Nepotism, Incentives and the Academic Success of College Students

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Abstract

This study investigates the role of parent-owned businesses on children's college success and post-college aspirations by using a data set from a private university in Turkey. This unique data set matches college students' administrative records with survey responses. The presence of self-employed parents and family businesses has a strong negative association with college success even after accounting for observed ability, parental background, and various individual characteristics. An explanation for the lower GPAs of the children of self-employed parents is that in the presence of parent-owned businesses students have a larger set of post-graduation options and are more likely to plan on becoming self-employed due to intergenerational transfer of self-employment. Hence, these students may not exert as much effort in acquiring the task-specific career-oriented human capital taught in college. In line with expectations, we find that the children of self-employed parents are more likely to have entrepreneurial intent and are less likely to plan to attend graduate school.

I. Introduction

Within the organization of a family, parental influence is central in molding a child's behavior. The occupational and educational choices of parents may have far-reaching

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effects not only on their own lives but also on future generations. This study explores the role of parent-owned businesses on their children's college success and post-graduation plans.[1]

Previous studies indicate that college success, measured by GPA, is correlated with factors including individual and family characteristics, social background and individual discipline (e.g., Betts and Morell [1999]; Irandoust and Karlsson [2002]). None, however, consider self-employed parents and family businesses as factors affecting students' incentives to exert effort in college. Parent-owned businesses may imply a larger set of post-graduation opportunities for a college student, but they may affect the incentives to obtain additional human capital during college.

According to human capital theory, additional years of education acquired by attending college add valuable skills to the stock of human capital and increase productivity. As per signalling theory (Spence [1973]), a college diploma may not add to individual productivity but has an informational value by signalling innate ability. Either theory can explain the choice of a high school senior who lacks the safety net of a parent-owned business to go to college. Students with parent-owned businesses may also choose to enroll in college to insure themselves against future uncertainty about the relative returns to different post-graduation plans. Therefore, regardless of the availability of a larger set of post-graduation employment options, a rational individual may choose to enroll in college.

When a job requires at least a college degree, years of schooling may lose their signalling and human capital values for the pool of college graduates. In this case, employers may focus on other information, such as GPA.[2] College GPA may affect a student's probability

[1]Parent-owned businesses refers to presence of both self-employed parents and family businesses. Having a self-employed parent does not necessarily mean that the family owns a business. A family business requires having employees other than self-employed parents. However, as we discuss in Section III, almost all of the self-employed parents operate within a family business.

[2]For instance, on the USJOBS website, the federal government's official one-step source of jobs and

of finding a job irrespective of signalling ability or acting as a proxy for human capital. Moreover, an extensive literature substantiates the impact of college GPA and college class rank on earnings (e.g., Weisbrod and Karpoff [1968]; Wise [1975]; Ehrenberg and Sherman [1987]; James et al. [1989]; and Hamermesh and Donald [2008]). While high college GPA may be important for a student planning on being a paid employee, a student who is planning on being self-employed, who may be affected by the presence of self-employed parents, may not value college GPA as highly.

Intergenerational transfer of occupations, which is common in many countries, is well documented by previous literature.[3] These intergenerational transfers are especially strong in self-employment: the children of self-employed parents are more likely to become self-employed (e.g., Lentz and Laband [1990]; Dunn and Holtz-Eakin [2000]; and Hout and Rosen [2000]). One of the widely cited reasons for intergenerational transfers is nepotism in the form of family firms employing their children in their businesses or simply transferring the ownership of businesses.[4] These intergenerational transfers also are possible if self-employed parents help their children to start new businesses. Self-employed parents may provide non-monetary resources to their children, for instance by passing their work experience, managerial human capital, industry-specific knowledge, and career-specific human capital on to their children.[5] Moreover, in the presence of capital market imperfections, successful entrepreneurs may relax the capital market constraints on their offspring by transferring their wealth (Dunn and Holtz-Eakin [2000]).

As a result, students with parent-owned businesses may exert less effort in college if they anticipate secure jobs and earnings in their family businesses regardless of their

employment information, applicants are asked to report their college GPAs.

[3]See Laband and Lentz (1983; 1989; 1992) for evidence in the United States; Scoppa (2009) finds that nepotism may play an important role in intergenerational transfer of public sector jobs in Italy; Kramarz and Skans (2007) find evidence for intergenerational transfer of employers in Sweden.

[4]See Bertrand and Schoar (2006) for an extensive review on the role of families in family firms.

[5]Lentz and Laband (1990) distinguish between the general occupational skills acquired via college education and job-specific skills or managerial human capital acquired by experience.

college success. If, in turn, family businesses employ relatives with lower levels of human capital, they may incur non-market costs and put themselves in a less competitive position compared to non-family business owners. Favoritism of this kind may affect the health and success of these businesses and of the economy.

Recent research on nepotism and firm performance shows that nepotism may be an important issue in the U.S. economy. Pérez-González (2006), using data from the CEO successions of publicly traded U.S. corporations, calculates that 36.4 percent of these firms' CEO successions involved nepotism. The firms that promote related CEOs significantly underperform those that promote unrelated CEOs.[6] Also, family CEOs who attended selective colleges perform better than CEOs who did not.[7]

We use a unique data set that we constructed by matching information from two different sources. The first part comes from a survey we initiated and conducted in December 2006.[8] We surveyed students in the College of Economics and Administrative Sciences at a major private university in Turkey. The second part of the data set comes from the confidential administrative records of the university. We are aware that the Turkish labor market may have some unique features that would limit the extent to which our results could be simply transposed to other economies. These especially include higher self-employment rates in Turkey, which also translate into higher parental self-employment rates in our sample compared to the self-employment rates in the U.S.[9] However, despite potential limitations, the results are of interest in their own right, and

[6]Bennedsen et al. (2007) find a negative impact of related CEOs on the performance of Danish firms.

[7]A high GPA may strongly predict future productivity as reflected in the performance of a business. The lower performance of related CEOs could stem from their lesser effort while in school, which previous studies have not controlled.

[8]For the questionnaire, see Appendix C of the IZA working paper "http://ftp.iza.org/dp3711.pdf" or alternatively contact Deniz Gevrek.

[9]In Turkey the self-employment rate for men varies between 27 and 50 percent in the urban and rural labor forces respectively; the self-employment rate for women varies between 5 and 14 percent respectively (Tansel [2001]). In the U.S. the self-employment rate for men varies between 15 and 30 percent, while for women it is around 9 percent (Fairlie [1999]; Hout and Rosen [2000]; and Dunn and Holtz-Eakin [2000]). See Section III for details on the self-employment rates in the U.S. and Turkey.

underline a mechanism in the intergenerational transfer of self-employment status that deserves broader study in other national contexts. Moreover, matching the survey data with students' administrative records would have been extremely difficult in the U.S. due to different privacy regulations.

This study investigates the impact of self-employed parents and post-graduation employment opportunities in shaping the incentives for college success. Our definition of the self-employed parent category does not include professionals such as doctors, lawyers, consultants, and accountants. Therefore, our definition of "self-employed" corresponds to "non-professional self-employed," and in the interest of saving space we occasionally use "self-employed" instead of "non-professional self-employed."

The empirical findings suggest that parent-owned businesses have a strong negative association with college students' GPAs even after controlling for demographic characteristics, observed ability, college major, and parental education. GPAs of men with two self-employed parents or only a self-employed mother are the lowest. The impact of self-employed parents on women's GPAs is similar to that on men's GPAs only when the only self-employed parent is the father.

We also find that the children of self-employed parents are more likely to have entrepreneurial post-graduation plans. The impact of having only a self-employed father on future self-employment plans is large, while the impact of having two self-employed parents on entrepreneurial intent is even larger. Students with self-employed parents are not only more likely to plan to be entrepreneurs, but they are less likely to plan to attend graduate school.

II. Theoretical Model

The objective of this theoretical framework is to understand how the presence of self-employed parents may affect students' future career and effort choices while in college.

We use a partial equilibrium model to study systematically the effects of self-employed parents on students' college GPAs. Let us assume an individual lives only for two periods, goes to school in the first period and works in the second. In the first period she simultaneously makes her post-graduation career choice and determines how much time to spend in college (attending classes and studying), e, while enjoying the remainder of her finite time in leisure activities, $l = T - e$, where T is total time available. Utility in the first period is only a function of leisure.

In the second period, with probability $(1-p)$ the student will work as a paid employee. In this case, she supplies her labor inelastically and earns $y(e)$, where e is the time/effort she spent in school.[10] She consumes all her income, and her second period utility depends only on consumption.

