

Sarah Mirrow

Major: *Economics*

Major: *Applied Mathematics*

Minor: *French*

Mentor: **Steven Bednar**

Clinic Closures and High School Dropouts: How Abortion Access Impacts Female Educational Attainment in Texas

ABSTRACT

Access to abortion in the United States has been a controversial issue for almost a century. There are few states where this is more apparent than Texas, where constantly changing policies have had drastic impacts on the availability of abortion providers. While research has been done on the impact of abortion on factors like crime and poverty, little has focused on how abortion access impacts female education. Using Texas student-level data from 1996 to present and the implementation of House Bill 2 (2013), a policy that led to the almost immediate closure of half of the abortion clinics in the state, this project seeks to understand the link between changes in abortion accessibility and rates of high school completion, graduation, and dropout for female students. It will also investigate the rates at which female graduates enroll in college. The conclusions of this study will help undermine the gender gap in education that reduces equal opportunity for women in the United States.

PERSONAL STATEMENT

If you asked me when I was five what I wanted to be when I grew up, I would have said “not an economist.” I would then proceed to answer with either princess or park ranger, depending on the day. My mom is an economist, and watching her work as a kid, I never thought I would follow in her footsteps. She sat in an office poring over spreadsheets all day – I wanted to be out in the world, helping people. In fact, when people asked my mom what she did for a living, she would point to me: I’d pull a “yuck” face and go “data data data, numbers numbers numbers.” All the adults would laugh, and my mom would shrug and say that I was not wrong. Since then, I have come to realize that I was not exactly right, either.

I took AP Economics in 10th grade. It was a requirement for graduation and something that I wanted to get out of the way. I was not particularly excited for the course, but I was curious to explore the dreaded number-filled profession that I so disdained when I was young. And then, to everyone’s surprise, I loved it. I loved the logic of economic theory, how behavior on both individual and national scales could be explained with reasoning and, yes, data and numbers. Most of all, I was drawn to economics because it felt real, like I could take the course material and apply it in a way that could change lives. I had never felt that way in school before. What other subject exists where you can add a subsidy curve onto a graph that immediately increases production of lifesaving medication? Or create a rent ceiling that allows people to find affordable housing? By the end of the year, I wanted more of this new world I had discovered.

Unfortunately, my high school only offered one economics course and I did not get to further explore the subject until college. Honestly, I was nervous to delve back in. It had been two years and a pandemic, and I wasn't sure if my former disdain of economics would re-emerge. It did not. I have taken four economics classes at Elon, and in every one I feel the same passion that I found in 10th grade. Now, I cannot wait to comb through numbers to find solutions to problems that I am beginning to understand.

There is a famous book written by Stephen J. Dubner and Steven Levitt entitled "Freakonomics". It has my favorite subtitle of any text: "A rogue economist explores the hidden side of everything" (Dubner and Levitt, 2005). To me, this sums up economics perfectly. Economics has the power to unlock everything, from government policy to income disparity, to what opportunities are available to the little girls daydreaming about being park rangers. It also represents the conclusion of my intellectual journey so far: if you look hard enough, you can find a solution to every problem. Now, when I am asked what I want to be when I grow up, I say a rogue economist.

As a recipient of the Lumen Prize, I would be able to purchase the formerly-dreaded data that I need to investigate a societal question that matters. I would be able to dig deep and investigate the hidden connections between abortion access and female education that no one has looked for before.

