

McFreedom: How Women Can Have It Their Way

An Income-Leisure Choice Model

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Abstract

Studies have shown that throughout the 1970s and 1980s, the labor force participation rate for married women increased dramatically. This study examines the impact of the growth of the fast food industry on the continued increase in labor force participation in today's labor market using multiple OLS and FGLS specifications. The study confirms that as the number of fast food establishments increased, after controlling for specific county-level trends, there was a corresponding increase in labor force participation of women in the United States upwards of 0.6% per additional establishment. Furthermore, these findings display evidence of diminishing returns. This evidence of diminishing returns serves as motivation for a causal link. The study concludes that the growth of the fast food industry has provided significant driving force for the transition of adult women from traditional family roles to that of wage-earners. Implications for future research are also included.

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I. Introduction

Lionel Robbins (1929) famously wrote that “the number of hours a man works is not a matter which is determined independently of other circumstances.” Today we can pose the same statement for women. The labor supply of a woman is highly dependent upon endogenous factors in her life, be it the choice to marry or remain single; to have children or not; and even the choice to invest in specific or general human capital. In 1965, Gary Becker outlined the choices made by each family unit relative to labor and leisure based on consumption choices, following the framework set up by Jacob Mincer (1962). Since then, the literature on female labor force participation (FLFP) has focused on three major impetuses for growth in the labor force participation rate: (a) changes in marginal rates of taxation; (b) the proliferation of birth control in the 1970s; and, (c) increased human capital attainment. This research offers a fourth explanation which underscores the root factor enabling women to enter the workforce – decisions over household time.

Building upon prior work on income and substitution effects, Orley C. Ashenfelter and James J. Heckman (1974) developed a model that estimated the impact of taxes on the labor supply decisions of individual household units. This led to a wave of literature, including works by Jerry A. Hausman (1985), Nada Eissa (1995), and Martin Feldstein (1995); which used changes in tax structure as a natural experiment to view family-level decision making in labor force participation. The main focus in this branch of the literature is that the secondary wage earner must feel sufficiently compensated before making the choice to substitute away from household leisure time towards time in the labor market.

Claudia Goldin and Lawrence F. Katz (2000; 2002) found that the advent of easily acquired contraception made human capital investments more worthwhile for young women who would now have more time to remain in the workforce before starting a family. This research lines up with the works of Jacob Mincer and Solomon W. Polachek (1974; 1978), and Polachek (1975; 1995), among others; which found that women are unlikely to invest as heavily in human capital early in life due to intermittent time spent in the labor market during their prime working age. Their findings showed that without continuous usage, high-end human capital can depreciate rapidly. Thus, women will focus more in low-level human capital which has a much smaller depreciation rate and therefore wind up at a major disadvantage in the labor market relative to men.

But what if women could shorten their home-time and thereby have a working career that is less intermittent? One would expect to see those women place a greater emphasis on their working careers by investing more heavily in human capital and thus become more likely to take part in the labor force. This study uses the growth of the fast food industry as a proxy to show illustrate that the relationship between time spent in the labor market and time spent at home for women has broader economic implications for society.¹ The challenge is separating out the inherent endogeneity present between increases in labor force participation and the availability of a growing demand for low-skill labor via the growth of the fast food sector both inside and outside the industry. In doing so, the goal of this study is to identify the relationship between the emergence of an

¹ See Francine Blau, Marianne Ferber, and Anne Winkler [2010:12-31] and Ariel Belasen [forthcoming] for further discussion of the breakdown of the “traditional role” of women in the labor market.

additional fast food restaurant and the increase in female labor force participation in the nearby locality.

II. Background

According to the US Census North American Industry Classification System (NAICS), a fast food restaurant is defined as a limited-service establishment in which “patrons generally order or select items and pay before eating. Food and drink may be consumed on premises, taken out, or delivered to the customer’s location.”² The origins of the fast food industry stem back to ancient times when urban dwellers first became dependent upon food vendors for meals during their work day.³ The fast food industry in the United States has bloomed from a few independently run limited-service restaurants into a \$150 billion dollar industry in a matter of three decades.⁴ From the advent of modern fast food at the St. Louis World Fair in 1904 to a growing chain of Automat cafeterias at the turn of the Twentieth Century to today’s globally-known McDonald’s franchises, US fast food has dominated the world market for the last century. The National Restaurant Association (2009) reports that 48% of the money spent on food in the United States is spent at food service establishments. This is dramatically up from the 25% spent in 1955. Currently, their estimates show total employment in the restaurant industry to be 13 million; 2.5 million of which are teenagers who are employed predominantly in the fast food sector.

