RESTAURANT FRANCHISING IN THE WESTERN UNITED STATES

Burhan F. Yavas, California State University, Dominguez Hills
Demos Vardiabasis, Pepperdine University

Abstract

This paper studies the effect of both economic and demographic factors on restaurant franchising (RF) in the Western United States. The study utilizes regression analysis of pooled cross-section (6 states) and time series (10 years) data. It is found that among the economic factors, the market size, measured by per capita gross domestic product, is the most significant. Also found important is the cost of raising capital, which is measured by the real rate of interest. On the demographic side, the level of urbanization is found to be positively related to restaurant franchising.

I INTRODUCTION

This study examines the effect of economic and demographic factors on restaurant franchising (RF) in the Western-Pacific region of the United States. Restaurant franchisors are currently operating in all of the states and are experiencing tremendous growth. As such, they are interested in the determinants of the RF, for this directly affects their profits. Furthermore, both managers and scholars have shown increasing interest in this subject. This is due, in part, to the fact that the franchise restaurant segment has evolved into a large and dynamic sector of the food service industry. In 1970, franchise restaurants accounted for 21 percent of total eating place sales. By 1983, restaurant franchise sales reached \$38.7 billion, constituting 41 percent of all eating places. The number of franchise units has more than doubled during the same period, reaching an impressive 67,525 units across the country. (NRA,1986 p.1). In addition, franchise restaurants make up a large proportion of the total franchise industry. In 1983, restaurants ranked number one in total employment,

second in total number of franchise units, and third in sales, with 9.2 percent of total franchise sales (NRA,1986 p.1). It may also be noted that the success of the restaurant industry occurred at the time of declining productivity and related difficulties in many other industries. Consequently, the restaurant industry has attracted more attention than ever before.

The primary objective of this paper is to analyze the relationship between demo-economic factors and the growth of restaurant franchising in the Western-Pacific (WP) region of the United States. The region we are considering consists of the states of Arizona, California, Nevada, Oregon, Utah, and Washington. There are two main reasons for bringing together these six states. First, these states experienced the strongest growth in both company and franchisee owned units during the period of 1979-1983, averaging 8.4 percent a year. Second, franchise operations typically follow expanding economies and population shifts. The rapid growth of economies, and the changes in

the demographics of the WP, made the region a perfect candidate as the general market area for our analysis.

Despite the significance of this topic, research on the determinants of restaurant franchising has not been extensive. In the literature, one usually encounters survey studies of well-known franchisors, typically addressing specific issues of current interest and/or future plans for expansion (Restaurant Business, 1983). Despite some weaknesses mentioned below, these studies have nevertheless isolated several factors as major forces for the expansion of restaurant franchising, namely:

- shift of population from rural to urban areas.
- increased demand for food purchased away from home due to a reduction in the amount of time spent in the kitchen, caused by an increase in female employment (U.S.D.C. , 1986 p. 8).
- increased demand for food purchased away from home due to an increase in income (NRA, 1986 p. 6).
- market growth.
- shortage of capital and high interest rates (NRA, 1986 p. 6).

To our knowledge, very little empirical analysis has been conducted to investigate the validity of the above hypotheses. The purpose of the present paper is to operationalize some of these hypotheses to test empirically the effect of the above factors in restaurant franchising. In addition to formal statistical testing of such hypotheses, this study improves upon the past studies by employing a multiple regression methodology on pooled time-series-cross-sectional data.

The following section states the hypotheses to be tested. In part III, the research method is described. In the final part, the results of the regression analyses are presented along with a brief discussion of their implications.

II HYPOTHESES

The hypotheses may be divided into two groups: (1) those dealing with economic events and RF; and (2) those dealing with the demographic factors and RF.

Hypotheses dealing with economic events:

H₁: There exists a positive relationship between the RF (number of units of franchisee-owned restaurants) in one state in year t and per capita income in the same state in year $t-k$.

