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Veterinarians and Student Loan Debt: Is the Burden Too Much?

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Selected Paper prepared for presentation at the Southern Agricultural Economics Association Annual Meeting, Mobile, AL, February 4-7, 2017

The work was primarily funded by the American Veterinary Medical Association. Brorsen receives funding from the Oklahoma Agricultural Experiment Station, USDA National Institute of Food and Agriculture Hatch Project number OKL02939, and the A.J. and Susan Jacques Chair.

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Veterinarians and Student Loan Debt: Is the Burden Too Much?

Abstract

United States student loan debt has escalated over the last decade and created public debate over the driving factors as well as the economic and social consequences. Despite repeated warnings about the effects of an uncontrolled student loan market, the available statistics showing all dimensions of the problem, and extensive literature on the causes of the increasing educational debt, the problem remains real in the United States. This paper uses 2016 American Veterinary Medical Association (AVMA) Census of Veterinarians data along with a survival model to determine the ability of veterinarians to service their educational debt and the effect of debt on wellness. While it may not be easy for them, it appears that most veterinarians have enough income to pay off their student debt. Veterinarians with student debt are more likely to own or co-own a private practice than those with no debt, which might be due to the need to finance purchase of the practice. The burden of carrying such debt has significant effects on veterinarians' wellness: burnout and secondary traumatic stress scores increase with the level of debt.

Key Words: burnout and fatigue, census of veterinarians, student debt, survival analysis

JEL Codes: I26, J01, Q10

Introduction

As the level of their income continues to trend higher, Americans have increased consumption of normal goods, including higher education (Campbell and Siegel. 1967; Lemke and Shughart II. 2016). Higher education is now and with good reason mostly viewed as an investment rather than consumption as it guarantees the investors potential future gains (Becker and Lewis, 1992). Investment in higher education is as important for private investors as it is for the federal government. Human capital theory suggests that an investment in education improves the productive capacity of a nation (Becker, 1993) and adds societal prestige to the degree recipient. In the last decades, the U.S. government has made tremendous efforts to ensure that all American families have access to higher education. The American Opportunity Tax Credit program subsidizes education for students; the income-based repayment plan makes it easier to refinance educational debt, and a frozen interest rate on subsidized student loans are intended to help students better able to service educational debt.

College enrollment has steadily increased over the past two decades, in response to public efforts to make higher education accessible to all and the increasing awareness that higher education is key to career success. The upward shift in the demand for higher education has resulted in a new market equilibrium featuring higher prices (tuition and fees). Because of the development of third-party payment methods, an individual can invest much more money than he/she actually possesses as long as he/she is persuaded that the difference between the present value of the expected benefits from the education and the present cost of education is positive. Today, Americans owe \$1.3 trillion of student loans and the proportion of borrowers in default or behind on their loans is increasing (Mitchell, 2016). A further concern is that students are being lured into incurring debt that they are unable to pay back. While arguments about the benefit of

acquiring knowledge remain valid, there are concerns that higher education is becoming unnecessarily expensive.

Debt is of particular concern among veterinary students because starting salaries in the field tend to be low relative to the years of education required to enter the discipline. The 2014 report from the Institute for College Access & Success indicates that the average student loan debt in the United States was \$28,950 per borrower, and during the same period examined, the average educational debt for a new graduate veterinarian is \$135,283 (AVMA, 2015). In addition, the five-year mean starting salary of a veterinarian who graduated between 2010 and 2014 is slightly above \$48,000, while the mean student debt during the same period is about \$119,800. It is clear that veterinary medical college students are contracting more debt than a typical four-year college student and the starting salaries for these new veterinarians are among the lowest in the category of graduate degree employment.

There is an ongoing public debate over the driving factors as well as the economic and social consequences of the escalating student loan debt. None of these studies so far has investigated the ability of students to repay their debt. This paper aims to determine the ability of veterinarians to service their student debt, and to estimate the expected length of time for student loan debt repayment to be achieved. Wellness is also a trending issue in the veterinary profession. Past studies have found a relationship between suicide and occupation (Agerbo et al., 2007). For veterinarians, the suicide rate is estimated to be almost four times higher than that for the general population (Bartram and Baldwin, 2008). Conditions of patients can leave lasting traumatic incidences on veterinarian's life that might lead to depression and in more severe case, to suicide. Methods used to assess professionals' wellness include, but not limited to the

Professional Quality of Life (ProQOL). Using the ProQOL and the level of student debt as risk factor, this paper determined the impact of high debt on veterinarians' wellness.

Veterinarians and Student Loan Debt

Data used in this analysis are from the 2016 Census of Veterinarians conducted by the AVMA, which is the largest professional association for veterinarians in the country, with more than 89,000 members. With a market share exceeding 65 percent, the association brings together professionals from diverse backgrounds into a highly segmented universe with distinct subsectors (private employment vs. public employment, small animal practices vs. large animal practices, specialty veterinary vs. general medicine). The Census of Veterinarians provides an annual update on the veterinary industry workforce and spotlights trends that could help explain the health of the industry.

