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Shiferaw Gurmu
Department of Economics
Andrew Young School of Policy Studies
Georgia State University

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ESSAYS IN LABOR ECONOMICS: ALCOHOL CONSUMPTION AND SOCIOECONOMIC OUTCOMES

BY

ERIC SARPONG

A Dissertation Submitted in Partial Fulfillment
of the Requirements for the Degree
of
Doctor of Philosophy
in the
Andrew Young School of Policy Studies
of
Georgia State University

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ACCEPTANCE

This dissertation was prepared under the direction of the candidate's Dissertation Committee. It has been approved and accepted by all members of that committee, and it has been accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Economics in the Andrew Young School of Policy Studies of Georgia State University.

Dissertation Chair:	Shiferaw Gurmu
Committee:	Paula E. Stephan Erdal Tekin Gregory B. Lewis

Electronic Version Approved:
Roy W. Bahl, Dean
Andrew Young School of Policy Studies
Georgia State University
December 2006

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ABSTRACT

ESSAYS IN LABOR ECONOMICS: ALCOHOL CONSUMPTION AND SOCIOECONOMIC OUTCOMES

By

ERIC SARPONG

December 2006

Committee Chair: Dr. Shiferaw Gurmu

Major Department: Economics

Recent studies indicate that alcohol consumption may affect socioeconomic outcomes through its effects on health capital and social capital. If, in fact, differences in socioeconomic outcomes are causally linked to differences in alcohol consumption, then lack of adequate insight into such connectivity may adversely affect the labor market and retirement outcomes of some groups of individuals in society. The rationale for examining the relationship between alcohol consumption and socioeconomic outcomes stems from growing concerns about deterioration in retirement outcomes resulting from declining health capital and recent shifts to incorporate social capital as a key performance or productivity indicator by employers. In two essays, this research examines the impact of alcohol consumption on wealth at retirement using data from the RAND Health and Retirement Study (HRS) from 1992 through 2002; and the effects of alcohol consumption on employment duration and earnings using the Geocode version of the National Longitudinal Survey of Youth (NLSY1979) micro dataset from 1984 through 1996. The theoretical foundation of the association between alcohol use and

economic outcomes relies on Grossman's (1972) health capital model. Empirically, the research relies on panel data methods and duration analysis to determine whether differences in socioeconomic outcomes can be explained by differences in alcohol consumption.

Using both duration analysis and panel data methods, the results indicate that drinking is positively related to improved socioeconomic outcomes as compared to total abstention, when endogeneity has not been taken into account. In contrast, under the duration analysis, estimation via instrumental variables approach indicates that alcohol consumption shortens employment duration. Panel data estimation indicates that the relationship between alcohol consumption and socioeconomic outcomes is rather an inverted U-shaped for some specifications, when endogeneity has been taken into account. Additionally, the effects of drinking on retirement wealth and earnings tend to diminish with the instrumental variables approach. The findings were unchanged even with abstainers partitioned into lifetime abstainers and infrequent or light drinkers (less than one drinking day per week). The results also confirm the positive association between human capital measures such as the level of education and economic outcomes and also the negative relationship between alcohol consumption and taxes on alcoholic beverages.

This dissertation contributes to the literature on alcohol-socioeconomic outcomes nexus and has implications for policies related to health, social capital and alcohol since a more inclusive alcohol and/or health policy could improve civic responsibility and narrow the health capital and social capital gap, both of which are critical to individual level socioeconomic success.

CHAPTER I: INTRODUCTION

Recent evidence suggests that alcohol consumption affects socioeconomic outcomes through its effects on social capital and health capital stocks of individuals. In particular, Mullahy and Sindelar (1994) have suggested that the effects of alcohol on labor market success occur indirectly through its impact on other determinants of productivity such as health capital, social capital and human capital. Such effects of alcohol consumption may even account for a portion of the differences in socioeconomic outcomes between individuals due to its effects through health and social capital (Veenstra et al. 1990; Kawachi et al. 1999; Veenstra 2000; Putnam 2001). Yet the relationship between alcohol consumption and economic outcomes such as retirement wealth and employment duration has not been thoroughly investigated within the economics discipline. To the extent that some segments of society either refrain from alcohol use or abuse alcohol excessively, the benefits or adverse consequences that may accrue from alcohol consumption may lead to disproportionate and/or differential economic outcomes for certain groups of individuals in society.

With the large proportion of the baby boomer workers contemplating retirement in a few years, there has been growing concern that a disproportionate segment of the post retirement population may be susceptible to rapid deterioration in retirement outcomes such as a rapid dissipation in retirement wealth. The theory is that health affects pre and post retirement expenditures hence we would expect that those individuals with large stocks of health capital may incur fewer expenses than their equally-situated counterparts. Indeed, the significance of the factors that affect retirement outcomes might become even more critical given that differences in post retirement wealth may reflect differences in health capital and social capital stocks earlier on in life.[1] Closely related to this concern are recent shifts to incorporate social capital as a key performance or productivity indicator by firms which could in turn either benefit or adversely affect the labor market outcomes of some groups of individuals in society, especially if differences in alcohol consumption are causally linked to economic outcomes. The above-mentioned potential significance of alcohol consumption and its relationships to economic outcomes (labor market and retirement) provides the rationale for undertaking this research.

Emanating from the above then, this dissertation research provides evidence on the relationships between (1) alcohol consumption, (2) retirement outcomes, and (3) labor market outcomes, using data from the Health and Retirement Survey (1992-2002), General Social Survey (1988, 1989, 1990,1991, 1993 and 1994) and the Geocode version of the National Longitudinal Survey of Youth (1984-1996) micro datasets. The dissertation is presented in two closely-related essays, with the first essay focusing on the relationship between alcohol consumption and retirement wealth. The second essay focuses on the effects of alcohol consumption on the length of time that an individual spends employed, as well as the effects of alcohol consumption on earnings. As previously mentioned, the first essay utilizes a sample culled from the RAND Corporation's version of the HRS datasets to investigate whether differences in retirement wealth can be explained by differences in alcohol consumption. The second essay, which uses the Geocode version of the NLSY79 micro dataset, examines the impact of individual alcohol consumption on employment duration and earnings. The

[1] Indeed, different individuals have different labor market outcomes with regard to earnings, times spent in employment and unemployment, earnings and occupational mobility, etc.

purpose of the third dataset, which is rich in social capital measures and socio-demographic variables, provides evidence on the association between alcohol use and social capital.

This dissertation contributes to the literature on the alcohol-SES nexus and also sheds some light on the debate about the impacts of social capital and health capital on economic outcomes by examining the correlates of differences in individual retirement wealth and, earnings and employment duration with dataset from the HRS and NLSY, respectively. In fact, this research is the first of its kind to link alcohol consumption to retirement outcomes using the HRS micro dataset.[2] Another key contribution from this research stems from the fact that unlike previous studies of alcohol consumption and economic outcomes, this research adds to the relationship between alcohol consumption and employment probabilities, in that it examines the relationship between alcohol consumption and the length of individuals' employment relationships. To summarize, this research examines the effects of alcohol consumption on retirement wealth in the first essay and employment duration and earnings in the second essay.

The empirical results indicate that alcohol consumption is positively associated with wealth at retirement, employment duration and earnings across several specifications using both panel data methods and survival analysis. The effects of drinking on economic outcomes (wealth at retirement, employment duration and earnings) diminish via instrumental variables estimation and the relationship becomes an inverted U-shaped. That is, in relations to abstaining, drinking moderately is associated with greater wealth at retirement, longer duration of employment or improved earnings,

[2] This research is unaware of any study that has focused specifically on the links between alcohol use and retirement outcomes using the HRS dataset.

when endogeneity in the alcohol measures are taken into consideration. On the other hand, drinking either heavily (Health and Retirement Survey) or lightly and heavily (National Longitudinal Survey of Youth) is now negatively associated with wealth at retirement, duration of employment and earnings, respectively, when endogeneity in the alcohol measures are accounted for in the model. The results are in line with a majority of the literature on the relationship between alcohol consumption and economic outcomes.

The rest of the dissertation is organized to reflect the structure of the Table of Contents. Also, brief definitions of health capital and social capital have been provided within the introductory sections of Essay I and Essay II. Also, details about what constitutes labor market outcomes (earnings and employment tenure) and retirement outcomes (retirement wealth) are given in the data section of each essay. Chapter two introduces the theoretical foundations of this dissertation research. The chapter proceeds first by analyzing and summarizing the current theory and knowledge relevant to the research questions. Both essays rely on a single theoretical foundation, Grossman's (1972) health capital model. This model provides a theoretical justification for the association between alcohol consumption and socioeconomic outcomes through health capital and/or social capital. Chapter three introduces Essay I, which examines the relationship between alcohol consumption and retirement outcomes. This chapter restates the research objectives and questions to be addressed and relates the current literature and the theoretical perspective to this essay. This chapter also provides the empirical specification for answering the questions posed in the introductory section, discusses the HRS dataset (1992-2002) and key variables used, as well as, address some pertinent data and econometrics issues. Chapter three also presents the results from the empirical model and how it helps answer the research question. Chapter four is designed to provide a brief empirical justification for the association between alcohol use and its effects on individual social capital stocks, using the General Social Survey (GSS) dataset from 1988 through 1994. Chapter five introduces the second essay, which examines the relationship between alcohol consumption and labor market outcomes (employment duration and earnings). This chapter restates the research objectives and questions to be addressed and relates the current literature and the theoretical perspective to this essay. As in the first essay, Chapter five provides the empirical specification, discusses the NLSY dataset, key variables used and deals with the relevant data and econometrics issues. Chapter five also presents the results and interpretation from the empirical model using the NLSY dataset (1985-1996). Chapter six restates the motivation for embarking on this dissertation research and the contributions of this dissertation to the current literature. This chapter also discusses the results and the limitations in view of the results from the three datasets, as well as, sheds some light on the directions for future research, implications for economic policy and concludes.

CHAPTER II: THEORETICAL BACKGROUND

There is a consensus that on average health is likely to worsen with old age and health problems are likely to be important concerns for individuals near or after retirement. At the same time there is epidemiological evidence that alcohol consumption improves health through its effects on low density lipoprotein (LDL), the latter tends to affect the cardiovascular system adversely (Berger et al. 1999; Zhang et al. 2000; Sato et al. 2002; Sun et al. 2002). If alcohol consumption improves health, then we would expect alcohol consumption to improve the individual's health capital stock. Improved health, in turn may affect an individual's capacity to earn income and other labor market benefits. Improved health may also lead to better retirement outcomes such as fewer post retirement medical expenses and less sickness. This research considers the extent to which differences in alcohol consumption affect economic outcomes such as retirement wealth, employment duration and earnings through its effects on health and social capital and on how such differences in drinking behavior may help inform on lifestyle modification that may help narrow the socioeconomic disparities between groups of individuals. But untangling such connectivity requires a theoretical background that explicitly lays out how individuals' drinking behavior may affect their overall well-being. Grossman's health capital model has been recognized as the preeminent theoretical innovation within the economics discipline for the analysis of such relationships between health capital or social capital production and economic outcomes.[3] Although, Grossman's model emphasizes the demand for medical care as an input into health production, this research focuses on individuals' alcohol consumption behavior as it

[3] In this regard, this section forms the theoretical background for both essays that is Essay I and Essay II.

relates to health and social capital accumulation.[4] Health in this model differs from the traditional demand theory in that health is a capital good which lasts for more than one period and it depreciates but can be replenished; that the individual desires alcohol or medical care since it is an input into the production of health itself (i.e., alcohol or medical care is a derived demand). This implies that individuals do not purchase health from the market but rather produce health with the combination of inputs and time; and that health is valued both as a consumption good because it increases utility and as an investment good since health allows the individual some level of leverage in the labor market and eventually improves her retirement outcomes during the individual's retirement period (e.g., reduces medical procedures, prescriptions cost).[5] Thus, it is expect that those individuals with large stocks of health capital would weather the vagaries of health related expenditures than their equally situated counterparts. An analogous argument can also be made for social capital, since social capital formation is akin to health capital or human capital, in that the majority of the variables that determine optimal health capital also determine those for social capital.[6] For instance, individuals with extensive social networks may be less stressed, and reduction in stress improves health. Indeed, pathways from alcohol consumption to health capital and social capital have recently been emphasized in the health economics literature and in the psychosocial and sociology literature (Glaeser et al. 2000).

[4] Grossman (2000) encouraged the incorporation of other market goods such as alcohol consumption, diet or exercise in the gross investment function.

[5] Pathways from alcohol consumption to health capital have also been emphasized by economists, relying on variants of Becker' (1962) human capital theory.

[6] It is straightforward to replace H_t in the utility function with S_t the stock of social capital held by the individual.

Formally, the individual seeks to maximize utility as a function of health "good or services" h_t and some goods Z_t:[7]

$$U_t = U(h_t, Z_t) \qquad \partial U / \partial h_t \geq 0, \qquad \partial^2 U / \partial h^2{}_t \leq 0 \tag{1}$$

$h_t = \phi_t H_t$, is the total consumption of health with $h' = h_{\min}$ implying that death is endogenous or death occurs whenever the individual allows her health capital to deteriorate below some minimum health level. Note that health investment increases the marginal utility of consumption within each period; $\partial U / \partial h_t = uh_t \cdot \dfrac{\partial h_t}{\partial H_t} = uh_t \cdot \phi_t$. The number of healthy days per unit stock is $\phi_t = \partial h_t / \partial H_t$; ($\phi_t > 0$). The model further assumes that health is a durable good that produces some services over time and the individual is endowed with an initial stock of health capital, which depreciates with age but which can be replenish with investment as follows:[8]

$$H_{t+1} - H_t = I_t - \delta_t H_t \tag{2}$$

[7] Preferences are assumed to be non-lexicographic and the utility function is quasi-concave.
[8] In the same dimension, the stock of social capital at time t can be replenished through investments in social capital S_t. Also in the same manner that an investment in health capital depreciates; investments in social capital also depreciate when the individual experiences an adverse life event such as unemployment or migration).

Equation (2) implies that changes in the health capital (social capital) stock equal gross investment I_t minus depreciation ($I_t' > 0$ and $I_t'' < 0$).[9] In the above equation δ is the depreciation rate common to health capital accumulation ($\delta \in [0,1]$). To increase utility the individual purchases market inputs (e.g. alcohol, exercise, medical care, nutritious food) and combines them with time to produce two goods or services according to the following production function:

$$I_t = I_t(A_t, TH_t; E_t) \tag{3}$$

and

$$Z_t = Z_t(X_t, T_t; E_t) \tag{4}$$

Equation (3) is the production function for gross investments in health or social capital I_t and equation (4) is the production function for other consumption goods Z_t. Here A_t is the alcohol consumption measure which is akin to medical care.[10] E_t is the stock of human capital or efficiency parameters reflecting individual productivity differences in the production of health and social capital or use of such capital. That is better educated individuals allocate their resources more efficiently and tends to select more marginally

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[9] Alternatively $I_{t-1} = \underbrace{H_t - H_{t-1}}_{net\ investments} + \underbrace{\delta_{t-1} H_{t-1}}_{depreciation}$

[10] Note: $\underbrace{A_t, X_t}_{market\ goods}$ and $\underbrace{TH_t, T_t}_{own\,time}$

productive health inputs than their counterparts with less education (allocative efficiency) implies education tends to increase H_{t+1}. Moreover, the fact that better educated individuals tend to produce more health or social capital stock from drinking or medical care than a comparable individual with less education (productive efficiency), implies larger values of H_{t+1}. The time variables TH_t and T_t represents the individual's own time used in gross investments and production of Z_t, respectively.[11] In particular the time constraint can be expressed as:

$$h_t = \Omega - TL_t \tag{5}$$

Equation (5) implies that the individual incurs a positive cost (time) in the consumption of health inputs and other goods. Ω is the length of the time-period and is defined as:[12]

$$\Omega = TW_t + TH_t + T_t + TL_t \tag{6}$$

That is, the individual spends her total time $\Omega = 365$ days, either working TW_t, seeking health capital and social capital TH_t, using or producing other goods T_t, or sick TL_t.[13] Equation (5) and (6) can be combined and rewritten as;

---

[11] Note also that since the individual both demands and produces her own health and social capital, some exogenous factors may affect both the individual's demand for health and/or social capital and gross investment in health and/or social capital.

[12] See Becker (1965) for exposition on the individuals' use of own time in the production of commodities such as health.

[13] Equation (6) ensures that all the effects of H_t goes through h_t.

$$TW_t = h_t - TH_t - T_t \quad (7)$$

Equation (7) implies that since non-sick leisure time is exogenous, increases in health or social capital H_t lead to more time being devoted to work which subsequently leads to higher consumption. Finally, the individual allocates her limited resources such that the sum of lifetime consumption equals the sum of lifetime earnings:

$$\Sigma_t (P_A A_t + P_X X_t)/(1+r)^t = \Sigma(W_t TW_t)/(1+r)^t + V_0 \quad (8)$$

Where r is the rate of time preference, W_t is the market wage rate, V_0 denotes initial assets, P_A and P_X are the price of alcohol A_t and other consumption goods X_t, respectively.[14] Equation (7) and (8) can then be combined as follows;

$$\Sigma_t (P_t A_t + P_X X_t)/(1+r)^t = \Sigma(W_t (h_t - TH_t - T_t))/(1+r)^t + V_0 \quad (9)$$

The problem for the individual then is to choose H_t as a function of A_t and X_t to maximize lifetime utility subject to (3), (4) and (9) as follows;[15]

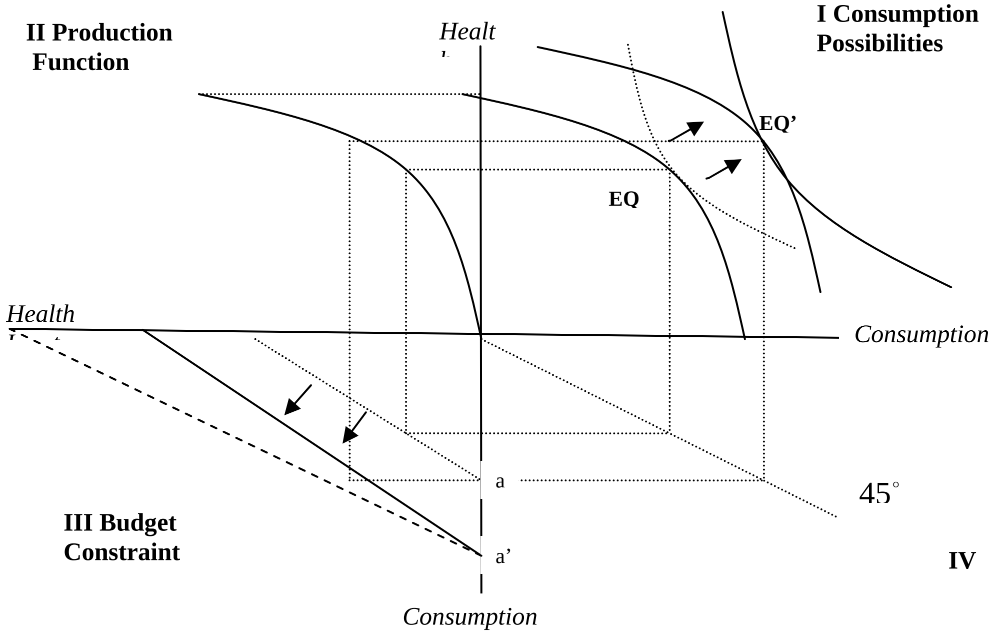
$$L(\cdot) \equiv \Sigma_{t=0}^{n} \frac{1}{(1+r)^t} u(h_t, Z_t) + \lambda \left[\Sigma_{t=0}^{n} \frac{1}{(1+r)^t} [W_t (h_t - TH_t - T_t) - (P_t A_t + P_X X_t)] \right] \quad (10)$$

[14] W_t can be thought of as wealth or income (proxy for command over resources).

[15] Note: Ω free, $A_t, X_t \geq 0$, $\forall\, t \in [0, \Omega]$, $r > 0$

where n represent the total length of time. The optimal health H^* as a function of the choice variables A^* and X^* ($A_t = A^*$, $X_t = X^*$): $H^* = H(A^*, X^*)$.[16]

Figure 1*: An Integrated Grossman Model in 4 Quadrants–Changes in Variables*



For ease of exposition, the comparative statics properties of the model can be illustrated with the aid of Figure 1 above:[17] Suppose there is an increase in income or wealth, the budget constraint in quadrant III shifts outward from a to a'. That is the individual demands more health (or social interactions) since health is a "normal good." Note that the consumption possibilities curve in quadrant I shifts outward from EQ to

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[16] The model can straight forwardly be used to derive optimal social capital by substituting H^* in the model for $S^*: S^* = S(A^*, X^*)$

[17] See Wagstaff (1986)

EQ'.[18] However, an increase in income (wealth or earnings) implies that the opportunity cost of health and social capital investments is now dearer given that the individual will be spending more time away from work. Thus the value of time for the individual is now higher and may cost more. Although, such time cost of investments may depend to a greater extent on the capacity of the individual with regards the efficiency parameter E_t, with which the individual invests in health or social capital. Now, suppose policy-makers or the government is better able to educate the public about the benefits of alcohol consumption on health and social capital formation. Such measures will lead to a reduction in the price of a unit of health and social capital inputs and rotate the slope of the budget constraint at the intercept on the horizontal axis in quadrant III to the left. Substitution (and possibly income) effects will lead to the choice of more health or social interactions relative to consumption or time spent at home.[19] The choice of more health or social interactions are expected to benefit the individual in the labor market with regards to improved productivity (less sickness and absenteeism) resulting in better salary, better employment conditions and attractive career path or even better quality of life during the individuals retirement period.

There are some limitations to the health capital model which Grossman dutifully acknowledges in subsequent versions of the model (Grossman 2000).[20] The model assumes that there is no uncertainty and that death is endogenous, both of which may be untenable (an exception is suicide). The relationship between education and health may

[18] In the interest of brevity, this analysis using Figure 1 is restricted to health capital but can straightforwardly be applied to social capital.
[19] Changes in health technology or education can be similarly analyzed using the above figure. Suppose there is an improvement in health technology or education. The health production function in quadrant II will shift upwards implying higher levels of health can now be derived from the same amount of inputs and this in turn will shift the health-consumption possibilities outwards in quadrant I.
[20] There may be other limitations other than those discussed above.

be more complex than that outlined by the model (Fuchs 1993). Also, due to heterogeneity in time preferences, individual health stocks will depreciate at different rates (Muurinen and Grand 1985). Thus, the depreciation rate of health stock may be higher for less educated and older individuals. Also, the relative price of health may increase with the wealth ensuring that the relationship between wages and health is ambiguous. Nevertheless, the above health capital model provides a concrete theoretical framework as a basis to conduct an empirical test of the extent to which differences in alcohol consumption affects economic outcomes such as retirement wealth, employment duration and earnings through its effects on health and social capital. From this theoretical foundation, it is possible to conduct an empirical analysis of the potential effects of the health and social capital on socioeconomic outcomes by addressing the following research questions using data from the GSS, RAND HRS and the Geocode version of the NLSY datasets:

1. Do differences in alcohol consumption behavior explain differences in individual social capital?

2. Are differences in retirement outcomes associated with differences in alcohol consumption?

3. Do differences in alcohol consumption behavior explain differences in labor market outcomes?

Addressing the first question entails using the GSS dataset as a case study to provide guidance to the reader of the association between empirical measures of individual alcohol consumption and social capital. The second question is addressed using the RAND HRS micro dataset in Essay I, while the last question is examined using the NLSY micro dataset in Essay II.

CHAPTER III: GSS CASE STUDY

Introduction

This section of the dissertation is designed to provide further empirical evidence to support the assertions made in the preceding chapter that differences in individual social capital stock can be explained by differences in alcohol use. The rationale for dwelling on social capital aspects is that the relationship between alcohol consumption and health capital has been well documented in the literature. A summary of some of these studies and their findings have been provided in the literature review section of the first essay within this dissertation. Thus, the use of the General Social Survey (GSS) dataset is designed to shed light on the relationship between alcohol consumption and social capital. To the best of my knowledge, the GSS dataset has not been used to establish the effects of alcohol consumption on social capital accumulation. Thus using this rich socioeconomic dataset to shed light on the relationship between alcohol consumption and social capital will be a fruitful empirical exercise. In addition, this portion of the dissertation could shed more light on whether alcohol consumption does indeed possess a predictive power with regards to economic outcomes.[21] To reiterate, this chapter of the dissertation research is intended to examine the causal association between alcohol consumption and the level of social capital using the GSS dataset.[22]

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[21] The literature review section of this research provides a summary of studies that have reached different conclusions, some similar to that asserted by this research, as well as studies that find results that are in line with long established notions of the relationship between alcohol and economic outcomes.

[22] To avoid repetition, a summary of the current literature on the relationship between alcohol consumption and social capital has been provided in the literature review section of Essay II.

General Social Survey (GSS) Data

The GSS dataset contains a rich array of variables that deal with social interaction and participation issues as well as socio-economic and demographic variables that allow one to test the association, if any, of the relationship between alcohol consumption and social capital. The dataset is independently pooled cross-sections from the General Social Survey (GSS) from 1988, 1989, 1990, 1991, 1993 and 1994. The choice of these particular years reflects the survey years for which alcohol questions were asked and for which the responses were relatively large. The GSS dataset has been conducted at one-to-two year intervals since 1972 by the National Opinion Research Center (NORC) at the University of Chicago and it monitors social changes in the United States. It contains major social capital variables which measure structural (connectedness or interaction), cognitive (reciprocity, bonds, trust, sharing), health aspects, as well as socioeconomic and demographic variables from 1972 through 2002. The data is generated from personal in-home interviews of over 40,000 respondents aged 18 and older with one person interviewed per household. Indeed the multi-dimensional and latent nature of social capital makes measurement of social capital difficult, but several studies including Bolin et al. (2003) capture social capital through a measure of social interactions. Social interactions seem to be a directly observable aspect of social capital (Bolin et al. 2003). Despite the use of several different indexes and indicators of social capital, the rationale for choosing social interaction as a measure of social capital in this section stems from its consistent use in many other studies. For instance, Coleman (1988) and Loury (1977) elaborated on social capital as forms of interpersonal relationships which are critical to individual and community production as well as consumption. Similarly, Rose (1999) also defines social capital as the stock of formal or informal social networks that individuals use to produce or allocate goods and services. Hall (1999) went further, focusing on networks of sociability, both formal and informal relationships (interactions with neighbors, colleagues and friends) as indicators of social capital.

To justify the choice of a social capital measure, a composite variable from the following two Likert-type ordinal variables was constructed. (1) Satisfaction with friends (A very great deal=1; a great deal=2; quite a bit=3; a fair amount=4; some=5; a little or none=6) and (2) Time spent with friends (Almost every day=1; once or twice a week=2; several times a month=3; about once a month=4; several times a year=5; about once a year or never=6). These are then reverse coded to allow the values to rise with improved social capital. Unfortunately, the composite variable was a poor indicator of social capital and thus was dropped in favor of the “time spent with friends” variable (Cronbach's α of 0.31, usually a coefficient of .80 or higher is considered reliable implying a good indicator). Although alternative measures of social interactions such as “time spent with work colleagues” and “time spent with family” were considered, given that friends may encompass work colleagues, the “time spent with friends” variable may be a relatively broader measure of social interaction than the “time spent with work colleagues” variable. Also, given the assumption that social interaction is for the express purpose of acquiring informal information that may aid the individual in the labor market, an individual who spends time only with family members may not transcend the socio-cultural barriers for which social interaction is intended to circumvent. The drawback to using the “time spent with friends” is that if the individual belongs to the bottom part of the socioeconomic hierarchy, spending time with friends may not lead to the type of social capital desired by employers in the labor market. Despite the above-mentioned draw back, the individuals' interactions with friends may be a better measure of social interaction than the other two alternatives.

The right-hand side variable of interest or outcome variable is the individual's drinking status, a binary drinking indicator, coded 1 if the individual uses alcohol and zero for total abstinence. In the GSS, respondents are asked whether they use any alcoholic beverage such as liquor, wine, or beer, or are total abstainers. The GSS question was "do you ever have occasion to use any alcoholic beverages such as liquor, wine, or beer, or are you a total abstainer? Again, if the respondent answers yes, it is coded 1 and if the respondent indicates total abstinence, it is coded 2. These categorical values were then recoded as drinkers=1 and zero for total abstinence. In addition to a health measure, the models estimated in this section controls for individual socioeconomic and demographic factors which may affect social capital such as age, sex, race, marital status, health, time dummies (1989, 1990, 1991, 1993 and 1994).[23] With regards to the health variable, respondents in the GSS are asked about their overall health "for each area of life I am going to name, tell me the number that shows how much satisfaction you get from that area-your health and physical condition" (a very great deal=1; a great deal=2; quite a bit=3; a fair amount=4; some=5; a little or none=6). The selection of these variables included in the various models in this section, as well as in the subsequent sections were partially determined by prior studies within the economics, psychology and sociology literature and partially determined by theoretical considerations.

In order to improve identification of the alcohol use measure, the weighted-average regional tax rate on alcoholic beverages is used as the identifying instrument in

[23] Age less than 40 is the reference category.

the first-stage logit (alcohol) equation. The rationale for using the regional alcoholic beverage tax rates has been provided in Essay I under the empirical section. Since alcohol or drinking may potentially be a choice variable, not accounting for such potential endogeneity will lead to biased estimated coefficients. Indeed, recent studies indicate that alcoholic beverage tax does increase the relative price of alcohol and thereby reduce the purchases and consumption of alcoholic beverage, all things being equal. To account for the endogeneity, a first stage alcohol equation was estimated and the predicted value from the first-stage was included as an additional regressor in the second-stage equation.

The total sample employed in the empirical analysis consists of 10, 505 observations. And Table 1 presents the summary statistics for selected variables and their definition. Of primary concern is whether or not alcohol use leads to increases or decreases in the levels of social capital as measured by the time spent with friends. A statistical snapshot of the major variables used indicate that on average, those who abstain from alcohol use tend to have a slightly less social interaction or lower levels of social capital than alcohol users. The average level of health status for abstainers, based on responses was lower than that for alcohol users. Again the higher the value, the better the respondents satisfaction placed on matters related to health. For the variable that captures individual smoking habits, 34 percent of alcohol users also smoke compared to just 22 percent for total abstainers. In fact, the means of several key variables that pertain to alcohol users were not markedly different from those for total abstainers. The rest of the statistics for the full set of variables are contained in Table 1.

Table 1: Description of Selected GSS Variables[24] (Means)

Variables	Definition	Overall	Abstainers	Drinkers
Dependent Variable				
Social Capital	Time spent with friends last week[25]	3.97	3.83	4.03
		(1.55)	(1.62)	(1.51)
Independent Variables				
Alcohol	Drinker =1, 0 otherwise	0.70		
		(0.46)		
Alcohol Tax[26]	Weighted Average Regional Tax on Alcohol	1.64	1.70	1.62
		(0.81)	(0.82)	(0.80)
Smoker	Yes=1 and 0 otherwise	0.30	0.22	0.34
		(0.46)	(0.41)	(0.47)
Age-Adult	Age of the respondent (40-69)	0.43	0.44	0.42
		(0.49)	(0.50)	(0.49)
Age-Older Adults	Age of the respondent (70+)	0.13	0.19	0.11
		(0.34)	(0.39)	(0.32)
Female	Equals to 1, if Female and 0 otherwise	0.57	0.60	0.56
		(0.50)	(0.49)	(0.50)
Black	Equals to 1, if Black and 0 otherwise	0.12	0.14	0.11
		(0.33)	(0.35)	(0.32)
Hispanic	Equals to 1, if Hispanic and 0 otherwise	0.04	0.05	0.04
		(0.20)	(0.22)	(0.19)
Health Capital	Satisfaction with health/physical activities[27]	5.36	5.22	5.42
		(1.47)	(1.57)	(1.42)
Married	Equals to 1, if Married and 0 otherwise	0.53	0.53	0.53
		(0.50)	(0.50)	(0.50)
Number of Children	Number of children	1.90	2.07	1.82
		(1.73)	(1.84)	(1.68)
Observations		10,505	3,134	7,371

[24] Education and regional dummy variables were included in some previous estimates but they were not significantly different from zero.
[25] The frequency distribution and percentages for this variable are provided in the appendix.
[26] The alcohol tax rates were scanned from the Tax Foundation publications (1988-1994).
[27] The frequency distribution and percentages for this variable are provided in the appendix.

Empirical Methodology

Given the dataset described in the previous section, pooling the cross sections allows the research question to be answered with a larger sample (1988-1991, 1993-1994). Pooling the data for the above-mentioned period also helps unearth the effects of time itself on these outcome variables. Since the alcohol variable is reported as a binary indicator, a logit model is used to estimate the first stage equation with the weighted-average regional tax rate on alcoholic beverages as the main identifying instrument. The logit model is fairly standard and available in most econometrics texts (Greene 2002), therefore the logit model for the alcohol equation is not specified here. The empirical analysis in this section focuses on the hypothesis that alcohol consumption does affect social capital positively. This hypothesis is tested using the following ordered logit specification:

$$SocialCapital_{it}^{*} = \beta X_{it} + \delta Alcohol_{it} + n_{it} \qquad (11)$$

where $SocialCapital_{it}^{*}$ is an unobserved latent variable which reflects the different levels of social capital ranked from lowest to highest values, $Alcohol_{it}$ is a dichotomous variable that captures respondents' alcohol consumption behavior, the vector X_i summarizes other socio-economic and demographic determinants of social capital and the associated vector β converts the explanatory variables into their various contributions to the stock of social capital. The disturbance term n_i is an unobserved disturbance term reflecting differences between individuals which are not controlled for in this model and assumed to be logistically distributed, $n_{it} \sim \text{logistic}(0,1)$. The coefficients of the above ordered logit model can be estimated through the method of maximum likelihood.[28] As mentioned above, possible endogeneity of the main right-hand side variable of interest (alcohol indicator) is accounted for through a first-step estimation of alcohol use as a function of the weighted-average regional alcoholic beverage tax rate, individual smoking behavior and other demographic variables. Using the same approach as in the first essay, the assumption that the weighted-average alcohol tax rate is uncorrelated with the error term in the above-specified structural equation but correlated with the alcohol consumption indicator, still holds to ensure unbiased and consistent estimates. Time dummies are also included to account for time-specific effects. The rationale for including the time-dummies is that if it were true that more alcohol users than total abstainers were more successful in acquiring social capital within a particular year, then omitting the time dummies would tend to ascribe the time effects to the alcohol indicator.

Empirical Results–The Impact of Alcohol Use on Social Capital

In an ordered logit regression, STATA sets the constants of the logit equation to zero and estimates the cut-off points for separating the various levels of the response variable. In this research, there are five equations but each of these equations is assumed to have the same coefficients as a result of the proportional odds assumption. That is, the intercepts of each equation would be different but the coefficients for the variables in each equation would not be significantly different, if they were estimated separately. The

[28] The ML Equation is provided in the technical appendix

coefficients from the STATA output are interpreted in the same manner as in a logistic regression coefficients, the only difference being that in an ordered logit model there are $j-1$ transitions to be estimated instead of just one transition. A positive coefficient indicates that there is an increased chance that an individual with a higher value on the independent variable will be observed in a higher outcome category (social capital). A negative coefficient indicates that there is an increased chance that an individual with a lower value on the independent variable will be observed in a lower category.

Table 2: First-Stage Logit Model (Dependent Variable–Alcohol Use)

Alcohol Tax	0.897*** (0.024)
Smoker	1.809*** (0.092)
Age-Adult	0.755*** (0.036)
Age-Older Adults	0.499*** (0.032)
Female	0.868*** (0.038)
Black	0.746*** (0.048)
Hispanic	0.668*** (0.069)
Period Dummies	Yes
Observations	10,505

Robust standard errors in parentheses correspond to unexponentiated coefficients * significant at 10%; ** significant at 5%; *** significant at 1%

For the binary alcohol logit model (1) presented in Table 2, the exponentiated coefficient of the independent variable can be used to determine the effects of the independent variables on the odds ratio. The first stage instrumental variables regression indicates that the coefficients on smoking, weighted-average regional alcohol tax rate, age, race and sex are all statistically significant. The results indicate that the weighted-average regional alcohol tax rates have a negative effect on the probability of drinking. The coefficient on the weighted-average regional tax on alcoholic beverages is negative (-.11). The exponentiated coefficient on the average-weighted regional tax rate is .89, implying that regional tax rates are more likely to affect drinking behavior negatively, which is expected.[29] The exponent on the smoking variable (smoker) is approximately 1.79, which also implies that smokers are 1.79 times as likely to use alcohol as non-smokers. The coefficients on gender (Female) and race (Black and Hispanic) dummies were negative and statistically significant. Their exponents (.87; .75; .67) are all less than unity, which implies that these individuals identified with such categories Female, Black or Hispanic, in that order, are less likely to use alcohol which is not unexpected based on the results from the first essay. The implications of the results from the first-stage regression indicate that the instrument (weighted-average regional tax rate) did perform as expected.

To ascertain whether alcohol consumption can predict the level of social capital, this study uses several specifications to regress the social capital measure on the alcohol variable and other economic and demographic variables. The exponentiated coefficients are interpreted exactly as in the preceding section, that is, the chances that an individual belongs to a higher social capital category is the exponentiated coefficient $e^{\hat{\beta}}$, and the effects are greater for a particular category, if the exponent is greater than unity. On the other hand the effects are less for a particular category if the exponent is less than unity.

[29] See (Chaloupka et al. 2002)

Table 3: Ordered Logit Estimates (Dependent Variable–Social Capital)

		Marital Status & Children Excluded	Marital Status, Health & Children Excluded
Drinker	1.123***	1.140***	1.142***
	(0.045)	(0.046)	(0.046)
Health	1.014	1.009	
	(0.013)	(0.013)	
Married	0.712***		
	(0.027)		
High School	1.200***	1.203***	1.203***
	(0.083)	(0.083)	(0.083)
College	1.097**	1.107**	1.108**
	(0.049)	(0.049)	(0.049)
Graduate	1.067	1.085	1.085
	(0.064)	(0.065)	(0.065)
Children	0.907***		
	(0.011)		
Age-Adult	0.746***	0.629***	0.628***
	(0.030)	(0.023)	(0.023)
Age-Older Adults	0.509***	0.469***	0.468***
	(0.033)	(0.030)	(0.029)
Female	0.955	0.963	0.962
	(0.034)	(0.034)	(0.034)
Black	0.976	0.997	0.995
	(0.057)	(0.056)	(0.056)
Hispanic/Others	0.809**	0.800**	0.800**
	(0.075)	(0.073)	(0.073)
Period Dummies	Yes	Yes	Yes
Observations	10,155	10,181	10,181

Robust standard errors in parentheses correspond to unexponentiated coefficients * significant at 10%; ** significant at 5%; *** significant at 1%.

The results from the ordered logit models which are presented in Table III-3 indicate that alcohol use is positively related to social capital and the positive sign on the coefficient does not change even when the alcohol variable is instrumented. The coefficient on the alcohol measure is positive and statistically significant across all specifications. The results support the hypothesis put forward in the introductory and theoretical sections of this dissertation in that the exponentiated coefficient (1.12, 1.14 and 1.14) on the alcohol variable indicates that drinkers were about 1.13 times as likely to have higher levels of social capital as their equally situated counterparts who do not use alcohol. The empirical results from the ordered logit model also show that the coefficients on the health status measure across the relevant specifications are positive but statistically insignificant in terms of its relationship with the outcome variable, social capital.

The results from the ordered logit model also show that individuals with a higher number of children in the household or who are married were less likely to spend time with friends than individuals with fewer children or whose status was anything but married. This negative association may reflect time constraints on married individuals and individuals with large families since investing time and energy in the creation and maintenance of social ties entails opportunity costs. The result also indicates that being an adult or an older adult is negatively related to the level of social capital, all things being equal. Non-Whites or women are less likely to have higher levels of social capital than Whites and men but the effects are not statistically significant. Also, educated respondents were more likely to have higher social capital than individuals with no education but the effects are only statistically significant for respondents with high school and college education.

The above models were re-estimated, this time controlling for endogeneity with the results presented in Table 4. Again the exponentiated coefficients on the alcohol variable are positive and significant and, not surprisingly, the effects of alcohol use on social capital actually declined with instrumental variables (IV) estimates. In particular, the coefficient on the alcohol measure is positive and statistically significant across all specifications (about 1.05). The exponentiated coefficients on the alcohol variable indicates that alcohol users are now about 1.05 times as likely to have higher levels of social capital than equally situated respondents who do not use alcohol. The effect of alcohol use on social capital does not change even under different specifications. The empirical results from Table 4 mirror those from Table 3 with no controls for endogeneity. The effects of the rest of the variables in the model are as in the previous estimation in Table 3.

Table 4: Instrumental Variables Ordered Logit Estimates (Dependent Variable–Social Capital)

		Marital Status & Children Excluded	Marital Status, Health & Children Excluded
Drinker	1.050***	1.051***	1.052***
	(0.016)	(0.016)	(0.016)
Health	1.015	1.010	
	(0.013)	(0.013)	
Married	0.711***		
	(0.027)		
High School	1.202***	1.205***	1.205***
	(0.083)	(0.083)	(0.083)
College	1.100**	1.111**	1.111**
	(0.049)	(0.049)	(0.049)
Graduate	1.068	1.087	1.087
	(0.064)	(0.065)	(0.065)
Children	0.907***		
	(0.011)		
Age-Adult	0.737***	0.620***	0.619***
	(0.030)	(0.023)	(0.023)
Age-Older Adults	0.499***	0.459***	0.457***
	(0.033)	(0.029)	(0.029)
Female	0.945	0.953	0.952
	(0.034)	(0.034)	(0.034)
Black	0.970	0.990	0.989
	(0.057)	(0.056)	(0.056)
Hispanic/Others	0.798**	0.789***	0.789***
	(0.074)	(0.072)	(0.072)
Period Dummies	Yes	Yes	Yes
Observations	10,155	10,181	10,181

Robust standard errors in parentheses correspond to unexponentiated coefficients * significant at 10%; ** significant at 5%; *** significant at 1%.

To ascertain whether there are group differences in the effect of alcohol use on social capital the ordered logit models were re-estimated by gender with and without controls for endogeneity and the results are presented in Table A1 through Table A3 in the appendix. In Table A1 (first two columns) the effects of drinking on social capital is positive but statistically insignificant for men while the effects of drinking on social capital is positive and statistically significant for women. In particular, the results indicate that women drinkers are about 1.13 times as likely to have higher social capital than women non-drinkers. When endogeneity is taken into account, men and women drinkers are about 1.06 and 1.04 times as likely to have higher social capital as non-drinkers of both sexes. Again, married individuals are less likely to have social capital as compared to unmarried individuals. This may point to the fact that time devoted to the raising and caring for children or attending to family responsibilities reduces the time needed for social interactions. In general, all the other variables in the model have the expected sign.

The specifications in Table A2 and Table A3 are restricted by race. Although, the coefficients on the alcohol measure under the White specification in Table A2 are all positive and statistically significant, the coefficients for the alcohol measures under the Non-Whites specification were insignificant. The results indicate that Whites drinkers are between 1.2 and 1.14 times as likely to have higher social capital as White abstainers. These effects dip slightly when the alcohol measure is instrumented to account for endogeneity in Table A3. Again the rest of the effects of the other variables in the model mirror those from the previous specifications. That is, where statistically significant, education and health are positively related to social capital. In contrast, where statistically significant, being married, being an older respondent and being Female are all negatively associated with social capital in comparison to the reference category.

To further exploit the effects of interactions, the previously-specified models were re-estimated with interaction terms and the results are presented in Table A4 and Table A5 in the appendix. Interaction terms such as Female*drinker, Black*drinker, Hispanic*drinker, High School*drinker, College*drinker and Graduate*drinker are included. These interaction terms are included to ascertain the moderating influence of these variables on the relationship between alcohol use and social capital. For instance if one believes that the relationship between social capital or time spent with friends and alcohol consumption may be moderated depending on the level of education, race or gender then including a multiplicative term in the model allows the researcher to capture the joint effects of drinking and say education on the outcome variable, social capital, over and above their separate effects. The interaction effects were not statistically significant across most specifications. The exponentiated coefficients on the alcohol values for the models were all positive and statistically significant except that of the specification in the last column of Table A5. Note that health, education and age variables were dropped in the latter model.

For Table A6 and Table A7, the models above were re-estimated, to unearth the cross-sectional dimension of the General Social Survey (GSS) dataset. This is particularly important in order to compare cohort effects on the likelihood of having higher levels of social capital, given that individual’s alcohol consumption status. The results can be interpreted as the percentage change in the dependent variable for a unit change in the independent variable such that: $[\exp(\beta)-1]*100$. The coefficients on the alcohol variable for most of the years were statistically insignificant and the rest of the estimates were very imprecise. For 1994, the exponentiated coefficients on the alcohol variable were about 1.14, which implies that given the time period under consideration, drinkers were about 1.14 times as likely to have higher levels of social capital than total abstainers. The effect of alcohol use on social capital diminishes somewhat to 1.063, after controlling for endogeneity in the alcohol measure. Most of the right-hand side variables for the 1994 cross sectional estimation were statistically significant in terms of their exponentiated coefficients and had the right sign.

