From January 2007 to July 2009, the number of participants in the United States Food Stamps Program (FSP) increased by 38%. Most analyses discussing this large participation increase attribute it to the recession that began in December 2007. However, existing literature has failed to explore how the recession increases participation. Specifically, there is no evidence as to whether the increase was caused entirely by decreases in income and assets or whether there were also secondary effects from changes in information, stigma, and transactions costs. This paper uses Consumer Expenditure Survey data from January 1993 to March 2009 to estimate the extent of these secondary effects. The paper also identifies the percent of the secondary effects that consist of changes in external stigma costs, by recognizing that the introduction of electronic benefit transfer (EBT) substantially decreased FSP external stigma costs. I find that a 1% point increase in the unemployment rate increases participation in FSP through secondary effects by 3.3% points. 87.5% of this effect is due to changes in external stigma costs. Further work is needed to examine the heterogeneity and the decomposition of these secondary effects, and the extent of these secondary effects on other welfare programs.
1. Introduction

From its conception in 1962, the federally run Food Stamps Program (FSP) has provided benefits to millions of Americans. As of June 2009, the number of Americans receiving food stamps reached 35 million (USDA). However, while many Americans participate in the program, others choose not to apply even if they are eligible. The take-up rate of food stamps is estimated to be between 41.3%-75% (Coe, 1979; Moffitt, 1983; Daponte et al., 1999; Blank and Ruggles, 1996). This low take-up rate is attributed to several factors: eligible non-participants' lack awareness of the program, application costs, and stigma costs associated with the use of food stamps. The take-up rate of welfare is intrinsically important since it defines the success of the program: to help those in need of assistance. If there is a low take-up rate, the program fails in its main objective since a large portion of needy families are not benefitting from the program.

During the fiscal years 2006 and 2007, food stamps participation was stable at 11.7 and 11.8 million households respectively; however, in 2008, participation increased by 7.8% to 12.7 million households, and in 2009, participation increased by 20% to 15.2 million households (USDA). While the participation rate in many other programs (Medicaid, TANF, and WIC) have also increased over the past two years, the increase in food stamps participation is particularly striking; therefore, I will use FSP as a case study among the more general case of other welfare programs.

The large increase in participation in food stamps is widely attributed to the most recent recession. Indeed, recent analysis have found food stamp participation to be countercyclical, estimating that a one percentage point increase in the unemployment rate increases FSP caseloads by 4-4.5% (Kornfeld, 2002; Figlio, et al. 2000). Below is a graph of the United States
unemployment rate and FSP participation rates from 1993 to 2009.\footnote{Using BLS unemployment rate data with 3 month moving averages for 1993- March 2001, and one year moving averages for March 2001, and food stamps participation data from the Consumer Expenditure Survey.} The graph clearly illustrates a positive correlation between the unemployment rate and FSP participation.

**Figure 1:** Percent Participation in FSP and the National Unemployment Rate

This effect of the unemployment rate on food stamps participation is expected, since high unemployment rates are known to decrease incomes and assets, which increases both eligibility and necessity of food stamps. However, while the increase in need and eligibility may be the main causes of the rise in participation, there may also be secondary factors related to the recession which may cause an increase in participation. In this study, I define “secondary effects” as any effect of the business cycle on the decision to participate; once I control for eligibility, income, and assets. These secondary effects may be caused by decreases in information costs, transaction costs, or psychological costs (also called stigma costs).

Psychological costs can be further decomposed into “external costs” based on the fear of others
knowing one's participation in welfare, and “internal costs” which come from one's own reluctance to rely on public assistance for basic needs. Secondary effects might also include compositional pool effects from the economic downturn making some people eligible who are not usually eligible. These people may have a different participation rate in FSP such that during economic downturns, the average take-up rate changes.

In this paper, my main goal is to identify the business cycle's secondary effects on participation in food stamps, as well as to identify some of the attributes of these effects. The structure of the paper is as follows: I first review the relevant literature and develop a theory of how the business cycle affects the decision to participate in food stamps. Then, I give a methodology of how I propose to estimate the secondary effects based on historical CEX data from January 1993 to April 2009. Next, I present my results and discuss the implications of them. Finally, I consider what further work can be conducted.

2. Literature Review

While there is substantial research devoted to welfare participation, identification of the different types of costs associated with participation, and the effect of the economic climate on participation, there is no empirical research on the business cycle's secondary effects on the decision to participate. Since there is little previous literature devoted to this specific topic, in order to understand secondary effects, I consider how the business cycle may change the costs and benefits to participating in welfare. Therefore, I first review the available research on the factors that influence participation in FSP and how these factors change in different situations. Then, I tie this information together with the direct effects of the business cycle on participation to theorize how these factors might change during the business cycle. Finally, I consider how several different situations may change the secondary effects from the business cycle.
The factors that influence the FSP take-up rate include primary factors, the costs and benefits to participating, and secondary factors, such as the business cycle, policy changes, and personal characteristics, which affect participation by influencing the primary factors. I am primarily interested in the impact from the business cycle; however, other subsidiary factors might change the business cycle effect. Therefore, I also consider the effects of the other factors in the context of how they interact with the business cycle and change its effect on the decision to participate.

2.1 Primary Factors Influencing FSP Take-up Rate

Over the past 30 years, the take-up rate of FSP has been estimated to be, at most, 75%. This suggests that participation in FSP has a cost, which means that that people will participate only if the benefits outweigh the costs. The previous literature on the take-up rate identifies three main types of costs of participating in welfare: information costs, transaction costs, and stigma costs. Information costs are the costs associated with understanding and mastering application procedures as well as gathering the information necessary to determine if one is eligible. Transaction costs are the costs associated with applying for the program and continued participation in the program. These costs include opportunity costs for the time it takes to apply, and costs associated with going to the local food stamps office to file the application. Stigma costs are the psychological costs of participating in the welfare program, which include external stigma costs and internal stigma costs, as described above.

Previous research has investigated the size, and thus importance, of these different costs on the decision to participate. Many authors suggest that the take-up rate is low because of high information costs. They find that eligible non-participants do not apply because they do not realize they are eligible (Coe 1979, Daponte et al. 1999; Schanzenback, 2009). They also
indicate that among those who are eligible, there is a general low awareness of the program's existence and purpose (Schanzenbach, 2009). Transaction costs, while usually estimated to be less important than information costs, are still important in the decision to participate in welfare (Zedlewski and Brauner, 1993; Blank and Ruggles, 1996, Manchester and Mumford 2008; Schanzenbach, 2009). This is especially true for less needy eligible non-participants where the value of the benefits do not justify the administrative costs of applying and maintaining eligibility (Blank and Ruggles, 1996). Manchester and Mumford (2008) estimate administrative costs at $9.25\(^2\) a week.

