An analysis of the impact of the recession on full-service restaurants and quick-service snackbars in the Netherlands

Abstract:
This research explores what the impact of the recent economic recession has been on the sales development of two separate segments of the food away from home industry in the Netherlands, namely full-service restaurants and quick-service snackbars. This analysis provides us with new insights into the dynamics of the restaurant industry. The investigation uses independent samples mean difference tests and time series OLS regressions as research methods. As predicted, the results revealed that the recession had a significant negative impact on full-service restaurant sales. The research does not reach a conclusion about the explicit impact of the recession on the snackbars segment.

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1. Introduction

The economic recession of 2008 has been a central topic of discussion over the past years; its dire effects have been scrutinized in copious scholarly novels, academic research studies and political debates. It has even inspired the scripts of various Hollywood movies. The fact that its impact has been severe is therefore not an extremely irrational assertion.

However, while the recession has been blamed for damaging the economy in the large sense, its effects have nested themselves in varying ways in different industry segments. Some industry segments are even said to have prospered from the economic recession. An example of an industry whose dubious fortune is often contemplated is the restaurant industry. The restaurant industry is otherwise known as the "food away from home" industry. By and large, the food away from home industry has been shown to suffer during recessionary times, with ample research confirming the hypothesis that a higher proportion of food expenditures was spent on food at home versus food away from home. Specifically, the U.S. Bureau of Labor Statistics reveal that the ratio of food at home to food away from home consumption increased during the recession, while it decreased again during the recovery period in the United States (Reed & Crawford, 2014).

But the food away from home sector is extremely diverse and can be split into various segments based on some distinguishable characteristics. These diverging characteristics have provided the individual segments with different degrees of strength in terms of enduring economic downturns.

For example, the fast-food industry has often been noted to thrive in contractionary periods. An article by the Economist highlights that in times of recession, consumers are likely to "trade down" from meals at higher-end restaurants to cheap meals served at fast-food facilities (The Economist, 2010). This has helped fast-food chains to better withstand the bitter forces of the recession compared to pricier full-service restaurants. They are sometimes said to be "recession-proof". Other research has lent additional support to the notion that limited-service chains are better at weathering recessions. Dave & Kelly (2011) discover that healthy eating habits are pro-cyclical, and that rises in unemployment are linked to a decrease in consumption of fruits and vegetables and an increase in the consumption of unhealthy food items such as snacks and fast-food (Dave & Kelly, 2011). They attribute the pattern of unhealthy eating to the deterioration of income and mental health experienced during recessions. Additionally, the U.S. Bureau of Labor Statistics reveal that the ratio of full-service restaurant to limited-service restaurant food consumption declined during the recession, and thereby they confirm their expectation that

consumers find ways to stretch their spending dollars in the food-away-from-home segment (Reed & Crawford, 2014).

Thus, the main consensus appears to be that the food-away-from-home industry en masse has suffered from consumer frugality during the recession. Yet there are some segments within the industry, specifically limited-service restaurants, which have been able to reap some benefits. These inferences inspired the overarching research question of this investigation, which reads:

> *In what way has the recession affected the food away from home industry in the Netherlands?*

The earlier mentioned assertions are largely based on elaborate research conducted in the United States, yet the conclusions may change when examining other countries. This investigation will attempt to determine what the effect of the recession has been on the restaurant industry in the Netherlands. The main question will be tackled by examining the full-service restaurant segment and the limited-service restaurant segment separately and comparing the results. Did limited-service restaurants in the Netherlands thrive, as was observed in the U.S.? And did full-service restaurants suffer?

Learning about the ways in which the recession has influenced the restaurant industry is informative for academics as well as for the restaurant industry itself. At an academic level, this research educates us on how the restaurant industry's performance fluctuates along the business cycle, and therefore it provides useful industry insights, which can in turn be used as input for macroeconomic policy-making. For the industry itself, this research raises awareness about which factors are important determinants of restaurant sales and how sales are affected during contractionary times. This allows the players in the restaurant sector to better understand their sales drivers and it provides them with tools to better shield themselves from the relentless forces of economics recessions.

In order to arrive at a conclusion this research will be structured as follows: at first literature related to the research topic will be reviewed and discussed. Based on the discoveries made in the literature review, hypotheses will be formulated. These hypotheses will be tested using an independent samples mean difference test and an ordinary least squares (OLS) method of regression. These methods, as well as the input variables, will be thoroughly explained. Thereafter, the choice of the models will be rationalized and the results generated by these

models will be presented and discussed. Finally, the research will be concluded, the limitations of the research discussed, and proposals for further research made.

2. Theoretical Framework

2.1 Literature Review

2.1.1 Food Away From Home as Luxury Good

Restaurant sales are driven by "food away from home expenditures" of consumers. Copious research has explored the topic of consumer expenditure dynamics and how these expenditures change along with business cycle movements. It is widely agreed upon in literature that expenditure tendencies vary between luxury and necessity goods (Vickers & Renand, 2003; Lewbel, 2006). These variations in income elasticity of demand for the goods have been conceptualized into the familiar Engel curve, with luxurious goods exhibiting higher elasticities and necessity goods being characterized by lower elasticities (Lewbel, 2006). Food away from home is often regarded as a luxury good, which denotes that in times of budgetary constraints it receives the last share, if anything is left at all, of the consumption budget. The reason for this is that this type of consumption is not regarded as necessary, and therefore it is not prioritized when making consumption decisions.

Researchers additionally proclaim that luxuries appear to be easier to postpone than necessities. Postponing the consumption of goods that have a high elasticity of inter-temporal substitution (luxuries such as dining out) causes less of a welfare loss than suspending the consumption of goods which are not easily substituted over time (necessities such as food at home) (Browning & Crossley, 2000). Consequently, in times of recession, when household budgets are strained, there appears to be a disproportionate adverse effect on expenditures on food at restaurants.

Some research has offered an alternative interpretation of luxury goods as "positional goods" (Kamakura & Du, 2011). This term alludes to the utility that one derives from a feeling of superiority when consuming more of these goods compared to other people. This interpretation also has implications during a recession: if most people are suffering from tighter budgets and spending less on luxury goods, such as expensive cars or dining out at fancy restaurants, one will feel less of a need to increase his or her own consumption of such luxury goods to uphold a superior status and gain utility. Hence, comparative utility is also a cause for a decline in luxury good consumption when the economy is in a recession.

2.1.2. Factors Driving Food Away From Home Demand

Convincingly, the literature suggests that the restaurant industry altogether is likely to be hurt during economic recessions. However, the restaurant industry is extremely diverse and can be segmented into a wide range of foodservices, such as full-service restaurants, fast food, hotels, retail stores, recreation places and bars (Stewart & Yen, 2004). Two broad classifications that are often identified are the full-service and the quick-service segment. Because these segments have different characteristics, key economic indicators may affect them differently, and therefore their performance during economic recessions may also vary. Limited-service restaurant sales might benefit from an economic recession because consumers are experiencing a decrease in their budget and as a result might shift their dining expenses from full-service restaurants to cheaper alternative dining options such as snackbars. Nevertheless, some studies have also indicated that all sectors in the restaurant industry, including both full-service and quick-service restaurants, are negatively affected by the recession, albeit to varying degrees (Youn & Gu, 2009).

