The Economics of Obesity

Joshua Blonz

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Professor Smith

I. *Introduction*

Obesity, or being 20% over recommended body weight, is an epidemic in the United States. In the last 30 years, the obesity rate has increased from 15% to 32.9% in adults aged 20-74.[1] This is cause for serious concern because being obese increases the risk of many life threatening illnesses including diabetes, heart disease and stroke.[2] Obesity is estimated to cause 300,000 excess deaths a year with a healthcare cost of $93 billion in 2002 (Philipson et al. 2004). This large increase in obesity rates has a profound economic impact on the U.S. economy, but obesity is not fully understood due to its complex nature. On the basic physiological level, obesity is linked to overeating and lack of exercise. Evolutionary biologists and psychologists have also studied the issue of why Americans are overeating. However, the bottom line is that health is a personal decision based on the budgetary and temporal constraints of every American. In order to better understand the issue, it is important to study how health choices interact with all the other decisions in a person's life.

This paper will focus on what factors contribute to a person being overweight. More specifically it will investigate which demographic and social factors contribute to obesity. From an economic perspective, obesity does not seem rational due to the many negative affects it can have on one's life. However, the epidemic is increasing at alarming rates. Instead of assuming that obesity is some form of irrational behavior, I will investigate if there are particular observable characteristics that constitute rational behavior and contribute to people to becoming obese.

[1] Statistics from the CDC's Behavioral Risk Factor Surveillance System (BRFSS).
[2] Statistics from CDC's fact book

Analysis will be centered on socioeconomic status, various health variables, and other demographic characteristics in order to investigate what factors might cause people to become overweight. Various other characteristics will be controlled for like participation in the food stamp program. Regional and cultural factors of diet will be examined to see if obesity might be attributed to one's surroundings. Temporal budget constraints will also be looked at using hours of labor force participation.

II. *Background*

Previous work on the economics of obesity is not overwhelming, but there are some papers that address the issue. The majority of the research investigates the effects of obesity on wages. The theory predicts that obesity could lower self-esteem which might in turn lower a worker's potential for advancement and higher wages. Others have theorized that being obese might lower productivity. Obesity also has the potential to lower wages through taste-based discrimination. Lempert (2007) found that obesity negatively affects the wages of white women but no other group.

Other research is more focused on how Americans deal with temporal budget constraints. Americans now spend significantly less time preparing and eating food and instead have shifted towards poor quality fast food. Even though fast food might provide a quick meal, it usually does not provide a healthful diet. Gomis-Porqueras and Peralta-Alva (2006) find that technological advancement has lowered the cost of eating away from home while, at the same time, lower taxes and the decreasing gender wage gap have increased the opportunity cost of preparing food at home.

Technological change is also thought to contribute to obesity through the workplace. As our society advances, labor market work is becoming less active. Working at a desk burns very few calories and Lakdawalla and Philipson (2002) investigated how career choices affect weight. They found that our modern sedentary lifestyle contributes to up to 60% of the increase in obesity. They also theorize that declining food prices due to agricultural innovation are a significant contributor to the epidemic.

Government assistance has also received attention as a potential contributor to obesity. Food stamps and similar programs are hailed for their ability to feed the hungry, but ironically they are also cited as contributing to overeating (Kaushal 2007). Although no conclusive evidence has been found, more research should be done.

Baum and Ruhm (2007) found that weight varies inversely with socioeconomic status in the U.S. They constructed a model where being poor might lead to the consumption of energy-dense foods that lack necessary nutrients. They found evidence to support their theory but cautioned that correlation does not imply causation and that being obese might be causing people to have lower earnings. As a corollary to their theory, they hypothesized that overweight people might have a high discount rate towards any type of future consumption, which might simultaneously reduce their educational investment and reduce their incentives to eat properly for the long term benefits.