It is unclear to what extent stigma cost affects the decision to participate in welfare programs. Some researchers find that stigma cost is the primary reason for non-participation in welfare programs (Moffit, 1983; Stuber, 2004, Manchester and Mumford, 2008), while others estimate that stigma costs are relatively insignificant (Ashenfelter, 1983). Stigma cost is heterogenous; education, gender, working status, race, age, and time on welfare all affect the extent to which an individual feels stigma (Horan and Austin, 1974; Stuber and Kronebusch, 2004). Some have argued that this heterogeneity might also apply to the neediness of individuals; less needy individuals feel more stigma, and thus stigma might act as an effective screening mechanism for need. However, Stuber and Kronesbusch (2004) find that in some cases, those who may feel the most stigma are also the most in need of the benefits offered. Additionally, stigma cost is flat and does not change with the benefit level (Moffitt, 1983). Moffitt (1983) estimates the stigma cost as $346\(^3\) a month. More recently, Manchester and Mumford (2008) estimate the stigma cost as $215\(^4\) a month. While there is some disagreement over the size and relative importance of these costs, it is clear that they are all contributing

\(^2\) In 1997 dollars.
\(^3\) Calculated by Manchester and Mumford (2008) in 1997 dollars for participation in Aid to Families with Dependent Children (AFDC).
\(^4\) For participation in FSP.
factors in the decision to participate in welfare programs.

While stigma, information, and transaction costs comprise the costs side of a cost-benefit analysis, the amount of the food stamp benefits determine whether the participation is worth the costs. The size of benefits increases as the income of the household decreases. Since there may be a large upfront cost to applying, and smaller costs to continue participation, the size of potential benefits in the future are also important.

2.2 Impact of Business Cycle

The decision to participate is based on a cost-benefit analysis, therefore the business cycle affects the decision to participate in welfare by affecting the three different types of costs and the potential benefits of participating.

The business cycle directly effects participation by changing incomes and assets. During economic downturns, the unemployment rate increases and wages stagnate (Borjas, 2009). For households, periods of unemployment decrease incomes. Moreover, individuals who are unemployed may need to decrease their assets in order to finance their consumption. Since FSP eligibility depends on both an asset and an income test, economic downturns increase the number of people who are eligible for FSP. Assuming a constant take-up rate, an increase in the number of people who are eligible increases the total number of participants in FSP.

Increases in the number of FSP participants could affect the decision to participate by decreasing information costs and stigma costs. As the number of people on FSP increases, the number of people who have information on the application procedures and eligibility rules increase as well. If social networks serve as an important source of information, this could substantially decrease information costs for many people. Additionally, an increase in the number of people on welfare may reduce external welfare stigma because one's social contacts
theorizes that the cost of deviating from social norms decreases as the number of people deviating increases. Lindbeck considers welfare stigma to be the cost associated from deviating from social norms, which value self-sufficiency and hard work. In the case of FSP, this suggests that as the number of people participating increases, the stigma associated with participation decreases, and thus total participation increases. Despite Lindbeck’s speculations that this may be the case, he gives no evidence that this is actually the case. Bertrand et al. (2000), however, do find evidence that social networks affect welfare participation. The authors find that having a social network with a high welfare participation rate increases the likelihood that a given member of the network will participate in welfare. However, this network effect may not only be due to lower stigma; having a network with high welfare participation may also decrease information costs. Indeed, Cohen-Cole (2006) found that in local welfare cultures, the decrease in information costs is more important than the decrease in stigma costs in increasing participation.

These studies have considered only the effect of local welfare cultures on the decision to participate; however, in the case of a national economic downturn there may be other effects. For example, during economic downturns, information and stigma costs may decrease due to increased national news coverage on welfare programs. Further, economic downturns create a climate of systematic economic failure, wherein the government, financial institutions, and big companies bare the majority of the blame for the downturn. In this climate, the individual may feel less shame and personal responsibility for her current low income and feel more deserving of help, thus experiencing a smaller stigma cost associated with participating in welfare programs (Stuber and Schlesinger, 2006). As mentioned previously, external stigma costs may decrease during an economic downturn. Internal stigma costs might also decrease since individuals are
more willing to rely on public assistance for basic needs knowing that their neediness may be due to systematic failure as opposed to individual failure.

The business cycle may also change the composition of people who are eligible for welfare programs. If the people who are eligible during economic downturns have different cost structures than those who are eligible during economic booms, then the average take-up rate may change during economic downturns even though costs may not change. Thus, the effect of the economic downturn can include effects from changes in the pool of eligible people. For example, an economic downturn may make many people only temporarily eligible. Blank and Ruggles (1996) find short spells of eligibility are correlated with non-participation because the potential benefits do not make up for the administrative costs. Therefore, the whole set of people who are suddenly only temporarily eligible for benefits during economic downturns may have a lower take-up rate than those who are consistently eligible, and the average take-up rate may decrease during the economic downturn (controlling for other effects). As well, those who are newly eligible to welfare may be less informed on a welfare program's existence, administrative procedures, and eligibility requirements. Additionally, if people who are newly eligible have never participated in a welfare program, they may be less inclined to rely on public assistance for fundamental needs and feel more internal stigma from participating in welfare programs. These compositional effects decrease the perceived effect of the business cycle on the decision to participate.

2.3 Impact of Policy Changes

While the theory on how the business cycle affects the decision to participant is relevant for all of the years that welfare programs have been in existence, there have been two changes in the past 15 years that may have changed the effects of the business cycle. The two main changes
were the welfare reform, passed in 1996, and the introduction of EBT during the 1990s and the beginning of 2000s. These policy changes could have both changed the costs and benefits of participating, and the secondary effects of the business cycle.

Welfare reform began in the mid-1990s when states began receiving waivers to change their Aid to Families with Dependent Children (AFDC) programs and experiment with new eligibility requirements and benefit schedules. On August 22, 1996 President Clinton signed the Personal Responsibility and Work Opportunity Act (PRWORA), which overhauled AFDC and renamed it Temporary Assistance for Needy Families (TANF) and which also made significant changes to FSP (with most changes effective October 1st 1996). The main results from the TANF reform are eligibility restrictions and the introduction of work requirements. Similarly, the reform on FSP restricts eligibility and decreases average benefits. The FSP reform restricted non-working able-bodied adults without dependents (ABAWDs) to participate in FSP for only 3 months out of a 36 month period. While these changes may have decreased total caseloads, they may have also decreased stigma. By better targeting FSP to needy individuals, and by introducing the work requirement, FSP might have gained respectability and reduced stigma associated with it. Since PRWORA may have decreased the stigma cost, the reform could also change the size of the business cycle's secondary effects. The business cycle's secondary effects increase participation by decreasing stigma costs; however, if stigma costs are generally lower, then there is less stigma for the business cycle to decrease so after PRWORA the size of secondary effect might decrease.