To thoroughly investigate the impact that economic recessions have on the sales of different types of restaurants, it is useful to first understand which underlying factors affect overall demand for food away from home. Once these determinants of restaurant demand are specified, understanding how they behave in the aggregate Dutch economy will allow me to translate the microeconomic consumer demand analysis to a macroeconomic investigation on the sales development of the respective restaurant sectors in the Netherlands. Using the identified factors as control variables will allow me to isolate the recessionary impact on the restaurant sales.

The factors that are often noted as being important determinants of demand for food away from home are disposable income, hours worked by the manager of the household, his or her age and education, size and structure of the household, population growth, gender and race. While some factors impact both the quick-service and full-service sector in similar ways, many exert different influences on each sector respectively. I will discuss each in turn.

A. Disposable Income of Households

Using a statistical demand model, Hiemstra and Kosiba (1994) found that one of the most important factors influencing the total demand for foodservice away from home in the U.S.

are income changes, indicated by the significant income elasticity of demand. McCracken and Brandt (1987) report similar findings for income. By splitting their analysis into three categories; namely conventional restaurants, fast food facilities, and other commercial establishments, they also discovered that the importance of the factors determining household expenditures on food away from home (FAFH) varied between different segments of the restaurant industry. For instance, the income elasticity at fast food facilities was much smaller than at restaurants and other commercial facilities. This finding supports the notion that quick-service restaurants may be more resistant to the economic downturns during recessions. By the same token, it implies that quick-service restaurants can benefit less, if not suffer, from increases in income during economic expansions, while full-service restaurants have great potential to thrive in such situations. Lee and Ha (2014) also discover the varying effect of disposable income on sales at full-service and limited-service restaurants in their study, where they specifically address the impact of the economic recession on these two broad segments of the restaurant industry in the United States. Using an OLS regression they found that the full-service restaurant sector has been more vulnerable to the recession compared to the limited-service restaurant sector in terms of sales, and explain this with their finding that disposable income is the most important factor of influence on sales in both sectors. The fact that the limited-service sector offers cheaper dining options provides it with an advantage during economic slumps. In similar vain, Byrne, Capps Jr. and Saha (1998) found that income had a strong and positive influence on the decision to eat at up-scale restaurants, as indicated by a marginal probability elasticity (MPE) of 0.5, while it had a weak but negative effect on quick-serve consumption, indicated by a MPE of -0.18. Likewise, Stewart, Blisard, Bhuyan & Nayga Jr. (2004) report that full-service restaurants benefit more from increases in consumer income in their study on demand for food away from home in the United States, where they explicitly compare between expenditures at full-service restaurants and at fast food chains using OLS regressions. All things considered, up-scale dining decisions are more sensitive to income changes. Hence, in times of economic recession, which are characterized by income deterioration, up-scale dining facilities will likely be hurt while quick-serve facilities can actually slightly benefit.

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B. Hours Worked by Household Manager

The hours worked by the household manager has a stronger positive influence on expenditures at fast-food restaurants than on full-service restaurants (Stewart, Blisard,

Bhuyan, & Nayga, Jr., 2004). This is in line with Byrne, Capps and Saha's (1998) finding that labour participation of the household manager is positively correlated with consumption of quick-serve dining, while it has a negative effect on full service dining consumption. McCracken and Brandt (1987) offer an explanation for this by noting that an increase in the value of time of the head of household increases fast-food and other commercial expenditures more than conventional restaurant expenditures. The value of time increases as the number of hours worked increase; those who work more hours have less spare time and therefore cherish whatever spare time they do have more. Up-scale dining is not necessarily considered as time saving, and hard workers will therefore prefer the time-efficiency of quick-serve facilities. This provides a dubious implication for the analysis of FAFH during a recession; during a recession there are more unemployed consumers who might value time less because they have more spare time at hand than their employed counterparts, limiting the benefit for the quick-service segment. Yet conversely, the unemployed might actually place more value on time because their spare time is spent actively seeking out for a job, in which case the fast-food industry would be boosted. Either way, there is a clear positive relationship between the value of time of consumers and sales in the fast-food industry, while the relationship with the full-service industry is unclear.

C. Age of the Household Manager

The age of the household manager is also recognized as having a strong and differential effect: an increase in age strongly reduces the same household's expenditures on fast food, while it actually slightly increases expenditures at full-service restaurants (Stewart, Blisard, Bhuyan, & Nayga, Jr., 2004). This could reflect variations in preferences at different life stages, with older people demanding more intense flavours due to a diminishing sensitivity of taste buds with age (Friddle, Mangaraj, & Kinsey, 2001). Or alternatively, it could be explained by an alleged learning curve within cooking, where cooking skills and efficiency improve with age, causing households with older household managers to opt for home-cooking more often and younger household managers to resort to convenience foods such as fast food (Stewart & Yen, 2004). These findings imply that an ageing population could potentially be harmful for the fast-food industry.

D. Educational Attainment of Households

Along with age, education appears to be a decisive factor for FAFH expenditures; compared to non-college educated households, college educated households spend more on dining out both at full-service restaurants and on fast-food (Stewart, Blisard, Bhuyan, & Nayga, Jr., 2004). This could reflect the fact that college-educated households are more likely to earn higher incomes and therefore have more to spend. Beyond financial considerations, education also appears to influence preferences for dining options. Household heads with at least some college education spend relatively less on quick-serve facilities than on up-scale dining, perhaps indicating a preference for higher quality or healthfulness attributes (Byrne, Capps Jr., & Saha, 1998).

E. Household Size and Structure

Household size is another factor that has been recognized as influencing the decision to consume FAFH, yet research findings have been contradicting. Quick-serve expenditures appeared to increase in correspondence to an increase in the size of the household, while up-scale expenditures appeared to be relatively resistant to changes in household size (Byrne, Capps Jr., & Saha, 1998). These findings suggest that quick-serve facilities are likely to suffer from the trending shift towards smaller households (Eurostat Statistics Explained, 2015), while up-scale facilities should hardly be affected. However, Stewart and Yen (2004) produce different results, namely that decreasing household sizes will actually uplift sales at both full-service and fast-food restaurants. Their results instead propose that both the fast-food as well as the full-service sector will profit from the trend of decreasing household sizes. Household structure is also cited as an important determinant of overall FAFH consumption in several studies; different household types tend to express different preferences for the various types of food facilities. For instance, Byrne, Capps and Saha (1998) observe that unmarried households are more likely to visit quick-serve and up-scale dining places, and are less likely to dine at mid-scale facilities. They attribute this finding to the fact that mid-scale facilities are often family oriented, making them less attractive for singles, whereas upscale restaurants are considered a better option for singles because they are popular locations for dates. Stewart, Blisard, Bhuyan and Nayga (2004) find that single-person and childless households spend more on dining out than traditional households do, both at full-service and at fast-food restaurants. Researchers rationalize that single-person households have higher per person time and monetary costs of cooking at home compared to traditional households,

making it harder for them to economize on dining at home and making dining out more appealing (Stewart & Yen, 2004). Single-parent families actually appear to spend less on dining out at both types of facilities (Stewart, Blisard, Bhuyan, & Nayga, Jr., 2004). Öztürk and Boylu (2014) discovered that single-parent families decreased their overall expenditures on dining out by 47.9% as compared to when they were married. They also noted that these changes in expenditures varied according to gender; females decreased their expenditures on eating out by a considerably larger amount (50.5%) than males (39.3%).