III. *The Theory*

The model in this paper will be built upon the work of Baum and Ruhm (2007). I will use their basic framework and expand upon it by integrating alternate theories from

other research. One societal shift that might contribute to the obesity epidemic is how attitudes towards eating have changed dramatically in the 20th century. Much of this is due to modernization and the simple fact that most people no longer have to produce their own food. Instead as people devote more of their time to the labor market, eating becomes one of the first daily activities to be shortened. This can have bad consequences for people's health because they turn to less healthful foods that can be eaten quickly. This trend is supported by the vast increase in expenditures on food eaten away from home (Binkley et al 2000).

This effect, however, may not be seen across all Americans. People with a higher socioeconomic status may suffer from the same time constraints as other workers, but they have the advantage of being able to afford healthful food. Poorer workers, however, usually do not have the option to buy nutritious food that can be eaten quickly. Instead, lower wage workers will more likely turn to fast food which has a higher caloric density and can cheaply satisfy hunger without providing the necessary nutritional value.

Many poor people also receive government assistance that might affect their eating habits. Food stamps are intended to provide food to those who can not afford it. However, the rules of the food stamp program stipulate that food stamps may only be spent on food that can be prepared at home such as breads and cereals, fruits and vegetables, meats, fish and poultry, and dairy products.[3] Mandating that a certain amount of money must be spent on a certain type of product might lead to over consumption. The average benefit is $86 a month per person or $200 a month per household, and this number is sometimes thought to be too high. In this way, food stamps might contribute to obesity through over consumption of calories.

[3] http://www.fns.usda.gov/fsp/faqs.htm#8

Other personal health decisions besides eating and exercise are also highly correlated with weight. Smoking is one of these areas that has theoretical links to obesity. (Choua et al. 2004) It is well known to decrease one's appetite and overall body weight. In the last 30 years, anti-smoking campaigns have significantly decreased smoking rates in the US, which might be linked to an increase in obesity. (Gruber and Frakes 2005)

IV. *Data and Econometric Model*

Modeling obesity is a difficult task because there is no single reason for obesity. Genetic predisposition to being overweight is a factor that is largely unobservable. Instead, models focus on factors that can be measured. My data are from the National Longitudinal Survey of Youth from 1979 (NLSY79). This data set was chosen because it gives data on height and weight along with numerous other demographic characteristics. Summary statistics can be seen in Table 2.

Being overweight is estimated by calculating a person's body mass index using height and weight.[4] Based on the World Health Organization's classification of obese, a person with a BMI greater to or equal to 30 will be considered obese. However, being overweight is a continuum, and realistically there is not a large difference between a BMI of 29 or 30.[5]

BMI is not considered the best way to judge obesity, but it is the easiest statistic to use in a large data set. One major caveat with the BMI is that it determines obesity based on only height and weight, ignoring a person's body fat percentage. Individuals

[4] BMI is calculated with a simple foruma. BMI=703 x weight (lb) / (height (in))^2

[5] While the distinction between a BMI of 29 and 30 is not significant, people are official declared obese if they have a BMI of 30 or greater. This paper will not discriminate between the two, and instead factors will be analyzed in terms of correlation with a higher body weight.

might be considered obese using the BMI definition when other more detailed tests would find them to be in good health. Despite its potential problems, BMI is still considered the best way to approximate obesity (Baum and Rhum 2007).

The NLSY79 is an ideal data set because it provides information on height, weight and many other demographic and socioeconomic characteristics. The NLSY79 provides information on participants who entered the study at around age 20 and are interviewed every year since then. The analysis conducted in this paper will not be longitudinal, but will take advantage of the longitudinal nature of the survey for various variables.

The econometric model will be as follows:

$$BMI = \beta_0 + \beta_1 X_i + \beta_2 PUB_i + \beta_3 INC_i + \beta_4 HEALTH_i + \varepsilon_i$$

Where X_i is a vector of demographic characteristics for person i, PUB_i represents public assistance variables, INC_i is various socioeconomic variables, $HEALTH_i$ is a vector which contains smoking habits and historical BMI_i, and ε represents the error term.

