used to estimate monthly assault counts. Along with the months, used as seasonal controls, an autoregressive error structure (for example AR terms at lags 4 and 12 shown above) was found to be effective in controlling for residual autocorrelation in the models and e_t is white noise. The p-values for the Box-Ljung Q statistics were considered for each model before a final form was selected. All models reported had a non-significant set of p-values for their Box-Ljung Q statistics to lag 31, but only one result from the Portmanteau test for white noise residuals is given in the results tables.

The log likelihood statistics and other diagnostics for each model are shown at the bottom of the appendix tables. The

Wald χ^2 p-value from the STATA output was 0.000 for all the models given in the appendices. The regression constant predicts the December level of assaults and all other months will be adjustments from the December level.

Table A2: Maximum likelihood estimation in levels for monthly data (January 2004 - June 2009)

Recorded assaults at licensed premises by group

	Top 48			Top 100			Other licensed premises (unranked)			All licensed premises		
	Coef.	Std. Err.	sig.	Coef.	Std. Err.	sig.	Coef.	Std. Err.	sig.	Coef.	Std. Err.	sig.
Underlying trend	0.89	0.16	0.00	1.74	0.23	0.00	-0.93	0.28	0.00	0.81	0.40	0.04
Trend change since Mar08	-5.92	1.75	0.00	-9.59	2.36	0.00	6.45	2.49	0.01	-3.21	3.57	0.37
Weekend time	18.69	4.64	0.00	27.54	5.46	0.00	19.16	10.08	0.06	46.36	11.42	0.00
Level change from Dec08	3.31	21.77	0.88	4.64	22.88	0.84	-60.55	25.86	0.02	-56.17	38.51	0.15
Jan	-9.93	6.52	0.13	-12.76	7.60	0.09	-65.80	13.19	0.00	-78.65	21.50	0.00
Feb	-5.20	9.17	0.57	-11.98	9.75	0.22	-73.12	12.91	0.00	-85.23	18.50	0.00
Mar	-0.38	7.26	0.96	2.70	11.13	0.81	11.28	29.71	0.70	13.95	31.07	0.65
Apr	-3.43	5.09	0.50	-1.02	7.12	0.89	17.40	10.63	0.10	16.21	13.46	0.23
May	-0.72	7.14	0.92	-5.14	9.30	0.58	-29.22	13.95	0.04	-34.55	18.88	0.07
Jun	2.36	7.34	0.75	13.33	9.16	0.15	-42.72	15.62	0.01	-29.21	21.21	0.17
Jul	1.79	18.57	0.92	-4.13	10.63	0.70	7.87	15.95	0.62	3.74	22.81	0.87
Aug	7.31	7.52	0.33	10.38	7.65	0.18	-28.30	15.56	0.07	-18.19	17.50	0.30
Sep	-9.88	5.41	0.07	-18.12	7.11	0.01	-43.86	13.96	0.00	-62.40	17.23	0.00
Oct	-8.63	10.14	0.40	-12.07	10.07	0.23	-27.07	17.20	0.12	-38.64	19.39	0.05
Nov	-5.40	8.48	0.52	-8.97	13.42	0.50	-22.71	17.87	0.20	-31.76	25.97	0.22
constant	66.38	6.64	0.00	109.64	9.08	0.00	476.69	14.50	0.00	586.73	18.08	0.00
AR terms	ar(4 12)			ar(4 12)			ar(4 12)			ar(4 12)		
Regression diagnostics	Statistic		sig.	Statistic		sig.	Statistic		sig.	Statistic		sig.
Wald chisq for model	182.29		0.00	256.92		0.00	225.74		0.00	160.17		0.00
MacKinnon approx. p-val for Phillips-Perron unit root test on dependent variable	-4.09		0.00	-3.29		0.02	-6.96		0.00	-6.69		0.00
Portmanteau test for white noise residuals Prob >Chisq(20)	20.07		0.45	21.21		0.39	5.16		1.00	13.13		0.87
Log likelihood for model	-258.7			-277.4			-300.5			-320.1		

Table A3: Maximum likelihood estimation in levels for monthly data (January 2004 - June 2009)