Discussion and Limitations

The principal aim of this section has been to shed light on the association between individual alcohol consumption and social capital. Therefore this process serves to provide some measure of support to the assertion made earlier on in the introductory and theoretical sections of this dissertation research. The results thus far provide a transitional confirmation with regards to the assertion that differences in individual labor market outcomes could be explained by alcohol use through its effect on social capital. Given these results then, individuals who refrain from alcohol use for various reasons may have relatively low stocks of social capital in that they may have relatively fewer social interactions that transcend ethnic or cultural barriers. Again the reason why low levels of social capital maybe detrimental to an individual's socio-economic status stem from studies in the current literature that have already linked social capital to better economic outcomes such as earnings.[30]

Although the results support the arguments in Chapter I and Chapter II, the fact that the data is independently pooled implies it lacks the advantages of a panel or longitudinal dataset. Thus, the usefulness of the empirical analysis and the effects of alcohol use on social interactions or social capital may be curtailed. Furthermore, the positive relationship found within the results may have resulted from the constructs of social capital but this may not be an overly limiting factor considering that several studies have used such social interaction measure to capture social capital (Bolin et al. 2003). In addition, the binary nature of the alcohol measure limits the ability of this research to capture the different levels of alcohol consumption by individuals (light, moderate and heavy) and its effects on socioeconomic outcomes. The results are in line with the assertions of some studies in the psychology and sociology fields, none of these studies partition alcohol consumption into light-moderate or heavy (see Graves et al. 1982; Gilbert 1987; Lo and Globetti 1995). The next step in this dissertation is to use the HRS and NLSY datasets to address research questions two and three.

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[30] The literature on the relationship between social capital and economic outcomes are provided in Essay II of this dissertation.

CHAPTER IV: ESSAY I-RETIREMENT WEALTH AND ALCOHOL CONSUMPTION

Introduction

The literature on alcohol consumption and economic outcomes suggests that the effects of alcohol consumption on economic outcomes are due mainly to alcohol's impact on health capital (Berger and Leigh 1988; Mullahy and Sindelar 1994; Tekin 2004). Some studies have shown that improved health leads to successful economic outcomes in terms of higher earnings for some individuals in the labor market (MacDonald and Shields 2001; Tekin 2004). If differences in alcohol consumption predict differences in labor market outcomes, then differences in alcohol consumption may explain differences in retirement outcomes. Thus, the prime concern of this essay is to ascertain whether differences in individual alcohol consumption levels do in fact explain differences in the level of retirement wealth using data from the RAND Corporation's version of the HRS public release micro-dataset (1992-2002).

What is Health Capital?

Health capital is an individual's health potential during the life cycle. This may reflect individual physical, emotional and social capability, as well as the quality of life regardless of the existing healthcare system. It is standard practice in the current literature to use self-rated health status or a measure reflecting the individuals' overall health as an indicator of health capital so from this point forward health capital implies the number of severe health conditions (e.g., hypertension, diabetes, cancer, bronchitis, congestive heart failure and stroke) afflicting the individual, unless stated otherwise. Indeed there is no question that socioeconomic outcomes may influence individual levels of health capital but the arguments contained in this essay focuses on the causality going from health to socioeconomic outcomes. What follows is a review of the existing literature on the relationship between alcohol consumption, health capital and retirement outcomes.

Evidence on Alcohol Consumption and Health Capital

Some studies indicate that alcohol consumption has a number of adverse health implications that might outweigh any potential health benefits that might accrue to the individual (Doll et al. 1994; Seitz and Poschl 1997). But, recent epidemiological studies have suggested a U-shaped physiologic benefit of alcohol consumption through its effects on cardiovascular conditions (Zhang et al. 2000). This type of relationship implies that the risk to health from moderate alcohol consumption will be relatively less than the risk to health for both total abstainers and heavy alcohol users. The argument is that ethyl alcohol or ethanol found in alcohol impedes the activities of oxides (super-oxide and hydroxide) or free radicals in cells. Why is this important? Free radicals engage in oxidation which damages cells. This in turn affects individual health status or health capital adversely. Also, recent evidence shows that ethyl-like chemicals found in red wine act to reduce low density lipoprotein within the lining of arterial walls.[31] High concentrations of low density lipoprotein clog arteries, which in turn have implications for cardiovascular diseases, as well as individual health capital.

[31] See Sato et al. (2002)

Studies by Sun et al. (2002) and Sato et al. (2002) indicate that the polyphenols contained in alcohol possess cardio-protective properties due to polyphenols' impact on oxidation with low density lipoproteins (LDL). These studies suggest that ethyl-like chemicals found in red wine may prevent LDL-induced alterations of endothelial functions. It is easy to infer from this evidence that such interventions in the body through alcohol consumption will have health benefits that in turn may help the individual improve her retirement outcomes. The argument in this essay is that such benefits from moderate alcohol use may eventually help the individual withstand unforeseen contingencies during the individual's retirement period, as well. Thus, investigating the extent to which alcohol consumption influences retirement outcomes through its effect on health would extend the findings of such studies and help provide guidance to the debate on current inequality in retirement well-being among various segments of society.

Berger et al. (1999), reach similar conclusions to those of Zhang et al. (2000), Sun et al. (2002) and Sato et al. (2002). In particular, Berger et al. (1999) reported that male physicians in the Physicians' Health Study who consumed more than one drink a week had a reduced overall risk of stroke compared to participants who had less than one drink per week. Cevilla et al. (2000) found that moderate alcohol consumption may reduce systolic blood pressure through its effects on arterial walls in the body and even protect individuals from cognitive deterioration during retirement. One implication from these results is that drinking may improve labor market participation as a result of better health and may improve earnings as a result of productivity-enhancing attributes of health. It is expected that such benefits from moderate alcohol use earlier in life and even during retirement would help the individual withstand the vagaries of old age much better than their equally-situated compatriots, ceteris paribus.

Notwithstanding the rosy picture presented above of the potential impact of alcohol consumption on health capital, several epidemiological studies point to the fact that people who drink alcohol heavily are at an increased risk for a number of health problems. In fact, alcohol consumption is a leading cause of cancer of various internal tissues such as the digestive tract (Doll et al. 1994; Seitz and Poschl 1997). Studies also show that among young people long-term heavy alcohol consumption has been identified as an important risk factor for stroke (You et al. 1997). Drinking to intoxication has been found to be associated with a significant increase in the risk of ischemic stroke in both men and women aged 16 through 40 years (Hillbom et al. 1995). Campbell et al. (1999) reveal that a majority of the studies on the relationship between alcohol consumption and health capital concluded that heavy alcohol consumption increased the risk of high blood pressure in both men and women. Note that these studies arguing against alcohol use consistently address the risks associated with heavy alcohol consumption rather than light-moderate alcohol use, which has been found to benefit the individual with regards to health.

Evidence on either side of the debate on alcohol consumption and its effects on health have consequences for public policies designed to address incidences of health decline and deaths attributed to cardiovascular conditions. Clearly there is an indication that abstaining from alcohol consumption may be detrimental to the individual’s health capital, which has consequences for economic outcomes. At the same time, the evidence suggests that the benefits of alcohol consumption might be superseded by the inherent risks to health associated with any level of drinking.

Evidence on Health Capital and Retirement Outcomes

The preceding provided evidence on the J-shaped or U-shaped relationship between alcohol consumption and health capital. This sub-section presents an argument on the possible linkage between alcohol consumption and retirement outcomes by providing evidence on the linkages between alcohol consumption, health capital and economic outcomes. Michaud and Soest (2004) study is one of several that provide evidence on the relationship between health and economic outcomes such as wealth. Using a dynamic panel data model, they tested the causality between health and wealth of elderly couples. Their study which accounted for unobserved heterogeneity found strong evidence of causality from elderly couples' health to their wealth. There are several differences between the study by Michaud and Soest (2004) and this research; although Michaud and Soest (2004) study examines health and wealth of a sample of HRS individuals, it does not specifically evaluate the impact of alcohol consumption on retirement outcomes such as wealth. Additionally, the empirical methodologies employed in this research are distinguishable from Michaud and Soest (2004) study. Despite the distinct approach of this dissertation, Michaud and Soest (2004) study of the relationship between wealth and health presents a glimpse of the alcohol consumption-wealth nexus. That is, drinking may improve health which in turn may lessen the adverse effects of health expenditure on retirement wealth.

A study with its focus on the causality running from wealth to health is that of Meer et al. (2003) which examines the relationships between health and economic resources using four waves of data from the Panel Study of Income Dynamics. Their results did indicate that wealth seems to affect health, but the magnitudes of the effects were very small. The implications are that first the causality from health to wealth may garner stronger support than that running from wealth to health. Secondly, the results from that study indicate that health capital may be driven by factors other than wealth changes. Finally, their study did not address issues relating to the causal impact of alcohol consumption on wealth through its effect on health. In contrast this essay provides evidence to show that the causality running from health capital to wealth, in particular retirement wealth is actually attributable to differences in individual alcohol consumption behavior.

Now, since evidence suggests that differences in earnings are attributable to differences in productivity (Berger and Leigh 1988; Mullahy and Sindelar 1994; Tekin 2004), and since productivity on the job has been causally linked to alcohol consumption, it seems reasonable to suggest that differences in retirement outcomes could also be explained by differences in alcohol consumption behavior.[32] The arguments contained in this essay suggest that the benefits from such alcohol-induced productivity gains may allow the individual to accumulate greater lifetime earnings and may also allow the individual to hold on to such accumulated wealth during retirement.[33] This essay thus

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[32] Mitchell et al. (2003), relying on the Health and Retirement Study (HRS) matched to administrative records on lifetime earnings provided by the Social Security Administration, finds that workers with lower earnings variability tend to have higher lifetime earnings levels.

[33] This is based on the assumption that earnings constitute a substantial portion of wealth or is instrumental in wealth accumulation for the individual.

inducts into the debate the role played by alcohol consumption in such earnings fluctuations and its subsequent effect on retirement wealth.

A Summary of the Current Literature

A comprehensive evaluation of the determinants of retirement outcomes should include behaviors such as individual alcohol consumption, especially when one is examining the impact of health on wealth. A review of the studies above on the relationship between alcohol consumption, health capital and economic outcomes provides some evidence as to how alcohol consumption may be linked to health and retirement wealth. Furthermore, the above-reviewed literature offers an opportunity to present a different perspective on the determinants of retirement outcomes. Thus far, the evidence presented suggests a positive link between light-moderate alcohol consumption and health capital on the one hand and a positive link between health capital and economic outcomes. The evidence suggests that alcohol consumption may lead to increases in health capital stock. Improved health capital, in turn may affect an individual's capacity to earn income. Improved health is also expected to lead to better retirement outcomes such as less post retirement medical expenses and less sickness.

Yet it is important to note that some of the above-mentioned literature points to a negative implication of alcohol consumption on socioeconomic outcomes which cannot be ignored in an analysis of the relationship between alcohol consumption and retirement outcomes. What makes this essay significant in terms of its contribution stems from the fact that none of these studies have actually linked differences in alcohol consumption to differences in retirement outcomes. An investigation into the influence of individual alcohol consumption and retirement well-being will enrich the literature on alcohol consumption and socioeconomic outcomes and also aid policies geared towards this group. In addition, the extent to which alcohol consumption affects socioeconomic outcomes such as, retirement has not been thoroughly investigated within the economics discipline. Thus, this essay takes a more inclusive approach to examining the correlates of better socioeconomic outcomes.

RAND HRS Data and Major Variables Description

The data for this essay comes from the RAND Corporation's version of the Health and Retirement Study (RAND HRS) with information on demographic variables, as well as, income, health, employment and wealth variables. The HRS covers about 7,600 households with at least one family member between the ages of 51 and 61 who were born between 1931 and 1941. The households in this survey were first interviewed in 1992 and followed every two years after 1996. The HRS intentionally over-samples Black and Hispanic households to provide a more accurate picture of the behavior of these minority households.[34] The RAND HRS has some advantages over other longitudinal datasets (NSLY, PSID, etc.) in terms of addressing the postulates of this essay, the effects of alcohol consumption on retirement wealth. The RAND HRS has a relatively large sample size with particular focus on a cohort of individuals at or near

[34] The overall unbalanced panel for the RAND HRS (1992-2002) is n = 13,485 and t = 6. The estimation algorithms in STATA adjust the total counts using $\Sigma_{i=1}^{n} T_i$ instead of nT to account for the total number of observations and proper variances and F tests are computed as well.

their retirement age. In addition, the RAND HRS has at least one observations on individuals, pre and post retirement as compared to other longitudinal datasets. This relatively larger sample size may improve estimation precision. The RAND HRS contain rich and extensive data on economic variables such as wealth, the outcome variable, as well as information on the main right-hand side variable of interest, alcohol. In terms of examining the extent to which differences in alcohol consumption explain differences in retirement outcomes, this allows the research question to be addressed with a relatively rich set of data. Table 5 provides a brief definition of the variables used and the descriptive statistics for some selected variables for the total sample, as well as by race and alcohol status. The main variables discussed in-depth here are the dependent variable, wealth at retirement and the main right-hand side variable alcohol consumption.

Wealth, the value of assets of an individual at a point in time, plays an important role in the measurement of individual economic well-being. Wealth provides regular receipts to the individual, prior to and during retirement, in the form of interest, dividends, capital gains (losses), etc. In addition, wealth provides individuals with some additional economic power since it impacts changes in assets and regulates consumption levels, before and during retirement. Stated differently, wealth is an important indicator of post-retirement well-being since it influences consumption; access to loans for medical procedures, especially if one does not have adequate insurance; quality of housing, residential location, and even the ability to finance higher education for dependents and provides insurance against fluctuations in retirement incomes. For this and other reasons, wealth may be a better measure of individual well being than, for instance, income. The latter has transitory and life-cycle components that make comparisons between individuals less appealing. Total wealth is calculated as the sum of all wealth components less all debt. That is, net total retirement wealth in the RAND Corporation's version of the HRS is equal to net financial wealth plus net housing wealth plus pension wealth plus social security wealth plus other wealth minus total debt.[35] In Table 6, the descriptive statistics indicate that the average wealth of a White respondent is about $249,713 compared to $86,398 for Non-Whites. Several studies confirm such wealth disparities by race among older Americans. With regards to regional differences from Table B1 in the appendix, wealth levels are on average higher in the West ($293,347), followed by the Mid-West ($236,787), Northeast ($225,124) and the South ($171,500). The right-hand side variable of interest, alcohol consumption, may affect socioeconomic outcomes (wealth at retirement) through its effects on health capital which may affect productivity in market and non-market settings. With regards to the alcohol variable, there are various measures of alcohol consumption within the HRS. For instance, in terms of the frequency of alcohol use, either the number of drinks per day or the number of days that the individual drank alcohol within the past three months can be used as a measure of alcohol consumption (Peters 2004). There is currently no consensus on appropriate method with which to capture individual alcohol consumption behavior in that the choice of a particular measure depends to a large extent on the dataset and the research question being addressed.

[35] Where respondents' net wealth is less than 1 (negative or zero), 1 is added to the value in the cell of the wealth variable. The data were then transformed by taking the logarithm of the values of the wealth variable.

Table 5: Selected RAND HRS Variables

Variables	Definition
Dependent Variables	
Wealth at Retirement	Total Retirement Wealth, (Net of Debt)
Independent Variables	
Abstainers	Less than 1 drinking day per week
Moderate	Between 2 and 5 drinking days per week
Heavy	Greater than 5 drinking days per week
Health Capital	Respondent's number of severe health conditions
Alcohol Tax	Regional Weighted-Average States' Tax Rates
1992 Age	Age of the individual in 1992
Smoking	Smoke =1, 0 otherwise
Female	Female =1 and 0 otherwise
Non-White	Black/Hispanic/Other =1 and 0 otherwise
Married	Married =1 and 0 otherwise
Partnered	Partnered =1 and 0 otherwise
Divorced	Divorced =1 and 0 otherwise
Separated	Separated =1 and 0 otherwise
Widowed	Widowed =1 and 0 otherwise
High School	12 years of education
Associates	Greater than 12 years but less 16 years of education
College	Greater or equal to 16 years of education
Regions	Northeast, Mid-west, South and West
Moderate* Female	Interaction term
Heavy *Female	Interaction term
Moderate*Health	Interaction term
Heavy*Health	Interaction term
Moderate*Non-White	Interaction term
Heavy*Non-White	Interaction term
Time Dummies	1994–2002

The method adopted for this research focuses on the frequency of drinking (Dawson and Room 2000; Mukamal et al. 2003). This method of capturing alcohol consumption behavior may provide a reasonable estimate of drinking frequency and may capture the drinking patterns of the individual. Using data collected from a 12-year study of 38,077 male health professionals (Health Professionals Follow-up Study), Mukamal et al. (2003) found that men who drank alcohol three or more days per week had a reduced risk of heart attack as compared to men who drank less than once a week (abstainers).

That is, men who consumed alcohol three or four days a week (light-moderate) were 32 percent less likely to experience adverse health effects such as a heart attack. Also, men who consumed alcohol five to seven days per week (heavy) were 37 percent less likely to have adverse health effects. These studies seem to provide a firm basis for the particular alcohol measure “drinking days per week” and the coding method chosen (abstainers, light-moderate and heavy).

In the HRS, different responses to alcohol consumption questions in waves one and two were matched to those from the subsequent waves after recoding for consistency. For instance, in waves one and two, if the response to the binary variable indicating whether the respondent ever drunk alcoholic beverages (yes =1), then a response is elicited for the respondent’s alcohol drinking frequency for the “drinking days per week” variable. From wave three onwards, the same initial question asks if the respondent ever drinks alcoholic beverages. If the answer is yes, two follow-up questions are asked about alcohol consumption behavior during the last three months: “in the last three months, on average, how many days per week have you had any alcohol (beer, wine, or any drink containing liquor) to drink” (ranges from $0-7$ and less than once a week coded to 0). Three alcohol categories are then created from the alcohol variable as abstainers, moderate and heavy drinkers. The definition of abstainers tends to vary from study to study and also on the broadness of the definition. In the National Health and Nutrition Examination Survey I, abstainers are respondents having less than one drink of beer, wine, or liquor in the previous year (Dufour et al. 1990; Dufour 1999). In contrast, in the National Longitudinal Alcohol Epidemiologic Survey abstainers are respondents consuming fewer than 12 drinking days per year. Dawson et al. (1995) define abstainers as respondents consuming less than 0.01 fl oz alcohol per day (i.e., fewer than 12 drinks in the past year). Williams and DeBakey (1992) also define abstainers as respondents who reported consuming fewer than 12 drinks during the previous year (.25 of a drink per week). Despite the above evidence which points to the appropriateness of the classification relied upon in this research, the abstainer variable is further partitioned into two categories resulting in four categories; abstainers, light, moderate and heavy drinkers. Thus the new abstainer category now reflects respondents who answered “no” to the question “do you ever drink any alcoholic beverage such as beer, wine, or liquor?” The summary statistics indicate that about 50 percent of the respondents are lifetime abstainers, 19.8 percent are light drinkers, 21.4 percent are moderate drinkers and 8.9 percent are heavy drinkers. The results of the model with these four alcohol measures are reported in the appendix for comparison (Table B16 through Table B18).

In Table 6, 70 percent of the respondents are abstainers and 21 percent drink moderately.[36] Surprisingly, the average wealth of respondents who drink heavily are about $367,436 compared to $175,997 and $276,627 for moderate drinkers and abstainers, respectively. Total abstainers appear to be less healthy than moderate or heavy drinkers. On average abstainers have about 1.7 severe health conditions whiles moderate drinkers and heavy alcohol users have about 1.3 severe health conditions. It appears that on average, the proportion of Whites who abstain from alcohol is slightly lower than that of Non-Whites (67 percent versus 78 percent). On the other hand, Whites drink moderately and heavily (22 percent and 10 percent) on average than Non-Whites (18 percent and 4 percent). The average alcohol drinking days per week for Whites may point to more liberal norms and attitudes towards alcohol use. The summary statistics also

[36] Table 6 presents summary statistics with the 3 alcohol categories.

indicate that 53 percent of the heavy drinkers are men, which may reflect societal acceptance. In contrast, about 57 percent of abstainers are women. Only about 24 percent of the respondents in the sample smoke. Health may affect different groups of individuals depending on whether the individual is an abstainer, moderate alcohol user or heavy alcohol user.

Alcohol may influence wealth at retirement through its effects on health, thus measures of health are included on the RHS in some specifications to test the robustness of this assumption. On average, the number of severe health conditions reported by Whites is lower than those reported by Non-Whites, 1.52 versus 1.78. Small values imply better health, while larger values reflect worsening health conditions for the individual. Also, on average, abstainers report a higher sum of severe health conditions (1.68) than either moderate drinkers or heavy drinkers (1.32 or 1.31). Although, there were no marked gender differences with regards to the health variables (sum of health conditions), the health status of respondents from the South were markedly lower than those of respondents in the Northeast, Mid-West and West.[37] With regards to education, on average, White respondents tend to have a higher proportion of respondents with high school completion (44 percent), associates (13 percent) and college and professional degree (18 percent) versus (33 percent; 10 percent; 12 percent) for Non-Whites. Also, the proportion of heavy alcohol users with at least 16 years of education was 28 percent. In addition, the summary statistics show the average age of respondents at the beginning of the survey to be around 55.6 years. On average White respondents have more years of education than Non-Whites under all three educational categories. Additionally, a test of whether male and female respondents have the same means with regards to their alcohol

[37] See appendix for the summary statistics on selected variables by region–Table B1

consumption behavior revealed that there was no marked differences between the two groups. The summary statistics by region are reported in Tables B1 in the appendix.

Table 6: Means of Selected RAND HRS Variables

Variables	Total Sample	Alcohol Use			Race	
		Abstainers	*Moderate*	*Heavy*	*Whites*	*Non-Whites*
Wealth	214,477 (602,223)	175,997 (466,182)	276,627 (617,949)	367,436 (1,189,104)	249,713 (665,199)	86,398 (227,240)
Abstainers	0.70 (0.46)				0.67 (0.47)	0.78 (0.41)
Moderate	0.21 (0.41)				0.22 (0.42)	0.18 (0.38)
Heavy	0.09 (0.28)				0.10 (0.30)	0.04 (0.20)
Alcohol Tax	1.71 (0.47)	1.74 (0.48)	1.65 (0.45)	1.64 (0.44)	1.69 (0.47)	1.80 (0.46)
Smoking	0.24 (0.43)	0.23 (0.42)	0.24 (0.43)	0.29 (0.45)	0.23 (0.42)	0.25 (0.43)
1992 Age	55.59 (5.89)	55.71 (5.85)	55.15 (5.94)	55.72 (5.99)	55.61 (5.87)	55.52 (5.96)
Non-White	0.22 (0.41)	0.24 (0.43)	0.18 (0.38)	0.10 (0.30)		
Female	0.55 (0.50)	0.57 (0.50)	0.51 (0.50)	0.47 (0.50)	0.54 (0.50)	0.58 (0.49)
Health	1.57 (1.38)	1.68 (1.44)	1.32 (1.21)	1.31 (1.20)	1.52 (1.36)	1.78 (1.44)
High School	0.41 (0.49)	0.41 (0.49)	0.43 (0.49)	0.39 (0.49)	0.44 (0.50)	0.33 (0.47)
Associates	0.12 (0.33)	0.11 (0.32)	0.14 (0.34)	0.15 (0.35)	0.13 (0.33)	0.10 (0.31)
College	0.17 (0.37)	0.13 (0.34)	0.23 (0.42)	0.28 (0.45)	0.18 (0.39)	0.12 (0.32)
Observations	75,178	52,436	16,055	6,679	58,958	16,220

The regional weighted-average alcoholic beverage tax rate is used as the identifying instrument for the first-stage alcohol equation. There is ample theoretical and empirical evidence to suggest that the decision by the individual to consume some amount of alcohol may not be exogenous (MacDonald and Shields 2001). Thus the estimated coefficient from a regression of wealth on alcohol consumption may be biased if the researcher fails to account for such endogeneity. Several economic studies including Chaloupka and Wechsler (1996) suggest that alcohol consumption behavior is responsive to price, implying changes in prices or taxes leads to changes in alcohol consumption behavior. Indeed, all states apply some form of taxes to alcoholic beverages (liquor, two types of wine and beer) and these tax rates vary from state to state. More recent data for the alcohol tax rates were downloaded from the Tax Policy Center's website.[38] The early editions of the excise tax data were electronically scanned from the Tax Foundation publications (1992-2000). The alcoholic beverage tax rates are aggregated by region due to the fact that the RAND HRS data being used does not allow the researcher to pin-point the location of the individual by county or state. The aggregated tax data are then weighted to reflect the annual volume of ethanol consumption (measured in '000s of gallons) in each state from 1992–2002. There are obviously some weaknesses to this approach of using the alcohol tax as an instrument, given that changes in prices may not deter alcohol consumption for some groups and unmeasured factors may be correlated with the tax on the alcoholic beverage. For instance, "partygoers" or students' at "get-togethers" may not be affected by changes in the alcoholic beverage tax since alcoholic beverages served at these occasions are almost always at no charge to the guest. Despite the above-mentioned limitations, utilize the tax on alcohol as an identifying instrument to correct for endogeneity is appropriate.

[38] http://www.taxpolicycenter.org/TaxFacts/TFDB/TFTemplate.cfm?Docid=399 (accessed November 2004).

Empirical Methodology-Wealth at Retirement and Alcohol Consumption

Recent evidence indicates that alcohol consumption is causally related to labor market outcomes, and may similarly be related to retirement outcomes as well. To investigate such causal impact of alcohol consumption on socioeconomic outcomes, panel data methods are relied upon throughout most of this dissertation. Panel data methods, unlike cross-sectional or time-series methods allow increased precision of the regression estimates and may reduce the collinearity among the explanatory variables. Panel data methods also allow the researcher to model temporal effects without aggregation bias, as well as control for omitted variables bias or unobserved heterogeneity (individual-specific fixed effects). To illustrate, in a wealth equation where individuals' ability is likely to be unobserved, using cross-sectional data will consign the ability measure to the error term. If ability or some unobserved variable is correlated with the other explanatory variables (e.g. drinking) then OLS will provide biased estimates of the rate of return to alcohol consumption. Thus, the effects of alcohol consumption on socioeconomic outcomes will overstate (understate) the true causal effects of alcohol consumption on retirement wealth. Under such circumstances, if we assume that ability is constant over time but varies across individuals then the ability variable would only be sub-scripted with i and not t. Taking first differences of the equation eliminates the unobservable ability effects and applying OLS to the first differenced model now produces unbiased and consistent estimates of β (the returns to drinking).[39] Alternatively, one can transform the OLS equation (deviations from the group means approach) and eliminate the unobservables that either varies over groups but are fixed across time or factors that are fixed across individuals but varies over time or both.

In choosing the appropriate method with regards to the restriction of the individual specific term α_i in the error term, Baltagi and Li's (1990) version of the Breusch and Pagan (1980) Lagrange multiplier test of $\sigma_\alpha^2 = 0$ is relied upon. If there is no individual specific component in the error term then OLS with robust standard errors is efficient. On the other hand, if there is individual specific unobserved heterogeneity in the error term $\sigma_\alpha^2 \neq 0$, then panel data is appropriate depending on the assumptions ascribed to the unobserved heterogeneity term α_i (fixed or random). The null was rejected under the Breusch and Pagan (1980) LM test for random effects; (xttest0) $\sigma_\alpha^2 \neq 0$, implying that RE or FE may be appropriate. The basic panel data model for cross sectional individuals indexed by $i = 1, \ldots, n$ over time period $t = 1, \ldots, T$ is of the form;

$$Wealth_{it} = \beta X_{it} + \gamma Alcohol_{it} + u_{it} \qquad (12)$$

In equation (12) $Wealth_{it}$ represents wealth at retirement of the ith individual, $Alcohol_{it}$ is the alcohol consumption variable, X_{it} is a vector of demographic and economic

[39] Note that the error process is now a moving-average and this may present some problems in estimation.

variables. The last term u_{it} is an error term and is such that $u_{it} = \alpha_i + \varepsilon_{it}$.[40] The major difference between the two panel data approaches (RE and FE) being used here is the restriction placed on the $E(\alpha_i, X_{it})$. The main advantage of the FE approach is that it allows the researcher to control for unobserved individual-specific effects that are time invariant. For instance, the FE approach allows the unobserved heterogeneity term α_i to be modeled explicitly whereas the RE model treats α_i as random error term. A major drawback of the FE approach is that it is inefficient due to the loss of degrees of freedom and also the researcher is not able to say anything about time-invariant variables or those variables that only change slowly. Given that time-invariant variables in this research are important, being able to comment on their estimated coefficients will enrich the research. Due to efficiency considerations and the above-stated shortcomings of the FE model, a decision was made to estimate the RE model as well. The major drawback of the RE model is that the restriction placed on the $E(\alpha_i, X_{it})$ may be untenable. A general Hausman (1978) specification test was carried out to discriminate between FE and RE. The null was rejected under the Hausman (1978) specification, indicating that FE is preferred.

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[40] There is an assumption of no time-specific component λ_t in the error term but year fixed effects are included. Again, for RE we require $E(\alpha_i, X_{it}) = 0$, for FE we assume that the individual specific term α_i is fixed.

Accounting for the Endogeneity of Alcohol Behavior

In empirical research, instrumental variables (IV) is called for if one believes that an omitted variable may be correlated with the dependent variable and the endogenous regressor, and can therefore influence the relationship between the two variables. Now, the model specified previously assumed that the alcohol consumption variable is exogenously determined. Yet, ample theoretical and empirical rationale indicates that the decision to consume some amount of alcohol may not be exogenous to economic outcomes. Stated differently, the alcohol consumption variable may be a choice variable, determined in response to certain socioeconomic factors such as the price of alcohol or the level of wealth. In addition, studies show that if the adverse health effects of alcohol consumption affect economic outcomes then the relationship between alcohol consumption and economic outcomes may be simultaneously determined in which case the alcohol consumption variable $Alcohol_{it}$ is correlated with the error term of the above specified model such that $\mathrm{E}(u_{it} \mid Alcohol_{it}) \neq 0$ and hence the estimates of γ will be biased and inconsistent in the above model (MacDonald and Shields 2001). Endogeneity can be controlled for by finding an instrument(s) that is correlated with alcohol consumption behavior but uncorrelated with the error term, independent of the outcome of interest, and regress the alcohol consumption variable on the instruments.[41] Depending on the validity and how good the instruments are, the first-stage of the IV regression “purges” the component of the endogenous variable that is not due to the exogenous

[41] Many statistical textbooks such as Greene (2002) and Wooldridge (2002)provide fuller discussions of 2SLS/instrumental variable estimation.

variation.[42] As stated in the data section above, taxes on alcoholic beverages are good candidate for instrumental variables regression since they tend to be exogenous. The first-stage alcohol equation with the regional weighted-average tax on alcoholic beverages as the identifying instrument is as follows:

$$Alcohol_{it} = \varsigma Tax_{it} + \beta X_{it} + \eta_{it} \tag{13}$$

where Tax_{it}, the identifying instrument, is the regional weighted-average tax on alcoholic beverages in the U.S., which is assumed to be independent of u_{it}, correlated with $Alcohol_{it}$, but independent of $Wealth_{it}$ given $Alcohol_{it}$ and u_{it}. Implying Tax_{it} has no direct effect on $Wealth_{it}$.[43] A Durbin-Wu-Hausman (DWH) test of whether the alcohol variable is actually endogenous and needs to be instrumented was performed in STATA. The null hypothesis is that the OLS estimators are consistent and that the differences between the OLS and IV coefficients are random. Note that a rejection of the null will indicate that endogenous regressors' effects on the estimates are meaningful, and instrumental variables techniques are required. Under the null, the test is Chi-squared distributed with k degrees of freedom, where k is the number of regressors specified as endogenous in the original instrumental variables regression. The null was rejected implying the OLS estimates will be inconsistent.

[42] It is often difficult to find a good and valid instrument. That is, instruments that have no effect on the outcome variable and some instruments may be only weakly correlated with the endogenous variable.
[43] The above model overcomes the identification problem, that is, the model is identified since the instrumenting exogenous variable (regional weighted-average alcohol tax) does not appear in the structural equation.

Notwithstanding this result, parameter estimates for both the OLS and instrumental variables (IV) models are reported to allow for comparison. Also, the Hansen's J over identification test statistic designed to verify the validity of the instrument in the alcohol equation (2) is not rejected. In addition, given the system of equations, it is possible that the error terms may be correlated and the $i's$ may not be identically distributed because the variance of the error term may not be constant. These problems, known as autocorrelation and heteroscedasticity, may lead to biased standard errors of the estimates of the parameters. To this end, the standard errors of the first-stage estimation are adjusted using a standard Huber-White-sandwich estimator which is available in STATA.

Empirical Results–Wealth at Retirement and Alcohol Consumption

Several estimation procedures are used; first, the structural model specified above is estimated via OLS, ignoring the panel nature of the dataset.[44] In the second procedure, the structural model is estimated with the assumption that all the variables in the covariate vector, including the alcohol variable, are completely exogenous. In yet a third procedure, instrumental variables (IV), a first-stage multinomial logit alcohol consumption model (reduced-form equation) is estimated with the tax price of alcohol as the identifying instrument to correct for the potential endogeneity in the alcohol consumption measures. The predicted value is then used as an additional regressor in the

[44] Note that OLS estimates reflect pooled OLS estimates.

structural equation with wealth at retirement as the outcome variable.[45] All estimations are implemented via STATA and the results are presented in Table 6 through Table 8 with robust standard errors.

The results in Table 7 are the first-stage Multinomial Logit (MNL) model. This is a regression of alcohol status on the regional weighted-average regional tax rate on alcoholic beverages, smoking measure , age-in-1992, race, gender, health capital and time dummies. The coefficients from the MNL model are relative risk ratios but these can be interpreted as the percentage change in the dependent variable for a change in the independent variable. The percent change in the odds of belonging to a particular category that is associated with a change in a variable is calculated as $[\exp(\beta)-1]*100$. If β is small, the non-exponentiated coefficient multiplied by 100 can be interpreted directly as a relative effect which gives the percentage change in the odds for the corresponding variable. For $|\beta|<1$, the error of such approximation is about .005. The results indicate that the identifying instrument, the weighted-average regional tax rate has a negative and statistically significant effect on alcohol consumption, which is in line with the conclusions from several of the literature on the relationship between alcohol use and taxes (Kenkel and Ribar 1994; Chaloupka et al. 2002).

[45] Exposition on the MNL model is provided in the technical appendix.

Table 7: First-stage Multinomial Logit Estimates (Dependent Variable–Alcohol)

	Moderate	Heavy
Constant	0.034	-1.789***
	(0.107)	(0.159)
Alcohol Tax	-0.344***	-0.349***
	(0.020)	(0.028)
Smoking	0.178***	0.492***
	(0.022)	(0.030)
1992 Age	-0.013***	0.004*
	(0.002)	(0.002)
Non-White	-0.217***	-0.904***
	(0.024)	(0.043)
Female	-0.279***	-0.348***
	(0.019)	(0.028)
Health	-0.154***	-0.163***
	(0.007)	(0.011)
High School	0.381***	0.350***
	(0.024)	(0.037)
Associates	0.527***	0.703***
	(0.032)	(0.046)
College	0.850***	1.131***
	(0.029)	(0.040)
Period Dummies	Yes	Yes
Observations	75,170	75,170

Robust standard errors in parentheses correspond to unexponentiated coefficients * significant at 10%; ** significant at 5%; *** significant at 1%. Note: Multinomial Logit (MNL) estimates are Relative Risk Ratios (RRR) and coefficients can be interpreted as $[\exp(\beta)-1]*100 =$ percentage change.

The coefficients on the average-weighted regional tax rate are minus 0.34 and minus 0.35 respectively, implying that alcohol tax decreases drinking by about 30 percent for an increase in the average alcohol tax ($[\exp(-0.34)-1]*100 = -29.47 \cong 30$ percent). In particular, the exponentiated coefficients from the multinomial regressions imply that an increase in the tax rate on alcoholic beverages multiplies the odds of being a light-moderate drinker rather than a total abstainer by 0.71. Therefore, an increase in the average alcohol tax will decrease the odds of drinking moderately as compared to abstaining completely from alcohol consumption. Similarly an increase in the average alcohol tax decreases the log odds (0.71) of being a heavy drinker instead of a total abstainer. Smoking has also been known to have a positive association with alcohol consumption and the results from the first-stage equation confirm this assertion.

Using the exponents of the coefficient on smoking, an increase in smoking is associated with a 20 percent increase in alcohol use for the moderate alcohol category and a 63.5 percent increase for the heavy alcohol use category. Note that a major problem with IV estimation is that when instruments and endogenous explanatory variables are only weakly correlated the IV estimates may be inconsistent (Bound et al. 1995). An F-test of the joint significance of the instruments in the first-stage multinomial equation suggests that regional tax Tax_{it} is highly correlated with the endogenous explanatory variable, $Alcohol_{it}$. The rest of the variables in the model have the expected sign in relation to their effects on alcohol use and are statistically significant.

The results from the benchmark model are presented in Table 8. The coefficients on the alcohol measures are positive and statistically significant under the pooled-OLS, RE and FE models. Focusing on the coefficients on the moderate alcohol measure respondents who drink moderately as opposed to abstaining from alcohol consumption see increases of about 33.3 percent, 7.6 percent and 4.2 percent in retirement wealth under the pooled-OLS, RE and FE models. Similarly, the effects of drinking heavily on wealth at retirement as opposed to abstaining from alcohol consumption ranges from about 39 percent, 12.1 percent and 8 percent increase under the pooled-OLS, RE and FE, respectively.

Table 8: OLS, RE and FE Estimates (Dependent Variable–Log-Wealth)

	OLS	RE	FE
Constant	9.335***	9.542***	11.091***
	(0.067)	(0.136)	(0.009)
Moderate	0.333***	0.076***	0.042***
	(0.015)	(0.011)	(0.012)
Heavy	0.390***	0.121***	0.080***
	(0.021)	(0.017)	(0.018)
Nonwhite	-0.949***	-0.996***	
	(0.018)	(0.037)	
1992 Age	0.020***	0.018***	
	(0.001)	(0.002)	
High School	0.889***	0.905***	
	(0.017)	(0.035)	
Associate	1.157***	1.181***	
	(0.022)	(0.046)	
College	1.677***	1.723***	
	(0.019)	(0.038)	
Female	-0.008	-0.061**	
	(0.013)	(0.027)	
Period Dummies	Yes	Yes	Yes
Observations	75,178	75,178	75,178

Robust standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%.

The results are in line with the empirical findings of Hamilton and Hamilton (1997) OLS regressions in that both moderate and heavy drinkers earn more than their equally situated counterparts who abstain from alcohol use.[46] Note that the effects of alcohol consumption are greater under the OLS estimates as compared to the RE and FE estimates, which seem to indicate that the OLS estimates may be biased upwards.[47] The coefficients on age and education under the OLS and the RE models have the expected sign and are statistically significant implying wealth increases with age and more education, all else held constant. Notice also that Non-Whites pay a penalty in terms of

[46] The results, in terms of the sign on the coefficients of the alcohol measure, are also similar to studies from Tekin (2004) without FE, MacDonald and Shields (2001), Auld (1998) and Peters (2004) without FE. See conclusion section for details.

[47] To instrument for health and some of these variables require strong and adequate instruments thus, the possible correlation of unobserved heterogeneity with the health measures cannot be ruled out.

their wealth at retirement. Although the coefficient on the Female variable from the OLS estimate is statistically insignificant in Table 7, most results show that being Female is negatively correlated with wealth at retirement as indicated under the RE estimates. A full set of period dummies are included in most estimations and the coefficients on the period dummy variables are in general positive and statistically significant, indicating the effects for all the later years are higher and statistically significantly different from the omitted year (period-1992).[48] The results presented in Table 8 do not change even when the abstainer alcohol category has been disaggregated into lifetime abstainers (those respondents who abstain completely from alcohol consumption) and individuals who drink less than once a week (see Table B17 in the appendix).

The estimates in Table 8 assumes that all the right hand side variables with the exception of the alcohol measures are exogenously determined, but as argued previously the decision to consume some amounts of alcohol may in turn depend on other factors. To ascertain how the assumption of endogeneity will change the estimates, the model from Table 8 is re-estimated via instrumental variables and the results are presented in Table 9. Again, the coefficients on the light-moderate alcohol measure in Table 9 are positive and statistically significant under the OLS and RE models but the FE estimates of the moderate drinking measure is statistically insignificant. The sign on the heavy drinking measure is negative and significant in most specifications. Drinking moderately as opposed to abstaining from alcohol consumption increases wealth at retirement by about 9.7 percent, 4.7 percent and 1.6 percent using OLS, RE and FE, respectively. In

[48] Variables such as marital status, regional dummies, occupational dummies and other family background characteristics were included in subsequent specifications of the structural model but their coefficients were determined to be statistically not significant and worsened the overall fit of the model.

contrast, under the instrumental variables regression, drinking heavily instead of abstaining from alcohol consumption leads to about 10.2 percent, 4.4 percent and 1.3 percent decrease in wealth at retirement via OLS, RE and FE, respectively. The sign on the coefficients of the heavy drinking alcohol measure support the assertion of an inverted U-shaped relationship reported by some recent studies.

Table 9: Instrumental Variables Estimates (Dependent Variable–Log-Wealth)

	OLS	RE	FE
Constant	6.943***	8.290***	10.900***
	(0.095)	(0.165)	(0.064)
Moderate	9.726***	4.716***	1.561***
	(0.252)	(0.322)	(0.417)
Heavy	-10.156***	-4.383***	-1.331**
	(0.385)	(0.441)	(0.538)
Nonwhite	-1.245***	-1.106***	
	(0.024)	(0.042)	
1992 Age	0.050***	0.033***	
	(0.001)	(0.002)	
High School	0.496***	0.697***	
	(0.020)	(0.038)	
Associate	0.871***	1.010***	
	(0.026)	(0.049)	
College	1.280***	1.472***	
	(0.029)	(0.048)	
Female	0.120***	0.020	
	(0.015)	(0.028)	
Period Dummies	Yes	Yes	Yes
Observations	75,178	75,178	75,178

Robust standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%.
Note: alcohol measures from the endogeneity-corrected models are in logarithms, coefficients are interpreted as $\Delta wealth = (\beta_k / 100) * \Delta$ *alcohol measure*.

Note the effects of moderate drinking on wealth at retirement are somewhat smaller once the alcohol measures have been instrumented. As in the previous results the coefficients on the time-invariant variables, Non-Whites, age in 1992 and education, have the expected signs and are statistically significant (except that on Female under the RE model). In particular, the results shows that being Non-White or being Female is negatively associated with retirement wealth while age in 1992 and education, as expected, are positively associated with wealth at retirement.

Partitioning the abstainer category into lifetime abstainers and respondents consuming alcohol less than once a week did not change the results in any significant manner (see Table B16 and Table B18 in the appendix). The alcohol tax is negative and statistically significant in the first stage model. The alcohol measures are mostly statistically significant in the model that does not account for endogeneity and the inverted U-shaped relationship between alcohol and retirement wealth is still evident in the instrumental variables counterpart. Table B19 provides the results of test of various hypotheses with regards to the coefficient of the alcohol measures using three and four alcohol classifications. That is, a test of differences between the estimated alcohol coefficients as well as a test of joint significance of these coefficients in Table B19. Here the interest lies in testing whether there are differences between the coefficients and whether the alcohol measures are jointly statistically significant with regards to their relationship with the dependent variable, retirement wealth after controlling for the other variables in the model. The test indicates that the light, moderate and heavy drinking measures are significantly different from each other and jointly significantly different from zero. Therefore they contribute to the explanation of the variation in retirement wealth, which is not surprising, given that they are all individually highly significant.