With probability p, she gets the option to become self-employed. In this case she can choose between self-employment (SE) or paid employment (PE). In either case she inelastically supplies her labor in the second period. The difference between these careers is the income they generate. If she chooses paid employment, she earns $y(e)$. If she chooses self-employment, she earns a stochastic income, y_{SE}, which is independent of e.[11]

Let $\tilde{u}$ and u be the utility functions in the first and the second periods. They are twice continuously differentiable, $\widetilde{u} \in C^2$ and $u \in C^2$, increasing and concave, $\widetilde{u}' > 0$, $u' > 0$, $\widetilde{u}'' < 0$, and $u'' < 0$. Because their arguments are in different units (time vs. income), they may or may not have different forms.

At the beginning of the first period, after observing individual-specific p, the student simultaneously makes leisure/effort and post-graduation career choices to maximize her

[10] $y(e)$ satisfies the following conditions: $y(e) \in C^2$; $y(e)' > 0$; and $y(e)'' < 0$.

[11] This simplifying independence assumption is made to keep the model tractable.

lifetime utility. We can formally state her utility maximization problem as:

$$\max_{\{e,l\}} \ \widetilde{u}(l) + \beta[p \max\{Eu(y_{SE}); u(y(e))\} + (1-p)u(y(e))] \quad s.t. \ \ e + l \leq T \tag{1}$$

If she chooses paid employment, then the optimal effort choice e^*_{PE} will satisfy the following first-order condition:

$$-\widetilde{u}'(T - e^*_{PE}) + \beta u'(y(e^*_{PE}))y'(e^*_{PE}) = 0 \tag{2}$$

If she chooses self-employment, then let e^*_{SE} be her optimal effort choice, which will satisfy the first-order condition:

$$-\widetilde{u}'(T - e^*_{SE}) + \beta(1-p)u'(y(e^*_{SE}))y'(e^*_{SE}) = 0 \tag{3}$$

Equation (3) implies that the optimal effort will depend on p if an individual chooses self-employment. Comparing two otherwise identical students, the one with self-employed parent(s) is more likely to get the self-employment option. In other words, she is expected to have a higher p. A higher likelihood of getting the self-employment option for those with self-employed parents may be caused by sheer nepotism and/or intergenerational transfers of entrepreneurial human capital and ability, among other things. It is straightforward to show that the higher the probability of getting the self-employment option, the lower the optimal effort when an individual chooses self-employment, $\frac{de^*_{SE}}{dp} < 0$.[12]

Equations (2) and (3) together imply that the optimal effort is always smaller if a

[12]Let $F = -\widetilde{u}'(T - e^*_{SE}) + \beta(1-p)u'(y(e^*_{SE}))y'(e^*_{SE}) = 0$. Therefore, $\frac{de^*_{SE}}{dp} = -\frac{\partial F/\partial p}{\partial F/\partial e^*_{SE}}$. Taking the partial derivatives, we get $\frac{de^*_{SE}}{dp} = -\frac{-\beta u'(y(e^*_{SE}))y'(e^*_{SE})}{\widetilde{u}''(T-e^*_{SE}) + \beta(1-p)\left(u''(y(e^*_{SE}))(y'(e^*_{SE}))^2 + u'(y(e^*_{SE}))y''(e^*_{SE})\right)} < 0$.

student chooses self-employment.[13]

$$e^*_{SE} < e^*_{PE} \quad for \quad p \in (0,1). \tag{4}$$

Given a chance to choose between two options, a student chooses self-employment over paid employment if the expected utility from self-employment is greater than or equal to the utility from paid employment, $Eu(y_{SE}) \geq u(y(e))$. The likelihood of choosing self-employment is increasing in the expected utility from self-employment, which depends on the distribution of the self-employment income. Self-employed parents may increase the expected utility, $Eu(y_{SE})$, by providing monetary and non-monetary resources to their children. For instance, the presence of self-employed parents may reduce the riskiness (in the sense of second-order stochastic dominance) of the self-employment option.[14] In this case, comparing two otherwise identical students, the child of self-employed parent(s) will have a larger expected utility from self-employment and therefore is more likely to choose self-employment.

The model provides two empirically testable hypotheses. First, the offspring of self-employed parents are more likely to choose the self-employment option. Second, students with self-employed parents will on average have lower GPAs, because their optimal effort is lower.

III. A New Data Set

The empirical analysis in this study relies on two data sources. The first part comes

[13]Proof: Let us assume that $e^*_{SE} \geq e^*_{PE}$ and rearranging the first order conditions (equations (2) and (3)), we get $\frac{\widetilde{u}'(T-e^*_{SE})}{(1-p)u'(y(e^*_{SE}))y'(e^*_{SE})} = \frac{\widetilde{u}'(T-e^*_{PE})}{u'(y(e^*_{PE}))y'(e^*_{PE})}$. Given $p \in (0,1)$, we must have $\frac{\widetilde{u}'(T-e^*_{SE})}{u'(y(e^*_{SE}))y'(e^*_{SE})} < \frac{\widetilde{u}'(T-e^*_{PE})}{u'(y(e^*_{PE}))y'(e^*_{PE})}$. If $e^*_{SE} \geq e^*_{PE}$, then we have $\widetilde{u}'(T-e^*_{SE}) \geq \widetilde{u}'(T-e^*_{PE})$, and $u'(y(e^*_{SE}))y'(e^*_{SE}) \leq u'(y(e^*_{PE}))y'(e^*_{PE})$, which implies $\frac{\widetilde{u}'(T-e^*_{SE})}{u'(y(e^*_{SE}))y'(e^*_{SE})} \geq \frac{\widetilde{u}'(T-e^*_{PE})}{u'(y(e^*_{PE}))y'(e^*_{PE})}$. Proof by contradiction.

[14]This conclusion is based on the fact that if a random variable Y is riskier than X, i.e. the distribution of X second-order stochastically dominates that of Y, and if X and Y have the same mean, then $E[u(X)] \geq E[u(Y)]$ for all concave functions u(.).

from an in-class survey we designed and administered to students in the College of Economics and Administrative Sciences of a private university in Turkey.[15] The survey was conducted in December 2006, spanning a period of three weeks.[16] The students answered detailed questions about their personal and family characteristics, GPA, scholarship status, post-graduation plans, number of younger and older siblings, and family business characteristics, if applicable.

The second part of the data set comes from the administrative records of all 1,122 students in the College.[17] The administrative data contain detailed information on each student's GPA, gender, age, year in college, Turkish Student Selection Examination (SSE) score, major, scholarship status, and parental education levels and occupations. We are able to match the surveyed individuals with their administrative records.

Of the 1,122 sophomores, juniors and seniors in the College, we obtained responses from 499 (44.5 percent). A less than perfect survey response rate sets up the possibility of a special type of sample-selection problem, survey non-response bias. Fortunately, because the dependent variable (GPA) and main variables of interest are available from administrative data and observed for the entire sample of 1,122 students, our main estimates are not subject to survey non-response bias. However, possible survey non-response bias will be addressed later in the paper when we investigate the relationship between self-employed parents and intergenerational transfer of self-employment.

The non-surveyed sample consists of students who failed to attend class on the day of the survey. The probability of surveying a student may depend on a student's course

[15]While private and public universities may differ, especially in tuition and fees, studying the links between intergenerational transfer of self-employment status and academic success would not be possible using data from a public university due to strict confidentiality issues governing public universities. Public university tuition costs for the academic year 2006-2007 varied between $82 and $682, while this private university's tuition is approximately $10,600 per year. The average tuition for private universities is approximately $10,000.

[16]To improve the survey, we pre-tested it on a group of 20 students from another college in the same university.

[17]Freshmen are excluded from the sample because their GPAs were not reported by December 2006.

load along with other determinants of attendance, such as the weather and idiosyncratic shocks. Therefore, students with heavier course loads are expected to be more likely to appear in our surveyed sample, because they are more likely to be present in a greater number of classes than those with lighter loads. We make use of individual current course load to identify survey response.

The item non-response rate among the surveyed students was very low, because we monitored students closely and insisted that they respond to as many questions as possible.

Summary statistics for the entire sample of students (n=1,122), surveyed students (n=499) and non-surveyed students (n=623) are presented in Table 1. The first row shows that the surveyed students have higher-than-average cumulative GPAs on a four-point scale. Consistent with expectations, the surveyed students take more classes (6.12 per semester) compared to others (5.88 per semester). The surveyed students are slightly younger, and there are many more female students among the respondents.