F. Gender, Population and Race

Other researchers have also revealed gender differences in consumption patterns on FAFH. According to the research by Byrne, Capps and Saha (1998), households with female household managers were less likely to eat out at quick-serve and up-scale restaurants and more likely to dine at mid-scale facilities in comparison to male household managers. McCracken and Brandt (1987) take the gender comparison a step further by splitting the two gender categories into different age categories. For each age category, males contributed more to expenditures on fast-food facilities than females did. For expenditures at restaurants, males contributed more compared to females, except for the age category 15-20. Bauer et al. (2009) similarly observe that males spend more than females at fast-food establishments in their study on fast-food consumption among adolescents; with 30.4% of males reporting frequent fast-food consumption, versus 27.3% of females.

Population growth can also be considered to be an influential factor in demand for restaurant sales. Researchers have estimated a significantly positive population elasticity, indicating that the demand for food away from home is highly responsive to changes in the population (Hiemstra & Kosiba, 1994).

Lastly, research has identified racial differences in food away from home choices and expenditures. Stewart, Blisard, Bhuyan & Nayga (2004) find that Asian, Black and Hispanic households each spend more on fast-food than white households do. Similarly, Byrne, Capps & Saha (1998) report that black households exhibited a higher likelihood to visit quick-serve and mid-scale facilities. It appears that increases in minority populations will stimulate the fast-food industry and depress the full-service sector (Stewart & Yen, 2004).

2.2 Differences between This Research and Related Research

a. Macroeconomic focus

Most of the related literature focuses on individual demand drivers and thus examines the topic from a microeconomic perspective. To allow for a macroeconomic analysis of the influence of consumer demand on overall countrywide restaurant sales, the demand drivers that are identified in the mentioned literary works will be transformed into aggregate factors.

b. Country of interest

Another dissimilarity of this investigation compared to those discussed in the literature is the country of interest. Most of the previous research was conducted in the United States. This paper will study the Dutch restaurant industry instead. All the factors identified could behave differently in the Netherlands, and therefore they might have different effects on sales in the framework of this paper. Nevertheless, they will be used as control variables in order to investigate their influence on sales in the Netherlands, as well as to help isolate the impact of the recession.

c. Snackbars as quick-service segment

Most of the reviewed literature distinguished between the full-service and quick-service restaurant segments and defined the quick-service segment as consisting specifically of fast-food chains, which is an explicitly defined segment of company categorizations in the United States. The CBS uses the European standardized categorization "Standaard Bedrijfsindeling" to define company segments. They do not identify a category for fast-food specifically but instead include fast-food restaurants in the segment "Snackbars". This category will be used to represent the quick-service segment in this paper.

3. Data & Methodology

3.1 Data Description

The data used is retrieved from the Centraal Bureau voor de Statistiek (CBS), which is a databank that reports all types of statistics about the Netherlands. The time frame considered includes the years 2005-2015. The time frame is set to these years due to the availability of data for the included variables. Quarterly data is used to increase the number of observations and hence generate more robust results.

3.2 Methodology

The following overarching hypotheses are formulated in order to assess the impact that the recession had on the sales development of quick-service and full-service restaurants in the Netherlands:

> H1: *The recession had a significant negative impact on sales at full-service restaurants in the Netherlands*
>
> H2: *The recession had a significant positive impact on sales at snackbars in the Netherlands*

Hypothesis 1 predicts that sales at full-service restaurants move pro-cyclically. Hypothesis 2 contends that sales at snackbars move counter-cyclically. In order to explore the validity of these hypotheses I will perform independent samples mean difference tests and a time series regression analysis.

An independent samples mean difference test is a t-test, which is used to assess whether the means of two groups differ significantly. This test will be performed separately for both the restaurants and the snackbars segment. In keeping with the overarching hypothesis for full-service restaurants, which asserts that the restaurant segment is hurt during recessions, the hypotheses of the independent samples mean difference tests for the restaurants segment are formulated as follows:

H_0: $\mu_{non\text{-}recession} = \mu_{recession}$ vs. H_1: $\mu_{non\text{-}recession} > \mu_{recession}$; where,

μ represents the average sales volume development.

For the snackbars segment, which is expected to prosper during recessions, the hypotheses are the following:

H_0: $\mu_{non\text{-}recession} = \mu_{recession}$ vs. H_1: $\mu_{non\text{-}recession} < \mu_{recession}$

For both tests a benchmark of 5% will be used to assess significance, which implies that the null-hypothesis is rejected if the reported p-value is smaller than 5%. The recession period is

set at the 1st, 2nd, 3rd and 4th quarter of 2009, provided that a recession is usually defined as a contraction in GDP growth for two consecutive quarters or longer (Business Dictionary), which is the case for the four quarters of 2009 in the Netherlands. All other observations make up the non-recession period.

Besides the independent samples mean difference test, a regression will also be performed using the ordinary least squares (OLS) method. This method minimizes the squared distance between the actual data points and a fitted line projected onto the data in order to find the best estimation of the effect of explanatory variables on a dependent variable. In this particular investigation the regression is specified as follows:

$$\%\Delta SalesVolume_t = \beta_0 + \beta_1 * RecessionIndicator_t + \beta_2 * \%\Delta x_t + \varepsilon_t,$$

The sales development is the dependent variable in this analysis and is expressed as the percentage change in sales volume. Two separate regressions will be performed for the two different food away from home segments. The subscript t represents the respective time period. The recession indicator is the main variable of interest and is defined in two ways, which will be explained in the "Explanatory Variable" section below. X_t represents a vector consisting of all the control variables that are incorporated in this analysis and their values in each corresponding time period. Percentage changes relative to the same period last year are used for each variable at quarterly observations. β_0, β_1, and β_2 are estimated parameters generated by the regression.

T-tests will be used to assess the significance of the explanatory variable as well as the control variables. As for the independent samples mean difference test, this study will use a 5% significance level as standard for assessing significance of the regressors, implying that if a t-statistic corresponding with a probability of less than 0.05 is obtained, that particular variable is considered significant. An F-test will be used to test whether all the variables together are jointly significant. For these tests too, a significance level of 5% will be used.