The theoretical argument from the perspective of this research is that alcohol consumption affects socioeconomic outcomes through its effects on health (indirect effect). Therefore, the above models presented in Table 8 and Table 9 do not include a health capital measure as an additional regressor. The assumption is that if the researcher controls for the effects of health in the model then there should be no effect whatsoever of alcohol consumption in a regression of retirement wealth on alcohol consumption. Yet evidence exists to suggest that alcohol consumption may also affect socioeconomic outcomes directly since it may impact cognitive ability and mood, thus influencing productivity or daily activity (Block et al. 1990). Therefore, we would expect an effect of alcohol consumption on the outcome variable (retirement wealth) even with the inclusion of health capital measures. Indeed, the inclusion of health capital measures as a RHS variable in a regression of economic outcomes on alcohol consumption tends to be a standard practice in the economics literature (Mullahy and Sindelar 1994; MacDonald and Shields 2001; Peters 2004). Table B2 and Table B3 in the appendix present results of models with health capital (number of severe health conditions) included as an additional regressor to ascertain the possible direct effects of alcohol consumption on retirement wealth. The coefficients on the alcohol measures in Table B2 are slightly smaller but they are positive and statistically significant across the three models. In particular, the coefficients on the moderate alcohol measure are 28.7 percent, 7.1 percent and 4.1 percent, respectively via OLS, RE and FE. Similarly, the coefficients on the moderate alcohol measure are 34.3 percent, 11.6 percent and 7.9 percent, respectively via instrumental variables OLS, RE and FE. The coefficient on the health capital variable (number of severe health condition) is negative and statistically significant across all three models, indicating the lower the number of severe health conditions the greater the upward effects on wealth at retirement. In particular, one additional severe health condition reduces wealth at retirement by about 18.5 percent, 7.7 percent and 2.6 percent via OLS, RE and FE estimates, respectively. Under the instrumental variables regression (Table B3), the coefficient on the moderate alcohol measure is still positive but not statistically significant under the FE model. The coefficients on the heavy alcohol measures are again negative and statistically significant, suggesting an inverted U-shaped relationship between alcohol consumption and retirement outcomes. Also the health capital measure is negative and statistically significant across all three models and their interpretation is analogous to those from the previous table.

To ascertain the robustness of the model, variables such as gender, race and education are dropped and the model re-estimated. These results are presented in Table B4 through Table B7 in the appendix. In Table B4 and Table B5 gender and race variables are dropped from the model. In general, the moderate alcohol measure is positive and statistically significant. The exception is that under the instrumental variables FE model the coefficient on the moderate alcohol measure is statistically insignificant. The coefficient on the heavy alcohol measure is positive and statistically significant under both RE and FE models. Under the instrumental variables RE model the coefficient on the heavy alcohol measure is statistically significant but it has an unexpected sign (positive). In Table B6 and Table B7 only the education variable is excluded from the model. The coefficient on the moderate alcohol measure is again positive and statistically significant. The coefficient on the heavy alcohol measure is positive and statistically significant in the model which does not account for endogeneity and negative and statistically significant under the instrumental variables approach. Surprisingly, the sign of the coefficient on the gender variable is now positive and statistically significant. In general, excluding some of these time-invariant variables from the model leads to somewhat imprecise estimates.

There is also ample indication that retirement outcomes tend to be different for different individuals based on certain observable characteristics such as gender, race/ethnicity or the stage of the life cycle in which the individual retires (Peters 2004). In order to examine the extent to which groups vary in their outcomes with respect to retirement wealth, the benchmark model is re-estimated by gender, race and age at retirement. The results are presented in Table B8 through Table B11 in the appendix. The estimates by gender in Table B8 indicate that the coefficients of the alcohol measures are all positive and statistically significant implying drinking is positively associated with retirement wealth for both men and women.[49] Surprisingly, the effects of drinking are relatively greater for women than for men except in the case of the estimates via FE. As in the benchmark instrumental variables regression, the estimates by gender in Table B9 indicate an inverted U-shaped relationship between drinking and retirement wealth. In particular, the coefficient on the moderate alcohol measure is positive and statistically significant across all the models, though their effects are relatively smaller. In contrast, the coefficient on the heavy alcohol measure is now negative and statistically significant for both men and women. These latest results are somewhat consistent with those from Peters (2004) and Tekin (2004). For instance, Peters (2004) found positive and statistically significant effects of current drinking on wages for both men and women but the statistical significance of the effects diminishes and in some instances disappears with additional controls and fixed effects regression, respectively. Also, the coefficients on the

[49] Independent means t-test (two-tailed) between male and female indicates that the groups have different means.

drinking levels were greater in magnitude in terms of their effects on wages for women than men. Similarly, Tekin (2004) found positive effects of drinking on wages via cross-section regression for both men and women and the magnitude of the effects were much larger for women than men.

Table B10 attempts to unearth the racial differences in retirement outcomes given the individual's alcohol consumption status. In general, the results for Whites and Non-Whites are in line with previous empirical evidence. The coefficients on the major variables under Whites and Non-Whites model have the expected signs and are statistically significant except the light-moderate variables via FE. The effects of moderate alcohol use on wealth at retirement for Whites and Non-Whites are surprisingly similar. Under the RE estimates, Whites who drink moderately or heavily expect to see about a 7.2 percent and 10.6 percent increase in wealth at retirement, respectively. Similarly, under the RE estimates, Non-Whites who drink moderately or heavily expect to see about a 5.7 percent and 16.2 percent increase in wealth at retirement, respectively. The effects of moderate drinking and heavy drinking for Whites via the FE estimates (3.6 percent and 6.6 percent) are similar with regards to the sign and statistical significance but are relatively smaller than those from the RE estimates. For Non-Whites, drinking heavily is still associated with increased wealth at retirement of about 13.2 percent but the effects of moderate drinking for Non-Whites are not significantly different from zero. Moreover, all the time-invariant variables have the expected signs and are statistically significant except the coefficient on the Female variable under the RE estimates.

The results presented in Table B11 attempt to disentangle any differences which might exist between respondents based on their retirement age. Not surprisingly under the

RE estimates, the effects of alcohol consumption on retirement wealth is relatively better for those respondents who retire at or after their 65h birthday (11 percent and 13.8 percent, respectively). In comparison, the effects of alcohol consumption on retirement wealth for those respondents who retire before their 65th birthday are 7 percent and 12.4 percent, respectively. In general, the effects of alcohol consumption on retirement wealth under the FE estimates are positive but only statistically significant for those respondents who retired before their 65th birthday (3.2 percent and 8.2 percent, respectively). Again the health capital variable and time-invariant variables have the expected signs and are statistically significant except the coefficient on the Female variable under the RE estimates. Generally, the effects of moderate drinking on retirement wealth do not change with alternative specifications via instrumental variables approach. The results also confirmed previous findings with regard to certain key variables such as gender, race, age, the level of education and health and their effects on retirement outcomes.

The previous estimated models did not include lag variables of the alcohol measures. To the extent that there is persistence in alcohol consumption patterns over time, current drinking may proxy for long-term alcohol consumption patterns. Indeed, Cook and Moore (2002) find that the probability of abstention given three prior years of abstention is .84 and that the probability of binge drinking given three prior years of binge drinking is .90. Yet, explicitly excluding lagged variables of alcohol consumption from a regression of retirement wealth on alcohol consumption may understate the total impact of the latter on retirement wealth. The drawback to including lagged variables of the alcohol consumption measures is that it may lead to collinearity among the explanatory variables and reduce the precision of the estimate. In spite of the above drawback, a relatively balanced picture of the effects of alcohol consumption on the outcome variable, retirement wealth, is presented in Table B12 and Table B13 in the appendix. The lagged variables of alcohol consumption measures are included as additional regressors and the model re-estimated. The relative sizes and statistical significance of the coefficients on the lagged and current versions of the alcohol measures provides evidence with regards to the effects of alcohol consumption on retirement wealth.[50]

A glance at the estimates in Table B12 indicate that the effects of moderate or heavy drinking on retirement wealth are still positive and statistically significant in comparison with abstention from alcohol use. The OLS, RE and FE estimates are similar to those results presented earlier in the essay. The coefficients for the lagged moderate alcohol measure are positive and statistically significant in all three models, though the contemporaneous value under the FE model is not significantly different from zero. The lagged value of the heavy alcohol measure is positive as well, but under both the FE and RE model, they are statistically insignificant. In particular, the total impacts of the two estimated coefficients of the moderate drinking variable indicate that drinking moderately increases retirement wealth by about 40 percent and 9.8 percent, respectively via OLS and RE. Similarly, drinking heavily increases retirement wealth by about 46 percent under the OLS model. In Table B13, the instrumental variables counterpart to Table B12, the sign and statistical significance of the estimated coefficients on the alcohol measures are as expected but are only significant under the OLS and RE models. Clearly, the relative sizes and statistical significance of the coefficients on the lagged and current

[50] Due to the fact that the HRS is conducted biennially, one lag of the alcohol measures which reflects two periods are included.

versions of the alcohol measures still points to an inverted U-shaped relationship between alcohol consumption and retirement wealth.

Additionally, all the estimated models via instrumental variables regression rely on multinomial logit (MNL) to estimate the parameters of the reduced-form equation (due to its flexible formulation) but results for the baseline model using ordered logit specifications are provided in the appendix for comparison (see Table B14 and Table B15). Note that alternative specifications whereby the reduced-form alcohol equations are estimated via ordered logit approach did not alter the sign or statistical significance of the estimated coefficients, though the magnitude of the effects were somewhat different.[51] In general, drinking does not seem to adversely affect retirement wealth when endogeneity of the alcohol measures are not taken into account. When the alcohol measures are instrumented, heavy drinking seems to lead to decreases in wealth at retirement, which seems to confirm the inverted U-shaped relationship between alcohol use and economic outcomes. There is now additional evidence that at least moderate alcohol consumption is favorably associated with economic outcomes.

Discussion and Limitations

The analysis contained in this essay has shed light on the relationship between drinking and wealth at retirement by arguing that the relationship between alcohol consumption and retirement outcomes is analogous to the observed positive relationship between alcohol consumption and labor market outcomes. To unearth such a relationship,

[51] Hamilton and Hamilton (1997) rely on MNL to estimate their first-stage drinking status equation hence the use of the MNL is not out of the ordinary.

the dissertation utilized a previously developed theoretical model and empirical techniques, some of which have had limited use in this literature. Overall, the results indicate that moderate alcohol consumption is positively associated with individual wealth levels at retirement. Also, the magnitude of the effects of alcohol consumption on socioeconomic outcomes seems to depend on the model specifications. The magnitude of the coefficients on the latter seems to be considerably smaller than the former even under different empirical methodologies and specifications. The results also confirmed recent reports of differential retirement outcomes for certain groups in society such as minorities, in that ethnicity plays an important role in the level of wealth at retirement. In the first stage estimations, designed to correct for the potential endogenous nature of alcohol consumption, the identifying instrument performed as expected. Overall the inverted U-shaped hypothesis was partially confirmed, especially when the endogenous nature of drinking are controlled for in the model. The instrumental variables estimates paint a more accurate picture of the effects of alcohol consumption on retirement outcomes.

While the results are promising in terms of answering the research question, these results are not intended to rule out the significant roles played by factors other than alcohol on retirement wealth. Also, these results, in terms of the sign on the coefficients of the alcohol measures, are similar to those of previous studies which examine the relationship between earnings and alcohol consumption and find a positive relationship. Note that studies such as Tekin (2004), Hamilton and Hamilton (1997), MacDonald and

Shields (2001) and Peters (2004), all find a positive relationship between alcohol consumption and earnings or wages under various specifications.[52]

[52] See the conclusion section for discussions on the relative magnitude and sign of the coefficients on the drinking variables from some of these studies. Although Kenkel and Ribar (1994) focus on problem drinking, the study does examine the effects of alcohol consumption as well.

CHAPTER V: ESSAY II–LABOR MARKET OUTCOMES AND ALCOHOL CONSUMPTION

Introduction

This second essay extends the analyses further by utilizing the longitudinal nature of the NLSY dataset (1984-1996) to examine the relationship between alcohol consumption and labor market outcomes. If alcohol consumption affects social capital and social capital influences socioeconomic success, then alcohol consumption through its effect on social capital may help explain labor market outcomes. Social capital is increasingly becoming an important evaluative criterion in terms of hiring practices, job assignments, internal mobility or decisions regarding wages and salaries (Holzer 1987; Montgomery 1991). The reliance of employers on social capital as a hiring or performance criteria may even be more prevalent in the professional services sector (e.g., accounting, investment banking, consulting) than in other sectors of the economy. This stems from the fact that both formal and informal social interaction is known to be critical to business operations, as well as economic outcomes for workers in this sector. In addition, evidence suggest that business socialization often leads to the diffusion of business information and initial contracting opportunities that are relevant to long-term profitability and well-being of firms (Saxanien 1994; Granovetter 1995; Putnam 2001). If social capital in the form of business and personal interactions are significant determinants of employment relationships such as longer tenure, upward mobility and total remunerations, then individuals with low levels of social capital will be at a disadvantage in such economic settings.

Definition of Business or Professional Services Firms

The justification for focusing on this sector of the economy is due to recent research which indicates that social capital is richly rewarded in sectors of the economy where social interactions are paramount to business success such as those in the accounting, consultancy, investment banking, insurance and high-tech industries (Saxanien 1994; Granovetter 1995; Putnam 2001). In other words, if alcohol use leads to social interaction (social capital) then drinkers would be greatly valued in the sectors of the economy where the survival of the business or firm depends to a greater extent on business and personal interactions. A number of studies use various classification methods to identify the professional business services sector. For instance, Nachum (1998) characterize this sector of the economy as professional business services while Miles et al. (1995) classify this sector as the knowledge-intensive business services. Indeed, there is no common definition of this sector, but the above classifications seem to refer to the same service sector. As a by-product, this research presents an analysis of the effects of alcohol consumption on labor market outcomes by focusing on the professional business services which encompass mostly the accounting, consultancy, investment banking, insurance and high-tech industries. What distinguishes this sector from other sectors of the economy, according to Miles et al. (1995), is that the professional business services sector relies heavily upon professional knowledge and thus their employment structures are heavily weighted towards highly skilled individuals. Therefore the employees of such firms are especially important since the firm’s knowledge or service product is partly embedded in its workers. To reiterate, important resources such as experience, skills and contacts are tied to the employees. In such a scenario, contacts or business interaction may be highly critical to business operation and profitability since service products are designed and implemented in close cooperation with the end user. Thus customer or client interaction would be an important part of overall firm strategy and profitability. What this implies is that firms may strive to hire and keep workers with the requisite social skills, those able to interact at the business, as well as personal level. An examination of the impact of alcohol consumption on the duration of employment and earnings, with an additional focus on a sector of the economy where social interactions are pervasive, will contribute to the current literature. Also, since firms are normally concerned with the expected tenure of potential and current hires, this essay contributes to the current literature by shedding light on whether differences in alcohol consumption can explain differences in employment duration and earnings.

A Review of the Literature

Before presenting a review of the literature on the relationship between alcohol consumption, social capital and labor market outcomes, a brief definition of social capital is warranted. Although there is no uniformity with regards to the definition of social capital, some studies tend to focus on the intensity of social interactions as evidence of social capital (Coleman 1988; Narayan and Pritchett 1997).[53] The consensus is that social capital is an informal individual resource which may be generated from social interactions and social networks and which the individual can exploit for socioeconomic

[53] For further literature on the definition of social capital see the World Bank website; http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTSOCIALDEVELOPMENT/EXTTSOCIALCAPITAL/0,,contentMDK:20194767~menuPK:418848~pagePK:148956~piPK:216618~theSitePK:401015,00.html (accessed June 2004).

or political gains.[54] The key feature of such a definition of social capital is that interconnectedness and sociability play important roles in the level of individual social capital accumulation and, as such, mechanisms or behaviors that promote sociability consequently result in social capital formation. In this regard, social drinking tends to deepen and strengthen the bonds of friendship, since it shows an individual's friendliness and sociability. Such bonds may in turn provide the individual access to semi-confidential information. In business settings, such as business lunch/dinner or banquets, alcohol consumption tends to loosen the atmosphere and provide an opportunity for business people to strike deals, interact and bond, exchange business information, as well as strengthen and consolidate business partnerships.[55] Such social resources act to improve the individual's economic outcomes according to Lin and Dumin (1986).[56] As will become apparent, social drinking (light-moderate alcohol consumption) promotes understanding and shared values that shape the way that individuals relate to each other through social interactions or social networking. What follows in the next subsection are studies that provide evidence on the causal relationship between alcohol consumption and social capital formation.

[54] See Glaeser et al. (2000) for discussions on how social capital is embodied in the individual.
[55] See also Adam et al. (2000); Chadwick and Goode (1998); Criqui (1996); Zakhari (1997) for alcohol related issues.
[56] See also Burt (1992)

Evidence on Alcohol Consumption and Social Capital

Scant evidence exists as to the physiological mechanism through which alcohol affects social capital formation, but current psychosocial evidence indicates that alcohol conveys an element of festive inversion through its chemical and symbolic properties. These chemical and symbolic properties allow individuals to create an alternative reality in which the potentially disturbing or frightening aspects of real world situations tend to be minimized while simultaneously enhancing the positive and celebratory aspects. In addition, the chemical and symbolic properties of alcohol tend to elevate mood and reduce anxiety, thereby creating an idealized world where social interaction, trust and information exchange can be facilitated. What this means is that moderate alcohol consumption promotes sociability in the form of social networking and social interaction which is almost always associated with social capital formation. Studies also show that the intoxicating effects of alcohol consumption tend to act as a buffer to the severe effects of both chronic strain and negative life events and also enhance excitement during festive occasions and increase cheerfulness, all of which in turn loosen inhibitions and facilitate social interactions. Thus drinking may provide an opportunity for an individual to form business and friendship associations.

In an observational study involving Maori, Pacific Islanders and Europeans in New Zealand which focused on the effects of alcohol consumption on social interactions, the authors found that 40 percent of drinkers had drinking companions from other ethnic groups, which seems to suggest a strong social interaction between drinkers of diverse backgrounds (Graves et al. 1982). The implications from this study is that the effects of alcohol consumption on social interactions, regardless of the consumption level, are insightful in that such effects of alcohol consumption on social interactions are not confined to certain cultures or ethnic demarcations. In addition such social interactions might not have occurred were it not for the symbolic and psychosocial properties of alcohol. What this study fails to take into account are nondrinkers and the notion that there could be heterogeneity in the sample of nondrinkers. That is, “Kiwis” (Maori, Pacific Islander and Europeans) nondrinkers may refrain from alcohol use for athletic reasons or for community norms or lifestyle. Also there are no indications that abstinence would not lead to improved social life. The above claim of social interaction or social integration spurred on by alcohol use has also been echoed by Gilbert (1987) in a study that focused on Hispanics and Non-Hispanic Whites in San Jose and Los Angeles. The author found that Chicanos, Mexican-Americans and Caucasians interacted freely in several social settings. Such social interactions across class, ethnic and racial delineations would have been limited had it not been for the presence of alcohol.

Recent studies of students affiliated with Greek organizations found that alcohol was regarded as a vehicle for friendship and social interaction in greater numbers than did students who were not affiliated with such organizations (Lo and Globetti 1995; Cashin et al. 1998). Also a study by Beck et al. (1995) found that drinking was used as a mechanism to overcome inhibition and to provide social facilitation. It is important to note the results from Lo and Globetti (1995) and Cashin et al. (1998) could potential be biased due to selectivity. Indeed, some individuals tend to interact with others who are similar to them which in turn may lead to the effects of social capital simply reflecting such selection effects. If we consider the assumption that sociability is the major reason for consuming alcohol, then individuals who use alcohol may be better integrated in society and may tend to have higher social capital. This may in turn translate into better labor market outcomes than people who do not drink (Leifman et al. 1995).

Even though there are numerous studies that have examined the beneficial aspects of social drinking, the evidence on the adverse effects of alcohol consumption on socioeconomic outcomes is equally impressive. Evidence indicates that alcohol consumption tends to affect economic outcomes negatively due to its adverse impact on individual productivity, reliability, career choices and stability. Indirectly, alcohol consumption may also affect labor market and retirement outcomes through its effect on human, health and social capital formation earlier on in life. There are also several pathways in which drinking, even social drinking, may negatively affect an individual. Medical research shows that alcohol is a depressant which tends to slow down brain activity or normal brain functioning by impairing information processing that could eventually lead to inaccurate assessment of situations and signals. Therefore, alcohol consumption, even light-moderate alcohol consumption, may lead to impulsive behaviors and aggression such as sexual and physical assault which may adversely affect the social capital of the individual with huge implications for labor market success (Koss and Gaines 1993). Further evidence suggests that individuals who consume alcohol excessively may experience a wide variety of adverse consequences with regards to their relationship with families, friends and work colleagues (Harford et al. 1991). In particular, alcohol consumption and dependence may lead to the disruption of family and social relationships, emotional problems and problems with the law.

Notwithstanding the above criticism of the relationship between alcohol consumption and social capital, the convergence of views seems to suggest that certain alcohol consumption levels are causally-linked to social capital which in turn may affect labor market outcomes. Also, there is no question that social interaction can occur, for instance, through golfing or fishing but the chemical and psychosocial properties of alcohol tend to break down inhibitive tendencies which allow social interactions and information exchange, unmatched by other mechanism through which social capital may be formed (Midanik 1994). Whether light-moderate alcohol consumption leads to better or worse labor market outcomes remains to be seen. In sum, given the consensus that light-moderate drinking does influence sociability and consequently social capital among individuals and groups, there is a justification for investigating whether alcohol consumption is a good predictor of labor market success. Evidence from studies such as MacDonald and Shields (2001), Skog (1980), Montgomery (1991), Tekin (2004) and Peters (2004) suggest that indeed alcohol consumption tends to have an impact on economic outcomes such as wages or earnings.

Why Social Capital may Promote Longer Employment Duration

While many studies have dwelled on the effects of alcohol use on other outcomes such as increased earnings as a measure of successful labor market outcome, this essay argues that longer employment duration is an important a measure of labor market competence and success.[57] To the extent that job interruptions tend to lead to severe penalties on subsequent jobs and steeper decline in wages, these studies implicitly support the assertion that alcohol use may have positive effects on tenure given its

[57] Additional evidence on alcohol consumption-labor market nexus includes French and Zarkin (1995); Auld (1998); Kenkel and Ribar (1994); Tekin (2004); MacDonald and Shields (2001). Studies on alcohol consumption and its effect on social capital includes Portes (1998) and Patterson (1998).

positive effects on labor supply and earnings. In particular, if socially adept individuals, contribute to business information diffusion, through social and informal interactions then employers will strive to keep those individuals, who have the requisite social capital that is relevant to long-term profitability and overall success of business operations. In addition, longer job tenure is an indicator of a good match between the employer and the employee. Longer job tenure also has implications for pensions and retirement incomes, wages at the subsequent firm, employment and re-employment probabilities and the preservation of individual human and social capital.

Note that under certain circumstances longer employment duration may not be desirable from the perspective of the individual. For instance, a study by Saxanien (1994) argues that there is a greater level of inter-firm mobility among the high tech workers in Silicon Valley. These high-tech workers in Silicon Valley usually establish social network loyalties among themselves and not to individual firms or even industries. Thus we would expect some individuals working in the high-tech sectors to move frequently from one project, company or industry to another to take advantage of information diffusion. Under such a scenario shorter employment duration may not accurately reflect the social skills of the individual, and longer employment duration may not benefit the individual within this particular sub-sector. Nevertheless, longer employment duration may improve socioeconomic outcomes for the individual due to the reasons outlined above.[58]

Indeed a study by Urwin et al. (2002) which examines the cost and benefits of social capital investments using the UK 2000 Time Use Survey (UKTUS 2000) reached

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[58] This NLSY data is such that job changes are observable for some respondents but the data does not allow this research to distinguish any differences with regards to the quality or prestige associated with the previous job vis-à-vis that of the subsequent job.

such a conclusion. Urwin et al. (2002) relied on four measures of social capital such as bonding networks, bridging networks and linking networks as measures of social capital. They reported that investment in social capital (linking networks) tend to exert a significant positive effect on wages. Although this result does not evaluate the causal impact of alcohol consumption, it does indirectly point to the assertion that behaviors that improve social capital formation may also improve labor market outcomes for the individual. This evidence supports the assertions made in the introductory sections of this essay under the assumption that alcohol consumption is causally linked to social capital, which has been shown to improve labor market outcomes.

A study by Koppel (1981), which examines the short-run effects of attitudes on earnings, found positive and direct effects of three socio-psychological variables (occupational aspirations, locus of control and expectations) on occupational attainment and earnings. Although the extent to which the effects from the above study persist over time were not exactly clear at the time, a study by Szekelyi and Tardos (1993), which relied on the PSID data and which used similar variables such as locus of control, future-orientedness and trust, did indicate a positive effect on future wage levels and wage growth. These studies bolster the argument that alcohol consumption may be positively related to labor market outcomes as a result of the influences from social capital.

Another study that supports the argument that socially skilled individuals tend to perform better in the labor market is that of Holzer (1987). In the study Holzer (1987) argues that employers place a premium on referrals from employees and treat them as more informative and reliable than they do applicants who go through the normal application process. Such methods are also used by employers to screen potential hires which in turn reduces employers' cost of doing business. If alcohol use is related to social capital, which in turn determines who gets access to labor market opportunities and business information, then an understanding of the relationship between alcohol consumption levels and labor market outcomes becomes even more critical. In other words, individual labor market success with regards to promotions into leadership positions, earnings, length of employer-employee attachment may not depend only on their human capital and physical characteristics but also on their socializing behavior.

Similarly, Montgomery (1991) examined how social networks provide employers with information about prospective hires. Montgomery (1991) theoretical model was based on the assumption that workers tend to refer employers to potential employees who are similar in terms of skill level. He further argues that employers tend to trust information from high ability employees and that employers will only refer high ability employees since their reputation is at stake. The model then predicts that a workers' wages and salaries will be determined by the number and type of social ties held. The model further predicts a large role for social capital in the determination of labor market outcomes such as earnings and tenure. Now, if we assume for a moment that drinking leads to social capital formation, then we can infer from the current evidence that drinking may indeed affect labor market outcomes.

Notwithstanding the favorable evidence of the positive impact of social capital on economic outcomes, recent studies on educational underachievement have been linked to the presence of social capital that actively encourages truancy and discourages achievement. The argument is that social capital breeds a condition of social exclusion due to the mediating factors associated with social class relations and the prevailing educational structures and processes. Such a condition would have adverse implications for individual labor market outcomes.[59] Similarly, social networks can be a powerful channel through which unhealthy behavior, such as smoking and drugs, may be encouraged. In addition studies show that although individuals from lower social classes may socially interact, engage in social drinking and even form networks, such informal sociability tends to be concentrated around friends, not work colleagues. To the extent that informal networks and information tends to be crucial for labor market opportunities, social interaction may improve or worsen socioeconomic outcomes depending on the types, quality and accessibility of such interactions (Perri 1997; Hall 1999).

Closely related to the above and as mentioned earlier, is the role of unobserved heterogeneity in the effects of social capital on labor market outcomes. Although both social interaction and peer effects tend to be aspects of social capital, in reality it may be difficult to separate the effects of social interaction from those of peer effects.[60] Indeed there may be selectivity with regards to peer group membership (social homophily). That is, individuals tend to interact with others who are similar to them which in turn may lead to the effects of social interaction or social capital simply reflecting such selection effects. Thus, the effects of social interaction or social capital on an outcome variable may be due to some extent by the effects of some unobservables. A solution to such unobserved individual heterogeneity may be to implement an instrumental variables approach or a fixed effects approach. Data limitations and valid instruments however made the instrumental variables approach virtually unfeasible. In addition, the NLSY data set does not provide information on an individual's reference group. To ascertain if

[59] See Brehm and Rahn (1997) and Perri (1997)
[60] Peer effects are the extent to which an individual's outcome is influenced by peers' outcomes.

similarities in attitudes or behavior among individuals are due to social interaction rather than peer effects, the models in this essay are estimated by fixed effects, as well.[61]

A Summary of the Current Literature

Some of the literature reviewed above, as well as the GSS case study, show that alcohol consumption does indeed affect social capital positively. At the same time, numerous studies, including those reviewed above indicate that social capital affects socioeconomic outcomes. The accumulation of evidence suggests that alcohol consumption may indeed improve labor market outcomes due to its effects on social capital. Evidence also shows that there are complementarities that exist between health capital and social capital.[62] Although the evidence thus far indicates some positive influences of alcohol consumption on economic outcomes, it is important to note that alcohol consumption and social capital may not necessarily lead to better labor market outcomes. Indeed, a review of the literature showed that the negative implications of alcohol consumption on labor market outcomes cannot be ignored in an analysis of the relationship between social capital and socioeconomic outcomes. In spite of evidence that points to the dangers of alcohol use, the consensus among the studies reviewed suggests that alcohol consumption is causally linked to social capital and that moderate alcohol consumption may impact economic outcomes in sectors of the economy where social and business interactions are pervasive.

[61] Cooper et al. (1999)
[62] See Cooper et al. (1999) and Veenstra (2000).

In sum, these studies on alcohol use and social capital, and their relationship to economic outcomes, bolster the case for an examination of the extent to which differences in alcohol consumption may affect labor market outcomes such as employment duration and earnings utilizing a different empirical approach. This essay is significant in the sense that since differences in labor market outcomes account for a substantial portion of differences in economic well-being, accounting for factors that drive these differences in labor market outcomes such as employment tenure will add to the current literature. In addition, this essay contributes to the literature on alcohol consumption and socioeconomic outcomes, since there are no studies that examine the relationship between alcohol consumption and the length of employment within the sectors of the economy where social capital is pervasive, such as the professional business services sector.

NLSY Data and Variable Description

The data used here is a sub-sample culled from the Geocode version of the National Longitudinal Surveys of Youth (NLSY79) for the period 1984 through 1996. The NLSY Geocode dataset contains geographic identifiers such as state and standard metropolitan statistical area (SMSA) of residence for each NLSY respondent. The Geocode version also contains information on state and standard metropolitan statistical area (SMSA) unemployment rates for individuals residing in those respective areas. An advantage of using the Geocode version of the NLSY79 macroeconomic spatial variables is that it helps improve the estimation precision of the reduced-form equations (increased variation in the alcohol tax variable–from region to state level). The NLSY79 is a nationally representative sample of 12,686 young men and women who were 14-22 years old when they were first surveyed in 1979 with the latest year being 2000. These individuals are now in their late 20s, 30s and 40s, and have been personally interviewed 19 times over two decades. These individuals were interviewed annually from 1979 to 1994 and biennially from 1996 to the present. The NLSY79 over-sampled Hispanics, Non-Hispanic blacks, economically disadvantaged youth, and active duty members of the military. [63] For the main variables of interest, tenure, earnings and alcohol consumption, there is information on the first two variables for all the period under consideration. With regards to the latter, there are 8 survey years (1982, 1983, 1984, 1985, 1988, 1989, 1992, and 1994) with questions on alcohol but since this study focuses on the period between 1984 and 1996 the survey years for which alcohol questions are used are 1984, 1985, 1988, 1989, 1992, and 1994. The longitudinal nature of the NLSY79 helps provide a certain measure of variation in respondents' alcohol behavior vis-à-vis their socioeconomic outcomes over a considerable period. In addition, the NLSY79 contains information on the respondents' education, religious affiliation, social attitudes and aspirations and other demographic variables.

[63] The overall unbalanced panel for the NLSY (1984-1996) is n = 12,686 and t = 12. Again, the estimation algorithms in STATA adjust the total counts using $\Sigma_{i=1}^{n} T_i$ instead of nT to account for the total number of observations and proper variances and F tests are computed as well.

Table 10: Description of Selected NLSY Variables

Variables	Definition
Dependent Variables	
Survival Time	Time until employment ends with employer (weeks)
Censor	End of Duration
Earnings	Total wages and salaries
Independent Variables	
Abstainer	Less than 1 drinking days per week
Light	Between 1and 2 drinking days per week
Moderate	Between 2 and 5 drinking days per week
Heavy	Greater than 5 drinking days per week
Alcohol Tax	States' weighted-average states' tax rate
Age	Age in years
Sociability[64]	Personality trait (introversion), Likert-scaled 1-4
Married	Equal to 1, if Married, 0 otherwise
Education	Number of years of Education
Female	Equal to 1, if Female, 0 otherwise
Non-White	Equal to 1, if Black or Hispanic/Other, 0 otherwise
Professional Services (SIC 700-890)	Equal to 1, if Industry is in SIC 700-890, 0 otherwise
Light* Female; Moderate* Female; Heavy *Female	Interaction terms
Light*Non-White; Moderate*Non-White; Heavy*Non-White	Interaction terms
Period Dummies	1985-1996

Major Variables

Table 10 provides a brief description of the variables used in this essay. The main variables of interest are time (tenure in weeks), earnings and alcohol consumption. The dependent variable under the first empirical methodology is time until employment ends with an employer and the dependent variable under the second empirical methodology is log earnings. Both employment tenure and earnings are significant determinants of labor market success. Employment tenure in the NLSY79 dataset refers to the total tenure or length of tenure with an employer in weeks. The respondent's employment tenure with

[64] The NLSY question pertaining to this variable has been provided in the appendix as well.

each employer is reported up to the most current survey year and thus it is cumulative through contiguous survey years, beginning on the first date the respondent reports working for the employer (the start date) and ending on the date the respondent reports leaving the employer (the stop date). If a respondent started working for an employer before or on the date of last interview, tenure since the date of last interview is added to the already existing time to reflect total tenure. If the respondent is working for the employer on the current interview date, the stop date is set to the current date. If the respondent reports working for this employer at the next interview, tenure between interviews is added to the total tenure of that particular respondent.

The average tenure for the overall sample is about 223 weeks. On average, Whites have slightly longer employment duration than Non-Whites (about 227 weeks versus 216 weeks). In contrast, professional business services workers have slightly shorter employment duration than other workers (about 220 weeks versus 225 weeks). There were no marked differences with regards to the four regions. Descriptive statistics on median duration of employment from the Kaplan-Meier estimate is provided at the beginning of the first empirical methodology section (duration analysis) and in the appendix, Table C1 and Figure C1 through Figure C7. The earnings measure used in the second half of this essay is total income from wages and salary before taxes during the past calendar year.

Table 11: Means of Selected NLSY Variables, Total Sample and Drinking Status

Variable	**Total Sample**	**Alcohol Use**			
		Abstainers	*Light*	*Moderate*	*Heavy*
Earnings	18,629	15,532	16,642	20,891	15,722
	(75,206)	(48,900)	(48,528)	(94,678)	(13,477)
Tenure	223.97	223.96	223.31	225.01	213.73
	(77.17)	(78.41)	(77.24)	(76.73)	(77.72)
Abstainer	0.13				
	(0.34)				
Light	0.33				
	(0.47)				
Moderate	0.51				
	(0.50)				
Heavy	0.03				
	(0.17)				
Age	29.47	29.76	29.32	29.50	29.56
	(4.20)	(4.26)	(4.21)	(4.17)	(4.20)
Alcohol Tax	1.54	1.58	1.54	1.54	1.56
	(0.28)	(0.29)	(0.27)	(0.27)	(0.27)
Less Social	0.26	0.30	0.26	0.25	0.26
	(0.44)	(0.46)	(0.44)	(0.43)	(0.44)
Social	0.55	0.50	0.56	0.55	0.51
	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)
Very Social	0.18	0.17	0.16	0.19	0.22
	(0.38)	(0.38)	(0.37)	(0.39)	(0.42)
Female	0.50	0.62	0.57	0.43	0.28
	(0.50)	(0.49)	(0.50)	(0.50)	(0.45)
Non-White	0.25	0.40	0.30	0.28	0.34
	(0.44)	(0.49)	(0.46)	(0.45)	(0.47)
Education	12.80	12.72	12.69	12.95	11.95
	(2.42)	(2.34)	(2.37)	(2.45)	(2.30)
Professional Business Services Firms	0.36	0.39	0.38	0.34	0.28
	(0.48)	(0.49)	(0.48)	(0.48)	(0.45)
Observations	117,359	15,404	39,353	60,328	3,652

The earnings variable is measured in current dollar amounts. It is hypothesized that individuals with higher stocks of social capital due to varying levels of alcohol consumption may experience improvements in earnings in the labor market. The summary statistics indicate that the average earnings in the sample are around $18,630, with moderate drinkers having slightly higher than average earnings ($20,891). The average earnings among White respondents were $19,544 versus $16,529 for Non-Whites. On average there were no significant differences between respondents from the professional business services sector and other sectors of the economy ($18,306 versus $18,809). As expected, the average earnings for respondents from the south were the lowest among all the four regions ($16,433), as compared to the Mid-West ($17,376) Northeast ($24,199) and West ($19,324).

As outlined above, alcohol consumption may affect socioeconomic outcomes (tenure, earnings, etc.) through its effect on health and/or social capital. In particular, it is assumed that improved social skills will in turn lead to better labor market outcomes such as longer job tenures and better earnings.[65] Socioeconomic outcomes may also affect individuals' alcohol consumption behavior, if alcohol is a normal good. That is, individuals may spend more on alcohol or alcohol related behaviors with increases in income (Petry 1995). The alcohol measure in the NLSY79, "number of drinking days per week" reflects the respondents' drinking pattern and frequency and this measure mirrors those in the National Health Interview Surveys (NHIS). Regarding the alcohol variable used in this section, NLSY respondents were asked the following question; "during the last 30 days, on how many days did you drink any alcoholic beverages, including beer, wine, or liquor?" The "number of days drank in last week" variable was created from this variable ("number of days drank in last month" divided by four weeks). The choice of this particular measure adopted for this research was due in part to NLSY question's focus on the frequency of drinking (Dawson and Room 2000; Mukamal et al. 2003). Four

[65] Skog (1980) argues that moderate alcohol drinkers have stronger social networks than non-drinkers and other classes of alcohol drinkers.

alcohol categories are then created from the alcohol variable, abstainers, light, moderate and heavy drinkers. In general, abstainers are individuals who reported consuming fewer than 12 drinks during the previous year which works out to a quarter of a drink per week (Dufour et al. 1990; Dawson and Room 2000 and; Williams and DeBakey 1992). On average, White respondents outnumber Non-Whites among the four alcohol categories. Also, workers in the professional business services sector are vastly outnumbered in all drinking categories.

Again, to ascertain the robustness of the model and the appropriateness of the classification relied upon in this research, the drinking variable is further partitioned into five categories as abstainers, light, low moderate, moderate and heavy drinkers. Thus the abstainer category now reflects respondents who answered “no” to the binary alcohol question (“do you ever drink any alcoholic beverage such as beer, wine, or liquor?”). The results of the model with these five alcohol measures are reported in the appendix for comparison. Additional summary statistics delineated by regions, sectors and ethnicity are provided in the appendix, Table C2 and Table C3.

The identifying instrument for the first-stage multinomial alcohol equation is the states’ weighted-average alcoholic beverage tax rate. The alcohol measures may potentially be a choice variable given that the decision by the individual to consume some amount of alcohol may be determined by other factors. The estimated coefficient from a regression of wealth on alcohol may be biased if such endogeneity is not accounted for in the model (MacDonald and Shields 2001). Most recent data for the states’ alcohol tax rates were downloaded from the Tax Policy Center’s website. The early editions of the excise tax data were then electronically scanned from the Tax Foundation publications

(1988-1996). The Geocode version of the NLSY allows the researcher to aggregate the alcoholic beverage tax rates by state. This aggregated tax data are then weighted to reflect the annual volume of ethanol consumption (measured in ‘000s of gallons) in each state from 1984–1996. A drawback to using the alcohol tax as an instrument is that drinkers may not be responsive to changes in alcohol prices and unmeasured factors may be correlated with the tax on alcoholic beverage.

Yet a number of studies in the literature suggest that the alcohol tax is an appropriate identifying instrument for handling endogeneity (Chaloupka and Wechsler 1996) . The summary statistics indicate that states in the South had the highest tax rate on alcoholic beverages at $1.77 per gallon versus $1.34 per gallon in Mid-West, the lowest among the four regions. These averages reflect attitudes toward morality with the “Bible Belt” having the most stringent “Sin Tax.” A number of demographic and socioeconomic variables such as age, gender, marital status, occupation, firm size and multiplicative terms are included to ascertain the robustness of the models but some of these were statistically insignificant and in a few cases adversely affected the precision of the estimates. Again the summary statistics for selected variables are in included in Table 11, Table C2 and Table C3.

Alcohol Consumption and Employment Duration: Evidence from Survival Analysis

The dependent variable under this duration analysis is time until an individual leaves a job (duration of tenure in weeks). The Kaplan-Meier estimate at survival time t, calculates the product limit of the survival function and reflects the number of individuals surviving in employment at time t relative to the number of individuals at risk of falling out of employment at time t.[66]

$$\hat{S}(t_j) = \prod_{j|t_j<t} \left(1 - \frac{d_j}{n_j}\right) \tag{14}$$

The graph of the Kaplan-Meier non-parametric estimator also provides a summary measure of the instantaneous probability of experiencing the event of interest, losing a job and the survival rate of holding onto one's employment. Figure C1 in the appendix is the K-M survival estimate which plots respondents' employment duration (in weeks) for the period under review. Each downward step gives an indication of the proportion of respondents failing at that particular point in time. The median survival time is 84 and 38,391 subjects experienced the event of interest which represents about 32.33 percent of the subjects at risk of experiencing the event of interest. From Figure C4, the median survival time is about of 170 weeks for Whites and about 55 weeks for Non-Whites. Note that survival curves closer to the origin fail faster than those curves

[66] Note: d_j is the number of individuals transitioning out of employment at time t_j and n_j is the number of individuals with censored and completed spells who are at risk of transitioning out of employment immediately prior to time t_j.

that are further away from the origin. In terms of drinking status, abstainers fail faster than all the other categories followed by heavy drinkers, moderate drinkers and light drinkers.

Figure C2, shows a hazard curve that rises and falls over the course of the period under review. The hazard declines and rises from time $t0$ to around the 50-week mark. This period is normally the probationary period, for the parties to decide whether to continue the contractual agreement or employment relationship. The hazard declines thereafter, levels off and rises again, past the 200-week mark. The Nelson-Aalen cumulative hazard function (Figure C3) rises from time $t0$ and is never decreasing. This function assesses the total amount of accumulated risk (becoming unemployed) that an individual indexed by i has faced from the beginning of time $t0$ to the present. Analogous interpretation can be applied to the rest of the survival and hazard function for the selected categorical variables. K-M survival estimates by region (not reported) suggest that respondents in the South tend to have shorter employment duration. This may reflect the relatively tough policies on drinking in many counties in the southern part of the country ("dry counties"). Also notice that the short employment duration might be attributable to policies in this part of the country which makes it relatively easy to dismiss an employee or make it easier for the employer to end the employment relationship.

Duration Analysis-Parametric Estimation (AFT)

A parametric approach can be used to model the duration of employment in the accelerated-failure-time form and the hazard $h(t)$ of the general parametric model is:

$$h(t) = \frac{f(t)}{S(t)} \tag{15}$$

The numerator is the probability density function $f(t)$ and it is the probability of the event of interest (falling out of employment) occurring within a differentiable time span

$$f(t) = \lim_{\Delta t \to 0} \frac{\Pr(t \le T \le t + \Delta t)}{\Delta t} = \frac{\partial F(t)}{\partial t} = -\frac{\partial S(t)}{\partial t}, \tag{16}$$

where Δt is a very small (infinitesimal) interval of time and the change in t is similar to the unconditional probability of having a spell of length exactly t. That is, leaving a state in a tiny interval of time $[t, t + \Delta t]$. The survival counterpart to the above is:

$$S(t) \equiv 1 - F(t) = \exp\left[-\int_0^t h(t)\, dt\right] \tag{17}$$

And in continuous time this implies:

$$h(t) = \lim_{\Delta t \to 0} \frac{\Pr(t \le T \le t + \Delta t \mid T \ge t)}{\Delta t} \tag{18}$$[67]

Integrating the above hazard leads to:

[67] Although most economics data such as the HRS and the NLSY are measured in discrete time, in general if this interval is in the limit infinitesimally small, the discrete time hazard function tends to the continuous time hazard, and the discrete time survivor function tends to the continuous time survivor function.

$$H(t) = \Lambda(t) = \int_0^t h(t)\, dt \qquad (19)$$

This is the integrated hazard, which is the cumulative hazard overtime and its particular relationship with the survival function is that $H(t) = -\ln[S(t)]$. Since the interest of this essay lies primarily in understanding the duration of employment, the regression model will be specified as the natural logarithm of time of duration of employment:[68]

$$\ln(t_i) = \beta' X + \varepsilon_i \qquad (20)$$

here vector X summarizes both the time-invariant covariates (sex, race, etc.) and time-varying covariates (drinking status, education, age, etc.) for each respondent.[69] Depending on the distributional assumptions made about the error term u_i ($\varepsilon_i = \ln(u_i)$), one can resort to an exponential, weibull, gompertz, gamma or log-logistic model.[70] For instance, if the error term u_i has an extreme value density, the weibull duration model is appropriate; if the error term u_i has a three parameter gamma density, the generalized gamma duration model is appropriate; if the error term u_i has a logistic density, then the log-logistic model is appropriate. Estimation of parameters of interest (β) in the above

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[68] The logarithmic transformation ensures that the predicted values of time are positive. Also note that AFT specification reflects the distribution of duration time rather than the distribution of the error term.