² See 2002 NAICS Definition for 722211 Limited-Service Restaurants:
<http://www.census.gov/epcd/naics02/def/ND722211.HTM>

³ John Stambaugh (1988) describes limited-service food vendors as an indispensable piece of daily life for inhabitants of Roman cities as insulae-style living spread across urban centers in the Empire.

⁴ National Restaurant Association, <http://www.restaurant.org/research/forecast.cfm>.

A study by James Berry (2002) of The Energy Information Administration⁵ confirms that as more people begin to depend on restaurants, and fast food in particular, for one or more of their daily meals, less time is spent at home and in the kitchen. The study found that in 2001, 67.6% of households consumed meals cooked at home at most once per day. As the average household relies less on food prepared at home and more on fast food restaurants for a quick lunch, one can ascertain that the decrease in demand for leisure hours leads to a substitution effect towards labor hours. Likewise as women become more likely to enter the labor force, we see this coincide with an increase in demand for additional fast food restaurants. This cycle underscores the expectation that women will increase their labor market exposure as the availability of nearby restaurants increases.

III. Methodology

To prove whether this expectation holds, it will be important to examine growth in the fast food sector at the regional level. That way national trends that may mask the individual impact of a restaurant can be isolated out of the findings. Prior studies of labor market behavior including Mincer (1962) and Ashenfelter and Heckman (1974) have shown that a more localized study will yield more visible results. To that end, it will be important to examine differences across localities, be they physical, socioeconomic, or cultural. Furthermore, in accordance with the previous studies, this study will utilize controls such as unemployment rates, average income, and educational attainment levels.

In order to properly assess the impact of the fast food sector on female labor force participation, one must first expand upon the traditional labor choice model. Using

⁵ The Energy Information Administration, <http://www.eia.gov>.

Mincer's (1962) framework, we can examine a simple model illustrating the labor/leisure tradeoff. Mincer defined the labor force participation (m) as a function of permanent (y) and temporary family income (w) along with other individual-specific traits (u):

$$m = \beta_p \cdot y + \gamma w + u \quad (1)$$

He then defined y as the combination of income from the husband (x_p) and wife (w). In doing so, he specified that earnings from the primary-wage earner (generally the husband) will be more permanent than the wife's earnings. Thus the equation was respecified as:

$$m = \beta_p (x_p + w) + \gamma w + u = \beta_p x_p + \alpha w + u \quad (2)$$

Mincer (1962) found that changes in w will lead to a stronger shift in the relative magnitudes of the income and substitution effects of the labor supply function of married women, thereby leading to stronger movements in m than similar shifts in x_p . In other words, Mincer found that married women will work more when their earnings increase and work less when their husbands' earnings increase. Thus, the negative coefficient of β_p and the positive coefficient of α tend to counteract one another. Mincer concluded that the coefficient on a woman's wages tended to be strong enough such that an across-the-board wage increase would increase the number of hours worked by a married woman.

Unlike Mincer (1962), this study is not concerned with the specific income and substitution effects in the household labor supply function, so the division in income is

unnecessary. Instead, the focus will be on the added worker effects of the above model. Furthermore, as mentioned in Section III, data limitations prevented marital status from being included in the county-level study, so the m is replaced with an f_i measuring the labor force participation rate of all adult women in county i . Additionally, following Blau and Kahn (2007) this study examines a number of additional potential factors remaining in the residual (u) of Mincer's (1962) model: education (E); unemployment (U); proximity to fast food establishments (FF); and a vector of specific county-level factors (Z). Thus equation (2) can be augmented to the following:

$$f_i = \beta_1 w_i + \beta_2 E_i + \beta_3 U_i + \beta_4 FF_i + \beta_{ij} Z_{ij} + v, \quad (3)$$