The demographic characteristics controlled for include: age, race, gender, education, parents education, geographic location, and number of children. Theory and past literature predicts that weight will be positively correlated with age due to how the human body functions and becomes less efficient as it becomes older. Weight is predicted to be negatively correlated with education and parents' education since higher education is usually correlated with higher socioeconomic status and hence a healthier diet. Education might also be a way that people learn about the dangers of being

overweight and might promote healthier life habits. The signs on race, gender and location in the country all control for cultural factors and it is difficult to hypothesize on what their effects might be. It is also hard to hypothesize the effect of number of children because more children could result in less time to prepare food at home, but might also prompt one of the parents to leave the labor force to work at home.

The PUB variable will study the effects of the food stamps public assistance program. Theory and previous literature predict that food stamps could increase the incidence of obesity as people are forced to spend more money on food than they would with a direct cash transfer.

Socioeconomic characteristics are central to this analysis, and the following variables will be controlled for: hours worked per week, wage (converted to $/hr) and number of jobs worked. Hours per week is predicted to be positively correlated with weight gain in poor people, but its effect is unclear for high wage people since they have the ability to purchase high quality food. Number of jobs is predicted to be positively correlated with weight gain because the strain of working various jobs at different times throughout the day probably reduces the ability of someone to take care of themselves. Wage, as discussed above, is predicted to have a negative correlation with weight.

Health characteristics capture other factors which might influence current BMI. The most important is historical BMI as a predictor of current BMI. Since a large component of weight is genetic, it might be hard to truly isolate the causes of obesity. However, previous weight is a good indicator if someone is overweight today because they have a heavy body type and hence were overweight 20 years ago as well. A strong positive correlation is predicted between historical BMI and current BMI. Smoking,

however, is predicted to be negatively correlated because of the well known appetite suppressing qualities of cigarettes. If someone smokes, they are less likely to overeat and hence be overweight.

The primary form of regression used will be a Tobit which allows for a bottom censored dependent variable. Since BMI can not drop below 0 (and in many cases must be above 10) the Tobit will allow for a better analysis. Results will show which characteristics contribute to a higher BMI.

V. *Results*

Simple regression results are presented in Table 1 below. These smaller specifications were run to give an initial view of the results. The first two columns show a lower censored Tobit regression on the entire population, one with age and one without. I ran a separate set of regressions with and without age for regression 1 and 2 to see if age within the cohort made a difference. All of the participants are between the ages of 39 and 47 for the 2004 round of questions, and most were between 41 and 44. The coefficient for age was negative and significant, the opposite of what was predicted. I do not think, however, that this is a problem with the theory, but instead could be a consequence of age distribution in the cross-section used. Removing age from the regressions does not change the significance of any of the other characteristics.

In general I have found that many of the theoretically predicted characteristics contribute to obesity in the NLSY79 sample. One of the most important variables, as hypothesized, was the participant's BMI in 1981 (23 years earlier). It was positive and

extremely significant, which confirms that one of the most important factors will be historic body type.

Race was another very important characteristic affecting the risk of obesity. Being black is associated with an increased body weight while being of hispanic origin has a more modest positive affect.

Education yielded results that follow from the above-stated theory, but results from the parents' education did not have significant results. Labor market variables behave in the predicted manner, with primary job wage being negatively correlated with being overweight and hours worked having the opposite effect.