PROJECT DESCRIPTION

Focus

Texas Senate Bill 8, otherwise known as the "Heartbeat Act," came into effect in 2021, marking the first six-week abortion ban since *Roe v. Wade* legalized abortion in the United States. Recently described as the "worst fears" of Texan abortion providers and patients, the Heartbeat Act is the latest policy in a longstanding debate over abortion in a state famous for mass clinic closures (McCammon and Hodges 2022). Between 1982 and 1992, Texas lost 49 abortion providers, leaving 93% of Texas counties with no access to abortion services (Amdorfer 1997). More recently, Texas passed House Bill 2 (HB2), which restricted medical abortion, banned abortion after 20 weeks of pregnancy, and required that providers have access to hospitals (Grossman 2014). The number of clinics providing abortions dropped from 41 in early 2013 to 22 by the end of the year (Grossman 2014). This overnight closure of abortion clinics had a drastic impact on the amount of abortions provided in Texas, decreasing medical abortions by about 70% and total abortions by about 13% (Grossman 2014). Lindo et al. (2020) found that an additional 50-mile distance to the nearest clinic decreased abortions by 16%. These nearly instantaneous clinic closures make Texas ideal for studying how access to an abortion provider impacts female educational attainment.

There is a lack of research on the causal relationship between abortion access and female education, which is crucial for reducing gender gaps in both market and non-market activities. Girls who leave school before obtaining a high school diploma are more likely to live in poverty (Basch 2011) and experience higher rates of domestic violence (Guiliano 2017). This has a cyclical impact: teen mothers have a 30% chance of having a mother who did not complete high school (Levine and Kearney 2012). Although there are external factors that determine both teen pregnancy and dropout rates, such as race, stigma, and socioeconomic status, teen mothers are statistically more likely to drop out, with 30% of white female dropouts citing pregnancy as their reason for leaving school (Dowden et al. 2018). Demographics also play a role, as minority students experience higher rates of pregnancy and inability to complete schooling. A recent study of Targeted Regulation of Abortion Providers (TRAP) laws that close abortion

clinics found that female college completion rates, especially for minorities, were impacted in affected areas (Jones and Torres 2021). They found that Black teens who lose access to providers are 1 to 3 percentage points less likely to enroll in and finish college than white teens. As only about 66% of individuals who graduate from high school attend college (HigherEdInfo 2018), it is crucial to consider the effect of clinic closures on high school outcomes as well.

This paper seeks to understand the specific impact abortion access has on female educational attainment in Texas. Clinic closures due to legislation like HB2 create measurable change in opportunities to terminate pregnancy unrelated to the demand for abortion services. This allows for econometric investigation of the direct causal impact of provider access on high school completion and college enrollment.

Scholarly Process

The process for this project is simplest explained using a hypothetical dataset that follows students throughout their educational careers. With this data, I could compare pairs of female students who had unplanned pregnancies and are identical in every dimension except that one lacked access to a provider and carried a pregnancy to term while the other had an abortion. This would allow direct analysis of how the availability of abortions for female students impacts their educational attainment. Unfortunately, that type of data does not exist.

Instead, I will compare educational outcomes for female students before and after HB2 went into effect. I will conduct this analysis between a treatment group, those affected by clinic closures, and a control group, those not affected, before and after clinic closures. As Lindo et al. (2020) have shown that increases in driving distance reduce abortions, students who live near clinics shut down by HB2 may exhibit divergent trends in educational attainment than those whose clinic access does not change. This forms an economic difference-in-differences model, where I can measure the change in dropout rates between the control group and the treatment group. The assumption behind this difference-in-differences model is that there are other effects, such as economic recessions or changes in the labor market, that will impact high school dropout rates. Therefore, to isolate the effect of clinic closures, I need to compare what happened to dropout rates in areas unaffected by clinic closures to what occurred near where clinics were shut down. Using this regression framework, I can also control for general demographic trends over time and factors at the school-level, such as race and family income. This will isolate just one variable that has an effect on dropout rates: change in access to abortion facilities.

The data needed to complete this project will come from several sources. The Texas Education Agency (TEA) has collected data on Texan students since 1996. They hold data on high school completion, graduation, and dropout rates that include information on race, gender, school location, and other demographic variables for each student. TEA also collects data on whether students attend college after completion of high school. As there is evidence of racial factors in teen pregnancy and not completing high school, obtaining TEA's racial data is crucial. Furthermore, as not all counties are equally affected by clinic closures, it is necessary to have data that is divided by location. Access to this individual-level data is one of the reasons that I am applying for Lumen, as the cost of this data exceeds my Honors research budget (\$1,000).

