Drugs, Money, and Family: A Theoretical and Empirical Analysis of Household Composition and Illegal Labor Market Income

Abstract

Despite the few studies on the illegal earnings of drug sellers, the motivating factors that cause some social actors to enter the illicit drug market as sellers remains unknown. Using pooled data from the Arrestee and Drug Abuse Monitoring Program (ADAM), I investigate how household size and composition affect illegal wages earned from illicit drug sales. My findings support existing studies on the economic returns to drug selling, but I also show that, contrary to widely held arguments, sellers living in two-parent households earn almost the same as sellers from single-parent households.

1 INTRODUCTION

Illegal drug consumption pervades many urban communities in the United States. Despite government programs that assist individuals in abating their drug use, illicit substance consumption persists. The market demand for these substances may be so great that some sellers feel their cost-to-benefit ratio is low. Moreover, other social, economic, and demographic forces may serve as catalysts for these individuals to enter the drug production market. Low human capital investments, depressed labor market opportunities in a neighborhood, or the well being of one’s family and household members could be factors that propel an individual into this market as suppliers of illicit drugs.

The purpose of this paper is to reconceptualize illegal earnings in the context of pressures from familial consumption. Previous research on crime focuses on neighborhood effects (e.g., poverty and differential policing) and family structures (single parent versus two parent households). The contribution of this paper is both theoretical and empirical: I integrate and expand broad strains of economic, sociological, and demographic literatures to create a unified understanding of drug selling that focuses on rationality and household demography; my thesis fully accounts for why people living under similar social conditions make
drastically different decisions regarding illegal labor market immersion; and I utilize rich, unanalyzed cross-sectional data on household co-residents and income earned (both legal and illegal) to test the plausibility of my theory. I intend to show that illegal labor market participation should not only be situated in economic logic but also in the context of household demography.

2 THE PROBLEM

The problem with existing research on drug selling is that it suffers from a major drawback: the lack of a systematic theory relating household consumption to individual production. On the surface, arguments relating household poverty to illegal economic action seem sufficient and plausible; however, such an explanation is wholly deficient because it cannot fully account for why different people in poverty choose to sell drugs. If poverty truly is the key mechanism behind drug production, at the street level at least, then such a theory cannot fully explain why the poor are both consumers and producers of illicit drugs. Such a theory would either lead to a market imbalance whereby there would be more producers (i.e., sellers) than consumers or the market would simply cease to exist.\(^1\) A fuller explanation might focus on gradational and relational aspects among people and households in poverty. I contend that the motivations of illegal substance distributors should be situated in the context of their familial relations and obligations.

Currently, most studies focus mainly on how family disruption in black, urban communities cause persistent high rates of crime (Sampson 1987); how exogenous forces (unemployment and neighborhood quality) affect and account for the magnitude of crime and incarceration levels (Alba, Logan, and Bellair 1994; Western and Beckett 1999); and the role

\(^1\)Another possibility is that the imbalance between potential suppliers and consumers would drive down the returns to selling to the point that enough potential sellers are pushed out of the market. At this point, supply would equilibrate with demand.
family structure plays in the intergenerational reproduction of poverty (McLanahan 1985; McLanahan and Booth 1989). Researchers treat these micro and macro processes as independent when, in fact, their interdependence may (better) explain the reasons behind a person being embedded in the illegal labor market as a drug supplier. Temporary shocks of unemployment, arrest, disability, and parental absence can place household income in disequilibrium; however, household income lost, due to these shocks, is mitigated when other household members obtain employment in legal and illegal sectors of the economy. If father absence has a detrimental economic effect on female-headed households, and if labor market opportunities are depressed in a neighborhood laden with crime, then illegal wages from drug sales may assist households in returning to economic equilibrium, if the seller does not act in his own pure self-interest.

Because researchers have overlooked the specific effects household characteristics have on an individual’s probability of entering the illegal economy as an illicit drug supplier, our understanding of why some poor family members choose to embed themselves in illegal labor market activities is limited. Disentangling neighborhood, labor market, and household effects may help to explain the cyclical and intergenerational processes whereby father absence translates into 1) household poverty for single mothers, 2) young males becoming drug sellers in order to reap the benefits of immediate economic returns to illegal activities, thereby abating household poverty, and 3) reproducing single households if the drug seller becomes a father and is incarcerated or resides outside the primary household of his child(ren).

This is an important social stratification issue for three reasons. First, people with less human capital may try to mitigate their poverty through illegal means in order to sustain themselves and their families at consumption levels commensurate to people with more human capital and higher wages. Second, because policing methods disproportionately target minority communities as both suppliers and consumers of drugs (Cole 1999), the social/class position of the parents—and, indirectly, the household—has implications on the probability
of an arrested drug seller being a non-white, since neighborhoods are racially segregated (Massey 1990; Massey and Denton 1993). Lastly, because poverty status is contingent on household income, which varies across family structures (McLanahan 1985) and household size, examining a drug seller’s household characteristics enables one to investigate whether or not these additional (illegal) wages ameliorate the plight of impoverished family units.

3 Sociological and Economic Theories of Deviance

Entering the illegal labor market as an illicit substance supplier may seem like an economically irrational decision given the risks involved (mortality and incarceration); yet the decision to enter such a market could also be the result of endogenous, long-term shocks of unemployment in the household, especially if the actor and his family members do not have sufficient capital to ensure the economic survival of the household. The rationality of drug selling should not only be situated in economic logic but also in sociological theory because collective social circumstances may be stronger catalysts for certain individuals to enter the illegal economy than others. Merton (1938) argues that institutionalized procedures are the mechanisms by which cultural goals (occupational status, financial success, etc.) are achieved in society, and when one’s social position or class location hinders an individual from achieving the cultural goal, anomie ensues because individuals strive for cultural goals through the rejection of institutional norms. He argues that a moral conflict ensues when actors feel obligated to pursue the culture goals through institutional means, even though they may be shut off from legitimate and efficacious institutional means. Although goods needed for basic survival (food, shelter, clothing) may not be a cultural goal, other markers of status and material consumption could serve to motivate people to strive for these cultural goals through the rejection of institutional means.