Overall these preliminary regressions give preliminary evaluation for what is going on but these results are only dealing with some of various factors which might affect body weight. Analysis of obesity in the overall population grants some insights on the factors that correlate with excess body weight, but it is more important to examine each gender separately. This can be seen by examining the summary statistics in table 2. Men and women exhibit different average characteristics for many of the variables. BMI, historic BMI, Father and Mother's years of education, living in the shout, hourly rates of pay, hours worked per week, number of children, working behavior and if the participant received food stamps are all statistically significant between men and women. The distribution of BMI is also different for men and women as is illustrated in Figures 1 and 2. These histograms show females having a distribution more centered around the lower twenties, while men are more skewed right. This is confirmed by examining the statistical significance between the two average BMIs. It is clear that the physiological differences between men and women make it hard to conduct the analysis in the same

regression. Gallagher et al. (1996) found that men had a lower percent body fat than women of the same BMI. Their eventual conclusion was that BMI cannot be used as a comparable measure of fatness in men and women. This suggests that analyses should be conducted separately for men and women to isolate the important factors for each gender.

Table 3 presents results for a Tobit regression by gender. Table 3 also includes many more control variables than the simple regression. The individual findings differ from the aggregate regression and the different characteristics affect men and women differently as predicted. As per the 1981 data, women are more influenced by BMI, but there are different significant covariates.

Education is a more important in determining the BMI of a man than a woman. Men follow the predicted negative sign for education and have statistically significant results, while the results for women are not significant. It is hard to interpret this result exactly, but it falls in line with the fact that women have a higher coefficient for their previous BMI than men.

Race was included in the model to control for potential cultural factors, and data are provided for blacks, whites and Hispanics, each separated by gender. Black is statistically significant and positive for both men and women. It is possible that this result is picking up the social and dietary differences between the African American and white community. It is interesting to note that the magnitude of the variable is much larger for women, which might imply that these cultural factors are much stronger for women than for men. Being Hispanic, however, is not found to be significant for either men or women.

Living in the North East for women is found to reduce their overall weight at a significant level. The result for this specific region does not necessarily describe too much about difference in cultural factors between the Northeast and the West (the control group). However, it does contribute to the idea that women might be more highly influenced by their characteristics (such as previous BMI) than their education decisions. It is interesting to note that the Northeast seems to be the most cohesive regional category with all of the states being in New England or around New York State. The Western region, in comparison, contains states as varied as Utah, California, Alaska and Wyoming. Further controls that dealt with whether the respondent lives in a city did not yield statistically significant results. In order to truly isolate geographic effects, more precise data would be needed.

The overall results for the labor force variables were consistent with what theory would predict. Hourly rate of pay was significant and negative for both men and women. Wages are closely linked to health, and better health is correlated with higher wages. Hours worked, however, do not have the same clear results. For women, more hours in the labor force are correlated with a higher BMI. Men, on the other hand, did not exhibit that same relationship. I would attribute this lack of significance to the inelastic nature of male labor supply (Lloyd and Niemi 1978). Usually men are going to work around 40 hours a week regardless of other factors in their life, and this decision is not health related.

Food stamps were found to have a positive significant effect on women's weight as predicted by theory. It makes sense that women might be the only group affected since a large portion of food stamp recipients are in single mother households (USDA 2005 data). Additional checks done on other forms of governmental assistance, such as

TANF and SSI, were found to not have a statistically significant effect on weight. This is an interesting insight as it seems that it is not the general act of receiving government assistance that might increase weight, but the food stamp program itself that is causing the weight gain.

The health covariates yielded significant results with the correct signs as predicted by theory. The results for smoking were negative and significant, which are not unexpected considering the appetite suppressing nature of cigarettes. Previous BMI continues to be one of the most important factors in determining one's current BMI. This follows directly from the idea that genetics and childhood health are some of the most important determinants of BMI. It is interesting to note that historic BMI is more important for women than for men.

Considering one of the primary focuses of this paper is to analyze labor force influences on weight, it is interesting that if a participant is working does not affect weight outcomes. However, to further analyze the influence of labor force status, I conducted a separate set of regressions on only the working population. Results for these regressions are presented in Table 4.[6]

Most of the results remain similar with a few major exceptions. The coefficient on father's years of education of men is positive and significant, the opposite sign of what the theory would predict. This result implies that the more years of education a man's father has, the fatter he will be. It is difficult to understand why this is happening since no previously theorized mechanism predicts this result. The results for women, however, remain not statistically significant.