	Recorded assaults on licensed premises by group and time of day																								
	Top 48				Top 100				Other licensed premises (unranked)				All licensed premises												
	Before midnight		Midnight to 5:00am		Before midnight		Midnight to 5:00am		Before midnight		Midnight to 5:00am		Before midnight		Midnight to 5:00am										
	Coef.	Std. Err.	sig.	Coef.	Std. Err.	sig.	Coef.	Std. Err.	sig.	Coef.	Std. Err.	sig.	Coef.	Std. Err.	sig.										
Underlying trend	0.35	0.13	0.01	0.55	0.13	0.00	0.75	0.24	0.00	1.04	0.17	0.00	-0.25	0.20	0.21	-0.74	0.09	0.00	0.50	0.27	0.06	0.30	0.20	0.13	
Trend change since Mar08	-2.05	0.64	0.00	-4.03	1.10	0.00	-3.84	1.40	0.01	-6.92	1.30	0.00	3.49	1.51	0.02	3.56	1.89	0.06	0.25	1.95	0.90	-4.17	3.21	0.19	
Weekend time	4.03	1.99	0.04	13.40	3.22	0.00	6.18	2.70	0.02	21.54	3.65	0.00	4.09	6.78	0.55	10.11	5.28	0.06	9.09	8.38	0.28	30.49	6.95	0.00	
Level change from Dec08	-0.30	6.75	0.96	3.42	13.18	0.80	-1.58	11.65	0.89	13.11	13.40	0.33	-39.52	17.81	0.03	-21.96	21.90	0.32	-45.80	22.56	0.04	-5.10	33.35	0.88	
jan	-5.66	5.17	0.27	-4.39	4.69	0.35	-9.48	6.08	0.12	-3.42	5.73	0.55	-83.87	12.76	0.00	14.30	10.44	0.17	-93.37	16.27	0.00	11.33	10.60	0.29	
feb	-8.15	4.73	0.09	2.47	6.41	0.70	-16.85	5.82	0.00	5.91	6.74	0.38	-74.49	12.56	0.00	-1.73	7.25	0.81	-92.20	16.43	0.00	4.22	12.24	0.73	
mar	-4.08	3.59	0.26	3.23	6.52	0.62	-7.93	7.97	0.32	11.08	7.84	0.16	-16.69	16.07	0.30	24.37	9.83	0.01	-25.10	20.88	0.23	36.34	13.16	0.01	
apr	-5.05	3.27	0.12	1.54	3.81	0.69	-2.20	5.59	0.69	2.60	5.56	0.64	3.90	12.25	0.75	10.49	7.21	0.15	0.98	15.69	0.95	14.86	9.82	0.13	
may	-1.66	3.25	0.61	0.55	7.14	0.94	-5.92	6.16	0.34	2.44	8.03	0.76	-45.35	12.36	0.00	12.70	8.70	0.14	-52.27	14.95	0.00	16.48	12.27	0.18	
jun	1.26	3.35	0.71	0.49	4.40	0.91	2.03	5.16	0.69	12.07	8.59	0.16	-58.92	13.97	0.00	8.62	9.91	0.39	-58.34	16.59	0.00	21.99	13.94	0.12	
jul	-7.10	4.57	0.12	8.74	13.28	0.51	-15.93	6.30	0.01	11.90	8.32	0.15	-26.04	15.99	0.10	29.70	12.46	0.02	-42.79	18.80	0.02	40.20	12.22	0.00	
aug	-6.08	3.11	0.05	12.20	5.74	0.03	-11.12	5.98	0.06	21.40	6.68	0.00	-39.45	15.08	0.01	6.01	24.40	0.81	-51.31	17.25	0.00	29.10	14.60	0.05	
sep	-10.08	3.08	0.00	0.39	4.09	0.92	-14.37	5.78	0.01	-2.46	6.10	0.69	-44.32	13.85	0.00	-2.19	12.51	0.86	-59.87	15.60	0.00	-4.30	12.13	0.72	
oct	-5.86	3.94	0.14	-2.84	6.38	0.66	-9.99	5.42	0.07	0.48	7.85	0.95	-35.97	14.95	0.02	4.10	9.46	0.67	-47.22	16.10	0.00	6.30	19.09	0.74	
nov	-1.04	3.09	0.74	-4.58	6.22	0.46	-5.94	6.08	0.33	-2.24	9.53	0.81	-25.40	14.81	0.09	-3.85	13.54	0.78	-32.55	19.13	0.09	-3.74	18.32	0.84	
constant	23.73	4.49	0.00	43.79	5.76	0.00	43.08	8.59	0.00	65.45	8.64	0.00	319.31	11.77	0.00	164.49	7.57	0.00	363.07	14.78	0.00	230.65	11.26	0.00	
AR terms	ar(1 4 5)			ar(4 12)			ar(1 2 7)			ar(4 12)						ar(1 3)									ar(5)
Regression diagnostics	Statistic	sig.		Statistic	sig.		Statistic	sig.		Statistic	sig.		Statistic	sig.		Statistic	sig.		Statistic	sig.		Statistic	sig.		
Wald chisq for model	72.56	0.00		173.12	0.00		75.55	0.00		223.89	0.00		131.16	0.00		128.68	0.00		115.23	0.00		79.80	0.00		
MacKinnon approx. p-val for Phillips-Perron unit root test on dependent variable	-4.12	0.00		-4.61	0.00		-3.79	0.00		-4.09	0.00		-7.54	0.00		-7.28	0.00		-6.83	0.00		-6.87	0.00		
Portmanteau test for white noise residuals Prob >Chisq(20)	15.32	0.76		13.93	0.83		19.64	0.48		16.91	0.66		13.19	0.87		7.19	1.00		9.84	0.97		15.59	0.74		
Log likelihood for model	-201.8			-241.4			-234.7			-256.4			-288.1			-258.0			-302.7			-284.3			