Although illegal behavior can be a response when individuals perceive themselves to
be cut off from the necessary legal means to achieve cultural goals, such behavior does not explain why individuals living and operating under the same social conditions reach different decisions about how to achieve these goals. One theory focuses on the differential availability of illegal means (Cloward 1959). Cloward (1959) contends that the anomie theory assumes conventional means are “differentially distributed,” and in his theoretical scheme, learning and opportunity structures are 1) finite and 2) location-specific within the social structure.

While theories of culture goals and opportunity structures may explain the logical, external conditions that may lead some people to sell drugs, rational action may be the best explanation for why some people immerse themselves in the illegal economy. Becker (1968) argues that rational choice explains crime much better than theories of anomie, criminal psychology, or trait inheritance, and in his 1996 Nobel Lecture, he says, “Rationality implied that some individuals become criminals because of the financial and other rewards from crime compared to legal work, taking account of the likelihood of apprehension and conviction and the severity of punishment,” (Becker 1996). Yet there are two unresolved issues in rational choice theory on this topic. First, endogeneity and causality problems stem from whether criminal acts and their rewards are the result of low or zero legal wages or vice versa; and second, certain criminal behaviors (e.g., drug selling) require that people have physical capital (height, demeanor, gender, etc.) and social networks that will enable them to actualize the rationality implicit in a particular criminal act. In the case of drug sellers, a combination of rational action and opportunity structures may better explain how poor people living in similar disadvantaged neighborhoods make different decisions about whether to commit criminal acts and which criminal acts to commit.

The most compelling evidence regarding the rationality of crime can be found in ethnographic research. In his study of the business ventures of gang members, Jankowski (1993) shows that the decision to sell drugs is motivated by the seller’s desire to increase the socioeconomic conditions of himself and his family, which underscores how deviant individuals can come to make rational decisions as to what is in their best interest. This suggests that the decision to enter the illegal economy might bear positive externalities for future household consumption, if the prospective seller enters the illicit drug market with the intent to achieve the desired cultural goals.
4 Data and Measures

I use pooled, cross-sectional data from the 1998 and 1999 Arrestee Drug Abuse Monitoring (ADAM) Program, which measures the levels and trends of people arrested and booked in 35 U.S. cities. Participation in the project is voluntary, and the collected information remains anonymous and confidential. The survey relies on self-reported consumption of illegal substances, and positive urinal tests reveal the types of drugs that are in the respondent’s system at the time of interview. Data on the arrestee’s legal and illegal wages are reported for the last month, as well as the revenues spent on illegal drug consumption. Demographic variables, such as the arrestee’s race, income, age, sex, education, and household characteristics (e.g., size, type, and the relationship to people in the household), are included. Arrestee’s current and previous offense(s), the seriousness of the offense (as indicated by felony or misdemeanor designations), and the previous arrest history are also present in the data. Despite detailed questions about the composition and size of the arrestee’s living environment, household income is not obtained.

Moreover, because these data are not random, it is difficult to generalize beyond those who were arrested and volunteered for this study. There is reason to believe that the people arrested are different from those who were not arrested, and respondents who volunteered may be unlike individuals who chose not to partake in the study. I am unable to quantify these sources of bias and error, but future studies would benefit from a randomized sample of criminals embedded in the illegal drug economy. However, procuring a sample frame for such a population is extremely difficult, thereby making statistically appropriate sampling procedures not an option for many researchers.

The arrestees were asked to quantify their legal and illegal earnings in the past 30 days and to explain their main source of that income.3 My dependent variable is the log of total

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3It could be that the earnings for the last 30 days are not representative of the average monthly income. To the extent that this is true, I am unable to quantify this bias.
illegal income. Age, education, household size—the sum of parents, spouses, boy/girlfriend, children, siblings, extended kin, friends, and unrelated members presently residing in the reported living quarters—are continuous variables; and the presence of the arrestee’s mother, father, boy/girlfriend, and/or spouse is dichotomously coded (1 if yes and 0 if no). Also, I created a dummy variable to indicate whether or not the arrestee is a drug seller (1 if yes and 0 if no) if any of the three charges he was arrested for involved drug sales or if he stated that his main source of income in the last 30 days was from drug sales.

5 The Household Size and Composition (HSC) Theory

“...everyday people struggling to survive, so you know, we just do what we can. We ain’t got no choice, and if that means getting killed, well s—, it’s what n——s do around here to feed their family,”

—Street-level drug seller (Levitt and Venkatesh 2000)

Popular media and much of society hold a strong belief that the marginal drug seller’s net earnings exceed thousands of dollars a month (Reuter, MacCoun, and Murphy 1990; Reuter and MacCoun 1992) and that sellers lead ostentatious and prodigal lifestyles, whereby they are the sole consumers of their wages (Lamar 1988). Whereas it may be true that some distributors lead extravagant lifestyles, there is no research to substantiate such absolute impressions, nor is there evidence that the legal and illegal revenues are for the benefit of self-consumption. These pop culture archetypes represent young men’s real life motivations, but the economic rationality implicit in them is compelling enough to warrant researchers not

