Child vs. Pet: The Effect of Abortion Legalization on the Demand for Pets

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Abstract

This paper examines whether abortion legalization led to increased demand for pets in the United States. We compare women living in early-legalizing states, whose peak childbearing years occurred in the early 1970s, to women in other states and cohorts and estimate their likelihood of pet ownership and time spent on pets after their peak childbearing years were over. We find the probability of owning any pet is approximately 9.6 percentage points higher for women affected by abortion legalization than for non-affected women, and that affected women spend on average 8 minutes more per day on pets.

Key words: Abortion legalization, fertility, pet, substitutes
JEL codes: J13, J22

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1. Introduction

This paper examines the effect of abortion legalization on the demand for pets. To date, much of the research in the United States shows that abortion legalization in the early 1970s led to a surge in the number of abortion cases (Finner and Henshaw, 2003), a large reduction in births (Levine et al., 1999), a significant fall in completed fertility and rise in childlessness (Ananat et al., 2007), improved child outcomes (Gruber et al., 1999), and mixed effects on crime rates (Donohue and Levitt, 2001; Joyce, 2004). While numerous empirical studies on birth control and fertility have been conducted, the relationship between children and pets has been largely overlooked, with the exception of Schwarz et al. (2007). Schwarz et al. (2007) find that households in the United States with more children spend less on pets, suggesting that children and pets are substitutes. However, their estimates are based on cross-sectional variation and are susceptible to endogeneity and selection bias. Given the long run decline in total fertility rates and the growing pet markets in many developed countries, the relationship between children and pets is important to enable estimation of the demand for pets and pet-related products and services.

The relationship between pets and children is theoretically ambiguous. Children are usually considered normal goods in most economic models, where the price of giving birth includes the opportunity costs of childbearing and raising. These costs could be particularly large for young women in their early twenties, a critical period in which their career trajectory is formed and during which much on-the-job-training takes place. Women may substitute pets for children during their peak years of childbearing or after their childbearing years are over, as pets may also bring as much joy to life as children may, and at lower opportunity costs. Although women may substitute pets for children, they may also acquire pets as their children's companions. Thus, it is an empirical question whether children and pets are substitutes or complements.

We exploit the arguably exogenous variation in the timing of the repeal of abortion legalization in several states in the United States to identify its effects on pet ownership and time spent on pets. In 1970, abortion became legal and widely available in five states: California, New York, Washington, Alaska, and Hawaii ("early-legalizing states"). California passed de facto legalization, while the other four states repealed anti-abortion laws (Ananat et al., 2007). In 1973, abortion became legal in all states as a result of the Supreme Court's ruling in *Roe v. Wade*. We compare women living in early-legalizing states, whose peak childbearing years occurred in the early 1970s, to women in other states and cohorts and estimate their likelihood of pet ownership

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and time spent on pets in 2010 and 2011. Therefore, we focus on the effects of abortion legalization on pet ownership and time spent on pets of women after their peak childbearing years are over and when their children have grown up – i.e., the present day.

2. Empirical Strategy

We follow Ananat et al.'s (2007) empirical strategy and estimate the effects of abortion legalization on pet ownership and time spent on pet-related activities of women after their childbearing ages have passed:

$$y_{ics} = \beta_1(Repeal_s \cdot D4655_i) + \beta_2(Repeal_s \cdot Dpost55_i) + \delta_s + \delta_c + \delta_s \cdot C + \epsilon_{ics}$$

The dependent variable y_{ics} measures whether a native-born woman i of cohort c in state s owns a pet or not, or the time (minutes) a woman currently spends on pets and pet-related activities per day. $Repeal$ is an indicator of whether the woman is living in Alaska, California, Hawaii, New York, or Washington, states which legalized abortion before 1973. $D4655$ is an indicator of the 1946-1955 birth cohorts who were between the ages of 16 and 26 in the early 1970s and $Dpost55$ is an indicator of post-1955 birth cohorts. In effect, we follow Ananat et al.'s (2007) assumption that women's peak years of childbearing are between 16 and 26. The specification includes state-specific (δ_s) and cohort-specific (δ_c) fixed effects to capture time-invariant demand for pets across states and aggregate patterns of changing preferences for pets over time. Furthermore, we permit state-specific cohort differences by including $\delta_s \cdot C$. Since a set of state fixed effects are included, the difference in pet demand between repeal and non-repeal states for cohorts born before 1946 is captured in the omitted category.

The coefficients of interest are β_1 and β_2. β_1 measures the difference in pet demand between repeal and non-repeal states for women born in the 1946-55 period (treated cohorts), relative to those born before 1946 (control cohorts) whose prime childbearing period was already over when abortion was legalized. We expect β_1 to be positive if legalization led to increased demand for pets, as indicated by current pet ownership and time currently spent on pets and pet-related activities per day. β_2 measures the difference in pet demand between repeal and non-repeal states for the post-1955 cohorts of women. Since the post-1955 cohorts of women were all

entitled to legal abortion throughout their childbearing years, we expect β_2 to be zero for there to be no underlying trend in the demand for pets between repeal and non-repeal states.