where w_i is the wage in county i , and Mincer's residual becomes the following: $u = \beta_2 E_i + \beta_3 U_i + \beta_4 FF_i + \beta_{ij} Z_{ij} + v$. Blau and Kahn (2007) point out that the number of young children that are under the age of six per household plays a significant role in the labor force participation rate of married women. Unfortunately, due to the limitations of the fast food data set, such household-level characteristics will be picked up by the residual. Therefore, what remains is a county-level aggregate look at the overall level of wages, educational attainment, and unemployment that will be coupled with individual characteristics of the counties including the number of newly-opened fast food restaurants.

Mincer (1962) found a positive effect on female labor force participation from an increase in the wage rate received by women, and a negative effect from an increase in the income of the husband. The model revealed that the impact on labor force

participation brought on by an increase in earnings for wives was of a greater magnitude than that of the impact of an increase in income for their husbands. By combining these two factors into a single measure, one should expect to find the net effect of wages on female labor force participation should be small, yet positive. However, much has changed in the last 45 years, so these prior results must be taken with a grain of salt. In fact, in his comments on Mincer's (1962) findings, Clarence D. Long (1962) notes that at the individual level the specific income and substitution effects are still household-specific, so a macro-level generalization may differ across empirical studies.

Among the remaining coefficients of interest: Increases in the average level of education in the observed county should have a positive impact on labor force participation. However, since education is a major determinant of wages, this study will use the illiteracy rate as a proxy. Thus since increases in education would be a positive influence on the participation rate, the opposite should be true for increases in the illiteracy rate. Meanwhile, increases in unemployment should have the opposite effect as high rates of unemployment can deter marginal workers (i.e. those individuals who are indifferent between spending time in the labor force and at home,) from entering the labor market. Finally, women who live close to fast food establishments should be able to choose to spend more time in the labor market and less time at home, thus indicating that as the number of fast food restaurants increase in a given county, the labor force participation rate should also increase; or vice versa that as more women go to work, the demand for fast food restaurants rises. To summarize, one should expect to see: $\beta_1 > 0$, $\beta_2 < 0$, $\beta_3 < 0$, and $\beta_4 > 0$.

IV. The Data

The data used in this study to measure the growth of the fast food sector comes from InfoUSA.com.⁶ InfoUSA.com, a division of InfoGroup, is a privately run database certified by the American Marketing Association. The data set contains a net increase of 4,861 fast food establishments opened in 2007.⁷ This number represents a 3% increase in the total number of establishments from the previous year.

To coincide with the fast food data, county-level working-age population statistics for both men and women along with urbanization rates were taken from the US Census Bureau's 2008 estimates,⁸ and coupled with labor force data from the Bureau of Labor Statistics (BLS).⁹ Furthermore, employment and earnings statistics were drawn from the BLS Quarterly Census of Employment and Wages (QCEW).¹⁰ The BLS surveys employers regarding their total wage bill, employment, and number of establishments each quarter.

This study uses end-of-the-year QCEW county-level data for 2007.¹¹ County-level unemployment data was garnered from the Local Area Unemployment¹² (LAU) study of the BLS. Finally, to control for specific county-level characteristics, data has been incorporated from the National Center of Education Statistics' (NCES) 2003

⁶ InfoUSA.com maintains a proprietary database of more than 210 million consumers and 14 million businesses. The author expresses deep gratitude to Chris Kennedy of InfoUSA.com for graciously providing the data used in this study pro bono.

⁷ While it would have been preferable to use data from the 1960's and 1970's, such detailed statistics were not available by county, and the time series using national data had too few observations to be considered relevant findings.

⁸ U.S. Census Bureau, <http://www.census.gov/popest/counties/>.

⁹ Bureau of Labor Statistics, <http://www.bls.gov>.

¹⁰ The Quarterly Census of Employment and Wages, <http://www.bls.gov/qcew/>.

¹¹ While it would have been preferred for this study to use employment and earnings data specifically pertaining to female employees, such data does not exist at the county level. Furthermore, due to the lack of specific statistics for marital status, all gender-based data in this study will be for men or women on the whole as opposed to as single or married.