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4I do not restrict my analysis to drug sellers because I have reason to believe that some respondents reporting illegal income may be less truthful in categorizing whether or not such earnings are from drugs or other criminal activities that yield monetary returns. I conducted a discriminant function analysis and found that between 33% and 44% of the respondents are false negatives (i.e., they are non-sellers who should probably be considered sellers), depending on how I specify the function. I do not recategorize these individuals as sellers because I prefer to include their activities in the baseline coefficient than to further exacerbate misreporting and selection bias.
ruling out such motivations before implementing empirical tests. Yet, there is no reason to believe that sellers in the illegal drug market act only or primarily out of self-interest, for their actions may be based on the economic state of their household. In this context, household size (HS) and composition (HC) could have a major impact on the illegal revenues of a drug seller (i.e., how much the distributor wants to sell and how much he makes) if financial hardships within the household emerge and persist. In such instances, the seller could live outside the household and remit partial earnings (similar to that of migrant workers), or the seller could reside within the household in order to ensure the financial well being of its members. Reuter et al. (1990) find that 70% of drug dealers in their sample resided in households where parents and others were the household heads and that 50% of the sellers reported supporting family members who lived in independent households. More specifically, 79% of dealers’ monthly financial contributions to household expenses were on the range of $332, for sellers who lived with others, to $554 for those who lived alone. While it is good to know summary statistics, Reuter et al. do not conduct multivariate statistics to find the effect household size and composition have on a seller’s illegal wages. Moreover, their study is confined to the D.C. area while this study incorporates data from 35 U.S. cities.

To understand drug selling and its relationship to contemporary household microeconomics, familial economic roles in traditional societies may provide a useful analytic framework. Chayanov (1966 [1925]) shows that the consumption demands and labor supply of Russian peasants, as their families develop and change over the life-cycle, are not only a function of family size, but also the overall age-sex structure of the household. One of his main points is that, conditional on how long the household has been in existence, every family transitions through distinct stages of household economic development, with regard to la-

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5I refer to sellers as males because the majority of my sample is male.
6I assume that the seller’s self-interest is primary. To the extent that a seller’s self-interest is based on the utility of other household members, I assume that such utility is less important due to the unshared potential risk that is endogenous only to the potential seller.
bor, consumption, and principles of complex cooperation. Moreover, he implicitly shows that households rely on familial transfers that originate, in part, from the economic productivity of children as they mature over the life-cycle.

While the economic roles of children have been evaluated and debated in anthropologic and demographic literatures (Caldwell 1976; Cain 1977; Lee and Kramer 2002), such a useful discussion is absent in criminological studies and should be applied and extended within a Chayanovian paradigm. Chayanov’s research is applicable to household arrangements in modern times because, as Reuter et al. show, economic transfers flow upwardly, downwardly, and laterally depending on a drug seller’s household composition and size. Building on Chayanov’s work, I propose a new relational explanation for the economic rationality of drug selling: the Household Size and Composition (HSC) theory. The HSC theory has two components: one part is based on the overall household dependency ratio as a function of the number of dependents to legal wage earners independent of composition, henceforth referred to as the household dependency ratio effect (HDRE); the second component focuses on composition independent of size.

Another major Chayanovian insight was relating household consumer-worker ratios to the economic needs of the family in order to assess demographic pressures over the life-cycle. More specifically, his analysis shows that the greater the family consumption demand, as evidenced by higher consumer-worker ratios, the more intensely the peasant worker had to labor. In the spirit of Chayanov’s ratio, the HDRE retains his theory relating economic production to familial consumption pressures, but the HDRE also clearly explicates two competing effects that are endogenously related to illegal labor market activities. First, household size (HS) could positively or negatively affect illegal revenues. As the number of household members increases, one might expect there to be a positive relationship between

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7Chayanov’s ratio is simply the number of household consumers to the number of household workers, weighted by age-sex specific consumption and worker units derived from Vologda budget studies.
illegal revenues generated and household size, if the household dependency ratio is above some threshold. If such is the case, then the drug seller may be trying to increase household production so that members can consume a sufficient amount of daily goods (food, shelter, clothing, education, etc.). The intensity, or the increased demand for illegal earnings, may also accompany greater risk, which could also produce a dampening effect on his desired illegal earnings as the seller approaches his risk utility threshold. Alternatively, if the dependency ratio is low, then one might expect a negative relationship between household size and illegal revenues generated. This would imply that the seller’s illegal wages would decrease because household production is spread across more working-age members, and if the seller is a rational actor, then it would be in his best interest to not engage in the drug trade.

Table 1 provides individual and household descriptive statistics for the entire sample (N=75450). Over 84% of the arrestees in my sample live in households that have five or fewer members. Given this information, and to explicate the HDRE as an extension of the HSC theory, consider the following matrix for illustrative purposes only.

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8For instance, he may not desire a particular clientele or he may simply refuse to distribute types and quantities of a substance that may engender harsher punishment if he is apprehended by law enforcement officials.

9If the household is composed of elderly members, then their pensions, retirement benefits, and social security payments act as sources of revenue similar to working-aged adults. If some working-aged adults do not contribute to household income, then this theoretical model may or may not hold true. However, it seems highly unlikely that all adult members will be unemployed in a household distribution skewed toward working-aged adults. Even if such is the case, then unemployment and disability payments act as incoming sources of revenue for the household.

10To avoid trivial solutions, I focus on households that have at least one dependent and one legal wage earner. My calculation of Chayanov’s consumer-worker ratio, and that of Lee and Kramer (2002), differs for two reasons: first, I do not weight by consumption, production, or time allocation; and second, in modern times, children are less economically productive than their counterparts in traditional societies, thereby making modern children more dependent on, and more costly to, their parents and adult figures. My formula asserts that anyone outside the labor market does not contribute to the economic stability of the household in times of modernity.