The surveyed students, on average, have higher SSE scores. In Turkey, the only gateway to enter college is the Student Selection Exam (SSE), which is conducted every year in mid-June.[18] The SSE score is well accepted as a good proxy for a student's ability. The Organisation for Economic Co-operation and Development (OECD) (2008) states that the SSE measures the basic aptitude of students for university-level study similarly to the traditional Scholastic Aptitude Test (SAT) of the College Board in the U.S. To quote OECD (2008):[19] "Neither the ÖSS, nor the SAT intends to measure what students know about specific subject matter learned from secondary education. In fact, in contrast to the subject-related tests that existed before 1999, success on the current ÖSS is not necessarily related to a student's mastery of a specific subject area in such as

[18]See detailed information on the SSE at this link: "http://www.osym.gov.tr/BelgeGoster.aspx?F6E10F8892433CFF7A2395174CFB32E15F640FC6104C033D."

[19]ÖSS is the Turkish acronym for Öğrenci Seçme Sınavı, which is translated in English as Student Selection Exam (SSE).

mathematics, natural sciences or the social sciences." Because the students observed in our sample took the SSE after 2001, we are fairly confident about using the SSE score as a measure of ability.

The educational attainment of the parents is similar for surveyed and non-surveyed students. The average educational attainment of mothers is 11.55 years, while that of fathers is 13.37 years. Seventy-four percent of mothers are either housewives, unemployed or retired. This percentage is consistent with the 25.5 percent labor force participation rate reported by the State Institute of Statistics based on the 2000 Turkish Household Labor Force Survey (THLFS).

The distributions of parental occupations for the entire sample suggest that almost 44 percent of the fathers and 6 percent of the mothers are non-professional self-employed individuals. Tansel (2001), using the 2000 THLFS, calculates that self-employed men make up 27 and 50 percent of the urban and rural labor forces respectively, while self-employed women make up 5 and 14 percent respectively. Based on the calculations from Census and THLFS data sets, the occupational distributions of the parents in the sample of students enrolled in this private university are thus similar to those of men and women in Turkey. U.S. self-employment rates are somewhat different from the ones in our sample. For instance, Hout and Rosen (2000) report a 24.2 percent self-employment rate for fathers, while Dunn and Holtz-Eakin (2000) find that the overall propensities for self-employment for fathers and mothers are 30 percent and 9 percent respectively. Fairlie (1999) calculates that the U.S. self-employment rate for whites is 15.23 percent.

Table 1 shows that a larger proportion of the non-surveyed students (49 percent) have self-employed fathers compared to those of surveyed students (38 percent), while the percentage of students with self-employed mothers is the same in the surveyed and non-surveyed samples. Having a smaller proportion of students with self-employed fathers in the surveyed sample may cause survey non-response bias when we explore the relationship

between parental self-employment and post-graduation plans in Section V, because post-graduation plans are only observed for the surveyed sample. We address the issue of survey non-response bias later in Section V.

Having a self-employed parent does not necessarily imply that the family owns a business. A family business requires having employees other than self-employed parents. Of 191 surveyed students who have self-employed fathers, however, only four report that their father is the only worker in the business. The rest of these 191 students report that their family businesses employ anywhere from two to 1,000 people. Out of these 191 students, 103 of their self-employed parents do not employ non-family members at the management level.[20]

Table 1 shows the distribution of post-graduation plans of the surveyed students. Sixteen percent of the students plan to work in their family businesses, and four percent are planning to start new businesses. We consider these two groups of students as "first-degree entrepreneurs." Seven and seventeen percent of the students say that their post-graduation plans involve either "working as employees first, and then working for their family businesses," or "working as employees first, and then starting a new business," respectively. We regard these two groups of students as "second-degree entrepreneurs." Twenty percent of the surveyed students say that they are planning to work as employees. Thirty-three percent say that they are planning to go to graduate school, and three percent say that they have other plans.

Table 2 shows the mother-father matched parental occupation distributions for the entire sample and the surveyed sample. The upper panel of Table 2 shows that out of 1,122 students, 499 and only 64 have self-employed fathers and self-employed mothers respectively. Forty-six students report having two self-employed parents. The lower panel

[20]Students with two self-employed parents and those with only self-employed mothers report similar family business structures and self-employment patterns to those with only self-employed fathers.

shows that out of 499 surveyed students, 191 and 28 have self-employed fathers and mothers, respectively.

IV. Self-Employed Parents and College Success

In this section we test the hypothesis that students with self-employed parents are expected to have lower GPAs on average. The empirical model is given by:

$$GPA_i = X_i'\delta_0 + \delta_1 SE_{father\ only} + \delta_2 SE_{mother\ only} + \delta_3 SE_{both\ parents} + \epsilon_i \tag{5}$$

where i indexes students. The dependent variable is the cumulative college GPA as of November 2006. College GPA is measured out of a maximum of 4 points. The indicator variables, $SE_{father\ only}$, $SE_{mother\ only}$ and $SE_{both\ parents}$, equal one if only the father or only the mother or both parents are non-professional self-employed individuals.[21] To see if self-employed parents have differential effects on their sons' and daughters' GPAs, equation (5) is estimated for the samples of men and women separately.

The explanatory variable set in equation (5) contains X_i, which is the vector of individual and parental characteristics, and ϵ_i, the error term. If parents of students with low GPAs took the unlikely path of becoming self-employed to secure the future of their offspring, then the indicator variables for parental self-employment, $SE_{father\ only}$, $SE_{mother\ only}$, $SE_{both\ parents}$ are potentially endogenous to the GPA equation. In this case the coefficient estimates of these variables are biased and inconsistent. We believe that reverse causality of this kind is highly unlikely, because parents generally make their occupational choices far before their children are enrolled in college.

Unobserved ability bias arises if the occupational choices of parents and parental ability, which is expected to be highly correlated with the offspring's ability, are correlated. More specifically, if high-ability parents are less likely to be self-employed, the negative

[21] The omitted group is the students with no non-professional self-employed parent.

coefficients for the presence of self-employed parents are downward biased and vice-versa. We tackle this issue by including two proxy variables for unobserved ability, the SSE scores of students and variables measuring parental education levels.

Table 3 shows the results of estimating equation (5) for two alternative specifications in three samples. The basic specification includes age, hours studied, and family income, in addition to the indicators for non-professional self-employed parents.[22] The extended specification augments the basic specification with the SSE score (a proxy for ability), indicator variables for the year of enrollment (or test year), SSE score and test year interactions, seven indicator variables for college major, and two continuous variables for parental education levels.[23]

Column 1 of Table 3 reports the estimates for the basic specification in the pooled sample of men and women. The students with only a self-employed father earned on average 0.23-point lower GPAs. The impact of having only a self-employed mother on GPA is -0.18, yet not significant at conventional levels. Interestingly, having two self-employed parents is associated with 0.37-point lower GPAs compared to those with no self-employed parents. The negative association between the presence of self-employed parents and GPAs is not trivial. For instance, in standard deviation units, having only a self-employed father or two self-employed parents is associated with 0.35σ and 0.58σ lower GPAs respectively.

Columns 2 and 3 show that in the basic specification the self-employment statuses of parents do not differentially affect men's and women's college GPAs, with one exception. While the relationship between having only a self-employed mother and GPA is not statistically significant in the pooled or women's samples, for men having only a self-

[22]Data on family income and number of hours spent studying are available for surveyed students only. We include two indicator variables for the missing responses of the non-surveyed students.

[23]The year of college enrollment corresponds to the SSE year because in Turkey the SSE scores are only valid for one year. The results are not affected if we include eight indicator variables for parental education instead of two continuous variables.

employed mother is associated with on average 0.35-point lower GPAs than those with no self-employed parents. This negative and significant effect on men may be due to the possibility that men are more likely to emulate their mothers if the only self-employed parent is the mother. This may be true if there are differences in the intergenerational transfer of self-employment based on the gender of the self-employed parent and the gender of the child.