[69] Alternatively, the duration t_i could be specified in a general format as: $t_i = \exp(\beta' X) * u_i$ with $\varepsilon_i = \ln(u_i)$.

[70] Due to slower computing rate, the gamma models did not achieve convergence and hence were not estimated. Although earlier preliminary versions showed that the gamma, log-logistic and weibull were not significantly different from the other

model is accomplished via standard maximum likelihood methods (Greene 2002) and with some effort it can be easily implemented in statistical packages such as STATA.

Generally, the log-likelihood function, which allows for censoring of a sample of n individuals indexed by $i = 1, \ldots, n$ with duration t_i, is:

$$\ln L = \sum_{i=1}^{N} [c_i \ln f(t) + (1 - c_i) \ln S(t) + \ln S(t)] \qquad (21)$$

Where c_i, is a censoring indicator defined such that:[71] $c_i = \begin{cases} 1 \; if \; spell \, is \, complete \\ 0 \; if \; spell \, is \, censored \end{cases}$

Results from Duration Analysis-Parametric AFT Models

A major advantage of the parametric duration models is that they can be estimated using standard maximum likelihood techniques. For a given covariate X_k the time ratio is $\equiv \dfrac{E(\ln(t) \mid X_k, \hat{\beta}_k)}{E(\ln(t) \mid X_k + 1, \hat{\beta}_k)} = \exp(\hat{\beta}_k)$. Note that a positive coefficient implies that an increase in the regressor leads to an increase in the duration of time, which corresponds to a decrease in the hazard rate. In the case of dummy covariates, a positive coefficient implies that a movement from 0 to 1 leads to increases in the duration of employment.

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[71] $L = \prod_{i=1}^{n} L_i \quad = L_i = [f(t_i)]^{c_i} [S(t_i)]^{1-c_i}$

$L = \prod_{i=1}^{N} [f(t_i)]^{c_i} [S(t_i)]^{1-c_i}$, and taking logs of this equation leads to the equation above.

Specifically, a positive and statistically significant coefficient (exponentiated coefficient greater than unity) under the weibull and log-logistic metrics implies an increase in the survival rate. Under the log relative hazards, a negative and statistically significant coefficient (exponentiated coefficient less than unity) from the weibull and gompertz estimates implies a decrease in the hazard rate.[72] The gompertz model is available only in the log relative hazards mode in STATA while the log-logistic model is available only in the AFT metrics so for the ease of exposition, the weibull and gompertz log relative hazards are provided in Table C16 and Table C17 of the appendix for comparison. The main results with robust standard errors are presented in Table 13 through Table 14, at the 99 percent, 95 percent and 90 percent confidence levels. Table 12 present estimates from the first-stage multinomial logit equations with the outcome variables being the respondents' drinking status (abstainers are the reference category).[73] Again, the multinomial logit (MNL) approach has been relied upon in estimating the first-stage drinking status (see Hamilton and Hamilton 1997; Barrett 2002).

[72] Again, the hazard ratios or time ratios, offers a gauge of the magnitude of the covariate effect that is more intuitive than the coefficient value. For dichotomous variables, the time ratios can be interpreted as the percent change in the estimated survival for a value of one to a value of zero, all other things being equal.
[73] Details on how the categorical alcohol variable was constructed are available in the appendix. This first-stage equation is intended to correct for potential endogeneity of the alcohol measures. Also expositions on the MNL model are provided in the technical appendix.

Table 12: First-stage Multinomial Logit Estimates (Dependent Variable–Alcohol Status)

	Light	Moderate	Heavy
Alcohol Tax	0.660***	0.636***	0.750***
	(0.028)	(0.026)	(0.061)
Less Social	0.975	1.126	1.390*
	(0.075)	(0.085)	(0.240)
Social	1.234***	1.423***	1.619***
	(0.094)	(0.106)	(0.277)
Very Social	1.075	1.438***	2.135***
	(0.084)	(0.110)	(0.370)
Non-White	0.669***	0.606***	0.764***
	(0.014)	(0.012)	(0.031)
Age	0.999	1.132***	1.056
	(0.033)	(0.036)	(0.068)
Age-square	1.000	0.998***	1.000
	(0.001)	(0.001)	(0.001)
Female	0.804***	0.468***	0.263***
	(0.016)	(0.009)	(0.011)
Education	0.986***	1.040***	0.888***
	(0.004)	(0.004)	(0.006)
Period Dummies	Yes	Yes	Yes
Observations	105,345	105,345	105,345

Robust standard errors in parentheses correspond to unexponentiated coefficients * significant at 10%; ** significant at 5%; *** significant at 1%. Note: Multinomial Logit (MNL) estimates are Relative Risk Ratios (RRR) and coefficients can be interpreted as $[\exp(\beta)-1]*100 =$ percentage change.

In Table 12, clearly the exponentiated coefficients are statistically significant and less than unity, implying that the alcoholic tax rate negatively affects alcohol consumption habits. In particular, drinkers are approximately twice as likely to reduce their intake of alcohol with an increase in the average tax rate as compared to total abstainers. In general, minorities are less likely to drink lightly, moderately or heavily as compared to abstaining completely from alcohol. The results also indicate that women are less likely to belong to any of the above-mentioned alcohol categories versus the reference category, total abstention. The results from the first-stage multinomial regression are in line with most of the current literature in terms of the sign on the coefficients for the drinking measures when alcohol tax is used as the identifying instrument.

Table 13: AFT Estimates (Dependent Variable-Time Until Employment Ends)

	Weibull	Log-logistic
Light	1.968***	2.137***
	(0.032)	(0.041)
Moderate	2.443***	2.683***
	(0.040)	(0.050)
Heavy	1.915***	2.010***
	(0.077)	(0.090)
Age	1.094***	1.092***
	(0.002)	(0.002)
Female	0.676***	0.646***
	(0.009)	(0.009)
Non-White	0.702***	0.673***
	(0.009)	(0.010)
Education	1.021***	1.022***
	(0.001)	(0.001)
Firm Size	1.000***	1.000***
	(0.000)	(0.000)
Unemployment Rate	1.023***	1.028***
	(0.007)	(0.008)
Observations	105,345	105,345

Robust standard errors in parentheses correspond to unexponentiated coefficients * significant at 10%; ** significant at 5%; *** significant at 1%.

In Table 13, the coefficients on the alcohol measures (light, moderate and heavy) from the parametric survival estimates presented under the weibull, log-logistic AFT metrics, all have positive and statistically significant coefficients. For instance, under both the log-logistic and weibull model, moderate drinkers are two and half times as likely (exponentiated coefficient of 2.44 and 2.68) to have longer employment duration as equally situated individuals who abstain from alcohol consumption. Similarly drinking lightly or heavily increases the survival rate of employment for individuals using the weibull and log-logistic AFT metrics (1.97 and 2.14 versus 1.92 and 2.01, respectively) which is to say it decreases the hazard of shorter employment under the log relative hazards metric of the weibull and gompertz models in the appendix (Table C16 and Table C17). The sign on the coefficients on the rest of the variables in the model were as expected and were statistically significant. Age, education, firm size and the unemployment rate, all increase the duration of employment under the weibull and log-logistic AFT metric. For instance, the older the individual the less likely she will opt for a job change which works to increase employment duration.

Furthermore, individuals working at larger firms tend to have longer survival rates since larger firms also tend to have higher survival rates than smaller firms. The rationale is that larger firms have a better ability to withstand adverse economic shocks, perhaps due to relatively good credit ratings and scale economies than smaller firms (Olley and Pakes 1996). Increased large firm survivability in turn affects internal jobs and the duration of such jobs, so we would expect a positive relationship between firm size and employment duration. The results also indicate that the unemployment rate is positively related to employment duration suggesting that during times of economic downturn individuals are less likely to leave their jobs or less willing to engage in activities that might cause dismissals. In contrast the exponentiated coefficients on the gender (Female) and ethnicity (Non-Whites) variables are all less than unity under the weibull and log-logistic models, implying decreases in the duration of employment or, alternatively, an increase in the hazard of shorter employment duration. In particular, women and Non-Whites tend to have shorter employment duration as compared to their equally-situated Male and White counterparts.

The associated graphs of the baseline hazard and survival functions evaluated at the means of the explanatory variables of the weibull and log-logistic AFT models, as well as the gompertz log relative hazards mode, are presented in Figure C8 through Figure C13.[74] The plots reflect the survival experience of a respondent with a covariate pattern equal to the average covariate pattern in the sample. The estimated survivor functions provided in Figure C8 through Figure C13 are not significantly different from each other under all three parameterizations but that of the gompertz model is slightly different or steeper. With regards to the estimated hazard functions, the weibull baseline hazard looks almost identical to the gompertz baseline survival function, which is not unusual. In contrast, the estimated hazards are distinct from each other, with the weibull and gompertz models exhibiting monotonically increasing hazards. The shape parameter p from the weibull estimate indicates that the hazards are falling over time with p greater than 1 (p = 1.009). The shape parameter reflects changes in the hazard $h(t)$ over time. That is, the shape parameter indicates whether the hazard $h(t)$ is falling, rising or constant over time and has implications for the choice of parametric duration model. The log-logistic model exhibits a non-monotonic hazard, rising initially then falling thereafter. For the log-logistic model the shape parameter γ is also close to 1 but not exactly 1 (γ = .818), indicating a baseline hazard function that first rises and then falls. The log-logistic metric provides the best overall fit of the model.

[74] The ML algorithm for the estimates using gamma distribution will not converge under that particular model specification. Earlier estimates indicated that the gamma distribution is not distinctly different from the weibull and log-logistic distributions.

Table 14: AFT –IV Estimates (Dependent Variable-Time Until Employment Ends)

	Weibull	Log-logistic
Light	0.016***	0.010***
	(0.006)	(0.004)
Moderate	85.083***	64.355***
	(30.397)	(26.009)
Heavy	0.016***	0.006***
	(0.013)	(0.006)
Age	1.071***	1.069***
	(0.002)	(0.002)
Female	1.506***	1.439***
	(0.087)	(0.090)
Non-White	0.838***	0.785***
	(0.021)	(0.022)
Education	1.020***	1.021***
	(0.001)	(0.001)
Firm Size	1.000***	1.000***
	(0.000)	(0.000)
Unemployment Rate	1.001	1.010
	(0.007)	(0.007)
Observations	105,345	105,345

Robust standard errors in parentheses correspond to unexponentiated coefficients * significant at 10%; ** significant at 5%; *** significant at 1%. Note: alcohol measures from the endogeneity-corrected models are in logarithms, coefficients are interpreted as $\Delta t = (\beta_k / 100) * \Delta$ *alcohol measure*.

The model presented in Table 13 is re-estimated to control for endogeneity and the results are presented in Table 14. Again coefficients that are greater than unity (positive) and statistically significant lead to increases in survival rates of employment while coefficients that are less than unity (negative) and statistically significant lead to increases in the risk of experiencing the event of interest (becoming unemployed) given that the individual has survived up to time t. The exponentiated coefficients on the light, moderate and heavy drinking measures under the weibull and log-logistic parameterizations are surprisingly different with the instrumental variables regression. In particular, drinking as opposed to abstention is now associated with decreases in the duration of employment. For instance, under the weibull and log-logistic metrics the exponentiated coefficients on the drinking measures are all less than unity, indicating drinking reduces the length of employment. The sign of the coefficients on the rest of the variables are as expected, except that of Female which is now positive (greater than unity) instead of negative indicating that women are more likely to have longer employment duration than their equally situated male counterparts. The estimates via instrumental variables regression seem to be less precise as compared to the model in Table 13. Also the effects of unemployment rate on the duration of employment are now statistically insignificant.

Moreover, these findings changed but not significantly with the abstainers category partitioned into lifetime abstainers and infrequent drinkers (less than one drinking day per week), the exception is that under the weibull model in the instrumental variables approach, moderate drinking is now positively associated with longer employment duration (see Table C20 through Table C22). The alcohol tax is still negative and statistically significant in the first-stage model. In addition to these tables, the results of the test of differences between the estimated alcohol coefficients and the test of joint significance for the alcohol measures using the three and four alcohol classifications are provided in the appendix (Table C23). With regards to the regression with four alcohol categories, the test indicates that the light and heavy drinking measures are not significantly different from each other under the instrumental variables approach as well as the models without controls for endogeneity. Yet the alcohol measures are jointly significantly different from zero. A similar pattern arises in the regression with the five alcohol categories, in that the low-moderate and heavy drinking measures are not significantly different from each other under the instrumental variables approach as well as the models without controls for endogeneity. Again, the alcohol measures are jointly significantly different from zero.

Chapter II argues that alcohol consumption affects socioeconomic outcomes through its effects on social capital (indirect effect) thus providing the rationale for excluding social capital measures as additional regressor in the models in Table 13 and Table 14. The assertion is that if one controls for the effects of social capital in the model then there should be no effect whatsoever of alcohol consumption in a regression of time (employment duration) on alcohol consumption. Yet evidence exists to suggest that alcohol consumption may also affect socioeconomic outcomes directly since it may impact cognitive ability and elation or mood thus influencing productivity and reliability (Block et al. 1990). Therefore, we may observe an effect of alcohol consumption on the outcome variable (time) even with the inclusion of social capital measures. Table C4 and Table C5 in the appendix present results of models with social capital (sociability) included as an additional regressor to ascertain the possible direct effects of alcohol consumption on labor market outcomes. In Table C4, the alcohol measures (light, moderate and heavy) from the parametric survival estimates presented under the weibull, log-logistic AFT metrics, all have positive and statistically significant coefficients. For instance, under both the log-logistic and weibull model, moderate drinkers are twice as likely (exponentiated coefficient of 2.07 and 2.17) to have longer employment duration as equally situated individuals who abstain completely from alcohol consumption. Similarly, drinking lightly or heavily increases the survival rate of employment tenure using the weibull and log-logistic AFT metrics (1.73 and 1.83 versus 1.78 and 1.77, respectively). The coefficients on the social capital variables are largely statistically insignificant except under the log-logistic AFT metric, implying that sociability either does not improve the length of employment duration or it has no effect on the duration of employment. Note that the reference category is not social (lesser degree of sociability). The sign on the coefficients on the rest of the variables in the model were as expected and were statistically significant. Age, education, firm size and the unemployment rate, all increase the duration of employment under the weibull and log-logistic AFT metric. For instance, the older the individual the less likely she will opt for a job change which works to increase employment duration.

The instrumental variables counterpart in Table C5 indicates that under the weibull model moderate drinkers are twice as likely (exponentiated coefficient of 2.75) to have longer employment duration as equally situated individuals who abstain from alcohol consumption. The effects of moderate drinking are somewhat smaller under the log-logistic model in that moderate drinkers are only about 1.29 times as likely to have longer employment duration as equally situated individuals who abstain from alcohol consumption. In contrast, drinking lightly or heavily decreases the survival rate of employment using the weibull and log-logistic AFT metrics. The coefficients on the social capital variables are all statistically significant except under the weibull and log-logistic AFT metrics, implying that sociability may actually reduce the duration of employment. This latest results may suggest that the social capital measures may not have adequately captured the sociability components of alcohol consumption in the model (e.g., the social capital measures are constant). The sign of the coefficients on the rest of the variables in the model were as expected (except that on the gender variable) and were statistically significant (except that on the race variable under the weibull model). Again, the results from the instrumental variables survival models are less precise as compared to the previous model. Also, an alternative specification of the benchmark model estimated with predicted variables from an ordered logit model are presented in Table C18 and Table C19 in the appendix and those are somewhat imprecise.

To examine the extent to which groups vary in their outcomes with respect to employment duration, the benchmark model is re-estimated by gender and race. These results are presented in Table C6 through Table C9 in the appendix. The estimates by gender in Table C6 indicate that the exponentiated coefficients of the alcohol measures are all positive and statistically significant implying drinking increases employment duration for both men and women.[75] The exponentiated coefficients on the rest of the variables have the expected sign and are all statistically significant except that of unemployment rate for women. In comparison, Tekin (2004) found an inverse U-shaped relationship between employment and alcohol consumption for both men and women via cross-sectional results. This inverse U-shaped relationship disappeared for men and diminished for women once unobserved heterogeneity has been controlled for in the model. The instrumental variables regression estimates by gender in Table C7 suggest an inverted U-shaped relationship between drinking and employment duration for only women. In particular, the coefficient on the moderate alcohol measure is positive and statistically significant. In contrast, the coefficient on the moderate alcohol measure for men is now negative and statistically significant. Clearly, when one accounts for

[75] Independent means t-test (two-tailed) between male and female indicates that the groups have different means.

endogeneity the effects of drinking moderately on employment duration are no longer positive.

Table C8 examines the racial differences in employment duration given the individual's alcohol consumption status. In general, the results for Whites and Non-Whites are in line with the previous estimates, that is, drinking leads to longer employment duration. The coefficients on the major variables under Whites and Non-Whites model have the expected signs and are statistically significant except that on firm size which is positive but statistically insignificant. In Table C9, the effects of drinking on employment duration are in general negative for both Whites and Non-Whites. The exception is that Non-Whites who drink moderately are several times more likely to have longer employment duration. Again, the estimates are somewhat imprecise and in particular the exponentiated coefficient on the female variable is greater than unity and statistically significant.

Another focus of this essay is its examination of the effects of alcohol consumption on labor market outcomes in the professional business services sector. The rationale for such a focus is that social capital may be critical to labor market success for individuals who work in sectors of the economy that rely heavily on trust and informal information sharing such as those in the professional business services sector. Thus, if social drinking is a critical component of labor market success, then drinkers who work in this sector may be at an advantage in comparison to non-drinkers. To ascertain the extent to which alcohol plays a role in determining labor market outcomes in this sector, the benchmark model presented in Table 13 and Table 14 was re-estimated separately by professional business services and non-professional business services sectors.[76]

Table C10 and C11 presents a model that attempts to test the above-mentioned hypothesis. A re-estimation of the previous model by industry with the alcohol measures as the key right-hand side variable of interest did not change the results in any significant way. In particular, the coefficients on the categories of the alcohol variable are positive (exponents greater than unity) and statistically significant under the two AFT metrics. Surprisingly, the impact of drinking on the duration of employment from the professional business services sector is not noticeably different from that of the non-professional business services sector. Individuals who drink are approximately twice as likely to have longer employment duration as non-drinkers. The coefficients on the rest of the variables are statistically significant and have the expected sign and their interpretations are analogous to those in the previous sections.

In Table C11, the instrumental variables estimates indicate that the coefficients on heavy drinking are positive and statistically significant (exponentiated coefficient of 38.8) in the professional business services sectors while the coefficients on moderate drinking are positive and statistically significant (exponentiated coefficient of 2.77) in the non-professional business services sectors. The result implies positive returns to drinking heavily in the professional business services sector in terms of employment duration. Similarly, there are positive returns to moderate drinking in the non-professional business services sector. With regards to these latest estimates, modest weight should be placed on

[76] The log-logistic metric presents the best overall fit of the model so the estimates by professional business services and race are via the log-logistic AFT metric

this latest instrumental variables result since the estimates are somewhat imprecise, with wrong signs on the coefficients of gender and education.

Alcohol consumption patterns persist over time, suggesting that current drinking may proxy for long-term alcohol consumption patterns (Cook and Moore 2002). Nevertheless, the previous models are re-estimated with lagged variables of the alcohol measures to present a more balanced picture of the effects of alcohol consumption on employment duration. Table C12 and Table C13 in the appendix, presents the results from this latest estimation. Again, the magnitude and statistical significance of the coefficients on the lagged and current versions of the alcohol measures provide evidence with regards to the effect of alcohol consumption on employment duration. In Table C12, the coefficients on the lagged and current versions of the alcohol measures indicate that the total effects of alcohol consumption on employment duration is even pronounced when the effects of the past alcohol consumption pattern of the individual are taken into account. In particular, under both the weibull and log-logistic AFT metrics, drinkers are about four times as likely to have longer employment duration as individuals who abstain from alcohol consumption. In contrast, the effects of alcohol consumption on employment duration are negative for heavy drinkers when past influences of alcohol consumption and the endogeneity in the alcohol measures are taken into account. In particular, taking into consideration the endogenous and persistent nature of alcohol consumption, the total effects suggest that individuals who drink lightly or moderately are more likely to have longer employment duration as opposed to abstaining.

Table C14 and Table C15 in the appendix presents estimates with multiplicative terms to ascertain the multiplicative influence of the other variables on the effects of alcohol consumption on employment duration, the latter, with instrumental variables. In Table C14, the results indicate that the effects of moderate drinking on employment duration tend to decrease if the individual is a minority or female, which seems plausible. In contrast, the effects of light or heavy drinking as opposed to abstention on employment duration tend to decrease for females but increases if the individual is a minority, which seems implausible. Note that coefficients greater than unity on the interaction terms leads to increases in the effects while coefficients less than unity decreases the effects. Also, the effects of the respective alcohol category on employment duration can be evaluated at the mean values of the moderating variables.[77] In Table C14, age has a diminishing effect on employment duration (note $\beta_{age} > 0, \beta_{age^2} < 0$). The only additional variable included in the model aside from the multiplicative terms is the size of the respondents' family and clearly it has a decreasing impact on the duration of employment. Table C15 presents the instrumental variables version and although some of the estimated coefficients retain their sign and statistical significance, adding the multiplicative terms as additional regressors in the instrumental variables version compounded the imprecision of the estimates. In particular, the coefficients on the alcohol variables have the wrong signs. The rest of the results are provided in the appendix. Again, alternative estimations via ordered logit specification are provided in the appendix for the first-stage model (Table C18) and the benchmark model in Table 13 (Table C19). The variables of interest in both the first stage equation and the benchmark model retain their signs and statistical significance. In particular the state' weighted-average alcohol tax has a negative sign in Table C18 and the moderate drinking measure has a positive sign in Table C19, both are

[77] (Example: $\Delta t = (\beta_{\text{mod}} + \beta_{\text{mod}*race} Nonwhite + \beta_{\text{mod}*gender} Female)$.

statistically significant. Overall, the instrumental variable estimates relying on the ordered logit approach are less precise in comparison to the multinomial logit approach.

Alcohol Consumption and Earnings: Evidence from Panel Data

To investigate the relationship between alcohol consumption and earnings, the panel data method employed in Essay I is employed for this analysis. Panel data methods, unlike cross-sectional or time-series methods, allow increased precision of the regression estimates and reduce the collinearity among the explanatory variables. Panel data methods also allow the researcher to model temporal effects without aggregation bias, as well as control for omitted variables bias or unobserved heterogeneity (individual-specific fixed effects). To illustrate, in an earnings equation where individuals' ability is likely to be unobserved, using cross-sectional data will consign the ability measure to the error term. If ability or some unobserved variable is correlated with the other explanatory variables (e.g. drinking) then OLS will provide biased estimates of the rate of return to alcohol consumption. Thus, the effects of alcohol consumption on socioeconomic outcomes will overstate (understate) the true causal effects of alcohol consumption on earnings. Under such circumstances, if we assume that ability is constant over time but varies across individuals then the ability variable would only be sub-scripted with i and not t. Taking first differences of the equation eliminates the unobservable ability effects and applying OLS to the first differenced model now produces unbiased and consistent estimates of β (the returns to drinking). Again, Baltagi and Li's (1990) version of the Breusch and Pagan (1980) Lagrange multiplier test of $\sigma_{\alpha}^{2} = 0$ is relied upon to choose the appropriate method (OLS versus RE and FE). If there is no individual specific component in the error term then OLS with robust standard errors is efficient. On the other hand, if there is individual specific unobserved heterogeneity in the error term $\sigma_{\alpha}^{2} \neq 0$ then panel data is appropriate depending on the assumptions ascribed to the unobserved heterogeneity term α_i (fixed or random). The null is rejected under the Breusch and Pagan (1980) LM test for random effects; (xttest0) $\sigma_{\alpha}^{2} \neq 0$ implying that RE or FE may be appropriate. The panel data model is formally specified as follows:

$$Earnings_{it} = \beta X_{it} + \pi Alcohol_{it} + \eta_{it} \qquad (22)$$

$$\text{for} \quad i = 1,\ldots,n \; and \; t = 1,\ldots,T$$

here, $Earnings_{it}$ the dependent variable represents the earnings of the ith individual and the vector X_{it} summarizes the observed covariates including an alcohol consumption measure, demographic and economic, as well as, multiplicative terms. Again, the disturbance term η_{it} : ($\eta_{it} = \alpha_i + \varepsilon_{it}$) is assumed to satisfy the Gauss-Markov conditions.[78] The major difference between the two panel data approaches (RE and FE) being used here is the restriction placed on the $E(\alpha_i, X_{it})$. The FE model is relatively inefficient due to the loss of degrees of freedom and the researcher is not able to comment on the time-invariant variables or those variables that only change slowly. On the other hand, the RE model places a restriction on the $E(\alpha_i, X_{it})$, but such a restriction may be untenable. Note

[78] See the empirical section of Essay I for the Gauss-Markov conditions and the structures of disturbance terms ε_{it} and η_{it} .

that both the fixed effects and random effects approach are provided so that the reader can compare the two models. A general Hausman (1978) specification test was carried out to discriminate between FE and RE. The null was rejected under the Hausman (1978) specification, indicating that FE is preferred.

Accounting for the Endogeneity of Alcohol Behavior

The same methodologies used in Chapter IV to address empirical issues such as endogeneity are employed in this chapter as well. For details on the approach readers may refer to the empirical section in Essay I. Again most of these empirical issues are dealt with in STATA. The states' weighted-average alcohol tax is used as the identifying instrument. This procedure is intended to control for the possible endogeneity in the alcohol measures. Potential endogeneity in the alcohol measures may result in biased estimated coefficients. Note that the instrumental variables (IV-2SLS) procedure handles both statistical endogeneity and structural endogeneity, in that it purges the drinking measures of its correlation with the disturbance term, leading to consistent estimates. The alcohol equation (reduced-form equation) is specified as follows:

$$Alcohol_{it} = \theta T_{it} + \beta X_{it} + e_{it} \tag{23}$$

The assumptions from the first essay with regards to the instrumental variable approach holds; the states' tax Tax_{it} has full rank, is of the same dimension as $Alcohol_{it}$ and Tax_{it} is independent of η_{it}, correlated with $Alcohol_{it}$ and independent of $Earnings_{it}$ given

$Alcohol_{it}$ and η_{it}.[79] A Durbin-Wu-Hausman (DWH) test of whether the alcohol variable is actually endogenous and needs to be instrumented was performed in STATA. The null hypothesis is that the OLS estimators are consistent and that the differences between the OLS and IV coefficients are random. A rejection of the null indicates that the endogenous regressors' effects on the estimates are meaningful, and instrumental variables techniques are required. Under the null, the test is Chi-squared distributed with k degrees of freedom, where k is the number of regressors specified as endogenous in the original instrumental variables regression. The null is rejected implying the OLS estimates will be inconsistent. The Hansen's J over identification test statistic designed to verify the validity of the instrument in the alcohol equation is not rejected. Note that parameter estimates for both the OLS and instrumental variables (IV) models are reported to allow for comparison.

Results from Panel Data Analysis

Again, several estimation procedures are used; first, the structural model specified above is estimated via pooled OLS.[80] In the second procedure, the structural model is estimated with the assumption that all the variables in the covariate vector, including the alcohol variable, are completely exogenous. In yet a third procedure, instrumental variables (IV), a first-stage alcohol consumption equation is estimated with the tax price of alcohol as the identifying instrument to correct for the possible endogenous nature of

[79] Note that the exogenous variable, states' weighted-average alcohol tax, used as an instrument does not appear in the structural equation ensuring that the model is identified.
[80] Additional analyses which take into account selectivity-correction in the earnings equation are presented in the appendix.

alcohol consumption and used the predicted value in the structural equation with earnings as the outcome variable. All estimations are implemented via STATA and are presented in Table 15 and Table 16 with robust standard errors.

Table 15: Pooled-OLS, RE and FE Estimates (Dependent Variable–Log-Earnings)

	Pooled-OLS	RE	FE
Constant	6.275***	6.954***	7.885***
	(0.035)	(0.083)	(0.207)
Light	0.071***	0.007	-0.010
	(0.009)	(0.009)	(0.010)
Moderate	0.106***	0.022**	0.000
	(0.009)	(0.009)	(0.010)
Heavy	0.058***	0.029	0.018
	(0.018)	(0.018)	(0.020)
Tenure	0.269***	0.163***	0.147***
	(0.002)	(0.002)	(0.003)
Age	0.010***	0.022***	0.014*
	(0.001)	(0.003)	(0.008)
Female	-0.476***	-0.480***	
	(0.006)	(0.015)	
Non-White	-0.188***	-0.239***	
	(0.006)	(0.018)	
Education	0.119***	0.080***	0.005
	(0.001)	(0.003)	(0.005)
Period Dummies	Yes	Yes	Yes
Observations	110,104	110,104	110,104

Robust standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 15 presents results from the benchmark model under the pooled OLS, RE and FE methods. All right hand side variables with the exception of the alcohol measures, are assumed to be exogenously determined.[81] The pooled OLS estimates of the alcohol measures are all positive and statistically significant. The RE estimates are positive but only statistically significant for moderate and heavy drinkers while the FE estimates are

[81] There could be possible correlation between the social capital measures and unobserved heterogeneity.

positive for moderate and heavy drinkers but statistically insignificant. The estimated coefficients can be interpreted as $\%\Delta Earnings = (100\beta_k) * \Delta\, Alcohol\, measure$. In general, drinking (light, moderate and heavy) increases earnings by about 7 percent, 11 percent and 6 percent respectively via pooled OLS estimates. In comparison, the RE estimates indicate that drinking (light, moderate and heavy) increases earnings by just .7 percent, 2.2 percent and 2.9 percent, respectively though the light and moderate drinking categories are not statistically significant. It can also be seen that the employment tenure is positively associated with higher earnings. An increase in the length of job tenure leads to about 27 percent, 16.3 percent and 14.7 percent increase in earnings for a typical NLSY respondent via pooled OLS, RE and FE estimates, respectively. Also being a woman or a minority is associated with a decrease in earnings. As expected, more years of education and age are all positively correlated with earnings. The FE estimates for the RHS variables of interest were not significantly different from zero.

As in the first essay, the above model is re-estimated via instrumental variables (IV) regression to correct for the possible endogenous nature of the alcohol measures. The results are presented in Table 16. The estimate in the first column ignores the panel nature of the dataset. The coefficients on all the alcohol measures are positive but only statistically significant for moderate and heavy drinkers via OLS, RE and FE approaches. The coefficients are relatively smaller in magnitude than those from the previous estimations. In particular, drinking moderately, as opposed to abstaining, leads to increases in earnings by about 1.8 percent, 2 percent and 1.5 percent via OLS, RE and FE models. It also appears that drinking heavily as opposed to abstaining, leads to increases in earnings by about 5.5 percent, 1.6 percent and 2.7 percent via the OLS, RE and FE approaches. Again the coefficients on the other variables are as expected under all three models.

Although, these findings did not change markedly with the abstainers category partitioned into lifetime abstainers and infrequent drinkers (less than one drinking day per week), in the instrumental variables approach all the drinking measures were negatively associated with earnings via the RE and FE (Table C41 and Table C42). In addition to these tables, the results of the test of differences between the estimated alcohol coefficients and the test of joint significance for these alcohol measures using three and four alcohol classifications are provided in the appendix (Table C43). With regards to the regression with the four alcohol categories, the test indicates that almost all the drinking measures were not significantly different from each other in the models without controls for endogeneity and jointly the FE estimates were not significantly different from zero. In the instrumental variables model, the estimated coefficients of the alcohol measures are jointly significant under both RE and FE, except that the light and heavy alcohol measures via RE were jointly not significantly different from zero. Also, the moderate and heavy drinking measures were not significantly different from each other in the instrumental variables model. Regarding the regression with the five alcohol categories, almost all the drinking measures were not significantly different from each other in the models without controls for endogeneity but they were jointly significantly different from zero under both the RE and FE models. Additionally, almost all the drinking measures were not significantly different from each other in the instrumental variables models and they were jointly not significantly different from zero.

Table C40 in the appendix presents alternative specification for the benchmark model estimated with predicted variables from an ordered logit model. Although, the moderate drinking measure has a positive sign under the pooled OLS and RE estimates, it is only statistically significant under the pooled OLS and even negative under the FE approach. Again, the instrumental variables estimate relying on the ordered logit approach is relatively imprecise in comparison to the multinomial logit approach.

Table 16: Instrumental Variables-OLS, RE and FE Estimates (Dependent Variable–Log-Earnings)

	Pooled-OLS	RE	FE
Constant	5.243***	6.117***	6.950***
	(0.147)	(0.232)	(0.378)
Light	0.195	0.063	0.785
	(0.212)	(0.394)	(0.825)
Moderate	1.763***	1.995***	1.497**
	(0.170)	(0.319)	(0.707)
Heavy	5.562***	1.614*	2.672**
	(0.515)	(0.896)	(1.268)
Tenure	0.270***	0.163***	0.147***
	(0.002)	(0.002)	(0.003)
Age	-0.000	0.014***	0.008
	(0.001)	(0.004)	(0.009)
Female	-0.131***	-0.183***	
	(0.025)	(0.064)	
Non-White	-0.120***	-0.138***	
	(0.012)	(0.025)	
Education	0.120***	0.060***	0.001
	(0.004)	(0.008)	(0.015)
Period Dummies	Yes	Yes	Yes
Observations	110,104	110,104	110,104

Robust standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%.
Note: alcohol measures from the endogeneity-corrected models are in logarithms, coefficients are interpreted as $\Delta Earnings = (\beta_k / 100) * \Delta$ *alcohol measure.*

As in the duration analysis section the models are re-estimated this time with social capital measures as additional regressors to ascertain the possible direct impact of alcohol consumption on earnings (Block et al. 1990). In Table C24, the pooled OLS estimates of the alcohol measures are all positive and statistically significant. The RE estimates are positive but only statistically significant for moderate drinkers while the FE estimates are all statistically insignificant. In general, drinking (light, moderate and heavy) increases earnings by about 7 percent, 10 percent and 5 percent respectively via pooled OLS estimates. In comparison, the RE estimates indicate that drinking moderately increases earnings by just 2 percent. It can also be seen that the coefficients on the social capital measures are positive under both the OLS and RE models. The results from the instrumental variables regression in Table C25 indicate that the alcohol measures are still positive but only statistically significant for the moderate alcohol measure via RE and FE and the heavy alcohol measure via FE. In particular, drinking moderately, as opposed to abstaining, leads to increases in earnings by about 1.5 percent under both the RE and FE approach. Similarly, drinking heavily as opposed to abstaining, leads to increases in earnings by about 2.7 percent via the FE approach. Again the coefficients on the other variables are as expected except that on the female variable which has the wrong sign. The social capital measures are positive and statistically significant implying that individuals with high degree of sociability tend to earn more than respondents who are less sociable. This is not unexpected, since sociability may endear the individual to her superiors which in turn could result in rapid upward mobility and rewards within the firm.

The models are re-estimated to ascertain any gender and ethnic difference with regards to the impact of drinking on earnings and the results are provided in the appendix, Table C26 and Table C27. The estimates by gender in Table C26 indicate that the effects of moderate drinking on earnings for men are positive and statistically significant via the RE model.[82] The rest of the alcohol measures were not statistically significant under both the RE and FE models. Most of the coefficients on the rest of the variables under the RE model are statistically significant and have the expected sign. The instrumental variables regression estimates by gender in Table C27 indicate an inverted U-shaped relationship between drinking and earnings for women only via the RE model. In particular, the coefficient on the moderate alcohol measure is positive and statistically significant. Also the effects of drinking on earnings are positive for men via the RE model. In contrast, the coefficient on the moderate alcohol measure for men is now negative and statistically significant for both men and women via the FE model. Again, when one accounts for endogeneity the effects of drinking moderately on earnings are no longer positive. In contrast, both Peters (2004) and Tekin (2004) found positive and statistically significant effects of current drinking on wages for both men and women but the statistical significance of the effects disappears with fixed effects regression and previously observed inverted U-shaped relationship disappears in the latter study.

In Table C28, the coefficients on the drinking measures for minorities are positive and statistically significant but the rest of the coefficients on the alcohol variables are not statistically significant. As in all estimations, the models are estimated via instrumental variables (IV) regression with the tax price of alcohol as the main identifying instrument to correct for the possible endogeneity in the alcohol measures. In Table C29, the effects of moderate alcohol use on earnings are still positive and statistically significant for both whites and minorities, the only exception is that the FE coefficient under Non-Whites is

[82] Independent means t-test (two-tailed) between male and female indicates that the groups have different means.

not statistically significant. In contrast, minorities pay a penalty in terms of earnings when drinking heavily while whites pay a penalty when drinking lightly. Again, the interpretations for the rest of the variables are similar to those outlined above. The results are not significantly different from the models estimated earlier, with the coefficients having the expected signs (except that on education via FE estimates) and statistical significance.

As in the previous empirical section, the models are re-estimated by industry (professional business services and non-professional business services) and the results are presented in Table C30 and C31 to ascertain the differences, if any, among these two sectors. The estimates are less precise and the signs on the light and heavy drinking variables under the RE and FE estimates for the professional business services sector are positive but only statistically significant for the moderate drinking variable via RE and FE, and he heavy drinking measure via FE. In contrast, the coefficients on moderate drinking are positive but only statistically significant for the non-professional business services sector for both RE and FE. These latest results partially dent the promising results from the duration analysis section in that since evidence suggest that social capital is relied upon heavily in the professional business services sector we would expect significant coefficients for at least the moderate drinking measures. In general, the coefficients on the rest of the variables are statistically significant and have the expected sign except the coefficients on the education term, which have the wrong sign under the FE. The interpretations of the rest of the variables in the model are analogous to those in the previous sections.

The estimates in Table C31 via instrumental variables approach are again less precise. The light and heavy drinking coefficients under the professional business services are all statistically insignificant except that on the heavy drinking variable under the RE estimates. The latter has a negative sign. Similarly, the light and heavy drinking coefficients under the non-professional business services are all statistically insignificant except that on the light drinking variable under the RE estimates, the latter also has a negative sign. The coefficients on the moderate alcohol measure are all positive under both the professional business services and non-professional business services but only statistically significant for the latter sector. The results from the estimation by economic sector, partially points to positive returns to moderate drinking, irrespective of the sector of the economy.

Table C32 and Table C33 in the appendix present the results from re-estimating the benchmark model, this time with lagged variables of the alcohol measures to present a more balanced picture of the effects of alcohol consumption on earnings. In Table C32, the total effects of the coefficients on the lagged and current versions of the moderate alcohol measures via OLS and RE indicate that the effects of light and moderate alcohol consumption on earnings are still positive when the effects of past alcohol consumption pattern of the individual are taken into account. In contrast, the effects of alcohol consumption on earnings are relatively murky when endogeneity in the alcohol measures are taken into account, possibly due to collinearity in the presence of the instrumental variables regression (see Table C33). In particular, the contemporaneous value of the moderate alcohol measure is negative across all three models but the total effects of moderate drinking on earnings is still positive. Similar interpretations can be applied to the rest of the variables from the results with the lagged values of alcohol consumption in Table C32 and Table C33 in the appendix.

Furthermore, to minimize potential specification error due to omission of certain variables, most theoretically relevant explanatory variables are included, as well as multiplicative terms and these are dropped in subsequent estimations. The results from this latest regression are provided in the appendix in Table C34 through Table C39. Table C34 and Table C35 present the results of the re-estimation of the previous model with all relevant explanatory variables. In Table C34, the results indicate that the effects of moderate drinking on earnings tend to decrease with the gender and ethnicity of the individual, which seems plausible but the interaction terms are not jointly significant under both methods. Similarly, the effects of heavy drinking on earnings tend to decrease with the gender and ethnicity of the individual, and the interaction terms are jointly significant under both methods. In contrast, gender and ethnicity influence on the effects of light drinking on earnings is not clear since the interaction terms are statistically insignificant under both methods. Again, the effects of the respective alcohol status on earnings can be evaluated at the mean values of the interacting variable.[83] In Table C34, age again has a diminishing effect on employment duration (note $\beta_{age} > 0, \beta_{age^2} < 0$). In addition, except for the coefficient on the education variable via FE, the coefficients on the rest of the variables are similar to those of the structural model in Table V-6, with regards to their sign and statistical significance.

Table C35 presents the instrumental variables version of the model with multiplicative terms. Clearly adding the multiplicative terms as additional regressors in

[83] (Example: $\Delta Earnings = (\beta_{\text{mod}} + \beta_{\text{mod}*race} Nonwhite + \beta_{\text{mod}*gender} Female)$.

the instrumental variables version compounds the imprecision of the estimates. Focusing on the RE and FE estimates, the coefficients on the moderate and heavy drinking variables have the wrong signs and are statistically significant, which seems to imply that the negative effects of alcohol use (moderate or heavy) is worse for minorities and women. Also, the observed inverted U-shape relationship between alcohol use and labor market outcomes disappears when endogeneity is accounted for in addition to the interaction terms. The estimates are somewhat imprecise but ideally the issue with the wrong sign could be alleviated by including additional regressors on the RHS. Unfortunately, this suggested solution resulted in statistically insignificant coefficients of the added regressors and an even worse overall model fit. A decision was made to re-estimates the models without the interaction terms but now including marital status. Table C36 and Table C37 presents the results from those estimations and clearly individuals who are married have better earnings prospects than unmarried individuals. Table C38 and Table C39 in the appendix presents results with variables such as health status and education excluded from the model, again to ascertain the possible indirect correlation between these variables and alcohol consumption and their effects on the outcome variable. The estimates are, in general, similar to those of the benchmark model indicating little evidence of such correlation.

Additionally, the pooled OLS and the panel data results may produce biased estimates if unobserved factors affect both the level of earnings and the probability that someone chooses to participate in the labor force (selection bias). To account for such potential selection bias arising from not accounting for an individual's choice of whether to participate in the labor force or not, the models are re-estimated via Heckman selection bias correction probit approach (Table C44 through Table C46). The exponentiated coefficients from the first-stage probit estimates presented in Table C44 are as expected, the size of the family, the unemployment rate and age are all negatively associated with labor force participation. Also Female and Non-White are negatively associated with labor force participation as compared to the reference category, Male and White. The signs and statistical significance of the estimated selection coefficient in the structural model presented in Table C45 through Table C46 suggests in an unambiguous fashion that unobservable characteristics are a negative attribute of a respondent. The average selection effect is computed as $\theta * [\textit{mean mills value}] = Q$. The interpretation of this is that a respondent with sample average characteristics who selects into the labor force incurs a $[\exp(Q) - 1] * 100$ reduction in earnings than an equally-situated respondent drawn at random from the population. That is, it reflects the extent to which conditional earnings change due to the selection effects. The rest of the results are not markedly different from the estimates without controls for selectivity, in that the signs and statistical significance of the coefficients of interest mirror those from the previous baseline estimates.

Discussion and Limitations

This essay utilizes data from the NLSY from 1984 through 1996 to examine the effects of alcohol consumption on employment duration and earnings with a focus on the professional business services sector. The reliability of these results is strengthened by the longitudinal nature of the dataset, the high response rate and the wealth of economic variables in the NLSY dataset. The results indicate that alcohol consumption in general tends to have a positive effect on labor market outcomes such as employment duration and earnings. In particular, drinking in moderation was found to have a greater positive impact on employment duration and earnings across the two empirical methodologies and across several empirical specifications in comparison to abstention. [84] On the other hand, estimating the effects of alcohol on labor market outcomes via instrumental variables approach seems to lend credence to the inverted U-shaped hypothesis. That is, when the models account for endogeneity, light and heavy drinking tends to have a negative effect on the outcome variable as compared to the reference category. Controlling for endogeneity does not change the positive association between moderate drinking and the outcome variable. Given that the decision to consume alcohol may be determined by other factors such as the tax price on alcohol, greater emphasis should be placed on the models that control for the potential endogeneity in the alcohol measures. Also, another focus of this essay was to determine whether the effects of alcohol consumption on labor market outcomes differ substantially between different economic sectors. The results indicate that there were no differences to suggest that labor market outcomes for workers in the professional services sector of the economy are markedly different from those of other sectors of the economy. This essay in effect sheds some light on the existence of such a relationship and contributes to the literature on moderate alcohol use and successful labor market outcomes.[85]

[84] See the conclusion section for discussions on the relative magnitude and sign of the effects of drinking on economic outcomes from current studies.

[85] Additionally, previous estimation with the inclusion of experience (age minus years of schooling minus 6) and experience squared in the earnings equation reduced the estimation precision. In some cases the experience variable were dropped due to collinearity with either the education variables or the age variable or both. Therefore the decision was made to exclude these variables from the estimation.