Moreover, I lack detailed data on the ages of household members, which would enable me to effectively conduct a detailed analysis of consumer demand and production across the households of drug sellers.
Let the $i^{th}$ row represent household worker capacity ($W$), the total number household members able to work; the $j^{th}$ column be the total number of dependents ($D$) in the household; $W+D = HS$, the total household size; $\gamma$ equal the median household income required to support a family of size $W+D$, adjusted for household age-sex consumption in a particular geographic space; and $\delta_{ij} = \frac{D}{W}$, the household dependency ratio (HDRE). According to my theory, there could be some dependency ratio threshold ($\delta$) that may incite people to engage in illegal activity due to legal household production constraints. For instance, if the income needed to sustain the household ($\gamma$) is held constant with the addition of another dependent, then $\gamma^*$ is the new household income needed to support the family and $\gamma^* - \gamma$ is the amount of money needed to support the additional member. More formally, if $\delta > 1$, then household consumption could be threatened because $\gamma < \gamma^*$ (i.e., economic resources are spread out over more individuals and the workers would have to produce more in order to return the household to steady-state equilibrium). However, as more household members obtain employment, the HDRE moves back toward the diagonal (i.e., $\lim_{\delta \to 1} g(\delta) = \gamma$ if $\delta = 1$). Drug selling could be one of many externalities due to the household HDRE.

Chayanov also showed that household composition matters because sex differences translate into consumption and production differences. Returning to the HSC theory, household composition (HC) may affect the illegal drug revenues of the seller insofar as enabling differential access to various illegal markets; the overall economic production from those market

\[ \delta_{ij} = \begin{bmatrix} 1.00 & 2.00 & 3.00 & 4.00 & 5.00 \\ 0.50 & 1.00 & 1.50 & 2.00 & 2.50 \\ 0.30 & 0.67 & 1.00 & 1.33 & 1.67 \\ 0.25 & 0.50 & 0.75 & 1.00 & 1.25 \\ 0.20 & 0.40 & 0.60 & 0.80 & 1.00 \end{bmatrix} \]

\[ 11^{11} \text{This also assumes that consumption and preferences are fixed.} \]
activities; contextual differences in family structures that translate into perceptions of relative need; and the overall weight of risk in the illegal activity itself. If the seller resides with his parents or other kin (children, siblings, extended family, etc.), for example, then he may care more about securing sufficient consumption of everyday goods for his family than his friends because of preexisting biological and emotional bonds. Furthermore, the presence of parents could suppress the illegal earnings of the seller. More specifically, it could be that the effect of a father’s presence within the household, compared to a mother’s presence, would be much more negatively related to the seller’s illegal income because males tend to earn higher legal wages than women. However, a mother’s presence in the household may also reduce the seller’s wages if he is concerned about exposing her to a possible risk, as a consequence of his illicit activities.

The household composition of my sample is qualified in Table 1, showing that mothers are present in 31% of the households, while only 13% of the respondents answered that their fathers are present. Ten percent of the sample resides in households that have both biological parents present. Twenty-two percent of the respondents live with their children and almost 30% are in households where their siblings are present. With regard to partner presence, 10% of the arrestees reside with spouses, while 27% live with boy/girlfriends. Less than one-fifth of respondents share living quarters with other relatives, and almost 5% of the arrestees are in households with their grandparents. Finally, the presence of other individuals in the household is worth knowing. Eighteen percent of arrestees reside in spaces where their friends are present, while 11.3% of respondents live with other unrelated individuals.
5.1 The Effect of Human Capital Investments and Legal Revenues on Illegal Wages

Economic literature mostly examines the effects of human capital investments on (legal) labor market wages. To date, there are very few studies that investigate the effect of human capital investments on illegal labor market wages. It could be that as drug sellers acquire more human capital skills and legal labor market earnings, their illegal income contracts because of the legal returns to education and additional skills. Moreover, if the drug seller is a rational actor, then he would want to decrease his illicit drug sales when his legal income rises because the original cost-to-benefit ratio has changed (i.e., the benefits of drug distribution have remained fairly fixed over time, but the cost of selling drugs would be higher due to the seller’s gains in education and skills, if he is apprehended by law enforcement officials).

A drug seller’s legal wages could also affect his desired illegal income. While research shows that the hourly economic returns to drug selling are small, the literature also contains evidence that drug sellers have legal incomes at all stages in the life-cycle (Reuter, MacCoun, and Murphy 1990; MacCoun and Reuter 1992; Reuter and MacCoun 1992; Levitt and Venkatesh 2000). Once again, if the drug seller is a rational actor, he would spread his risk across (legal and illegal) labor markets, thereby creating the impression that any illegal wages he earned could be from his legal employment—depending on his education and skill-base.

Table 2 illustrates the legal and illegal wages the arrestees earned in the last 30 days. For the entire sample, the mean and median legal wages are greater than their illegal income. Yet, only examining the entire sample could obfuscate earning disparities between non-drug distributors and drug sellers. Non-drug distributors’ legal wages are slightly higher than those of drug sellers, while drug distributors have higher illegal earnings than non-sellers. Like previous researchers, I find that drug sellers are immersed in both legal and illegal
sectors of the economy. Levitt and Venkatesh (2000) find that, although employed in the legal labor market, the hourly illegal earnings of street level drug sellers is less than the legal minimum wage despite a 28% increased risk of death. It could be that sellers have a difficult time finding additional legal employment, or it could be that illegal employment confers more flexibility than a legal secondary or tertiary job. These lower wages from illicit drug sales may be due to trade-offs between employment flexibility and economic returns in the presence of inflexible primary legal employment. An interesting question arises from this discussion: What is the elasticity of illegal earnings with respect of legal wages?