Columns 4-6 present the results for the extended specification. The coefficient estimates of $SE_{father\ only}$, $SE_{mother\ only}$, and $SE_{both\ parents}$ are smaller in absolute value (-0.09, -0.01 and -0.24, respectively), but the estimates of $SE_{father\ only}$ and $SE_{both\ parents}$ are still highly significant in the pooled sample.[24] The overall impact of having only a self-employed father on GPA is driven equally by men and women. Both groups earned on average 0.09-point (s.e.=0.04) lower GPAs compared to those with no self-employed parents. Interestingly, the presence of only a self-employed mother or two self-employed parents has a differential impact on the GPAs of men and women. Men who have only a self-employed mother or two self-employed parents earned 0.26-point (s.e.=0.09) and 0.32-point (s.e.=0.09) lower GPAs respectively. For women, the effects of having only a self-employed mother or two self-employed parents on GPAs, reported in column 6 of Table 3, are insignificant at 0.07 (s.e.=0.14) and -0.13 (s.e.=0.12), respectively.

Smaller negative coefficients of the variables measuring parental self-employment status suggest that if we fail to control for observed individual and parental ability, the coefficient estimates for the variables accounting for parental self-employment are downward-biased. Unsurprisingly, the ability proxy, SSE score has a positive and significant effect on students' GPAs.[25] These downward-biased estimates imply a negative correlation be-

[24]The first specification provides an upper bound to the causal effect of parental self-employment on college GPA. The main idea of adding more controls to the basic specification is to tighten the upper bound for the estimates.

[25]For the year 2002 the coefficient estimate for the SSE score is highly significant at 0.012. For the years 2003, 2004, and 2005 the impact of SSE score on a student's college GPA is also positive yet weaker.

tween parental ability and self-employment, because students' ability measured by SSE scores correlates positively with college GPA and there are intergenerational transfers in ability.

Columns 4-6 reveal that father's education does not have a statistically significant effect on GPA. On the other hand, mother's education has a negative impact on GPA in the men's sub-sample. If highly educated mothers are less likely to be stay-at-home mothers, the negative impact of highly educated mothers may be due to less time devoted to child development.

The F-test shows that the indicator variables for parental self-employment are jointly significant in the GPA equation for all specifications, except for the extended specification in the women's sub-sample.

The OLS results suggest that the children of the self-employed have, on average, lower GPAs even after controlling for observed ability.[26] If we assume that they would follow their parents' self-employment by either working for their family businesses or starting new businesses, these students may have had fewer incentives to exert high effort even in high school. This lack of incentive would then be reflected in their SSE scores. To examine this issue, we test whether the SSE scores differ systematically between the offspring of self-employed parents and non self-employed parents for various parental self-employment

[26]The lower GPAs of the children of the self-employed may result from students exerting lower effort in college, which can be imperfectly measured by the number of hours spent studying, attending classes etc. We use 413 (of 1,122) students' responses to our survey question, "On average how many hours a day do you study?" as a proxy for effort in college. The estimates of the effect of self-employed parents on the number of hours studied are presented in Appendix B of the IZA working paper http://ftp.iza.org/dp3711.pdf. We find a negative statistically significant effect of self-employed parents on the number of hours studied only for men with only self-employed mothers. One would expect a stronger negative relationship between parental self-employment and number of hours studied if number of hours studied were a good proxy for effort in college. In our case, there are two reasons why number of hours studied may not entirely capture effort in college. First, the number of hours studied is only observed for a sub-sample of surveyed students; the results may be biased due to sample-selection issues mentioned in Section III. Second, the number of hours studied may not serve as a good proxy for effort in college, because it wasn't created using time-use diaries; our survey question renders recall data, which may not be as accurate.

structures. The null hypothesis is that the difference between the average SSE scores of students with or without self-employed parents is not statistically different from zero.[27] If the null hypothesis is rejected, the SSE scores of students with self-employed parents differ from those of other students and selection may be an important issue. Table 4 shows that even though students with self-employed parents have slightly lower SSE scores, in each case we fail to reject the equality of the average test scores between the students with and without self-employed parents.[28]

There is a possibility of a sample-selection bias, other than the one mentioned in Section III, if the decision to enroll in college is affected by the presence of parent-owned businesses. For instance, if higher-ability children of the self-employed are more likely to enroll in college, then our sample of students with self-employed parents are those high achievers among the children of self-employed and the negative coefficients for the presence of self-employed parents are upward biased, and vice-versa. Given data limitations, pinpointing or dealing with a potential sample-selection bias of this kind is not viable.

So far we have considered linear regression-based methods in which the identification of the "treatment" (the presence of non-professional self-employed parents) on college GPA depends on linear selection on observables. To examine the robustness of our results we also use matching methods. Although both matching methods and regression-based methods estimate the impact of a "treatment" under the assumption of selection on observables, Black and Smith (2004) discuss two potential problems associated with the use of linear regression methods in observational studies. First, linear conditioning on

[27]The groups are students with only self-employed fathers, only self-employed mothers, and two self-employed parents. We exclude any professional self-employed parents.

[28]We compare descriptive statistics for students with at least one self-employed parent and those who do not have any self-employed parents. The comparative summary statistics by parental self-employment are presented in Table A in the Appendix of the working paper http://ocean.otr.usm.edu/ w783885/NEPOTISM-LE-03-WEB.pdf, or alternatively contact Deniz Gevrek at deniz_gevrek@yahoo.com. We find that parental education levels, college GPAs, and the SSE scores are lower for those with at least one self-employed parent compared to those with no self-employed parents. In other aspects students are similar regardless of the presence of parent-owned businesses.

observables may create bias due to misspecification of the functional form in a linear regression-based model. Second, the linearity assumption may mask the failure of the "common support" issue. We find that our results are robust to consideration of matching methods instead of linear regression-based models.[29]

A. Isolating the Effect of Parents with Professional Occupations

We next investigate whether there is a statistically significant relationship between having a parent with a professional occupation and college GPA. The data set allows us to differentiate between parents who are retired, unemployed/out of the labor force, employees, non-professional self-employed individuals and professionals.[30] The professionals may be self-employed (those who have their own private practices), employees (those who work, for instance, in a hospital or a law firm), or both self-employed and employees at the same time.

The treatment group in equation (5) includes students with two non-professional self-employed parents ($SE_{both\ parents}$), students with only a non-professional self-employed mother ($SE_{mother\ only}$), and with only a non-professional self-employed father ($SE_{father\ only}$), while in the last two cases the other parent can be retired, unemployed/out of the labor force, employee or professional.[31] The comparison group (i.e. students with no $SE_{both\ parents}$, $SE_{mother\ only}$ or $SE_{father\ only}$) includes students who have: (i) two parents with professional occupations; (ii) only a mother with a professional occupation and a father who is either retired, unemployed/out of the labor force or an employee; (iii) only a father with a professional occupation and a mother who is either retired, unemployed/out

[29]The details on the matching algorithms used and propensity score matching estimates appear in Appendix A of the IZA working paper http://ftp.iza.org/dp3711.pdf.

[30]The self-employed group excludes professional self-employed parents. Professional self-employed parents are, for instance, doctors, lawyers, and accountants.

[31]Eleven of those 1,122 students who have non-professional self-employed fathers have professionally employed mothers, while five of those 1,122 students who have non-professional self-employed mothers have professionally employed fathers.

of the labor force or an employee; and (iv) two parents who are any combination of retired, unemployed/out of the labor force or employee.[32] If having a professionally employed parent correlates with GPA, the presence of professionally employed parents in the treatment and the comparison groups may bias the estimates in Table 3.

In order to separate the effect of having a non-professional self-employed parent from that of having a professionally employed parent, we recoded the parental occupation groups so that mother/father can either be non-professional self-employed, professional, or other (retired, unemployed/out of the labor force, or an employee). This recoding gives nine mutually exclusive, parental-matched occupational groups.

Table 5 shows the estimates for when we repeat the estimation exercise of Table 3 by including five more indicator variables for parental occupation (the comparison group now consists of 414 students who do not have any non-professional self-employed or professional parents) in the pooled sample. The coefficients of $SE_{father\ only}$, $SE_{mother\ only}$ and $SE_{both\ parents}$ are unaffected when we include these five indicator variables. The extended specification of Table 5 indicates that the coefficients of $SE_{father} \wedge Pro_{mother}$, $SE_{mother} \wedge Pro_{father}$, $Pro_{father\ only}$, $Pro_{mother\ only}$ and $Pro_{both\ parents}$ are not statistically significant at any conventional levels.[33] Our results are robust when we isolate the effect of the professionally employed parents from that of the non-professional self-employed parents.

V. Parental Occupation and Post-Graduation Plans

In this section, we quantify whether different parental employment statuses generate different post-graduation plans. To address this issue, the surveyed students were asked

[32]There are 34, 26, 181 and 414 students in groups (i)-(iv) respectively, a total of 655 students in the comparison group.