3. Data

We use data from the March Current Population Survey (CPS) and the American Time Use Survey (ATUS) in 2010 and 2011. The merged data provide information about the current location, gender, country of birth, age of respondents, and time respondents allocated to different activities. To maximize the likelihood that the respondents were living in the current locations in 2010 and 2011 between 1960s and 1970s, we include only individuals born in the United States. To provide as much as correspondence between the current study and the previous study by Ananat et al. (2007), we include only individuals born between the 1930s and the 1960s.

[Insert Table 1]

Table 1 provides summary statistics of the 2010 and 2011 samples from the ATUS matched with the CPS. All women were born between 1934 and 1968.[1] On average, 21.2 percent of these women own any pet in 2010 and 2011, where pet ownership is inferred by whether they spent any time on pet-related activities (excluding time spent on activities related to non-household members' pets). Pet-related activities include time spent taking care of pets and time spent visiting veterinarians and obtaining other pet-related services. The average time spent on pet-related activities is roughly 8.4 minutes per day among all sampled women, while the average time spent on pet-related activities is 39.6 minutes per day among pet owners. 51.6 percent of women are working and 41.1 percent are not in the labor force.

4. Results

Table 2 reports the estimated effects of abortion legalization on the probability of pet ownership and daily time spent on pet-related activities. Column (1) indicates that early legalization of abortion led to an increase in the probability of affected women owning any pet by 9.6 percentage points (after their childbearing ages were over) relative to non-affected women. These women are those who were responsive to abortion legalization by reducing the total

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[1]We also use sample of women born between 1931 and 1970, and the results are similar.

number of births they have ever given. On the other hand, the coefficient for *Repeal×Dpost55* is not statistically significant, meaning that women who were all subject to legal abortion throughout their peak childbearing years have no greater demand for pets than those never subject to legal abortion during their prime childbearing years. The results indicate a lack of an underlying trend in differences in pet demand between repeal and non-repeal states.

[Inset Table 2]

Given Ananat et al.'s (2007) estimate that abortion legalization led to 0.5 fewer completed births per woman on average and our estimate that abortion legalization decreased the likelihood of owning any pet by 9.6 percentage points, we can make some assumptions to infer the relationship between children and pet ownership. If we conservatively assume that women having any pet at home have only one pet, and that the positive effect of abortion legalization on pet ownership channels occurred only through its negative effect on fertility, the estimates suggest that for every one-child reduction in fertility, pet ownership will increase by 0.2 on average. The results indicate that pet demand is responsive to fertility to some extent.

Column (2) is estimated using only a sample of working women, while column (3) is restricted to women not in the labor force. Working women, regardless of marital status, have a greater opportunity cost of an additional child than women not in the labor force. In addition, they are more likely to have pets than other women since they have more income, even though they have less time for pets. The results show that abortion legalization raised the probability of owning pets by 15 percentage points for working women, but by only 8.8 percentage points for women not in the labor force.

Column (4) in Table 2 shows that abortion legalization led to significantly greater time spent on pet-related activities. On average, abortion legalization increased time spent on pet-related activities by roughly 8 minutes per day (after these women passed their childbearing years). Columns (5) and (6) report estimates based on the sample restricted to women who are working and not in the labor force, respectively. As expected, working women do not spend more time on pets as a result of abortion legalization, even though they are more likely to have pets. On the other hand, abortion legalization increased time spent by women not in the labor force on time spent on pets by 18 minutes per day. In most cases, we see differences in pet

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ownership and time on pets for the 1946 to 1955 cohorts in the repeal states, while the coefficients for the cohorts born after 1955 are not statistically and substantively significant.

Table 3 reports the estimates using alternative definitions of non-repeal states based on distance away from the repeal states. Specifically, non-repeal states that are farther away from the repeal states may serve as better "controls", as women living in distant non-repeal states were less likely to travel to the repeal states. Previous studies by Ananat et al. (2007) and Levine et al. (1999) show that the effects of abortion legalization are much larger when early-repeal states are compared to more distant comparison states, suggesting that travel between states dampens the estimated impacts. Because of our relatively small sample size, in order to ascertain whether potential mobility may dampen the results, we divide the non-repeal states into neighboring states which border the repeal states and distant states which do not border any repeal states. As we expected, the estimated effects are greater when comparing repeal states to farther non-repeal states. Pet ownership and time spent on pet-related activities for repeal-state women born between 1946 and 1955 does not vary significantly compared to women in the neighboring states, while they increase by 12.3 percentage points and 10 minutes respectively compared to the distant group in non-repeal states. For all distances, the results are not significant for the cohorts born after 1955.