CHAPTER VI: CONCLUSION

The complex relationships between alcohol consumption, health and social capital, and economic outcomes are of interest to economists, as well as researchers in other disciplines. This dissertation has focused on evaluating this possible relationship between alcohol consumption and economic outcomes, utilizing previously developed theoretical (Grossman 1972) and empirical (panel methods and survival analysis) models. Using longitudinal data from two separate datasets, HRS (1992-2002) and NLSY (1985-1996), as well as a pooled cross-section time series dataset GSS (1988-1994), this dissertation has demonstrated that indeed there is a positive association between alcohol consumption on the one hand and retirement wealth, employment duration and earnings, depending on the model specification and econometric assumptions. In general, different assumptions made with respect to the alcohol measures tend to lead to different results. If one assumes that the individual's alcohol consumption choices are made irrespective of the countervailing economic and socio-cultural norms, one arrives at a particular result. On the other hand if one assumes that the choice by the individual to consume some amount of alcohol is in turn determined by other factors then one may arrive at a different conclusion. For instance, if the research questions are examined without instrumental variables approach, all the estimates from the two essays (RAND HRS and NLSY) seem to confirm that alcohol consumption tends to lead to better socioeconomic outcomes such as retirement wealth, employment duration and earnings. In comparison, with the RAND HRS dataset, instrumental variables regression seems to confirm an inverted U-shaped relationship between alcohol consumption and retirement wealth. With the NLSY dataset, instrumental variables regression did not confirm an inverted U-shaped relationship between alcohol consumption and employment duration and at times the effects of alcohol consumption on employment duration are negative. Moreover, the identifying instrument in the first-stage estimates was deemed adequate in all three chapters (Chapters III, IV and V). That is, the coefficients on the alcohol tax were statistically significant and had the expected sign, implying that either the regional or states' alcoholic tax rate negatively affects alcohol consumption behavior. What follows is a discussion of the results from the various benchmark models estimated in this dissertation and how they compare to the results from previous studies.

A Comparison of the Results from Essay I and Essay II

Clearly the results suggest that there is a complex interrelationship between alcohol consumption, health and social capital, and socioeconomic outcomes given the dataset, choice of RHS variables, empirical methodology and the assumption made with regards to the implementation of these methods. Although, these results rely on empirical methods that are markedly different from those of previous studies discussed below, the results are in general consistent with those findings. With regards to the HRS dataset, light-moderate drinkers had a 33.3 percent, 7.6 percent and 4.2 percent greater retirement wealth than abstainers via pooled OLS, RE and FE, respectively. Similarly, heavy drinkers had about 39 percent, 12.1 percent and 8 percent greater retirement wealth than equally situated non-drinkers via pooled OLS, RE and FE, respectively. In contrast, when endogeneity is controlled for in the model, only moderate drinking is seen to have a positive impact on retirement wealth. For instance moderate drinking affects retirement wealth by about 9.7 percent, 4.7 percent and 1.6 percent using OLS, RE and FE, respectively. In contrast, under instrumental variables regression drinking heavily instead of abstaining from alcohol consumption leads to about 9.4 percent, 4.1 percent and 1.2 percent decrease in wealth at retirement via OLS, RE and FE, respectively. Note that the magnitudes of the effects using the instrumental variables approach are somewhat smaller and at times not significantly different from zero under the FE estimates.

A similar pattern emerges using the NLSY dataset, in that drinkers (light, moderate and heavy) earn about 7 percent, 11 percent and 6 percent more than abstainers, respectively via pooled OLS estimates. In comparison, the RE estimates indicate that drinkers (light, moderate and heavy) earn about 0.7 percent, 2.2 percent and 2.9 percent more than abstainers, respectively (note that the light and heavy drinking categories are not statistically significant). These results are similar to that in Chapter IV. The instrumental variables results using the NLSY dataset indicate that both moderate and heavy drinkers earn more than abstainers. In particular, drinking moderately, as opposed to abstaining, leads to about 1.8 percent, 2 percent and 1.5 percent positive impact on earnings via OLS, RE and FE models. Also heavy drinkers earn about 5.5 percent, 1.6 percent and 2.7 percent more than abstainers via the OLS, RE and FE approaches. As compared to the results that rely on the HRS dataset, an inverted U-shaped relationship does not emerge when endogeneity is accounted for in the model.

The results for the duration model are somewhat surprising. For instance, under both the log-logistic and weibull model, moderate drinkers are two and half times as likely (exponentiated coefficient of 2.44 and 2.68) to have longer employment duration as equally situated individuals who abstain from alcohol consumption. Similarly drinking lightly or heavily increases the survival rate of employment for individuals using the weibull and log-logistic AFT metrics (1.97 and 2.14 versus 1.92 and 2.01, respectively). A slightly different picture emerges when one accounts for endogeneity in the main RHS variable of interest in the duration models. That is, when endogeneity is taken into account, the positive effects of alcohol consumption on employment duration disappear and at times the sign on the coefficient becomes negative. This suggests drinking as opposed to abstention from alcohol consumption leads to a shorter duration of employment. Tekin (2004) found that after controlling for unobserved individual heterogeneity, the positive impact of alcohol consumption on employment probability diminished significantly and this was more pronounced for men than for women. This suggests that the effects of alcohol consumption on earnings versus employment duration are different when endogeneity is properly controlled for in the model. Clearly, not controlling for endogeneity in the alcohol measures is inappropriate given the overwhelming empirical evidence suggesting that drinking is a choice variable. Therefore, greater emphasis should be placed on those results from the instrumental variables approach.

A Comparison of the Results between the Two Essays and Recent Studies

Some of the results from this dissertation are consistent with those of MacDonald and Shields (2001), French and Zarkin (1995), Tekin (2004), Peters (2004) and Hamilton and Hamilton (1997). For instance, MacDonald and Shields (2001) find that male drinkers with base characteristics who drank 21 units of alcohol per week expect to see a 4.5 percent increase in wage via OLS and female drinkers who consume about 14 units of alcohol per week, as opposed to abstaining, expect to see about 3.4 percent increase in wage. Notice that this dissertation finds positive impact of alcohol consumption on the various measures of socioeconomic outcomes when possible endogeneity in the model is ignored. In MacDonald and Shields' (2001) instrumental variables (IV) regression the effects of drinking on wages for males increased to 13.7 percent via instrumental variables regression from 4.5 percent under OLS. The differences between MacDonald and Shields (2001) and this dissertation is that in MacDonald and Shields' (2001) study the coefficients on their alcohol measures increased substantially via instrumental variables (IV) regression, as did Tekin (2004) in his wage model. In contrast, the estimated coefficients on the alcohol measures decreased markedly and under certain specifications were negative in this dissertation. Tekin (2004) also finds positive returns to earnings from alcohol consumption for men and the premium was about 20 percent. For women, the relationship is an inverted U-shaped which disappears with FE estimation. French and Zarkin (1995) also found that non-drinkers earn between 6 percent and 10 percent less than drinkers and also found an inverse-U shaped relationship between drinking and wages. Similar results were found by Zarkin et al. (1998), that male drinkers earn 7 percent more than equally situated nondrinkers. Using OLS, Hamilton and Hamilton (1997) also found that abstainers earn about 7.4 percent less than moderate drinkers. Finally, Peters (2004) found that male drinkers earn 22 percent more than male non-drinkers.

Obviously a majority of the recent studies finds positive relationships between alcohol consumption and socioeconomic outcomes but there seem to be little agreement when endogeneity and/or individual fixed effects are taken into account. In the same regard, this research has demonstrated that examining the effects of alcohol consumption on socioeconomic outcomes without considering the potential endogeneity in the alcohol measures may lead to a less than balanced policy prescription. In most specifications the effects of alcohol consumption on the outcome variable diminishes when controlling for endogeneity in the alcohol measures, an exception is MacDonald and Shields (2001). That is, the effects of alcohol consumption on the various outcome variables tend to decrease considerably when both endogeneity and unobserved individual-specific effects are controlled for in the model.

While there is a consensus among most researchers that health capital affects labor market outcomes, there is virtually no study that examines the relationship between individual behavior with regards to alcohol consumption and retirement wealth. Thus, the essay in Chapter IV is unique and significant in that it is the first HRS study of its kind to examine the effects of alcohol consumption on the level of wealth at retirement. This essay also contributes to the debate on the connectivity between alcohol consumption, health capital and economic outcomes and also offers some guidance in terms of policy prescription geared towards changing the behaviors of certain segments in society. The second essay is important since it contributes to the debate on alcohol consumption and labor market outcomes. The second essay is also important since it extends the debate on alcohol consumption and labor market outcomes beyond earnings and employment probabilities by examining the extent to which alcohol consumption impacts the length of that employment relationship once the individual is employed. It also utilizes different empirical methodologies to reach conclusions similar to those of previous research. The case study is also significant since it sheds some light on the relationship between alcohol use and a commonly used measure of social capital. In most economic studies of the relationship between alcohol consumption and economic outcomes, the effects of alcohol consumption on health or social capital is implied or inferred from other studies. The case study contributes to the current literature on alcohol consumption and social capital.

In terms of policy considerations, it is clear that the effects of alcohol consumption on economic outcomes are more complex than the current data might lead us to believe and this fact is compounded by the effects of social stigma on any alcohol related recommendations for health capital or social capital accumulation. But given that cardiovascular diseases tend to be a leading cause of mortality in the U.S., it may not be unreasonable to suggest that the adult public be educated concerning the potential health and social benefits of drinking alcohol in moderation, especially if it is not contraindicated by a physician. Indeed, educating individuals about these inputs into health capital production may increases the use of these inputs and lead to better health outcomes which in turn may lead to better socioeconomic outcomes. If policy-makers are to reduce the pronounced disparities in health and social capital between groups of individuals in society, there should be a concerted effort on educating the public about health-related behavior modification. Recall that extreme behaviors such as excessive drinking have been found to affect socioeconomic outcomes negatively. Also, to the extent that differential alcohol behavior may influence a person's socioeconomic outcomes, a reexamination of policies that educate and lessens the social stigma associated with alcohol use may still be warranted, in view of the results from the GSS Case Study, Essay I and Essay II.

There are, however, quite a number of arguments against recommending moderate drinking to the public for fear of unintended consequences such as problem drinking or addiction which tends to be related to a number of adverse health conditions, not to mention its adverse effect on social capital accumulation. Drinking can lead to addictive behaviors which might render the individual incapable of effective choices. Although Becker and Murphy (1988) rational addiction model argues that drinking (drug use) is part of a solution to lifetime-utility maximization in that addictive behavior enhances the welfare of the individual and any externality resulting from such addictive behavior can be dealt with by suitable governmental action, in making choices, rational individuals may not incorporate all current and future costs and benefits of their behavior in the decision making process and how it might lead to unforeseen consequences such as increased health-related cost to society or even death. Thus recommending alcohol as a beneficial health or social ritual that might improve the individuals' socioeconomic outcomes requires a great deal of caution. What role for governmental action? Since choices made with regards to drinking may be influenced by information and incentives from interactions with peer groups, co-workers, mass media, authority figures, etc., a carefully crafted governmental action that educates the public of the potential harmful effects and addictive nature of alcohol may forestall some of the adverse effects of alcohol consumption on society.

Additionally, if individuals or groups are at the bottom part of the socioeconomic stratum, any external intervention may not be enough to encourage behavior modification due to the money and time cost facing these individuals. Also, the availability of social networking facilities that encourages alcohol socialization may not in and of itself ensure social interaction between diverse groups of people. Indeed, alcohol socialization may vary by social class and to a greater extent by ethnic origin.

Notwithstanding the preceding criticism, refraining from alcohol use or abusing alcohol may lead to adverse implications for the individual with regards to either labor market or retirement outcomes. From the foregoing, it appears that there is qualified support that indeed drinking does explain differences in retirement outcomes, employment duration and earnings, based on the empirical evidence. The empirical evidence is qualified due to theoretical, econometric and data caveats. These issues, some of which have been acknowledged in the previous sections, suggest future research. Future research will focus on addressing these issues with matched employer-employee dataset with information on ethanol contents of alcohol consumption, place and social context of alcohol consumption, measures of social capital, objective health capital measures and employment history over an extended period of time. In terms of the empirics, future research will build on this work by examining more closely and rigorously the factors that mediate rather than confound this relationship between alcohol consumption and socioeconomic outcomes.

APPENDICES

Appendix A: Supplement to Chapter III-GSS Case Study

Table A1: Ordered Logit Estimates by Gender (Dependent Variable–Social Capital)

	Male	Female	Male–IV Estimates	Female–IV Estimates
Drinker	1.050	1.125*	1.064**	1.041**
	(0.079)	(0.068)	(0.027)	(0.021)
Health	1.009	1.017	1.009	1.019
	(0.020)	(0.016)	(0.020)	(0.016)
Married	0.621***	0.766***	0.619***	0.765***
	(0.038)	(0.037)	(0.038)	(0.037)
High School	1.215*	1.199**	1.214*	1.197**
	(0.133)	(0.106)	(0.133)	(0.106)
College	1.063	1.142**	1.050	1.147**
	(0.073)	(0.067)	(0.072)	(0.067)
Graduate	1.121	1.037	1.120	1.035
	(0.090)	(0.093)	(0.090)	(0.093)
Children	0.934***	0.894***	0.934***	0.894***
	(0.018)	(0.014)	(0.018)	(0.014)
Age-Adult	0.682***	0.801***	0.670***	0.794***
	(0.043)	(0.042)	(0.042)	(0.042)
Age-Older Adults	0.519***	0.512***	0.511***	0.502***
	(0.057)	(0.043)	(0.056)	(0.042)
Black	1.056	0.945	1.035	0.940
	(0.103)	(0.070)	(0.101)	(0.069)
Hispanic/Others	0.697***	0.900	0.681***	0.892
	(0.093)	(0.115)	(0.092)	(0.114)
Period Dummies	Yes	Yes	Yes	Yes
Observations	4,331	5,824	4,330	5,822

Robust standard errors in parentheses correspond to unexponentiated coefficients * significant at 10%; ** significant at 5%; *** significant at 1%.

Table A2: Ordered Logit Estimates by Race (Dependent Variable–Social Capital)

	Whites	Non-Whites	Whites	Non-Whites
Drinker	1.124***	1.118	1.141***	1.132
	(0.050)	(0.109)	(0.051)	(0.110)
Health	1.021	0.978	1.014	0.980
	(0.014)	(0.030)	(0.014)	(0.030)
Married	0.683***	0.897		
	(0.028)	(0.083)		
High School	1.163*	1.329**	1.159*	1.350**
	(0.093)	(0.184)	(0.092)	(0.187)
College	1.118**	0.941	1.133***	0.943
	(0.053)	(0.121)	(0.054)	(0.121)
Graduate	1.108	0.798	1.130*	0.807
	(0.071)	(0.135)	(0.072)	(0.137)
Children	0.893***	0.955*		
	(0.012)	(0.023)		
Age-Adult	0.754***	0.715***	0.626***	0.653***
	(0.033)	(0.071)	(0.026)	(0.060)
Age-Older Adults	0.521***	0.429***	0.474***	0.423***
	(0.036)	(0.091)	(0.032)	(0.088)
Female	0.965	0.934	0.969	0.935
	(0.038)	(0.088)	(0.038)	(0.086)
Period Dummies	Yes	Yes	Yes	Yes
Observations	8,521	1,634	8,538	1,643

Robust standard errors in parentheses correspond to unexponentiated coefficients * significant at 10%; ** significant at 5%; *** significant at 1%.

Table A3: Instrumental Variables Ordered Logit Estimates by Race (Dependent Variable–Social Capital)

	Whites	Non-Whites	Whites	Non-Whites
Drinker	1.046***	1.077	1.047***	1.079
	(0.018)	(0.050)	(0.018)	(0.050)
Health	1.022	0.980	1.015	0.982
	(0.014)	(0.030)	(0.014)	(0.030)
Married	0.682***	0.891		
	(0.028)	(0.082)		
High School	1.164*	1.328**	1.160*	1.349**
	(0.093)	(0.184)	(0.092)	(0.187)
College	1.120**	0.945	1.136***	0.946
	(0.053)	(0.121)	(0.054)	(0.121)
Graduate	1.109	0.794	1.132*	0.801
	(0.071)	(0.134)	(0.072)	(0.135)
Children	0.892***	0.956*		
	(0.012)	(0.023)		
Age-Adult	0.745***	0.709***	0.617***	0.648***
	(0.033)	(0.071)	(0.025)	(0.060)
Age-Older Adults	0.511***	0.419***	0.464***	0.413***
	(0.036)	(0.088)	(0.031)	(0.085)
Female	0.955	0.935	0.958	0.937
	(0.037)	(0.088)	(0.037)	(0.087)
Period Dummies	Yes	Yes	Yes	Yes
Observations	8,521	1,634	8,538	1,643

Robust standard errors in parentheses correspond to unexponentiated coefficients * significant at 10%; ** significant at 5%; *** significant at 1%.

Table A4: Ordered Logit Estimates with Interaction Terms (Dependent Variable– Social Capital)

		Marital Status & Children Excluded	Marital Status, Health & Children Excluded
Drinker	1.116**	1.125**	1.210***
	(0.061)	(0.062)	(0.055)
Health	1.014	1.009	
	(0.013)	(0.013)	
High School	1.184	1.186	
	(0.166)	(0.163)	
College	1.146	1.142	
	(0.101)	(0.101)	
Graduate	1.160	1.159	
	(0.140)	(0.143)	
Married	0.711***		
	(0.027)		
Children	0.907***		
	(0.011)		
Age-Adult	0.740***	0.624***	
	(0.030)	(0.023)	
Age-Older Adults	0.506***	0.466***	
	(0.033)	(0.030)	
Female	0.949	0.957	0.934*
	(0.034)	(0.034)	(0.033)
Black	0.955	0.974	1.033
	(0.101)	(0.101)	(0.105)
Hispanic/Others	0.921	0.899	1.002
	(0.151)	(0.149)	(0.164)
Female*Drinker	0.984	0.994	1.024
	(0.031)	(0.031)	(0.032)
Black*Drinker	1.030	1.032	1.018
	(0.129)	(0.127)	(0.124)
Hispanic/Others*Drinker	0.812	0.830	0.831
	(0.162)	(0.165)	(0.164)
High School*Drinker	1.019	1.021	
	(0.164)	(0.162)	
College*Drinker	0.941	0.959	
	(0.096)	(0.098)	
Graduate*Drinker	0.890	0.912	
	(0.123)	(0.128)	
Period Dummies	Yes	Yes	Yes
Observations	10,155	10,181	10,181

Robust standard errors in parentheses correspond to unexponentiated coefficients * significant at 10%; ** significant at 5%; *** significant at 1%.

Table A5: Instrumental Variables Ordered Logit Estimates with Interaction Terms (Dependent Variable–Social Capital)

		Marital Status & Children Excluded	Marital Status, Health & Children Excluded
Drinker	1.051**	1.043*	1.006
	(0.026)	(0.026)	(0.025)
Health	1.014	1.009	
	(0.013)	(0.013)	
High School	1.184	1.186	
	(0.166)	(0.163)	
College	1.146	1.142	
	(0.101)	(0.101)	
Graduate	1.160	1.159	
	(0.140)	(0.143)	
Married	0.711***		
	(0.027)		
Children	0.907***		
	(0.011)		
Age-Adult	0.740***	0.624***	
	(0.030)	(0.023)	
Age-Older Adults	0.506***	0.466***	
	(0.033)	(0.030)	
Female	0.949	0.957	0.934*
	(0.034)	(0.034)	(0.033)
Black	0.955	0.974	1.033
	(0.101)	(0.101)	(0.105)
Hispanic/Others	0.921	0.899	1.002
	(0.151)	(0.149)	(0.164)
Female*Drinker	0.984	0.994	1.024
	(0.031)	(0.031)	(0.032)
Black*Drinker	1.030	1.032	1.018
	(0.129)	(0.127)	(0.124)
Hispanic/Others*Drinker	0.812	0.830	0.831
	(0.162)	(0.165)	(0.164)
High School*Drinker	1.019	1.021	
	(0.164)	(0.162)	
College*Drinker	0.941	0.959	
	(0.096)	(0.098)	
Graduate*Drinker	0.890	0.912	
	(0.123)	(0.128)	
Period Dummies	Yes	Yes	Yes
Observations	10,155	10,181	10,181

Robust standard errors in parentheses correspond to unexponentiated coefficients * significant at 10%; ** significant at 5%; *** significant at 1%.

Table A6: Cross-Sectional Ordered Logit Estimates (Dependent Variable–Social Capital)

	1989	1991	1994
Drinker	1.166	1.012	1.139*
	(0.122)	(0.104)	(0.087)
Health	0.998	1.011	0.973
	(0.033)	(0.034)	(0.021)
Married	0.715***	0.729***	0.684***
	(0.071)	(0.073)	(0.048)
High School	1.601**	1.259	1.064
	(0.308)	(0.222)	(0.146)
College	1.054	1.114	1.126
	(0.133)	(0.142)	(0.087)
Graduate	1.089	1.188	1.060
	(0.155)	(0.190)	(0.125)
Children	0.898***	0.924**	0.903***
	(0.027)	(0.030)	(0.021)
Age-Adult	0.866	0.699***	0.777***
	(0.094)	(0.074)	(0.058)
Age-Older Adults	0.694**	0.623***	0.465***
	(0.121)	(0.110)	(0.057)
Female	0.830**	0.997	0.946
	(0.078)	(0.096)	(0.063)
Black	0.801	1.087	1.097
	(0.140)	(0.153)	(0.118)
Hispanic/Others	1.040	0.704	0.707**
	(0.246)	(0.183)	(0.121)
Observations	1,478	1,454	2,913

Robust standard errors in parentheses correspond to unexponentiated coefficients * significant at 10%; ** significant at 5%; *** significant at 1%.

Table A7: Cross-Sectional Instrumental Variables Ordered Logit Estimates-(Dependent Variable–Social Capital)

	1989	1991	1994
Drinker	1.085*	1.049	1.063*
	(0.054)	(0.041)	(0.034)
Health	1.000	1.009	0.974
	(0.033)	(0.033)	(0.021)
Married	0.718***	0.727***	0.677***
	(0.071)	(0.073)	(0.048)
High School	1.598**	1.256	1.080
	(0.306)	(0.221)	(0.149)
College	1.053	1.116	1.130
	(0.132)	(0.143)	(0.087)
Graduate	1.078	1.182	1.067
	(0.154)	(0.188)	(0.126)
Children	0.896***	0.924**	0.904***
	(0.027)	(0.030)	(0.021)
Age-Adult	0.877	0.693***	0.744***
	(0.096)	(0.074)	(0.058)
Age-Older Adults	0.680**	0.626***	0.439***
	(0.118)	(0.111)	(0.055)
Female	0.844*	0.976	0.914
	(0.081)	(0.097)	(0.064)
Black	0.817	1.114	1.058
	(0.144)	(0.160)	(0.116)
Hispanic/Others	1.062	0.710	0.675**
	(0.253)	(0.186)	(0.118)
Observations	1,478	1,454	2,913

Robust standard errors in parentheses correspond to unexponentiated coefficients * significant at 10%; ** significant at 5%; *** significant at 1%.

GSS Case Study: Choice of Variables and Detail Definition-Major Variables

Dependent Variable

Social Capital: The "time spent with friends" variable from the GSS dataset is used to capture social capital. This variable is Likert scaled from 1-6. Social capital in the form of socialization and acquisition of information has been identified as a result of psychosocial benefits associated with alcohol use. This outcome variable is intended to shed light on the potential relationship between alcohol use and labor market outcome.

Total Sample			
Time Spent with Friends	*Frequency*	*Percent*	*Cum_ Frequency*
6	1,064	10.45	10.45
5	683	6.71	17.16
4	1,903	18.69	35.85
3	2,401	23.58	59.43
2	2,107	20.7	80.13
1	2,023	19.87	100
Total	10,181	100	

Independent Variables-Variable of Interest

Alcohol Consumption: This variable is a binary response variable with 1 indicating that the individual uses alcohol and 0 otherwise. Alcohol use is generally regarded as a risky behavior but recent studies have shown that moderate use of alcohol could help the individual add to health and social capital in the same way as individuals accumulate educational capital.

Health Capital or Status: Recent evidence indicates that moderate alcohol consumption exerts a protective effect against coronary artery disease (CAD), along with some other diseases. In effect health is improved by certain levels of alcohol use by improving subjective health and reducing stress, all of which have implications for labor market and retirement outcomes. The GSS question is: "Your health and physical condition" The health variable is also Likert-scaled from 1-7.

Total Sample			
Health	*Frequency*	*Percent*	*Cum_ Frequency*
1	153	1.46	1.46
2	475	4.52	5.98
3	507	4.83	10.8
4	1,671	15.91	26.71
5	1,679	15.98	42.69
6	3,518	33.49	76.18
7	2,502	23.82	100
Total	10,505	100	

Smoke: This is a binary response variable indicating whether the individual smokes or not. This is an instrumental variable used in the first stage alcohol equation. Smoke=1 and 0 otherwise

Age: Age is included to capture the impact of life-cycle effects on alcohol use, health and social capital. It is expected that health capital may decline with age and that health may decline much more rapidly during the working years for those at the bottom of the income distribution than for those at the top due in apart to medical care accessibility and behavioral choices.

Gender: There could be differences among individuals with respect to physical health status and the level of social capital acquired; however we will expect men in general to have better physical health than women. In terms of social capital there are no conclusively evidence that determines whether there are gender related advantages. Male=0 Female=1

Race/Ethnicity: Alcohol use patterns can be influenced by factors such as racial/ethnic groups' norms and attitudes regarding alcohol use. Individuals with more liberal alcohol norms and attitudes are more likely to socialize than are those with more conservative norms and attitudes. White=1 Black=2 Hispanic/Other=3

Marital Status: An individual's marital status is a significant factor in determining what type of health or social outcome befalls that particular individual. Marital status may affect a person's emotional and economic well-being. Married=1 and 0 otherwise

Education: Educational attainment influences socioeconomic status, and thus can play a role in well-being at during an individual life. Higher levels of education are usually associated with higher incomes, higher standards of living, and above-average health status but with regards to its impact on social capital there is a void. Also the educational level of the individual may affect productivity and the efficiency with which households transform such social and health capital into better labor market and retirement outcomes.

Weighted-Average Regional Tax Rates on Alcoholic Beverages: This variable is used as the identifying instrument for the first-stage alcohol equation. More recent data for the alcohol tax rates was downloaded from the Tax Policy Center's website and the Tax Foundation publications (1992-2000).

Division: The nine divisions above are culled from the GSS dataset and it is based on a relatively homogeneous grouping of states within a census geographic region (four regions), established by the Census Bureau for the presentation of census data. This variable is a proxy for residential location. The exact residential location variable is normally restricted and is not part of the public release data.

Appendix B: Supplement to Chapter IV–Essay I

Table B1: Means of Selected RAND HRS Variables–by Region

Variable	**Northeast**	**Mid-west**	**South**	**West**
Wealth	220,115	233,475	169,574	301,685
	(656,491)	(470,676)	(358,612)	(105,649)
Abstainers	0.62	0.70	0.75	0.62
	(0.48)	(0.46)	(0.43)	(0.48)
Moderate	0.26	0.22	0.18	0.25
	(0.44)	(0.41)	(0.38)	(0.43)
Heavy	0.11	0.08	0.07	0.12
	(0.32)	(0.27)	(0.26)	(0.33)
1992 Age	55.65	55.64	55.53	55.61
	(5.65)	(5.61)	(6.08)	(6.01)
Non-White	0.25	0.15	0.26	0.16
	(0.43)	(0.36)	(0.44)	(0.36)
Female	0.56	0.54	0.55	0.54
	(0.50)	(0.50)	(0.50)	(0.50)
Health	1.50	1.54	1.68	1.43
	(1.31)	(1.35)	(1.45)	(1.31)
High School	0.43	0.51	0.37	0.37
	(0.50)	(0.50)	(0.48)	(0.48)
Associate	0.11	0.12	0.11	0.17
	(0.32)	(0.32)	(0.31)	(0.37)
College	0.19	0.15	0.15	0.22
	(0.39)	(0.36)	(0.36)	(0.41)
Observations	13,141	17,695	32,376	11,966

Additional Results for the Panel Data Analysis

Table B2: OLS, RE and FE Estimates with Health Variable (Dependent Variable–Log-Wealth)

	OLS	RE	FE
Constant	9.196***	9.474***	11.122***
	(0.066)	(0.134)	(0.013)
Moderate	0.287***	0.071***	0.041***
	(0.015)	(0.011)	(0.012)
Heavy	0.343***	0.116***	0.079***
	(0.020)	(0.017)	(0.018)
Health	-0.185***	-0.077***	-0.026***
	(0.005)	(0.006)	(0.007)
Non-White	-0.920***	-0.982***	
	(0.017)	(0.037)	
1992 Age	0.028***	0.022***	
	(0.001)	(0.002)	
High School	0.827***	0.879***	
	(0.016)	(0.034)	
Associate	1.094***	1.154***	
	(0.021)	(0.046)	
College	1.567***	1.675***	
	(0.019)	(0.038)	
Female	0.006	-0.054**	
	(0.013)	(0.027)	
Period Dummies	Yes	Yes	Yes
Observations	75,178	75,178	75,178

Robust standard errors in parentheses   * significant at 10%; ** significant at 5%; *** significant at 1%.

Table B3: Instrumental Variables Estimates with Health Variable (Dependent Variable–Log-Wealth)

	OLS	RE	FE
Constant	8.538***	9.098***	11.211***
	(0.110)	(0.197)	(0.159)
Moderate	4.495***	2.166***	0.196
	(0.311)	(0.473)	(0.742)
Heavy	-9.035***	-4.050***	-1.141**
	(0.383)	(0.440)	(0.536)
Health	-0.180***	-0.074***	-0.035**
	(0.008)	(0.011)	(0.016)
Non-White	-1.299***	-1.145***	
	(0.024)	(0.042)	
1992 Age	0.041***	0.028***	
	(0.001)	(0.003)	
High School	0.743***	0.827***	
	(0.022)	(0.042)	
Associate	1.172***	1.171***	
	(0.028)	(0.054)	
College	1.763***	1.733***	
	(0.034)	(0.062)	
Female	-0.050***	-0.069**	
	(0.016)	(0.031)	
Period Dummies	Yes	Yes	Yes
Observations	75,178	75,178	75,178

Robust standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%.
Note: alcohol measures from the endogeneity-corrected models are in logarithms, coefficients are interpreted as $\Delta wealth = (\beta_k / 100) * \Delta$ *alcohol measure.*

Table B4: RE and FE Estimates with Gender and Race Variables Dropped (Dependent Variable–Log-Wealth)

	RE	FE
Constant	8.988***	11.122***
	(0.130)	(0.013)
Moderate	0.075***	0.041***
	(0.011)	(0.012)
Heavy	0.129***	0.079***
	(0.017)	(0.018)
1992 Age	0.024***	
	(0.002)	
High School	1.024***	
	(0.035)	
Associate	1.289***	
	(0.046)	
College	1.845***	
	(0.039)	
Period Dummies	Yes	Yes
Observations	75,178	75,178

Robust standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%.

Table B5: Instrumental Variables Estimates with Gender and Race Variables Dropped (Dependent Variable–Log-Wealth)

	RE	FE
Constant	8.627***	11.211***
	(0.171)	(0.159)
Moderate	1.360***	0.196
	(0.436)	(0.742)
Heavy	1.838***	-1.141**
	(0.409)	(0.536)
1992 Age	0.024***	
	(0.002)	
High School	0.911***	
	(0.041)	
Associate	1.110***	
	(0.053)	
College	1.538***	
	(0.058)	
Period Dummies	Yes	Yes
Observations	75,178	75,178

Robust standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%.
Note: alcohol measures from the endogeneity-corrected models are in logarithms, coefficients are interpreted as $\Delta wealth = (\beta_k / 100) * \Delta$ *alcohol measure.*

Table B6: RE and FE Estimates with Education Variables Dropped (Dependent Variable–Log-Wealth)

	RE	FE
Constant	10.884***	11.091***
	(0.139)	(0.009)
Moderate	0.092***	0.042***
	(0.011)	(0.012)
Heavy	0.145***	0.080***
	(0.017)	(0.018)
Non-White	-1.225***	
	(0.039)	
1992 Age	0.010***	
	(0.002)	
Female	-0.112***	
	(0.028)	
Period Dummies	Yes	Yes
Observations	75,178	75,178

Robust standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%.

Table B7: Instrumental Variables Estimates with Education Variables Dropped (Dependent Variable–Log-Wealth)

	RE	FE
Constant	7.801***	10.900***
	(0.166)	(0.064)
Moderate	7.871***	1.561***
	(0.299)	(0.417)
Heavy	-3.103***	-1.331**
	(0.418)	(0.538)
Non-White	-1.075***	
	(0.041)	
1992 Age	0.038***	
	(0.003)	
Female	0.150***	
	(0.028)	
Period Dummies	Yes	Yes
Observations	75,178	75,178

Robust standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%.
Note: alcohol measures from the endogeneity-corrected models are in logarithms, coefficients are interpreted as $\Delta wealth = (\beta_k / 100) * \Delta$ *alcohol measure.*

Table B8: OLS, RE and FE Estimates by Gender (Dependent Variable–Log-Wealth)

	Male	Female	Male	Female	Male	Female
	OLS	OLS	RE	RE	FE	FE
Constant	8.988***	9.568***	9.182***	9.749***	11.142***	11.053***
	(0.103)	(0.083)	(0.202)	(0.173)	(0.013)	(0.013)
Moderate	0.306***	0.357***	0.070***	0.073***	0.038**	0.034*
	(0.021)	(0.021)	(0.016)	(0.016)	(0.017)	(0.017)
Heavy	0.358***	0.429***	0.105***	0.122***	0.069***	0.070**
	(0.028)	(0.030)	(0.023)	(0.025)	(0.025)	(0.028)
Nonwhite	-0.927***	-0.961***	-0.981***	-1.004***		
	(0.026)	(0.024)	(0.056)	(0.050)		
1992 Age	0.029***	0.014***	0.026***	0.012***		
	(0.002)	(0.001)	(0.003)	(0.003)		
High School	0.742***	1.016***	0.762***	1.034***		
	(0.023)	(0.023)	(0.049)	(0.049)		
Associate	0.958***	1.337***	0.979***	1.372***		
	(0.030)	(0.031)	(0.065)	(0.065)		
College	1.544***	1.803***	1.596***	1.851***		
	(0.026)	(0.027)	(0.052)	(0.056)		
Period Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	34,137	41,033	34,137	41,033	34,137	41,033

Robust standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%.

Table B9: OLS, IV-RE and IV-FE Estimates by Gender (Dependent Variable–Log-Wealth)

	Male	Female	Male	Female	Male	Female
	OLS	OLS	RE	RE	FE	FE
Constant	6.776***	7.116***	8.094***	8.432***	11.016***	10.784***
	(0.146)	(0.121)	(0.244)	(0.212)	(0.094)	(0.090)
Moderate	9.024***	10.618***	4.148***	5.237***	1.358**	1.708***
	(0.359)	(0.370)	(0.430)	(0.496)	(0.547)	(0.653)
Heavy	-9.967***	-10.541***	-4.280***	-4.138***	-1.625**	-0.623
	(0.511)	(0.625)	(0.544)	(0.768)	(0.642)	(0.965)
Nonwhite	-1.315***	-1.180***	-1.137***	-1.054***		
	(0.036)	(0.034)	(0.062)	(0.058)		
1992 Age	0.056***	0.045***	0.039***	0.028***		
	(0.002)	(0.002)	(0.004)	(0.003)		
High School	0.384***	0.577***	0.587***	0.789***		
	(0.029)	(0.028)	(0.053)	(0.054)		
Associate	0.759***	0.960***	0.867***	1.129***		
	(0.036)	(0.036)	(0.069)	(0.069)		
College	1.291***	1.237***	1.441***	1.472***		
	(0.040)	(0.041)	(0.065)	(0.070)		
Period Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	34,143	41,035	34,143	41,035	34,143	41,035

Robust standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%.
Note: alcohol measures from the endogeneity-corrected models are in logarithms, coefficients are interpreted as $\Delta wealth = (\beta_k / 100) * \Delta$ *alcohol measure.*

Table B10: RE and FE Estimates by Race (Dependent Variable–Log-Wealth)

	Whites	Non-Whites	Whites	Non-Whites
	RE	RE	FE	FE
Constant	9.239***	0.000	11.356***	10.281***
	(0.146)	(0.000)	(0.014)	(0.035)
Moderate	0.072***	0.057*	0.036***	0.053
	(0.011)	(0.033)	(0.012)	(0.036)
Heavy	0.106***	0.162***	0.066***	0.132**
	(0.017)	(0.059)	(0.019)	(0.064)
1992 Age	0.025***	0.010*		
	(0.002)	(0.005)		
High School	0.928***	0.710***		
	(0.038)	(0.079)		
Associate	1.189***	1.063***		
	(0.050)	(0.115)		
College	1.685***	1.732***		
	(0.042)	(0.092)		
Female	-0.035	-0.125*		
	(0.028)	(0.069)		
Period Dummies	Yes	Yes	Yes	Yes
Observations	58,950	16,220	58,950	16,220

Robust standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%.

Table B11: RE and FE Estimates by Age at Retirement (Dependent Variable–Log-Wealth)

	RE	FE	RE	FE
	Before 65th	Before 65th	On or After 65th	On or After 65th
Constant	9.444***	11.096***	9.525***	11.257***
	(0.141)	(0.015)	(0.300)	(0.045)
Moderate	0.070***	0.032**	0.110***	0.045
	(0.013)	(0.014)	(0.025)	(0.035)
Heavy	0.124***	0.082***	0.138***	0.042
	(0.019)	(0.022)	(0.038)	(0.054)
Non-White	-0.959***		-1.028***	
	(0.037)		(0.062)	
High School	0.867***		0.911***	
	(0.035)		(0.054)	
Associate	1.128***		1.267***	
	(0.045)		(0.076)	
College	1.655***		1.721***	
	(0.039)		(0.061)	
Female	-0.037		-0.164***	
	(0.027)		(0.044)	
Period Dummies	Yes	Yes	Yes	Yes
Observations	60,462	60,462	14,675	14,675

Robust standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%.

Table B12: OLS, RE and FE Estimates with Lagged Alcohol Measures (Dependent Variable–Log-Wealth)

	OLS	RE	FE
Constant	9.315***	9.547***	11.042***
	(0.078)	(0.155)	(0.009)
Moderate	0.222***	0.052***	0.024
	(0.022)	(0.013)	(0.014)
Heavy	0.286***	0.102***	0.066***
	(0.034)	(0.021)	(0.023)
Nonwhite	-0.933***	-0.958***	
	(0.020)	(0.041)	
1992 Age	0.019***	0.018***	
	(0.001)	(0.003)	
High School	0.905***	0.933***	
	(0.019)	(0.039)	
Associate	1.182***	1.222***	
	(0.026)	(0.053)	
College	1.706***	1.773***	
	(0.022)	(0.044)	
Female	0.025*	0.001	
	(0.015)	(0.031)	
Moderate Lagged_1	0.183***	0.046***	0.023*
	(0.022)	(0.013)	(0.013)
Heavy Lagged_1	0.174***	0.031	0.005
	(0.034)	(0.019)	(0.020)
Period Dummies	Yes	Yes	Yes
Observations	56,008	56,008	56,008

Robust standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%.

Table B13: OLS, IV-RE and IV-FE Estimates with Lagged Alcohol Measures (Dependent Variable–Log-Wealth)

	OLS	RE	FE
Constant	7.003***	8.025***	11.160***
	(0.110)	(0.201)	(0.088)
Moderate	4.726***	2.312***	-0.043
	(0.762)	(0.429)	(0.491)
Heavy	-4.519***	-2.306***	-0.067
	(0.944)	(0.559)	(0.638)
Nonwhite	-1.263***	-1.110***	
	(0.029)	(0.048)	
1992 Age	0.050***	0.034***	
	(0.002)	(0.003)	
High School	0.498***	0.713***	
	(0.023)	(0.044)	
Associate	0.895***	1.056***	
	(0.030)	(0.057)	
College	1.313***	1.537***	
	(0.034)	(0.058)	
Female	0.147***	0.075**	
	(0.017)	(0.032)	
Moderate Lagged_1	5.571***	2.934***	0.568
	(0.772)	(0.431)	(0.483)
Heavy Lagged_1	-6.627***	-3.224***	-0.872
	(0.926)	(0.543)	(0.592)
Period Dummies	Yes	Yes	Yes
Observations	56,015	56,015	56,015

Robust standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%.
Note: alcohol measures from the endogeneity-corrected models are in logarithms, coefficients are interpreted as $\Delta wealth = (\beta_k / 100) * \Delta$ *alcohol measure.*

Table B14: First-stage Ordered Logit Estimates (Dependent Variable–Alcohol)

	Alcohol Use
Alcohol Tax	-0.336***
	(0.017)
Smoking	0.297***
	(0.019)
1992 Age	-0.006***
	(0.001)
Non-White	-0.420***
	(0.021)
Female	-0.298***
	(0.017)
Health	-0.153***
	(0.006)
High School	0.365***
	(0.021)
Associates	0.586***
	(0.028)
College	0.936***
	(0.025)
Period Dummies	Yes
Observations	75,178

Robust standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%.

Table B15: Instrumental Variables Estimates (Dependent Variable–Log-Wealth), First-stage via Ordered Logit

	OLS	RE	FE
Constant	9.697***	9.514***	10.818***
	(0.101)	(0.176)	(0.153)
Light-Moderate	1.340***	2.828***	3.945***
	(0.514)	(0.694)	(0.933)
Heavy	-5.759***	-5.991***	-5.978***
	(0.641)	(0.802)	(1.001)
Non-White	-1.043***	-1.018***	
	(0.023)	(0.043)	
1992 Age	0.025***	0.020***	
	(0.001)	(0.002)	
High School	0.922***	0.894***	
	(0.021)	(0.040)	
Associate	1.266***	1.202***	
	(0.029)	(0.054)	
College	1.920***	1.837***	
	(0.034)	(0.058)	
Female	-0.104***	-0.100***	
	(0.016)	(0.030)	
Period Dummies	Yes	Yes	Yes
Observations	75,178	75,178	75,178

Robust standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%.
Note: alcohol measures from the endogeneity-corrected models are in logarithms, coefficients are interpreted as $\Delta wealth = (\beta_k / 100) * \Delta$ *alcohol measure.*

Table B16: First-stage MNL Estimates (Dependent Variable–Alcohol)

	Light	Moderate	Heavy
Constant	1.849***	1.424***	-0.370**
	(0.117)	(0.115)	(0.164)
Alcohol Tax	-0.509***	-0.501***	-0.511***
	(0.022)	(0.021)	(0.029)
Smoking	0.183***	0.235***	0.550***
	(0.024)	(0.024)	(0.031)
Period Dummies	Yes	Yes	Yes
Observations	75,178	75,178	75,178

Robust standard errors in parentheses correspond to unexponentiated coefficients * significant at 10%; ** significant at 5%; *** significant at 1%. Note: Multinomial Logit (MNL) estimates are Relative Risk Ratios (RRR) and coefficients can be interpreted as $[\exp(\beta)-1]*100 =$ percentage change. As in the benchmark model background characteristics such as age, as well as race, gender and education dummies are included in the model.

Table B17: OLS, RE and FE Estimates (Dependent Variable–Log-Wealth)

	OLS	RE	FE
Constant	9.144***	9.487***	11.072***
	(0.068)	(0.136)	(0.011)
Light	0.323***	0.077***	0.036***
	(0.017)	(0.012)	(0.013)
Moderate	0.433***	0.117***	0.061***
	(0.016)	(0.013)	(0.015)
Heavy	0.493***	0.162***	0.100***
	(0.021)	(0.018)	(0.020)
Period Dummies	Yes	Yes	Yes
Observations	75,178	75,178	75,178

Robust standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%. As in the benchmark model background characteristics such as age, as well as race, gender and education dummies are included in the model.

Table B18: Instrumental Variables Estimates (Dependent Variable–Log-Wealth)

	OLS	RE	FE
Constant	7.000***	8.529***	11.360***
	(0.123)	(0.186)	(0.121)
Light	0.175	-0.826***	-2.165***
	(0.346)	(0.248)	(0.296)
Moderate	9.137***	4.855***	2.699***
	(0.334)	(0.262)	(0.320)
Heavy	-9.323***	-3.355***	-0.311
	(0.387)	(0.432)	(0.531)
Period Dummies	Yes	Yes	Yes
Observations	75,178	75,178	75,178

Robust standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%. Note: alcohol measures from the endogeneity-corrected models are in logarithms, coefficients are interpreted as $\Delta wealth = (\beta_k / 100) * \Delta$ *alcohol measure.* As in the benchmark model background characteristics such as age, as well as race, gender and education dummies are included in the model.