Table A4: Maximum likelihood estimation in levels for monthly data (January 2004 - June 2009)

Recorded assaults on licensed premises by group and type of assault

	Top 48						Top 100						Other licensed premises (unranked)						All licensed premises								
	Aggravated assault		Common assault		Aggravated assault		Common assault		Aggravated assault		Common assault		Aggravated assault		Common assault		Aggravated assault		Common assault		Aggravated assault		Common assault				
	Coef.	Std. Err.	sig.	Coef.	Std. Err.	sig.	Coef.	Std. Err.	sig.	Coef.	Std. Err.	sig.	Coef.	Std. Err.	sig.	Coef.	Std. Err.	sig.	Coef.	Std. Err.	sig.	Coef.	Std. Err.	sig.			
Underlying trend	0.38	0.17	0.02	0.38	0.09	0.00	0.80	0.17	0.00	0.79	0.15	0.00	-0.04	0.13	0.74	-0.87	0.13	0.00	0.68	0.19	0.00	0.68	0.19	0.00	-0.09	0.28	0.76
Trend change since Mar08	-2.83	0.83	0.00	-3.09	0.91	0.00	-4.32	1.14	0.00	-5.61	1.46	0.00	1.85	1.27	0.15	2.89	1.42	0.04	-1.74	1.81	0.34	-1.74	1.81	0.34	-2.96	2.05	0.15
Weekend time	5.42	2.35	0.02	11.86	2.39	0.00	7.83	2.89	0.01	16.16	2.21	0.00	10.33	3.33	0.00	5.43	7.56	0.47	16.38	4.53	0.00	16.38	4.53	0.00	20.27	6.85	0.00
Level change from Dec08	4.54	9.58	0.64	-0.05	12.22	1.00	-0.02	14.27	1.00	6.51	17.35	0.71	-22.34	13.50	0.10	-27.61	17.41	0.11	-23.78	18.92	0.21	-23.78	18.92	0.21	-20.07	20.74	0.33
jan	-1.81	6.35	0.78	-6.01	3.40	0.08	-0.97	6.87	0.89	-6.86	5.01	0.17	-20.42	6.09	0.00	-47.84	6.90	0.00	-22.62	7.50	0.00	-22.62	7.50	0.00	-57.14	10.95	0.00
feb	-2.83	6.33	0.66	-1.24	7.04	0.86	-7.90	7.58	0.30	-0.98	8.38	0.91	-16.81	5.87	0.00	-60.66	8.61	0.00	-27.41	9.65	0.00	-27.41	9.65	0.00	-63.98	11.55	0.00
mar	1.32	5.88	0.82	1.49	4.09	0.72	3.77	6.35	0.55	1.84	6.29	0.77	12.06	7.19	0.09	-3.85	14.22	0.79	13.74	8.75	0.12	13.74	8.75	0.12	-3.95	15.02	0.79
apr	2.43	4.69	0.61	-3.27	2.73	0.23	3.87	7.52	0.61	-2.22	4.18	0.60	8.76	4.80	0.07	4.27	7.26	0.56	10.25	7.03	0.15	10.25	7.03	0.15	0.16	9.14	0.99
may	0.55	5.55	0.92	0.10	4.51	0.98	-2.11	7.00	0.76	-0.30	8.57	0.97	-4.23	8.80	0.63	-28.35	8.88	0.00	-9.33	12.68	0.46	-9.33	12.68	0.46	-30.62	10.34	0.00