Data on abortion availability will come partially from Lindo et al. (2020) who published the name and location of abortion clinics in Texas and border states from 2003 until 2017. I will be able to add data by compiling my own list of abortion providers in Texas that extends to 1996, which is the first year of the

TEA data, as well as into currently open clinics. I will accomplish this by searching for scholarly articles tracking abortion history as well as looking into the histories of individual abortion clinics to discover when they opened and closed.

To determine how clinic openings and closures affect access, I will use a program in Stata, the industry-standard software for economics research, called Georoute. I will use Georoute, which measures driving distance and time from any two locations, to determine the distance from each school to the nearest clinic. Then, I will determine how HB2 affected access to clinics for each school. This is important to note, because changes in providers will have different effects depending on school location. As TEA does not provide individual student addresses, I will assume that students live relatively close to their school.

Proposed Products

My goals for this research range from physical products to my own intellectual development. The main product of this research will be an Honors thesis. I aim to publish in a scholarly journal for either economics or undergraduate research in order to add my findings into the body of economic work studying abortion. I also plan on presenting my project here at Elon for SURF, as well as at academic conferences hosted by the Eastern, Southern, and Midwest Economic Associations and the Association for Public Policy Analysis and Management. The Lumen scholarship will allow me to travel to these conferences and share my results with a wider audience. Both publication and presentation will not only allow me to share my research with others, but will help me develop the writing and communication skills necessary for a career as an economist.

Personally, this project will prepare me not only for furthering my education, but for future career opportunities as well. I aim to improve my research skills, hone my academic writing, and contribute something meaningful to the existing body of work on abortion. However, I also want to give back to the Elon community. Although my research is based on data from Texas, my findings will be applicable for areas across the country, including North Carolina. I intend to present this research at Elon to raise awareness about abortion and female education and ensure that everyone in the community has full knowledge of every available option to prevent the sacrifice of educational attainment.

FEASIBILITY

The main potential obstacle to this project is a lack of access to individual-level data without the support of the Lumen Prize. I have communicated with Brittany Wright, the manager of the Research and Analysis Division at TEA, about purchasing data. The exact cost will be determined by how many variables and years of data I request, but we do not expect it to exceed \$4,000. Although TEA publishes aggregate data on high school graduation rates that are freely available, not having the funds to access individual demographics information will make this study less reliable.

Finding the history of Texan abortion clinics in the years before 2003 may also pose a challenge. Abortion history is complicated, less useful than current provider locations, and frequently stigmatized because of political views. Although it is not necessary to find data back to 1996 to complete the project, with enough hours searching through archives and reading the histories of individual clinics, I believe that I can extend the Lindo et al. dataset further back in time. This will allow me to further understand high

school completion and graduation rates and abortion impacts before HB2, which forms the main portion of the project.

In terms of my personal skill level at data analysis, I believe that I am well prepared. I have taken ECO 2300, Statistics For Decision Making, which introduced me to regression analysis and doing research in Microsoft Excel. Since then, I have taken STS 2720, which focuses on statistical coding. This course prepared me for data cleaning, visualization, and analysis in statistical software that is becoming industry standard. I will take ECO 3300, Introduction to Econometrics, in Spring 2023, which will provide me with the basics of analysis techniques for economics and working in Stata. However, I was already introduced to these concepts during my participation in the Econ Games in 2021, and I will continue to hone these skills when I participate in the Econ Games this spring. Finally, I plan to take STS 3470, which is a continuation of statistical analysis. With these classes and experiences behind me, I am confident that I possess the data analysis skills necessary to complete this project.