Another change to FSP during the 1990s was state's implementation of electronic benefit allotments (EBT) in place of physical food stamps. The rational for this change was that using an EBT card is less conspicuous than using actual stamps, so users of EBT cards would receive less overt stigma than those using regular food stamps. Indeed, the EBT system is highly
effective at hiding participation in FSP (personal communication, D. Baskin). Thus, the introduction of EBT may likely eliminate nearly all external stigma costs. While Manchester and Mumford (2010) find that EBT increased the take-up rate of FSP by 30%, other studies have found insignificant effects (Figlio et al., 2000). While EBT decreases external stigma costs, it also decreases the flexibility of food stamps and increases the transaction costs for some groups. Another purpose of EBT is to reduce illegal trafficking of food stamps, which comes from households selling their food stamps for money. While this reduced flexibility may decrease the benefit of FSP for some households, it might also increase the respectability of FSP and decrease the stigma cost. One problem with EBT, however, is that the technology might be a barrier to the elderly and disabled as well as households that are not familiar with ATM cards (Figlio et al. 2000).

The decrease of flexibility and the increase of transaction costs from the EBT system might reduce participation by a fixed amount, but the cost should not vary during the business cycle. However, since stigma costs vary during the business cycle, the decrease in the external stigma cost from EBT may change the size of the business cycle's secondary effects. If external stigma costs decrease substantially due to the introduction of EBT, then during a recession, external stigma costs may decrease by less than before EBT was introduced since they are now smaller in general. Therefore, the business cycle should have a smaller effect on the decision to participate after EBT has been implemented.

2.4 Impact of Individual Differences

The effects from the business cycle may not only change due to policy changes, but they also may differ for individuals. Since the business cycle's secondary effects are due to decreases in information and stigma costs, if particular individuals have smaller information and/or stigma
costs, their decision to participate may be less affected by the changes in these costs due to economic downturns. For example, Stuber and Kreishenger (2006) find that people who are white feel less identity and external stigma than other races, and Horan et al. (1974) find that people who are more educated feel more stigma but have smaller information costs. Since these different baseline costs than others in the population, it is possible that the business cycle has different effects on these people. If changes in stigma costs are a large portion of the secondary effects, white people might be affected less by the business cycle than others, since they have less total stigma to decrease. If well-educated people have much higher stigma costs, then they may be more affected by the business cycle than others. If, on the other hand, well-educated people have much smaller information costs than others, then well-educated people may be less affected by the business cycle than others. Although education and race are two examples, the generality holds: anyone who has different information and stigma costs than the average person are affected by the unemployment rate differently.

2.5 Summary

The decision to participate in FSP is motivated by the different primary costs and benefits of participating – information costs, transaction costs, and stigma costs. The business cycle will affect the decision to participate by decreasing information and stigma costs, and by changing the compositional pool of those who are eligible. Policy changes might change the effect of the business cycle by decreasing costs. I theorize that 1996 welfare reform and change to EBT decreased stigma costs, and thus decreased the effect of the business cycle. Finally, the business cycle might have heterogeneous effects on people based on their baseline information and stigma costs. To verify my theories, I need to empirically evaluate these effects with data.

3. Methodology
3.1 Data Requirements

For my regression, I need data to construct eligibility, to identify participation in FSP, to identify the business cycle at the state and national level, and to establish important controls (such as possible benefits).

3.1.a Data Requirements to Construct Eligibility

To construct eligibility, I need to simulate the various rules and tests of eligibility for FSP. In general, food stamp eligibility is governed by three tests:

1. Income cannot exceed 130% of the poverty threshold for family size.
2. Net income cannot exceed the poverty threshold.
3. Total assets cannot exceed $2000\(^5\).
4. Able-bodied adults are required to work with some exceptions.

Net income is constructed (according to FSP eligibility requirements) by subtracting a 20% deduction from earned income, subtracting a standardized deduction based on family size, and then subtracting deductions for medical costs (for families with elderly or disabled), child support costs, dependent care costs (when needed for work, training or education) and shelter costs. Households with elderly members or members who receive certain types of disability payments do not need to pass the gross income test. Currently, the definition of assets does not include the home, or the resources of people who receive Supplemental Security Income (SSI), TANF, and most retirement pensions. There is a different asset threshold for families with senior members or disabled members. Participation in FSP requires all able-bodied adults between 16 and 60 to register for work or cooperate in seeking and keeping employment in order to be qualified for food stamps with some exceptions. As well, with PRWORA enacted in 1996, able-

\(^5\) It is $3000 if the household includes a person over 65, and it doesn't count resources of people on TANF, SSI, pension plans.
bodied adults without dependents (ABAWDs) who are working less than 20 hours a week can only receive food stamps 3 months out of a 36 month period. However, the Balanced Budget Act of 1997 allowed states to exempt up to 15 percent of the ABAWDs who would otherwise be ineligible. PRWORA also excluded immigrants (with some exceptions) from eligibility for FSP.

Therefore to construct an accurate measure of eligibility, I need the following information: monthly income, total liquid assets, received benefits from TANF and SSI, whether there are disabled family members or seniors in the household, the value of vehicles, the number of family members, monthly child care costs medical costs, shelter costs, immigrant status, employment status, receipt of food stamps in the last 36 months, and when and where states used waivers to suspend ABAWD eligibility restrictions.

3.1.b Data Requirement to Establish Participation in the FSP

Food stamp participation data are essential for analyzing the decision to participate in FSP. Administrative records have the least amount of error in establishing participation; however, they include only data of people who participated. Since I want to analyze the decision to participate only among those who are eligible, I need a random sample of those who are eligible. Therefore, I cannot use administrative participation data and I must rely on self-reported participation in FSP. The disadvantage is that there is significant amounts of measurement error in self-reported FSP participation. Bollinger and David (1997) find that without modeling the process of measurement error, there can be highly misconstrued estimates of participation. This measurement error is related to the amount of perceived stigma associated with FSP. If stigma costs change over the business cycle, then the measurement error in participation also changes over the business cycle. Specifically, people are more willing to admit they participate in FSP during economic downturns since there is lower stigma associated with FSP. Therefore, self-reported participation may cause an upward bias to my estimates of secondary effects.
3.1.c Data Requirements for Economic Indicators

Not only am I interested in whether the business cycle affects the decision to participate in FSP, I am interested in how this decision is affected by the state business cycle versus the national business cycle. To ascertain the difference, I will need comparable data at the state and national level. My prime independent variable, the business cycle, can be described by various economic indicators: the percent change in GDP, the unemployment rate, the poverty level, disposable income, expenditures, and more. However, the only monthly economic indicator for both states and US is the unemployment rate.