6 METHODOLOGY

To evaluate the plausibility of the HSC theory (and HDRE indirectly through HS), I will test several hypotheses. First, if illegal revenues are negatively related to increases in household size, then this could provide evidence for my theory of drug selling, because \( \delta \) converges to 1 (or below) as more co-residents obtain legal employment because there are fewer legal workers than dependents. Because I do not have data on the ages of each member within the household, I will assume that the age structure is old, for 22% of the respondents say they live with their biological children (i.e., one might think that \( \delta < 1 \) for the household HDRE).\(^{12}\) Second, I anticipate the relationship between human capital (as measured by education) and illegal revenues to be negative and strong because of increased opportunity costs to further educational endowments. Finally, HC could matter differently for households composed of biological and non-biological members. Yet, even within biological households, one might expect parental presence in the household to have a strong, negative effect on illegal wages, and that father-presence would suppress illegal income more strongly than the

\(^{12}\)My concept of “old” refers to anyone who is 16 or older, since there are some households that have more children (younger than 16) than adults. I choose 16 as the cutoff because that is the age at which an individual can legally obtain work.
mother-presence, since males tend to have higher earnings and fathers could serve as stronger deterrents to illegal activities.

6.1 Methods

There is reason to believe that respondents who report zero illegal and/or legal wages may be from different family units than arrestees who report such wages. This bias could substantially under predict the effects household size and composition have on illegal income if a sizable fraction of the sample reports zero illegal earnings. To obtain sensible estimates of household effects for sellers and non-sellers, I use a city fixed effects tobit model with bootstrapped standard errors.\textsuperscript{13} The tobit model is a censored regression model that accounts for the fact that illegal wages are inherently censored at zero and the high percentage of respondents who report zero wages. The model will yield unbiased estimates in the presence of high zero illegal wage earners, compared to the use of a multivariate OLS model (Long 1997; Greene 2003), and the bootstrapped standard errors estimate the asymptotic variance of the estimator. I assume that the functional form of multivariate model will follow a log-linear earnings distribution. The structural equation for the tobit model is

\[
y_i = \begin{cases} 
y_i^* = x_i \beta + \varepsilon_i & \text{if } y_i^* > \tau \\
y_i = \tau_y & \text{if } y_i^* \leq \tau
\end{cases}
\]

\[\varepsilon_i \sim N(0, \sigma^2)\]  

(1)

Since all cases are used in the model, \(y^*\) is the latent variable observed for values greater than \(\tau\) and is censored for values less than or equal to \(\tau\). I add one dollar to all respondents, and I code \(\ln(y) = \tau_y = 0\) because some people did not report illegal wages. This leads to \(\tau = \tau_y = 0\).

\textsuperscript{13}The bootstrapped samples were replicated 100 times using the full sample size for each model.
6.2 Models

Equation (2) represents the multivariate tobit model. I estimate the log of monthly illegal earnings as a function of household size and composition, personal characteristics, human capital investments, and arrest/drug history on his illegal earnings.

\[
\ln(\text{illegal income}_i) = \theta_1 + \theta_2 d98_i + \delta_i \text{seller}_i + X_i \beta + c_i + u_i
\]  

(2)

where \(i\) indexes individuals; \(d98_i\) is a dummy variable equal to 1 if the year is 1998; \(\text{seller}_i\) is a dummy variable for whether or not the person is a drug seller; \(X_i\) is a vector of covariates representing demographic characteristics (legal income, years of education, age, race, gender, whether or not the person has ever served time, and the size and composition of the household; \(c_i\) is the city fixed effect; and \(u_i\) is the normal error term.

7 FINDINGS

Because longitudinal data on drug sellers do not exist, there is no research on the life-cycle earnings profile of drug sellers. The illegal earnings of this subpopulation could wax and wane at all stages of the life-cycle in response to economic hardships. I examine the earnings profile of drug sellers independent of other factors. The age, household size, years of education, and the log of legal wages that maximize illegal earnings (5) is calculated by taking the derivative (4) of equation (3) and setting age, household size, years of schooling, and log of legal wages equal to zero. Figures 1-4 correspond to the functional form of this model.
\[ \ln(y) = \beta_0 + \beta_1 X + \beta_2 X^2 + \epsilon \]  

(3)

\[ \frac{\partial \ln(y)}{\partial X} = \beta_1 + 2\beta_2 X \]  

(4)

where \( 0 = \frac{\partial \ln(y)}{\partial X} \)

\[ X = \left| -\frac{\beta_1}{2\beta_2} \right| \]  

(5)

From Table 1 we see that 72.5% of the sample is between the ages of 15 and 35.\(^ {14}\)

Figure 1 shows that older drug sellers earn more up to the age of 24.3, after which, they begin to experience a decline in their illegal drug earnings. Unlike the seller’s profile, the entire sample maximizes its life-cycle earnings at the age of 30. Both of these earnings maximization profiles occur much earlier in life than for non-incarcerated workers. Because I use pooled, cross-sectional data, the patterns I obtain over age do not reflect a cohort trend, but rather a period estimate. However, if there were a series of cross-sectional data on this issue every five to ten years and the overall pattern exhibited persists, one could argue that the period effects may resemble the overall cohort trend.

Figure 2 illustrates that as household size increases, drug sellers’ illegal wages decrease, and that the seller’s illegal wage reaches a minimum when there are 7.2 members in the household. As shown in Table 1, almost 86% of the arrestees completed 12 or fewer years of education. Figure 3 indicates that a drug seller’s education is positively related to his illegal revenues but fall after completing 10 years of schooling.

Finally I fit a log-log model (6) to calculate the elasticity of illegal wages controlling for legal wages.