Table B19: Hypothesis Testing for HRS Benchmark Model

	RE		FE	
HRS Hypothesis Testing-F statistics. H_0 **:**	***Differences P-values***	***Joint P-values***	***Differences P-values***	***Joint P-values***
3 Alcohol Categories				
Moderate = Heavy	0.0075		0.0355	
Moderate=0 Heavy=0		0.0000		0.0000
IV-Estimates				
Moderate = Heavy	0.0000		0.0010	
Moderate=0 Heavy=0		0.0000		0.0009
4 Alcohol Categories				
Light =Moderate	0.0009		0.0478	
Light=Heavy	0.0000		0.0007	
Moderate=Heavy	0.0080		0.0348	
Light=0 Moderate=0		0.0000		0.0002
Light=0Heavy=0		0.0000		0.0000
Moderate=0 Heavy=0		0.0000		0.0000
Light=0 Moderate=0 Heavy=0		0.0000		0.0000
IV-Estimates				
Light =Moderate	0.0000		0.0000	
Light=Heavy	0.0000		0.0048	
Moderate=Heavy	0.0000		0.0002	
Light=0 Moderate=0		0.0000		0.0000
Light=0Heavy=0		0.0000		0.0000
Moderate=0 Heavy=0		0.0000		0.0000
Light=0 Moderate=0 Heavy=0		0.0000		0.0000

Choice of Variables and Detail Definition-Major Variables

Dependent Variable

Wealth: Wealth is computed in the RAND Corporation's Version of the HRS as:
Net Retirement Wealth =
(Net Financial Wealth + Net Housing Wealth + Pension Wealth + Social Security Wealth + Other Wealth)–(Total Debt)
Net Financial Wealth =
(Savings + investments + business assets + non-residential real estate)
Net Housing wealth = current market value of residential housing
Pension wealth = the present value of retirement benefits
Social Security wealth = the present value of social security
Other Wealth = wealth not included above
Total Debt =
(Outstanding debt not related to housing + outstanding mortgage debt + other debt)

Missing HRS wealth components were imputed via STATA. The net value of total wealth less IRA is calculated as the sum of all wealth components (except the value of IRAs and Keogh plans) less all debt.

Independent Variables-Variable of Interest

Alcohol Consumption: There are various measures of alcohol consumption used in the HRS, for instance in terms of the frequency of alcohol use, either the number of days that the individual had six or more drinks or the number of days that the individual drank alcohol last week, can be used as a measure. Since there are different variables for how often the respondent drinks in Waves 1 and 2 than in subsequent waves, waves 1 and 2 variables are matched to those from the subsequent waves after recoding for consistency. Missing values for the drinking days per week variable are imputed.

Total Health Condition = Number of Severe Health Conditions ever had: This variable gives the number of adverse health conditions the respondent reports ever having such as cancer, diabetes stroke, etc. The stock of health that an individual possesses and to which individuals can add to through improvements in individual health or accumulations in health may be viewed in the same way as human capital. In the HRS, this variable refers to the respondent's number of severe health conditions ranges from 1 through 5 with lower values indicating a healthy score-card.

Age at Retirement: A categorical variable which indicates the age of the respondent at retirement. This variable is introduced to capture cohort characteristics, if any, that might impact differences in wealth levels of respondents. It is expected that health may decline with age and it health may decline much more rapidly during the working years for those at the bottom of the income distribution than for those at the top due in apart to medical care accessibility and behavioral choices.

$$\text{Age at retirement} = \begin{cases} 0 \; if \;\; years \leq 65 \\ 1 \; if \;\; years > 65 \end{cases}$$

Gender: There could also be differences among retirees with respect to physical health status; however we will expect men in general to have better physical health than women. Male=0 and Female=1.

Race/Ethnicity: Alcohol use patterns can be influenced by factors such as racial/ethnic groups' norms and attitudes regarding alcohol use. Individuals with more liberal alcohol norms and attitudes are more likely to be current drinkers than are those with more conservative norms and attitudes. White=0, Non-White =1.

Education: Educational attainment influences socioeconomic status, and thus can play a role in well-being at older ages. Higher levels of education are usually associated with higher incomes, higher standards of living, and above-average health status among older Americans. Also the educational level of the individual may affect productivity and the efficiency with which households transform such health capital into better labor market and retirement outcomes and individual characteristics. The HRS reports 2 types of educational variables, the respondent's number of years of education variable is employed in Essay I (0-17+).

Weighted-Average Regional Tax Rates on Alcoholic Beverages: This variable is used as the identifying instrument for the first-stage alcohol equation in Essay I, the GSS Case Study and Essay II. More recent data for the alcohol tax rates was downloaded from the Tax Policy Center's website. The early editions of the tax data were then electronically scanned from the Tax Foundation publications (1988-1996). For the weighted-average regional alcoholic beverage tax rates, the average of the rates on liquor, wine (2 types) and beer for each state and weighted this average by the annual ethanol consumption (in '000s of gallons) in that particular state from 1988–1996 are computed. These are then used in calculating the weighted-average for each region.

Marital Status: The questions and coding of marital status differs from wave to wave, but in general respondents are asked about their marital status as: An individual's marital status may be a significant factor in determining what type of retirement outcome befalls that particular individual. Marital status can also affect a person's emotional and economic well-being by influencing living arrangements and availability of caregivers among older Americans. Individuals with better retirement outcomes tend to be those with married and/or living with their partners or spouses. In general the marital status dummies were highly insignificant and hence were dropped from the models.

Region: The four regions are based on a relatively homogeneous grouping of states established by the Census Bureau for the presentation of census data. This variable is a proxy for residential location. The exact residential location variable is normally restricted and is not part of the public release data. In general the regional dummies were highly insignificant and hence were dropped from the models.

Appendix C: Supplement to Chapter V–Essay II

Table C1: NLSY Survival Rates (Dependent Variable: _t = Duration of Employment)

Beginning Interval		**Total**	**Censored**	**Survival**
1	30	118,741	31,346	0.736
30	60	87,395	18,284	0.582
60	90	69,111	11,357	0.4864
90	120	57,754	8,888	0.4115
120	150	48,866	6,721	0.3549
150	180	42,145	5,736	0.3066
180	210	36,409	4,897	0.2654
210	240	31,512	4,132	0.2306
240	270	27,380	3,635	0.2
270	300	23,745	2,984	0.1748
300	330	20,761	2,898	0.1504
330	360	17,863	2,353	0.1306
360	390	15,510	2,399	0.1104
390	420	13,111	1,740	0.0958
420	450	11,371	1,716	0.0813
450	480	9,655	1,500	0.0687
480	510	8,155	1,170	0.0588
510	540	6,985	1,133	0.0493
540	570	5,852	919	0.0415
570	600	4,933	843	0.0344
600	630	4,090	782	0.0279
630	660	3,308	569	0.0231
660	690	2,739	596	0.018
690	720	2,143	462	0.0142
720	750	1,681	308	0.0116
750	780	1,373	320	0.0089
780	810	1,053	258	0.0067
810	840	795	239	0.0047
840	870	556	157	0.0034
870	900	399	132	0.0022
900	930	267	77	0.0016
930	960	190	80	0.0009
960	990	110	89	0.0002
990	1,020	21	10	0.0001
1,020	1,050	11	5	0.0001
1,050	1,080	6	4	0
1,140	1,170	2	2	0

Table C2: Means of Selected NLSY Variables, Race and Industry

Variables	**Race**		**Industry**	
	Whites	*Non-Whites*	*Professional Services*	*Non-Professional Services*
Earnings	19,544	16,529	18,306	18,809
	(67,676)	(90,101)	(83,806)	(69,933)
Tenure	227.24	216.46	220.78	225.75
	(76.12)	(79.03)	(75.28)	(78.16)
Abstainer	0.11	0.17	0.14	0.12
		(0.38)	(0.35)	(0.33)
Light	0.33	0.33	0.35	0.32
		(0.47)	(0.48)	(0.47)
Moderate	0.53	0.47	0.49	0.52
		(0.50)	(0.50)	(0.50)
Heavy	0.03	0.03	0.02	0.03
		(0.18)	(0.15)	(0.18)
Age	29.39	29.67	29.42	29.50
	(4.18)	(4.22)	(4.24)	(4.17)
Alcohol Tax	1.51	1.61	1.52	1.55
	(0.26)	(0.29)	(0.26)	(0.28)
Less Social	0.25	0.28	0.26	0.27
	(0.44)	(0.45)	(0.44)	(0.44)
Social	0.56	0.50	0.55	0.54
	(0.50)	(0.50)	(0.50)	(0.50)
Very Social	0.17	0.19	0.18	0.18
	(0.38)	(0.40)	(0.39)	(0.38)
Female	0.50	0.49	0.65	0.41
	(0.50)	(0.50)	(0.48)	(0.49)
Non-White			0.31	0.30
			(0.46)	(0.46)
Education	12.90	12.57	13.43	12.45
	(2.53)	(2.12)	(2.54)	(2.27)
Professional Services Firms	0.36	0.36		
	(0.48)	(0.48)		
Observations	82,696	36,045	42,603	76,138

Table C3: Means of Selected NLSY Variables, Regions

Variables	**Regions**			
	Northeast	*Mid-West*	*South*	*West*
Earnings	24,199	17,376	16,433	19,324
	(134,867)	(51,897)	(41,031)	(73,509)
Tenure	229.41	227.08	221.62	219.89
	(74.52)	(77.20)	(78.14)	(77.20)
Abstainer	0.10	0.11	0.16	0.12
	(0.30)	(0.31)	(0.37)	(0.33)
Light	0.31	0.35	0.32	0.35
	(0.46)	(0.48)	(0.47)	(0.48)
Moderate	0.56	0.52	0.48	0.50
	(0.50)	(0.50)	(0.50)	(0.50)
Heavy	0.03	0.03	0.03	0.03
	(0.18)	(0.16)	(0.18)	(0.16)
Age	29.26	29.49	29.54	29.52
	(4.10)	(4.20)	(4.22)	(4.22)
Alcohol Tax	1.50	1.34	1.77	1.37
	(0.20)	(0.14)	(0.25)	(0.14)
Less Social	0.24	0.27	0.27	0.26
	(0.43)	(0.44)	(0.44)	(0.44)
Social	0.55	0.57	0.52	0.57
	(0.50)	(0.50)	(0.50)	(0.50)
Very Social	0.20	0.15	0.20	0.16
	(0.40)	(0.36)	(0.40)	(0.37)
Female	0.48	0.50	0.52	0.47
	(0.50)	(0.50)	(0.50)	(0.50)
Non-White	0.31	0.21	0.41	0.19
	(0.46)	(0.41)	(0.49)	(0.40)
Education	13.09	12.84	12.70	12.70
	(2.47)	(2.30)	(2.44)	(2.44)
Professional Services Firms	0.40	0.35	0.34	0.36
	(0.49)	(0.48)	(0.48)	(0.48)
Observations	21,624	27,465	46,506	23,146

Figure C1: Overall Employment Survival Rates for NLSY Respondents

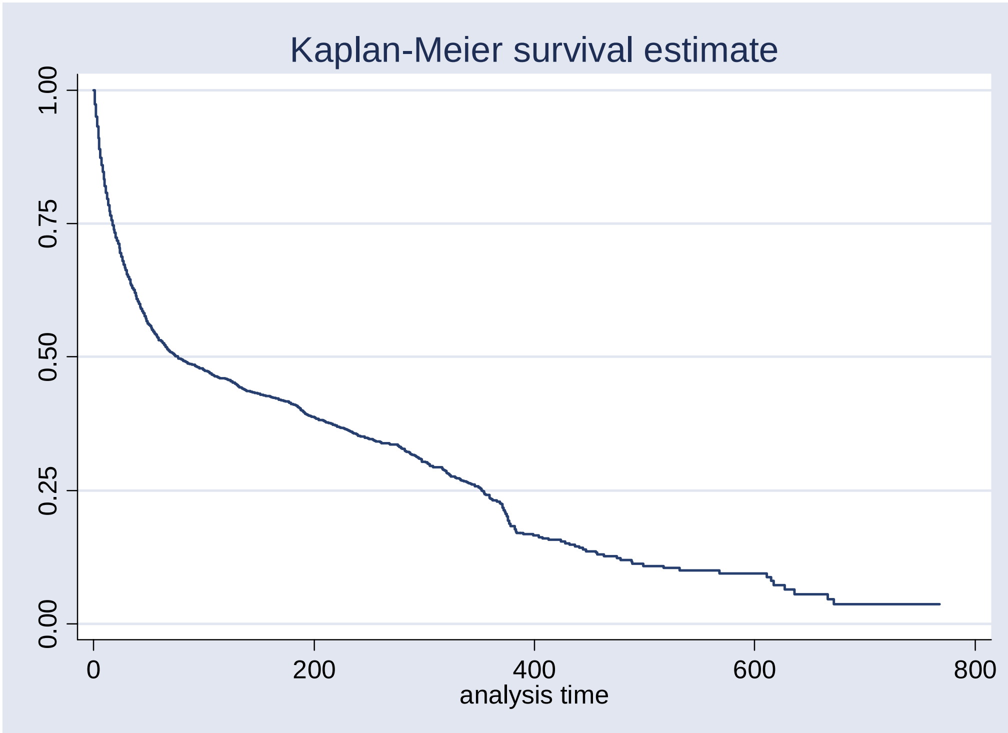


Figure C2: Hazard Rates for NLSY Respondents

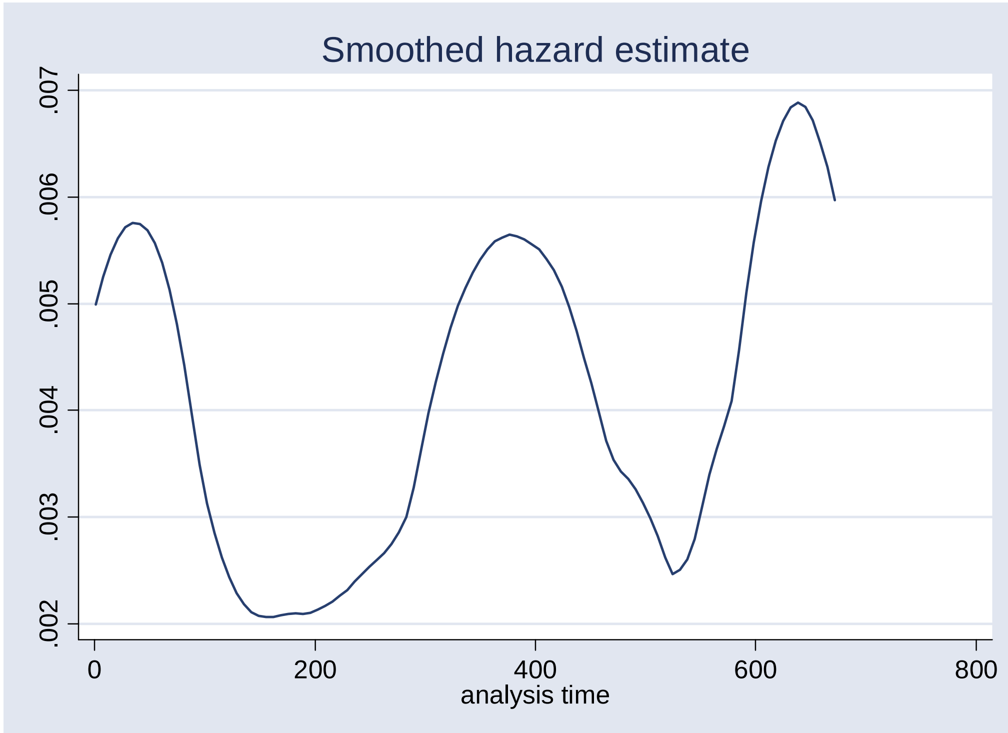


Figure C3: Cumulative Hazard Rates for NLSY Respondents

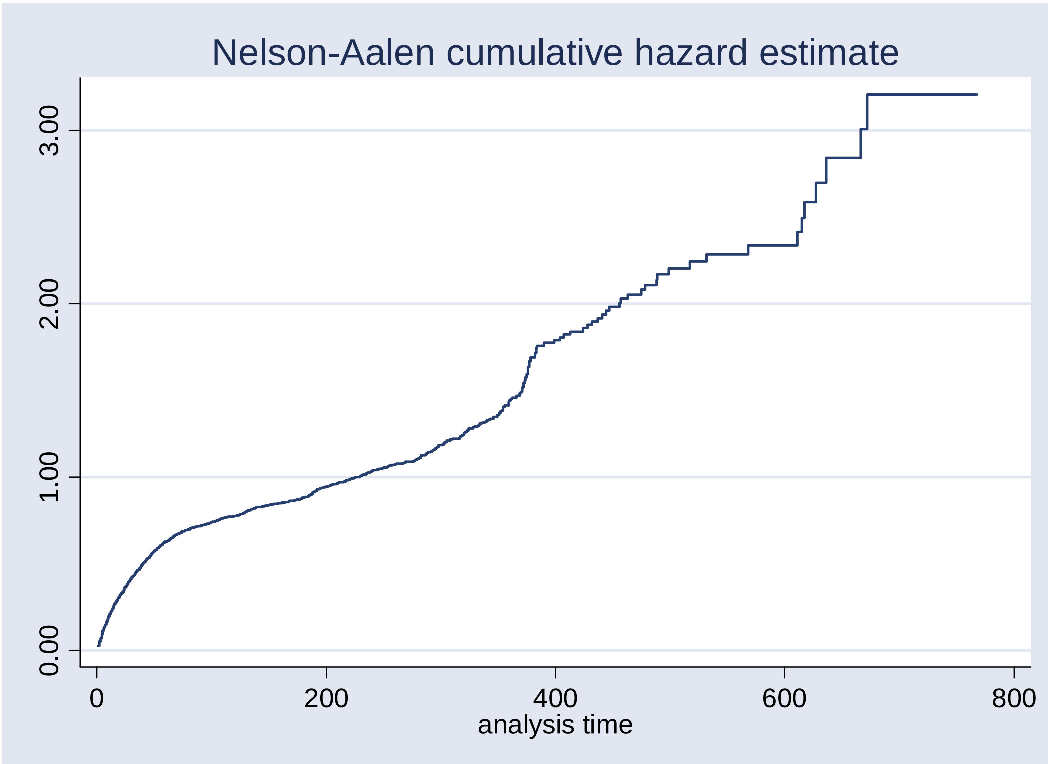


Figure C4: Survival Rates for NLSY Respondents By Race

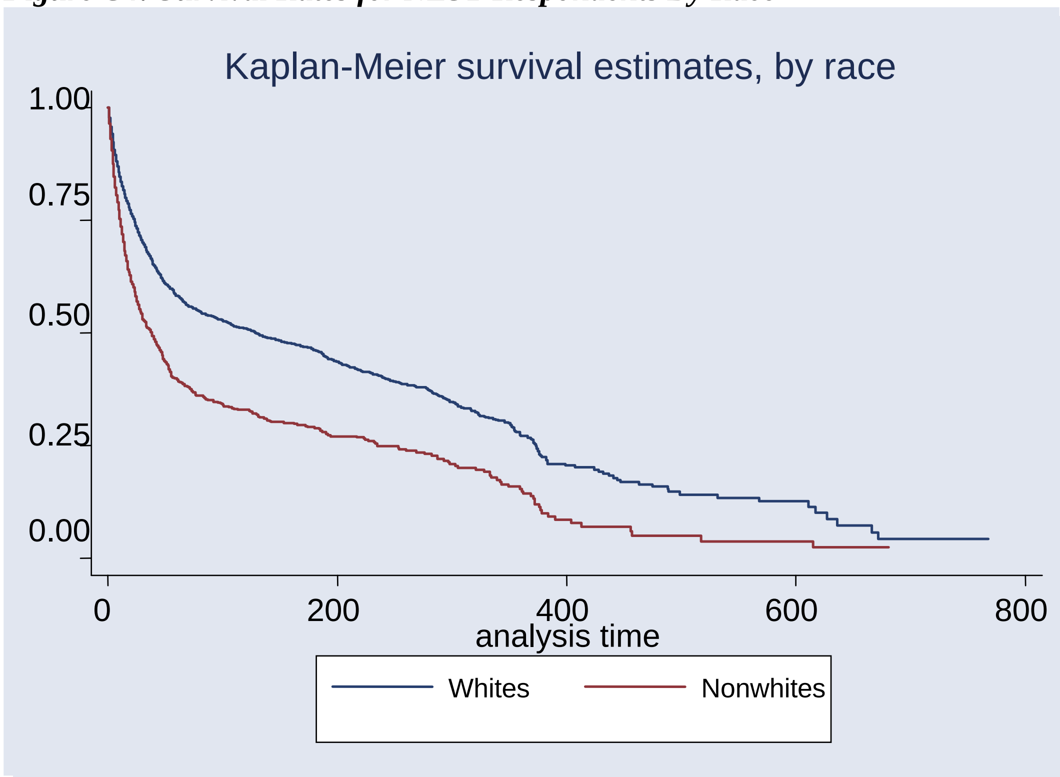


Figure C5: Hazard Rates for NLSY Respondents By Race

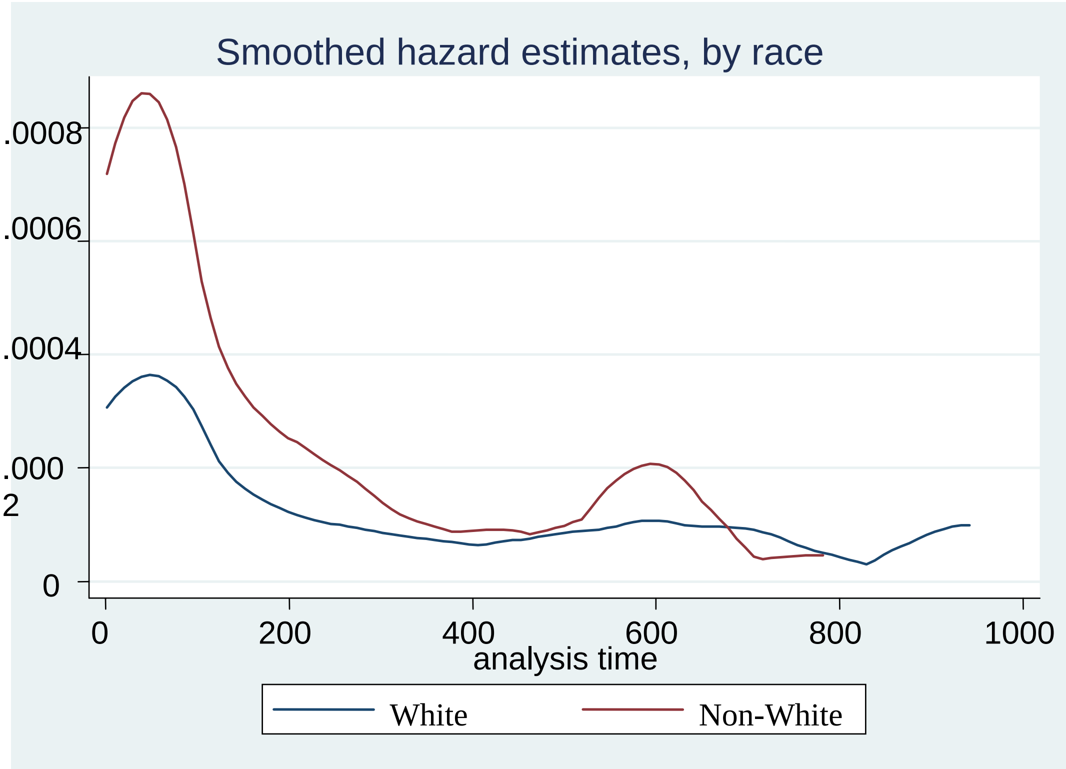


Figure C6: Survival Rates for NLSY Respondents By Alcohol Status

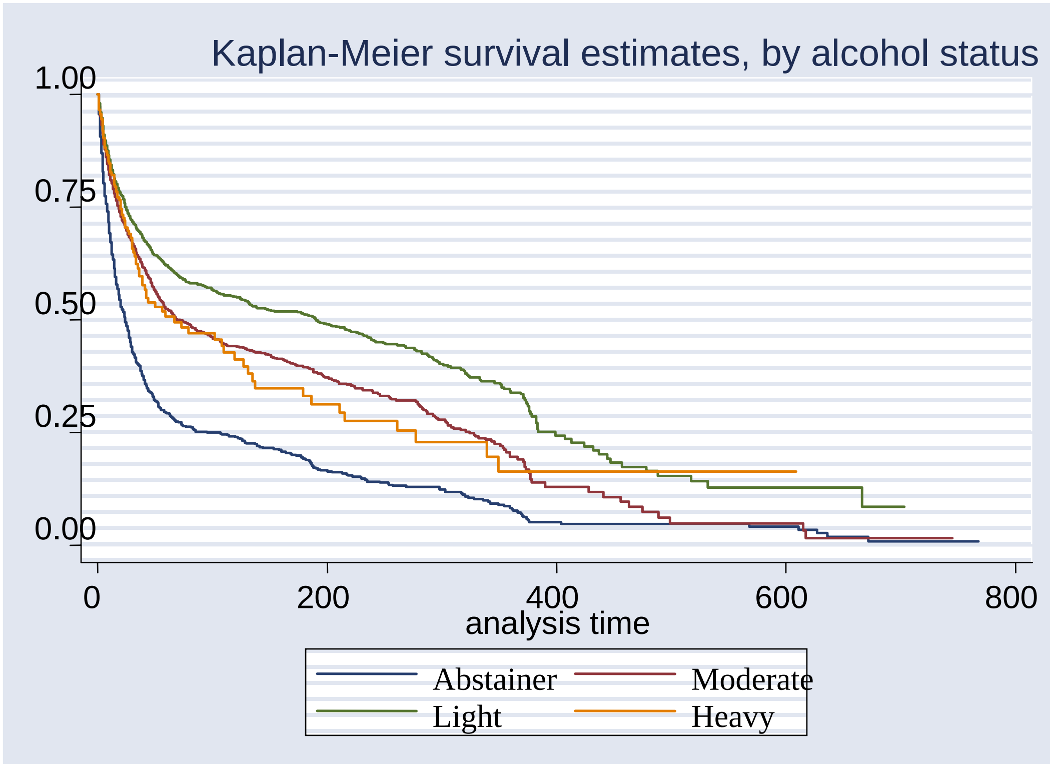


Figure C7: Hazard Rates for NLSY Respondents by Alcohol Status

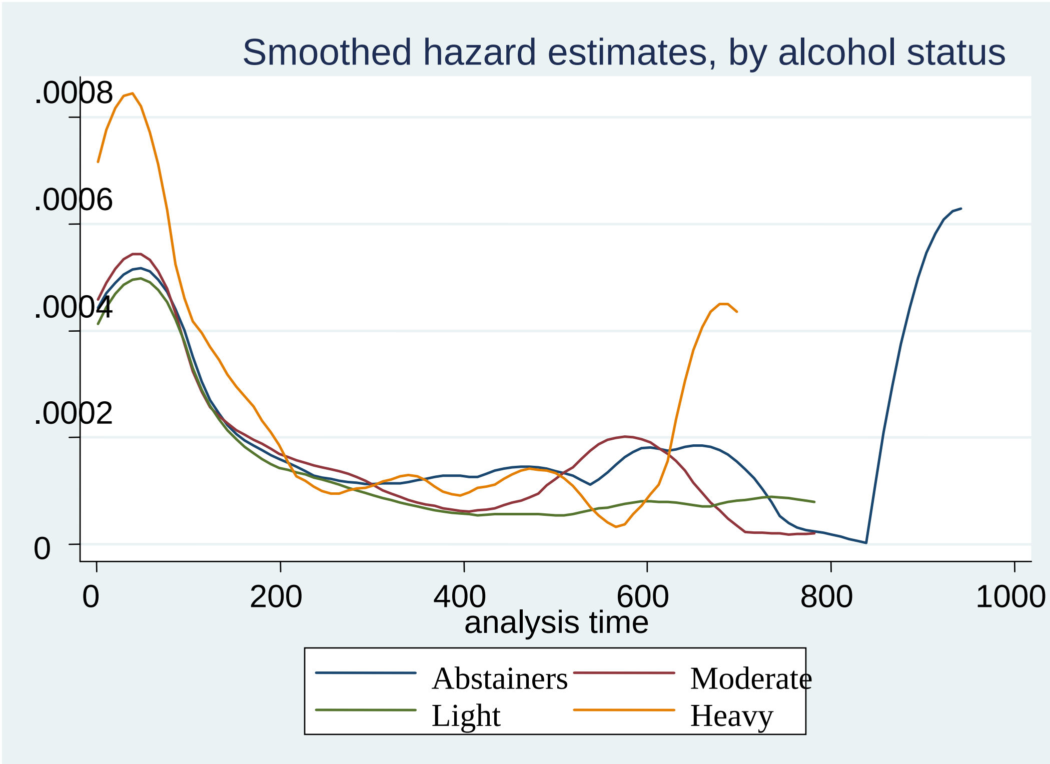


Figure C8: Survival Function-Weibull AFT Metric

Figure C9: Hazard Function-Weibull AFT Metric

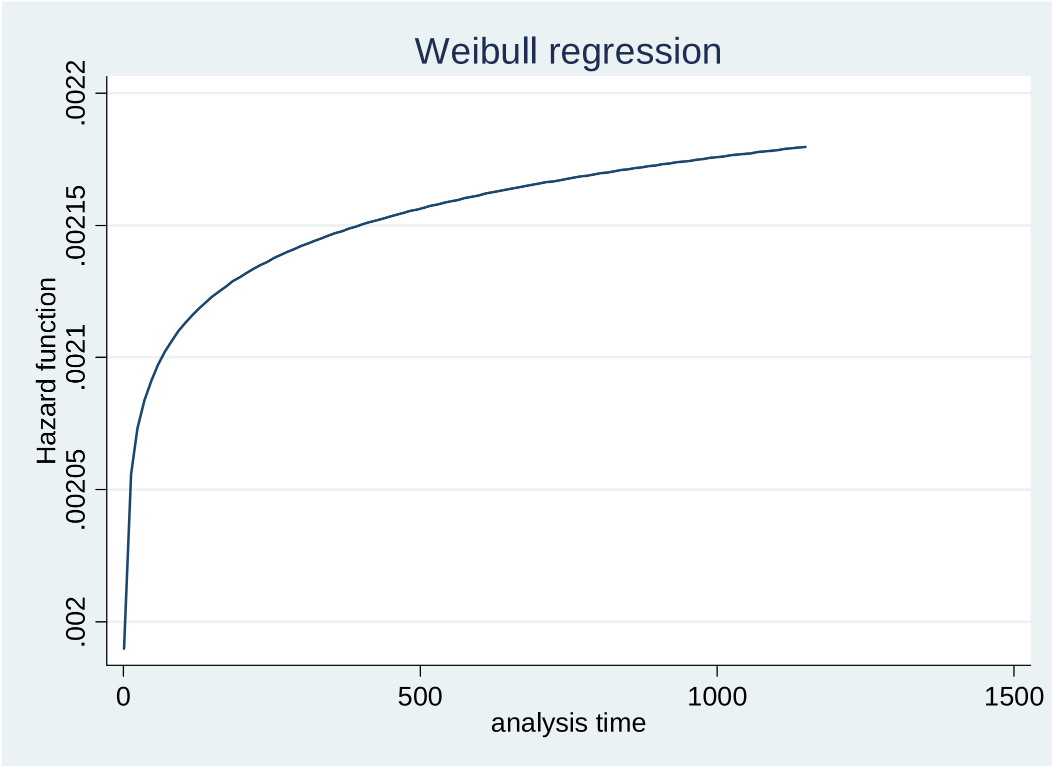


Figure C10: Survival Function-Log-logistic AFT Metric

Figure C11: Hazard Function-Log-logistic AFT Metric

Figure C12: Survival Function-Gompertz Metric

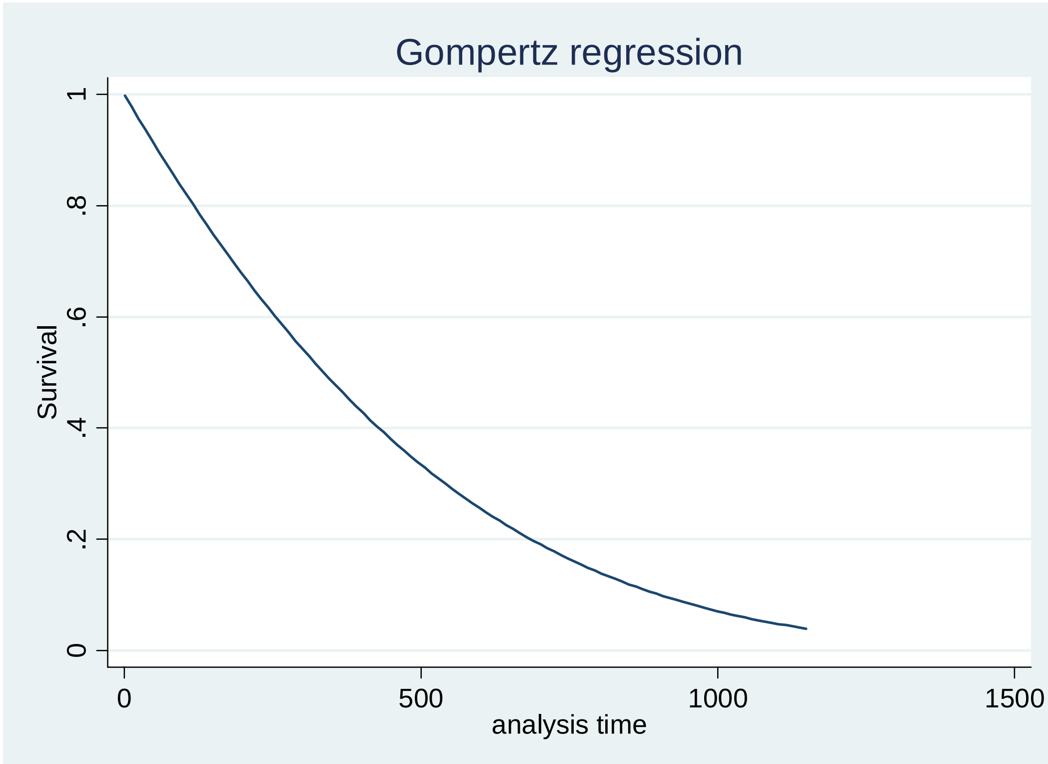
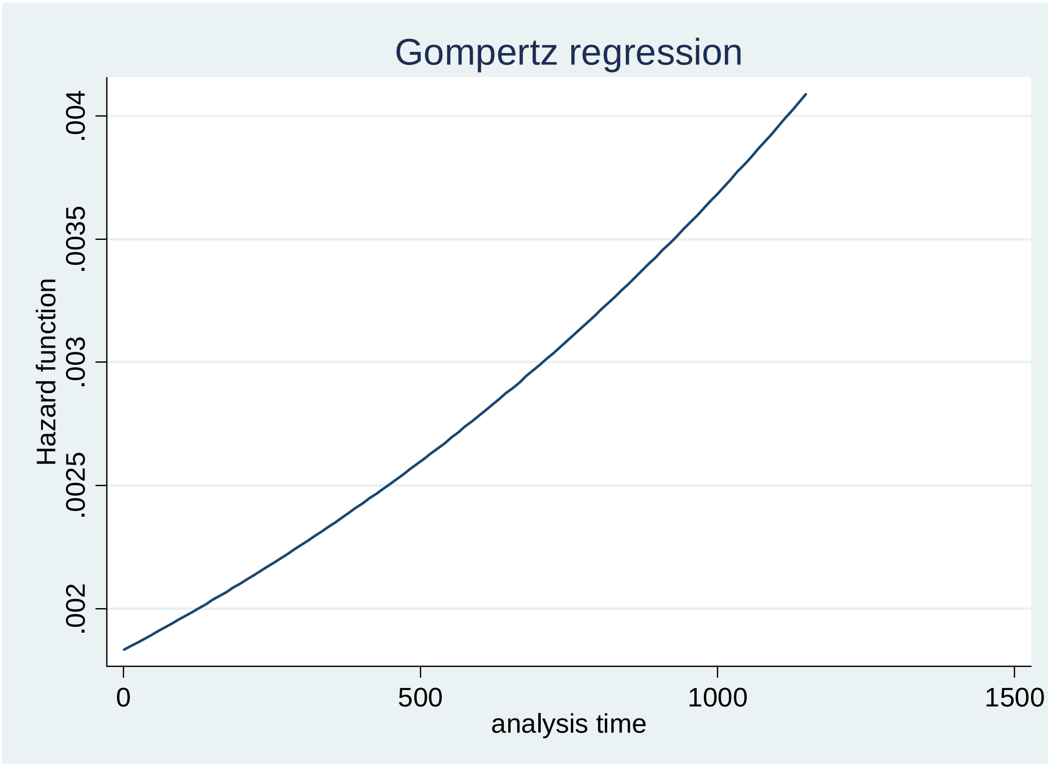


Figure C13: Hazard Function-Gompertz Metric



Additional Results for the Duration Analysis

Table C4: AFT Estimates with Social Capital Measures (Dependent Variable-Time Until Employment Ends)

	Weibull	Log-logistic
Light	1.727***	1.832***
	(0.028)	(0.030)
Moderate	2.071***	2.169***
	(0.034)	(0.034)
Heavy	1.775***	1.773***
	(0.093)	(0.067)
Less Social	0.967	0.909**
	(0.045)	(0.044)
Social	1.048	0.978
	(0.048)	(0.047)
Very Social	0.968	0.897**
	(0.045)	(0.044)
Age	1.059***	1.046***
	(0.002)	(0.002)
Female	0.831***	0.867***
	(0.010)	(0.011)
Non-White	0.796***	0.803***
	(0.010)	(0.010)
Education	1.026***	1.018***
	(0.003)	(0.003)
Firm Size	1.000***	1.000**
	(0.000)	(0.000)
Unemployment Rate	1.048***	1.059***
	(0.007)	(0.007)
Observations	105,345	105,345

Robust standard errors in parentheses correspond to unexponentiated coefficients * significant at 10%; ** significant at 5%; *** significant at 1%.

Table C5: AFT–IV Estimates with Social Capital Measures (Dependent Variable-Time Until Employment Ends)

	Weibull	Log-logistic
Light	0.001***	0.001***
	(0.001)	(0.000)
Moderate	275.307***	129.490***
	(122.185)	(54.624)
Heavy	5.151*	4.250*
	(4.429)	(3.737)
Less Social	0.722***	0.676***
	(0.035)	(0.034)
Social	0.789***	0.749***
	(0.039)	(0.038)
Very Social	0.504***	0.481***
	(0.030)	(0.029)
Age	1.027***	1.015***
	(0.002)	(0.002)
Female	3.034***	3.012***
	(0.224)	(0.215)
Non-White	0.983	0.947**
	(0.028)	(0.026)
Education	0.905***	0.904***
	(0.007)	(0.007)
Firm Size	1.000***	1.000***
	(0.000)	(0.000)
Unemployment Rate	1.027***	1.038***
	(0.007)	(0.007)
Observations	105,345	105,345

Robust standard errors in parentheses correspond to unexponentiated coefficients * significant at 10%; ** significant at 5%; *** significant at 1%. Note: alcohol measures from the endogeneity-corrected models are in logarithms, coefficients are interpreted as $\Delta t = (\beta_k / 100) * \Delta$ *alcohol measure*.

Table C6: AFT Log-logistic Estimates by Gender (Dependent Variable-Time Until Employment Ends)

	Male	Female
Light	2.420***	1.968***
	(0.074)	(0.048)
Moderate	3.732***	2.092***
	(0.109)	(0.050)
Heavy	2.853***	1.357***
	(0.170)	(0.097)
Age	1.091***	1.095***
	(0.003)	(0.002)
Non-White	0.638***	0.687***
	(0.014)	(0.013)
Education	1.014***	1.026***
	(0.001)	(0.001)
Firm Size	1.000***	1.000***
	(0.000)	(0.000)
Unemployment Rate	1.072***	0.991
	(0.012)	(0.010)
Observations	56,761	55,424

Robust standard errors in parentheses correspond to unexponentiated coefficients * significant at 10%; ** significant at 5%; *** significant at 1%.

Table C7: AFT Log-Logistic IV Estimates by Gender (Dependent Variable-Time Until Employment Ends)

	Male	Female
Light	0.007***	0.002***
	(0.006)	(0.001)
Moderate	36.061***	5,470.571***
	(26.342)	(2,948.245)
Heavy	0.000***	0.000***
	(0.000)	(0.000)
Age	1.074***	1.061***
	(0.004)	(0.003)
Non-White	0.764***	1.053
	(0.035)	(0.042)
Education	1.014***	1.026***
	(0.001)	(0.001)
Firm Size	1.000***	1.000***
	(0.000)	(0.000)
Unemployment Rate	1.050***	0.958***
	(0.012)	(0.009)
Observations	56,761	55,430

Robust standard errors in parentheses correspond to unexponentiated coefficients * significant at 10%; ** significant at 5%; *** significant at 1%. Note: alcohol measures from the endogeneity-corrected models are in logarithms, coefficients are interpreted as $\Delta t = (\beta_k / 100) * \Delta$ *alcohol measure*.

Table C8: AFT Log-Logistic Estimates by Race (Dependent Variable-Time Until Employment Ends)

	Whites	Non-Whites
Light	1.902***	1.791***
	(0.050)	(0.037)
Moderate	1.981***	2.228***
	(0.049)	(0.046)
Heavy	1.964***	1.658***
	(0.122)	(0.078)
Age	1.058***	1.039***
	(0.003)	(0.002)
Female	0.898***	0.857***
	(0.019)	(0.013)
Education	0.969***	1.034***
	(0.005)	(0.003)
Firm Size	1.000***	1.000
	(0.000)	(0.000)
Unemployment Rate	1.120***	1.043***
	(0.014)	(0.008)
Observations	30,837	74,508

Robust standard errors in parentheses correspond to unexponentiated coefficients * significant at 10%; ** significant at 5%; *** significant at 1%.

Table C9: AFT Log-Logistic IV Estimates by Race (Dependent Variable-Time Until Employment Ends)

	Whites	Non-Whites
Light	0.000769***	0.026***
	(0.000528)	(0.015)
Moderate	2.265	2,194.85***
	(1.598)	(1,245.55)
Heavy	55.443**	1.498
	(87.767)	(1.682)
Age	1.024***	1.013***
	(0.004)	(0.003)
Female	2.283***	3.138***
	(0.300)	(0.271)
Education	0.902***	0.905***
	(0.012)	(0.008)
Firm Size	1.000***	1.000
	(0.000)	(0.000)
Unemployment Rate	1.109***	1.020***
	(0.014)	(0.007)
Observations	30,837	74,514

Robust standard errors in parentheses correspond to unexponentiated coefficients * significant at 10%; ** significant at 5%; *** significant at 1%. Note: alcohol measures from the endogeneity-corrected models are in logarithms, coefficients are interpreted as $\Delta t = (\beta_k / 100) * \Delta$ *alcohol measure*.

Table C10: AFT Log-Logistic Estimates by Professional Business Services (Dependent Variable-Time Until Employment Ends)

	Professional Business Services	Non-Professional Business Services
Light	1.921***	1.768***
	(0.048)	(0.037)
Moderate	2.118***	2.186***
	(0.053)	(0.044)
Heavy	1.791***	1.768***
	(0.110)	(0.084)
Age	1.036***	1.050***
	(0.002)	(0.002)
Female	0.899***	0.902***
	(0.018)	(0.014)
Non-White	0.846***	0.776***
	(0.017)	(0.012)
Education	1.016***	1.034***
	(0.004)	(0.004)
Firm Size	1.000*	1.000***
	(0.000)	(0.000)
Unemployment Rate	1.045***	1.065***
	(0.010)	(0.009)
Observations	37,272	68,073

Robust standard errors in parentheses correspond to unexponentiated coefficients * significant at 10%; ** significant at 5%; *** significant at 1%.