3.1.d Data Requirements for Controls

An economic downturn not only increases eligibility, but it also makes those who are eligible qualify for higher benefits, and in more need of the benefits. Since I want to look only at the secondary effects of the business cycle on participation, it is important to control for income, assets, potential benefits, and employment status. If my measures are imperfect, it might make my estimate for the secondary effect upward biased since it would include hidden income effects.

Another important control is the real value of FSP benefits. FSP benefits are indexed annually by the Thrifty Food Plan (TFP). Benefits are updated in October of each year based on the TFP from June of that same year. The real value of the benefits fluctuate based on the time of year, so it might be important to include month fixed effects as a robustness check. Different regions in the US have different levels of food prices. Hawaii and Alaska have a different TFP, eligibility requirements, and benefit levels because their food prices are very different than the other 48 states. Without specific state or region food price indexes, it is difficult to control for the real value of benefits; however, state fixed effects control for level differences between states. Since Hawaii and Alaska have different eligibility requirements, benefits levels, and food prices, I do not include observations from Alaska and Hawaii in my data set.
In the welfare stigma literature, various sets of individual characteristics are identified as affecting the size of one's welfare stigma cost. These include: working status, race, age, education, sex, and time on welfare (Horan and Austin, 1974; Stuber and Kronebusch, 2004). Marital status, size of household, and income are found to be important determinants of misreporting food stamp participation (Bollinger and David, 1997). Therefore, these factors might also be important controls in my regression.

3.2 Data Used for Empirical Analysis

The data set that I use to perform my empirical analysis is the CEX (Consumer Expenditure Survey) from January 1993 through March 2009. Even though the CEX includes data from before 1993, only in 1993 did it include information on the reference person's state of residence. Even after 1993, the CEX could not disclose the state of residence for some of the participants for confidentiality reasons. To secure anonymity, the CEX put missing values for some states and recoded the states of some other participants. Since state of residence is key in identifying when survey participants had access to EBT, I dropped all years before 1993 and all observations where the state was missing or possibly recoded.

The CEX has a panel format, with one panel per year with quarterly interviews. Some of the data, however, are only collected in certain interviews. Expenditure data (such as medical costs, shelter costs, and education costs) are collected quarterly. Self-reported food stamp participation is collected quarterly until April 2001, and then it is collected only in the 2nd and 5th interviews as an annual indicator. Income is collected in the 2nd and 5th interviews. Current assets as well as change is assets from a year ago are collected in the 5th interview. The CEX also includes information on individual and household characteristics, such as education, hours worked, family size, number of children under 18 living in the household, number of elderly in
the household, and whether there is anyone disabled in the household. With this information, it is possible to construct (a somewhat crude) measure of eligibility. Since asset information is only given in the 5th interview, I impute values for the previous interviews. Similarly, since income information is only given in the 2nd and 5th interviews I impute the level of income for the 3rd and 4th interview.\(^6\) The obvious weaknesses in this choice of data is the lack of complete income and asset information for all of the interviews and the fact that FSP participation is recorded quarterly and sometimes annually rather than monthly. However, it has the desirable features of having data available up to the April 2009 (thus containing a large portion of the most recent economic downturn), and having information on expenditures which allows a more precise net income eligibility test.

My main macro-economic variables are the monthly national and state unemployment rate. The unemployment rate is highly correlated with the business cycle and it is the only macro-economic variable for which monthly state data is available (Borjas, 2009). As well, it is directly comparable over time and different states. While I am interested in the difference between the effects of the national unemployment rate and the state unemployment rate, these two measures are highly correlated\(^7\) and might cause multicollinearity if I include them both in one regression. Therefore I focus on one of them, and as a robustness check consider the other. I focus on the national unemployment level, since it is the more important indicator when considering national policy. The state and national unemployment rates are from the Bureau of Labor Statistics. Because my micro-economic data from the CEX is quarterly through the first quarter of 2001, and annual after first quarter of 2001, I have to use moving averages of the unemployment rates to come up with quarterly and annual unemployment rates.

\(^6\) For more information on the imputation measures please see Appendix I.

\(^7\) From 1993-2009, the correlation between the state unemployment rate and the national net-of-state unemployment rate was .62.
3.3 Methodology Implications of Data Sets

Starting in April 2001, the CEX began to collect FSP participation as an annual value instead of as a quarterly value. This change could affect my analysis since the change from quarterly participation to annual participation data might increase my measurement error.

When participation becomes annual, I have to construct whether a person is eligible at any time during the previous year rather than whether he or she is eligible at any time during the previous quarter. I also have to control for income and assets over the entire year. Since I have limited data, the change to annual participation data increases the measurement error in my eligibility measure and the income and asset controls. Therefore, I am less able to control for the income effects of the business cycle, which could make my estimates of secondary effects upward biased. To control for this change, I create a dummy variable for after April 2001 and interact this with the unemployment level and see if there is a statistically significant difference in the secondary effects after April 2001.

3.4 Methodology for Constructing Eligibility

Because of the computational difficulty of constructing eligibility status over multiple years (with different rules) and lack of specific data, I slightly simplify the tests. I define net income as gross income less 20% of earned income minus a standard deduction, a dependent care deduction, a medical expense deduction (if the household has an elderly or disabled person), and an excess shelter cost deduction. The actual asset threshold is $2000; however, Moffitt (2002) finds that households will spend down or hide assets in order to meet the threshold. As a robustness check, I will construct eligibility with the actual asset threshold ($2000) and the more lenient assumption ($4500). Also as a robustness check, I will construct an eligibility measure that is slightly more lenient in all of the tests (110% of the gross income test, asset threshold of...
$2500, and 110% of the net income test). Since I will be considering participation and eligibility over the course of a quarter and over the course of a year, with only current income and asset information, a more lenient eligibility test will hopefully include some of the participants who might have been eligible earlier in the year even if they are not quite eligible now. I will only consider assets in checking, interest-earning accounts, and in securities. Since ABAWDs after 1996 may or may not be eligible based on their FSP participation in the past 36 months and state exemptions, as a robustness check I will exclude them from my regression.