In order to draw truthful conclusions one must be aware of some operational concerns regarding OLS, and make sure that these are adjusted for. Firstly, in the presence of heteroscedasticity, which refers to a non-constant variance of the error terms, standard errors

can be inappropriately large and hence incorrect t-statistics will result. This, in turn, can lead to erroneous conclusions. Heteroscedasticity can be detected by performing various heteroscedasticity tests available in EViews. Autocorrelation between error terms can pose another problem. This can be detected by looking at the pattern exhibited in the residual graph, or otherwise by interpreting the value of the Durbin-Watson statistic. If the Durbin-Watson statistic is close to 2, there is no concern of autocorrelation. However, if the value of the Durbin-Watson is close to 0 or 4, there is evidence of positive or negative autocorrelation respectively. To correct for heteroscedasticity and autocorrelation, the Heteroskedastic and Autocorrelation Consistent (HAC) option in EViews will be selected.

Another important concern is whether the error terms are normally distributed. If this normality assumption is violated, neither single nor joint hypothesis tests about the model parameters can be performed reliably. To test for normality the Bera-Jarque test can be performed in EViews. If the Bera-Jarque test yields a probability of greater than 0.05, then there is insufficient evidence of non-normality and therefore the assumption of normality is justified.

Furthermore, it is important to assess whether the appropriate functional form (in this case linear) is employed. This can be assessed by using the Ramsey RESET test in EViews, which yields a t, F and χ^2 statistic. If the probabilities of these statistics are greater than 0.05 then there is insufficient evidence to propose that the relationship is non-linear, and therefore one can reliably assume that the correct functional form is employed.

Lastly, multicollinearity can pose a problem. Multicollinearity refers to a situation where some or all of the independent variables are highly correlated with each other. If this is the case, the model might provide a high R^2, while the individual coefficients have high standard errors and can be insignificant. However, the estimators generated by the model will still be consistent, unbiased and efficient. Multicollinearity can be detected by observing the correlations between the independent variables, where high correlations are suggestive of multicollinearity. Solutions are to remove one of the collinear variables, to collect more data, or to ignore it.

For each of the models these concerns are taken into account and possible violations are resolved in order to ensure a theoretically sound model.

The quality of the regression can be evaluated using various indicators. The most common indicator is the 'goodness of fit' measure, otherwise known as the R^2 of the regression model. This figure measures how well the generated model fits the existing data, and thus it determines how useful the estimated parameters are in predicting the relationship between the variables. Its value ranges from 0-1; with values close to 0 indicating a very weak fit and values close to 1 indicating an excellent fit. However, a cautionary note for the R^2 measure is that it will always improve if a variable is added, regardless of whether the added variable is relevant or irrelevant. To overcome this problem the Adjusted R^2 is often used, which accounts for this issue. Hence, this research will use the Adjusted R^2 to assess the quality of the regressions. Another indicator that can be used for assessing models is the Schwarz criterion. This indicator is useful when making comparisons between models, which both use the same sample size. A model with a lower Schwarz criterion is preferred, since a lower Schwarz criterion implies that there is less unexplained variation of the dependent variable. Both the Adjusted R^2 and the Schwarz criterion will be used as evaluation tools for selecting the preferred model, which will in turn be used for answering the hypotheses.

3.3 Variables

a. Dependent Variable

For the dependent variable the data from CBS on sales development in the restaurant sector in the Netherlands is used. They report their data as the percentage change in sales relative to the prior year. To determine *real* sales changes I used the *volume* rather than the *value* development of sales, hereby factoring out price changes. The CBS reports on various segments. I will perform two separate regression analyses; one using the segment "Restaurants" (SBI2008 code 56101) to represent the full-service sector, and another one using the segment "Snackbars" (SBI2008 code 56102) to represent the limited-service sector. These categorical classifications are designed by the "Standaard Bedrijfsindeling (SBI) 2008," which is a standardized categorization of economic entities contingent on their main line of business. The SBI 2008 is based on the classifications made by the European Union and the United Nations (Centraal Bureau voor de Statistiek). The category "Restaurant" includes dining places where meals are served for the purpose of direct consumption at the

spot along with an offering of drinks or small snacks intended for direct consumption at the spot (Overheidscijfers.nl). The category "Snackbars" is described as dining places offering meals, which may or may not be prepared at the spot, intended to be consumed either directly or not directly after preparation and to be consumed at the spot or to be taken out. This category also includes fast-food restaurants (Overheidscijfers.nl).

b. Explanatory Variable

Since the aim of this research is to study the effect of the recession on sales in the restaurant sector, the primary variable of interest will be a recession indicator. Recessions can be expressed in numerous ways. Two common ways to define a recession are using real GDP growth and unemployment rate. To be thorough in my analysis and strengthen the validity of the results, I will run multiple regressions using both recession indicators.

Recession Indicator 1: *Real GDP Growth*	
Definition	Gross Domestic Product (GDP) is a measure of economic activity in a country combining consumption, investment and government expenditures and the net of import and export expenditures. The growth in GDP thus represents economic growth. However, GDP can grow in line with prices even when there is no real increase in economic activity. To correct for this inflationary effect, and thus isolate the growth in real economic activity, real GDP growth is often used instead. Real GDP equals the nominal GDP divided by a price index, or it can otherwise be defined as the volume development of nominal GDP (Callen, 2008).
Functional specification	Percentage volume development of GDP relative to the same period last year specified for each quarter from 2005 – 2015.

Recession Indicator 2: *Unemployment Rate*	
Definition	Unemployment is defined as the number of people without a paid job, who have actively looked for a job and are willing and able to work. The unemployment rate equals the number of unemployed as a percentage of the total working population. The working population consists of all people of working age who are willing and able to work (Bartley & Ferrie, 2001).
Functional specification	The annual percentage change in the seasonally adjusted unemployment rate, determined for each quarter from 2005 – 2015.

c. Control Variables

To take into account the effect of the factors that are discussed in the literature section, various control variables will be added to the regression. The control variables will be defined in terms of yearly percentage changes, at quarterly observations. The table below describes each variable's specification. For some variables CBS only reports yearly figures. In order to obtain quarterly figures for those variables the assumption is made that those

variables remain relatively constant throughout the year, and therefore their yearly figures are used for each quarter in the corresponding year.

Control Variable	Description
Income	The income variable is defined as total disposable income, which is derived by multiplying the number of households with the disposable income per household. Cautionary note: the CBS reports data for disposable income only up until and including 2014, and therefore regressions including the disposable income variable have fewer observations.
Hours worked	The hours worked variable is defined as the total number of hours worked in a year, seasonally adjusted.
Education	The education variable is defined as the number of college educated people as a percentage of the total Dutch population.
Household structure	This variable is left out of consideration in this study because the many household categories are difficult to formulate into aggregate factors and thus the interpretations would become ambiguous in this particular study.
Household size	Household size is included as the number of small households as a percentage of total households. The CBS identifies household sizes in five categories: single-person, 2-person, 3-person, 4-person, and households with 5 or more people. For the purpose of this research, a small household will be defined as all single-person, 2-person and 3-person households.
Population	The population variable is defined as the percentage growth in the population relative to the prior year, calculated as (population in $year_t$ – population in $year_{t-1}$) / population in $year_{t-1}$.
Gender	To control for gender effects, a gender variable defined as the percentage of males as a fraction of the total population is included.
Age	The age variable will be specified as the number of people older than 65 years as a percentage of the population. CBS separates the age groups into five age categories: younger than 20, 20 to 40, 40 to 65, 65 to 80, and older than 80.
Race	To control for racial differences, the number of foreigners as a percentage of the population is included.