To conduct the Census, the AVMA membership list was used as a sampling frame from which 21,638 veterinarians were randomly drawn to receive the survey questionnaire. The survey, which was developed and administered by the Survey Research Laboratory of the University of Illinois at Chicago, was electronically delivered and kept active for three weeks. A reminder was sent at the end of each week, and the survey officially closed at the end of the third week. Of the 21,638 questionnaires that reached their destinations, 2,545 were returned, yielding a response rate of 11.8 percent.

The subject of focus of this paper is the debt status of the respondents, the amount of debt incurred, and the length of repayment. Respondents were asked to state whether or not they had taken out a student loan that was used to fund their DVM degree. The majority of the respondents (77.3 percent) revealed that they indeed have incurred debt in funding their

veterinary education. Of these people, 50.2 percent graduated during the last 10 years, 24.2 percent graduated between 11 and 20 years ago, and the remaining 25.6 percent have at least 20 years of professional experience. This distribution shows how important the debt problem is for veterinarians. In fact, of those who graduated between 1996 and 2014, only two out of 10 respondents are debt free, while four out of 10 respondents with more than 20 years of experience in the field are debt free.

The mean debt of those with student debt is \$133,576 with a minimum debt of \$8,500 and a maximum reported debt of \$450,000. The typical college student debt in the United States in 2015 was approximately \$35,000; the average debt for veterinary students is exceedingly high by comparison. The high student debt of veterinarians is largely attributed to the high cost associated with the veterinary medical education: Like all higher education, veterinary medical education cost has risen sharply over the past three decades. A DVM degree costs \$28,000 to \$54,000 per year for in-state tuition and fees, and up to \$66,000 per year for out-of-state applicants. The tuition and fees plus average living expenses increase on average 4 percent each year (VIN, 2015) and the candidates of the class of 2020 will have to spend on average \$147,000 to \$250,000 each, for in-state and out-of-state education, respectively. At public institutions, which are relatively less expensive, the estimated cost of footing the bill is \$191,000 to \$393,000 for non-residents. In comparison, general education in the private non-profit institutions costs on average \$33,480 per year per student and, with about \$15,000 for living expenses, total \$48,480 per year per student. This is about one-fourth the cost of veterinary medical school.

Debt and Professional Development

The rising cost of veterinary education has led to massive student loan debt in the veterinary profession, and the social and economic consequences of this crisis are without doubt important issues to be discussed. In terms of professional development, student debt limits new veterinarians' ability to acquire their own practices immediately after graduating from veterinary schools. In this analysis, only private practice veterinarians are included. Private practice includes all positions in private veterinary clinics, animal hospitals, and pet stores that provide veterinary services to animals. In total, 470 respondents meet the employment criterion and are used as experimental units. A joint distribution of debt status ($X_1 = 1$: respondent has incurred student debt, $X_1 = 0$, otherwise), practice ownership status ($X_2 = 1$: respondent owns or co-owns a practice, $X_2 = 0$, otherwise), and number of years since DVM graduation (group 1: 0 to 10 years, group 2: 11 to 20 years, and group 3: 21 years and over). The distribution is presented in Figure 1.

In their first 10 years after graduation (group 1), veterinarians with student loans debt are more likely to be employed as associate veterinarians. More than 70 percent of people in this category are non-practice owners and 63.2 percent are non-practice owners with student debt. After 10 years in the profession, a new pattern emerges. There are more practice owners (59.1 percent) than associate veterinarians (40.9 percent). A possible explanation is that new graduates are facing the challenge of servicing their student loan in their first years after graduation. In the United States, unlike other countries, the length of student loan repayment is typically 10 years from graduation. In the last group (20 years and over after graduation), the majority (83.2 percent) are practice owners and only 16.8 percent still work as associate veterinarians.

Debt and Wellness: Compassion, Burnout and Secondary Traumatic Stress

Wellness was evaluated using the Professional Quality of Life Scale (ProQOL), Version 5.

PROQOL is typically used to compute the level of compassion satisfaction and compassion fatigue for workers in a specified industry (Hudnall Stamm, 2009). The three indexes of wellness considered here are compassion satisfaction, burnout and secondary traumatic stress (compassion fatigue). Compassion score measures the pleasure an individual derives from being able to perform adequately his/her work. We hypothesized that the level of debt might have some influence on the compassion score of an individual. Previous studies have found a relationship between student debt and student mental health (Stradling, 2001). Students, who perceived their education debt as excessive and are using a high share of their income to service their debt might not be as happy with their career as their peers who are debt free. Burnout is a component of compassion fatigue. Symptoms of burnout include but are not limited to feeling hopeless and loss of efficiency at work and may lead to depression and suicide. The hypothesis here is that veterinarians with high student debt are more likely to experience burnout. Secondary traumatic stress refers to exposure to a patient's condition that might have adverse implications on a veterinarian's life.

The average score for all these three components is 50. Typically, 25 percent of people will score higher than 57, and 25 percent will score below 43. A high score in compassion satisfaction indicates that the person enjoys and values what he/she is doing. A high burnout score indicates that the person is at risk of being depressed and prompts a recommendation that the subject be under medical surveillance. In contrast to burnout, high secondary traumatic stress does not necessarily imply a health problem, but sparks a suggestion that the person consult his/her supervisor.