3.5 Summary Statistics

Table 1: Summary Statistics of Key Variables and How They Change with Different Eligibility Measures

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
<th>Mean</th>
<th>SD</th>
<th>Mean</th>
<th>SD</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Unemployment Rate</td>
<td>5.23</td>
<td>0.87</td>
<td>5.23</td>
<td>0.87</td>
<td>5.23</td>
<td>0.87</td>
<td>5.24</td>
<td>0.88</td>
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<tr>
<td>State Unemployment Rate</td>
<td>5.31</td>
<td>1.3</td>
<td>5.31</td>
<td>1.29</td>
<td>5.31</td>
<td>1.3</td>
<td>5.37</td>
<td>1.28</td>
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<tr>
<td>EBT</td>
<td>0.65</td>
<td>0.48</td>
<td>0.65</td>
<td>0.65</td>
<td>0.65</td>
<td>0.48</td>
<td>0.65</td>
<td>0.48</td>
</tr>
<tr>
<td>Participates in FS</td>
<td>0.28</td>
<td>0.45</td>
<td>0.27</td>
<td>0.44</td>
<td>0.28</td>
<td>0.45</td>
<td>0.33</td>
<td>0.47</td>
</tr>
<tr>
<td>Unemployed</td>
<td>0.03</td>
<td>0.17</td>
<td>0.17</td>
<td>0.17</td>
<td>0.03</td>
<td>0.17</td>
<td>0.03</td>
<td>0.18</td>
</tr>
<tr>
<td>Real Eligible Benefits</td>
<td>0.42</td>
<td>0.52</td>
<td>0.39</td>
<td>0.51</td>
<td>0.42</td>
<td>0.52</td>
<td>0.4</td>
<td>0.53</td>
</tr>
<tr>
<td>Real Income</td>
<td>4.93</td>
<td>4.42</td>
<td>5.34</td>
<td>4.93</td>
<td>4.94</td>
<td>4.45</td>
<td>5.43</td>
<td>4.62</td>
</tr>
<tr>
<td>Real Assets</td>
<td>1.04</td>
<td>4.21</td>
<td>1.28</td>
<td>4.85</td>
<td>1.81</td>
<td>5.81</td>
<td>1.09</td>
<td>3.39</td>
</tr>
<tr>
<td>Number of Vehicles</td>
<td>0.92</td>
<td>1.04</td>
<td>0.96</td>
<td>1.05</td>
<td>0.94</td>
<td>1.05</td>
<td>0.96</td>
<td>1.07</td>
</tr>
<tr>
<td>Age of HH</td>
<td>45.66</td>
<td>20.11</td>
<td>45.64</td>
<td>20.02</td>
<td>45.82</td>
<td>20.2</td>
<td>50</td>
<td>20.01</td>
</tr>
<tr>
<td>If HH is White</td>
<td>0.71</td>
<td>0.46</td>
<td>0.71</td>
<td>0.45</td>
<td>0.71</td>
<td>0.45</td>
<td>0.69</td>
<td>0.46</td>
</tr>
<tr>
<td>Weeks Worked of HH</td>
<td>20.71</td>
<td>22.76</td>
<td>21.77</td>
<td>23.03</td>
<td>20.82</td>
<td>22.79</td>
<td>19.01</td>
<td>22.97</td>
</tr>
<tr>
<td>Disabled in Household</td>
<td>0.2</td>
<td>0.4</td>
<td>0.19</td>
<td>0.4</td>
<td>0.2</td>
<td>0.4</td>
<td>0.25</td>
<td>0.43</td>
</tr>
<tr>
<td>Number Children under 18</td>
<td>1.02</td>
<td>1.42</td>
<td>1.02</td>
<td>1.41</td>
<td>1.01</td>
<td>1.41</td>
<td>1.3</td>
<td>1.48</td>
</tr>
<tr>
<td>Number of Persons over 64</td>
<td>0.29</td>
<td>0.54</td>
<td>0.29</td>
<td>0.54</td>
<td>0.3</td>
<td>0.54</td>
<td>0.37</td>
<td>0.58</td>
</tr>
<tr>
<td>If HH is Married</td>
<td>0.29</td>
<td>0.45</td>
<td>0.3</td>
<td>0.46</td>
<td>0.29</td>
<td>0.45</td>
<td>0.34</td>
<td>0.47</td>
</tr>
<tr>
<td>Family Size</td>
<td>2.62</td>
<td>1.83</td>
<td>2.64</td>
<td>1.82</td>
<td>2.61</td>
<td>1.83</td>
<td>2.98</td>
<td>1.88</td>
</tr>
<tr>
<td>Standard Eligibility</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Lenient Eligibility</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Lenient Assets Eligibility</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>No ABAWDs</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

The table above includes the mean and variance of key variables under different sample

8 The amount the real market value of vehicles exceeds $4500 is also included in the resource definition. This simplification is necessary there is no data on car value in the data set I will use. Instead, I will add as a covariate to the regression number of vehicles in the household.
selections. The sample selections are indicated by putting an “X” in the appropriate rows at the bottom. The last two columns are the summary statistics when there are no sample restrictions.

Since I use different measures of eligibility in my analysis as robustness checks, I want to make sure that the characteristics of the population under the different restrictions are not changing in unforeseen ways that may confound my results. The average national and state unemployment rate and the EBT measure change very little over the different eligibility measures, which suggests that these variables are independent of the eligibility measures. If my standard eligibility measure accurately portrays eligibility, then I would expect that the participation rate FSP would decrease with the more lenient measures since they are increasing the number of people who are ineligible and cannot participate in food stamps. The fact that participation does not change very much suggests that my more lenient eligibility measures include people who are eligible and participated in FSP. Participation in food stamps increases substantially when I exclude ABWADs. This could be because I am excluding those who are ineligible due to the 1996 welfare reform, and/or it could indicate that I am excluding a population that is less likely to participate. This difference will be important to remember in my analysis of the regression that excludes ABWADs because it might change the interpretation of results. The rest of the variables changes (or lack of changes) over eligibility measures are unsurprising given the different sample selections so I do not discuss them further.

3.6 Regressions

The main regression I ran is:

\[
Pr(\text{Participate In Food Stamps}\mid \text{Eligible})_{i,s,t} = \\
\beta_0 + \beta_1 \text{NationalUR}_{i,t} + \beta_2 \text{NationalUR} \times \text{EBT}_{s,t} + \beta_3 \text{EBT}_{s,t} + \beta_4 \text{NationalUR} \times \text{post}96_{i,t} + \\
\beta_5 \text{NationalUR} \times \text{post}01_{i,t} + \text{Covariates} + \epsilon_{i,s,t}
\]

The coefficient on the national unemployment rate, $\beta_1$, indicates the size of the business cycle's secondary effects on the decision to participate. The coefficient on the interaction
between states with EBT and the unemployment rate, $\beta_2$, indicates how the size of the secondary effects changes for states with EBT. Since EBT's main effect was eliminating a large portion of external stigma costs, the interaction term considers the change in secondary effects once the effect from a decrease external stigma costs is eliminated. Thus, another interpretation for $\beta_2$ is the portion of the secondary costs that are due to changes in external stigma costs. The coefficient on EBT, $\beta_3$, is the general effect of EBT on the decision to participate. If this is positive, this indicates that the decrease in external stigma costs outweigh any decrease in flexibility and increase in transaction costs. The coefficient on the interaction between the national unemployment rate and after September 1996, $\beta_4$, indicates how secondary effects changed after the 1996 welfare reform. Finally, the coefficient on the interaction between the national unemployment rate and after March 2001, $\beta_5$, indicates how secondary effects changed after March 2001. Since the participation data changes to annual data after March 2001, if this coefficient is statistically significantly different from zero, this may indicate that the change in data increased measurement error substantially.