\(^{14}\)For convenience purposes, age was recoded into a categorical variable for this table.
\[ \ln(y) = \beta_0 + \beta_1 \ln(X) + \epsilon \] (6)

where \( \beta_1 = \frac{100 \times (\Delta Y/Y)}{100 \times (\Delta X/X)} \)

I calculate an elasticity of -.31, implying that a 10% increase in legal wages is associated with a statistically significant \((p < .001)\) 3.1% decrease in illegal wages. Moreover, Figure 4 shows the rate of change in the elastic effect of a drug seller’s legal wage on his illegal earnings. When the seller is perfectly embedded in the illegal market (i.e., he has no legal earnings), his illegal wages are approximately $854 per month. As the seller makes more legal wages, his illegal income falls steadily and then rises. The rise could be due to the fact that increases in household size may require additional production on his part in order to ensure sufficient consumption for all household members, if \( \delta > 1 \) for the HDRE. Yet, the decline in his illegal earnings is probably due to income substitution effects (i.e., sellers substitute away from illegal earnings as legal wages rise), which may be the result of risk aversion methods.

### 7.1 Evaluating the HSC Hypothesis

From Equation (2), Table 3 illustrates the effect household size and composition, personal characteristics, human capital investments, and previous arrest history have on illegal wages. Model 1 shows that household size has a small, but significant, negative effect on the illegal wages of the drug seller. The seller’s legal wages tend to be negatively associated with the income generated from illicit substance sales, with a slight attenuation in the elasticity.

In model 2, I focus on the composition of the household. The size effect becomes positive, but changes in magnitude. Each additional household member raises illegal wages, and this increase is accompanied by the positive effects of certain members in the household, namely,
parental and adult figures. Having both parents present in the household, however, slightly reduces the effects of illegal earnings. These effects could be the result of single parent and guardian households not accumulating enough legal labor market earnings to support the household. Yet, siblings, children, and other relatives reduce illegal income more strongly than adult members.

Further, models 3 and 4 add controls for non-biological household members. Controlling for these individuals reverses the size effect and their presence attenuates the impact of having children present in the household. Now the effect of having biological household members present moderately increases the effects of having illegal earnings. When the biological composition of households is not controlled (model 4), the presence of non-biological household members tends to increase the illegal revenues of the seller, unless he is married. Although the non-biological estimates are positive, they are slightly weakened by the exclusion of biological family members from the model. It could be that the sellers are trying to improve their own socioeconomic conditions independent of their families but it does not preclude positive externalities from existing (in the form of earnings remittances to family members, as Jankowoski (1993) finds).

Finally, I add controls for whether or not the respondent was arrested in the last year (model 5). Whether or not a person served time in the last year does have a strong, positive and significant effect (p < .001) on one’s illegal wages. The effect of household size remains negative and small.

7.2 Learning More About the Size and Composition Effects: Decomposing Tobit Coefficients

One cannot easily interpret the tobit coefficients in Table 3 because of the censoring issue in the data (i.e., the expected value of illegal income above $\tau$ (7) is the result of both
independent variables and the probability of having illegal income). McDonald and Moffitt (1980) and Roncek (1992) state that it is a mistake to interpret tobit coefficients as the effect of an independent variable on a dependent variable for cases that are above the limit because $\beta_k$ incorporates cases that are at the limit. However, researchers can decompose the effect of an independent variable \( \beta \) into two parts: one, the change in the expected illegal earnings for respondents who have illegal incomes greater than $\tau$ (9), weighted by the probability of being above $\tau$; and two, the change in the probability of having an illegal income above $\tau$ (10), weighted by the expected illegal income if above $\tau$.

\[
Ey^* = X_\beta + \frac{\sigma f(z)}{F(z)} \quad (7)
\]

\[
\frac{\partial Ey}{\partial X_i} = F(z) \frac{\partial Ey^*}{\partial X_i} + Ey^* \frac{\partial F(z)}{\partial X_i} \quad (8)
\]

\[
\frac{\partial Ey^*}{\partial X_i} = \beta_k \left[ 1 - \frac{zf(z)}{F(z)} - \frac{f(z)^2}{F(z)^2} \right] \quad (9)
\]

\[
\frac{\partial F(z)}{\partial X_i} = \beta_k \frac{f(z)}{\sigma} \quad (10)
\]

where $z$ is the z-score for the area under the normal curve; $F(z)$ is the cumulative normal distribution function associated with the proportion of cases above $\tau$; $f(z)$ is the value of the derivative of the normal curve at a point; $\sigma$ is the standard deviation of the error term for the model; $Ey^*$ is the expected illegal wage for observations above $\tau$; $\frac{\partial Ey^*}{\partial X_i}$ is the change in the expected illegal wages for respondents who have illegal wages greater than $\tau$; and $\frac{\partial F(z)}{\partial X_i}$ is the change in the cumulative probability of having illegal wages greater than $\tau$ for individuals who report illegal earnings.\(^{15}\)

From the bracketed term in (9), I find that 33.6% of the total change in illegal wages,\(^{15}\) Approximately 44.9% of my respondents have illegal wages greater than $\tau$. Also, for the normal pdf, $f(z) = \frac{1}{B \sqrt{2\pi}} e^{-\left[\frac{1}{2}(\frac{z-A}{B})^2\right]}$ where $A$ is the mean (equal to 0) and $B$ is the scale (equal to 1).
resulting from changes in the size and composition of households, is generated by marginal changes in the value of having illegal wages greater than $\tau$. Conversely this implies that about 66% of the total change in household size and composition is generated by changes in the probability of having any illegal income.

Furthermore, I calculate the effect of household size on the probability of having illegal wages for respondents without illegal wages. Using Equation (10) and the household size coefficient from model 2 in Table 3, I find that an additional household member increases the probability of having illegal wages greater than $\tau$ by 1.4%.