The PROQOL model is based on 30 questions (Appendix A). For each component, 10 questions were used to determine the score. The response options for each question are: 1 = never to 5 = very often. For each of the three sub-categories of wellness, the responses for each individual are summed up and categorized as to the level of compassion satisfaction (γ), burnout (θ), and secondary traumatic stress (μ). These values will be expressed by γ_i for compassion satisfaction, θ_i for burnout, and μ_i for secondary traumatic stress where i identified a specific individual.

These values are then interpreted as follows:

- $\gamma_i/\theta_i/\mu_i < 22$, the score for this individual is less or equals 43 (low)
- $23 < \gamma_i/\theta_i/\mu_i < 41$ the score for this individual is around 50 (average)
- $\gamma_i/\theta_i/\mu_i > 42$ the score for this individual is 57 or more (high)

Respondents were stratified into four groups depending on the amount of educational debt they have. The four groups are NONE (no educational debt), MODERATE (\$1 – \$50,000), HIGH (\$50,000-\$150,000), and EXTREME (\$150,000 and over). The distributions of γ_i , θ_i , and μ_i by category of debt are presented in Figures 2-4. Compassion satisfaction γ did not show any significant pattern and will not be included in further analysis. The distributions for burnout θ and secondary traumatic stress μ indicate that people with high student debt are more likely to experience each of these two events.

The analysis was conducted using the ANOVA model with the SAS 9.4 generalized linear model (GLM) procedure. The analysis consists of determining whether the difference in mean scores across debt groups is statistically significant. In other words, to confirm that people with extreme student debt present higher burnout and compassion fatigue scores than others as implied by the distributions. The response variables are burnout level (θ_i) and secondary traumatic stress level

(μ_i). Age, gender and debt level are used as explanatory variables to explain the variations in scores. The results are attached in Appendixes 1 and 2.

For burnout, the overall statistics (P-value = 0.0001) indicate that the model fit the data relatively well and that factors used in the model are enough to explain the variations in burnout score. All factors are statistically significant at 1 percent significance level except for age. The expected burnout when no covariate is considered falls within the normal range of 23 to 41. The majority of veterinarians experience a normal burnout score. For secondary traumatic stress, the overall model is statistically significant (P-value = 0.0001) and all variables are statistically significant at 0.01 significance level. The expected secondary traumatic score is between 23 and 41, indicating that the majority of respondents fall into the normal range. The differences in mean score for both burnout and secondary traumatic stress are reported in Table 1. The results indicate that the mean score for veterinarians with extreme student debt is significantly higher than that of veterinarians with high to low debt. There is now evidence that student debt not only affects veterinarians' professional development but, more importantly, exacerbates their burnout and their compassion fatigue.

Determining Ability to Service Student Loan Debt

A survival analysis is typically used to estimate the distribution of an event time within a population of interest. Veterinarians graduate from veterinary medical school with, of course, different amounts of student debt. When they enter the profession and start receiving a salary, they begin to pay back their student loan debt. Because they do not have the same amount of debt, and are servicing debt at different rates depending on their ability, some veterinarians pay their debt faster than others. The survival time here refers to the duration between the year of graduation and the year when all student debt is all cleared.

Survey respondents were asked whether or not they have incurred educational debt during their secondary education and/or during their time as veterinary medical students. Those who have incurred student debt were asked how long it took them to repay the full amount of debt or how long they have been actively repaying their student loans (those who have not finished repaying). Individuals who have not finished servicing their debt by the time of the survey are considered (right) “censored.”

A progressively censored method (Cohen, 1965) was considered because of heterogeneity in graduation date. That is, time to event is recorded as the time from which an individual graduates until the student debt is fully repaid (uncensored) or until 2016 after completing the Census of Veterinarians. Observations on individuals who have not experienced the event are therefore censored and their time to service their student debt is unknown. Censoring was independent and non-informative.

The length of full service of the student debt is assumed to follow the exponential distribution. The exponential distribution has become a popular and preferred distribution in survival analysis (Lee and Wang, 2003). One of the prominent characteristics of the exponential distribution, as pointed out by Lee and Wang (2003), is that it has a purely random event pattern.

The probability density function of the exponential distribution in a survival analysis is given by:

$$f(t) = f(x) = \begin{cases} \phi e^{-\phi t}, & t \geq 0, \phi > 0 \\ 0, & t < 0 \end{cases} \quad 1.1$$

with a cumulative distribution $F(t) = 1 - e^{-\phi t}$, a survivorship function $S(t) = e^{-\phi t}$, and a hazard function $h(t) = \phi$, where ϕ is independent of t , where ϕ is the hazard rate.

The model used to fit the data is similar to that proposed by Byar et al. (1974). The length of time between graduation and full service of student debt is given by:

$$\phi_i = a_0 + \sum_{j=1}^p a_j x_{ji} \quad 1.2$$

where ϕ_i is the hazard rate for the individual i , a_0 is the underlying hazard rate when no covariate is considered, and $\sum_{j=1}^p a_j x_{ji}$ records the effect of each covariate on the veterinarians ability to repay their debt.