As robustness checks on the primary regression, I look at two other measures of eligibility that are more lenient, I drop all ABAWDs, include month dummies, include state dummies, and use the date of statewide implementation of EBTs instead of the state's start date of EBT implementation. As well, to see if the state's business cycle has drastically different secondary effects, I will run the same regression but with the state unemployment rate.

My secondary regression is:

$$Pr(\text{Participate In Food Stamps } \mid \text{Eligible})_{i,s,t} = \beta_0 + \beta_1 \text{NationalUR}_t + \beta_2 \text{NationalUR} \times \text{EBT}_s + \beta_3 \text{EBT}_s + \beta_4 \text{NationalUR} \times \text{post96}_t + \beta_5 \text{NationalUR} \times \text{post01}_t + \beta_6 \text{NationalUR} \times \text{RaceWhite}_i + \beta_7 \text{NationalUR} \times \text{Education}_i + \text{Covariates} + \epsilon_{i,s,t}$$

This regression includes interactions between the national unemployment rate and an indicator
for being white, and the national unemployment rate and education.  \( \beta_6 \) indicates the difference in the secondary effects from the baseline effect (\( \beta_1 \)) for people who are white. Similarly, \( \beta_7 \) indicates the change in secondary effects when education increases.

The coefficients of these regressions are estimated by probit regression since the dependent variable, participation in FSP, is a binary response variable. I also adjust the standard errors for clusters since not all of the dependent variables vary by individual. The other covariates I include are real income, real assets, real potential benefits, number of vehicles household has, whether head of household is unemployed, whether there is a disabled person in the household, the number of children under 18, number of people over 64 in household, family size, and characteristics of household head: age, dummy for Caucasian, dummy for married, and number of weeks worked in past year. I index “real” values by the annual inflation rate.

4. Analysis

Table 2: The Estimated Coefficients From the Primary Regression Under Different Eligibility Measures and Robustness Checks

<table>
<thead>
<tr>
<th></th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>VI</th>
<th>VII</th>
</tr>
</thead>
<tbody>
<tr>
<td>National UR</td>
<td>0.032***</td>
<td>0.031***</td>
<td>0.032***</td>
<td>0.040***</td>
<td>0.033***</td>
<td>0.021**</td>
<td>0.016*</td>
</tr>
<tr>
<td>National UR*EBT</td>
<td>-0.028*</td>
<td>-0.027*</td>
<td>-0.028*</td>
<td>-0.035**</td>
<td>-0.028*</td>
<td>-0.006</td>
<td></td>
</tr>
<tr>
<td>EBT</td>
<td>0.144*</td>
<td>0.138*</td>
<td>0.144*</td>
<td>0.187**</td>
<td>0.146*</td>
<td>0.047</td>
<td></td>
</tr>
<tr>
<td>National UR*After ’96</td>
<td>-0.012**</td>
<td>-0.011**</td>
<td>-0.011**</td>
<td>-0.013**</td>
<td>-0.011**</td>
<td>-0.013**</td>
<td>-0.011**</td>
</tr>
<tr>
<td>National UR*After ’01</td>
<td>0.006</td>
<td>0.006</td>
<td>0.005</td>
<td>0.005</td>
<td>0.006</td>
<td>0.004</td>
<td>0.004</td>
</tr>
<tr>
<td>Standard Eligibility</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Lenient Eligibility</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lenient Assets Eligibility</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No ABAWDs</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Month Controls</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EBT State-wide</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Implementation Date</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>State Controls</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Significance at .05 level. ** Significance at .01 level. *** Significance at .001 level.

Also included in regression: dummy for if household head is unemployed, real benefits household qualifies for, real income, real assets, number of vehicles, age, dummy for if household head is white, number weeks worked by household head, dummy for if a disabled person lives in household, number of children younger than 18 in household, number of people older than 64 in household, dummy for if household head is married, and family size.
The above table gives the coefficients from the regression as marginal effects under different eligibility measures and robustness checks. Each column is a different regression, with the rows at the bottom indicating which eligibility measure and/or robustness check was used in that regression.\(^9\)

### 4.1 Results to Primary Regression

The coefficient on the national unemployment rate is .032 and is statistically significant at any standard level (Table 2). Therefore, a one percentage increase in the unemployment rate increases the likelihood of participating in FSP by 3.2 percentage points. This confirms that the business cycle has secondary effects that make people more likely to participate in FSP. Since the coefficient on the interaction term of the unemployment rate and EBT is -.028, these secondary effects decrease by 2.8 percentage points in states where EBT has been implemented (Table 2). To understand this effect, note that the coefficient on EBT is .144, which indicates that the presence of EBT increases the likelihood of participating in FSP by 14.4 percentage points, which is statistically significant (Table 2). This suggests that EBT considerably decreases external stigma costs. Consider two states, one whose FSP program utilizes EBT (A) and one whose does not (B). Because state A has EBT, rather than physical food stamps, state A would likely have less external stigma than state B. When the unemployment rate increases, external stigma decreases as does internal stigma and information costs. In state A, there is little external stigma, so an increase in the unemployment rate cannot decrease the existing external stigma significantly. However, in state B, where there is more external stigma, an increase in the unemployment rate can decrease the external stigma by much more. Therefore, the effect of the unemployment rate in state A on FSP participation will be smaller than its effect on state B.

---

\(^9\) For example, the coefficient of the national unemployment rate under standard eligibility (column I, row 1) can be interpreted as: with a 1 percentage point increase in the national unemployment rate, the likelihood of participating in FSP increases by 3.2 percentage points.
Since EBT decreases only external stigma cost, the decrease of secondary effects from EBT (2.8% points) can be interpreted as the portion of secondary effects which is due to decreases in external stigma costs. From this interpretation, the secondary effect of the unemployment rate is 87.5% due to external stigma costs and 12.5% due to changes in other costs. While I cannot distinguish the source of the residual effect, it is fairly small, which indicates that the business cycle affects information, transaction costs, internal stigma costs, and the eligibility pool to a lesser extent than external stigma costs (or that the sum effect of these changes is small).