[6] Working is defined as having nonnegative hourly rate of pay

Living in the Northeast loses its significance when the regression is run only on working individuals. This probably means that the effects from working dominate over any regional variations that this variable was previously picking up.

The final difference between the two specifications is the loss of significance from food stamps. This, however, is to be expected since 51% of the recipients are part of the working poor and the others may not be employed (Cunnyngham et al. 2006). While it is possible to be in or out of the labor force and receive food stamps, once the analysis is only on working individuals, much of the effects of food stamps are lost.

VI. Conclusion

The focus of this paper is to determine what socioeconomic elements contribute to one's overall weight and what might be driving the increase in obesity in the U.S. This is a difficult task considering the multifactoral nature of this condition. Medically based obesity research has found that genetic background and previous health will be hugely influential in determining current Body Mass Index. This was understood at the outset of the paper, and analysis was focused on what other socioeconomic factors might also be correlated with being overweight.

The results of the paper confirmed that a BMI measurement taken 23 years before the 2004 sample was extremely significant in predicting current BMI. People who were healthy in the past are much more likely to be healthy in the present, and visa versa. This might be due in a large part to genetics, and that we might not have the power to significantly change our bodies after a certain point in our lives. The interesting part, however, was the difference in magnitudes between men and women. The impact of

previous BMI was somewhat higher for women, implying that historic weight is more important. These results are noteworthy because women did not have significant covariates in relation to educational attainment. This might suggest that the historic weight characteristics of women are more important than educational decisions made during one's lifetime. Unfortunately, the data do not provide an ability to test this hypothesis.

The socioeconomic factors that this paper set out to analyze behaved in the predicted way. This confirms, to some extent, that being overweight is correlated with lower wages and more hours worked. Male hours worked, however, did not have significant results. This is most likely due to the inelastic nature of male labor supply.

The positive effect of food stamps on a woman's weight also provided interesting insights into the interaction between receiving free food and being overweight. The relevance of the in-kind nature of the food stamp program (instead of general cash aid) also calls into question the motivation behind the food stamp program and provides policy implications.

It is important to interpret the results of this paper with care. One potential problem arises from the inaccuracies that are bound to result from people self-reporting their height and weight. This error could either be random from people not having accurate measures, or it could be biased due to people not wanting to correctly report a high weight. It is also essential to appreciate that these results are only statistical correlations. The fact that a higher wage is negatively correlated with obesity does not mean if one gets a pay raise they will automatically lose weight. The effect could work both ways, and being obese might be the cause of lower wages as other research has

investigated. Unfortunately, limited data makes it hard to isolate the mechanisms through which economics and obesity interact. Future research would benefit from better data and instruments.

Works Cited

Baum, Charles L. and Christopher J. Ruhm. "Age, Socioeconomic Status and Obesity Growth" NBER working paper 13289 August 2007.

Baum, Charles L. "The effects of race, ethnicity, and age on obesity" *Journal of Population Economics 20:687–705 (2007)*

Burke, Mary A and Frank Heiland. "Social Dynamics of Obesity" *Economic Inquiry; Jul 2007; 45, 3; ABI/INFORM Global pg. 571*

Choua, Shin-Yi, Michael Grossman and Henry Saffera, "An economic analysis of adult obesity: results from the Behavioral Risk Factor Surveillance System" *Journal of Health Economics Volume 23, Issue 3, May 2004, Pages 565-587*

Cunnyngham, Karen E., Laura A. Castner, and Allen L. Schirm. "Reaching Those in Need, State Food tamp Participation Rates in 2004". Mathematica Policy Research Inc. October 2006

Gruber, Jonathan and Michael Frakes. "Does Falling Smoking Lead to Rising Obesity" NBER working paper 11483, June 2005.