H₂: There is a positive relationship between the RF in one state in year t , and the cost of raising capital in the same state in year $t-k$. While the first hypothesis may be self evident, H₂ requires some explaining. The argument here is that economic factors have made growth through company-owned units difficult. Therefore, franchising may provide these businesses with a) a new method of distribution, b) an ability to compete with large companies, and c) an opportunity for those with limited capital to own their own businesses. Accordingly, it is expected that the independent "Mom and Pop Hamburger Stand" will become franchised as it gets increasingly more difficult to raise capital. The real rate of interest, rate of interest minus the rate of inflation, is used as a measure of cost of capital. The specification that higher real interest rates result in higher levels of restaurant franchising activity requires the use of individually-owned franchises as the dependent variable, rather than total number (both company-owned and individually-owned) of franchises. Per capita Gross Domestic Product (PCGDP) is used in this study as the indicator of income.

Hypotheses dealing with demographic factors:

H₃: A positive relationship exists between RF in one state in year t , and

the rate of urbanization in that state in year t-k.

H₄: A positive relationship exists between RF in one state in year t, and the proportion of female workers in that state in year t-k.

It is thought that urbanization would be positively related to RF since it was demonstrated to be important in the surge of service industries in the U.S. (U.S.D.C. , 1983). Urbanization is measured by metropolitan population. **H₄** is formulated so that we can test to see if a growing number of women going to work would increase the demand for food purchased away from home (U.S.D.C. , 1986 p. 8).

III METHODOLOGY

The above hypotheses are tested using regression analysis over time and across states. The six Western-Pacific states for which data were available from 1974 to 1983 (10 years) are included in this study. These six states were recipients of 15 percent of all restaurant franchising in the U.S. in 1983 (NRA, 1986).

Data:

Data on Restaurant Franchising are obtained from the U.S. Department of Commerce, "Restaurant Franchising in the Economy", various issues. Also utilized is "Franchise Restaurants: A Statistical Appendix to Foodservice Trends" published by the National Restaurant Association (NRA) in 1986. RF reflects the total number of individually-owned restaurant franchise units in respective states.

The data on Gross Domestic Product (GDP) in each state are obtained from the "Statistical Abstract of the United States" published by the U.S. Department of Commerce. GDP is in constant U.S. dollars, with 1972=100. Per Capita GDP is computed as the ratio of GDP

to resident population.

The indicator of the cost of capital is the real rate of interest. The data on this variable are obtained from the prime rate and the Consumer Price Index (CPI) and are denoted by INT. It may be noted that due in part to high rates of inflation during the sample period used in this study, all of the economic variables utilized are expressed in real, as opposed to nominal terms.

The main source of demographic data is again the "Statistical Abstract of the United States". This study uses metropolitan population as a measure of urbanization and this variable is labeled URB. The female labor force participation rate is computed as the ratio of female employment to total employment. The examination of the data matrix, however, indicated relatively high correlation between metropolitan population and the rate of female labor force participation. Accordingly, the latter variable is deleted from the data matrix.

The Model:

Given P states and M observations on the variables in each state, the basic model is as follows:

$$RF_t = B_0 + B_1 PCGDP_{i,t-k} + B_2 INT_{i,t-k} + B_3 URB_{i,t-k} + \sum_{i=1}^P it$$

(i = 1, 2, ..., P; and t = 1, 2, ..., M)

with P=6 States and M=10 years.

where the **B_i**'s are the regression parameters, **it** is the error term, and the variables are as defined above. The independent variables are all lagged k years. In this study, the model is estimated for k=0, and k=1. In both cases, F tests are conducted in order to test the overall significance of the

regression equation given above. In addition, t-tests are carried out for individual regression coefficients. All t-tests are one-tail tests with the null hypotheses of $B_i = 0$ for all $i=1,2,3$; and

the alternative of $B_i > 0$. This is because

the relationships that exist between the independent variables on the one hand and the dependent variable (RF) on the other are thought to be positive. Therefore we expect to reject the null hypotheses that $B_i = 0$ in favor of the

alternative hypotheses that $B_i > 0$.