After 1996, the secondary effect from the unemployment rate decreased by 1.2% points, which is consistent with the fact that welfare reform may have decreased the stigma associated with using FSP by making more stringent work requirements (Table 2). This means that the point estimate of the net secondary effects after 1996 in states with EBT is -.8% points. This estimate is not statistically significantly different than zero; however, this does suggest that the policy changes in the 1990s and early 2000s decreased stigma costs enough such that, after welfare reform and EBT were implemented, the business cycle's negative compositional pool effect dominated or compensated for the other positive secondary effects. Secondary effects do not change a statistically significant amount after 2001, which indicates that there is a small or negligent increase in measurement error with the use of annual data instead of quarterly data. The point estimate for the business cycle's secondary effect for the most recent recession is slightly negative (-.002) but not statistically significantly different than zero. Therefore, I cannot reject the hypothesis that the most recent recession had no secondary effects.

4.2 Robustness Checks to the Primary Regression

When I use more lenient measures of eligibility as in regression II and III, the estimates...
are very similar and coefficients only differ by .001 at most. When I drop ABAWDs (whose eligibility is difficult determine after 1996) many of the effects show an increase in magnitude. The effect of the national unemployment rate increases to 4.1% points, and the effect of the national unemployment rate interacted with EBT decreases to -3.5% points (Table 2). The total effect of EBT increases to 18.9% points (Table 2). However, the effect of the national unemployment rate after 1996 does not change. This may be because discarding ABWADs not only discards people who may be ineligible after 1996, but also discards people who are less needy and less likely to participate in general. Since they are less likely to participate, they are also less likely to be swayed by changes in stigma, information, and transaction costs. Therefore by discarding this group, I am discarding a group of individuals who have a small treatment effect, which makes the average treatment effect increase. When I include month fixed effects, the results change by very little.

So far, the robustness checks have not changed the main results; however, when I used the dates of total statewide implementation of EBT rather than the date of first implementation, the effects from EBT become much smaller and are no longer statistically significant. This is counter-intuitive. Since EBT affects external stigma costs by decreasing visibility of use, it should have only a partial, smaller, effect when not everyone in the state has access to it, and a larger effect once it is fully implemented. It is possible that the implementation start dates are capturing some time fixed effect or state effect that is unrelated and stronger than the EBT effect. This indicates a decrease in the confidence of the estimation for external stigma cost.

When I control for state fixed effects, almost all of the variation in EBT is taken into account. Because of this multicollinearity, it is impossible to estimate the effect of EBT when state fixed effects are included. Therefore, when I add state fixed effects, I leave out the variables involving EBT. When state fixed effects are included, the effect of the national
unemployment rate decreases to 1.6% points and is significant at the .05 level (Table 2). The change in the effect of the national unemployment rate after 1996 is -1.1% points and is statistically significant at the .01 level (Table 2). Therefore, after 1996, there is still a net positive effect from the unemployment rate, even if small and insignificant (.5% points). The coefficient on the change in the effect of the unemployment rate after 2001 remains statistically insignificant.

4.3 Results to Primary Regression using the State Unemployment Rate

<table>
<thead>
<tr>
<th></th>
<th>I</th>
<th>II</th>
</tr>
</thead>
<tbody>
<tr>
<td>State UR</td>
<td>0.002</td>
<td>0.018***</td>
</tr>
<tr>
<td>State UR*EBT</td>
<td>0.037***</td>
<td></td>
</tr>
<tr>
<td>EBT</td>
<td>-0.186**</td>
<td></td>
</tr>
<tr>
<td>State UR*After '96</td>
<td>-0.013*</td>
<td>-0.009***</td>
</tr>
<tr>
<td>State UR*After '01</td>
<td>0.001</td>
<td>0.003</td>
</tr>
<tr>
<td>Standard Eligibility</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

* Significance at .05 level. ** Significance at .01 level. *** Significance at .001 level.

If I use the state unemployment rate instead of the national unemployment rate, I see confounding results. The effect of the state unemployment rate in non-EBT states is not statistically different from zero (Table 3). This effect increases when EBT is implemented, but the direct effect of EBT on participation is negative (Table 3). It's unclear exactly how to interpret these results, which are very different than the results from using the national unemployment rate. One reason these result may be different is that the state unemployment rate effect, under different time and state conditions (based on the EBT, 1996, and 2001 interaction terms), absorbs some of the state fixed effects. If, however, I include state fixed effects, the coefficient on the state unemployment rate (.018) is very similar to the coefficient on the national unemployment rate (.016, Table 3 and 2 respectively). This suggests that the
national and state unemployment rate must have very similar effects on the decision to participate in FSP. The effects from the state unemployment rate are slightly larger, which is probably because many of the secondary effects, such as decreases in information costs and decreases in stigma costs, happen at the local level (Figure 2).

**Figure 2:** The Estimated Secondary Effects Using the National and State Unemployment Rate with State Fixed Effects

![Graph showing estimated secondary effects](image)

4.4 Results to Secondary Regression

<table>
<thead>
<tr>
<th></th>
<th>I</th>
</tr>
</thead>
<tbody>
<tr>
<td>National UR</td>
<td>0.058***</td>
</tr>
<tr>
<td>National UR*EBT</td>
<td>-0.027*</td>
</tr>
<tr>
<td>EBT</td>
<td>0.142*</td>
</tr>
<tr>
<td>National UR*After '96</td>
<td>-0.011**</td>
</tr>
<tr>
<td>National UR*After '01</td>
<td>0.006</td>
</tr>
<tr>
<td>National UR*Education</td>
<td>-0.005***</td>
</tr>
<tr>
<td>National UR*White</td>
<td>-0.019**</td>
</tr>
</tbody>
</table>

* Significance at .05 level. ** Significance at .01 level. *** Significance at .001 level.

When I include individual interaction effects to check for heterogeneity of the unemployment rate among individuals, the baseline effect of the unemployment rate increases to .058 and the effect from EBT and welfare reform stays fairly constant (Table 4). The
coefficient on the interaction term between the unemployment rate and education is -.005 (where education is variable between 1-7) and is statistically significant at any standard level (Table 4). This means that those who are well-educated are affected less by the unemployment rate in their decision to participate than those who have less education. This suggests that well-educated people have smaller costs to participating such that an increase in the unemployment rate affects their decision less. Well-educated people have higher stigma costs and lower information costs, therefore, the negative coefficient suggests that lower information costs dominate the higher stigma costs. However, this might also indicate that the unemployment rate effects information costs more than stigma costs. Being white also decreases the effect of the unemployment rate on the decision to participate by 1.9% points (Table 4). Since white people have smaller stigma costs, they are less affected by the unemployment rate than those who have higher costs.