The likelihood function is given by:

$$L(a_0, a_1, \dots, a_p) = \prod_{i=1}^r \left(\sum_{j=0}^p a_j x_{ji} \right) \exp \left[- \left(\sum_{j=0}^p a_j x_{ji} \right) t_i \right] \times \prod_{k=1}^s \exp \left[- \left(\sum_{j=0}^p a_j x_{jk} \right) t_k^+ \right] \quad 1.3$$

and taking the logarithms of the equation (1.3) gives the log-likelihood function:

$$l(a_0, a_1, \dots, a_p) = \sum_{i=1}^r \left[\log \left(\sum_{j=0}^p a_j x_{ji} \right) - \left(\sum_{j=0}^p a_j x_{ji} \right) t_i \right] - \sum_{k=1}^s \left(\sum_{j=0}^p a_j x_{jk} \right) t_k^+ \quad 1.4$$

where t_1, \dots, t_r is the exact times of repayment for the uncensored observations. The number of years of repayment for the censored observations is denoted by t_1^+, \dots, t_s^+ . The maximum likelihood estimates are obtained by solving simultaneously the equation below:

$$\sum_{i=1}^r \left(\frac{x_{ji}}{\sum_{j=0}^p a_j x_{ji}} - x_{ji} t_i \right) - \sum_{k=1}^s x_{jk} t_k^+ = 0 \quad 1.5$$

The Dependent Variable

The event of interest (dependent variable) for the survival model is a dichotomous variable, with $Y = 1$: the subject has finished repaying his/her DVM debt and $Y = 0$: the subject was still repaying his/her debt by the time the survey was received. The length of time taken to service the student debt for individuals in the first group ($Y = 1$) is known. People in the second group were still repaying by the time the survey was conducted and we do not know how many more years before they become debt free. Of those included in our analysis, 17.0 percent were debt free by the time of the survey and 83.0 percent were still repaying.

The Explanatory Variables

Explanatory variables are the number of years since graduation, gender, type of employment, amount of debt, and annual income of the respondents. The descriptive statistics of variables used in the survival analysis are presented in Table 2. The number of years since graduation is a continuous variable and is obtained by subtracting the date of graduation from the base year 2016. For this analysis, only people who graduated between 2000 and 2014 were included so that years since DVM graduation range from 2 to 16 years.

Gender is important in debt analysis. The veterinary profession is characterized by a massive entry of women after 1987. The male-to-female ratio was 1:1 in 1987 and started to decrease substantially as male enrollment sharply dropped. The applicant pool was constituted by 44 percent men in 1985, but only 28 percent in 2007 (Slater and Slater, 2000). The number of female veterinarians in the United States is believed to have outnumbered that of their male counterparts in 1989. This gender shift has changed the face of the profession. Past studies on professional income of veterinarians have concluded that the massive entry of women in the profession has lowered the overall income of veterinarians (Brown and Silverman, 1999; Cron et al., 2000).

In addition to the income disparities, past studies have found that male graduates have lower student debt than female graduates. This finding if proven true might impact veterinarians' ability to service their debt with respect to their gender. Category with higher student debt might find it harder to service it all other things kept constant.

Type of employment is also included to control for difference in income. Private practices are divided into five sub-groups: companion animal exclusive practice, companion animal predominant practice, mixed animal practice, food animal exclusive practice, food animal predominant practice, and equine practice. The public and corporate employment encompasses civil service, uniformed service, academia, state or local government, industry or commercial organizations, not-for-profit institutions, and all other veterinary employment. A last group, advanced education, was added to account for veterinarians who are enrolled in a Ph.D. program, a residency program, or a specialized degree program by the time the survey was administered. The distribution of respondents by type of employment seems consistent with the distribution of the general population of U.S. veterinarians. The majority of respondents (81.1 percent) are veterinarians employed in private practices and the remaining 18.9 percent are from public sector or corporate employment or enrolled in advanced education. These sub-groups were included into the model via dummies keeping companion animal (exclusive) practice as a base dummy.

Location was added to account for the difference in living expenses across regions. Living expenses are relatively lower in some regions so that veterinarians might be able to service their debt in a relatively short period of time. Regions were constructed using the first two digits of the zip codes. In total 10 regions were constituted and Region 0 was used as a base dummy.

Empirical Results

The maximum likelihood estimates for ability to service student debt are shown in table 3. The likelihood ratio test of the global null hypothesis indicates that at least one regression coefficient is statistically different from 0 ($p\text{-value} < .0001$). The value of the likelihood for the model with covariates (1,231.47) is lower than that of the model without covariates (1,366.97) suggesting that at least one of the covariates helps in explaining the ability to service debt. The model coefficients, the standard errors, the tests of significance, and the hazard ratios are reported in Table 3. The interpretation of the results is more straightforward when hazard ratios are converted into percentage changes. To simplify things, only hazard ratios of statistically significant factors were converted (Table 3).