[33]Interestingly, for students who have a non-professional self-employed mother(father) and a professionally employed father(mother), i.e., $SE_{mother} \wedge Pro_{father}$ ($SE_{father} \wedge Pro_{mother}$), the non-professional self-employed parent does not have a significant negative effect, partly due to very small sample sizes: there are 11 and 5 out of 1,122 students with $SE_{father} \wedge Pro_{mother}$ and $SE_{mother} \wedge Pro_{father}$ respectively.

to choose one of the following seven post-graduation plans: 1) work in the family business; 2) start a new business; 3) work as an employee; 4) first work as an employee and then work for the family business; 5) first work as an employee and then start a new business 6) go to graduate school; or 7) other.

A. Determinants of Post-Graduation Plans

The model and the previous literature suggest that, if entrepreneurial tendencies are passed on from parent to child, the children of self-employed people are more likely to be self-employed after graduation. Equations for different post-graduation plans of a student i can be written as:

$$PGP_{ji} \quad = \quad 1[Z_i'\alpha_{j0} + \alpha_{j1}SEP_{ji}' + \epsilon_{ji} > 0] \qquad j = 1, ..., 6, \tag{6}$$

where PGP_{ji} for $j = 1, ..., 6$ are indicator variables for six post-graduation plan categories excluding "planning to be an employee." SEP_{ji} is a vector of explanatory variables for different parental self-employment statuses. Z_i is a vector of additional exogenous variables that would affect post-graduation plans. These variables are age, SSE score, indicator variables for gender, year of enrollment, and interaction terms for SSE score and year of enrollment. Equation (6) can be estimated as a multinomial logit model.

Table 6 shows the marginal effects evaluated at the sample means relative to the base outcome "planning to be an employee." The SEP_{ji} includes two indicator variables: $SE_{father\ only}$ and $SE_{both\ parents}$.[34] Students with only a self-employed father are 26 percentage points more likely to plan to work in their family businesses than to plan to be employees. Strikingly, students with two self-employed parents are almost 62 percentage

[34]These indicator variables take on a value one if only the father or both parents are non-professional self-employed individuals. We cannot control for $SE_{mother\ only}$ since some of the dependent variables (post-graduation plans) do not vary with the variable $SE_{mother\ only}$, the indicator variable for having only a self-employed mother. For the same reason, we cannot include the interaction terms ($Female \times SE_{father\ only}$) or ($Female \times SE_{both\ parents}$).

points more likely to plan to work in their family businesses. Students with only a self-employed father are 7 percentage points more likely to plan to be employees first and then become self-employed after graduation.

Having self-employed parents not only increases the likelihood of a college student's entrepreneurial intent, but also it decreases a student's probability of planning to invest further in education. Having two self-employed parents decreases the probability of planning to go to graduate school by 37 percentage points, while having only a self-employed father decreases the probability of planning to go to graduate school by 10 percentage points. Women are less likely plan to work in the family business or start a new business than to become employees. A rise in family income increases the probability of planning to work in the family business.

In Table 6, the χ^2-tests reveal that $SE_{father\ only}$ and $SE_{both\ parents}$ are jointly significant at the one percent level. However, the choice-specific (outcome-specific) χ^2-tests show that these two variables are not jointly significant in the equation for planning to go to graduate school and planning to pursue other future plans. To test the validity of using a multinomial logit model, we use Hausman-McFadden's IIA test. The results in Table 6 show the IIA assumption is valid and that a multinomial logit model is appropriate.

B. Survey Non-Response Bias

A potential problem with the above estimates, which focus on the surveyed sample only, arises from the possibility of survey non-response bias, a special type of sample-selection problem. The distributions of parental occupations in Table 1 and Table 2 show that students with self-employed fathers are under-represented in the survey.[35] The dependent variable in our multinomial logit model, post-graduation plans, is only available for the surveyed sample. Table 1 demonstrates that the surveyed and the non-surveyed

[35]Thirty-eight percent of the surveyed students have self-employed fathers, while 49 percent of the non-surveyed students have self-employed fathers.

students are not identical along many other dimensions. Therefore, estimation results based only on the surveyed sample may suffer from a survey non-response bias.

In order to account for this possible bias we estimate the following two-equation binary response model with selection:

$$S_{i1} = 1[Z'_{i1}\delta_1 + \epsilon_{i1} > 0] - surveyed. \quad (7)$$

$$E_{i2} = 1[Z'_{i2}\delta_2 + \epsilon_{i2} > 0] - plan\ to\ be\ 1^{st} - degree\ entrepreneur. \quad (8)$$

We can estimate this two-equation model via a maximum likelihood procedure by making two assumptions: (i) The latent errors, ϵ_{i1} and ϵ_{i2}, are bivariate normally distributed with zero means, unit variances and a correlation coefficient of ρ_1; and (ii) these latent errors are independent of Z_{i1}.[36] Equation (8) is the structural equation of interest, where E_{i2} is a binary indicator that takes on a value of one if student i plans to be a first-degree entrepreneur after graduation.[37] Equation (7) is the selection equation, where S_{i1} is the survey response indicator and E_{i2} is observed only when $S_{i1} = 1$. The explanatory variable set in equation (8) contains Z_{i2}, which is a vector of exogenous variables that would affect post-graduation plans, such as parental self-employment, gender, gender and parental self-employment interactions, age, SSE score, year of enrollment, and interaction terms for SSE score and year of enrollment.

To identify possible survey non-response bias, we need at least one explanatory variable in Z_{i1} of equation (7) in addition to the Z_{i2} of the structural equation. Otherwise, the identification is from the nonlinearities in the probit equations. A potential identifier should be correlated with whether a student is surveyed or not, but it should not affect post-graduation plans directly. As mentioned in the data section, the probability of

[36] See Wooldridge (2002) for details on this model.

[37] Students who are planning to work in their family businesses or those who are planning to start a new business are classified as "first-degree entrepreneurs."

responding to our in-class survey is expected to be higher for students who attend many classes. Therefore, the students who take a heavier course load are more likely to appear in our in-class survey.

We use individual current course load to identify survey response. However, students who have entrepreneurial tendencies may consistently take fewer or more classes compared to those lacking entrepreneurial intentions. In this case, using current course load to identify the survey response equation without accounting for a student's average course load may be problematic. To solve this problem, we also control for a student's average course load both in the selection equation and in the structural equation. Even if a future entrepreneur takes fewer classes each semester, accounting for the individual average course loads, the current course load should not directly affect future plans. Moreover, as Table 1 shows, current course load is clearly correlated with the probability of being surveyed.

Whether a variable is a valid instrument is always open to debate. Nevertheless, we see no reason to assume that the course load taken by a student at the beginning of the Fall 2006 semester, controlling for their average course load over their college career, should affect a student's post-graduation plans (recorded in December 2006). An instrument is strong if its coefficient is highly significant in the survey response equation.[38] If $\rho_1 \neq 0$, students are non-randomly assigned to the surveyed sample, and the standard probit estimation of the impact of self-employed parents on entrepreneurial intent without correcting for survey non-response bias will yield biased and inconsistent estimates.

The estimation strategy can be summarized as follows: We estimate the selection equation via probit and get $\widehat{\delta_1}$ in order to construct the conditional densities, $P(E_{i2} = 1 \mid Z_{1i}, S_{1i} = 1)$ and $P(E_{i2} = 0 \mid Z_{1i}, S_{1i} = 1)$. Then we estimate $\widehat{\delta_2}$ and $\widehat{\rho_1}$ via a maximum

[38] Staiger and Stock (1997) suggest that if the t-statistic for an instrument is above $\sqrt{10}$, it is considered to be a strong instrument.

likelihood model using $P(E_{i2} = 1 \mid Z_{1i}, S_{1i} = 1)$, $P(E_{i2} = 0 \mid Z_{1i}, S_{1i} = 1)$ and $\widehat{\delta_1}$.

Table 7 shows the results of estimating the two-equation model described above for two alternative specifications. The first has an indicator variable ($1 \leq SE_{Parent}$) that takes on a value of one if at least one parent is self-employed, while the second has two indicator variables, $SE_{father\ only}$ and $SE_{both\ parents}$, to control for self-employed parents. The first and fourth columns of Table 7 present the coefficients from the probit selection equation (7). Students with at least one self-employed parent or only a self-employed father are less likely to be in the surveyed sample. In the second specification, the χ^2-test reveals that the variables $SE_{father\ only}$ and $SE_{both\ parents}$ and their interactions with the female indicator variable are jointly significant in both the selection and structural equations. We find that women are more likely to be in the surveyed sample. Consistent with our expectations, the coefficient of the identifier variable, current course load, is positive and highly significant in all specifications. Interestingly, students with heavier average course loads are less likely to be surveyed.