[Insert Table 3]

Table 4 shows placebo tests using the sample of non-married men whose childrearing and pet ownership decisions should be least affected by abortion legalization. If there are unobserved trend differences between affected women in repeal states and non-repeal states, the estimated effect of abortion legalization on demand for pets would be biased. Therefore, we examine the demand for pets among non-married men using the same identification strategy, arguing that any trends exhibited by non-married men are likely to capture the extent of biases. As shown in Table 4, in most cases the effects are either insignificant or negative. These findings indicate that if anything, the estimates shown in Table 4 would suffer from downward bias.

[Insert Table 4]

5. Conclusions

Given the significant negative effect of abortion legalization on lifetime fertility, one may expect the demand for pets to increase if children and pets are substitutable. We exploit the variation in abortion legalization across states in the United States and across time in the early 1970s which allowed some cohorts of women to abort pregnancies and we use rich information from the American Time Use Survey data to study the demand for pets. We find that the demand for pets is affected by liberalization of birth control methods, suggesting a substitutable property of pets for children. The probability of women affected by abortion legalization owning any pet is 9.6 percentage points higher than for non-affected women. Affected women spend, on average, 8 minutes more per day on pets than do other non-affected women. Our reduced form estimate, together with the estimated effect of legalization on completed fertility by Ananat et al. (2007), suggests that for every one-child decrease, the demand for pets increases by 0.2. Due to the lack of data on pet ownership in the past, we are unable to examine the effect of abortion legalization on demand for pets at the time of law changes in the 1970s. This paper serves as a first step towards understanding the demand for children versus pets.

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Table 1: Summary Statistics

	Women born in 1934-1968
Pet ownership	0.212
	(0.409)
Time spent on pets (per day)	8.400
	(29.009)
Time spent on pets (per day) given ownership	39.617
	(52.285)
Working	0.516
	(0.500)
Not in labor force	0.411
	(0.492)
Observations	6,221

Notes: Standard deviation is in parentheses. Data sourced from ATUS and CPS 2010 and 2011.

Table 2: Pet ownership and time spent with pets by work status

	(1)	(2)	(3)	(4)	(5)	(6)
	All	Working	Not in labor force	All	Working	Not in labor force
Dependent variable	Pet ownership			Time spent with pets		
repeal×D4655	0.096**	0.150**	0.088*	8.077***	1.790	18.268**
	(0.045)	(0.056)	(0.047)	(2.676)	(5.894)	(7.299)
repeal×Dpost55	0.047	0.107	-0.029	6.363	-0.819	13.971
	(0.083)	(0.127)	(0.120)	(5.475)	(8.387)	(12.795)
Observations	6,221	3,207	2,558	6,221	3,207	2,558
R-squared	0.042	0.075	0.082	0.044	0.107	0.071

Notes: Standard errors are clustered by state and shown in parentheses, * p<0.10, ** p<0.05, *** p<0.01. All specifications include state, year, and cohort-specific fixed effects along with state-specific trends. The results are robust to having the District of Columbia coded as a repeal state as in Joyce (2004).

Table 3: Estimated effects with distance from repeal states

Dependent variable	With neighboring non-repeal states		With distant non-repeal states	
	Pet ownership	Time spent with pets	Pet ownership	Time spent with pets
repeal×D4655	-0.021	-1.545	0.123***	10.023***
	(0.083)	(2.482)	(0.043)	(2.702)
repeal×Dpost55	-0.260	-11.474	0.115	10.119*
	(0.200)	(7.136)	(0.077)	(5.470)
Observations	1,824	1,824	5,337	5,337
R-squared	0.059	0.032	0.045	0.051

Notes: Neighboring states are those which border the repeal states: AZ, CT, ID, MA, NV, NJ, OR, PA, VT. The results are similar when we include DC as a repeal state (as in Joyce, 2004) and MD and VA as neighboring states, then. Standard errors are clustered by state and shown in parentheses, * $p<0.10$, ** $p<0.05$, *** $p<0.01$. All specifications include state, year, and cohort-specific fixed effects along with state-specific trends.

Table 4: Placebo tests on non-married men

Dependent variable	(1) All	(2) Working	(3) Not in labor force	(4) All	(5) Working	(6) Not in labor force
	Pet ownership			Time spent with pets		
repeal×D4655	-0.056	-0.365**	0.301	-16.683*	-20.984	-6.844
	(0.218)	(0.142)	(0.300)	(9.939)	(14.556)	(9.334)
repeal×Dpost55	-0.004	-0.284	0.466	-16.911	-22.750	-2.927
	(0.254)	(0.207)	(0.367)	(20.778)	(34.208)	(13.141)
Observations	2,140	1,159	769	2,140	1,159	769
R-squared	0.114	0.172	0.268	0.093	0.125	0.214

Notes: Standard errors are clustered by state and shown in parentheses, * $p<0.10$, ** $p<0.05$, *** $p<0.01$. All specifications include state, year, and cohort-specific fixed effects along with state-specific trends.