¹² Local Area Unemployment, <http://www.bls.gov/lau>.

National Assessment of Adult Literacy (NAAL).¹³ A summary of the descriptive statistics at the average US County level can be found in Tables 1 and 2 in the appendix.

V. Empirical Analysis

The original estimate of the model will assume that any county-specific factors (Z) will be mitigated for the average county.¹⁴ This assumes that the summed deviations from the mean values for Z will be zero; and therefore, the β_{ij} vector will revert to constants and be included as a single β_0 intercept. Thus the specification for Model 1 is as follows:

$$\hat{f}_i = \hat{\beta}_0 + \hat{\beta}_1 w_i + \hat{\beta}_2 E_i + \hat{\beta}_3 U_i + \hat{\beta}_4 FF_i \quad (4)$$

Data for the wages comes from the QCEW's average weekly wage measure. The average level of education is measured by proxy using the illiteracy rate recorded in the NAAL. The unemployment rate is reported by the BLS by county. The measure for fast food is the number of new establishments as recorded by InfoUSA.com. The results of the initial estimation of the impact on growth in the fast food industry on female labor force participation can be found in Table 3 (see below). The specification in equation (4), seen in Model 1, reveals that while $\hat{\beta}_4 > 0$, it reflects just a 0.09% increase in female labor force participation in the average county coinciding with each new firm opening.

¹³ The NCES completed the NAAL in 2003 (<http://nces.ed.gov/NAAL/estimates/>), and, to date, no update is yet available. While it would be preferred to use 2008 estimates, it stands to reason that the literacy data has not changed drastically over those four years.

¹⁴ This assumption will be relaxed in subsequent specifications of the model.

Table 3: US County Level Regression of the Female Labor Force Participation Rate

Coefficient:	Model 1	Model 2	Model 3	FGLS
New Fast Food Establishments				
<i>Coefficient:</i>	0.0909***	0.0548**	0.5834***	0.4165***
<i>P-value:</i>	0.000	0.016	0.000	0.000
Illiteracy Rate				
<i>Coefficient:</i>	-0.7884***	-0.3756***	-0.3649***	-0.5347***
<i>P-value:</i>	0.000	0.000	0.000	0.000
Average Weekly Wage				
<i>Coefficient:</i>	0.0109***	0.0105***	0.0084***	0.0082***
<i>P-value:</i>	0.000	0.000	0.000	0.000
Unemployment Rate				
<i>Coefficient:</i>	-2.9976***	-3.4147***	-3.4105***	-3.5537***
<i>P-value:</i>	0.000	0.000	0.000	0.000
Growing Counties				
<i>Coefficient:</i>			0.9799*	0.9332*
<i>P-value:</i>			0.096	0.069
Metropolitan Counties				
<i>Coefficient:</i>			4.4421***	3.7790***
<i>P-value:</i>			0.000	0.000
Interaction of Metro & FF				
<i>Coefficient:</i>			-0.5663***	-0.3847***
<i>P-value:</i>			0.000	0.000
Appalachian Counties				
<i>Coefficient:</i>		-12.8565***	-12.8407***	-11.7537***
<i>P-value:</i>		0.000	0.000	0.000
Mid-Atlantic Counties				
<i>Coefficient:</i>		-6.3080***	-7.9763	-6.8862***
<i>P-value:</i>		0.000	0.000	0.000
Mountain Counties				
<i>Coefficient:</i>		-5.3299***	-5.1826***	-5.2422***
<i>P-value:</i>		0.000	0.000	0.000
New England Counties				
<i>Coefficient:</i>		-2.3664	-3.3555**	-3.6720***
<i>P-value:</i>		0.135	0.034	0.006
Pacific Counties				
<i>Coefficient:</i>		-3.4486***	-4.4532***	-4.7193***
<i>P-value:</i>		0.002	0.000	0.000
Plains Counties				
<i>Coefficient:</i>		-5.7861***	-5.4319***	-5.4480***
<i>P-value:</i>		0.000	0.000	0.000
Southeast Counties				
<i>Coefficient:</i>		-6.1112***	-6.7817***	-5.8080***
<i>P-value:</i>		0.000	0.000	0.000
Southwest Counties				
<i>Coefficient:</i>		-10.0944***	-10.2353***	-9.0196***
<i>P-value:</i>		0.000	0.000	0.000
Adj-R²	.3537	.4101	.4171	.4456
F	419.78	177.25	145.80	163.83
n	3,073	3,073	3,073	3,073

