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Have Restaurant Firms Been Using Right Recession Turnaround Strategies? Evaluating with Propensity Score Measure

Abstract

Among the diverse strategies that restaurants use in recessions, some studies have shown that strategies that increase advertising, profit margins, or asset turnover have yielded promising results in terms of firm performance. However, the success of these turnaround strategies might be due to the health or size of a firm rather than the implementation of these strategies. Therefore, this study empirically tested this question utilizing the propensity score measure (PSM) due to concerns with selection bias across restaurant segments. The results showed significant improvements in revenue for limited-service and franchise restaurants when aggressive advertising was used but no improvements in profitability. The profit margin strategy had no impact on revenue but affected profitability and stock returns positively for all segments. Finally, the asset turnover strategy had adverse effects on revenue the year after a recession for all segments. These mixed results suggest that managers need to be cautious when implementing recession turnaround strategies.

Keywords: *economic recession; propensity score measure; advertisement; profit margin; asset turnover*

1. Introduction

There is no question that restaurant performance is affected by larger economic conditions. For example, the largest decrease in real restaurant growth was recorded by the National Restaurant Association (NRA) during and after the recent recession in 2008. Due to restaurants' negative performance during recessions, revenue and stock returns in the context of recessions have been extensively researched within the hospitality field. Such studies have empirically shown that macro-economic conditions do significantly affect restaurant performance (e.g. Barrows & Naka, 1994; Chan & Lim, 2011; Chen *et al.*, 2005; Koh *et al.*, 2013).

As a response to such fluctuations in economic conditions, firms attempt to alter business strategies. In expansion periods, firms invest in equipment and increase inventory to meet growing demand. In contraction periods, firms tend to adapt to the situation by cutting back on investments and conserve cash to adjust to reductions in consumer spending, growing unemployment, and credit shortages (O'Malley *et al.*, 2011). However, applying cost cutting strategies in recessions, such as reducing stores to increase asset turnover, has been known to have adverse effects both during and after recession periods (Pearce & Michael, 2006). Affiliated businesses may become disloyal or attempt to renegotiate contract terms to change purchasing patterns. Moreover, demand may not pick up as fast as firms expect after recession periods due to decreases in marketing during recession periods (Pearce & Michael, 2006; Barrett *et al.*, 2009). For these reasons, some studies have found that aggressive counter recession turnaround strategies that increase advertisements and operating profit margins are beneficial to revenue and profitability (Clark, 2008; Little *et al.*, 2011; Park & Jang, 2015; Pearce & Michael, 2006). Park & Jang (2015) found that counter-cyclical advertising benefits a restaurant's revenue in the short

term, while Little et al. (2011) found that firms that utilized a differentiating strategy by introducing new products during a recession performed better than firms that used cost reduction strategies. The concept of increasing advertisements is supported by the reasoning that recessions can provide opportunities for firms to increase their market share since other competitors are less likely to invest in advertising at such times (Srinivasan *et al.*, 2011). The results of strategy management research on increasing operating profit margins and asset turnover strategies, which are related to cost efficiency, seem promising in that both strategies had a positive effect on firm performance both during recessions and in the long run (McLaughlin, 1990; Little *et al.*, 2011). Nevertheless, extensive empirical studies as to whether these strategies are truly effective have failed to provide a definite answer because mixed results have been found across diverse industries (Tellis & Tellis, 2009).

Accordingly, this research poses the following question: Do aggressive advertisements, operating profit margins, and asset turnover enhance financial performance in recessions? Or is it simply that restaurants with strong market power or that are not in financial distress are capable of implementing these strategies during economy recessions, which in turn increases firm performance regardless of the strategy? If this is true, then it might point to a selection bias issue in previous studies, which is an endogeneity problem, since the selected healthier firms are more likely to perform better financially in recessions regardless of whether these strategies are implemented. This is problematic for all regression type models that seek to find casual relationships between recession strategies and firm performance since endogeneity generates biased estimates (Li, 2013). To address this issue, this research utilized a propensity score measure (hereafter, PSM), which matches firms based on similar characteristics in terms of size

and leverage to adjust for distributions between firms that implement the strategies and control groups.

A reasonable amount of empirical research supports the possibility of such selection bias where large firms or less distressed firms are capable of choosing recession turnaround strategies that other firms cannot take advantage of. For example, larger firms spend much more on advertising than small firms regardless of the economic situation. Using the COMPUSTAT database from 1988 to 1990, Chauvin and Hirschey (1993) found that the advertising expenses of the largest 20 companies across all sectors were 43 times greater than the average expenditures reported for all sample firms. Moreover, larger firms have more sources to finance debt as opposed to smaller firms in recessions, making larger firms less vulnerable to macro-economic changes (Latham, 2009). A shortage of bank credit hinders new projects or investments for small firms since banks are the primary source for financing capital (Sahin *et al.*, 2011). Firms are also reluctant to change strategies in a recession because they will incur a definite increase in expenses, but the future outcome is uncertain (Mascarenhas & Aaker, 1989). In such situations, financially distressed firms are less likely to implement marketing or operational strategies since credit is scarce in recessions and taking on more risk by increasing expenses or changing strategies can multiply the adverse effects of economic turmoil (Sahin *et al.*, 2011).

In addition to the endogeneity problem of firm size and leverage affecting restaurant strategies, different restaurant segments may also use different strategies in order to endure a recession. It has been noted that restaurant performance varies among restaurant segments in recessions, particularly between full-service restaurants and limited-service restaurants (Koh *et al.*, 2013; Lee and Ha, 2014; Zheng *et al.*, 2013). Studies in restaurant research have found that limited-service restaurants are more utilitarian orientated businesses, while full-service

restaurants are more emotionally orientated businesses (Hanzaee & Rezaeyeh, 2013; Ha & Jang, 2013). For these reasons, the impact of recessions on full-service restaurants is more volatile than for limited-service restaurants (Koh *et al.*, 2015). This difference in volatility might affect recession turnaround strategies at limited and full-service restaurants differently since the treatments are more effective for firms that are more exposed to risk in economic downturns.

The volatility of restaurant firms' performances in a recession is also affected differently based on whether a firm is franchised. Steady cash flows from royalties and franchise fees from franchisees decrease volatility in recession periods compared to non-franchise firms (Koh *et al.*, 2015). Following the same analogy of the difference in treatment effectiveness between segments, non-franchise firms applying recession turnaround strategies may yield better results due to their higher sensitivity to recessions.