The second and fifth columns show the marginal effects after estimating (8) as a probit model without accounting for survey non-response bias. Having at least one self-employed parent, only a self-employed father or two self-employed parents is associated with an increase in the probability of planning to be a first-degree entrepreneur by 26, 27 and 59 percentage points, respectively. The impact of having two self-employed parents is the largest on students planning to be first-degree entrepreneurs. For students with only a self-employed father or two self-employed parents, the self-employment statuses of the parents do not differentially affect children's entrepreneurial intent by gender. Older students and women are less likely to plan on becoming entrepreneurs.

The last columns of models 1 and 2 show the marginal effects after estimating the second stage of the two-equation model. The coefficients of ($1 \leq SE_{Parent}$) and $SE_{father\ only}$

are highly significant and much larger than those predicted from the models that do not control for the survey non-response bias, while the statistically significant coefficient on $SE_{both\ parents}$ is not affected. The probability of first-degree entrepreneurial intent increases by 35, 35 and 59 percentage points for the students with $(1 \leq SE_{Parent})$, $SE_{father\ only}$ and $SE_{both\ parents}$, respectively. This increase is over and above the probability of the baseline outcome, which is 20 percent.[39] The negative impact of age and being female on planning to be a first-degree entrepreneur disappear when we correct for the survey non-response bias.

The Wald test statistics for the independence of latent errors, (H_0: $\rho_1 = 0$), of the selection and the structural equations are insignificant for both models. Therefore, the Wald tests of independent equations fail to reject the null hypotheses.[40] This result indicates that ignoring selection into the surveyed sample would not render the estimates of the probit model for E_{i2} equation biased and inconsistent, yet some of the estimates do change after we account for survey non-response bias.

VI. Conclusions

This study provides evidence that parental self-employment and family businesses have a strong negative association with college students' GPAs. Our results suggest that GPAs of men with two self-employed parents or with only a self-employed mother are the lowest. We find that parental self-employment has a differential impact on men's and women's GPAs with one exception: having only a self-employed father has a similar effect on the GPAs of both men and women. For women, the relationship between having self-employed parents and GPA is not as strong: self-employment statuses of parents have a negative statistically significant effect on their GPAs only for those with only a non-professional self-employed father. The inclusion of various controls reduces the negative impact on

[39] See Table 1.

[40] The correlation coefficients in Model 1 and Model 2 are insignificant.

GPA of having only a self-employed father by about half, while the negative impact on GPA of having two self-employed parents is reduced by only one-third.

An explanation for the lower GPAs of the children of self-employed parents is that in the presence of self-employed parents and family businesses students have a larger set of post-graduation options and are more likely to plan on becoming self-employed due to intergenerational transfer of self-employment. Hence, these students may not exert as much effort in acquiring the task-specific career-oriented human capital taught in college. When parent-owned businesses opt for employing their children with lower levels of human capital instead of following a competitive hiring procedure, family businesses deviate from profit-maximizing behavior and internalize possible costs this may impose on their businesses. Nepotism of this kind prevails very frequently in most countries and threatens the success of family businesses and of economies.

The results also confirm that students with parent-owned businesses are more likely to have entrepreneurial tendencies upon graduation. Children of the self-employed are much more likely to plan on joining their respective family businesses after graduation. After accounting for survey non-response bias, the probability of the strongest entrepreneurial intent among students with at least one self-employed parent is almost 175 percent more than the baseline case. More interestingly, for students with two self-employed parents this probability is almost 300 percent more than the baseline case. Children of self-employed parents are not only more likely to become self-employed upon graduation, but they are also less likely to plan to attend graduate school.

Future research might investigate the role of sibling order and the number and gender of siblings on post-graduation plans and college success. Preliminary results based on this data set show that the presence and number of older male and female siblings interact with the self-employment status of the parents to affect students' college success and post-graduation plans. For instance, while having only older sister(s) increases the college

success of students with no self-employed parents, having only older sister(s) reduces the college success of those with self-employed parents. Interestingly, having only older brother(s) has no statistically significant effect on college GPAs of students without self-employed parents, while having only older brother(s) raises the college GPAs of students with self-employed parents.

Future studies may involve understanding the relative importance of nepotism, intergenerational transfers of entrepreneurial ability, and level of access to managerial and industry-specific human capital in generating these effects. The limitations of the data set in the current study do not permit these analyses.

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Table 1: Comparative Summary Statistics for Surveyed and Non-Surveyed Samples

	All (1,122)		Surveyed (499)		Non-Surveyed (623)	
Variable	mean	(s.d.)	mean	(s.d.)	mean	(s.d.)
Cumulative GPA	2.42	(0.62)	2.54	(0.62)	2.31	(0.61)
Course Load	5.99	(1.57)	6.12	(1.28)	5.88	(1.76)
Average Course Load	5.72	(1.16)	5.75	(1.22)	5.71	(1.11)
Age	21.49	(1.60)	21.38	(1.67)	21.58	(1.52)
Female	0.49	(0.50)	0.57	(0.49)	0.43	(0.49)
Major:						
Business Admin. & Econ.	0.11	(0.31)	0.08	(0.27)	0.13	(0.33)
Economics	0.12	(0.32)	0.14	(0.34)	0.11	(0.32)
Government	0.05	(0.21)	0.05	(0.22)	0.05	(0.21)
Economics (Honors)	0.02	(0.12)	0.01	(0.11)	0.02	(0.13)
Business Admin. & Econ. (Honors)	0.03	(0.16)	0.02	(0.15)	0.03	(0.18)
International Finance	0.12	(0.32)	0.10	(0.29)	0.13	(0.34)
International Relations	0.19	(0.39)	0.23	(0.41)	0.17	(0.36)
Business Admin.	0.36	(0.48)	0.37	(0.48)	0.36	(0.47)
SSE Score	253.30	(62.26)	263.05	(58.77)	245.49	(63.90)
Mother's Education	11.55	(4.77)	11.45	(4.74)	11.64	(4.79)
Father's Education	13.37	(4.70)	13.36	(4.70)	13.38	(4.70)
Mother's Occupation:						
Housewife or Does not Work	0.61	(0.48)	0.61	(0.48)	0.62	(0.48)
Retired	0.13	(0.33)	0.18	(0.38)	0.08	(0.27)
Works as an Employee	0.15	(0.35)	0.10	(0.30)	0.18	(0.38)
Self-Employed/Employer	0.06	(0.23)	0.06	(0.23)	0.06	(0.23)
Professional	0.05	(0.22)	0.05	(0.22)	0.06	(0.23)
Father's Occupation:						
Does not Work	0.01	(0.11)	0.01	(0.10)	0.02	(0.12)
Retired	0.15	(0.35)	0.20	(0.40)	0.10	(0.30)
Works as an Employee	0.23	(0.42)	0.13	(0.33)	0.31	(0.46)
Self-Employed/Employer	0.44	(0.49)	0.38	(0.49)	0.49	(0.50)
Professional	0.16	(0.36)	0.27	(0.44)	0.07	(0.26)
Post-Graduation Plans:						
Work In Family Business			0.16	(0.36)		
Start New Business			0.04	(0.21)		
Work as Employee			0.20	(0.39)		
Employee→Family Firm			0.07	(0.25)		
Employee→New Firm			0.17	(0.37)		
Graduate School			0.33	(0.47)		
Other			0.03	(0.18)		
Hours Studied			1.79	(1.07)		
Family Income (thousand YTL):						
0-20			0.17	(0.37)		
20-40			0.15	(0.35)		
40-60			0.10	(0.30)		
60-80			0.10	(0.31)		
80-100			0.09	(0.28)		
100-120			0.06	(0.24)		
120-140			0.04	(0.20)		
140-160			0.04	(0.18)		
160+			0.12	(0.32)		

Table 2: Parents' Occupations Matched

Entire Sample

	Father					
Mother	Does not Work	Retired	Employee	Employer	Professional	All
Housewife/Does not Work	10	86	125	374	95	690
Retired	3	56	27	34	24	144
Employee	3	18	86	34	23	164
Employer	0	4	9	46	5	64
Professional	0	3	12	11	34	60
All	16	167	259	499	181	1,122