Note: *Significant at the 10% level; **Significant at the 5% level; ***Significant at the 1% level

The data shows that the average US County had 39,177 working age women in 2007, so we can express that increase in terms of women entering the labor market which would be 35.26 women in the average US County.¹⁵ Furthermore, the average county had 1.57 additional fast food restaurants in 2007, thus we would anticipate the average number of additional women in the labor market coinciding with this fast food growth to be 55.41 additional female participants per US County.

The estimation of the remaining coefficients also yields results that match up with the expected direction of the coefficients. An increase in the average weekly wage will increase the participation rate by just 0.01%. That estimate for β_1 comes very close to the hypothesized value of zero. Assuming a 40-hour work week, a one dollar per hour increase in the average weekly wage will result in a 0.44% increase for the labor force participation of women. And given that there are approximately 39,177 working age women in the average US County, the above percentage reflects an increase of 172 women per county. The estimate for β_2 explains that a one percent increase in the illiteracy rate will decrease the female labor force participation rate in the average US County by 0.79%. A much larger change in labor force participation can be felt when the unemployment rate changes. And finally, the estimate for β_3 indicates that a full one percentage decrease in the unemployment rate will increase labor force participation of women by three percent on average, reflecting an increase of 1,175 women in the labor market of the average US County.

As stated in footnote 15, the wide disparity between counties renders the average effect somewhat meaningless. Therefore, the second specification of the model (equation

¹⁵ Note that the actual range of working age women is quite wide, with a minimum of 32 women in Loving County, TX and a maximum of 3.9 million women in Los Angeles County, CA. Thus, at the minimum, that increase is essentially zero; while at the maximum it could be as high as 3,550 additional women.

5) adds a series of regional dummy variables¹⁶ to reduce some of the variability between counties across different regions of the country.¹⁷ The model now takes the following form:

$$\hat{f}_i = \hat{\beta}_0 + \hat{\beta}_1 w_i + \hat{\beta}_2 E_i + \hat{\beta}_3 U_i + \hat{\beta}_4 FF_i + \hat{\beta}_5 AP + \hat{\beta}_6 MA + \hat{\beta}_7 MT + \hat{\beta}_8 NE + \hat{\beta}_9 PC + \hat{\beta}_{10} PL + \hat{\beta}_{11} SE + \hat{\beta}_{12} SW \quad (5)$$

The findings here reveal estimated coefficients that are similar in sign (see Model 2 in Table 3), but not magnitude, to those of the original specification; indicating a likely omitted variable bias in the prior model. There is still a small, yet significantly positive relationship between growth in the fast food sector and the labor force participation rate of women. This result is smaller at a roughly 0.05% increase in LFPR for each additional restaurant. This change would lead to an increase of roughly 22 female workers in the average US County, which is slightly more than one-half of the impact seen in the original specification. Similarly, the average impact of an additional one percent increase in the rate of illiteracy is reduced in half from 0.79% down to 0.38%. Meanwhile, the two labor market measures: average weekly wages and the unemployment rate remained

¹⁶ The nine regions are broken down across contiguous geographic and cultural lines:

Appalachia: AL, AR, KY, LA, MS, TN, and WV

Mid-Atlantic: DC, DE, MD, NJ, NY, and PA

Midwest: IA, IL, IN, MI, MN, MO, OH, and WI

Mountain: ID, MT, UT, and WY

New England: CT, MA, ME, NH, RI, and VT

Pacific: AK, CA, HI, OR, and WA

Plains: KS, ND, NE, OK, and SD

Southeast: FL, GA, NC, SC, and VA

Southwest: AZ, CO, NM, NV, and TX

¹⁷ Note that the Midwest region was used as the baseline so that the remaining regions would all have a similar sign in the regression analysis.

the same. Finally, the regional differences across counties run as high as 12.86%. While the overall variability in female labor force participation was better explained by this specification of the model, there still remains much to be desired in the differentiation of the effects across counties.