jun	0.32	5.34	0.95	3.87	4.84	0.42	3.43	7.39	0.64	13.01	4.73	0.01	-9.28	6.75	0.17	-31.80	8.74	0.00	-8.77	9.22	0.34	-8.77	9.22	0.34	-20.05	11.70	0.09
jul	4.25	6.21	0.49	0.56	4.13	0.89	-2.25	8.02	0.78	2.08	4.73	0.66	20.30	6.09	0.00	-10.00	8.44	0.24	15.31	8.59	0.07	15.31	8.59	0.07	-9.74	10.11	0.34
aug	4.22	5.63	0.45	3.82	3.96	0.34	-0.19	7.35	0.98	11.38	4.99	0.02	-1.88	6.44	0.77	-28.32	16.64	0.09	-3.24	8.30	0.70	-3.24	8.30	0.70	-19.61	10.07	0.05
sep	0.39	5.17	0.94	-7.82	4.16	0.06	-4.27	7.28	0.56	-9.17	7.36	0.21	-1.86	7.52	0.81	-38.94	8.93	0.00	-7.22	6.98	0.30	-7.22	6.98	0.30	-49.25	11.27	0.00
oct	-0.07	6.96	0.99	-5.44	5.14	0.29	-3.24	9.78	0.74	-4.06	8.07	0.62	1.21	13.70	0.93	-33.51	9.27	0.00	-3.55	12.18	0.77	-3.55	12.18	0.77	-38.52	11.20	0.00
nov	0.74	5.64	0.90	-2.56	3.68	0.49	-2.37	7.23	0.74	-2.85	6.34	0.65	2.91	7.62	0.70	-21.03	18.28	0.25	-0.87	10.69	0.94	-0.87	10.69	0.94	-26.93	16.78	0.11
constant	23.51	7.21	0.00	42.53	3.78	0.00	38.97	7.76	0.00	67.59	6.04	0.00	151.54	6.89	0.00	309.00	8.66	0.00	194.92	9.36	0.00	194.92	9.36	0.00	379.12	10.98	0.00
AR terms	ar(1 3 5)			ar(4 12)			ar(1 3 6)			ar(1 3 4 6 12)			ar(1 4 12)			ar(1 2 12)			ar(1 3 12)			ar(1 3 12)			ar(4 5 12)		
Regression diagnostics	Statistic	sig.		Statistic	sig.		Statistic	sig.		Statistic	sig.		Statistic	sig.		Statistic	sig.		Statistic	sig.		Statistic	sig.		Statistic	sig.	
Wald chisq for model	56.80	0.00		155.73	0.00		106.47	0.00		191.20	0.00		178.47	0.00		423.01	0.00		203.86	0.00		203.86	0.00		222.16	0.00	
MacKinnon approx. p-val for Phillips-Perron unit root test on dependent variable	-4.14	0.00		-4.82	0.00		-3.56	0.01		-3.58	0.01		-6.75	0.00		-6.09	0.00		-6.52	0.00		-6.52	0.00		-5.93	0.00	
Portmanteau test for white noise residuals Prob >Chisq(20)	16.01	0.72		20.00	0.46		15.86	0.73		25.68	0.18		19.06	0.52		7.13	1.00		9.86	0.97		9.86	0.97		14.35	0.81	
Log likelihood for model	-210.8			-224.5			-227.6			-243.5			-249.0			-269.0			-263.6			-263.6			-286.7		

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