In sum, this study divided restaurants into limited and full-service restaurant subcategories, as well as franchise and non-franchise restaurant sub-categories, in order to identify differences in financial performance based on the three recession strategies. This is a unique contribution of this study because these restaurant categories have not previously been investigated in conjunction with economic turnaround strategies. This study further differentiates itself from others by utilizing PSM to control the endogeneity problem of restaurant firms that have greater market shares or less financial distress and, thus, have a higher probability of being able to choose to use recession turnaround strategies. Although this paper is purely exploratory in nature, it is crucial for both restaurant practitioners and investors to better understand whether restaurant segments or franchising affect which firms endured past recession periods since these recession strategies incorporate risk either by increasing costs or altering business strategies under an economy with falling demand and higher uncertainty.

2. Literature review

2.1 Advertisement in recessions

The primary reason to increase advertising expenses is to boost sales by increasing demand or maintaining market share under a competitive structure through brand loyalty (Becker & Murphy, 1993). However, the effect of advertising expenses on sales differs depending on the economic cycle (O'Malley *et al.*, 2011). There are two opposing opinions on the relationship between advertising expenditures and sales in recessions. The dominant theory explaining advertising expenditures and economic cycles suggests that firms follow a pro-cyclical advertising pattern, which supports that firms should adjust advertising costs depending on changes in demand (Kamber, 2002). This argument is supported by the reasoning that other factors, such as price, are more vital to consumption decisions than advertisements. In contrast, other scholars have argued that a counter cyclical advertising strategy, which refers to spending more on additional advertising during a recession, has its benefits (Danaher *et al.*, 2008; Tellis & Tellis, 2009). Singh *et al.* (2005) claimed that advertisements reduce a firm's risk by rendering products less vulnerable to external shocks in terms of consumer demand; firms increase advertising in a recession to gain demand lost by firms that reduced advertising. Empirical results for these two conflicting theories are mixed across all industries and no dominant theory has emerged (Kamber, 2002). For example, Kijewski (1982) reported that reducing advertisements during recessions had no effect on profits, while Kamber (2002) found a strong relationship between aggressive advertising and sales. Within the restaurant research context, Park and Jang's (2015) empirical results showed that increasing advertisements improves the performance of restaurant firms in recessions. Using an error correction model, their study found

that restaurants that advertised during recessions experienced a positive short-term impact on firm revenue but not in the long run.

However, the potential of aggressive marketing alone cannot justify a firm proactively implementing this strategy. Instead, a firm's capability must also be taken into consideration (Srinivasan *et al.*, 2005). Firms have different capabilities depending on their size or leverage that may affect the decision to increase advertising in recessions. Kamber (2002) claimed that larger companies have a greater tendency to spend more, proportionally, on advertising in recessions as opposed to smaller companies. Kamber (2002) reasoned that larger companies have the resources to sustain the impact of a recession and its aftermath due to established market presence and greater access to credit markets.

Further, Grullon and Kanatas, (2006) argued that a negative relationship exists between financial leverage and advertising expenses. This is because leverage increases the probability of financial distress, which in turn causes a firm to be less aggressive in terms of advertising expenditures due to concerns about losing the value of the investment. Moreover, Grewal and Tansuhaj (2001) found that high leveraged firms had limited strategic options. Myers (1977) also explained that financially distressed firms with greater leverage are also affected by agency problems because bondholders and shareholders are reluctant to spend more on advertisements. The findings of past literature on the relationship between firm performance and both firm size and leverage call into question whether increases in advertising expenses during a recession truly effect firm performance or whether it is simply that firms that have stronger market power or are in less distress tend to do better in recessions regardless. Further, the likelihood of these companies increasing advertising expenses is greater than for smaller or financially distressed firms.

2.2 Operating profit margins and asset turnover strategies in recessions

In a recession period demand reduces significantly, which negatively affects revenue (Shama, 1980). To respond to changes in the economy, firms are forced to implement different strategies to either stimulate demand or increase efficiency (Little *et al.*, 2011). One way that firms stimulate demand is to introduce new products with higher profit margins. Using 111 retail companies, Little *et al.* (2011) empirically found that during the 2008 recession firms that utilized the operating profit margin strategy rather than increasing efficiency, such as implementing the asset turnover strategy, were more profitable. In the restaurant industry, the primary source of operating income is based on food costs (Mun & Jang, 2018). To increase the margins of food costs, restaurants can offer more expensive menus with better quality ingredients (Mun & Jang, 2018). However, a significant increase in prices can have an adverse effect on demand. In other words, quantity may decrease as higher priced menus are offered (Min & Min, 2011). Introducing new products with increased prices in a recession may seem counter intuitive. However, Srinivasan *et al.* (2011) explained that since demand is already decreasing due to economic conditions, firms that apply such strategies need special new products to differentiate themselves from competitors. In sum, although it has not been determined whether revenues increase during recession periods if firms utilize the profit margin strategy, the previous literature implies that firms do experience increased profitability during a recession if the strategy succeeds.

As for asset turnover, Soliman (2008) defined asset turnover as the utilization and efficiency of assets in inventory and working capital. More specifically, an asset turnover strategy in recessions refers to reducing long-term assets, such as fixed assets, and short-term

assets, such as inventory, to enhance asset utilization efficiency (Bibeault, 1982). Palepu and Healy (2008) suggested that firms that pursue low cost strategies maintain tight controls and generate high asset turnover and low profit margins. The empirical findings of Fairfield and Yohn (2001) showed a relationship between changes in asset turnover and the forecast for changes in returns on assets in the following year, which emphasizes the importance of asset efficiency and firm profitability. Some researchers in strategy management have argued that turnaround strategies are required in recessions, and firms should confront the negative effects by cutting costs or inefficient assets (Bibeault, 1982; Pearce & Robbins, 1993). However, the oversimplified statement that cutting costs or assets during a recession leads to higher profitability has been severely criticized, especially when deep cost reductions are applied. For example, McLaughlin (1990) found that companies that apply moderate cost cuts during recessions not only survive in the long run but also grow faster in terms of market-share than competitors that made extreme cuts in costs. Further, Srinivasan *et al.*'s (2005) empirical studies found no effect on firm performance when cost cutting strategies are implemented in recessions.