Table C11: AFT Log-Logistic IV Estimates by Professional Business Services (Dependent Variable-Time Until Employment Ends)

	Professional Business Services	Non-Professional Business Services
Light	0.011***	0.000***
	(0.007)	(0.000)
Moderate	28.390***	277.619***
	(18.729)	(152.404)
Heavy	3,879.998***	11.358**
	(6,360.983)	(12.587)
Age	1.014***	1.012***
	(0.003)	(0.003)
Female	2.409***	4.033***
	(0.270)	(0.374)
Non-White	0.907**	0.946
	(0.039)	(0.033)
Education	0.957***	0.904***
	(0.011)	(0.009)
Firm Size	1.000	1.000***
	(0.000)	(0.000)
Unemployment Rate	1.031***	1.042***
	(0.010)	(0.008)
Observations	37,272	68,079

Robust standard errors in parentheses correspond to unexponentiated coefficients * significant at 10%; ** significant at 5%; *** significant at 1%. Note: alcohol measures from the endogeneity-corrected models are in logarithms, coefficients are interpreted as $\Delta t = (\beta_k / 100) * \Delta$ *alcohol measure.*

Table C12: AFT Estimates with Lagged Alcohol Measures (Dependent Variable-Time Until Employment Ends)

	Weibull	Log-logistic
Light	1.414***	1.528***
	(0.043)	(0.056)
Moderate	1.538***	1.651***
	(0.051)	(0.062)
Heavy	1.574***	1.668***
	(0.145)	(0.170)
Age	1.079***	1.080***
	(0.003)	(0.004)
Female	0.900***	0.873***
	(0.020)	(0.022)
Nonwhite	0.700***	0.671***
	(0.015)	(0.017)
Education	1.013**	1.020***
	(0.006)	(0.006)
Firm Size	1.000	1.000
	(0.000)	(0.000)
Unemployment Rate	1.055***	1.048***
	(0.013)	(0.014)
Light Lagged_1	1.436***	1.554***
	(0.044)	(0.056)
Moderate Lagged_1	1.612***	1.725***
	(0.053)	(0.065)
Heavy Lagged_1	1.692***	1.791***
	(0.156)	(0.185)
Light Lagged_2	1.406***	1.516***
	(0.043)	(0.055)
Moderate Lagged_2	1.640***	1.773***
	(0.055)	(0.068)
Heavy Lagged_2	1.577***	1.678***
	(0.142)	(0.171)
Light Lagged_3	0.000***	0.000***
	(0.000)	(0.000)
Moderate Lagged_3	0.000***	0.000***
	(0.000)	(0.000)
Heavy Lagged_3	0.000***	0.000***
	(0.000)	(0.000)
Observations	23,749	23,749

Robust standard errors in parentheses correspond to unexponentiated coefficients * significant at 10%; ** significant at 5%; *** significant at 1%.

Table C13: AFT–IV Estimates with Lagged Alcohol Measures (Dependent Variable-Time Until Employment Ends)

	Weibull	Log-logistic
Light	50.414***	347.050***
	(90.195)	(732.901)
Moderate	247.525***	254.989***
	(406.323)	(478.280)
Heavy	0.000***	0.000***
	(0.000)	(0.000)
Age	1.065***	1.072***
	(0.005)	(0.005)
Female	1.931***	1.754***
	(0.357)	(0.354)
Nonwhite	1.052	1.018
	(0.069)	(0.074)
Education	0.911***	0.911***
	(0.019)	(0.021)
Firm Size	1.000	1.000
	(0.000)	(0.000)
Unemployment Rate	1.006	1.005
	(0.014)	(0.015)
Light Lagged_1	0.000***	0.000***
	(0.000)	(0.000)
Moderate Lagged_1	0.000***	0.000***
	(0.000)	(0.000)
Heavy Lagged_1	42.091***	100.405***
	(73.342)	(2040.001)
Light Lagged_2	0.997	0.609
	(1.940)	(1.376)
Moderate Lagged_2	0.499	0.410
	(0.968)	(0.957)
Heavy Lagged_2	9.057	20.213*
	(13.644)	(36.526)
Light Lagged_3	0.000***	0.000***
	(0.000)	(0.000)
Moderate Lagged_3	0.033***	399.410***
	(0.216)	(2970.000)
Heavy Lagged_3	0.001***	29.470***
	(0.020)	(179.501)
Observations	21,375	21,375

Robust standard errors in parentheses correspond to unexponentiated coefficients * significant at 10%; ** significant at 5%; *** significant at 1%. Note: alcohol measures from the endogeneity-corrected models are in logarithms, coefficients are interpreted as $\Delta t = (\beta_k / 100) * \Delta$ *alcohol measure.*

Table C14: AFT Estimates with Multiplicative Terms (Dependent Variable-Time Until Employment Ends)

	Weibull	Log-logistic
Light	1.954***	2.018***
	(0.054)	(0.058)
Moderate	2.897***	2.957***
	(0.078)	(0.080)
Heavy	2.157***	2.073***
	(0.130)	(0.117)
Age	1.337***	1.307***
	(0.021)	(0.021)
Age-square	0.996***	0.996***
	(0.000)	(0.000)
Female	1.102***	1.161***
	(0.027)	(0.030)
Non-White	0.832***	0.826***
	(0.020)	(0.021)
Education	1.022***	1.014***
	(0.003)	(0.003)
Firm Size	1.000***	1.000***
	(0.000)	(0.000)
Unemployment Rate	1.059***	1.070***
	(0.007)	(0.007)
Family Size	0.964***	0.971***
	(0.003)	(0.003)
Light*Female	0.802***	0.827***
	(0.025)	(0.027)
Moderate*Female	0.614***	0.612***
	(0.019)	(0.019)
Heavy *Female	0.585***	0.641***
	(0.052)	(0.049)
Light*Non-White	1.079**	1.072**
	(0.035)	(0.035)
Moderate*Non-White	0.858***	0.889***
	(0.027)	(0.028)
Heavy*Non-White	1.272**	1.249***
	(0.144)	(0.098)
Observations	105,345	105,345

Robust standard errors in parentheses correspond to unexponentiated coefficients * significant at 10%; ** significant at 5%; *** significant at 1%.

Table C15: IV-AFT Estimates with Multiplicative Terms (Dependent Variable-Time Until Employment Ends)

	Weibull	Log-logistic
Light	0.005***	0.005***
	(0.004)	(0.004)
Moderate	66.478***	43.260***
	(49.001)	(29.532)
Heavy	0.007***	0.004***
	(0.008)	(0.004)
Age	1.110***	1.096***
	(0.023)	(0.023)
Age-square	0.999***	0.999***
	(0.000)	(0.000)
Female	0.173***	0.295***
	(0.087)	(0.140)
Non-White	26.814***	20.609***
	(9.492)	(7.573)
Education	0.906***	0.903***
	(0.009)	(0.008)
Firm Size	1.000***	1.000***
	(0.000)	(0.000)
Unemployment Rate	1.037***	1.047***
	(0.007)	(0.007)
Family Size	0.958***	0.964***
	(0.003)	(0.003)
Female*Light	6.990***	3.279*
	(4.362)	(1.998)
Female*Moderate	39.794***	22.281***
	(22.509)	(12.021)
Female*Heavy	0.366	1.374
	(0.654)	(2.491)
Non-White* Light	0.032***	0.040***
	(0.017)	(0.022)
Non-White* Moderate	0.007***	0.009***
	(0.003)	(0.004)
Non-White*Heavy	332.981***	1,257.994***
	(290.377)	(1,140.268)
Observations	105,345	105,345

Robust standard errors in parentheses correspond to unexponentiated coefficients * significant at 10%; ** significant at 5%; *** significant at 1%. Note: alcohol measures from the endogeneity-corrected models are in logarithms, coefficients are interpreted as $\Delta t = (\beta_k / 100) * \Delta$ *alcohol measure*.

Log Relative Hazards Estimates

Under the log relative hazards mode, a negative and statistically significant coefficient (exponentiated coefficient less than unity) has the effect of decreasing the hazard rate whiles a positive and statistically significant coefficient (exponentiated coefficient greater than unity) has the opposite interpretation (the signs are reversed in this case). In Table V-A4, the exponentiated coefficients on the drinking measures are all negative (less than unity) and statistically significant under both the weibull and gompertz metric. The exponentiated coefficients on the alcohol variables are about 0.57, 0.48 and 0.56 which implies that drinking as opposed to abstention reduces the hazard of shorter employment duration.

Table C16: IV Log Relative Hazards Counterpart to Estimates in Table V-4 (Dependent Variable-Time Until Employment Ends)

	Weibull	Gompertz
Light	0.576***	0.579***
	(0.009)	(0.009)
Moderate	0.480***	0.482***
	(0.008)	(0.008)
Heavy	0.560***	0.559***
	(0.029)	(0.033)
Age	0.944***	0.937***
	(0.002)	(0.002)
Female	1.206***	1.204***
	(0.015)	(0.016)
Non-White	1.259***	1.267***
	(0.016)	(0.017)
Education	0.975***	0.976***
	(0.003)	(0.003)
Firm Size	1.000***	1.000***
	(0.000)	(0.000)
Unemployment Rate	0.954***	0.952***
	(0.006)	(0.006)
Observations	105,345	105,345

Robust standard errors in parentheses correspond to unexponentiated coefficients * significant at 10%; ** significant at 5%; *** significant at 1%.

The results with endogenous regressors in Table V-A5 are similar to the AFT metrics, in that the exponentiated coefficients on the moderate alcohol measure under the weibull and gompertz model are clearly less than unity which implies a negative effect of moderate drinking on the hazard of shorter employment duration. In contrast, the exponentiated coefficients on both the light and heavy drinking measures under the weibull and gompertz log relative hazards model are clearly greater than unity which implies a positive effect of drinking either lightly or heavily on the hazard of shorter employment duration. In this case it increases the hazard of shorter employment duration under the weibull and gompertz metrics. The sign on the coefficients on the rest of the variables in the model are as expected, that is the reverse of those found in the AFT metrics.

Table C17: Log Relative Hazards Counterpart to Estimates in Table V-5–Endogenous Alcohol Measures (Dependent Variable-Time until Employment Ends)

	Weibull	Gompertz
Light	764.155***	735.073***
	(315.392)	(313.007)
Moderate	0.003***	0.004***
	(0.001)	(0.002)
Heavy	0.190*	0.288
	(0.165)	(0.258)
Age	0.973***	0.966***
	(0.002)	(0.002)
Female	0.325***	0.338***
	(0.024)	(0.026)
Non-White	1.017	1.033
	(0.029)	(0.031)
Education	1.106***	1.106***
	(0.009)	(0.009)
Firm Size	1.000***	1.000***
	(0.000)	(0.000)
Unemployment Rate	0.973***	0.972***
	(0.006)	(0.007)
Observations	105,345	105,345

Robust standard errors in parentheses correspond to unexponentiated coefficients * significant at 10%; ** significant at 5%; *** significant at 1%. Note: alcohol measures from the endogeneity-corrected models are in logarithms, coefficients are interpreted as $\Delta t = (\beta_k / 100) * \Delta$ *alcohol measure*.

Table C18: First-stage Ordered Logit Estimates (Dependent Variable–Alcohol Status)

Age	1.107***
	(0.022)
Age-square	0.999***
	(0.000)
Alcohol Tax	0.830***
	(0.020)
Less Social	1.123**
	(0.058)
Social	1.225***
	(0.062)
Very Social	1.392***
	(0.072)
Female	0.525***
	(0.006)
Non-White	0.798***
	(0.010)
Education	1.021***
	(0.002)
Period Dummies	Yes
Observations	105,345

Robust standard errors in parentheses correspond to unexponentiated coefficients * significant at 10%; ** significant at 5%; *** significant at 1%.

Table C19: IV-AFT Estimates (Dependent Variable-Time until Employment Ends) with First-stage via Ordered Logit

	Weibull	Log-logistic
Light	0.000259***	0.000148***
	(0.000)	(0.000)
Moderate	1.605	1.546
	(1.939)	(1.684)
Heavy	0.000001***	0.00001***
	(0.000)	(0.000)
Age	1.056***	1.043***
	(0.002)	(0.002)
Female	1.358***	1.395***
	(0.083)	(0.083)
Non-White	0.939**	0.922***
	(0.024)	(0.024)
Education	1.008**	1.002
	(0.004)	(0.003)
Firm Size	1.000***	1.000**
	(0.000)	(0.000)
Unemployment Rate	1.042***	1.050***
	(0.007)	(0.007)
Observations	105,345	105,345

Robust standard errors in parentheses correspond to unexponentiated coefficients * significant at 10%; ** significant at 5%; *** significant at 1%.

Table C20 : First-stage Multinomial Logit Estimates (Dependent Variable–Alcohol Status, Five Categories)

	Light	Low Moderate	Moderate	Heavy
Alcohol Tax	0.650***	0.405***	0.397***	0.509***
	(0.082)	(0.050)	(0.049)	(0.071)
Period Dummies	Yes	Yes	Yes	Yes
Observations	105,345	105,345	105,345	105,345

Robust standard errors in parentheses correspond to unexponentiated coefficients * significant at 10%; ** significant at 5%; *** significant at 1%. Note: Multinomial Logit (MNL) estimates are Relative Risk Ratios (RRR) and coefficients can be interpreted as $[\exp(\beta)-1]*100 =$ percentage change. As in the benchmark model background characteristics such as age, education, firm size, unemployment rate, as well as race and gender dummies are included in the model.

Table C21: AFT Estimates (Dependent Variable-Time until Employment Ends)

	Weibull	Log-logistic
Light	1.117***	1.097**
	(0.044)	(0.050)
Low Moderate	2.219***	2.359***
	(0.086)	(0.105)
Moderate	2.768***	2.975***
	(0.107)	(0.132)
Heavy	2.201***	2.267***
	(0.118)	(0.138)
Observations	105,345	105,345

Robust standard errors in parentheses correspond to unexponentiated coefficients * significant at 10%; ** significant at 5%; *** significant at 1%. As in the benchmark model background characteristics such as age, education, firm size, unemployment rate, as well as race and gender dummies are included in the model.

Table C22: IV-AFT Estimates (Dependent Variable-Time until Employment Ends)

	Weibull	Log-logistic
Light	1.074***	1.061***
	(0.004)	(0.003)
Low Moderate	0.179***	0.069***
	(0.098)	(0.042)
Moderate	141.542***	87.403***
	(70.158)	(48.367)
Heavy	96.430***	70.076***
	(114.306)	(91.573)
Observations	105,345	105,345

Robust standard errors in parentheses correspond to unexponentiated coefficients * significant at 10%; ** significant at 5%; *** significant at 1%. Note: alcohol measures from the endogeneity-corrected models are in logarithms, coefficients are interpreted as $\Delta t = (\beta_k / 100) * \Delta$ *alcohol measure*. As in the benchmark model background characteristics such as age, education, firm size, unemployment rate, as well as race and gender dummies are included in the model.

Table C23: Hypothesis Testing-NLSY Benchmark Model–Duration Analysis

	Weibull		Log-logistic	
HRS Hypothesis Testing-F statistics. H_0 **:**	***Differences P-values***	***Joint P-values***	***Differences P-values***	***Joint P-values***
4 Alcohol Categories				
Light=Moderate	0.0000		0.0000	
Light=Heavy	0.4879		0.1596	
Moderate=Heavy	0.0000		0.0000	
Light=0 Moderate=0		0.0000		0.0000
Light=0 Heavy=0		0.0000		0.0000
Moderate=0 Heavy=0		0.0000		0.0000
Light=0 Moderate=0 Heavy=0		0.0000		0.0000
IV-Estimates				
Light=Moderate	0.0000		0.0000	
Light=Heavy	0.9767		0.6033	
Moderate=Heavy	0.0000		0.0000	
Light=0 Moderate=0		0.0000		0.0000
Light=0 Heavy=0		0.0000		0.0000
Moderate=0 Heavy=0		0.0000		0.0000
Light=0 Moderate=0 Heavy=0		0.0000		0.0000
5 Alcohol Categories				
Light=Low Moderate	0.0000		0.0000	
Light=Moderate	0.0000		0.0000	
Light=Heavy	0.0000		0.0000	
Low Moderate=Moderate	0.0000		0.0000	
Low Moderate=Heavy	0.8414		0.3690	
Moderate=Heavy	0.0000		0.0000	
Light=0 Low Moderate=0		0.0000		0.0000
Light=0 Moderate=0		0.0000		0.0000
Light=0 Heavy=0		0.0000		0.0000
Low Moderate=0 Moderate=0		0.0000		0.0000
Low Moderate=0 Heavy=0		0.0000		0.0000
Moderate=0 Heavy=0		0.0000		0.0000
Light=0 Low Moderate=0 Moderate=0		0.0000		0.0000
Light=0 Low Moderate=0 Heavy=0		0.0000		0.0000
Light=0 Moderate=0 Heavy=0		0.0000		0.0000
Low Moderate=0 Moderate=0 Heavy=0		0.0000		0.0000
Light=0 Low Moderate=0 Moderate=0 Heavy=0		0.0000		0.0000
IV-Estimates				
Light=Low Moderate	0.0000		0.0000	
Light=Moderate	0.0000		0.0000	
Light=Heavy	0.0000		0.0000	
Low Moderate=Moderate	0.0000		0.0000	
Low Moderate=Heavy	0.6437		0.1818	
Moderate=Heavy	0.0000		0.0000	
Light=0 Low Moderate=0		0.0000		0.0000
Light=0 Moderate=0		0.0000		0.0000
Light=0 Heavy=0		0.0000		0.0000
Low Moderate=0 Moderate=0		0.0000		0.0000
Low Moderate=0 Heavy=0		0.0000		0.0000
Moderate=0 Heavy=0		0.0000		0.0000
Light=0 Low Moderate=0 Moderate=0		0.0000		0.0000
Light=0 Low Moderate=0 Heavy=0		0.0000		0.0000
Light=0 Moderate=0 Heavy=0		0.0000		0.0000
Low Moderate=0 Moderate=0 Heavy=0		0.0000		0.0000
Light=0 Low Moderate=0 Moderate=0 Heavy=0		0.0000		0.0000

Additional Results for the Panel Data Analysis

Table C24: OLS, RE and FE Estimates with Social Capital Measures (Dependent Variable–Log-Earnings)

	Pooled-OLS	RE	FE
Constant	6.064***	6.665***	7.885***
	(0.044)	(0.107)	(0.207)
Light	0.067***	0.006	-0.010
	(0.009)	(0.009)	(0.010)
Moderate	0.101***	0.021**	0.000
	(0.009)	(0.009)	(0.010)
Heavy	0.051***	0.028	0.018
	(0.018)	(0.018)	(0.020)
Less Social	0.168***	0.232***	
	(0.028)	(0.072)	
Social	0.238***	0.323***	
	(0.028)	(0.071)	
Very Social	0.296***	0.358***	
	(0.028)	(0.072)	
Tenure	0.270***	0.163***	0.147***
	(0.002)	(0.002)	(0.003)
Age	0.011***	0.022***	0.014*
	(0.001)	(0.003)	(0.008)
Female	-0.476***	-0.479***	
	(0.006)	(0.015)	
Non-White	-0.185***	-0.235***	
	(0.006)	(0.017)	
Education	0.117***	0.079***	0.005
	(0.001)	(0.003)	(0.005)
Period Dummies	Yes	Yes	Yes
Observations	110,104	110,104	110,104

Robust standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%.

Table C25: Instrumental Variables-OLS, RE and FE Estimates with Social Capital Measures (Dependent Variable–Log-Earnings)

	RE	FE
	Log Earnings	Log Earnings
Constant	6.104***	6.950***
	(0.264)	(0.378)
Light	0.058	0.785
	(0.690)	(0.825)
Moderate	1.496**	1.497**
	(0.608)	(0.707)
Heavy	1.214	2.672**
	(0.939)	(1.268)
Less Social	0.187**	
	(0.077)	
Social	0.258***	
	(0.076)	
Very Social	0.245**	
	(0.098)	
Tenure	0.163***	0.147***
	(0.002)	(0.003)
Age	0.016***	0.008
	(0.005)	(0.009)
Female	-0.258*	
	(0.141)	
Non-White	-0.159***	
	(0.035)	
Education	0.064***	0.001
	(0.012)	(0.015)
Period Dummies	Yes	Yes
Observations	110,104	110,104

Robust standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%.
Note: alcohol measures from the endogeneity-corrected models are in logarithms, coefficients are interpreted as $\Delta Earnings = (\beta_k / 100) * \Delta$ *alcohol measure.*

Table C26: RE and FE Estimates by Gender (Dependent Variable–Log-Earnings)

	RE–Male	RE–Female	FE–Male	FE–Female
Constant	6.792***	6.641***	8.030***	7.744***
	(0.110)	(0.124)	(0.267)	(0.326)
Light	0.006	0.007	-0.009	-0.012
	(0.013)	(0.013)	(0.014)	(0.014)
Moderate	0.023*	0.021	0.007	-0.006
	(0.013)	(0.013)	(0.014)	(0.015)
Heavy	0.026	0.038	0.017	0.038
	(0.021)	(0.038)	(0.023)	(0.043)
Tenure	0.145***	0.183***	0.132***	0.165***
	(0.003)	(0.004)	(0.003)	(0.004)
Age	0.035***	0.007	0.016	0.011
	(0.004)	(0.005)	(0.010)	(0.013)
Non-White	-0.333***	-0.147***		
	(0.024)	(0.026)		
Education	0.073***	0.087***	0.011	-0.000
	(0.004)	(0.004)	(0.007)	(0.008)
Period Dummies	Yes	Yes	Yes	Yes
Observations	56,228	53,873	56,228	53,873

Robust standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%.

Table C27: Instrumental Variables-RE and FE Estimates by Gender (Dependent Variable–Log-Earning)

	RE–Male	RE–Female	FE–Male	FE–Female
Constant	3.804***	7.083***	0.555	6.193***
	(0.470)	(0.444)	(0.840)	(1.077)
Light	3.478***	-1.151	17.380***	4.239*
	(0.778)	(0.707)	(2.325)	(2.462)
Moderate	3.186***	1.718***	-2.529**	-3.126*
	(0.445)	(0.494)	(1.166)	(1.871)
Heavy	4.438***	-6.668	9.385***	-3.564
	(1.439)	(4.281)	(1.892)	(6.359)
Tenure	0.145***	0.184***	0.132***	0.165***
	(0.003)	(0.004)	(0.003)	(0.004)
Age	0.031***	0.003	0.057***	0.035*
	(0.005)	(0.005)	(0.014)	(0.018)
Non-White	-0.199***	-0.053		
	(0.034)	(0.038)		
Education	0.076***	0.042**	0.209***	0.064
	(0.013)	(0.017)	(0.032)	(0.044)
Period Dummies	Yes	Yes	Yes	Yes
Observations	56,228	53,876	56,228	53,876

Robust standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%.
Note: alcohol measures from the endogeneity-corrected models are in logarithms, coefficients are interpreted as $\Delta Earnings = (\beta_k / 100) * \Delta$ *alcohol measure.*

Table C28: RE and FE Estimates by Race (Dependent Variable–Log-Earning)

	Whites-RE	Non-Whites-RE	Whites-FE	Non-Whites-FE
Constant	0.000	6.795***	7.911***	7.866***
	(0.000)	(0.125)	(0.407)	(0.239)
Light	-0.004	0.014	-0.020	-0.005
	(0.015)	(0.011)	(0.017)	(0.012)
Moderate	0.009	0.029**	-0.005	0.004
	(0.015)	(0.011)	(0.017)	(0.012)
Heavy	-0.035	0.063***	-0.036	0.049**
	(0.032)	(0.021)	(0.035)	(0.023)
Tenure	0.178***	0.155***	0.161***	0.140***
	(0.005)	(0.003)	(0.005)	(0.003)
Age	0.020***	0.023***	-0.000	0.020**
	(0.006)	(0.004)	(0.016)	(0.010)
Female	-0.367***	-0.534***		
	(0.029)	(0.018)		
Education	0.093***	0.074***	0.007	0.005
	(0.006)	(0.003)	(0.011)	(0.006)
Period Dummies	Yes	Yes	Yes	Yes
Observations	32,879	77,222	32,879	77,222

Robust standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%.

Table C29: Instrumental Variables RE and FE Estimates by Race (Dependent Variable–Log-Earning)

	Whites-RE	Non-Whites-RE	Whites-FE	Non-Whites-FE
Constant	5.858***	5.302***	8.316***	5.941***
	(0.466)	(0.365)	(0.669)	(0.486)
Light	-4.246***	3.894***	-5.394***	4.267***
	(1.230)	(0.907)	(1.387)	(1.035)
Moderate	6.446***	-1.210	7.418***	-1.009
	(1.150)	(0.781)	(1.310)	(0.904)
Heavy	5.977***	1.250	6.294***	2.008
	(1.838)	(1.143)	(2.424)	(1.566)
Tenure	0.179***	0.155***	0.161***	0.140***
	(0.005)	(0.003)	(0.005)	(0.003)
Age	-0.017*	0.036***	-0.044**	0.033***
	(0.009)	(0.006)	(0.018)	(0.011)
Female	1.025***	-1.047***		
	(0.255)	(0.181)		
Education	0.009	0.123***	-0.099***	0.056***
	(0.022)	(0.016)	(0.027)	(0.019)
Period Dummies	Yes	Yes	Yes	Yes
Observations	32,879	77,225	32,879	77,225

Robust standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%.
Note: alcohol measures from the endogeneity-corrected models are in logarithms, coefficients are interpreted as $\Delta Earnings = (\beta_k / 100) * \Delta$ *alcohol measure.*

Table C30: RE and FE Estimates by Professional Business Services (Dependent Variable–Log-Earnings)

	Professional Services-RE	Non-Professional Services-RE	Professional Services-FE	Non-Professional Services-FE
Constant	6.564***	6.547***	7.959***	8.099***
	(0.162)	(0.117)	(0.380)	(0.264)
Light	-0.019	0.027**	-0.046***	0.009
	(0.015)	(0.011)	(0.018)	(0.012)
Moderate	-0.003	0.047***	-0.037**	0.026**
	(0.015)	(0.011)	(0.018)	(0.013)
Heavy	-0.059	0.072***	-0.080*	0.071***
	(0.036)	(0.020)	(0.042)	(0.022)
Tenure	0.149***	0.171***	0.125***	0.151***
	(0.004)	(0.003)	(0.005)	(0.003)
Age	0.020***	0.024***	0.010	0.012
	(0.005)	(0.003)	(0.015)	(0.010)
Female	-0.422***	-0.457***		
	(0.022)	(0.016)		
Non-White	-0.254***	-0.212***		
	(0.025)	(0.019)		
Education	0.090***	0.086***	0.008	-0.007
	(0.004)	(0.003)	(0.009)	(0.008)
Period Dummies	Yes	Yes	Yes	Yes
Observations	38,929	71,172	38,929	71,172

Robust standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%.

Table C31: Instrumental Variables-RE and FE Estimates by Professional Business Services (Dependent Variable–Log-Earning)

	Professional Services-RE	Non-Professional Services-RE	Professional Services-FE	Non-Professional Services-FE
Constant	5.483***	5.926***	5.993***	7.083***
	(0.408)	(0.328)	(0.677)	(0.501)
Light	2.247**	-0.340	3.157**	0.895
	(1.097)	(0.883)	(1.388)	(1.126)
Moderate	0.500	1.839**	0.741	1.562*
	(1.026)	(0.746)	(1.255)	(0.925)
Heavy	-1.968	3.416***	2.701	2.841*
	(1.674)	(1.103)	(2.338)	(1.677)
Tenure	0.149***	0.171***	0.125***	0.151***
	(0.004)	(0.003)	(0.005)	(0.003)
Age	0.027***	0.014**	0.014	0.006
	(0.008)	(0.006)	(0.017)	(0.012)
Female	-0.611***	-0.102		
	(0.234)	(0.175)		
Non-White	-0.207***	-0.131***		
	(0.057)	(0.042)		
Education	0.094***	0.074***	0.031	-0.010
	(0.020)	(0.015)	(0.027)	(0.021)
Period Dummies	Yes	Yes	Yes	Yes
Observations	38,929	71,175	38,929	71,175

Robust standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%.
Note: alcohol measures from the endogeneity-corrected models are in logarithms, coefficients are interpreted as $\Delta Earnings = (\beta_k / 100) * \Delta$ *alcohol measure.*

Table C32: OLS, RE and FE Estimates with Lagged Alcohol Measures (Dependent Variable–Log-Earnings)

	Pooled-OLS	RE	FE
Constant	7.663***	7.741***	9.692***
	(0.067)	(0.116)	(0.397)
Light	0.060***	0.023**	0.004
	(0.014)	(0.011)	(0.012)
Moderate	0.077***	0.039***	0.017
	(0.014)	(0.012)	(0.013)
Heavy	0.050	0.046*	0.040*
	(0.032)	(0.024)	(0.024)
Tenure	0.127***	0.080***	0.071***
	(0.004)	(0.004)	(0.004)
Age	0.016***	0.024***	0.004
	(0.002)	(0.004)	(0.011)
Female	-0.318***	-0.303***	
	(0.008)	(0.020)	
Non-White	-0.158***	-0.180***	
	(0.009)	(0.022)	
Education	0.102***	0.072***	-0.003
	(0.002)	(0.004)	(0.007)
Light Lagged_1	0.057***	0.020*	0.006
	(0.015)	(0.011)	(0.012)
Moderate Lagged_1	0.061***	0.022*	0.005
	(0.015)	(0.012)	(0.013)
Heavy Lagged_1	0.042	0.043*	0.043
	(0.028)	(0.023)	(0.027)
Light Lagged_2	0.069***	0.034***	0.020*
	(0.015)	(0.011)	(0.011)
Moderate Lagged_2	0.056***	0.023**	0.008
	(0.015)	(0.012)	(0.012)
Heavy Lagged_2	0.029	0.029	0.033
	(0.031)	(0.025)	(0.027)
Period Dummies	Yes	Yes	Yes
Observations	22,068	22,068	22,068

Robust standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%.

Table C33: Instrumental Variables-RE and FE Estimates with Lagged Alcohol Measures (Dependent Variable–Log-Earnings)

	Pooled-OLS	RE	FE
Constant	6.620***	6.404***	7.050***
	(0.233)	(0.404)	(0.821)
Light	2.793**	4.204***	2.817
	(1.126)	(1.237)	(1.958)
Moderate	-2.450***	-1.709**	-0.713
	(0.759)	(0.749)	(1.119)
Heavy	-0.394	0.288	3.658**
	(2.199)	(1.470)	(1.621)
Tenure	0.122***	0.074***	0.064***
	(0.004)	(0.004)	(0.004)
Age	0.009***	0.013***	0.007
	(0.002)	(0.004)	(0.012)
Female	0.010	0.059	
	(0.069)	(0.145)	
Non-White	-0.014	-0.040	
	(0.026)	(0.049)	
Education	0.083***	0.083***	0.044
	(0.010)	(0.017)	(0.031)
Light Lagged_1	-1.028	-1.465*	-0.428
	(1.207)	(0.830)	(0.882)
Moderate Lagged_1	1.088	-0.641	0.179
	(1.242)	(0.863)	(0.893)
Heavy Lagged_1	-2.255**	-1.739**	-0.923
	(1.024)	(0.710)	(0.746)
Light Lagged_2	1.619*	1.076*	0.617
	(0.853)	(0.586)	(0.624)
Moderate Lagged_2	3.327***	2.215***	1.447**
	(0.927)	(0.660)	(0.679)
Heavy Lagged_2	-0.001	0.746	0.463
	(0.713)	(0.506)	(0.536)
Light Lagged_3	1.566	1.257	4.576***
	(2.327)	(1.550)	(1.751)
Moderate Lagged_3	3.032	2.467	4.753**
	(2.998)	(2.006)	(2.045)
Heavy Lagged_3	-2.589	-0.763	3.495*
	(2.782)	(1.914)	(1.991)
Period Dummies	Yes	Yes	Yes
Observations	19,856	19,856	19,856

Robust standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%.
Note: alcohol measures from the endogeneity-corrected models are in logarithms, coefficients are interpreted as $\Delta Earnings = (\beta_k / 100) * \Delta$ *alcohol measure.*

Table C34: OLS, RE and FE Estimates with Multiplicative Terms (Dependent Variable–Log-Earnings)

	OLS	RE	FE
Constant	3.014***	3.034***	4.359***
	(0.134)	(0.166)	(0.240)
Light	0.085***	0.025*	0.000
	(0.015)	(0.014)	(0.015)
Moderate	0.109***	0.042***	0.000
	(0.014)	(0.014)	(0.015)
Heavy	0.120***	0.078***	0.000
	(0.024)	(0.023)	(0.026)
Tenure	0.251***	0.157***	0.141***
	(0.002)	(0.002)	(0.003)
Age	0.155***	0.231***	0.229***
	(0.009)	(0.009)	(0.012)
Age-square	-0.002***	-0.003***	-0.004***
	(0.000)	(0.000)	(0.000)
Female	-0.324***	-0.379***	
	(0.015)	(0.021)	
Non-White	-0.136***	-0.196***	
	(0.015)	(0.022)	
Education	0.107***	0.071***	-0.005
	(0.001)	(0.003)	(0.005)
Light*Female	-0.006	-0.001	-0.003
	(0.018)	(0.018)	(0.020)
Moderate*Female	-0.022	-0.006	-0.011
	(0.017)	(0.018)	(0.020)
Heavy *Female	-0.080**	0.008	0.029
	(0.040)	(0.041)	(0.047)
(Light)*Non-White	0.003	-0.024	-0.017
	(0.018)	(0.019)	(0.021)
(Moderate)*Non-White	-0.054***	-0.030	-0.012
	(0.018)	(0.019)	(0.021)
(Heavy)*Non-White	-0.179***	-0.123***	-0.099**
	(0.037)	(0.037)	(0.041)
Period Dummies	Yes	Yes	Yes
Observations	110,104	110,104	110,104

Robust standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%.

Table C35: Instrumental Variables-RE and FE Estimates with Multiplicative Terms (Dependent Variable–Log-Earnings)

	RE	FE
Constant	-1.699**	-1.931**
	(0.751)	(0.775)
Light	13.993***	17.853***
	(1.728)	(0.000)
Moderate	-4.924***	-5.669***
	(0.810)	(0.971)
Heavy	-5.022***	-4.023**
	(1.334)	(0.000)
Tenure	0.156***	0.140***
	(0.002)	(0.003)
Age	0.295***	0.298***
	(0.012)	(0.015)
Age-square	-0.004***	-0.004***
	(0.000)	(0.000)
Female	-1.140***	
	(0.291)	
Non-White	0.261	
	(0.198)	
Education	0.200***	0.176***
	(0.022)	(0.025)
Female*Light	-4.116***	-5.415***
	(0.471)	(0.542)
Female*Moderate	0.471	0.694
	(0.463)	(0.659)
Female*Heavy	-0.026	13.406***
	(2.267)	(3.526)
Non-White*Light	0.094	-0.440
	(0.246)	(0.288)
Non-White*Moderate	-1.394***	-1.668**
	(0.282)	(0.659)
Non-White*Heavy	-1.913**	0.377
	(0.756)	(1.887)
Period Dummies	Yes	Yes
Observations	110,104	110,104

Robust standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%.
Note: alcohol measures from the endogeneity-corrected models are in logarithms, coefficients are interpreted as $\Delta Earnings = (\beta_k / 100) * \Delta$ *alcohol measure.*

Table C36: OLS, RE and FE Estimates with Regional Dummies (Dependent Variable–Log-Earnings)

	OLS	RE	FE
Constant	6.052***	6.052***	7.310***
	(0.101)	(0.101)	(0.204)
Light	0.013	0.013	-0.005
	(0.009)	(0.009)	(0.010)
Moderate	0.027***	0.027***	0.004
	(0.009)	(0.009)	(0.010)
Heavy	0.034**	0.034**	0.025
	(0.017)	(0.017)	(0.019)
Tenure	0.159***	0.159***	0.143***
	(0.002)	(0.002)	(0.003)
Age	0.025***	0.025***	0.021***
	(0.003)	(0.003)	(0.008)
Female	-0.381***	-0.381***	
	(0.014)	(0.014)	
Non-White	-0.206***	-0.206***	
	(0.016)	(0.016)	
Education	0.072***	0.072***	-0.005
	(0.003)	(0.003)	(0.005)
Married	0.065***	0.065***	0.046***
	(0.006)	(0.006)	(0.007)
Regional Dummies	Yes	Yes	Yes
Period Dummies	Yes	Yes	Yes
Observations	110,104	110,104	110,104

Robust standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%.

Table C37: Instrumental Variables-RE and FE Estimates with Regional Dummies (Dependent Variable–Log-Earnings)

	RE	FE
Constant	6.539***	7.818***
	(0.273)	(0.397)
Light	-2.425***	-2.091**
	(0.677)	(0.821)
Moderate	2.972***	2.738***
	(0.601)	(0.681)
Heavy	-2.393***	-2.622**
	(0.911)	(1.288)
Tenure	0.158***	0.143***
	(0.002)	(0.003)
Age	0.012**	0.010
	(0.005)	(0.009)
Female	0.161	
	(0.134)	
Non-White	-0.047	
	(0.035)	
Education	0.007	-0.063***
	(0.012)	(0.015)
Married	0.065***	0.046***
	(0.006)	(0.007)
Regional Dummies	Yes	Yes
Period Dummies	Yes	Yes
Observations	110,104	110,104

Robust standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%.
Note: alcohol measures from the endogeneity-corrected models are in logarithms, coefficients are interpreted as $\Delta Earnings = (\beta_k / 100) * \Delta$ *alcohol measure.*

Table C38: Pooled-OLS, RE and FE Estimates (Dependent Variable–Log-Earnings)

	OLS	RE	FE
Constant	9.641***	9.689***	9.426***
	(0.010)	(0.016)	(0.010)
Light	0.039***	-0.005	-0.010
	(0.011)	(0.010)	(0.011)
Moderate	0.112***	0.009	0.003
	(0.010)	(0.010)	(0.011)
Heavy	-0.085***	0.008	0.018
	(0.021)	(0.020)	(0.022)
Female	-0.435***	-0.452***	
	(0.007)	(0.019)	
Non-White	-0.247***	-0.275***	
	(0.007)	(0.021)	
Observations	110,104	110,104	110,104

Robust standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%.

Table C39: Instrumental Variables-RE and FE Estimates (Dependent Variable–Log-Earnings)

	RE	FE
Constant	12.231***	13.875***
	(0.179)	(0.225)
Light	-6.553***	-7.600***
	(0.126)	(0.142)
Moderate	1.306***	4.427***
	(0.242)	(0.356)
Heavy	2.980***	10.214***
	(0.678)	(1.033)
Female	0.049	
	(0.046)	
Non-White	-0.420***	
	(0.024)	
Observations	110,104	110,104

Robust standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%.
Note: alcohol measures from the endogeneity-corrected models are in logarithms, coefficients are interpreted as $\Delta Earnings = (\beta_k / 100) * \Delta$ *alcohol measure.*

Table C40: Pooled-OLS, RE and FE Estimates (Dependent Variable–Log-Earnings) with First-stage via Ordered Logit

	Pooled-OLS	RE	FE
Constant	9.473***	11.712***	14.296***
	(1.552)	(2.540)	(3.454)
Light	-6.708**	-11.643**	-13.921**
	(2.899)	(4.703)	(6.300)
Moderate	-1.396*	-0.559	-0.891
	(0.763)	(1.313)	(1.882)
Heavy	-8.915	-14.562	-18.779
	(7.890)	(12.295)	(15.704)
Tenure	0.269***	0.162***	0.146***
	(0.002)	(0.002)	(0.003)
Age	0.005***	0.004	-0.007
	(0.002)	(0.003)	(0.008)
Female	-0.263***	0.178***	
	(0.039)	(0.048)	
Non-White	-0.118***	-0.008	
	(0.015)	(0.023)	
Education	0.110***	0.057***	-0.017***
	(0.002)	(0.003)	(0.005)
Period Dummies	Yes	Yes	Yes
Observations	110,104	110,104	110,104

Robust standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%.
Note: alcohol measures from the endogeneity-corrected models are in logarithms, coefficients are interpreted as $\Delta Earnings = (\beta_k / 100) * \Delta$ *alcohol measure.*

Table C41: Pooled-OLS, RE and FE Estimates (Dependent Variable–Log-Earnings, Five Categories)

	Pooled-OLS	RE	FE
Constant	6.301***	7.023***	7.947***
	(0.043)	(0.085)	(0.208)
Light	-0.026	-0.069***	-0.059**
	(0.028)	(0.023)	(0.025)
Low Moderate	0.046*	-0.065***	-0.073***
	(0.027)	(0.023)	(0.025)
Moderate	0.082***	-0.050**	-0.062**
	(0.027)	(0.023)	(0.025)
Heavy	0.040	-0.041	-0.044
	(0.031)	(0.027)	(0.030)
Period Dummies	Yes	Yes	Yes
Observations	110,104	110,104	110,104

Robust standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%.

Table C42: Instrumental Variables–Pooled-OLS, RE and FE Estimates (Dependent Variable–Log-Earnings, Five Categories)

	Pooled-OLS	RE	FE
Constant	4.727***	5.680***	7.297***
	(0.855)	(1.193)	(1.533)
Light	0.730	0.626	-0.210
	(0.979)	(1.315)	(1.605)
Low Moderate	0.680	0.514	0.414
	(0.851)	(1.241)	(1.801)
Moderate	2.365***	2.490**	1.278
	(0.912)	(1.252)	(1.513)
Heavy	6.243***	1.961	1.894
	(0.945)	(1.464)	(1.920)
Period Dummies	Yes	Yes	Yes
Observations	110,104	110,104	110,104

Robust standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%.
Note: alcohol measures from the endogeneity-corrected models are in logarithms, coefficients are interpreted as $\Delta Earnings = (\beta_k / 100) * \Delta$ *alcohol measure.*

Table C43: Hypothesis Testing-NLSY Benchmark Model–Panel Data Analysis

	RE		FE	
HRS Hypothesis Testing-F statistics. H_0 **:**	***Differences P-values***	***Joint P-values***	***Differences P-values***	***Joint P-values***
4 Alcohol Categories				
Light=Moderate	0.0108		0.0964	
Light=Heavy	0.1764		0.1157	
Moderate=Heavy	0.6551		0.3150	
Light=0 Moderate=0		0.0098		0.2181
Light=0 Heavy=0		0.2616		0.2073
Moderate=0 Heavy=0		0.0465		0.5974
Light=0 Moderate=0 Heavy=0		0.0184		0.2162
IV-Estimates				
Light=Moderate	0.0007		0.6189	
Light=Heavy	0.0538		0.1821	
Moderate=Heavy	0.6814		0.3732	
Light=0 Moderate=0		0.0000		0.0001
Light=0 Heavy=0		0.1537		0.0870
Moderate=0 Heavy=0		0.0000		0.0248
Light=0 Moderate=0 Heavy=0		0.0000		0.0003
5 Alcohol Categories				
Light=Low Moderate	0.7091		0.1569	
Light=Moderate	0.0383		0.7581	
Light=Heavy	0.1176		0.4283	
Low Moderate=Moderate	0.0086		0.0832	
Low Moderate=Heavy	0.1394		0.1004	
Moderate=Heavy	0.5879		0.2952	
Light=0 Low Moderate=0		0.0101		0.0093
Light=0 Moderate=0		0.0036		0.0421
Light=0 Heavy=0		0.0051		0.0502
Low Moderate=0 Moderate=0		0.0012		0.0051
Low Moderate=0 Heavy=0		0.0070		0.0046
Moderate=0 Heavy=0		0.0809		0.0288
Light=0 Low Moderate=0 Moderate=0		0.0009		0.0133
Light=0 Low Moderate=0 Heavy=0		0.0109		0.0109
Light=0 Moderate=0 Heavy=0		0.0085		0.0660
Low Moderate=0 Moderate=0 Heavy=0		0.0029		0.0078
Light=0 Low Moderate=0 Moderate=0 Heavy=0		0.0018		0.0173
IV-Estimates				
Light=Low Moderate	0.7899		0.4442	
Light=Moderate	0.0000		0.0219	
Light=Heavy	0.1364		0.0962	
Low Moderate=Moderate	0.0005		0.5195	
Low Moderate=Heavy	0.0719		0.2851	
Moderate=Heavy	0.5620		0.6334	
Light=0 Low Moderate=0		0.8869		0.7399
Light=0 Moderate=0		0.0000		0.0569
Light=0 Heavy=0		0.2524		0.2501
Low Moderate=0 Moderate=0		0.0011		0.6239
Low Moderate=0 Heavy=0		0.1786		0.4799
Moderate=0 Heavy=0		0.1297		0.6063
Light=0 Low Moderate=0 Moderate=0		0.0000		0.0004
Light=0 Low Moderate=0 Heavy=0		0.3223		0.3898
Light=0 Moderate=0 Heavy=0		0.0000		0.0644
Low Moderate=0 Moderate=0 Heavy=0		0.0016		0.6503
Light=0 Low Moderate=0 Moderate=0 Heavy=0		0.0000		0.0010

Heckman Selectivity Model

This section adds to the current literature by not only examining the effects of drinking on earnings but also by explicitly analyzing the underlying labor force participation decisions. The intuition is to ascertain whether observed or unobserved factors that affect the probability of a respondent being in the sample also affect the outcome variable. The procedure is to estimate the probability of participating in the labor force in a particular year for all individuals in the NLSY dataset. The inverse Mills ratio from the selectivity-corrected equation is used as an additional independent variable in the earnings equation. The earnings model is then estimated for individuals with positive hours worked and positive earnings in a given year. Formally, let y_{it} denote a binary indicator variable for whether a respondent participates in the labor force in year t or not, then;[86]

$$E(y_{it} \mid x_{it}) = \Pr(y_{it} = 1 \mid x_{it}) = F(x_{it}, \beta) = \Phi(x_{it}, \beta) \quad \text{for } y_{it} = 1 \quad \text{if } y_{it}^{*} > 0$$

Now for n observations on $\{y_{it}, x_{it}\}$, the latent variable approach for the probit case is as follows:

$$\Pr(y_{it} = 1 \mid x_{it}, \beta) = \Phi(x_{it}, \beta)$$

$$\Pr(y_{it} = 0 \mid x_{it}, \beta) = 1 - \Phi(x_{it}, \beta)$$

$$\text{For } y_{it} = \begin{cases} 1 \; if \;\; y_{it}^{*} \geq 0 \\ 0 \quad otherwise \end{cases}$$

The variables used to identify the probit equation's parameters are those assumed to shift the probability of participation but not the log earnings itself. Variables such as the family size, the unemployment rate, religious preference, age, marital status, regional dummies, etc. are assumed to perform this task.[87] There is no theoretical reason why the chosen variables should not influence earnings but whether it does remain an empirical question that should be investigated. The specification of the probit equation also includes the following independent variables such as education, unemployment rate, demographic characteristics, regional and time dummies.[88] Applying (Heckman 1979) method of selectivity correction, the earnings equation is re-written as follows.

$$Earnings_{it} = \beta X_{it} + \pi Alcohol_{it} + \theta \lambda_{i} + v_{it}$$

[86] In general, due to the non-normality and the heteroskedasticity in the disturbance term of the linear probability model (LPM), as well as, the fact that the conditional expectations are not bounded between zero and one, the linear probability model approach is not suitable here.
[87] The inclusion of mother's education, father's education and spouse's income in the reduced-form probit model resulted in less precise estimates, these variables were subsequently dropped.
[88] Definition and justification for the inclusion of these variables in the selectivity-correction equation are provided in the endnotes.