Pooling cross-section and time-series data:

As it was indicated above, this study uses pooled time-series-cross-sectional data. The most important advantage of such an approach is the enlargement of the sample size. The sample is considerably larger than if only time-series or cross-sectional data were employed. As a result, a single pooled regression has the advantage of containing greater precision than several different regressions. On the other hand, however, inappropriate pooling may introduce aggregation bias which may result in inaccurate estimates. In this study, several tests are conducted to determine the appropriateness of pooling.

First, the equality of the error variances for the six states is tested using the usual F test between all possible pairs of states (Neter & Wasserman, 1974 p.165).

Second, covariance analysis is utilized to test the differences in the complete relationship between 6 states.

Third, covariance analysis is used again to test differences in intercepts (slopes assumed constant for all states). This is usually referred to as the test of intercept homogeneity (Johnston, 1972 p.199).

Finally, differences in slopes between states are tested (test of slope homogeneity, Johnston, 1972).

The results of these tests were used to assess the appropriateness of certain methods of pooling. In addition to formal statistical tests of homogeneity, this study uses three different versions of the basic model to estimate regression coefficients. The purpose here is to determine the sensitivity of the parameter estimates to the various assumptions on which the models are based.

Specifically, the three versions of the basic model are the following:

1. the ordinary least squares (OLS) model.
2. the time-wise autoregressive and cross sectionally correlated (TSCS) model.
3. the covariance (COV) model.

The main difference between OLS and TSCS models lies in their treatment of the error term. The OLS model assumes homoscedasticity (constant variance), cross sectional independence, and timewise nonautoregression. The TSCR model, on the other hand, combines the assumptions usually made when dealing with time-series data with those made when dealing with cross-sectional data. For example, observations on individual states at a point of time are assumed to have heteroscedastic error terms. Furthermore, "when cross-sectional units are geographical regions with arbitrarily drawn boundaries - such as the states of the United States - we would not expect this assumption (cross-sectional independence) to be well satisfied." (Kmenta, 1986 p.618).

Concerning the time-series data, the expectation is that the error terms can be autoregressive. Therefore, when dealing with pooled time-series-cross-sectional data, we may combine these assumptions. The result is the TSCS

model.

Finally, the COV model uses dummyvariables for both different states and different years. Therefore, the intercept is no longer constrained to B_0 for all state-years, but is allowed to vary so as to take into account both state specific and year specific effects.

IV RESEARCH FINDINGS

All States:

Table 1 presents the results of the regression analysis for all six states for $k=0$ and for $k=1$. The results of COV and TSCS are presented but not the

results of OLS. The COV model is more appropriate than the OLS model because the tests of intercept homogeneity resulted in the rejection of the hypothesis that intercepts are equal in both $k=0$ and $k=1$. The computed F values are 3.25, and 2.36 respectively, and the critical F value in both cases is approximately 2.09. On the basis of homogeneity tests alone, the TSCS model appears to be better than the COV model, since the test of intercept homogeneity indicates the appropriateness of pooling. However, since the TSCS procedure does not provide us with R^2 or F values, its results are reported along with the results of COV model.

Table 1
Regression Results: All States

Model	PCGDP B_1	INT B_2	URB B_3	F	R^2
COV $k=0$	495.7* (243.1)	624.4** (143.1)	.18** (.014)	218.6	.987
COV $k=1$	593.1* (279.1)	579.8** (164.6)	.19** (.016)	188.6	.985
TSCS $k=0$	127.3** (20.59)	29.9** (4.83)	.216** (.020)		
TSCS $k=1$	130.2** (20.95)	13.08* (5.69)	.234** (.016)		

* indicates significance at the .05 level.

** indicates significance at the .01 level.

Standard errors are in parentheses.