Nevertheless, similar to advertising, the likelihood of using the profit margin strategy or asset turnover strategy can be affected by a firm's market power and financial health. A company must take risks to achieve higher profit margins because the demand for new products is unpredictable (Fisher, 1997). Restaurants with stronger market power or that are less distressed might have more room to take such risks and introduce new higher profit margin products in a recession. Further, in general firms with greater market share typically have higher profitability regardless of economic conditions. Using Profit Impact of Market Strategies (PIMS) data, Buzzell *et al.* (1975) supported this notion and claimed that economies of scale, market power to negotiate costs, and quality of management are all possible reasons that larger firms have higher

profit margins. Moreover, large firms are more likely to engage in innovative activities. Acs and Audretsch (1987) argued that in industries that are not in a later lifecycle phase, larger firms are more innovative than smaller firms when larger firms have the advantage of economies of scale and market power through advertisements.

In terms of asset turnover strategies, larger firms with greater market shares are more likely to have higher sales turnover due to improved productivity, better asset management, and superior investments (Ghosh, 2004). By using acquisition data, Ghosh's (2004) empirical results found that an increase in market shares positively related to better asset turnover and, in turn, increased profitability in the long run, which is an example of increasing market shares. In recessions, highly leveraged firms are also more likely to increase asset turnover by implementing asset divestment. Firms that are financially distressed and unhealthy are more likely to divest assets that do not generate profits or are not core assets (Sudarsanam & Lai, 2001). For these reasons, the possibility of selection bias due to firm characteristics such as size and leverage affecting the likelihood of choosing operating profit margin strategy or asset turnover strategy may exist. If this is true, then firms that implemented recession turnaround strategies did not perform better due to these treatments but due to their market share and financial health instead.

2.3 Leisure products in economic recessions

The menu items offered by restaurants are considered leisure products, which are non-essential goods that are associated with emotional values (Kivetz & Simonson, 2002; Tribe, 2011). There are two distinct, commonly agreed upon aspects of leisure goods: (1) they are associated with emotional, or hedonic, value and (2) households will choose essential products

before leisure goods when discretionary income is scarce but try to enjoy more leisure goods when discretionary income is ample. As an example, Shama (1980) found that during economic recessions, people purchase more food at supermarkets and reduce spending on eating out. From a restaurant perspective, revenue consists of both price and quantity, where quantity is a function of demand (Cachon & Lariviere, 2005). If consumers forfeit leisure products first in economic downturns, then companies that sell goods based largely on hedonic value will experience larger decreases in demand. This can be denoted as

$$\Delta Revenue_1 \approx Price \times \Delta f(Hedonic_1) < \Delta Revenue_2 \approx Price \times \Delta f(Hedonic_2)$$

subject to the discretionary budget line in economic recessions where $Hedonic_1 < Hedonic_2$.

Further, Lee and Ha (2012) found that the primary reason for lower sales at full-service restaurants during recessions was because of lower demand, although hedonic value was not explicitly cited. Moreover, Stiglitz (1984) claimed that prices are less likely to be lowered in recessions if lower prices signal lower quality. These findings support the possibility that lower demand during recessions is a result of decreased household income rather than lower prices.

2.4 Differences in consumption for limited and full-service restaurants in recessions

Utilitarian consumer behavior is described as a functional or task-related standpoint that is often thought of as similar to work (Babin *et al.*, 1994; Batra & Ahtola, 1990). In contrast, Holbrook and Hirschman (1982) described hedonic consumer behavior as seeking “fun, fantasy, arousal, sensory stimulation, and enjoyment.” Numerous restaurant studies have found that restaurant segments embody different mixes of utilitarian and hedonic value. Accordingly, consumers choose a restaurant segment based on which one will maximize utility in a particular situation. Hanzaee and Rezaeyeh (2013) investigated fast food restaurants and found that

utilitarian value had a stronger influence on behavioral intentions than hedonic value.

Furthermore, Ha and Jang (2013) examined the main attributes of varied restaurant segments and concluded that casual restaurants and fine dining restaurants are largely associated with emotional, or hedonic, values. In sum, the findings indicated that QSRs offer the least hedonic value, then casual dining restaurants, and finally fine dining restaurants possess the most hedonic value, which can be denoted as

$$\text{Hedonic values} = \{H_{\text{QSR}} < H_{\text{Casual}} < H_{\text{Fine dining}}\}$$

where, H = Hedonic values.

If people are more willing to change consumption behaviors associated with hedonic values rather than utilitarian values in economic recessions, then how much a restaurant's financial performance decreases will differ across full-service and limited-service restaurants as well. The findings of Koh *et al.* (2013) support this notion. The study found that limited-service restaurants outperform full-service restaurants during recessions. The findings imply that in recessions the volatility of full-service restaurants' performances in terms of revenue is greater than limited-service restaurants. In sum, a restaurant's financial performance may decrease in a recession due to reduced discretionary spending. Accordingly, financial performance drops more significantly for full-service restaurants than limited-service restaurants. This difference can affect the three recession strategies in this study since full-service restaurants are more exposed to macro risks and more likely to benefit from implementing these strategies than limited-service restaurants.

2.5 Difference between franchise and non-franchise firms in recessions

Ketchen *et al.* (2006) claimed that the profitability of strategic-groups, such as franchises, varies by industry. In the hospitality industry franchising is one of the most dominant and successful business strategies for expansion (Hoover, 2003). Aside from its other merits, when restaurant firms are expanding, franchising has also been found to reduce volatility by stabilizing earnings in recession periods (Koh *et al.*, 2015). In general, franchise firms tend to have lower failure rates than independent restaurants (Hua & Templeton, 2010). This is because operational risk is lowered by stable income from franchise fees and consistent royalties, which generates a sustainable cash flow even in recessions (Roh, 2002). Sohn *et al.* (2014) compared franchise and non-franchise firms' betas, which significantly differed in expansion and recession periods. They found that lodging firms that use asset-light franchising strategies have steady income compared to non-franchise firms in recession periods due to stable fees from franchisees. Similarly, Koh *et al.* (2015) found that franchise restaurant firms tend to be less volatile in recessions and argued that the steady income from fees and royalties temper fluctuations in firm performance. Franchise firms showed a flatter U-shaped curve than non-franchise firms in response to extreme economic conditions, which indicates that franchise firms experience less volatility in recessions compared with non-franchise firms. The results of past empirical research suggest the possibility that the effects of recession strategies differ depending on whether the firm is franchised. If firms that experience more volatility in recessions experience a stronger treatment effect, then non-franchise restaurants would have better results when implementing recession turnaround strategies due to their greater volatility.