4. Results

4.1 Independent Samples Mean Difference Tests

Table 1. Independent Samples Mean Difference Test: Sales Development Recession vs. Non-Recession

	Overall		Non-recession		Recession			
	Mean	N	Mean	N	Mean	N	t-statistic	p-value
Restaurants	0.458	40	1.339	36	-7.475	4	8.731	0.000
Snackbars	0.865	40	1.061	36	-0.900	4	2.688	0.007

As can be drawn from Table 1, the mean difference between the sales development during the recession and during the non-recessionary time periods is significant for both the restaurants sector and the snackbars sector. In fact, the signs indicate that the sales development during the recession is significantly lower than during non-recession years in both sectors. This is in line with the hypothesis proposed for restaurants, however, it does not confirm the hypothesis formulated for snackbars, which assumed that the mean sales development of snackbars would be significantly larger during the recession compared to the non-recessionary period. Nevertheless, notably, the average decline in sales development during the recession is much smaller for snackbars than for restaurants (-0.900 versus -7.475 respectively). This is in line with the expectations, namely that snackbars are more resistant to economic downturns and hence experience less of a negative shock in their sales.

It is also noteworthy that overall, the sales of restaurants on average grew by only about half as much as the sales of snackbars (0.458/0.865), while when splitting the analysis up into non-recession and recession periods, it appears that restaurants sales grew 1.262 (1.339/1.061) times as much as snackbars sales on average in non-recession periods, while their sales declined by 8.306 (7.475/0.900) times as much as snackbars sales during the recession. This once more conforms to predictions made based on earlier findings, and could for example be indicative of the fact that the income elasticity of demand for the quick-service segment is smaller than that of the full-service restaurant segment, which in turn explains the relatively small decline in snackbars sales during the recession compared to restaurants, and yet also the relatively minor increase in their sales compared to restaurants during the non-recession years.

4.2 Choices of Regression Models

For each model, a regression function including all the previously discussed control variables was used as the starting point before arriving at the preferred model used to analyse the influence of either real GDP growth or unemployment rate on the sales volumes of restaurants or snackbars.

Model A. Sales volume development of restaurants using real GDP growth

The correlation table (Figure 1 in Appendix 1) revealed that some variables were extremely highly correlated with one another, which could cause the multicollinearity problem. For example, race and population are nearly perfectly correlated. Race is also highly correlated

with gender and disposable income. In addition, disposable income is extremely highly correlated with hours worked, population and gender. To partially solve this issue, both race and disposable income were removed from the model. The resulting model (2) has a lower adjusted R^2, which would in principal indicate a worse fit. However, as mentioned earlier, multicollinearity can inflate the R^2 even when the fit is not necessarily good. Thus, the adjusted R^2 of model (1) is not considered appropriate as a criterion for comparison. The Schwarz criterion also cannot be used for comparison between model (1) and model (2), because removing disposable income from the model leads to an increase in observations, and therefore the two models do not have an equal sample size. However, based on a well-founded case for multicollinearity, model (2) is preferred to the initial model. To determine whether model (2) can be further improved, hours worked was also removed, because it is insignificant at the 5% level and its correlation with real GDP growth is relatively high. However, the resulting model (3) is less favoured compared to model (2) based on the lower adjusted R^2, the higher Schwarz criterion and given that the values of the remaining variables do not change by a lot.

To explore the possibility that the sales developments of restaurants can be influenced by sales developments of restaurants in the previous period, the one-period lag of the dependent variable was added to the initial regression including all variables. It appeared that the lagged value of restaurant sales was highly significant. Thereafter the same process of removing highly correlated and insignificant variables was undertaken in order to arrive at the most preferred model including a lag of restaurant sales. This yielded model (4), and given that adjusted R^2 is higher than those of all the other models, model 4 is chosen as the preferred model and used for interpretations and conclusions.

A. Dependent variable: Sales Development Restaurants

Regressor	**(1)**	**(2)**	**(3)**	**(4)**
Constant	24.17162* (12.02818)	0.095600* (4.658052)	12.62447** (5.685190)	1.855376* (1.080496)
Sales Restaurants(-1)				0.665550*** (0.059232)
Real GDP growth	0.306039 (0.229957)	1.124670*** (0.369788)	1.409998*** (0.424763)	0.584890*** (0.131926)
Disposable income	-0.147764 (0.892304)			
Hours worked	0.531267 (0.690782)	1.139855* (0.613469)		

Education	-1.169036** (0.273936)	-1.539811*** (0.321315)	-1.523972*** (0.333327)	-1.168056*** (0.167127)
Household size	-56.28148** (12.12410)	-34.04149*** (11.46557)	-35.51215** (14.60696)	
Population	6.518546 (12.71464)	-20.50612*** (4.806749)	-24.64082*** (7.220571)	-8.185373*** (2.481716)
Gender	86.27353 (53.29079)	111.2549** (41.34590)	110.7767** (45.00752)	56.37538*** (15.81051)
Age	2.724686 (0.484223)	3.201482*** (0.540013)	2.662946*** (0.357502)	0.878802*** (0.201455)
Race	-13.76368 (9.364467)			
Summary Statistics				
Adjusted R2	0.858391	0.751683	0.729747	0.885658
F-statistic	24.57337***	17.86531***	18.55152***	50.05589***
Schwarz criterion	4.746223	5.213227	5.236428	4.402717
N	36	40	40	39

The values reported in the parentheses are the standard errors of the estimates. HAC (Newey-West) standard errors are applied.
, **, and * indicate a significance at the 10%, 5%, and 1% level respectively*

Model B. Sales volume development of restaurants using unemployment rate

The correlation table (Figure 2 in Appendix 1) reveals that hours worked is extremely highly correlated with unemployment, and once more that race and population are nearly perfectly correlated. Hence, to adjust for a highly probable multicollinearity issue, hours worked and race are removed from the initial model. The adjusted R^2 is not used for comparison between the initial model and model (2) for reasons stated in the discussion of the previous model. The Schwarz criterion can be used in this case, because the sample size remains equal. Based on the Schwarz criterion model (2) is slightly preferred. To assess whether a more improved model can be reached, population and gender are removed from the model. The population variable is chosen because it has a relatively high correlation with disposable income, which could still cause the problem of multicollinearity. Additionally, its effect, as well as that of the gender variable, were highly insignificant in the first two models. Because it is suspected that multicollinearity was still present, the adjusted R^2 is not used to assess the quality of model (3) compared to model (2). Instead, comparison is made based on the Schwarz criterion, which favours model (3). Similarly as for model A, it is tested whether including a one-period lag of the dependent variable adds significant explanatory value to the regression,

and indeed this variable appeared to be highly significant. Likewise, the process of coming to the best fitting model is carried out, ultimately yielding model (4), which is preferred to model (1), (2), and (3) based on a higher adjusted R^2, and therefore it is used for the interpretation of the results and the evaluation of the hypothesis.