The results presented above are consistent for both $k=0$ and $k=1$. It is found that the coefficients of INT and URB are significant at the .01 level; while the coefficient of PCGDP is significant at the .05 level for the COV model. This is true for both of the lags examined here. Briefly, these results indicate that an increase in PCGDP has an anticipated positive effect on restaurant franchising. The implication is that an increase in income increases demand for food eaten away from home. Stronger support is provided for the expected positive relationship between urbanization, as measured by metropolitan population, and restaurant franchising. Finally, the results of the regression analysis suggest that an increase in the cost of capital gives an added impetus to restaurant franchising. Once again this is interpreted as indicating that the restaurant franchising provides an effective method of overcoming such problems as shortage of capital and high interest rates.

It is also found that among the year dummies, two turned out to be significant at the .05 level. Negative values of the dummies for 1979 and 1980 seem to indicate that certain factors have affected RF adversely during that time period. It may be that the general slowdown of economic activity at the time is responsible for such a result.

We also find the state dummies for Nevada and Washington to be significant at the .01, and .05 levels, respectively. The estimated coefficients are -474, and -484 for the one-year lagged model. This result may suggest that we have failed to include all the relevant explanatory variables that do not have the same value for all the states, and that certain features of these states have resulted in the reduced franchising activity there.

Table 1 above also reports the re-

sults of TSCS model for all the states. Two points about this model should be noted. First, the test of partial homogeneity (assuming constant slopes) indicates appropriateness of pooling at the .05 percent significance level.

Second, the model assumes a first-order autoregressive error structure with contemporaneous correlation between cross sections. The covariance matrix is estimated by a two-stage procedure leading to the estimation of model regression parameters via generalized least squares. This procedure is shown to produce unbiased and consistent estimators (Kmenta 1986).

Briefly, the results indicate that all of the independent variables have their expected positive coefficients. Furthermore, these coefficients are significant at the .01 percent level for $k=0$. The results of the other lag examined here do not differ substantially from the zero-year lagged model.

All States Except California:

The state of California accounts for more than all the other states combined in terms of the number of franchise restaurants. This may have been responsible for our inability to accept the null hypotheses of overall homogeneity. Cattin and Wittink argue for combining subsets that have the same overall relationship (Cattin and Wittink 1976). Accordingly, we have excluded California in pooling the data and repeated the tests. This resulted in the acceptance of the hypotheses of intercept homogeneity for both the OLS and TSCS models. The results of both models are shown in table 2 below.

The results of the OLS and TSCS models are consistent in terms of the signs of coefficients. The TSCS model is judged to be better on the basis of the significance tests. The TSCS model with $k=0$ provides strong support for all three of the hypotheses examined in this study.

Conclusions:

This study does find a significant direct relationship between restaurant franchising and economic-demographic events. Among the economic factors, per capita gross domestic product and the cost of raising capital are both found to be significant. It is also found that the rate of urbanization directly affects decisions regarding restaurant franchising. This last result demonstrates the appropriateness of expanding the scope of examination to include dimensions of the demographic environment.

Finally, some suggestions for improvement should be noted. First, restaurant franchising is a very broad term that includes many different types of restaurants. There may be differences among them in terms of growth patterns. Therefore, considerable insight might be gained if different types of restaurants are studied individually. Second, this study can be extended to include all of the states not just the western states. This way, generality of the results can be enhanced.

Table 2
Regression Results: All States except California

Model	PCGDP	INT	URB	F	R ²
OLS					
k=0	31.4 (22.6)	15.7 (10.8)	.263 ** (.021)	59.8	.79
k=1	20.5 (23.9)	12.2 (11.4)	.271 ** (.022)	56.0	.77
TSCS					
k=0	28.4 ** (10.4)	9.01 ** (2.67)	.25 ** (.028)		
k=1	58.2 ** (15.7)	2.28 (3.76)	.194 ** (.028)		

Figures in parentheses are standard errors; ** and * indicate significance at the .01 and .05 levels respectively.

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