Thus we are led to the third and final specification which brings in additional county-level demographic characteristics via an additional pair of variables: one distinguishes between counties whose populations are increasing (G); and the other (M) identifies counties that include major metropolitan centers. The prior variable is defined as a county whose population has increased over the last five years; while the latter is defined as a county whose rural composition is ten percent or less. Finally, M is interacted with FF to differentiate between fast food establishments inside and outside of metropolitan regions. It is likely that counties experiencing population growth will have a younger average population, and since younger women are more likely to work (see, for example, Catherine Weinberger and Peter Kuhn [2010]), the labor force participation rate of women should be higher in these counties. Similarly, metropolitan areas have more potential jobs available than their rural counterparts. This should also lead to an increase in the participation rate of women. Equation (6) summarizes the new model and (for simplicity,) uses R to reflect the vector of regional dummy variables:

$$\hat{f}_i = \hat{\beta}_0 + \hat{\beta}_1 w_i + \hat{\beta}_2 E_i + \hat{\beta}_3 U_i + \hat{\beta}_4 FF_i + \hat{\beta}_5 M_i + \hat{\beta}_6 (FF * M_i) + \hat{\beta}_7 G_i + \hat{\beta}_j R_{ij} \quad (6)$$

Although the signs of the estimated coefficients do not change, the magnitudes in this specification are much different in this model than in previous models (see Model 3

in Table 2). First, one can see that in urban settings, the relationship between FLFP and fast food restaurants is negligible at best (a 0.01% increase in FLFP coinciding with each new net fast food restaurant opening) while those built in a non-metropolitan county exhibit a much stronger relationship (a 0.58% increase in FLFP) on the female labor force participation rate. A projection of this relationship across the average number of additional fast food restaurants built per county indicates that slightly more than 121 additional women, on average, entered the labor market in non-metropolitan counties.¹⁸ A potential explanation of this finding is that traditional household roles for women are much more prevalent in rural regions of the country. Therefore, potential female labor force participants in these regions have much more to gain from a reduction in required household time. One can deduce that there likely is a maximum level of saturation of fast food establishments, after which the relationship between the restaurants and FLFP is negligible.

Aside from the coefficients for the net growth of the fast food sector, the two newly introduced factors both display positive effects on the female labor force participation rate which coincides with the findings of Weinberger and Kuhn (forthcoming). Women in counties that have shown positive population growth are, on average, 0.98% more likely to join the labor force; however, this is only significant at the 10% level. Counties that are part of major metropolitan centers have a female labor force participation rate that is 4.44% greater on average than in other counties. The introduction of the metropolitan factor appears to have changed the magnitude and significance of a few of the regional dummy variables, most prominently: the New

¹⁸ For comparison's sake, the equivalent growth in a metropolitan county would have been 1,646 additional women entering the labor force, which shows the 121 to be relatively substantial for a rural area.

England Counties, the Mid-Atlantic Counties, and the Pacific Coast Counties. This can be explained by the heavy presence of large cities along the Northeast Corridor (the “BosWash Megalopolis”) and the California Coastline. However, the remaining independent variables (those from Model 2) are not any more statistically different than before.

Finally, the model is corrected for heteroskedasticity using Feasible Generalized Least Squares (FGLS) estimation as outlined in White (1980).¹⁹ Equation (7) uses an exponential function of the fitted values of the residuals regressed against the standard regressors as the weights, labeled \hat{h} :

$$\hat{f}_i = \frac{\hat{\beta}_0}{\sqrt{\hat{h}}} + \frac{\hat{\beta}_1}{\sqrt{\hat{h}}} w_i + \frac{\hat{\beta}_2}{\sqrt{\hat{h}}} E_i + \frac{\hat{\beta}_3}{\sqrt{\hat{h}}} U_i + \frac{\hat{\beta}_4}{\sqrt{\hat{h}}} FF_i + \frac{\hat{\beta}_5}{\sqrt{\hat{h}}} M_i + \frac{\hat{\beta}_6}{\sqrt{\hat{h}}} (FF * M_i) + \frac{\hat{\beta}_7}{\sqrt{\hat{h}}} G_i + \frac{\hat{\beta}_j}{\sqrt{\hat{h}}} R_{ij} \quad (7)$$