It appears that the expected annual increase in the hazard rate is 42 percent. The hazard rate, in fact, describes rate of failing to meet the event at time t and thus ignores the accumulation of hazard from the starting point of the subject being placed into observation to t . That is, starting from 2000, the hazard rate for the new graduates to service their student loan debt increases by approximately 44 percent. The increase in the education costs has led to an increase in the amount of debt contracted by students. The increase in the average student debt during the last 10 years has exceeded the rate of increase in the average starting salary. An additional year after graduation increases an individual's ability to service his or her student debt. In most cases, debt repayment is set at a certain rate which may be deducted from paychecks.

The hazard rate increases by 53 percent for veterinarians in colleges or universities as opposed to veterinarians working in exclusive companion animal practices. This is unexpected since the professional income for veterinarians in academia is typically higher than that for companion animal veterinarians.

The increase in the level of debt increases the hazard rate by 51 percent. People with high student debt are more likely to fail to meet the event (repay their student debt). In considering the factor of income, it is observed that a higher income decreases the hazard rate by more than 100 percent. Regions have significant impacts on ability to repay. Region 0 was taken as base dummy and the results indicate that veterinarians hazard ratio in all other regions is lower than that for Region 0.

Conclusion

This paper uses data from the AVMA 2016 census of veterinarians to determine veterinarians' ability to service their student debt, the length of debt repayment, and the effects of student debt on veterinarians' professional development and wellness. Covariates such as number of years since DVM graduation, gender, location, employment type, income, and level of debt were used to determine factors affecting the length of repayment. A survival model was used to fit the data. The results indicate that gender, number of years since graduation, and location have significant effects on whether or not an individual has serviced the totality of his/her debt.

In terms of social and economic development of veterinarians, the results indicate that veterinarians who graduated with high student debt are less likely to own a private practice, but during the second decade into the profession, they will eventually own or co-own a practice, a tendency perhaps driven by the perception that being an owner of a practice improves professional income and might help service the debt. Also, the burden of the debt is found to have some significant implications on veterinarians' wellness. The results from the ProQOL indicate that veterinarians with high to extreme student debt are more likely to experience burnout and secondary traumatic stress.

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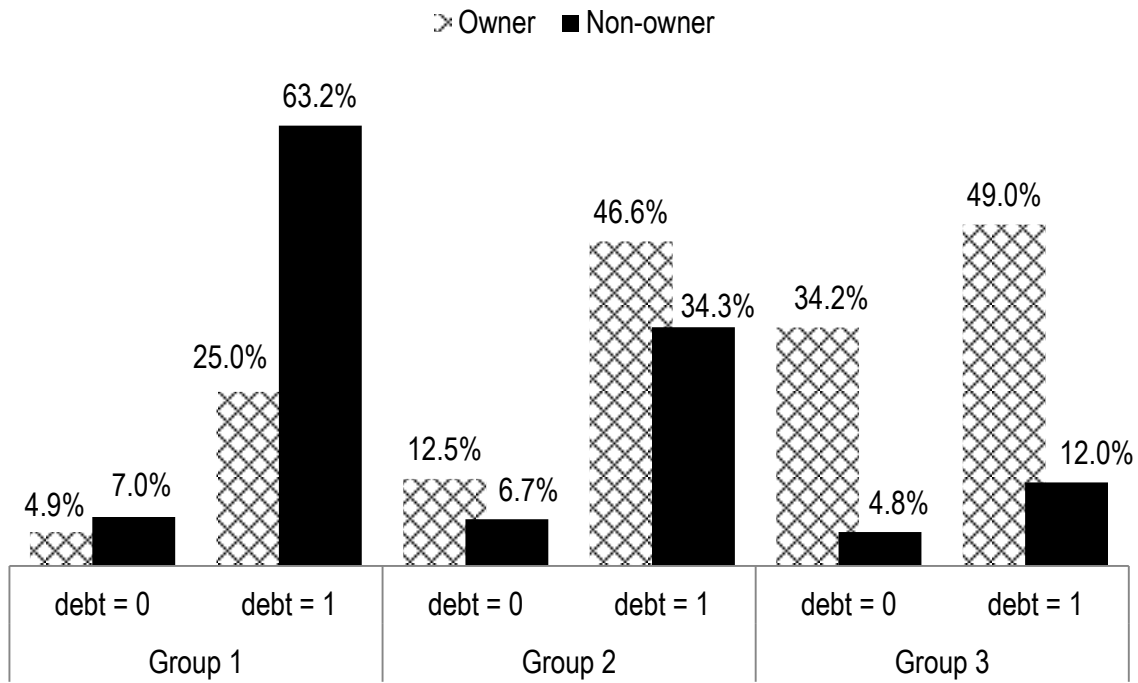