B. Dependent Variable: Sales Development Restaurants

Regressor	(1)	(2)	(3)	(4)
Constant	21.63772 (13.34531)	6.532425 (5.605887)	0.232993 (2.071218)	0.575150 (1.060719)
Restaurants Sales(-1)				0.645612*** (0.082388)
Unemployment rate	-0.081590 (0.068960)	-0.088996** (0.036653)	-0.104951*** (0.030813)	-0.089627*** (0.024355)
Disposable income	0.109373 (1.030463)	0.767209 (0.493917)	1.242458*** (0.249071)	
Hours worked	-0.185929 (1.218577)			
Education	-1.088660*** (0.221623)	-1.220336*** (0.215675)	1.210031*** (0.221114)	-1.099085*** (0.139988)
Household size	-52.70528*** (14.38367)	-40.78706*** (11.82828)	-37.17014*** (10.18203)	
Population	15.14068 (16.61362)	-8.848872 (6.876429)		
Gender	64.65040 (68.79509)	1.293098 (21.53070)		32.56714** (12.75307)
Age	3.022781*** (0.533818)	3.481115*** (0.568704)	3.935246*** (0.464647)	1.346456*** (0.334031)
Race	-15.19215 (10.36850)			
Summary Statistics				
Adjusted R2	0.863426	0.849631	0.848234	0.886451
F-statistic	25.58579***	29.25164***	40.12357***	50.44266***
Schwarz criterion	4.710020	4.681269	4.560430	4.395759
N	36	36	36	39

*The values reported in the parentheses are the standard errors of the estimates. HAC (Newey-West) standard errors are applied. *, **, and *** indicate a significance at the 10%, 5%, and 1% level respectively*.

Model C. Sales volume development of snackbars using real GDP growth

The first step from the initial model (1) to model (2) is identical to the one made for model A, for the same reasons. To test whether model (2) can be further enhanced, the age variable is removed because it is insignificant in both model (1) and model (2). The resulting model (3)

has a slightly higher adjusted R^2 and a slightly lower Schwarz criterion, and is therefore chosen as most fitting. As for restaurants, for snackbars it was also explored whether the lagged value of the sales development of snackbars was significant and whether including it in the regression adds explanatory value. However, the one-period lag of the dependent variable appeared to be insignificant and the models worsened when including it. Therefore, the models including the lagged dependent variable are not reported, and model (3) remains the ultimately preferred model.

C. Dependent Variable: Sales Development Snackbars

Regressor	**(1)**	**(2)**	**(3)**
Constant	35.10240** (12.77739)	21.73350*** (7.140378)	11.99018*** (2.174731)
Real GDP growth	-0.598818 (0.372865)	0.111952 (0.153494)	0.122203 (0.190089)
Disposable income	-1.020100 (0.656987)		
Hours worked	1.485799** (0.871792)	1.385777*** (0.385229)	1.179023*** (0.377723)
Education	-1.253074*** (0.221002)	-1.599746*** (0.260320)	-1.653972*** (0.270935)
Household size	-47.98392*** (10.63174)	-24.19762*** (6.944564)	-22.49933*** (7.116844)
Population	26.33864 (19.80996)	-9.855953*** (2.918650)	-10.99192*** (3.113772)
Gender	146.1469*** (44.12750)	94.92250*** (22.69216)	97.73168*** (23.30029)
Age	-0.232989 (0.465461)	0.441632 (0.337271)	
Race	-22.38038* (12.08637)		
Summary Statistics			
Adjusted R2	0.639023	0.600433	0.603378
F-statistic	7.884348***	9.372227***	10.88841***
Schwarz criterion	4.969042	4.951324	4.882475
N	36	40	40

*The values reported in the parentheses are the standard errors of the estimates. HAC (Newey-West) standard errors are applied. *, **, and *** indicate significance at the 10%, 5%, and 1% level respectively.*

Model D. Sales volume development of snackbars using unemployment rate

In this case, the steps from model (1) to model (2) and from model (2) to model (3) are equivalent to the steps made for model B, and they are made for identical reasons. To test whether model (3) can yet be improved, the age variable is removed, because it is insignificant at the 5% level. The resulting model (4) has a lower adjusted R^2 as well as a lower Schwarz criterion. In this case the adjusted R^2 and the Schwarz criterion conflict in terms of pointing out which model is preferred, and therefore no clear favourite can be determined. In this case the choice is made based on the standard errors, assuming that a model including variables with lower relative standard errors produces more reliable results. Thus, model 3 is selected. The same counts as for model C regarding the lagged value of snackbars sales development; namely the one-period lag of the dependent variable was insignificant and worsened the models, and therefore it is not included in the chosen model.

D. Dependent Variable: Sales Development Snackbars

Regressor	**(1)**	**(2)**	**(3)**	**(4)**
Constant	26.17353*** (7.047225)	9.037582** (4.375031)	6.806048*** (1.568217)	7.930920*** (1.792419)
Unemployment rate	0.057188 (0.050961)	-0.040817 (0.024125)	-0.042089* (0.024143)	-0.024393 (0.026126)
Disposable income	-0.652269 (0.434852)	0.576561 (0.511913)	0.734118** (0.286666)	0.674609** (0.283498)
Hours worked	1.628716** (0.764954)			
Education	-1.402947*** (0.207875)	-1.370641*** (0.237321)	-1.337945*** (0.223272)	-1.373823*** (0.236906)
Household size	-41.87439*** (9.562081)	-27.93760*** (6.755824)	-26.89667*** (6.676699)	-24.77349*** (7.261061)
Population	4.343235 (10.31173)	-3.454214 (6.040870)		
Gender	129.6776*** (39.45426)	46.50234*** (14.39617)	39.34982*** (8.562609)	35.98544*** (9.877830)
Age	-0.180019 (0.422617)	0.479607 (0.497045)	0.636320* (0.318328)	
Race	-11.20767* (6.001994)			
Summary Statistics				
Adjusted R2	0.622039	0.618337	0.629289	0.619483
F-statistic	7.400226***	9.100555***	10.90218***	12.39604***
Schwarz criterion	5.015020	4.899790	4.806224	4.766690

N	36	36	36	36

*The values reported in the parentheses are the standard errors of the estimates. HAC (Newey-West) standard errors are applied. *, **, and *** indicate a significance at the 10%, 5%, and 1% level respectively.*

4.3 Interpretations and Discussion of Results from Models

Table 2 in Appendix 2 presents the four chosen models (A, B, C and D) beside each other.

a. Restaurants

I. Real GDP growth

The formulated hypothesis predicts a positive causal relationship between real GDP growth and restaurant sales: the sales volume will grow when real GDP grows, and it will decline when real GDP declines (which is the case during a recession). The results of model A are in line with this prediction, more specifically, a 1% increase in GDP growth leads to a significant 0.58% increase in sales volume for restaurants. Hence, the results indicate that restaurant sales were hurt by the recession.