3. Methodology

3.1 Data and variables

To empirically test how different strategies impact changes in revenue, profitability, and stock returns during economic recessions, a total of 180 observations were collected through COMPUSTAT from 1990 to 2010. To determine when recessions occurred, this study followed NBER's recession periods in 1991, 2001, and 2008. Annual restaurant firm revenue and stock prices were collected using COMPUSTAT. Annual revenue was later transformed into change in revenue ($\Delta\text{Revenue}$) from the previous year as a percentage. Stock prices were later transformed to stock returns of $t-1$, which is the return from the previous year as a percentage after adjustments for dividends and splits to avoid unreal increases or decreases in stock returns. Limited-service and full-service restaurants were divided by North American Industry Classification Systems (NAICS) codes. A dummy variable was created afterwards with limited-service restaurants given the value of zero and full-service restaurants given the value of one. To identify franchise and non-franchise firms, each firm's 10-k report listed in the SEC website (<https://www.sec.gov>) was used to identify whether the firm was franchised and earned royalties or fees from franchisors. A dummy variable was then created, where franchise firms were given the value of one and zero otherwise. Total assets of each company i at time t were collected through COMPUSTAT and used to control for firm size. Debt over stockholder's equity was collected through COMPUSTAT as well and used to control for each firm's leverage. Size and leverage were later squared to include possible non-linear relationships within the model. Sales, net income, and total assets were collected through COMPUSTAT. Return on assets (hereafter, ROA) and return on sales (hereafter, ROS) were calculated to use as dependent variables.

Dummy variables were also created for the three recession strategies. A dummy variable for increase in advertisements during a recession was given the value of one if advertising expenses over Sales of firm i increased from $t-1$ in the recession and zero otherwise. The dummy

variable for Operation Profit Margin was given the value one if Operating profit margin (measured as Operating income over Sales where Operating income = Sales – Cost of Sales – Operating Expenses) of firm i was higher than $t-1$ in recession periods and zero otherwise. Finally, the dummy variable for increased Asset turnover in recession periods was given the value of one if Asset turnover (measured by Sales over Net Operating Asset where Net Operating Asset = Accounts receivable + Inventory + Net Property, Plant, and Equipment) for firm i was higher than $t-1$ in the recession and zero otherwise.

3.2 Propensity score matching (PSM)

This study utilized PSM due to potential selection bias since larger firms or less distressed firms are more likely to implement aggressive advertising, operation efficiency, and asset turnover strategies. In such cases, the firms that implement these strategies would already have better revenues, ROAs, ROSs, and stock returns prior to the recession because they are healthier firms *before* implementing the above recession strategies. PSM is often used in labor economics research and medical research (Dehejia & Wahba, 1999; Li, 2013; Wolfe & Michaud, 2004) to identify the average treatment effect for the treated, which can be denoted by

$$\tau_{ATT} = E[Y(1)|D = 1] - E[Y(0)|D = 1]$$

where $E[Y(1)|D = 1]$ is the success of the strategy ($Y(1)$) conditioned on the firm implemented the strategy ($D = 1$) minus $E[Y(0)|D = 1]$ the failure of the effect of the strategy ($Y(0)$) conditioned on the firm implemented the strategy ($D = 1$). However, in non-experimental studies and regressions the dummy variable is used for firms that are $E[Y(0)|D = 0]$, which is the failure of the effect of the strategy ($Y(0)$) conditioned on firms that did not implement the strategy ($D = 0$). In mathematical terms this means

$$E[Y(1)|D = 1] - E[Y(0)|D = 0] = \tau_{ATT} + E[Y(0)|D = 1] - E[Y(0)|D = 0]$$

and if $E[Y(0)|D = 1] - E[Y(0)|D = 0] \neq 0$, estimators of regression are biased. However, one problem arises when using ATT, which the counterfactual outcomes of $E[Y(0)|D = 1]$ and $E[Y(1)|D = 0]$ cannot be observed. However, this can be reconstructed by utilizing PSM, which captures the likelihood of study participants based on observable variables. The main objective is to replace as many confounding variables as possible, which are firm variable characteristics that make it more likely a firm will choose a particular strategy, in order to find the true causal relationship between each strategy and firm performance in recessions. Although there are diverse matching methods, this study used the 3-nearest neighbor and Kernel matching methods, which are standard matching methods used in economics papers to verify the casual relationship between recession turnover strategies and firm performance.

4. Results

4.1 Descriptive analysis and the role of market share and distress regarding the three strategies

Table 1 presents the descriptive results divided by limited-service, full-service, franchise, and non-franchise restaurants. When dividing the sample by limited and full-service restaurants, this study found that on average full-service restaurants did better than limited-service restaurants in terms of changes in revenue during the recession periods. However, the standard deviation was higher for full-service restaurants, which indicates that the variation is larger for full-service restaurants. This supports the findings of Koh *et al.* (2013). When dividing the same data into franchise and non-franchise firms, the results show that non-franchise firms did better in terms of changes in revenue than franchise firms in recessions. However, the standard deviation was also higher for non-franchise firms, which supports the findings of Koh *et al.*

(2015) that non-franchise firms experience greater volatility than franchise firms in recessions. When comparing strategies across segments, the results showed that limited and full-service restaurants had a similar percentage of restaurants, approximately 64 percent, that increased advertising expenses during the recessions. However, when comparing franchise and non-franchise firms' aggressive advertising strategies, the results showed that 72 percent of franchise firms increased their advertising expenses, while 54 percent of non-franchise firms increased their advertising expenses. Both limited-service restaurants and franchise firms used the profit margin strategy more than full-service and non-franchise restaurants. However, full-service and non-franchise firms used asset turnover strategies more than limited-service and franchise restaurants. This inverse relationship between the profit margin strategy and the asset turnover strategy could indicate that full-service and non-franchise firms have fewer ways to finance credit during recessions and, therefore, instead sell assets to increase efficiency in recessions.