Figure 1: Ownership and Debt Status by Years after DVM Graduation

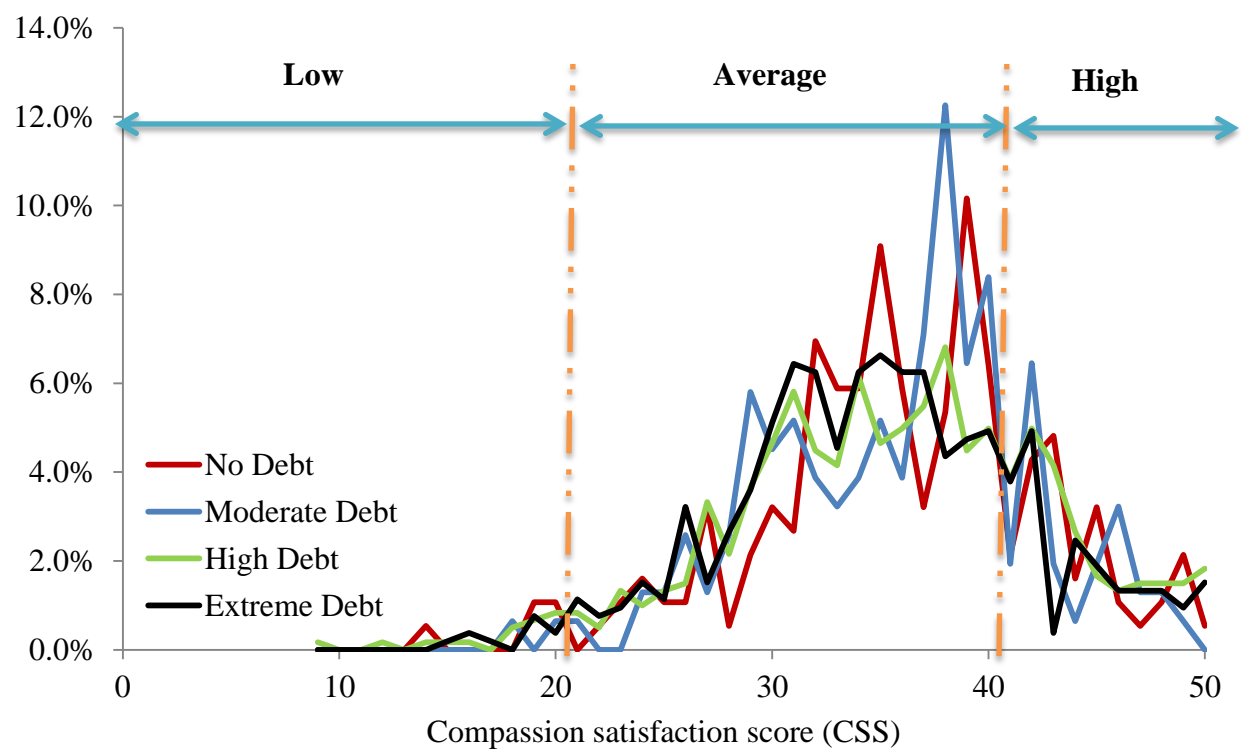


Figure 2: Compassion Score and the Level of Student Debt

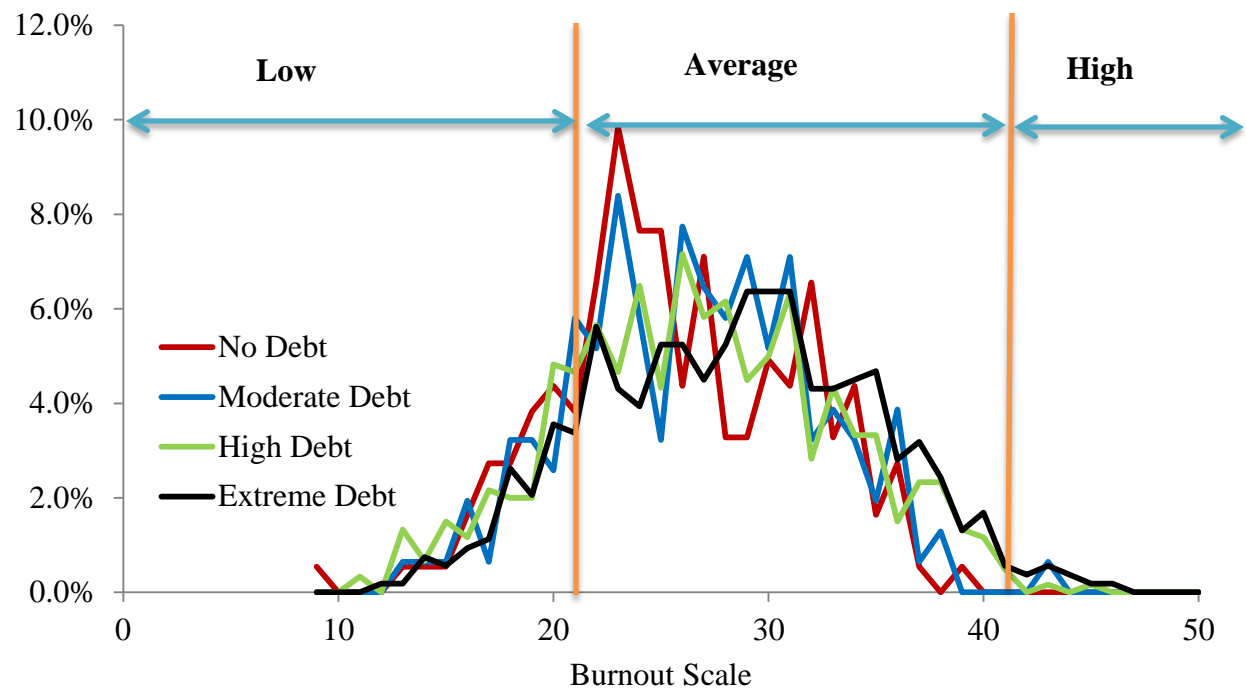


Figure 3: Burnout Score and the Level of Student Debt

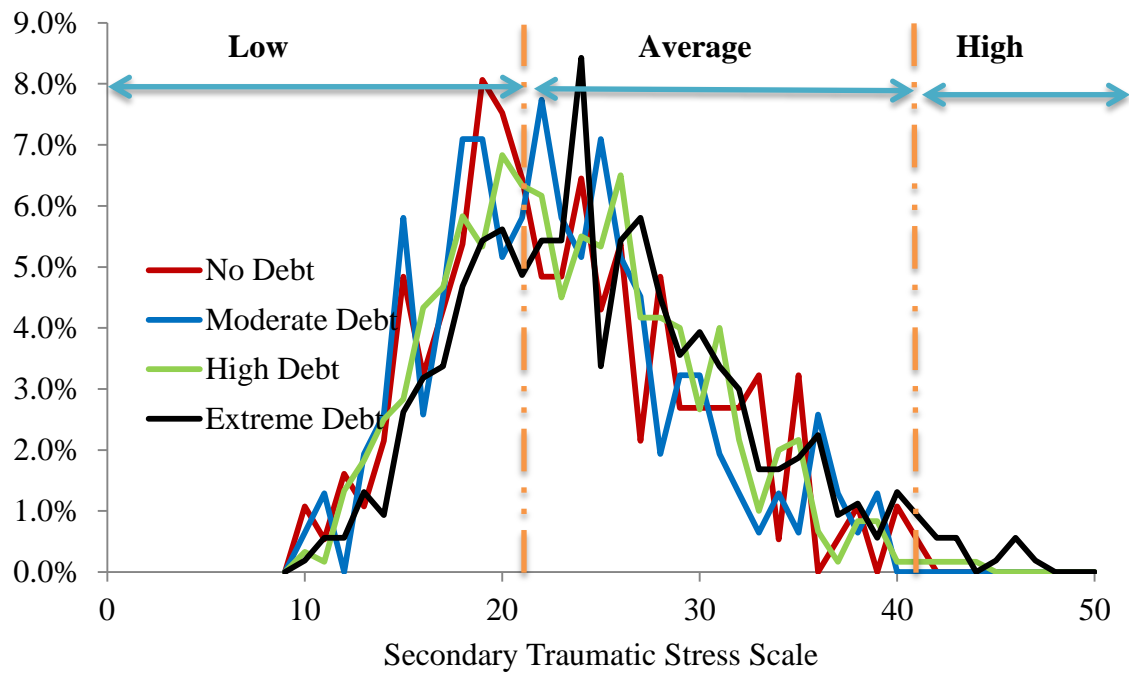


Figure 4: Secondary Traumatic Stress Score and the Level of Student Debt

Table 1: Difference in Burnout and Compassion Fatigue with Respect to Level of Debt

Debt Level Comparison	Difference between means "burnout score"		Difference between means "secondary traumatic stress score"	
Level 3 - Level 2	1.478	***	1.664	***
Level 3 - Level 1	1.792	***	2.212	***
Level 3 - Level 0	2.170	***	1.768	***
Level 2 - Level 3	-1.478	***	-1.664	***
Level 2 - Level 1	0.314		0.548	
Level 2 - Level 0	0.692		0.104	
Level 1 - Level 3	-1.792	***	-1.768	***
Level 1 - Level 2	-0.314		-0.104	
Level 1 - Level 0	0.378		0.444	
Level 0 - Level 3	-2.170	***	-2.212	***
Level 0 - Level 2	-0.692		-0.548	
Level 0 - Level 1	-0.378		-0.444	

Note: Comparisons significant at the 0.05 level are indicated by ***.

Table 2: Descriptive Statistics of the Variables Used in Analysis

Variables	Frequency	Percentage
Dependent variable		
Subject has finished repaying her/his student debt	162	17.0%
Subject is still repaying her/his student debt	789	83.0%
Private Practice employment		
Food animal (exclusive) practice	12	1.3%
Food animal (predominant) practice	16	1.7%
Mixed animal practice	64	6.7%
Companion animal (predominant) practice	97	10.2%
Companion animal (exclusive) practice	542	57.0%
Equine practice	40	4.2%
Public or Corporate Employment		
Government - civil service	17	1.8%
Government - uniformed service	8	0.8%
Local/state government	13	1.4%
University/veterinary college	53	5.6%
Industry/commercial organizations	26	2.7%
Not-for-profit institutions	20	2.1%
Other veterinary employment	20	2.1%
Advanced education	23	2.4%
Location of the practice		
Region 0	55	5.8%
Region 1	72	7.6%
Region 2	121	12.8%
Region 3	112	11.8%
Region 4	94	9.9%
Region 5	91	9.6%
Region 6	100	10.6%
Region 7	92	9.7%
Region 8	79	8.4%
Region 9	130	13.7%
Gender		
Male	204	21.5%
Female	747	78.6%