Lastly, I predict the probability of being censored, across all households, conditional on dealer status, having a legal income, and household size. Figure 5 shows two things. First we see that the probability of being censored increases as the number of people in the household rises. This may be true if additional household members are more likely to be workers than dependents, thereby suppressing the HDRE (i.e., making $\delta < 1$). Secondly we see that, controlling for household size, there is an enormous gap in the probability of being censored for dealers and non-dealers who may or may not have legal income. This seems relatively plausible; yet, the results highlight the fact that non-dealers with legal incomes also have sources of illegal incomes.

8 CONCLUSION

In this paper I have relied extensively on the work of anthropologists and economic demographers to explicate a possible reason for immersion in illegal markets. By extending the work of Chayanov, and juxtaposing families in traditional societies with those living in developed economies, I construct a theory of drug selling which focuses on household consumption pressures and economic production. Under this theory, researchers can account for why people living under similar social conditions come to make different decisions about self-immersion
in illicit drug markets. Although I am unable to analyze this theory in depth, due to data limitations and the lack of data availability, I am able to test other parts of the HSC hypothesis, with the results indicating that there is some evidence for the HC theory. Household composition matters more in determining the seller’s illegal income than household size. Sellers living in single-parent households headed by either parent do not see reductions in their illegal wages. As a matter of fact, my findings indicate that, contrary to widely held arguments, sellers living in two-parent households earn almost the same as sellers from single parent households (model 5 in Table 3), all else equal. Residing with a boy/girlfriend has a strong (p < .0001), positive effect on a seller’s illegal income, even after controlling for the presence of friends and other unrelated members. This suggests that biological affiliations among household members have mixed effects on a seller’s illegal income while non-biological acquaintances exacerbate this effect.

Furthermore, despite societal beliefs that all or most drug sellers are only engaged in the illegal economy, my findings support previous research: that many sellers are simultaneously embedded in legal and illegal labor markets (Table 2), with their legal earnings being negatively related to their illegal income from illicit drug sales. Moreover, a drug seller’s illegal market wage decreases as the household size increases. This could be due to an older age structure in the household, which may suggest that the contribution of adult and adolescent members to household productivity strongly reduces the seller’s illegal wage, even though it may also increase the likelihood that the person will sell drugs.

Education is negatively related to a drug seller’s illicit labor market earnings. It could be that the 14.5% of the sample that has more education were subsidizing their human capital investments with the illegal revenues generated from illicit drug transactions. Moreover, if sellers are apprehended, tried, and found guilty of drug sales or having the intent to distribute drugs in their possession, then they may not qualify for federal student aid because of felony
convictions. If they are not awarded assistance because of their conviction, then this may serve to further immerse the sellers in the illegal economy because their future human capital investments are dependent on illicit drug sales. Simply put, it is difficult to resolve these endogenous effects.

Therefore, household size and composition, personal characteristics, human capital investments, and previous arrest history may help to explain the likelihood of a person entering the illegal labor market as a drug seller, for these statistically significant factors partially elucidate the variation in a drug seller’s illegal wages. Economic demographers, economists, and criminologists need to focus more attention on the effects family and household composition have on the illegal labor market earnings of drug sellers. This area of research has gone unnoticed for far too long.

\[16\] On FAFSA forms, all students applying for federal education assistance must answer the question regarding whether or not they have been convicted of a felony crime.
References


# TABLES AND FIGURES

Table 1: Descriptive Statistics of Individual and Household Characteristics

<table>
<thead>
<tr>
<th>Age Category</th>
<th>(percent)</th>
<th>Household Size</th>
<th>(percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-14</td>
<td>0.8</td>
<td>1</td>
<td>9.7</td>
</tr>
<tr>
<td>15-20</td>
<td>21.1</td>
<td>2</td>
<td>22.2</td>
</tr>
<tr>
<td>21-25</td>
<td>17.2</td>
<td>3</td>
<td>21.8</td>
</tr>
<tr>
<td>26-30</td>
<td>17.5</td>
<td>4</td>
<td>19.0</td>
</tr>
<tr>
<td>31-35</td>
<td>16.7</td>
<td>5</td>
<td>12.6</td>
</tr>
<tr>
<td>36+</td>
<td>26.7</td>
<td>6+</td>
<td>14.7</td>
</tr>
</tbody>
</table>

Sex
- Male: 77.3
- Female: 22.7

Parental Presence? (Yes)
- Mother: 30.0
- Father: 13.0
- Mother & Father: 10.0

Race
- Non-whites: 68.0
- Whites: 32.0

Partner Presence? (Yes)
- Spouse: 10.0
- Boy/Girlfriend: 27.1

Drug Seller?
- Yes: 8.0
- No: 92.0

Extended Kin Present? (Yes)
- Grandparents: 4.9
- Other Relatives: 17.8

Education
- Less than HS: 60.5
- High School: 25.0
- Some College: 11.9
- College Degree: 2.6

Other Members Present? (Yes)
- Children: 22.0
- Siblings: 29.6
- Friends: 18.3
- Unrelated: 11.0
Table 2: Log of Legal and Illegal Wages Earned in the Last 30 Days by Level of Analysis

<table>
<thead>
<tr>
<th>Income</th>
<th>Mean</th>
<th>Median</th>
<th>S.D.</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Entire Sample</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Legal</td>
<td>5.53</td>
<td>6.40</td>
<td>2.47</td>
<td>74944</td>
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<tr>
<td>Illegal</td>
<td>2.38</td>
<td>0</td>
<td>2.92</td>
<td>75022</td>
</tr>
<tr>
<td><strong>Non-Drug Sellers</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Legal</td>
<td>5.67</td>
<td>6.40</td>
<td>2.36</td>
<td>68942</td>
</tr>
<tr>
<td>Illegal</td>
<td>2.14</td>
<td>0</td>
<td>2.77</td>
<td>69058</td>
</tr>
<tr>
<td><strong>Drug Sellers</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Legal</td>
<td>3.94</td>
<td>5.30</td>
<td>3.10</td>
<td>6002</td>
</tr>
<tr>
<td>Illegal</td>
<td>5.20</td>
<td>5.99</td>
<td>3.20</td>
<td>5964</td>
</tr>
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</table>
Table 3: The Effect of Household Size, Personal Characteristics, Human Capital Investments, and Previous Arres-ests on Illegal Wages (Standard Errors are in Parentheses)