Surveyed Sample

	Father					
Mother	Does not Work	Retired	Employee	Employer	Professional	All
Housewife/Does not Work	3	48	32	141	81	305
Retired	2	39	11	18	21	91
Employee	1	12	17	6	14	50
Employer	0	1	2	21	4	28
Professional	0	2	1	5	17	25
All	6	102	63	191	137	499

Table 3: The Effect of Self-Employed Parents on College GPA

	GPA					
	Basic Specification			Extended Specification		
	All	Men	Women	All	Men	Women
	(1)	(2)	(3)	(4)	(5)	(6)
Control Group Mean	2.548	2.451	2.646	2.548	2.451	2.646
	[0.644]	[0.644]	[0.629]	[0.644]	[0.644]	[0.629]
$SE_{father\ only}$	-0.225^{***}	-0.179^{***}	-0.269^{***}	-0.095^{***}	-0.091^{*}	-0.089^{*}
	(0.037)	(0.054)	(0.052)	(0.034)	(0.046)	(0.049)
$SE_{mother\ only}$	-0.181	-0.349^{***}	-0.145	-0.014	-0.264^{***}	0.074
	(0.112)	(0.088)	(0.152)	(0.101)	(0.093)	(0.146)
$SE_{both\ parents}$	-0.375^{***}	-0.459^{***}	-0.252^{*}	-0.236^{***}	-0.316^{***}	-0.127
	(0.082)	(0.088)	(0.137)	(0.078)	(0.090)	(0.124)
Age	-0.033^{***}	-0.031^{**}	-0.026^{*}	0.015	-0.001	0.042^{***}
	(0.010)	(0.014)	(0.014)	(0.012)	(0.017)	(0.015)
Income/1,000	-0.003^{***}	-0.003^{***}	-0.002^{***}	-0.002^{***}	-0.002^{***}	-0.0009
	(0.0005)	(0.0008)	(0.0007)	(0.0004)	(0.0007)	(0.0006)
Additional Controls †						
Hours Studied	Yes	Yes	Yes	Yes	Yes	Yes
SSE Score	No	No	No	Yes	Yes	Yes
Exam Year Indicators	No	No	No	Yes	Yes	Yes
Exam Score × Year	No	No	No	Yes	Yes	Yes
College Major	No	No	No	Yes	Yes	Yes
Parental Education	No	No	No	Yes	Yes	Yes
F-stat [p-value]	15.43	12.53	8.49	4.63	6.14	1.40
	[<.001]	[<.001]	[<.001]	[0.003]	[<.001]	[0.243]
Observations	1,122	573	549	1,122	573	549
R^2	0.111	0.118	0.110	0.372	0.384	0.410

NOTE: The dependent variable is the individual GPA. Standard deviations and standard errors are given in brackets and parentheses respectively. The linearized standard errors are derived from a consistent variance-covariance matrix using Huber-White sandwich estimators. ***, ** and * indicate respectively 1%, 5% and 10% significance levels. The indicator variables for the Business Administration Economics Combined Honors major and test year 2002 are omitted. †See next page for the parameter estimates of these variables.

Table 3 (continued)
The Effect of Self-Employed Parents on College GPA

	GPA					
	Basic Specification			Extended Specification		
	All	Men	Women	All	Men	Women
	(1)	(2)	(3)	(4)	(5)	(6)
Hours Studied	−0.029	−0.014	−0.018	−0.038	0.019	−0.022
	(0.087)	(0.027)	(0.105)	(0.074)	(0.121)	(0.090)
Hours Studied^2	0.016	−0.014	0.021	0.018	−0.006	0.022
	(0.017)	(0.027)	(0.020)	(0.014)	(0.023)	(0.016)
Business Administration & Economics				−0.808***	−0.807***	−0.661***
				(0.085)	(0.127)	(0.103)
Economics				−0.795***	−0.690***	−0.715***
				(0.081)	(0.121)	(0.106)
Government				−0.568***	−0.411***	−0.601***
				(0.098)	(0.147)	(0.127)
Economics (Honors)				0.199**	0.366***	0.137
				(0.078)	(0.116)	(0.112)
International Finance				−0.814***	−0.614***	−0.924***
				(0.079)	(0.124)	(0.096)
International Relations				−0.748***	−0.518***	−0.866***
				(0.076)	(0.123)	(0.091)
Business Administration				−0.826***	−0.704***	−0.845***
				(0.072)	(0.113)	(0.086)
SSE Year 2003				0.379	0.432	0.305
				(0.380)	(0.590)	(0.568)
SSE Year 2004				0.252	−0.137	0.084
				(0.381)	(0.582)	(0.542)
SSE Year 2005				0.462	0.246	0.309
				(0.487)	(0.722)	(0.714)
SSE Score				0.012***	0.011***	0.012***
				(0.001)	(0.002)	(0.002)
SSE Score × Year 2003				−0.006***	−0.006**	−0.006**
				(0.001)	(0.003)	(0.003)
SSE Score × Year 2004				−0.005***	−0.004	−0.005*
				(0.001)	(0.0003)	(0.003)
SSE Score × Year 2005				−0.006***	−0.005*	−0.006*
				(0.002)	(0.003)	(0.003)
Father's Education				−0.001	0.001	−0.001
				(0.042)	(0.005)	(0.006)
Mother's Education				−0.007*	−0.011**	−0.005
				(0.003)	(0.005)	(0.005)

Table 4: Testing the Equality of the SSE Scores by Parents' Occupations

		Contrasts by Parental Self-Employment Status		
	Control Mean	Control vs. $SE_{father\ only}$	Control vs. $SE_{mother\ only}$	Control vs. $SE_{both\ parents}$
SSE Score	256.408	6.118	25.490	5.622
	{64.569}	(3.877)	(15.486)	(9.765)
t-Stat		1.578	1.646	0.575
		[0.115]	[0.103]	[0.565]
Observations	605	453	18	46

NOTE: Standard deviation is given in braces. Standard errors are reported in parentheses. p-values for t-stats are reported in brackets. Control group includes students who do not have any self-employed parents. ***, ** and * indicate respectively 1%, 5% and 10% significance levels.

Table 5: The Impact of Professional Parents on College GPA

	GPA	
	Basic Specification	Extended Specification
(i) $\text{SE}_{father\ only}$	-0.270^{***}	-0.091^{**}
	(0.042)	(0.038)
(ii) $\text{SE}_{mother\ only}$	-0.250^{*}	-0.056
	(0.142)	(0.126)
(iii) $\text{SE}_{both\ parents}$	-0.418^{***}	-0.221^{***}
	(0.082)	(0.078)
(iv) $\text{SE}_{father} \wedge \text{Pro}_{mother}$	-0.237	-0.071
	(0.148)	(0.104)
(v) $\text{SE}_{mother} \wedge \text{Pro}_{father}$	-0.260^{**}	0.007
	(0.109)	(0.116)
(vi) $\text{Pro}_{father\ only}$	-0.127^{**}	0.017
	(0.059)	(0.051)
(vii) $\text{Pro}_{mother\ only}$	-0.199	-0.031
	(0.131)	(0.141)
(viii) $\text{Pro}_{both\ parents}$	-0.179^{*}	-0.018
	(0.101)	(0.085)
Additional Controls †		
Family Income	Yes	Yes
Age	Yes	Yes
Female Indicator	Yes	Yes
Hours Studied	Yes	Yes
Exam Score × Year	No	Yes
Exam Year Indicators	No	Yes
College Major	No	Yes
Parental Education	No	Yes
F-Statistics and p-values		
H_o: *(i)=...=(viii)=0*	6.56 (<.001)	1.71 (.092)
H_o: *(i)=(ii)=(iii)=0*	16.91 (<.001)	3.48 (.015)
H_o: *(iv)=...=(viii)=0*	2.59 (.024)	0.16 (.978)
H_o: *(vi)=(vii)=(viii)=0*	2.66 (.047)	0.08 (.970)
Observations	1,122	1,122
R^2	.129	.384

NOTE: The dependent variable is the individual GPA. Standard errors are given in parentheses. The linearized standard errors are derived from a consistent variance-covariance matrix using Huber-White sandwich estimators. ***, ** and * indicate respectively 1%, 5% and 10% significance levels.
†See Table 5 of the IZA working paper http://ftp.iza.org/dp3711.pdf for the parameter estimates of these variables.