II. Unemployment rate

The hypothesis predicts that in a recession, when unemployment increases, restaurant sales will decrease. Model B's results conform to this prediction: a negative relationship between the unemployment rate and the sales volume development of restaurants. More specifically, as unemployment rate increases by 1%, the sales volume at restaurants decreases by 0.09% according to the model. This effect is significant at the 1% level. Nonetheless, the impact size of the unemployment rate is relatively small and much smaller compared to the effect size measured using real GDP growth. This makes it difficult to determine how strong the effect of the recession in fact is on restaurant sales. In either case however, the hypothesis is confirmed.

III. Other variables:

The chosen models do not provide a clarification about the effect of disposable income, hours worked, household size and race on restaurant sales development, because both models for restaurant sales (model A and B) exclude these variables from the regression, for reasons stated earlier.

The models do suggest that the one-period lagged value of restaurant sales development has a significant positive influence of somewhere between 0.65-0.67%.

The education variable has a highly significant negative influence on the sales volume development of restaurants. The chosen models suggest that as the fraction of higher educated people in the Netherlands increases, the sales volume development of restaurants decreases by roughly between 1.10-1.17%. This challenges the findings reported in the related literature, which suggest that higher educated people are more likely to dine out at restaurants.

The population variable is neglected in model B, but according to model A, as the population grows with 1%, the sales volume development of restaurants decreases by approximately 8.19%. This is also an unexpected finding, since considering other findings and common intuition one would expect that population growth would have a positive influence on restaurant sales.

The gender variable appears to have a significant positive influence on the sales volume development of restaurants: model A suggests that as the percentage of males in the population increases, the sales volume development of restaurants will increase by roughly 56%, while model B suggest that it will increase by approximately 33%. This finding is quite extreme and is interpreted with caution. One can observe that the variable's value fluctuates a lot between the models, and it has relatively high standard errors, which raises doubts about its stability and therefore about its interpretation. The large fluctuations are most likely due to the multicollinearity problem, since it has relatively high correlations with other variables. In the selected models, this problem is solved as much as possible, however, given the limited amount of observations used, the interpretation of such an unstable variable must still be done with caution.

The significant age variable indicates that as the percentage of elderly as a fraction of the population increases, the sales volume at restaurants will increase by somewhere between 0.88%-1.35%. This is in line with findings reported in earlier literature proposing that elderly have a preference for tasteful foods and therefore will desire dining out at restaurants.

b. Snackbars

I. Real GDP growth

The hypothesis expects that the recession had a positive impact on sales at snackbars. Thus, it predicts a negative relationship between real GDP growth and snackbars sales. However, the chosen model remains inconclusive about the

effect of real GDP growth on the sales volume at snackbars because the real GDP growth variable is insignificant at the 5% level. Hence, there is insufficient evidence to support the hypothesis.

II. Unemployment rate

According to the formulated hypothesis, there should be a positive relationship between the unemployment rate and the sales volume of snackbars: as the unemployment rate increases, which is indicative of a recession, the sales volume at snackbars will increase too. The chosen model does not offer sufficient evidence to confirm this hypothesis because the unemployment rate variable is insignificant at the 5% level. However, it is significant at the 10% level. Its interpretation in that case is that as the unemployment rate increases by 1%, the sales volume at snackbars decreases by roughly 0.04%. This result contradicts what the hypothesis predicts. Nonetheless, since the effect is extremely small and it is not significant at the selected benchmark level, the interpretation is disregarded.

III. Other variables

Disposable income has a significant positive impact on snackbars sales volume according to model D: as the disposable incomes of households increase with 1%, the sales volume at snackbars increases by 0.73%. This result appears somewhat in line with previous research findings, which propose that demand for quick-service restaurants are relatively income inelastic. Given that the effect size of this variable is relatively small, it appears that indeed the demand for quick-service restaurants, and hence the sales development of this segment, is relatively insensitive to changes in disposable income.

The hours worked variable is positive and significant according to model C: as the number of hours worked increase by 1%, the sales volume of snackbars increases by 1.18%. This conforms to what is reported by other literature and similarly suggests that as people work more they value their spare time more and turn to convenient food options such as snackbars more often.

The education variable is significant and negative in both models: as the fraction of higher educated people increases by 1%, the sales volume at snackbars decreases by roughly 1.34% - 1.65%. This negative effect is contradictory to what was found in some research mentioned earlier, namely that higher

educated people spend more on dining out, regardless of the type of facility. Yet it is still somewhat in line with results reported in other studies, since the sales at snackbars decline by relatively more than at full-service restaurants, confirming the proposition that higher educated people have a preference for higher-end full-service restaurants compared to quick-service restaurants.

Household size is highly significant and negative in both models: as the fraction of small households in the Netherlands increases by 1%, the sales volume at snackbars decreases by 22.50% - 26.90%. These results endorse the findings by Byrne, Capps and Saha (1998), which argue that quick-service restaurants will likely suffer from decreasing household sizes because a positive relationship exists between household size and quick-service restaurant expenditures.

The population variable is disregarded in model D, however, in model C it appears to have a significant negative impact of 11% on sales volume at snackbars. As with the negative result found for restaurant sales, this finding is equally surprising, since one would expect that population growth would have a positive impact on sales, regardless of the segment.

The gender variable has a significant positive impact on sales at snackbars, which is also revealed in other studies. However, the effect size varies to a large extent between the two models: model C suggests that an increase in the percentage of males by 1% leads to an estimated increase in the sales volume at snackbars of 97.73%, while for model D this increase is only 39.35%. As was mentioned earlier, the relatively high correlations with other variables and the limited amount of data used can be a source of this volatility. One must be cautious not to draw mislead conclusions about this variable and question whether this result is realistic.

The age variable does not appear to have a significant impact on the sales volume at snackbars in neither of the two models, and therefore the interpretation of this variable is disregarded.

Lastly, as mentioned in the restaurants section of the results, the race variable is neglected.

5. Conclusion, Limitations and Suggestions

5.1 Conclusion

This research explored what the impact of the recent economic recession was on the food away from home industry in the Netherlands by looking at two separate segments within the industry: full-service restaurants and snackbars, which represent the quick-service segment. Two methods were applied: the independent samples mean difference test and a time series regression analysis. For the regression analysis two different recession indicators were used to investigate the recessionary impact: real GDP growth and the unemployment rate. The results of both the mean difference test and the regressions confirmed the overarching hypothesis that full-service restaurant sales move pro-cyclically, and indicate that this segment suffered from the economic recession, as was expected. The results for the effect of the recession on the snackbars segment were inconclusive according to the regression analysis. The mean difference test for snackbars yielded opposite results from what was hypothesized: the average sales development during the recession was significantly smaller than the sales development during the non-recessionary period. Nevertheless, the test did reveal that the average sales development of snackbars declined less during the recession compared to restaurants, which is in line with the presumption that snackbars have a greater resilience to recessionary impacts.