(Please insert table 1 here)

Table 2 summarizes the relationship between the recession strategies and firm size and leverage. Using a probit model, this study found that size and leverage have a weak relationship with all recession turnaround strategies, whereas only advertising expenses for full-service restaurants showed significant results. The findings showed that restaurant firms do not choose strategies based on their market size or financial condition. However, this does not indicate that PSM cannot be implemented. Based on a monte-carlo simulation, the findings of Brookhart *et al.* (2006) showed that covariates that are unrelated to the treatment but related to the outcome

increase the precision of the estimated treatment effect without increasing bias and, thus, should be included in the model.

(Please insert table 2 here)

4.2 Propensity score before and after matching

PSM graphs were used as diagnostics to identify whether each firm that used an aggressive strategy during a recession was properly matched based on similar values on the propensity scores. As an example, Figures 1 and 2 are the propensity scores for the aggressive strategy group observations and the control group observations both before and after matching limited and full-service restaurants, respectively, using nearest neighbor matching. For both figures, the left columns are before matching, while the right columns are after matching. Each row represents the aggressive advertising strategy, profit margin strategy, and asset turnover strategy, respectively. As shown in both figures 1 and 2, there are significant improvements in propensity scores for aggressive advertising after using nearest neighbor matching. However, other strategies showed improvements as well.

(Please insert figure 1 here)

(Please insert figure 2 here)

4.3 The three strategies across restaurant segments

Tables 3-1 and 3-2 present the empirical results for limited and full-service restaurants. ATT_i indicates the average treatment effect on the treated for year i , where 0 indicates the ATT

during the recession year and 1 and 2 indicate the ATT after the recession at year $t+1$ and $t+2$, respectively. *Unmatched* is the difference between the treated and untreated groups with no matching methods, whereas 3 *Nearest Neighbor* and *Kernel* are the matching methods between the treated and untreated groups by size and leverage. Using PSM, the results showed that limited-service restaurants were only significant during recessions, while full-service restaurants showed no significance after matching for firm size and leverage. When observing the effect of increases in advertisements during a recession in the long-run, no effect was found for either segment. The findings confirmed Park and Jang's (2014) empirical findings that counter cyclical advertising is a short-term strategy and extended their study by revealing that only limited service restaurants benefited from this strategy in past recessions. However, in terms of return on assets (hereafter, ROA), return on sales (hereafter, ROS), and stock returns, increases in advertising had no significance across either segment during or after the recession. The results showed that although advertising might increase demand, it does not lead to higher earnings due to the costs embedded in the strategy, which stockholders also consider when investing in a firm.

The empirical results for changes in revenue due to the profit margin strategy showed both limited and full-service restaurants to have no significance across either segment. However, in terms of profitability, ROA and ROS showed positive and significant results, which indicates that higher efficiency products are successful when properly initiated during recessions. More interestingly, both ROA and ROS were both positively carried over to $t+1$ for limited-service restaurants using operation profit margin strategies. With respect to stock returns, all segments experienced higher returns during recession periods when implementing the profit margin strategy. However, full-service restaurants that used the profit margin strategy during the

recession experienced lower returns than full-service restaurants that did not after a one-year period.

Finally, for the asset turnover strategy, empirical results showed positive significance across segments for changes in revenue for firms that implemented the strategy during recessions but negative significance in the following years. The result implies that although asset turnover strategies have been shown to increase changes in revenue in the short-run, firms that implemented this strategy performed worse in later periods than firms that did not implement the strategy during a recession. Moreover, the strategy did not affect either profitability indicators or stock returns.

(Please insert table 3-1 here)

(Please insert table 3-2 here)

4.4 The three strategies across franchise and non-franchise restaurants

Tables 4-1 and 4-2 display the empirical results for the three strategies across franchise and non-franchise firms. For the advertising strategy, the results showed that only franchise firms had a positive change in revenue in comparison with firms that did not implement the strategy during the recessions. However, no significance was found between non-franchise firms that implemented aggressive advertising strategies and non-franchise firms that did not implement the strategy. Even worse, firms that implemented the strategy experienced greater losses than non-franchise firms that did not use the strategy. The results indicated several reasons to practice great caution when implementing the advertising strategy for non-franchise firms. In terms of profitability, ROA and ROS showed mixed results, where *3 Nearest Neighbor* or *Kernel*

matching methods showed either significant results or no results. Thus, this study failed to confirm the effects of aggressive advertising strategies on profitability. Furthermore, stock returns showed no results across franchise and non-franchise restaurants.

The results showed that for non-franchise firms the profit margin strategy had no effect on revenue during the recession but generated positive and significant differences in ROA and ROS the following year. However, it is interesting that the positive impact of the strategy was not priced in stock returns in the following years; firms that used the strategy had lower returns than firms that did not implement the strategy.

Finally, the results for the asset turnover strategy showed that all franchise and non-franchise restaurants significantly underperformed in terms of revenue in the following year compared to firms that did not use the strategy. The case was much worse for non-franchise firms, since firms that used aggressive asset turnover strategies showed no difference from firms that did not use the strategy during recession periods. Profitability and stock returns should be approached with even greater caution for non-franchise firms implementing this turnover strategy because the results were worse compared to non-franchise firms that did not use this strategy. However, stock returns were higher in the following year for non-franchise firms that implemented turnover strategies than non-franchise firms that did not use the strategy.

(Please insert table 4-1 here)

(Please insert table 4-2 here)

5. Conclusions

This study attempted to contribute the literature related to restaurant turnaround strategies used in recessions by: (1) controlling for the endogeneity problem of restaurants firms that have stronger market power or are less distressed before the recession being more likely to implement these strategies and (2) investigating the heterogeneous outcomes in financial performance by each segment when these strategies are implemented.

In terms of theoretical contributions, the empirical results extended the literature by potentially answering questions that were left unanswered by previous studies. First, the results for aggressive advertising in recessions re-confirmed Park and Jang's (2015) findings that this strategy is effective only in the short term. This study also extended Park and Jang's (2015) paper by empirically showing that only limited-service and franchise restaurants that implemented the advertising strategy had higher changes in revenue compared to firms that did not. However, the strategy was strictly strategic in the sense that there was no real increase in firm value since profitability and stock returns showed no positive significance when the strategy was implemented. Moreover, non-franchise firms experienced lower changes in revenue in the following year.