Gomis-Porqueras, Pere and Adrian Peralta-Alva "A Macroeconomic Analysis of Obesity in the U.S." University of Miami Working Papers No 606 2006

Kaushal, N. "Do food stamps cause obesity? Evidence from immigrant experience" *Journal of Health Economics 26 (2007) 968–991*

Lakdawalla, Darius and Tomas Philipson. "The Growth of Obesity and Technological Change: A Theoretical and Empirical Examination. NBER Working Paper 8946. May 2002.

Lempert, David. "Women's Increasing Wage Penalties from Being Overweight and Obese" BLS Working Papers 414 December 2007

Lloyd, Cynthia B and Beth Niemi "Sex Differences in Labor Supply Elasticity: The Implications of Sectoral Shifts in Demand" The American Economic Review, Vol. 68, No. 2, Papers and Proceedings of the Ninetieth Annual Meeting of the American Economic Association. (May, 1978), pp. 78-83.

Philipson, Tomas, Carolanne Dai, Lorens Helmchen, and Jayachandran N. Variyam "The Economics of Obesity: A Report on the Workshop Held at USDA's Economic Research Service." May 2004

Plantinga, Andrew J. and Stephanie Bernell "The Association Between Urban Sprawl and Obesity: Is It A Two-Way Street? *Journal of Regional Science, VOL. 47, NO. 5, 2007, pp. 857–879*

Smith, Trenton G, Christiana Stoddard, and Michael G. Barnes. "Why the Poor Get Fat: Weight Gain and Economic Insecurity" School of Economic Sciences Working Paper Series March 2007.

Table 1 – Specification Check Tobit Regressions

	Regression 1 Entire Population With Age	Regression 2 Entire Population Without Age
Age	-0.273	
	[0.025]***	
BMI 1981	1.053	1.016
	[0.017]***	[0.017]***
Years of Education	-0.119	-0.125
	[0.028]***	[0.029]***
Dad's Years of Education	0.000	0.000
	[0.021]	[0.022]
Mom's Years of Education	-0.032	-0.036
	[0.029]	[0.029]
Black	1.550	1.560
	[0.182]***	[0.184]***
Hispanic	0.544	0.566
	[0.261]**	[0.263]**
Male	-0.340	-0.296
	[0.121]***	[0.122]**
Hourly rate of pay at Primary Job	-0.013	-0.014
	[0.003]***	[0.003]***
Hours worked per week at all jobs	0.005	0.005
	[0.002]***	[0.002]***
Number of Children	0.042	0.071
	[0.047]	[0.047]
Did participant smoke in 1998	-0.950	-0.956
	[0.137]***	[0.138]***
Constant	18.085	7.156
	[1.150]***	[0.568]***
Observations	5712	5712
Pseudo R squared	0.087	0.0838

Standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

Data taken from NLSY79. Observation year was 2004 when participants were between the ages of 39 and 47. These simple regressions judge initial magnitudes on some of the main variables. Age is included and then removed to test if age affects any of the other results.

Table 2 – Means in Standard Deviations (in Parentheses)