<table>
<thead>
<tr>
<th>Variable</th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>M4</th>
<th>M5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-0.881</td>
<td>-2.995</td>
<td>-2.693</td>
<td>-1.084</td>
<td>-3.047</td>
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<tr>
<td></td>
<td>(0.276)</td>
<td>(0.313)</td>
<td>(0.317)</td>
<td>(0.292)</td>
<td>(0.314)</td>
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<tr>
<td></td>
<td>(0.085)</td>
<td>(0.089)</td>
<td>(0.088)</td>
<td>(0.089)</td>
<td>(0.086)</td>
</tr>
<tr>
<td>Household Size</td>
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<td>-0.190</td>
<td>-0.112</td>
<td>-0.195</td>
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<tr>
<td></td>
<td>(0.013)</td>
<td>(0.021)</td>
<td>(0.056)</td>
<td>(0.015)</td>
<td>(0.056)</td>
</tr>
<tr>
<td>Age</td>
<td>0.329</td>
<td>0.386</td>
<td>0.380</td>
<td>0.311</td>
<td>0.356</td>
</tr>
<tr>
<td></td>
<td>(0.014)</td>
<td>(0.016)</td>
<td>(0.016)</td>
<td>(0.015)</td>
<td>(0.016)</td>
</tr>
<tr>
<td>Age Squared</td>
<td>-0.005</td>
<td>-0.006</td>
<td>-0.005</td>
<td>-0.005</td>
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</tr>
<tr>
<td></td>
<td>(0.0002)</td>
<td>(0.0002)</td>
<td>(0.0002)</td>
<td>(0.0002)</td>
<td>(0.0002)</td>
</tr>
<tr>
<td>Male</td>
<td>-0.545</td>
<td>-0.404</td>
<td>-0.429</td>
<td>-0.532</td>
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<tr>
<td></td>
<td>(0.042)</td>
<td>(0.043)</td>
<td>(0.043)</td>
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<td>(0.043)</td>
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<tr>
<td>Non-white</td>
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<tr>
<td></td>
<td>(0.027)</td>
<td>(0.029)</td>
<td>(0.029)</td>
<td>(0.028)</td>
<td>(0.028)</td>
</tr>
<tr>
<td>ln(legal income)</td>
<td>-0.262</td>
<td>-0.200</td>
<td>-0.191</td>
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<td>-0.158</td>
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<td>(0.011)</td>
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<td>(0.011)</td>
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<tr>
<td>Education</td>
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<td>-0.055</td>
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<td>(0.012)</td>
<td>(0.012)</td>
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<tr>
<td>Mother</td>
<td>0.175</td>
<td>0.634</td>
<td>0.629</td>
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<tr>
<td></td>
<td>(0.072)</td>
<td>(0.098)</td>
<td>(0.097)</td>
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<tr>
<td>Father</td>
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<td>0.645</td>
<td>0.611</td>
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<td></td>
<td>(0.155)</td>
<td>(0.170)</td>
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<td>Both Parents</td>
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<tr>
<td></td>
<td>(0.184)</td>
<td>(0.186)</td>
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<td>Grandparents</td>
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<td>0.448</td>
<td>0.417</td>
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<tr>
<td></td>
<td>(0.096)</td>
<td>(0.110)</td>
<td>(0.109)</td>
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<tr>
<td>Children</td>
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<tr>
<td></td>
<td>(0.030)</td>
<td>(0.060)</td>
<td>(0.060)</td>
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<td></td>
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<tr>
<td>Siblings</td>
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<td>(0.063)</td>
<td>(0.062)</td>
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<td>Other Relatives</td>
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<td>0.239</td>
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<td>(0.060)</td>
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<td>Spouse</td>
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<tr>
<td></td>
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<tr>
<td>Boy/Girlfriend</td>
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<tr>
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<td>(0.091)</td>
<td>(0.061)</td>
<td>(0.090)</td>
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<th>Variable</th>
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<th>M2</th>
<th>M3</th>
<th>M4</th>
<th>M5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friends</td>
<td>0.543 ± 0.062</td>
<td>0.402 ± 0.027</td>
<td>0.512 ± 0.061</td>
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<td></td>
</tr>
<tr>
<td>Unrelated</td>
<td>0.298 ± 0.063</td>
<td>0.204 ± 0.033</td>
<td>0.272 ± 0.063</td>
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<tr>
<td>Served Time</td>
<td>1.688 ± 0.056</td>
<td></td>
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</tr>
<tr>
<td>$\sigma$</td>
<td>5.361 ± 0.026</td>
<td>5.303 ± 0.027</td>
<td>5.287 ± 0.027</td>
<td>5.303 ± 0.027</td>
<td>5.222 ± 0.027</td>
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<tr>
<td>N</td>
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<tr>
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<td>$D_f$</td>
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<td>19</td>
<td>12</td>
<td>20</td>
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</table>
Figure 1: The Life-cycle Predicted Illegal Earnings by Age for the Entire Sample and Drug Sellers
Figure 2: The Predicted Illegal Earnings by Household Size for the Entire Sample and Drug Sellers
Figure 3: The Predicted Illegal Earnings by Years of Education Completed for the Entire Sample and Drug Sellers
Figure 4: The Predicted Illegal Earnings by Legal Earnings for the Entire Sample and Drug Sellers

Figure 5: The Probability of Being Censored by Dealer and Legal Income Status Across Household Size