As for the profit margin strategy, the results showed differences by segment, which has some implications for practitioners. There was no effect on changes in revenue but positive effects on profitability indicators during the recession. Moreover, the treatment for limited-service and non-franchise firms had positive effects that lasted through the following year. However, non-franchise restaurants that used the profit margin strategy had lower stock returns in the following years than non-franchise restaurants that did not use the strategy despite the positive impact of the treatment in the following years. For asset turnover strategies, limited-service, full-service, and franchise firms showed positive effects during the recession but

performed worse than firms that did not implement the strategy. One intriguing point to mention is that stock returns showed a positive effect from the strategy in the following years. This might be due to investors considering asset restructuring as a positive signal in the following years. The empirical results showed that extreme caution should be exercised when non-franchise firms implement recession strategies, particularly the aggressive advertising and asset turnover strategies. Overall, the results of this empirical study showed that implementing these recession strategies are challenging and the returns may not be as promising as believed. Thus, it is important for practitioners to reconsider such strategies to ensure that there is a solid reason for using them.

Although this study potentially fills in some gaps in the previous literature, it also has limitations. PSM controls for selection bias, but the model depends on both the variables that affect the likelihood of the firm implementing the strategy and those that affect the dependent variable. Based on previous literature, this research study used firm size and leverage, which turned out not to have a strong relationship with recession strategies with the exception of full-service restaurants using the aggressive advertising strategy. However, there might be additional variables to consider in future research. In addition, since the recession strategy was considered as a treatment, the results of the study were not able to capture the difference in magnitude of each strategy since it was treated as a dummy variable.

For further research, investigating whether different proportions of franchising affect recession strategies differently might be intriguing. Bradach (1997) and Lewin-Solomons (2000) suggested that a firm can maximize its financial performance by creating synergy between company owned and franchise units. Moreover, the findings of Hsu and Jang (2009) showed an inverted U-shaped firm performance depending on the proportion of franchised restaurants, with

the optimal proportion of franchise restaurant firms ranging from 37 to 46 percent. The findings of past research open up the possibility of a relationship between percentage of franchise firms and recession turn around strategies. In other words, performance might be affected differently by recession turnaround strategies depending on the percentage of franchise firms. Finally, comparing results between combined segments, such as franchise limited-service firms and franchise full-service firms or firms that choose multiple strategies, might also reveal new findings outside the scope of this research.

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Table 1
Descriptive analysis by restaurant segment

	ΔRev	<i>Stock returns</i>	<i>ROA</i>	<i>ROS</i>	<i>Size</i>	<i>Lev</i>	<i>Ad exp strategy</i>	<i>Profit margin strategy</i>	<i>Asset turnover strategy</i>
Limited-service μ	.082	.157	-.062	-.030	1345	.675	.649	.488	.413
Limited-service σ	.163	.874	.473	.317	4100	.495	.481	.503	.495
Full-service μ	.105	.094	-.017	-.034	240.1	.690	.642	.388	.487
Full-service σ	.275	1.21	.104	.180	442.4	.507	.482	.489	.502
Franchise μ	.086	.156	.021	.022	1055	.644	.716	.487	.417
Franchise σ	.210	.782	.089	.101	3532	.477	.715	.502	.495
Non-Franchise μ	.097	.122	-.032	-.058	266.3	.672	.535	.296	.528
Non-Franchise σ	.202	1.66	.112	.189	753.8	.443	.505	.461	504

ΔRev is the annual change in revenue during a recession; *Stock returns* is the annual change in fiscal stock prices; *ROA* is the return on assets; *ROS* is the return on sales; *Size* is the total assets of firm *i*; *Lev* is the total debt over stockholder's equity; *Ad exp strategy* is the dummy variable for aggressive advertising strategy; *Profit margin strategy* is the dummy variable for aggressive profit margin strategy; *Asset turnover strategy* is the dummy variable for aggressive asset turnover strategy. μ represents the mean. σ represents the standard deviation.

Table 2

Summary of the independent variables used in the probit regression model

Limited vs. Full Service Restaurants						
<i>Dependent variable</i>	<u>Ad exp strategy</u>		<u>Profit margin strategy</u>		<u>Asset turnover strategy</u>	
	Limited-service	Full-service	Limited-service	Full-service	Limited-service	Full-service
<i>Size</i>	-.000 (.000)	.001* (.001)	.000 (.000)	-.000 (.000)	.000 (.000)	-.001 (.000)
<i>Lev</i>	-.703 (.551)	-.921* (.523)	-.763 (.616)	.162 (.447)	.136 (.332)	-.065 (.443)
$\Delta Rev (t-1)$	.213 (1.53)	-.428 (1.25)	-.711 (1.52)	.937 (1.14)	.806 (1.45)	.315 (1.11)
$\Delta Rev (t-2)$	-.396 (1.18)	.193 (.916)	-.633 (1.02)	-.923 (.851)	.717 (1.01)	.458 (.829)

Franchise vs. Non-Franchise Restaurants						
<i>Dependent variable</i>	<u>Ad exp strategy</u>		<u>Profit margin strategy</u>		<u>Asset turnover strategy</u>	
	Franchise	Non-franchise	Franchise	Non-franchise	Franchise	Non-franchise
<i>Size</i>	-.000 (.000)	.002 (.001)	.000 (.000)	-.000 (.001)	.000 (.000)	.000 (.001)
<i>Lev</i>	-.619 (.435)	-.569 (.656)	-.346 (.344)	-.532 (.783)	.114 (.302)	-.169 (.610)
$\Delta Rev (t-1)$	.320 (1.31)	-.827 (1.60)	-.286 (1.23)	.522 (1.63)	2.35** (1.20)	2.58 (1.68)
$\Delta Rev (t-2)$	.188 (1.02)	-.013 (1.18)	-2.03** (.975)	.563 (1.21)	-.159 (.826)	2.81** (1.40)

* > 0.10, ** > 0.05, and *** > 0.01

Table 3-1

Intertemporal Treatment Effects of Aggressive Advertising, Operating Profit Margins (OPM), and Asset Turnover (AT) for Limited and Full-Service Restaurants