4.4 Discussion

While many of the effects change with the robustness checks, there are a few things that are apparent from the data. The national unemployment rate does increase the likelihood of participating in FSP – by 2-3% points per 1% point increase in the unemployment rate (controlling for eligibility and assets). After 1996, this effect decreases by about 1% point to 1-2% points. This could be because the 1996 reform decreased the stigma associated with FSP since it decreased the eligibility of those who did not work and those who were ostensibly less needy. Since there was less stigma associated with FSP in general, this reduced the effect of the unemployment rate. It is less clear how EBT effects the decision to participate and the secondary effects of the unemployment rate. There is some evidence that EBT decreases the external stigma cost associated with FSP and therefore reduces the effect of the unemployment rate on the decision to participate. Thus, when I consider time periods after 1996, and states with EBT,
(the case for all states in the most recent regression) the net secondary effect becomes negative (though statistically insignificant). This suggests that once baseline welfare stigma costs decrease, the business cycle's compositional pool effect dominates, or compensates for other secondary effects. However, if I use the date that EBT was implemented statewide rather than the start date of the initial pilot, the effects of EBT become smaller and insignificant.

One problem with this analysis is that the date that EBT was implemented may not be exogenous to the model. Earlier implementation may be correlated with the level of stigma in the state, which would further confound the analysis. As well, while there is clearly a secondary effect from the unemployment rate, it is possible I am measuring the effect with large amounts of error. For one, there might be significant amounts of measurement error in the income, assets and eligibility measure. While my results did not change significantly with the change to annual data, there could be a large baseline error in the quarterly data. An inability to correctly measure eligibility, income, and assets would inflate the estimates as they would be encompassing some of the effects from increased eligibility, smaller incomes, and assets which come with the economic downturns. On the other hand, my estimates might also not be capturing the full secondary effect. If the secondary effect comes from changes in stigma and information costs, these effects might lag over time, so that even after the unemployment rate has gone up, people are more likely to participate in FSP. This is because stigma may be sticky and it may take a significant period of time for people to adjust their attitudes to the economic climate. Further, it may take people time to absorb the increased amount of information on FSP, and they may retain it even after the unemployment rate goes down and popular media (including news programming) stops covering FSP. As well, the secondary effects that I measure also include compositional effects from changes in the composition of people who are eligible for fSP during economic recessions. If during economic downturns, as theorized, the pool of people who are
eligible include those who are in general less likely to participate (for various reasons), then my estimates of secondary effects would be biased downward.

4.5 Extensions

Further extensions of this work could be to use other data sets to further confirm my analysis. For example, it may be helpful to extend this analysis to the SIPP. Even though the SIPP only has data going through 2004, it has consistent quarterly data on participation in FSP and data available from 1984. Access to administrative records of EBT would help further analyze the effect of EBT on FSP participation. With exact data on what percentage of the state population is using EBT, it might be easier to identify the effect of EBT from the state fixed effect.

Another avenue for research would be to try to further decompose the different effects from the unemployment rate. The attempt to use EBT as an indicator for external stigma worked well, but indicators for internal stigma, information, and transaction costs are also required. Further research could also try to control for compositional effects, possibly by limiting the sample to people who are consistently eligible for food stamps. Finally, it is clear from my analysis that the secondary effects are different for different populations. When I exclude ABAWDs, the effect of the unemployment rate increases. Additionally, white people and people who were more educated are less affected by the unemployment rate. Thus it appears that the secondary effects are heterogeneous over the population. A further avenue of research would be to analyze the treatment effect for other specific populations rather than the average treatment effect. It is possible the effect for people who have never participated before is much larger (or smaller) than the effect for past participants.
5. Conclusion

To have a full working model of participation in food stamps and other welfare programs, it is important not only to consider the obvious economic factors but also other secondary factors. As my research shows, these factors can change people's decision to participate. While there have been studies about the importance of some of these costs, none have considered how these costs might change during economic downturns and how that might affect participation. To further understand these effects, it is necessary to try to decompose the secondary effects into their separate costs. Some researchers have worked to decompose the costs (Betrand et al., 2000; Cohen-Cole and Zanella, 2008; Manchester and Mumford, 2009, 2010), however these analysis have barely considered how these costs change over time and with the structure of the economy. This paper estimates that the secondary effect of a 1% point increase in the unemployment rate increases the likelihood of participating by 3.2% points. 87.5% of this effect is composed of changes in external stigma costs during recessions. Additionally, these secondary effects decrease with welfare reform and are heterogeneous among individuals. The secondary effects for this most recent regression are statistically insignificant suggesting that the large increase in participation in the past two years is due to income and assets effects. Knowing more about these secondary costs can help policy makers better design welfare programs which minimize information, stigma, and transaction costs. While policy makers are constrained by budgets and cannot increase benefits without great cost, minimizing secondary costs can help increase the participants' utility and the effectiveness of welfare programs.
6. References


Dean, Baskin. Personal Interview. 29 April 2010.


Appendix I: Computing Assets and Incomes

In the CEX, along with question about current assets, there is also a question asked about the difference in assets from a year ago. Therefore, if a family has full asset information for both of these questions, it is possible to create a imputed value from a weighted average based on the interview number. For example, if a family reports $1000 in assets currently, and $500 in assets change in assets from a year ago, for the imputed value for the first interview would be:

\[ 0.25 \times 500 + 0.75 \times 1000 = 875. \]

Unfortunately, while simple, this method does not control for inflation. In my actual method, if the date is \( t \) (in years), to impute for interview number \( i \) (2, 3, 4, or 5), where \( t(i) \) is time at the interview.

\[
Assets_i = \left( \frac{4 - (i - 1)}{4} \times \frac{Assets_{t-1}}{CPI_{t-1}} \right) + \left( \frac{(i - 1)}{4} \times \frac{Assets_t}{CPI_t} \right) \times CPI_{t(i)}
\]

This maybe adding unnecessary complexity and preciseness to the imputation, however it does control for inflation which is correlated with economic downturns.

Since assets help construct the eligibility measure and are an important control, if assets are missing this could cause the effects I am trying to measure look larger. Therefore, I dropped observations from the regression that had missing asset data due an invalid nonresponse, or from a “don't know”, refusal, or other type of nonresponse.

Since assets from the previous period are by subtracting the change in assets from a year ago from the current assets, if current assets are missing it will be impossible to compute assets from a year ago. If the change in assets is missing, I just use the current assets indexed for inflation.

Income is only collected in the 2\(^{nd}\) and 5\(^{th}\) interview, therefore I used a weighted average similar to the assets computation for computing income for the 3\(^{rd}\) and 4\(^{th}\) interview.
\[ Income_i = \left(\frac{3 - (i - 1)}{3}\right) \frac{Income_{i=2}}{CPI_{i(2)}} + \left(\frac{i - 1}{3}\right) \frac{Income_{i=5}}{CPI_{i(5)}} \times CPI_{i(i)} \]

Where \( i \) refers to the interview number (2, 3, 4 or 5), and \( t(i) \) refers to the time at interview \( i \).

Similarly to assets, I dropped any income responses that were missing and not complete.