Response to "Comments on MS 1815"

We are very grateful for your detailed advice and in-depth feed-back to our manuscript. We highly value your constructive suggestions.

Q1. Major issue:

Please do not rely on OLS standard errors (even bootstrapped) when drawing inferences from the cross-sectional regressions. By construction, the errors terms in your regressions will be heteroskedastic and contemporaneously correlated. I recommend the portfolio technique developed by Sefcik and Thompson in their 1986 *Journal of Accounting Research* paper as an appropriate estimation procedure. [See also the paper by Chandra and Balachandran in the 1992 *Journal of Finance*.] If you want to allow for the return variance to change in the event window, a procedure is outlined by Karafiath in the 1994 *Journal of Financial and Quantitative Analysis*. Alternatively, after creating the Sefcik-Thompson portfolios, you can bootstrap the standard errors using the procedure outlined in Hein and Westfall in their 2004 *Journal of Financial Econometrics* paper.

Response:

Portfolio method

As the referee indicated, the portfolio time-series regression method developed by Sefcik and Thompson (1986) have been developed to address concerns about bias caused by cross correlation and cross-sectional heteroscedasticity in disturbances. Recently, studies from top journals have also widely adopted this method to construct portfolios for their event studies, for example, Borisov, Goldman, & Gupta (2015), Bowen & Khan(2014), Chen & Khurana (2014). However, after carefully considering our research questions and the debating about the smoking ban in Macao casinos, we come to the conclusion that the portfolio method is not suitable to our study this time. The reasons are as follows:

1) A portfolio method of event study will not help to answer our research questions and fulfill our aims of study, because this study focuses on the differentiated market responses of the individual stocks.

Instead of examining the mean abnormal return of some homogeneous casino firms, this study focuses on the heterogeneous abnormal returns of the individual casino firms in Macao upon a series of announcement of smoking bans. The differences in the abnormal returns are essentially determined by the casinos' operating characteristics.

Actually, in the early stage of this study, we performed tests using portfolio method, constructing equally-weighted, valued weighted and other weighted portfolios. When we presented the portfolio-based return results of Macao casinos to scholars, policy makers and industry managers, most of them showed strong interests in the differentiated abnormal returns and had no surprises about the insignificant or negative abnormal returns of the portfolios. We then came to realize that the differentiated ARs based on individual stocks actually may provide good explanations and solutions to the heated smoking ban debates in Macao.

The research method in this study actually is the one discussed by Binder(1998). Extracted from Binder(1998) on Page 124

Tests of the hypothesis that the event affected security prices which examine the average abnormal return, based on estimates of the prediction errors or the estimated gammas in equation (7), will not be very powerful when abnormal returns differ in sign across the <u>sample firms</u>. This asymmetry can be modeled by disaggregating equation (7) into a multivariate regression model (MVRM) system of return equations with <u>one equation for</u> each of the *N* firms (securities) experiencing the *A* events:

$$R_{1t} = \alpha_1 + \beta_1 R_{mt} + \sum_{a=1}^{A} \gamma_{1a} D_{at} + u_{1t}$$

$$R_{2t} = \alpha_2 + \beta_2 R_{mt} + \sum_{a=1}^{A} \gamma_{2a} D_{at} + u_{2t}$$

$$\vdots$$

$$R_{Nt} = \alpha_N + \beta_N R_{mt} + \sum_{a=1}^{A} \gamma_{Na} D_{at} + u_{Nt}.$$
(8)

This methodology, which allows the coefficients to <u>differ across firms</u>, <u>appears to have</u> been first suggested by Gibbons (1980, Appendix H) and first implemented by Binder (1983, 1985a, 1985b) and Schipper and Thompson (1983).^{48,49}

2) Given existence of cross section correlation, Binder (1998) concluded that the degree of bias caused by cross-correlation depends on the number of observations in both the estimation period T and the event period S. When S is small relative to T, the uncorrected (biased) test statistic will be very close to the corrected (unbiased) one. But, when S is relatively large, the bias is substantial. In our study, the event period is only one day, while the estimation periods included are at least 577 days.

Seemingly Unrelated Regression

To address the potential concerns of cross-section correlation, we have performed Seemingly Unrelated Regression (SUR) as the Referee mentioned in Report 1. We adopted SUR because this method can correct correlated errors while generate coefficients for individual stocks.

The preliminary results are reported in the table on the next page. The SUR results are consistent with OLS bootstrapped results without significant difference.

In our final manuscript, we will provide the results of SUR as robustness check in the appendix if necessary.

Firms	AR (2011/02/15)	AR (2014/03/19)	AR (2015/01/29)
Galaxy	-0.0160***	-0.0302***	-0.0110***
	(0.00202)	(0.000796)	(0.00104)
SJM	-0.00584***	-0.000366	0.0151***
	(0.00200)	(0.000775)	(0.000950)
Sands China	0.00467***	0.00566***	0.000684
	(0.00174)	(0.000791)	(0.000906)
Wynne Macao	0.0329***	0.00107	0.00307***
	(0.00168)	(0.000836)	(0.00109)
Melco Crown		-0.00370***	0.00937***
		(0.00115)	(0.00134)
MGM Macao		-0.0192***	-0.00228**
		(0.000834)	(0.00108)

The abnormal returns during Macao smoking ban events (SUR, single market index model)

Note:

- 1. Melco listed on Nasdaq and Nasdaq market index is applied accordingly.
- 2. The test period is from January 1st, 2010 to February 15th, 2011. Melco Crown Entertainment and MGM Macao went public later in 2011.
- 3. The test period for the first four casinos is from 2010.01.01~ 2014.03.20. The test period for Melco Crown Entertainment and MGM Macao is from 2012.01.01~ 2014.3.19.
- 4. The test period is from January 1st, 2012 to January 29th, 2015 for all six firms.
- 5. Bootstrapped (with repetition of 1000 times) standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
- 6. Since we use One-day event window method in this study, there is only one dummy variable for one event window. The AR of one event window actually equals to the CAR of that window.
- 7. Bootstrapped (with repetition of 1000 times) standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
- 8. All results are based on estimation equation: $R_{i,t} = \alpha_i + \beta_i R_{m,t} + \lambda_i D + \varepsilon_{i,t}$.

Testing with multi-factor models

To control for potential contemporary factors other than the market index, we also tested multi-factor model, including market indexes such as Shanghai Stock Exchange Index and International Gaming industry indexes (such as VanEck Vectors Gaming ETF). However, the Macao casinos are not significantly correlated with these indexes and the results have little improvement. As Mackinlay (1997) concluded: "Generally, the gains from employing multifactor models for event studies are limited. The reason for the limited gains is the empirical fact that the marginal explanatory power of additional factors the market factor is small."

Again, in our final manuscript, we will further clarify our explanation about our approach.

2. Details:

Q2.1 Why are the greek letters in equation (3) wearing hats? The expectation of equation (1) is: $E(R_{i,t}) = \alpha_i + \beta_i R_{m,t}$

No hats! Perhaps you meant:

$$\hat{R}_{i,t} = \frac{\hat{\alpha}_i}{\hat{\alpha}_i} + \hat{\beta}_i R_{m,t}$$

In which case the *estimated* abnormal return is:

$$\widehat{AR}_{i,t} = R_{i,t} - \widehat{R}_{i,t}$$

And please subscript the greek letters; since the variables are subscripted for both firm and time the parameters should be subscripted by firm.

Response:

We clarify Equation 2 and 3 as follows,

 $AR_{i,t} = R_{i,t} - E(R_{i,t}|R_{m,t}), \quad (2)$ $E(R_{i,t}|R_{m,t}) = \alpha_i + \beta_i R_{m,t}. \quad (3)$

The coefficients α_i and β_i are the true parameters which will be estimated based on our samples by ordinary least squares.

According to Mackinlay (1997), the fitted values of abnormal returns (based on sample regression results) are as follows (noted as Equation 7 in MacKinlay's paper),

$$\widehat{AR}_{i\tau} = R_{i\tau} - \hat{\alpha}_i - \hat{\beta}_i R_{m\tau}.$$
 (7)

Q2.2 The explanation given for the inclusion of the lagged market return in equation (4) is a puzzle. Lagged values of the market return are usually included in the regression to allow for non-synchronous trading.

Response:

In our final manuscript we have decided to drop the lagged term of the market index and to adopt the single market index model.

As shown in our response letter dated July 16th, there is no significant differences in results using models with or without lagged term of the market index.

Q2.3 Please review the 1988 *Financial Review* paper by Karafiath. The 'event parameter approach'was not introduced in 1988. Karafiath cites earlier papers by Binder, Malatesta, and Thomspon. In the econometrics literature this model specification is now characterized as the

inclusion of 'pulse dummies.' See the paper by Fomby and Murfin in the 2005 *Applied Financial Economics Letters*.

Response:

We will also cite Dufour (1980), Binder(1985), Malatesta(1986), and Thomspon (1985). Binder (1998) mentioned that "this method was apparently first used by Izan (1978). We will cite Izan(1978) too.

Reference:

Binder, J. J. (1985). On the use of the multivariate regression model in event studies. *Journal of Accounting Research*, 370-383.

Binder, J. (1998). The event study methodology since 1969. *Review of quantitative Finance and Accounting*, *11*(2), 111-137.

Borisov, A., Goldman, E., & Gupta, N. (2015). The corporate value of (corrupt) lobbying. *Review of Financial Studies*, hhv048.

Bowen, R. M., & Khan, U. (2014). Market reactions to policy deliberations on fair value accounting and impairment rules during the financial crisis of 2008–2009. *Journal of Accounting and Public Policy*, *33*(3), 233-259.

Chen, L. H., & Khurana, I. K. (2014). The impact of eliminating the Form 20-F reconciliation on shareholder wealth: Evidence from US cross-listed firms. *The Accounting Review*, *90*(1), 199-228.

Dufour, J. M. (1980). Dummy variables and predictive tests for structural change. *Economics Letters*, 6(3), 241-247.

Malatesta, P. H. (1986). Measuring abnormal performance: The event parameter approach using joint generalized least squares. *Journal of Financial and Quantitative Analysis*, 21(1), 27-38.

Izan, Haji Y. "An Empirical Analysis of the Economic Effects of Mandatory Government Audit Requirements." Ph. D. dissertation, University of Chicago, 1978

Thompson, R. (1985). Conditioning the return-generating process on firm-specific events: A discussion of event study methods. *Journal of Financial and Quantitative Analysis*, 20(02), 151-168.

Sefcik, S. E., & Thompson, R. (1986). An approach to statistical inference in cross-sectional models with security abnormal returns as dependent variable. *Journal of Accounting Research*, 316-334.