Table 6: The Determinants of Post-Graduation Plans: Marginal Effects after Multinomial Logit

	(Base Outcome=Plan to be an Employee)					
	Family Business	New Business	Employee→ Family Business	Employee→ New Business	Graduate School	Other
(i) $SE_{father\ only}$	0.265***	0.005	0.071**	−0.019	−0.103*	−0.037*
	(0.049)	(0.004)	(0.031)	(0.012)	(0.057)	(0.027)
(ii) $SE_{both\ parents}$	0.616***	−0.029***	0.148	−0.212***	−0.367***	0.004
	(0.104)	(0.009)	(0.097)	(0.021)	(0.051)	(0.022)
Age	−0.008	−0.004**	−0.016	0.001	0.015	−0.002
	(0.011)	(0.002)	(0.010)	(0.005)	(0.019)	(0.003)
Female	−0.078**	−0.008*	−0.020	−0.008	0.039	−0.003
	(0.032)	(0.004)	(0.025)	(0.013)	(0.053)	(0.012)
Income/1,000	0.0009***	0.0002	0.0002	0.0003	−0.0004	−0.0003**
	(0.0002)	(0.0003)	(0.0002)	(0.002)	(0.0005)	(0.0001)
SSE Score	−0.008***	−0.0008***	−0.003***	−0.0005	0.011***	−0.001
	(0.002)	(0.0003)	(0.001)	(0.0008)	(0.003)	(0.008)
Year 2003	−0.539**	−0.177	−0.015	−0.029	0.962***	−0.023
	(0.280)	(0.233)	(0.035)	(0.038)	(0.045)	(0.041)
Year 2004	−0.283	−0.221	0.035	−0.077	0.530	−0.094
	(0.241)	(0.313)	(0.024)	(0.089)	(0.633)	(0.132)
Year 2005	−0.339**	−0.021	−0.095	−0.043	−0.115	−0.147
	(0.160)	(0.027)	(0.084)	(0.038)	(0.476)	(0.164)
SSE × Year 2003	0.007***	0.0007**	0.002	0.006	−0.012***	0.001
	(0.002)	(0.0002)	(0.002)	(0.009)	(0.003)	(0.001)
SSE × Year 2004	0.005**	0.0007**	0.001	0.008	−0.007*	0.001
	(0.002)	(0.0003)	(0.001)	(0.009)	(0.004)	(0.001)
SSE × Year 2005	0.006***	0.0005	0.002*	0.003	−0.006*	0.001
	(0.002)	(0.0003)	(0.001)	(0.009)	(0.003)	(0.001)
χ^2 ($Pr>\chi^2$)	23,806 (<.001)					
Pseudo R^2	.152					
Log Pseudolikelihood	-727.35					
χ^2 Stat for *(i)*=*(ii)*=0	17,600					
[degrees of freedom]	[12]					
($Pr>\chi^2$)	(<.001)					
Choice Spec. χ^2 Stat	53.94	4157.06	19.48	3,575	4.03	3.80
[degrees of freedom]	[2]	[2]	[2]	[2]	[2]	[2]
(i)=*(ii)*=0 ($Pr>\chi^2$)	(<.001)	(<.001)	(<.001)	(<.001)	(.133)	(.149)

Hausman Tests Of IIA Assumption H_0=Odds (Outcome-J vs Outcome-K) are Indep. of Other Alternatives

	χ^2	df.	$(P>\chi^2)$	Evidence
Work in the Family Firm	.000	2	>.999	for H_0
Start a New Firm	.000	1	>.999	for H_0
Employee→Family Firm	.000	2	>.999	for H_0
Employee→New Firm	.000	1	>.999	for H_0
Graduate School	.000	2	>.999	for H_0
Other	.000	2	>.999	for H_0
Work as an Employee	.000	2	>.999	for H_0

NOTE: Standard errors are given in parentheses. The linearized standard errors are derived from a consistent variance-covariance matrix using Huber-White sandwich estimators. ***, ** and * indicate respectively 1%, 5% and 10% significance levels. The indicator variable for test year 2002 is omitted. The results reported for the multinomial estimations are marginal effects rather than coefficients.

Table 7: The Determinants of Entrepreneurial Intent Corrected for Survey Non-Response Bias: Marginal Effects After Maximum Likelihood Probit Model with Sample Selection

	Model 1			Model 2		
		Pr(First-Degree Entrepreneur)			Pr(First-Degree Entrepreneur)	
	Pr(Surveyed)	Not Corrected	Corrected	Pr(Surveyed)	Not Corrected	Corrected
Current Course Load	0.089***			0.090***		
	(0.026)			(0.027)		
($1 \leq$ SE$_{Parent}$)	−0.201*	0.262***	0.346**			
	(0.122)	(0.057)	(0.142)			
Female×($1 \leq$ SE$_{Parent}$)	−0.178	−0.023	−0.023			
	(0.158)	(0.063)	(0.094)			
SE$_{father\ only}$				−0.267**	0.273***	0.354**
				(0.116)	(0.064)	(0.162)
SE$_{both\ parents}$				0.153	0.595***	0.594***
				(0.268)	(0.137)	(0.159)
Female×SE$_{father\ only}$				−0.089	−0.020	−0.026
				(0.163)	(0.064)	(0.092)
Female×SE$_{both\ parents}$				−0.518	−0.056	−0.062
				(0.495)	(0.098)	(0.169)
Average Course Load	−0.177***	−0.018	−0.037	−0.182***	0.017	0.035
	(0.041)	(0.016)	(0.430)	(0.041)	(0.015)	(0.047)
Age	0.058**	−0.026**	−0.040	0.057*	−0.024**	−0.038
	(0.030)	(0.011)	(0.028)	(0.030)	(0.011)	(0.031)
Female	0.493***	−0.094*	−0.160	0.466***	−0.089*	−0.149
	(0.107)	(0.053)	(0.152)	(0.105)	(0.052)	(0.157)
SSE Score	−0.002	−0.009***	−0.014***	−0.002	−0.010***	−0.014**
	(0.004)	(0.002)	(0.005)	(0.004)	(0.002)	(0.006)
Year 2003	0.451	−0.757***	−0.866***	0.501	−0.799***	−0.891***
	(0.935)	(0.172)	(0.170)	(0.923)	(0.156)	(0.155)
Year 2004	−0.756	−0.566**	−0.689***	−0.766	−0.591**	−0.705***
	(1.03)	(0.230)	(0.266)	(1.03)	(0.233)	(0.270)
Year 2005	−0.366	−0.362**	−0.415	−0.334	−0.404***	−0.431
	(1.23)	(0.146)	(0.276)	(1.23)	(0.155)	(0.296)
SSE×Year 2003	0.0004	0.009***	0.012**	0.0001	0.009***	0.012**
	(0.0004)	(0.002)	(0.005)	(0.004)	(0.002)	(0.005)
SSE×Year 2004	0.005	0.007***	0.010**	0.005	0.007***	0.010**
	(0.005)	(0.002)	(0.004)	(0.005)	(0.002)	(0.004)
SSE×Year 2005	0.006	0.007***	0.009**	0.007	0.007***	0.010**
	(0.005)	(0.002)	(0.003)	(0.005)	(0.002)	(0.004)
Number of Obs.	1,108	485	1,108	1,108	485	1,108
Censored Obs.	623		623	623		623
Uncensored Obs.	485		485	485		485
Log pseudolikelihood	-891.1	-191.3	-891.1	-885.2	-186.2	-885.2
$\widehat{\rho}$ (s.e.)	−0.323 (0.703)			−0.303 (0.766)		
Wald Test for Indep. Eqns. ($\rho = 0$) $\chi^2(1)$ (p-value)	.18 (.66)			.14 (.71)		
χ^2-Stat for SE Parent Dummies (p-value)				32.81 (<.001)	31.77 (<.001)	32.81 (<.001)
χ^2-Stat for SE Parent Dummies×Female (p-value)	57.23 (<.001)	43.45 (<.001)	57.23 (<.001)	64.52 (<.001)	53.08 (<.001)	64.52 (<.001)

NOTE: Standard errors are given in parentheses. The linearized standard errors are derived from a consistent variance-covariance matrix using Huber-White sandwich estimators. ***, ** and * indicate respectively 1%, 5% and 10% significance levels. The indicator variable for test year 2002 is omitted. The results reported for the entrepreneurial intent equation estimations are marginal effects rather than coefficients, while the results for the survey response equation are the coefficients after probit estimation.