Thus, linking back to the overarching research question; the recession had a significant negative impact on the full-service restaurant segment, while its effect on the snackbars segment is undetermined according to this research.

The research also shed light on the effects of other variables on the sales of the two segments. Disposable income of households was found to have a significant positive effect on sales of snackbars, though its effect appeared to be relatively minor. The number of hours worked by households also had a significant positive effect on sales at snackbars, while its effect on full-service restaurants was insignificant. The number of higher educated people as a percentage of the population had a significant negative impact on sales in both the full-service and snackbars segment. The number of small households as a percentage of all households had a significant negative impact on snackbars sales development, while its effect on restaurants was not determined. The result for the population variable was somewhat surprising, as it indicated that population growth had a significant negative impact on sales at both full-

service restaurants and snackbars. The percentage of males in the population appeared to have a significant positive influence on sales in both segments, however, the effect size was rather extreme and therefore the credibility of the result obtained was drawn into question. Lastly, the number of people aged 65+ as a percentage of the total population had a significant positive impact on the sales of full-service restaurants, while the impact of this factor on snackbars sales was insignificant.

5.2 Limitations

A limitation of this investigation is that because only a limited amount of data was available to perform the analysis on, the results are somewhat less reliable. Hence, the conclusions presented can only be interpreted with caution. Unfortunately, this problem could not be resolved because no additional data was available.

Secondly, beyond the general descriptions of the two chosen restaurant segments, the exact composition is unknown. It is not entirely clear which specific restaurants each segment contains and the conclusions drawn can therefore not be extrapolated to named restaurants. This also makes it difficult to make detailed comparisons with the results of the studies conducted in the United States, which were mentioned in the literature review.

5.3 Suggestions for further research

A suggestion for further research is to perform the same study in other European countries. European countries use similar categorizations of industry segments as the Netherlands does, because they are based on classifications made by the European Union and the United Nations. Therefore, the results generated in those countries would be more comparable and could be used as additional evidence to confirm or question the results found in this study.

Furthermore, to give the research a more detailed touch, company-specific case studies could be done. This could enhance our understanding of what particular factors, such as brand familiarity and company size, might be playing a role in the performance of restaurants and how they might provide restaurants with resistance against recessionary pressures. However, this would require collecting data on sales and other firm-specific characteristics, which are often not publicly available.

6. Appendices

Appendix 1. Correlation Tables

Figure 1. Correlations with Real GDP Growth

Real GDP growth									
Correlations	REAL GDP GROWTH	DISPOSABLE INCOME	HOURS WORKED	EDUCATION	HOUSEHOLD SIZE	POPULATION	GENDER	AGE	RACE
REAL GDP GROWTH	1.00000	0.61476	0.75234	-0.05842	-0.20448	-0.58255	-0.75381	-0.42284	-0.70872
DISPOSABLE INCOME	0.61476	1.00000	0.82124	0.13576	-0.01873	-0.85294	-0.61274	-0.50303	-0.87130
HOURS WORKED	0.75234	0.82124	1.00000	0.04823	-0.16272	-0.67435	-0.71523	-0.57802	-0.73869
EDUCATION	-0.05842	0.13576	0.04823	1.00000	0.49266	-0.15462	0.17624	-0.07824	-0.06865
HOUSEHOLD SIZE	-0.20448	-0.01873	-0.16272	0.49266	1.00000	-0.11859	0.15880	0.21203	-0.08020
POPULATION	-0.58255	-0.85294	-0.67435	-0.15462	-0.11859	1.00000	0.73605	0.18833	0.97370
GENDER	-0.75381	-0.61274	-0.71523	0.17624	0.15880	0.73605	1.00000	0.31283	0.82940
AGE	-0.42284	-0.50303	-0.57802	-0.07824	0.21203	0.18833	0.31283	1.00000	0.25146
RACE	-0.70872	-0.87130	-0.73869	-0.06865	-0.08020	0.97370	0.82940	0.25146	1.00000

Figure 2. Correlations with Unemployment Rate

Unemployment									
Correlations	UNEMPLOYMENT	DISPOSABLE INCOME	HOURS WORKED	EDUCATION	HOUSEHOLD SIZE	POPULATION	GENDER	AGE	RACE
UNEMPLOYMENT	1.00000	-0.73639	-0.91150	-0.00071	0.27803	0.62269	0.65032	0.59529	0.68226
DISPOSABLE INCOME	-0.73639	1.00000	0.82124	0.13576	-0.01873	-0.85294	-0.61274	-0.50303	-0.87130
HOURS WORKED	-0.91150	0.82124	1.00000	0.04823	-0.16272	-0.67435	-0.71523	-0.57802	-0.73869
EDUCATION	-0.00071	0.13576	0.04823	1.00000	0.49266	-0.15462	0.17624	-0.07824	-0.06865
HOUSEHOLD SIZE	0.27803	-0.01873	-0.16272	0.49266	1.00000	-0.11859	0.15880	0.21203	-0.08020
POPULATION	0.62269	-0.85294	-0.67435	-0.15462	-0.11859	1.00000	0.73605	0.18833	0.97370
GENDER	0.65032	-0.61274	-0.71523	0.17624	0.15880	0.73605	1.00000	0.31283	0.82940
AGE	0.59529	-0.50303	-0.57802	-0.07824	0.21203	0.18833	0.31283	1.00000	0.25146
RACE	0.68226	-0.87130	-0.73869	-0.06865	-0.08020	0.97370	0.82940	0.25146	1.00000

Appendix 2. Summary table of chosen models

Table 2

	Restaurants		Snackbars	
Regressor	**Model A**	**Model B**	**Model C**	**Model D**
Constant	1.855376* (1.080496)	0.575150 (1.060719)	11.99018*** (2.174731)	6.806048*** (1.568217)
Sales (-1)	0.665550*** (0.059232)	0.645612*** (0.082388)		
Real GDP Growth	0.584890*** (0.131926)		0.122203 (0.190089)	
Unemployment rate		-0.089627*** (0.024355)		-0.042089* (0.024143)
Disposable income				0.734118** (0.286666)
Hours worked			1.179023*** (0.377723)	
Education	-1.168056*** (0.167127)	-1.099085*** (0.139988)	-1.653972*** (0.270935)	-1.337945*** (0.223272)
Household size			-22.49933*** (7.116844)	-26.89667*** (6.676699)
Population	-8.185373*** (2.481716)		-10.99192*** (3.113772)	
Gender	56.37538*** (15.81051)	32.56714** (12.75307)	97.73168*** (23.30029)	39.34982*** (8.562609)
Age	0.878802*** (0.201455)	1.346456*** (0.334031)		0.636320* (0.318328)
Summary Statistics				
Adjusted R2	0.885658	0.886451	0.603378	0.629289
F-statistic	50.05589***	50.44266***	10.88841***	10.90218***
Schwarz criterion	4.402717	4.395759	4.882475	4.806224
N	39	39	40	36

*The values reported in the parentheses are the standard errors of the estimates. HAC (Newey-West) standard errors are applied. *, **, and *** indicate a significance at the 10%, 5%, and 1% level respectively.*

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