Table 3: Factors Affecting Veterinarians' Student Debt Repayment

Parameter	Percent change	Parameter estimate	Standard error	Pr > ChiSq	Hazard ratio
Years since DVM graduation (1)	0.416	-0.537	0.105	0.000	0.584
(1) squared		0.016	0.005	0.001	1.016
Board Certificate		0.254	0.325	0.436	1.289
Food animal (pred.) practice		1.153	0.797	0.148	3.167
Food animal (excl.) practice		0.228	0.783	0.771	1.256
Mixed animal practice		0.566	0.356	0.112	1.761
Companion animal (pred.) practice		-0.481	0.295	0.103	0.618
Equine practice		0.165	0.499	0.741	1.180
Gov. Civil service		0.146	0.817	0.858	1.157
Gov. Uniformed service		0.601	0.648	0.354	1.823
Universities/Veterinary college	0.533	-0.761	0.351	0.030	0.467
State/local government		0.380	0.766	0.620	1.462
Industry/commercial organizations		0.165	0.437	0.706	1.179
Not-for-profit institutions		-0.025	0.421	0.952	0.975
Advanced education		0.068	1.061	0.949	1.071
Other veterinary employment		-0.164	0.590	0.781	0.849
Log(DVM debt)	0.511	-0.715	0.139	0.000	0.489
Log(Professional income)	-1.006	0.696	0.261	0.008	2.006
Gender (Male =1)	-0.774	-0.573	0.253	0.023	1.774
REGION_1	-6.835	2.059	0.551	0.000	7.835
REGION_2	-4.749	1.749	0.559	0.002	5.749
REGION_3	-2.559	1.270	0.552	0.021	3.559
REGION_4	-4.485	1.702	0.571	0.003	5.485
REGION_5	-8.119	2.210	0.570	0.000	9.119
REGION_6	-4.032	1.616	0.542	0.003	5.032
REGION_7	-6.883	2.065	0.548	0.000	7.883
REGION_8	-7.796	2.174	0.536	0.000	8.796
REGION_9	-3.893	1.588	0.530	0.003	4.893

Appendix 1: Effect of Age, Gender, and Level of Debt on Burnout Score

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	1562.70	312.54	8.02	0.0001
Error	1470	57258.49	38.95		
Corrected Total	1475	58821.19			
Source	DF	Type III SS	Mean Square	F Value	Pr > F
Age	1	103.59	103.59	2.66	0.1031
Level of debt	3	755.66	251.89	6.47	0.0002
Gender	1	416.94	416.94	10.7	0.0011

Appendix 2: Effect of Age, Gender, and Level of Debt on Secondary Traumatic Stress Score

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	2351.01	470.20	10.73	0.0001
Error	1470	64396.22	43.81		
Corrected Total	1475	66747.22			
Source	DF	Type III SS	Mean Square	F Value	Pr > F
Age	1	307.07	307.07	7.01	0.0082
Level of debt	3	701.01	233.67	5.33	0.0012
Gender	1	872.24	872.24	19.91	0.0001

Appendix 3: PROQOL version 5 (2009) Questionnaire

When you [help] people you have direct contact with their lives. As you may have found, your compassion for those you [help] can affect you in positive and negative ways. Below are some questions about your experiences, both positive and negative, as a [helper]. Consider each of the following questions about you and your current work situation. Select the number that honestly reflects how frequently you experienced these things in the *last 30 days*.

1=Never 2=Rarely 3=Sometimes 4=Often 5=Very Often

Compassion Satisfaction Score

- 3. I get satisfaction from being able to [help] people.
- 6. I feel invigorated after working with those I [help].
- 12. I like my work as a [helper].
- 16. I am pleased with how I am able to keep up with [helping] techniques and protocols.
- 18. My work makes me feel satisfied.
- 20. I have happy thoughts and feelings about those I [help] and how I could help them.
- 22. I believe I can make a difference through my work.
- 24. I am proud of what I can do to [help].
- 27. I have thoughts that I am a "success" as a [helper].
- 30. I am happy that I chose to do this work.

Burnout Score

- 1. I am happy.
- 4. I feel connected to others.
- 8. I am not as productive at work because I am losing sleep over traumatic experiences of a person I [help].
- 10. I feel trapped by my job as a [helper].
- 15. I have beliefs that sustain me.
- 17. I am the person I always wanted to be.
- 19. I feel worn out because of my work as a [helper].
- 21. I feel overwhelmed because my case [work] load seems endless.
- 26. I feel "bogged down" by the system.
- 29. I am a very caring person.

Secondary Traumatic Stress Score

- 2. I am preoccupied with more than one person I [help].
- 5. I jump or am startled by unexpected sounds.
- 7. I find it difficult to separate my personal life from my life as a [helper].
- 9. I think that I might have been affected by the traumatic stress of those I [help].
- 11. Because of my [helping], I have felt "on edge" about various things.
- 13. I feel depressed because of the traumatic experiences of the people I [help].
- 14. I feel as though I am experiencing the trauma of someone I have [helped].
- 23. I avoid certain activities or situations because they remind me of frightening experiences of the people I [help].
- 25. As a result of my [helping], I have intrusive, frightening thoughts.
- 28. I can't recall important parts of my work with trauma victims.