	Limited-service restaurants			Full-service restaurants		
	<i>Unmatched</i>	<i>3 Nearest Neighbor Matching</i>	<i>Kernel Matching</i>	<i>Unmatched</i>	<i>3 Nearest Neighbor Matching</i>	<i>Kernel Matching</i>
Increase in Advertising on ΔREV						
ATT ₀	.088***	.067**	.071**	.066*	.005	.030
ATT ₁	-.070	-.091	-.075	-.019	-.041	-.045
ATT ₂	-.031	-.023	-.023	.074*	.066	.047
Operating Profit Margin on ΔREV						
ATT ₀	.000	.020	.017	-.016	-.002	-.004
ATT ₁	-.034	-.067	-.036	.025	.042	.049
ATT ₂	.002	-.014	-.007	.068*	.062	.082*
Asset turnover on ΔREV						
ATT ₀	.042*	.043*	.065**	.088***	.101***	.077**
ATT ₁	-.114**	-.111*	-.127**	-.012	-.058*	-.047*
ATT ₂	-.016	.000	-.013	.044	.022	.032
Increase in Advertising on ROA						
ATT ₀	.010	.012	.020	.060**	.019	.007
ATT ₁	-.049*	-.044	-.048	-.023	-.041	-.040
ATT ₂	-.013	.005	-.006	.019	-.013	-.014
Operating Profit Margin on ROA						
ATT ₀	.037**	.062**	.035*	.058**	.067**	.071**
ATT ₁	.057**	.085**	.085**	.033	-.018	.046
ATT ₂	.005	-.026	-.020	.021	.024	.023
Asset turnover on ROA						
ATT ₀	.021	.018	.008	-.020	-.011	-.025
ATT ₁	-.006	-.011	-.023	-.033	-.032	-.042
ATT ₂	-.015	-.024	-.019	.023	-.014	-.013

* > 0.10, ** > 0.05, and *** > 0.01

ATT_{*i*} indicates the average treatment effect of treated at time *i*. Increase in advertising is a dummy variable where the value was 1 if advertising expenses / Sales of firm *i* increased from *t*-1 in the recession and 0 otherwise. Operating Profit Margin is a dummy variable where the value was 1 if Operating profit margin (measured by Operating income / Sales where Operating incomes = Sales – Cost of Sales – Operating Expenses) for firm *i* was higher than *t*-1 in the recession and 0 otherwise. Asset turnover is a dummy variable where the value was 1 if Asset turnover (measured by Sales / Net Operating Asset where Net Operating Asset = Accounts receivable + Inventory + Net Property, Plant, and Equipment) for firm *i* was higher than *t*-1 in the recession and 0 otherwise.

Table 3-2

Intertemporal Treatment Effects of Aggressive Advertising, Operating Profit Margin (OPM), and Asset Turnover (AT) for Limited and Full-Service Restaurants

	Limited-service restaurants			Full service restaurants		
	<i>Unmatched</i>	<i>3 Nearest Neighbor Matching</i>	<i>Kernel Matching</i>	<i>Unmatched</i>	<i>3 Nearest Neighbor Matching</i>	<i>Kernel Matching</i>
Increase in Advertising on ROS						
ATT ₀	.008	.012	.013	.036**	.017	.007
ATT ₁	-.026	-.021	-.022	-.012	-.018	-.020
ATT ₂	.002	.013	.008	.007	-.008	-.008
Operating Profit Margin on ROS						
ATT ₀	.036**	.034*	.021	.032**	.035**	.039**
ATT ₁	.045**	.055**	.054**	.017	-.004	.026
ATT ₂	.011	-.011	-.010	.005	.008	.008
Asset turnover on ROS						
ATT ₀	.015	.021	.002	-.012	-.009	-.015
ATT ₁	-.009	-.011	-.021	-.022	-.025	-.026
ATT ₂	.002	-.007	-.007	.004	-.010	-.009
Increase in Advertising on Stock returns						
ATT ₀	.241	.176	.217	.038	-.127	-.165
ATT ₁	.007	-.120	-.009	-.060	.064	.057
ATT ₂	-.720	-1.11*	-.872*	.018	-.032	-.109
Operating Profit Margin on Stock returns						
ATT ₀	.728**	.490**	.543**	.742**	.809**	.791**
ATT ₁	.084	.172	.240	-.216	-.601**	-.400*
ATT ₂	-.641	-.911	-.846	.109	-.059	.014
Asset turnover on Stock returns						
ATT ₀	-.579**	-.161	-.466	-.167	-.436	-.338
ATT ₁	-.022	-.147	-.019	-.009	.108	.008
ATT ₂	-.485	-.148	-.193	.439**	.474**	.429**

* > 0.10, ** > 0.05, and *** > 0.01

Table 4-1

Intertemporal Treatment Effects of Aggressive Advertising, Operating Profit Margin (OPM), and Asset Turnover (AT) for Franchise and Non-Franchise Restaurants

	Franchise restaurants			Non-Franchise restaurants		
	<i>Unmatched</i>	<i>3 Nearest Neighbor Matching</i>	<i>Kernel Matching</i>	<i>Unmatched</i>	<i>3 Nearest Neighbor Matching</i>	<i>Kernel Matching</i>
Increase in Advertising on ΔREV						
ATT ₀	.101***	.078**	.074**	.047	.072	.061
ATT ₁	-.022	-.008	-.032	-.061	-.088*	-.093*
ATT ₂	.030	.029	.029	.033	.015	.055
Operating Profit Margin on ΔREV						
ATT ₀	-.041	-.028	-.025	.091**	.046	.052
ATT ₁	-.013	.004	.006	.077	.054	.050
ATT ₂	.028	.039	.029	.071	.038	.013
Asset turnover on ΔREV						
ATT ₀	.074**	.059**	.055*	.034	-.000	.020
ATT ₁	-.082**	-.118**	-.095**	-.014	-.109*	-.096*
ATT ₂	.014	-.000	-.003	.010	-.034	-.013
Increase in Advertising on ROA						
ATT ₀	.005	-.006	-.009	.056	.100*	.059
ATT ₁	-.061	-.090*	-.065	.005	-.011	-.012
ATT ₂	.009	.001	.011	-.048	-.004	.011
Operating Profit Margin on ROA						
ATT ₀	.035*	.018	.023	.037	.017	.026
ATT ₁	.018	.041	.016	.063	.082*	.079*
ATT ₂	-.000	.006	.002	.037	.017	.006
Asset turnover on ROA						
ATT ₀	.009	.005	-.010	-.054*	-.066*	-.069*
ATT ₁	-.053	-.024	-.026	.028	.002	.017
ATT ₂	-.015	-.020	-.022	.040	.026	.062