Variable	Full Population Mean N=6913	Men Only Mean N=3399	Women Only Mean N=3514
BMI in 2004	27.851	**28.282**	**27.383**
	(5.763)	(4.862)	(6.571)
Age	43.320	43.342	43.296
	(2.327)	(2.32)	(2.334)
BMI 1981	22.524	**23.127**	**21.870**
	(3.579)	(3.36)	(3.693)
Years of Education	13.492	13.455	13.532
	(2.485)	(2.54)	(2.424)
Dad's Years of Education	11.822	**11.955**	**11.676**
	(3.578)	(3.631)	(3.513)
Mom's Years of Education	11.571	**11.667**	**11.468**
	(2.758)	(2.75)	(2.764)
Black	14.17%	14.29%	14.04%
	(.349)	(.35)	(.347)
Hispanic	6.36%	6.51%	6.20%
	(.244)	(.247)	(.241)
Male	52.02%	100.00%	0.00%
	(.5)	(.)	(.)
Northeast	16.49%	16.53%	16.45%
	(.371)	(.371)	(.371)
North central	28.97%	29.66%	28.23%
	(.454)	(.457)	(.45)
South	36.69%	**35.48%**	**38.01%**
	(.482)	(.479)	(.485)
Live in a City	69.62%	70.22%	68.98%
	(.46)	(.457)	(.463)
Hourly rate of pay at Primary Job	17.705	**21.582**	**13.502**
	(18.506)	(21.112)	(14.024)
Hours worked per week at all jobs	40.705	**45.444**	**35.567**
	(31.093)	(32.624)	(28.471)
Number of Children	1.290	**1.195**	**1.394**
	(1.237)	(1.255)	(1.209)
Did participant smoke in 1998	26.48%	26.20%	26.78%
	(.441)	(.44)	(.443)
Did participant receive food stamps	3.58%	**2.07%**	**5.21%**
	(.186)	(.142)	(.222)
Is participant working	84.56%	**89.26%**	**79.47%**
	(.361)	(.31)	(.404)

Bolded numbers represent statistically significant difference between Men and Women. Data taken from NLSY79 2004 cross section when participants were between the ages of 39 and 47. Observation number differ from total in a few categories, but the difference is not significant

Table 3 – Tobit Regressions for Entire Population, by Gender

	Men Entire Population	Women Entire Population
Age	-0.305	-0.209
	[0.032]***	[0.039]***
BMI 1981	0.941	1.141
	[0.023]***	[0.026]***
Years of Education	-0.184	-0.047
	[0.035]***	[0.047]
Dad's Years of Education	0.038	-0.012
	[0.027]	[0.035]
Mom's Years of Education	-0.045	-0.012
	[0.037]	[0.045]
Black	0.701	2.218
	[0.238]***	[0.303]***
Hispanic	0.345	0.631
	[0.335]	[0.432]
Northeast	-0.152	-0.869
	[0.245]	[0.316]***
North central	-0.006	-0.398
	[0.219]	[0.285]
South	0.234	-0.431
	[0.217]	[0.278]
Live in a City	0.129	-0.305
	[0.163]	[0.205]
Hourly rate of pay at Primary Job	-0.010	-0.025
	[0.004]**	[0.008]***
Hours worked per week at all jobs	0.001	0.008
	[0.002]	[0.004]**
Number of Children	0.096	0.007
	[0.058]*	[0.079]
Did participant smoke in 1998	-1.044	-1.068
	[0.171]***	[0.221]***
Did participant receive food stamps	0.685	1.046
	[0.547]	[0.461]**
Is participant working	-0.113	0.394
	[0.275]	[0.309]
Constant	22.486	12.660
	[1.452]***	[1.915]***
Observations	2699	2820
Pseudo R squared	0.086	0.089

Standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

Data taken from NLSY79. Observation year was 2004 when participants were between the ages of 39 and 47. This set of regressions is run on the entire population, regardless

Table 4 – Tobit Regressions for Working Population, By Gender

	Men Working Population	Women Working Population
Age	-0.311	-0.218
	[0.033]***	[0.043]***
BMI 1981	0.932	1.084
	[0.023]***	[0.029]***
Years of Education	-0.187	-0.05
	[0.036]***	[0.052]
Dad's Years of Education	0.063	-0.007
	[0.028]**	[0.038]
Mom's Years of Education	-0.035	-0.034
	[0.037]	[0.049]
Black	0.934	2.488
	[0.250]***	[0.328]***
Hispanic	0.551	0.445
	[0.344]	[0.471]
Northeast	-0.258	-0.591
	[0.252]	[0.345]*
North central	-0.004	-0.131
	[0.225]	[0.311]
South	0.208	-0.273
	[0.223]	[0.308]
Live in a City	0.122	-0.121
	[0.165]	[0.223]
Hourly rate of pay at Primary Job	-0.011	-0.026
	[0.004]***	[0.008]***
Hours worked per week at all jobs	0.001	0.012
	[0.002]	[0.004]***
Number of Children	0.098	0.019
	[0.059]	[0.088]
Did participant smoke in 1998	-1	-1.282
	[0.177]***	[0.243]***
Did participant receive food stamps	-0.128	0.749
	[0.690]	[0.612]
Constant	22.465	14.475
	[1.457]***	[2.079]***
Observations	2399	2246
Pseudo R squared	0.089	0.084

Standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

Data taken from NLSY79. Observation year was 2004 when participants were between the ages of 39 and 47. This set of regressions is run on only the working population.

Figure 1 - Histogram of Male BMI

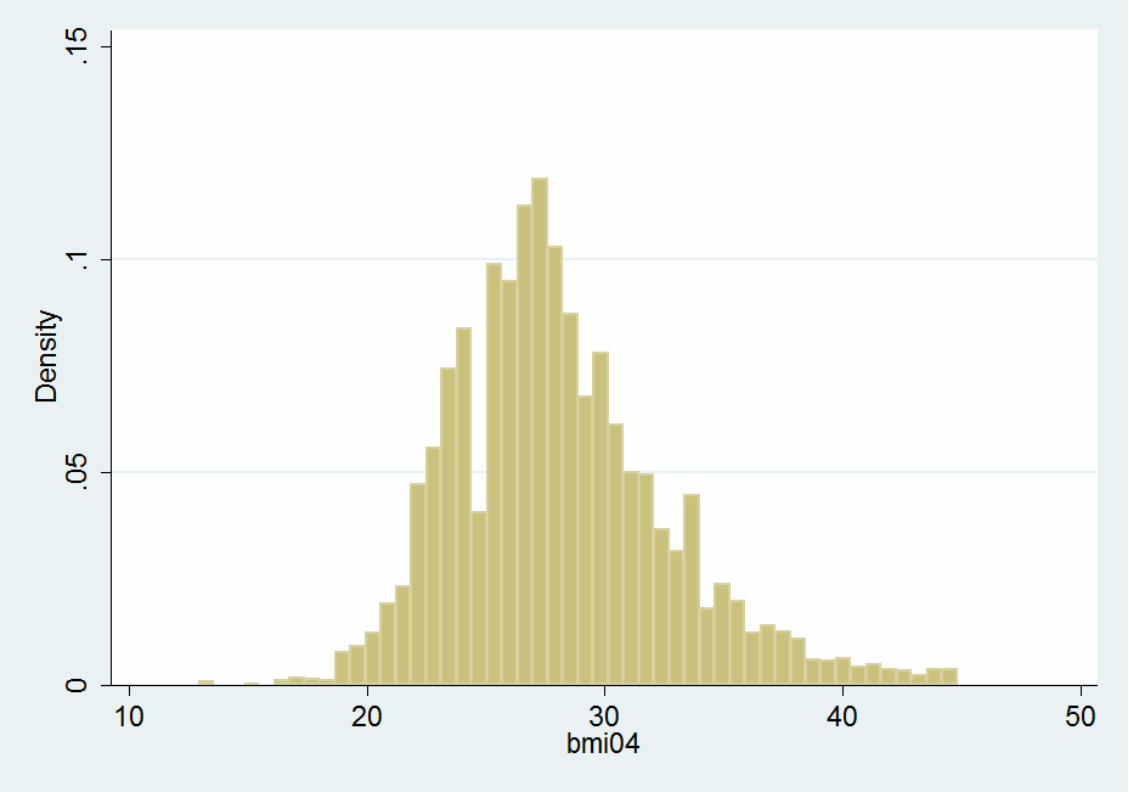

Figure 2 - Histogram of female BMI