Where the inverse Mills ratio (IMR) λ is included to control for selectivity and θ is the estimated coefficient and the rest of the notations are defined as previously.[89] The earnings equation is under the assumption of normality for the error term: $v_i \sim N(0, \sigma^2)$

$\lambda_1 = \frac{\phi(\Psi_i)}{\Phi(\Psi_i)}$ And $\lambda_0 = \frac{-\phi(\Psi_i)}{1-\Phi(\Psi_i)}$

Where the cdf is $\Phi(.) = \int_{-\infty}^{z} \phi(.)\ \partial t$ and the pdf is $\phi(.) = (2\prod)^{-1/2} \exp(-t^2/2)$ with the resulting likelihood function: $\ln L(\beta \mid x_i) = \sum_{i=1}^{n} \{(1-y_i)\ \ln[1-\Phi(\Psi_i)] + y_i \ln \Phi(\Psi_i)\}$.[90]

By definition λ is a positive number for participants and tends to zero as the probability of participation tends to one. Hence individuals with lower participation propensities will have higher values of λ. The estimated selection coefficient is negative and statistically significant throughout, with the null hypothesis of no selection effects rejected (reflecting the presence of sample selection bias). Thus, it provides a justification for estimating a selection model in addition to the models previously estimated. It is worth noting that further interrogation of the data is warranted since the selection term might be sensitive to the identifying instruments.

[89] Rather than rely on the STATA programming algorithm, the (Heckman 1979) two-step procedure is implemented in two separate steps by first estimating the reduced form probit model and saving the predictions which are then transformed into their standardized probit values z : z = the inverse of the cumulative standard normal distribution function. The inverse Mills ratio is constructed using z as follows: inverse mills ratio = normal density (z)/normal (z). Finally, the structural model is then re-estimated, augmented by the inverse mills ratio.

[90] the first order condition is such that $S(\beta) = \sum_{i=1}^{n} \left\{ \frac{y_i - \Phi(x_i, \beta)}{\Phi(x_i, \beta)[1-\Phi(x_i, \beta)} \ \phi(x_i, \beta)\, x_i \right\}$

Table C44: First-Stage Selectivity Model–Probit Estimates (Dependent Variable–Labor Force Participation)

Family Size	0.943***
	(0.003)
Unemployment Rate	0.934***
	(0.005)
Age	0.996**
	(0.002)
Non-White	0.855***
	(0.010)
Female	0.857***
	(0.008)
Education	1.028***
	(0.002)
Married	1.162***
	(0.012)
Regional Dummies	Yes
Period Dummies	Yes
Observations	128,167

Robust standard errors in parentheses correspond to unexponentiated coefficients * significant at 10%; ** significant at 5%; *** significant at 1%.

Table C45: Selectivity Model–RE and FE Estimates (Dependent Variable–Log-Earnings)

	RE	FE
Constant	6.429***	7.603***
	(0.103)	(0.205)
Light	0.014	-0.004
	(0.009)	(0.010)
Moderate	0.026***	0.005
	(0.009)	(0.010)
Heavy	0.043**	0.035*
	(0.017)	(0.019)
Tenure	0.159***	0.142***
	(0.002)	(0.003)
Age	0.027***	0.023***
	(0.003)	(0.008)
Female	-0.313***	
	(0.014)	
Non-White	-0.125***	
	(0.016)	
IMR	-1.437***	-1.055***
	(0.074)	(0.083)
Education	0.059***	-0.013**
	(0.003)	(0.005)
Period Dummies	Yes	Yes
Observations	101901	101901

Robust standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%.

Table C46: Selectivity Model–IV-RE and IV-FE Estimates (Dependent Variable–Log-Earnings)

	RE	FE
Constant	6.626***	7.853***
	(0.271)	(0.396)
Light	-1.916***	-1.663**
	(0.677)	(0.823)
Moderate	3.062***	2.842***
	(0.569)	(0.671)
Heavy	-2.011**	-2.180*
	(0.912)	(1.291)
Tenure	0.158***	0.142***
	(0.002)	(0.003)
Age	0.015***	0.012
	(0.005)	(0.009)
Female	0.206	
	(0.131)	
Non-White	0.047	
	(0.034)	
IMR	-1.456***	-1.062***
	(0.074)	(0.083)
Education	-0.002	-0.068***
	(0.012)	(0.015)
Period Dummies	Yes	Yes
Observations	101901	101901

Robust standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%.
Note: alcohol measures from the endogeneity-corrected models are in logarithms, coefficients are interpreted as $\Delta Earnings = (\beta_k / 100) * \Delta$ *alcohol measure.*

Essay II: Choice of Variables and Detail Definition-Major Variables

Dependent Variables

Time (Tenure): This is the length of time that the individual spends with an employer. Total tenure with employer (in weeks) is as of the respondent's interview date for a particular employer. A total tenure through contiguous survey years is available for all employers, full-and part-time, for whom valid start and stop dates of employment are reported. This is accomplished by linking identical employers through contiguous survey years. The cumulative tenure in number of weeks is constructed in three stages for a hypothetical employee as follows:

T1 = [Tenure from July 7, 1988–July 31, 1989 at the 1989 interview]
T2 = T1 + [Tenure from August 1, 1989–August 1, 1990 at 1990 interview]
T3 = T1 + T2 + [Tenure from August 2, 1991–May 15, 1992 (time worked for employer X from 1991 to 1992, before respondent left)].

Earnings: This is the total income from wages, salary, tips and other income before tax deductions in past calendar year not counting any money received from other sources such as military pay. NLSY79 panel contains an in-depth income questions that allows the researcher to trace over time detailed age/income profiles. In terms of the broader debate on why earnings vary with alcohol consumption and social capital is provided in the literature review section.

Independent Variable of Interest

Alcohol Consumption: The alcohol consumption measure has been discussed extensively in the text. Data alcohol variables used in this dissertation are available from 1983 to 1989 and 1994, thus missing data are imputed (multiple imputation). Alcohol consumption status is categorized differently by different studies but in this research the categories abstainers, light, moderate and heavy alcohol are based on the Health and Human Services Department's definition:

1. Abstainers = less than 1 drinking days per week[91]
2. Light alcohol users = between 1 and 2 drinking days per week
3. Moderate alcohol users = between 2 and 5 drinking days per week
4. Heavy alcohol users = greater than 5 drinking days per week

Other Independent Variables

Gender: There is evidence that female quit rates are higher than that of male quit rates, and also females have shorter working lives because of career interruptions leading to less firm specific human capital. Displaced women are less likely to be employed at the time of the survey as men. Male=0 and Female=1.

[91] This category was further portioned into total abstainers and infrequent (light) drinkers: less than 1 drinking days per week.

Race/Ethnicity: Categorical variables such race and/or ethnicity will be included as regressors as well. Studies show that Non-Whites are 15 percentage points less likely to be employed at the survey date as whites (NLSY79). White=0, Non-White=1.

Age: Age is included to capture the impact of life-cycle effects on job tenure. Younger workers, for example, are more likely to gain knowledge about the labor market and their own preferences by trying a variety of different jobs. We therefore expect age and job tenure to be positively correlated since the benefits of job change tend to decline with age.

Marital Status: Married men have higher promotion rates than single or never married men, although this differential disappears if his spouse is employed. Men with a spouse in employment also have significantly lower quit and layoffs rates, and have lower transition rates into another job, unemployment and economic inactivity. This perhaps indicates a stronger attachment to the labor market. Married women (especially those with a husband in the labor force), widowed or divorced women, and women with children have lower probabilities of entering temporary jobs than single never married women. Married=1 (Marital Status: married=1, remarried=5) and Married=0 (Marital Status: separated=2, divorced=3, and widowed=6).

Education: Education and occupation are included in the model as measures of skill. As we might expect, education generally increases the promotion rate for men, but also the quit rate. Evidence shows that more education is positively related to long tenure and multivariate analysis reveals that the probability of employment is monotonically increasing with the level of educational attainment. Highly educated men are less likely to be laid off relative to those with less or no qualifications. The NLSY ask respondents' highest grade completed as of survey year (ranges between 0 and 20).

Sociability: The NLSY79 collects social capital-related data from respondents such as respondents' (1) perceived self-esteem; (2) feelings of control over one's own life; (3) sociability; and (4) perceptions of influential people in one's life, for selected years. Two questions were asked of respondents in 1985 about the extent of their sociability (shy or outgoing) as age 6 and as an adult. Sociability is intended to capture the possible social capital stock of the respondent.

Weighted-Average States' Tax Rates on Alcoholic Beverages: This variable is used as the identifying instrument for the first-stage alcohol equation in Essay I, the GSS Case Study and Essay II. More recent data for the alcohol tax rates was downloaded from the Tax Policy Center's website. Early editions of the tax data were then electronically scanned from the Tax Foundation publications (1988-1996). For the weighted-average regional alcoholic beverage tax rates, the average of the rates on liquor, wine (2 types) and beer for each state and weighted this average by the annual ethanol consumption (in '000s of gallons) in that particular state from 1988–1996 is calculated. This weighted-average is then used in computing the tax rate for each region.

Unemployment Rate (proxy for Business Cycle): Demand side variables, measured by the unemployment rate are important in determining job tenure. Employment levels or rates of quits could either be positively related or negatively related depending on other factors. For instance, during an economic expansion, new job opportunities appear for those employed and those unemployed as well, leading the former to seek alternative employment. It also indicates that employers might try harder to keep these workers. Conversely, during recessions these same forces may push job tenure in opposite direction. We might expect workers to be laid off when labor demand is low and unemployment high, and a number of British studies show that quits are pro-cyclical and layoffs counter-cyclical.

Firm Characteristics: There is evidence suggesting that turnover is different between firms, industries, worker groups and in many other dimensions. With regards to firm size, duration of employment might be negatively related to firm size. That is individuals with jobs in small firms (defined as employing fewer than 25 workers) are more likely to experience a dismissal or layoff from that job.

Professional Business Services: The justification for focusing on this industrial sector is due to recent research which indicates that certain groups of individuals have had relatively little success in gaining long term employment in this sector. The NLSY categorizes industry and Occupation based on SIC-Codes and this sector encompasses SIC codes 700 through 890)

States: These are the fifty states of the U.S. This variable is a local approximation of the respondent's current residential location. Access to the Geocode version of the NLSY made it possible to locate the respondent's current resident by State.

Appendix D: Technical Appendix

I: Ordered Logit Model (GSS Case Study)

The relationship between the unobserved y_i^* and the observed outcome y_i for the i^{th} individual can be summarized as follows;

$$y_i = 1 \; if \; y_i^* \le \alpha_1$$
$$y_i = 2 \; if \; \alpha_1 < y_i^* \le \alpha_2$$
$$\vdots$$
$$\vdots$$
$$y_i = J \; if \; y_i^* \ge \alpha_{j-1} \qquad (39)$$

Here the threshold α_j ($j = 1, 2, \ldots, J$) reflects the differences in social capital levels resulting from optimism about social interactions[92] In addition to the above we require that the threshold α_j be $\alpha_1 < \alpha_2 \ldots < \alpha_{j-1}$, such that the i^{th} individual is assumed to belong to category j if $\alpha_{j-1} < y_i^* \le \alpha_j$.[93] The resulting probabilities are specified as follows;[94]

$$\Pr(y_i = 1) = \Pr(x_i{}'\beta + \varepsilon_i \le \alpha_1) = \frac{1}{1 + \exp(x'\beta - \alpha_1)}$$

$$\Pr(y_i = 2) = \Pr(x_i{}'\beta + \varepsilon_i \le \alpha_2) - \Pr(x_i{}'\beta + \varepsilon_i \le \alpha_1) = \frac{1}{1 + \exp(x'\beta - \alpha_2)} - \frac{1}{1 + \exp(x'\beta - \alpha_1)}$$

$$\Pr(y_i = J) = \Pr(\alpha_j \le x_i{}'\beta + \varepsilon_i) = 1 - \frac{1}{1 + \exp(x'\beta - \alpha_{j-1})}$$

The maximum likelihood which follows directly from equation (3) can be specified as follows (McKelvey and Zavoina 1975);

$$L(\alpha, \beta) = \prod_{i,j} P(y_{ij} = 1) = \prod_{i=1}^{N} \prod_{j=1}^{J} P(y_{ij} = 1)^{y_{ij}} = \prod_{i=1}^{N} \prod_{j=1}^{J} \left[\Omega(\alpha_j - x_i'\beta)] - [\Omega(\alpha_{j-1} - x_i'\beta))\right]^{y_{ij}}$$

Subsequently, the log-likelihood function for the ordered logit model is given by:

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92 The time (years) subscript $t = 1, \ldots, T$ is henceforth suppressed.

93 The resulting probabilities are specified and provided in the appendix

94 y_i = 1, if the individual places the least value on the social capital index variable

$\vdots$

y_i = J, if the individual places the greatest value on the social capital indicator variable

$$\ln L = \sum_i \sum_j y_{ij} \ \ln[\Omega(\alpha_j - x_i'\beta)] - [\Omega(\alpha_{j-1} - x_i'\beta)]$$

The above can be solved for the βs by maximizing the likelihood directly or by solving the first order conditions:

Letting $F_{ij} = \Omega(\alpha_j - x_i'\beta)$ and $f_{ij} = \psi(\alpha_j - x_i'\beta)$

$$\frac{\partial \ln L}{\partial \beta} = \sum_i \sum_j y_{ij} \ \frac{f_{i,\,j-1} - f_{ij}}{F_{ij} - F_{i,\,j-1}} x_i = 0$$

$$\frac{\partial \ln L}{\partial \beta} = \sum_i \sum_j y_{ij} \ \frac{f_{i,\,j-1} - f_{ij}}{F_{ij} - F_{i,\,j-1}} x_i = 0$$

$$\frac{\partial \ln L}{\partial \alpha_k} = \sum_j y_{ik} \ \frac{f_{ik}}{F_{ik} - F_{i,k-1}} - y_{i,k+1} \frac{f_{ik}}{F_{i,k+1} - F_{ik}} = 0$$

$k = 1, \ldots, m-1$

The variance of the ML estimators can be estimated by the inverse of the information matrix. The estimate of the second order derivatives-Hessian (negative definite matrix) can be obtained numerically or with statistical software such as STATA:

For the logit model, the marginal effects of x_{ij} on the probability that y=1 is given by;

$$\frac{\partial \Pr[y_j = 1 \mid x_i]}{\partial x_{ij}} = \Pr\left[y_j = 1 \mid x_{ij} = 1\right] - \Pr\left[y_j = 1 \mid x_{ij} = 0\right]$$

$$= \Omega((\alpha_j - \bar{x}\hat{\beta});\, x_{ij} = 1) - \Omega((\alpha_j - \bar{x}\hat{\beta});\, x_{ij} = 0)$$

Since most of the variables used here are discrete in nature, the emphasis is on the change in the predicted probabilities as x_{ij} changes from one value to the next.

II: First-stage Multinomial Logit model (Essay I and Essay II)

Since the drinking status of these HRS respondents are mutually exclusive (abstainer, light-moderate and heavy), a multinomial logit model that provides an empirical framework within which to address the relationship between *j* drinking categories and alcohol taxes are expressed as follows;

Let $y_{ij} = 1$ if the i^{th} individual chooses the j^{th} alternative and let $y_{ij} = 0$, *otherwise* where $j =$ 1, 2, 3. Then $pr(y_{ij} = 1) = \pi_{ij}$; and since the probabilities must sum to unity we have: $\pi_{i1} + \pi_{i2} + \pi_{i3} = 1$. In its more general form with *j* alternatives, the multinomial logit with type I extreme value distribution is expressed as: $\pi_{ij} = \dfrac{\exp(\alpha_j + x_j\beta_j)}{\sum_j^k \exp(\alpha_j + x_j\beta_j)}$ where k is the number of outcomes being modeled. This, in general terms, expresses the probability that an individual with characteristics x_i chooses the j^{th} category. By means of a Theil normalization, α_1 is set to zero and β_1 is set to zero.[95]

$$\pi_{i1} = \frac{1}{1 + \exp(\alpha_2 + x_i\beta_2) + \exp(\alpha_3 + x_i\beta_3)} \qquad , \ \exp(0) = 1$$

$$\pi_{i2} = \frac{\exp(\alpha_2 + x_i\beta_2)}{1 + \exp(\alpha_2 + x_i\beta_2) + \exp(\alpha_3 + x_i\beta_3)}$$

$$\pi_{i3} = \frac{\exp(\alpha_3 + x_i\beta_3)}{1 + \exp(\alpha_2 + x_i\beta_2) + \exp(\alpha_3 + x_i\beta_3)}$$

It is evident that in this particular case that the condition $\pi_{i1} + \pi_{i2} + \pi_{i3} = 1$ is still satisfied.[96] The estimated coefficients of the MNL estimates have relative risk ratio interpretation and the relative risk ratio in the case of the reported coefficients are in terms of the Theil normalization category (base category-abstainers).

$$\log \exp[\frac{\pi_2}{\pi_1}] = \alpha_2 + x'\beta_2 \quad \text{or} \quad \log \exp[\frac{\pi_3}{\pi_1}] = \alpha_3 + x'\beta_3$$

However, to ascertain the relative risk ratio of a coefficient to another category other than the base category, then the coefficients of the intermediate category will have to be subtracted from the relevant category.

$$\log \exp[\frac{\pi_3}{\pi_2}] = \log \exp[\frac{\pi_3}{\pi_1}] - \log \exp[\frac{\pi_2}{\pi_1}] = \alpha_3 + x'\beta_3 \text{-} \alpha_2 + x'\beta_2$$

---

[95] Given the same set of characteristics, a different set of coefficients should generate a different set of probabilities but different parameterizations can generate identical probabilities leading to indeterminacy.

[96] This multinomial logit model presented above is based on Essay I (HRS) which models three alcohol outcomes. It is straight forward to extend the model to the case where there are four outcomes as in Essay II (NLSY).

Although, somewhat more complicated than in the binary logit model, the marginal effects for a small change in an explanatory variable on the probability of one of the non-normalized events occurring is generally given by:

$$\frac{\partial \pi_j}{\partial x} \pi_j [\beta_j - \sum_k \beta_k \pi_k]$$

The marginal probability for the normalized first category π_1 is given by:

$$\frac{\partial \pi_1}{\partial x} \pi_1 [0 - \beta_2 \pi_2 - \beta_3 \pi_3]$$

The parameters of the multinomial logit model are estimated by specifying the following log likelihood function.

$$L = \sum_n \sum_k y_{ij} \log \exp(\pi_{ij})$$

The number of parameters to be estimated is determined by the number of individual characteristics multiplied by $k-1$ where k is the number of drinking categories. A weakness of the multinomial logit is the assumption of independent of the remaining alternatives. This is known as the independence of irrelevant alternatives (IIA) property. That is extreme value errors associated with each of the m random errors $[\varepsilon_1, \varepsilon_2, \ldots, \varepsilon_m]$ are independent of each other. The relevant test statistic for testing the validity of the IIA property is an extension of the Hausman (1978) test, the Hausman and McFadden (1984) test: $\tau = [\tilde{\theta}_j - \hat{\theta}_j]'[V(\tilde{\theta}_j) - V(\hat{\theta}_j)]^{-1}[\tilde{\theta}_j - \hat{\theta}_j] \sim \chi_k^2$

Under the null hypothesis of IIA the test statistic τ has a limiting χ_k^2 where k is the number of parameters estimated. The intuition for the test is that under the IIA assumption, there should be no differences in parameter estimates if we arbitrarily exclude a category. Note that if χ_k^2 <0, the estimated model does not meet asymptotic assumptions of the test. The IIA tests in both essays were in favor of the null hypothesis.

III: Distributional Assumptions for the Duration Models

The parametric duration models of the duration of employment in the second essay are analyzed with three different distributional assumptions about the error term. Estimation is accomplished by plugging in $f(t)$ and $S(t)$ in the log-likelihood function and estimating the parameters via MLE in STATA.

Weibull: The assumption of constant hazards proved to be untenable since the failure probability varied over time, thus making the weibull distribution an appropriate candidate. In fact the weibull model nests the exponential model due to the fact that it can have hazards that are constant, monotonic increasing or monotonic decreasing. The error term is assumed to have a Type III extreme value distribution. The PDF of the weibull is:

$$f(t) = \lambda p(\lambda t)^{(p-1)} * \exp(-\lambda t)^{p} \text{ for } 0 \le t < \infty, \quad p > 0 \text{ this implies that } h(t) = \lambda p(\lambda t)^{p-1}$$

And using the relationship between the cumulative (integrated) hazard and the survival function, the survival representation will be $S(t) = \exp(-\lambda t)^{p}$ .The parameter p is the shape parameter and it determines whether the hazard is increasing ($p > 1$), decreasing ($p < 1$) or constant ($p = 1$).

Log-Logistic: In addition to the weibull there are other AFT models such as the Log-logistic, Gompertz and Gamma models. In the Log-logistic model, the error term is assumed to follow a logistic distribution and the PDF of the log-logistic is:

$$f(t) = (1/\sigma)\exp[-(t-a)/\sigma]\{1+\exp[-(t-a)/\sigma]\}^{-2}, \text{ for } 0 \le t < \infty, \quad \sigma > 0$$

The hazard function is specified as: $h(t) = \dfrac{\lambda\gamma(\lambda t)^{\gamma-1}}{[1+(\lambda t)^{\gamma}]}$. And the associated survival function is: $S(t) = \dfrac{1}{[1+(\lambda t)^{\gamma}]}$. This model allows for the possibility of non-monotonic hazards such as an inverted U-shaped hazard where the hazard first rises, then falls, $\hat{\gamma} < 1$. If the hazard is such that $\hat{\gamma} > 1$, the hazard is declining and it exhibits exponential (flat) hazards if $\hat{\gamma} = 1$. Also, the coefficients from the log-logistic model can be interpreted as odds ratios (Hosmer and Lemeshow 1989).

Gompertz: Another distribution considered in this research is the Gompertz model (similar to proportional hazards) which has a two parameter distribution. The hazard is specified as: $h(t) = \lambda \exp(\gamma t)$. And the survival counterpart is: $S(t) = \exp[-\lambda\gamma^{-1}(e^{\gamma t} - 1)]$

BIBLIOGRAPHY

Adam, Dean, Nicky Welch, Christine Pendlebury, and Kiri Merritt. *A Culture of Consumption: An Investigation into Alcohol Related Drinking Problems Amongst University Students*. Hamilton: University of Waikato, 2000.

Auld, M. Christopher. "Wages, Alcohol Use, and Smoking: Simultaneous Estimates." *Economics Working Paper Archive at WUSTL* HEW 9808001 (1998).

Baltagi, Badi, and Qi Li. "A Lagrange-Multiplier Test for the Error Components Model with Incomplete Panels." *Econometric Reviews* 9, no. 1 (1990): 103-107.

Barrett, Garry F. "The Effect of Alcohol Consumption on Earnings." *The Economic Record* 78, no. 240 (2002): 79-96.

Beck, K. H., D. L. Thombs, C. A. Mahoney, and K. M. Fingar. "Social Context and Sensation Seeking: Gender Differences in College Student Drinking Motivations." *International Journal of the Addictions* 30 (1995): 1101-1115.

Becker, Gary S. "Investment in Human Capital: A Theoretical Analysis." *Journal of Political Economy* 70 (1962): 9-49.

________. "A Theory of the Allocation of Time." *The Economic Journal* 75 (1965): 493-517.

Becker, Gary S., and Kevin S. Murphy. "A Theory of Rational Addiction." *Journal of Political Economy* 96, no. 4 (1988): 675-700.

Berger, Klaus, Umed A. Ajani, Carlos S. Kase, J. Michael Gaziano, Julie E. Buring, Robert J. Glynn, and Charles H. Hennekens. "Light-to-Moderate Alcohol Consumption and the Risk of Stroke among U.S. Male Physicians." *New England Journal of Medicine* 341, no. 21 (1999): 1557-1564.

Berger, Mark C., and J. Paul Leigh. "The Effect of Alcohol Use on Wages." *Applied Economics* 20, no. 10 (1988): 1343-51.

Block, Robert I., Sara Farnham, Kathleen Braverman, Russell Noyes Jr., and Mohamed M. Ghoneim. "Long-Term Marijuana Use and Subsequent Effects on Learning and Cognitive Functions Related to School Achievement: Preliminary Study." *National Institute on Drug Abuse Research Monograph Series* 101 (1990): 96–111.

Bolin, Kristian, Björn Lindgren, Martin Lindström, and Paul Nystedt. "Investments in Social Capital Implications of Social Interactions for the Production of Health." *Social Science and Medicine* 56, no. 12 (2003): 2379-90.

Bound, John, David A. Jaeger, and Regina M. Baker. "Problems with Instrumental Variables Estimation When the Correlation between the Instruments and the Endogenous Explanatory Variables Is Weak." *Journal of the American Statistical Association* 90 (1995): 443–450.

Brehm, John, and Wendy Rahn. "Individual-Level Evidence for the Causes and Consequences of Social Capital." *American Journal of Political Science* 41, no. 3 (1997): 999-1024.

Breusch, Trevor, and Adrian R. Pagan. "The Lagrange-Multiplier Test and Its Applications to Model Specification in Econometrics." *Review of Economic Studies* 47 (1980): 239-253.

Burt, Ronald S., ed. *Structural Holes: The Social Structure of Competition*. Cambridge: Harvard University Press, 1992.

Campbell, Norman R., Mary J. Ashley, S. George Carruthers, Yves Lacourcière, and Donald W. McKay. "Nonpharmacologic Therapy to Prevent and Control Hypertension III: Recommendations on Alcohol." *Canadian Medical Association Journal* 160 (1999): 13-20.

Cashin, Jeffrey R., Cheryl A. Presley, and Philip W. Meilman. "Alcohol Use in the Greek System: Follow the Leader?" *Journal of Studies on Alcohol* 59 (1998): 63-70.

Cevilla, Jorge A., Martin Prince, Suzanne Joels, Simon Lovestone, and Anthony Mann. "Long Term Predictors of Cognitive Outcome in a Cohort of Older People with Hypertension." *British Journal of Psychiatry* 177 (2000): 66-71.

Chadwick, Derek J., and Jamie A. Goode. "Alcohol and Cardiovascular Diseases." In *Novartis Foundation Symposium 216*, ed. Derek J. Chadwick and Jamie A. Goode. New York: John Wiley and Sons, 1998.

Chaloupka, Frank J., Michael Grossman, and Henry Saffer. "The Effects of Price on Alcohol Consumption and Alcohol-Related Problems." *Alcohol Research and Health* 26 (2002): 22-34.

Chaloupka, Frank J., and Henry Wechsler. "Binge Drinking in College: The Impact of Price, Availability, and Alcohol Control Policies." *Contemporary Economic Policy* 14, no. 4 (1996): 112-124.

Coleman, James. "Social Capital in the Creation of Human Capital." *American Journal of Sociology* 94 (1988): 95-120.

Cook, Philip J., and Michael J. Moore. "Economics of Alcohol Abuse and Alcohol-Control Policies." *Health Affairs* 21 (2002): 120–133.

Cooper, Helen, Sara Arber, Lin Fee, and Jay Ginn. *The Influence of Social Support and Social Capital on Health: A Review and Analysis of British Data*. London: Health Education Authority, 1999.

Criqui, Michael H. "Alcohol and Coronary Heart Disease: Consistent Relationship and Public Health Implications." *Clinica Chimica Acta* 246 (1996): 51-57.

________, ed. *Moderate Drinking: Benefits and Risks*. Edited by Sam Zakhari and Marion Wassef, Alcohol and the Cardiovascular System. Bethesda: National Institutes of Health, National Institute on Alcohol Abuse and Alcoholism, 1996.

Dawson, Deborah A., Bridget F. Grant, S. Patricia Chou, and Roger P. Pickering. "Subgroup Variation in U.S. Drinking Patterns: Results of the 1992 National Longitudinal Alcohol Epidemiologic Study." *Journal of Substance Abuse* 7 (1995): 331-344.

Dawson, Deborah A., and Robin Room. "Towards Agreement on Ways to Measure and Report Drinking Patterns and Alcohol-Related Problems in Adult General Population Surveys: The Skarpö Conference Overview." *Journal of Substance Abuse* 12 (2000): 1-21.

Doll, Richard, Richard Peto, Emma Hall, Keith Wheatley, Richard Gray, and and Richard Gray Keith Wheatley. "Mortality in Relation to Consumption of Alcohol: 13 Years' Observations on Male British Doctors." *British Medical Journal* 309 (1994): 911-918.

Dufour, Mary C. "What Is Moderate Drinking." *Alcohol Research and Health* 23, no. 1 (1999): 5-14.

Dufour, Mary C., James D. Colliver, M. Beth Grigson, and Frederick S. Stinson. "Use of Alcohol and Tobacco." In *Health Status and Well-Being of the Elderly*, ed. Joan C. Cornoni-Huntley, Robert R. Huntley and Jacob J. Feldman, 172 - 183. New York: Oxford University Press, 1990.

French, Michael T., and Gary A. Zarkin. "Is Moderate Alcohol Use Related to Wages: Evidence from Four Worksites." *Journal of Health Economics* 14 (1995): 319-344.

Fuchs, Victor R., ed. *What Is Health Economics?*, The Future of Health Policy. Boston: Harvard University Press, 1993.

Gilbert, M. Jean. "Alcohol Consumption Patterns in Immigrant and Later Generation Mexican American Women." *Hispanic Journal of Behavioral Sciences* 9, no. 3 (1987): 299-313.

Glaeser, Edward L., David Laibson, and Bruce Sacerdote. "The Economic Approach to Social Capital." *The Economic Journal* 112 (2000): 437.

Granovetter, Mark. *Getting a Job: A Study of Contacts and Careers*. 2 ed. Chicago: The University of Chicago Press, 1995.

Graves, Theodore D., Nancy B. Graves, Vineta Semu, and Iulai Ah Sam. "Patterns of Public Drinking in a Multi-Ethnic Society." *Journal of Studies on Alcohol* 43, no. 2 (1982): 990-1009.

Greene, William. *Econometric Analysis*: Prentice-Hall, 2002.

Grossman, Michael. "On the Concept of Health Capital and the Demand for Health." *Journal of Political Economy* 80, no. 2 (1972): 223-255.

________, ed. *The Human Capital Model*. Edited by Anthony J. Culyer and Joseph P. Newhouse, Handbook of Health Economics. Amsterdam: Elsevier, 2000.

Hall, Peter. "Social Capital in Britain." *British Journal of Political Science* 29 (1999): 417-461.

Hamilton, Vivian, and Barton H. Hamilton. "Alcohol and Earnings: Does Drinking Yield a Wage Premium?" *Canadian Journal of Economics* 30 (1997): 135-151.

Harford, Thomas C., Bridget F. Grant, and Deborah S. Hasin, eds. *Effect of Average Daily Consumption and Frequency of Intoxication on the Occurrence of Dependence Symptoms and Alcohol-Related Problems*. Edited by Walter B. Clark and Michael E. Hilton, Alcohol in America: Drinking Practices and Problems. Albany: State University of New York Press, 1991.

Hausman, Jerry A. "Specification Tests in Econometrics." *Econometrica* 46 (1978): 1251-1271.

Hausman, Jerry A., and Daniel McFadden. "Specification Tests for the Multinomial Logit Model." *Econometrica* 52, no. 5 (1984): 1219-1240.

Heckman, James. "Sample Selection Bias as a Specification Error." *Econometrica* 47, no. 1 (1979): 153-61.

Hillbom, Matti, Helena Haapaniemi, Seppo Juvela, Heikki Palomaki, Heikki Numminen, and Markku Kaste. "Recent Alcohol Consumption, Cigarette Smoking, and Cerebral Infarction in Young Adults." *Stroke* 26, no. 1 (1995): 40-45.

Holzer, Harry J. "Informal Job Search and Black Youth Unemployment." *American Economic Review* 77 (1987): 446-452.

Hosmer, D. W. Jr., and S. Lemeshow. *Applied Logistic Regression*. New York: John Wiley and Sons, Inc., 1989.

Kawachi, Ichiro, Bruce P. Kennedy, and Roberta Glass. "Social Capital and Self-Rated Health: A Contextual Analysis." *American Journal of Public Health* 89, no. 8 (1999): 1187-1193.

Kenkel, Donald S., and David C. Ribar, eds. *Alcohol Consumption and Young Adults' Socioeconomic Status*. Edited by Clifford M Winston Martin N Baily, Peter C Reiss, Brookings Papers on Economics Activity: Microeconomics: Brookings Institution Press, 1994.

Koppel, Ross. "The Role of Social Psychological Variables in the Status Attainment of Young Men." PhD dissertation, Temple University, 1981.

Koss, Mary P., and John A. Gaines. "The Prediction of Sexual Aggression by Alcohol Use, Athletic Participation, and Fraternity Affiliation." *Journal of Interpersonal Violence* 8, no. 1 (1993): 94-108.

Leifman, H., E. Kühlhorn, P. Allebeck, S. Andreasson, and A. Romelsjö. "Antecedents and Covariates to a Sober Lifestyle and Its Consequences." *Social Science and Medicine* 41 (1995): 113–121.

Lin, Nan, and Mary Dumin. "Access to Occupations through Social Ties." *Social Networks* 8 (1986): 365-385.

Lo, Celia C., and Gerald Globetti. "The Facilitating and Enhancing Roles Greek Associations Play in College Drinking." *International Journal of the Addictions* 30, no. 10 (1995): 1311-1322.

Loury, Glenn C., ed. *A Dynamic Theory of Racial Income Differences*. Edited by Phyllis Wallace and Annette M. La Mond, Women, Minorities, and Employment Discrimination. Lexington: Heath, 1977.

MacDonald, Ziggy, and Michael A. Shields. "The Impact of Alcohol Consumption on Occupational Attainment in England." *Economica* 68, no. 271 (2001): 427-53.

Meer, Jonathan, Douglas L. Miller, and Harvey S. Rosen. "Exploring the Health-Wealth Nexus." *Journal of Health Economics* 22, no. 5 (2003): 713-30.

Michaud, Pierre-Carl, and Arthur van Soest. "Health and Wealth of Elderly Couples: Causality Tests Using Dynamic Panel Data Models." *IZA Discussion Papers* 1312 (2004): 50.

Midanik, Lorraine T. "Workshop on Measurement Issues in Alcohol Consumption: Comparing Usual Quantity/Frequency and Graduated Frequency Scales to Assess Yearly Alcohol Consumption: Results from the 1990 Us National Alcohol Survey." *Addiction* 89 (1994): 407 - 412.

Miles, Ian, Nikos Kastrinos, Kieron Flanagan, Rob Bilderbeek, Pim Hertog, Willem Huntink, and Mark Bouman. "Knowledge-Intensive Business Services: Users, Carriers and Sources of Innovation." In *Innovation Programme*, 15. Luxembourg: EIMS Publication, 1995.

Mitchell, Olivia S., John W. R. Phillips, Andrew Au, and David McCarthy. *Lifetime Earnings Variability and Retirement Wealth*. University of Michigan, 2003.

Montgomery, James D. "Social Networks and Labor-Market Outcomes: Toward an Economic Analysis." *American Economic Review* 81 (1991): 1408-1418.

Moody, Scott, ed. *Facts and Figures on Government Finance*. Washington, D.C.: Tax Foundation, 1988-2000.

Mukamal, Kenneth J., Lewis H. Kuller, Annette L. Fitzpatrick, William T. Longstreth, Murray A. Mittleman, and David S. Siscovick. "Prospective Study of Alcohol Consumption and Risk of Dementia in Older Adults " *Journal of the American Medical Association* 289, no. 11 (2003): 1405-1413.

Mullahy, John, and Jody L. Sindelar. "The Direct and Indirect Effects of Alcoholism on Income." *Milbank Quarterly* 72, no. 2 (1994): 359-375.

Muurinen, Jana M., and Julian Le Grand. "The Econmic Analysis of Inequality in Health." *Social Science and Medecine* 20, no. 10 (1985): 1029-1035.

Nachum, Lilach. "Danish Professional Service Firms. Why Are They Not Competitive Internationally?" A Comparative Analysis between Danish and U.K Management Consulting Firms." *Scandinavian Journal of Management* 14, no. 1/2 (1998).

Narayan, Deepa, and Lant Pritchett. *Cents and Sociability: Household Income and Social Capital in Rural Tanzania*. Washington DC: World Bank, 1997.

Olley, G. Steven, and Ariel Pakes. "The Dynamics of Productivity in the Telecommunications Equipment Industry." *Econometrica* 64, no. 6 (1996): 1263-1297.

Patterson, Orlando. "Affirmative Action: Opening up Workplace Networks to Afro-Americans." *The Brookings Review* 16, no. 2 (1998): 17-23.

Perri, 6. "Social Exclusion: Time to Be Optimistic, in Demos, the Wealth and Poverty of Networks, 1997." Demos Collection, London.

Peters, Bethany L. "Is There a Wage Bonus from Drinking? Unobserved Heterogeneity Examined." *Applied Economics* 36 (2004): 2299-2315.

Petry, Nancy M. "Ro 15-4513 Selectively Attenuates Ethanol, but Not Sucrose, Reinforced Responding in a Concurrent Access Procedure: Comparison to Other Drugs." *Psychopharmacology* 121 (1995): 192-203.

Portes, Alejandro. "Social Capital: Its Origins and Applications in Modern Sociology." *Annual Review of Sociology* 24 (1998): 1-24.

Putnam, Robert D. "Social Capital: Measurement and Consequences." *Canadian Journal of Policy Research* 2, no. 1 (2001): 41-51.

Rose, Richard, ed. *Getting Things Done in an Anti-Modern Society: Social Capital Networks in Russia*. Edited by P. Dasgupta and I. Serageldin, 1999.

Sato, Motoaki, Nilanjana Maulik, and Dipak K. Das. "Cardio-Protection with Alcohol: Role of Both Alcohol and Polyphenolic Antioxidants." *Annals of the New York Academy of Sciences* 957 (2002): 122-135.

Saxanien, Ann. *Regional Advantage: Culture and Competition in Silicon Valley and Route 128*. Cambridge: Harvard University Press, 1994.

Seitz, Helmut, and Gudrun Poschl. "Alcohol and Gastrointestinal Cancer: Pathogenic Mechanisms." *Addiction Biology* 2, no. 1 (1997): 19-33.

Skog, Ole-Jørgen. "Social Interactions and the Distribution of Alcohol Consumption." *Journal of Drug Issues* 10 (1980): 71-92.

Sun, Albert Y., Agnes Simonyi, and Grace Y. Sun. "The "French Paradox" And Beyond: Neuroprotective Effects of Polyphenols." *Free Radical Biology and Medicine* 15, no. 32 (2002): 314-318.

Szekelyi, Maria, and Robert Tardos. *Attitudes That Make a Difference: Expectancies and Economic Success*. Madison: Institute for Research on Poverty, 1993.

Tax Policy Center. *Tax Facts: States' Alcohol Excise Tax Rates* Washington, D.C.: Tax Policy Center 1999-2002, accessed November 2004; Available from http://www.taxpolicycenter.org/TaxFacts/TFDB/TFTemplate.cfm?Docid=399.

Tekin, Erdal. "Employment, Wages, and Alcohol Consumption in Russia." *Southern Economic Journal* 71, no. 2 (2004): 397-417.

Urwin, Peter, Giorgio Di Pietro, Gregor Jack, and Patrick Sturgis. "Assessing the Income Effects of Networking and the Accumulation of Social Capital Using the Uk 2000 Time Use Survey." In *Conference of the International Associaton for Time Use Research*. Lisbon, Portugal, 2002.

Veenstra, Jan. "Social Capital, Ses and Health: An Individual-Level Analysis." *Social Science and Medicine* 50 (2000): 619-629.

Veenstra, Jan, Theo Ockhuizen, Hettie van de Pol, Michel Wedel, and Gertjan Schaafsma. "Effects of a Moderate Dose of Alcohol on Blood Lipids and Lipoproteins Postprandially and in the Fasting State." *Alcohol and Alcoholism* 25 (1990): 371-377.

Wagstaff, Adam. "The Demand for Health: A Simplified Grossman Model." *Bulletin of Economic Research* 38, no. 1 (1986): 93-95.

Williams, Gerald D., and Samar F. DeBakey. "Changes in Levels of Alcohol Consumption: United States, L983 to L988." *British Journal of Addictions* 87 (1992): 643-648.

Wooldridge, Jeffrey M. *Econometric Analysis of Cross Section and Panel Data*. Cambridge: MIT Press, 2002.

World Bank. *Social Capital Initiative* Washington, D.C.: World Bank, 1998, accessed June 2004; Available from http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTSOCIALDEVELOPMENT/EXTTSOCIALCAPITAL/0,,contentMDK:20194767~menuPK:418848~pagePK:148956~piPK:216618~theSitePK:401015,00.html.

You, Roger X., John J. McNeil, Heather M. O'Malley, Stephen M. Davis, Amanda G. Thrift, and Geoffrey A. Donnan. "Risk Factors for Stroke Due to Cerebral Infarction in Young Adults." *Stroke* 28 (1997): 1913-1918.

Zakhari, Sam. "Alcohol and the Cardiovascular System: Molecular Mechanisms for Beneficial and Harmful Action." *Alcohol Health and Research World* 21 (1997): 21-29.

Zarkin, Gary, Michael T. French, Thomas Mroz, and Jeremy Bray. "Alcohol Use and Wages: New Results from the National Household Survey on Drug Abuse." *Journal of Health Economics* 17 (1998): 53-68.

Zavoina, Richard, and William D. McKelvey. "A Statistical Model for the Analysis of Ordinal Level Dependent Variables." *Journal of Mathematical Sociology* 4 (1975): 103-120.

Zhang, Qing H., Kabita Das, Shahid Siddiqui, and Adam K. Myers. "Effects of Acute, Moderate Ethanol Consumption on Human Platelet Aggregation in Platelet-Rich Plasma and Whole Blood Alcohol." *Clinical and Experimental Research* 24, no. 4 (2000): 528-534.

VITA

Eric Sarpong was born in Accra, Ghana in 1972. He graduated in 1999 from Kennesaw State University, Georgia, receiving a Bachelor of Business Administration degree in Accounting. Between 1999 and 2000, Eric worked as a Litigation Associate with the Philips-Hitchner Group, currently Acuitas, an Atlanta, Georgia Certified Public Accounting firm specializing in litigation, forensic accounting and business valuation services.

In 2000, Eric entered the master's program in economics at the Andrew Young School of Policy Studies, Georgia State University. In 2001, Eric was admitted into the Ph.D. program at Andrew Young School of Policy Studies, Georgia State University. He earned a Master of Arts in Economics from the Andrew Young School of Policy Studies, Georgia State University in December 2002. While pursuing his doctoral degree, Eric taught at Georgia State University, teaching introductory macroeconomics in the spring of 2006 and again in the fall of 2006. He also served as a tutor to undergraduate students at the Andrew Young School of Policy Studies, Department of Economics' Tutoring Lab and as a Teaching Assistant to Dr. Inas Rashad.

In the fall of 2006, Eric received his Doctor of Philosophy degree in economics from the Andrew Young School of Policy Studies, Georgia State University. His major field was Labor Economics.