A summary of the results of the FGLS estimation can be seen in the final column in Table 3. Since the coefficients are weighted using a positive function of the variance of the OLS residuals, one should expect to see that the values of the estimators will be lower. Therefore, the FGLS estimators are consistent with the signs but not the magnitudes of the OLS estimators in Model 3. Indeed, the impact of fast food restaurants on individual counties in this model is reduced to 0.42% for non-metropolitan counties and 0.03% for metropolitan counties. Similar results can be seen for the other coefficients as well.

¹⁹ The White Test (see White (1980) for more details) revealed a small, yet significant ρ , therefore FGLS should provide slightly more efficient estimators.

VI. Conclusion

The study examined the relationship between the fast food industry and the two roles women typically play in society: the “traditional” role in a family; and the role of a wage earner in the labor market. The study found that in a given US County, there is a direct positive relationship between the number of new fast food restaurants and the female labor force participation rate. This can be attributed to both a substitution effect away from leisure time for the women as well as an increase in demand for fast food as more women enter the labor market. Through multiple specifications of the model, it was found that this relationship is stronger in rural areas than in urban areas, with the potential increase in labor force participation upwards of 0.58% in counties with a relatively unsaturated supply of fast food restaurants. To achieve more individualized results, a further study could examine the distribution of fast food restaurants in a given locality to determine just how close the nearest fast food restaurant must be from a person’s home and place of work.

These findings have some policy implications relating to the proposed fast food and soft drink “sin taxes” as well. While proposals for “sin taxes” on fast food restaurants have not been successful on a national level, states like Illinois have begun implementing sin taxes on certain sugary foods and drinks which indirectly affect the fast food industry. These taxes could potentially diminish further expansion of the fast food sector and thus preventing this positive externality from coming to fruition in some of the more rural counties where higher price elasticity of demand will lead to fewer potential sales. Subsequent research could compare the net value added of the sin tax via the

prevention of the negative externality of added health costs with that of the positive externality of increased labor force participation for adult women.

Finally, one may note that for many women, time spent in the workforce will often be intermittent throughout her prime working age due to maternity leave. At that point, her male colleagues will begin to accrue additional work experience while she remains out of work. Just as the availability of affordable child care can reverse this trend, a duration analysis-based study may reveal that this time away from work may be mitigated by the presence of quick and easy fast food options.

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Appendix

Table 1: Descriptive Statistics (for 2008 Unless Specified Differently)

	n	Mean	Standard Deviation
Female Labor Force Participation			
Average County	3,088	50.07%	15.54%
Metropolitan	217	56.22%	10.89%
Non-Metropolitan	2,871	49.60%	15.74%
New Fast Food Establishments			
Average County	3,088	1.57	9.93
Metropolitan	217	13.37	34.83
Non-Metropolitan	2,871	0.68	1.84
Illiteracy Rate (2003)			
Average County	3,086	12.83%	6.13%
Metropolitan	217	13.80%	7.53%
Non-Metropolitan	2,869	12.76%	6.01%
Average Weekly Wage			
Average County	3,075	\$597.14	\$151.18
Metropolitan	216	\$775.71	\$243.11
Non-Metropolitan	2,859	\$583.65	\$132.46
Unemployment Rate			
Average County	3,088	5.82%	2.11%
Metropolitan	217	5.58%	1.47%
Non-Metropolitan	2,871	5.83%	2.15%

Table 2: Average County Working-Age Population Statistics

	n	Mean	Standard Deviation
Overall			
Total:	3,088	76,144.23	242,080.7
Male:	3,088	37,266.77	118,234.2
Female:	3,088	39,177.46	123,910
Metropolitan			
Total:	217	548,548.4	736,373.9
Male:	217	266,400.7	360,636.8
Female:	217	282,147.8	375,991.1
Non-Metropolitan			
Total:	2,871	40,760.98	64,015.9
Male:	2,871	19,948.05	31,275.72
Female:	2,871	20,812.93	32,771.55