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November 2008 (Oral): Industrial Organization  
June 2008 (Oral): Labor Economics  
May 2007 (Written): Macroeconomics, Microeconomics

**Dissertation Title:** Local knowledge, Franchising, and the Limits of the Firm.

**Committee:**

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**Expected Completion Date:** May 2012

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Ph.D., Economics, Yale University, May 2012 (expected)  
M.Phil., Economics, Yale University, May 2010  
M.A., Economics, Yale University, May 2008  
B.A., Mathematics & Economics, University of Pennsylvania June 2006

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Yale University Doctoral Fellowship, 2006-  
Cowles Foundation Fellowship 2006-2010  
Yale University Summer Fellowship, 2007,2008  
Dissertation Fellowship Spring 2010, Fall 2011  
University Scholars, a research based honors program at Penn: 2002-2006  
Dean's list (Penn) 2003,2004,2005,2006.

**Teaching Experience:**

Financial Markets, Professor Robert Shiller, Spring 2011  
Introductory Microeconomics, Professor Steven T. Berry, Fall 2010  
Financial Theory, Professor John Geanakoplos, Fall 2009  
American Economic History, Professor Benjamin Chabot, Spring 2009  
General Equilibrium Theory, Professor Truman Bewley, Fall 2008

**Research Experience:**

Research Assistant, Professor Noam Wasserman, Harvard Business School, Summer 2007  
Research Assistant, Professor Abraham Wyner, Wharton School, Sept 2005-May 2006  
Research Assistant, Professor Brian Hall, Harvard Business School, Summer 2003

**Computing Experience:**

SAS, STATA, Matlab, ArcGIS, Excel

**Job Market Paper:**

**Franchising and Local Knowledge: An Empirical Investigation in the Pizza Delivery Industry**

## References:

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## **Job Market Paper Abstract: Franchising and Local Knowledge: An Empirical Investigation in the Pizza Delivery Industry.**

There is a large literature examining the determinants of franchising. The empirical literature tends to focus on two explanations of why firms would cede ownership of some of their brand's outlets in return for royalty fees: double-sided moral hazard and risk-sharing. The empirical findings on moral hazard generally match the predictions of the theory: the greater (proxies for) the importance of franchisee effort, the more franchised outlets are observed, and the greater (proxies for) the importance of franchisor effort, the more company-owned outlets are observed. (See LaFontaine & Slade 2007 JEL for a review of the relevant studies.) However, the empirical findings on risk-sharing are the opposite of what the theory would predict: Higher measured riskiness is positively related to franchising. One possible explanation is that franchisees have greater knowledge of the fluctuations in local demand and other outlet specific factors. Franchisees' superior knowledge would be most valuable where such fluctuations are most important, that is in locations where measured variability (i.e. risk) is greatest. However, the empirical literature has been unable to find evidence that the importance of local knowledge is a determinant of franchising. Even the more fundamental hypothesis of whether franchised outlets are indeed better informed about fluctuations in local demand has not been tested. In this paper, I examine whether franchised pizza delivery stores in a major US chain have greater knowledge of local demand fluctuations than company-owned ones do, as revealed by their pricing behavior. I find that franchised outlets are better informed than company-owned ones about current local demand.

The analysis is carried out in two stages. In the first stage, I estimate a spatial logit model of demand that has a census tract-time specific structural error. In the second stage, I perform several tests for whether franchised and company-owned stores reveal knowledge of the shift that their residual demand curve has undergone due to the local demand shocks and whether one of these groups reveals more knowledge than the other. These tests are based on the rank

correlation between a store's week-to-week change in price and the week-to-week (parallel) shift in its demand curve. The use of rank correlations is based upon the insight that although the relationship between the optimal adjustment in price and the parallel demand shift is non-linear and not precisely known, it is monotonically increasing for any upward sloping supply curve. So, regardless of the specific supply function, a fully informed firm will increase(decrease) prices more in response to a bigger outward(inward) demand shift than in response to a smaller outward(inward) demand shift. Hence, when the rank order of a firm's price shifts and demand shifts disagree this indicates a lack of information about the demand shock. I use the Spearman and Kendall measures of rank correlation for each test.

Informational differences are only one among several possible causes of differences in observed pricing behavior. Therefore, alternative explanations are considered. These include: frictions that cause lumpy price adjustment, (e.g. menu costs.) frictions that cause partial adjustment, (e.g. quadratic adjustment costs.) agglomeration bias, (a.k.a Simpson's paradox.) and serially correlated shocks. Each of these alternative explanations is addressed in turn and is either ruled out by the data or is insufficient to explain the results.

Therefore, I use three different approaches to test for the importance of informational advantages. Firstly, I test whether the rank correlation of price change and demand shift is significantly different from zero, for the group of franchised stores and for the group of company-owned stores. Secondly, I compute the rank correlation of price change and demand shift for each individual store, and test whether the proportion of stores whose correlation is positive is significantly different from half. I do this for franchised stores and for company-owned ones. Finally, I compute the rank correlation of price change and demand shift for each individual store, and test whether the correlation of franchised stores is Finally, I compute correlations for each store, and then, for each possible combination of a single franchised and company-owned store, look at which correlation is greater. I then test whether the proportion of combinations where the franchised store's correlation is greater is significantly greater than half.

For both the Spearman and Kendall measures of rank correlation and across the various specifications and tests, franchisee price shifts have a significantly positive rank correlation with demand shifts while company-owned stores do not. This suggests that franchisees are able to make use of some knowledge of the current local demand shocks, but there is nothing to indicate that company-owned stores are. Additionally, I find that franchised stores' knowledge of local demand shocks is driven wholly or primarily by knowledge of local taste shocks, rather than by knowledge of shifts in consumer utility from rival products.