* > 0.10, ** > 0.05, and *** > 0.01

Table 4-2

Intertemporal Treatment Effects of Aggressive Advertising, Operating Profit Margin (OPM), and Asset Turnover (AT) for Franchise and Non-Franchise Restaurants

	Franchise restaurants			Non- Franchise restaurants		
	<i>Unmatched</i>	<i>3 Nearest Neighbor Matching</i>	<i>Kernel Matching</i>	<i>Unmatched</i>	<i>3 Nearest Neighbor Matching</i>	<i>Kernel Matching</i>
Increase in Advertising on ROS						
ATT ₀	.005	-.003	-.010	.035	.067*	.037
ATT ₁	-.032*	-.037	-.030	.004	.001	-.004
ATT ₂	.010	.006	.015	-.028	-.017	-.014
Operating Profit Margin on ROS						
ATT ₀	.030**	.011	.015	.016	.014	.011
ATT ₁	.018	.023	.010	.034	.053*	.046*
ATT ₂	.003	.007	.003	.013	.008	.000
Asset turnover on ROS						
ATT ₀	.011	.007	-.005	-.040**	-.050**	-.042*
ATT ₁	-.029*	-.016	-.022*	-.002	-.024	-.012
ATT ₂	-.003	-.010	-.009	.010	.006	.017
Increase in Advertising on Stock returns						
ATT ₀	.200	.114	.152	-.046	.059	.094
ATT ₁	-.111	-.014	.021	.147	-.019	-.208
ATT ₂	-.107	-.046	-.042	.120	.805	1.41
Operating Profit Margin on Stock returns						
ATT ₀	.568***	.544***	.580***	1.48**	1.47	1.55
ATT ₁	-.119	-.277	-.201	-.374	-.612**	-.533**
ATT ₂	-.023	-.006	-.016	-.218	-.122	-.207
Asset turnover on Stock returns						
ATT ₀	-.192	-.241*	-.280*	-.895	-1.52**	-1.57**
ATT ₁	-.113	-.121	-.227	.418*	.374*	.626**
ATT ₂	.050	.165**	.095	.093	.555	.095

* > 0.10, ** > 0.05, and *** > 0.01

Figure 1

Propensity scores before/after matching firms that implemented the strategies for limited-service restaurants

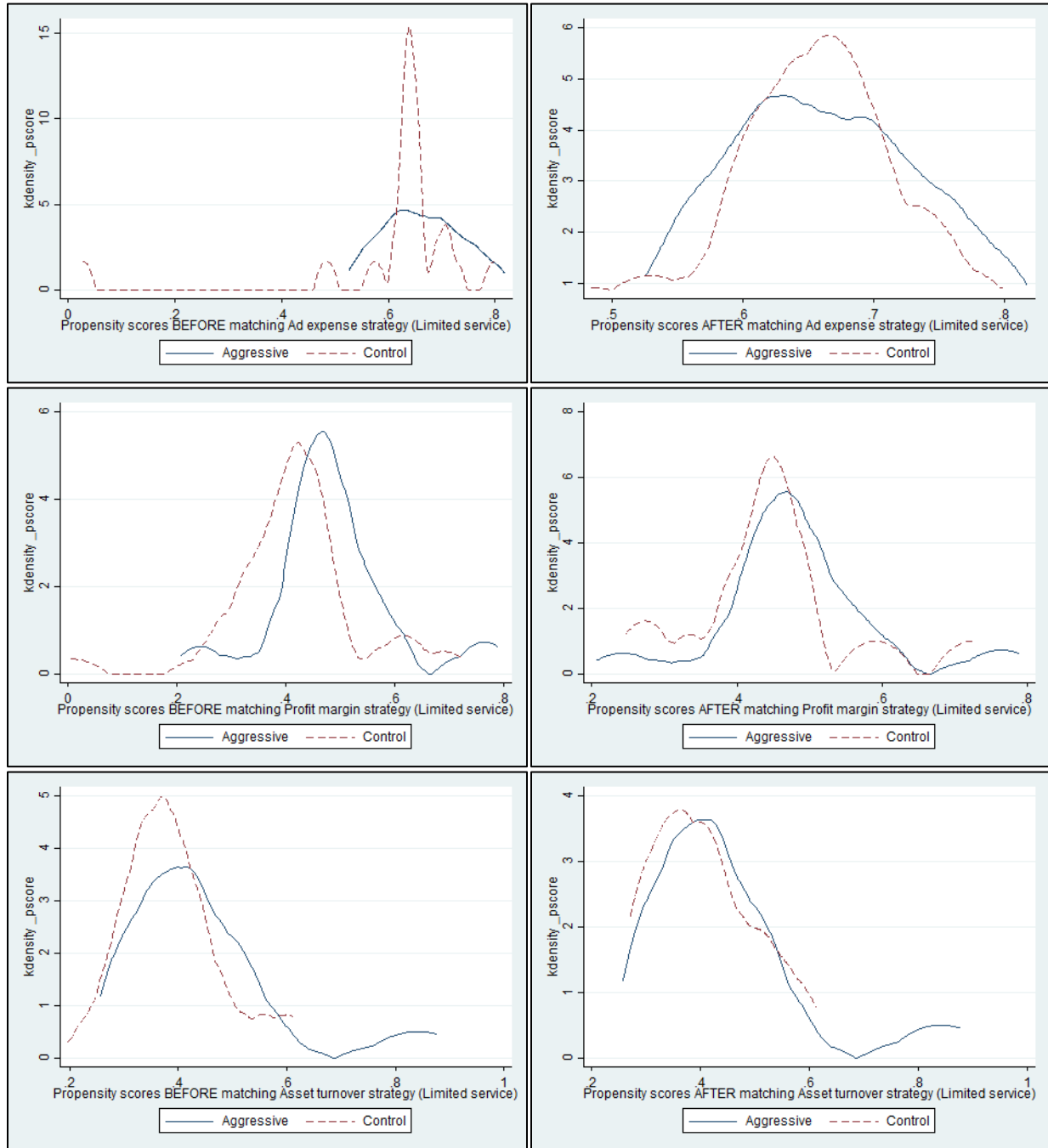


Figure 2

Propensity scores before/after matching firms that implemented the strategies for full-service restaurants