BUDGET

Data: \$4,000 (from TEA)

Conferences: \$4,350

(Please note that airfare and hotel fees are estimates based on released 2022 locations)

- Eastern Economic Association (4 days): \$200
 - Travel, lodging, and registration paid by Economics Department
 - Food: \$200
- Southern Economic Association (3 days): \$1,500
 - Airfare: \$400
 - Lodging: \$700
 - Nonmember Submission Fee: \$200
 - Student Registration: \$50
 - Food: \$150
- Midwest Economic Association (3 days): \$1,100
 - Airfare: \$300
 - Lodging: \$600
 - Student Submission Fee: \$20
 - Student Registration: \$45
 - Food: \$135
- Association for Public Policy Analysis and Management (4 days): \$1,550
 - Airfare: \$200
 - Lodging: \$1,000
 - Student Registration: \$150
 - Food: \$200

Student Stata BE License (2 years): \$200

Books and Articles: \$100

Graduate School Visits/Applications: \$2,000

Journal Submission Fee: \$200

Tuition: \$10,150

Total: \$21,000 (including \$1,000 Honors Research Budget)

* Note: excess funds will be earmarked for tuition

PROPOSED EXPERIENCES and PRODUCTS

	Experiences	Products
Summer 2022	-Economics Internship	
Fall 2022	-Study abroad at DIS in Copenhagen -Obtain TEA data -Obtain available clinic data	-Honors Thesis Proposal
Winter 2023	-Clean and merge datasets -Dataset exploration -Begin regression analysis -Begin compiling my own clinic data	-Expanded clinic dataset
Spring 2023	-4 hours of HNR 498 -Take ECO 3300, Introduction to Econometrics -Continue compiling my own clinic data -Present at SURF	-Completed clinic dataset -Presentation for SURF
Summer 2023	-Economics or research internship	
Fall 2023	-2 hours of HNR 498 -Complete regression analysis -Honors Presentations of Progress -Present at Southern Economic Association Conference -Present at Association for Public Policy Analysis and Management Conference	-Complete data analysis -Presentation for conferences
Winter 2024		-Completed draft of Honors Thesis
Spring 2024	-2 hours of HNR 498 -Present at SURF -Present at Eastern and Midwest Economic Association Conferences	-Completed Honors Thesis -Honors Thesis Defense

BIBLIOGRAPHY

83(2) HB 2—Enrolled version—Bill Text. (n.d.). Retrieved March 6, 2022, from <https://capitol.texas.gov/tlodocs/832/billtext/html/HB00002F.HTM>

Arndorfer, E., Michael, J., Moskowitz, L., Grant, J. A., & Siebel, L. (1998). *A State-By-State Review of Abortion and Reproductive Rights*. DIANE Publishing.

Basch, C. E. (2011). Teen Pregnancy and the Achievement Gap Among Urban Minority Youth. *Journal of School Health*, 81(10), 614–618. <https://doi.org/10.1111/j.1746-1561.2011.00635.x>

Dowden, A., Gray, K., White, N., Ethridge, G., Spencer, N.F., & Boston, Q. (2018). A Phenomenological Analysis of the Impact of Teen Pregnancy on Education Attainment: Implications for School Counselors. *Journal of school counseling*, 16.

Grossman, D., Baum, S., Fuentes, L., White, K., Hopkins, K., Stevenson, A., & Potter, J. E. (2014). Change in abortion services after implementation of a restrictive law in Texas. *Contraception*, 90(5), 496–501. <https://doi.org/10.1016/j.contraception.2014.07.006>

Grossman, D., White, K., Hopkins, K., & Potter, J. E. (2017). Change in Distance to Nearest Facility and Abortion in Texas, 2012 to 2014. *JAMA*, 317(4), 437–439. <https://doi.org/10.1001/jama.2016.17026>

Giuliano, P. (2017). *Gender: An Historical Perspective* (Working Paper No. 23635; Working Paper Series). National Bureau of Economic Research. <https://doi.org/10.3386/w23635>

HigherEdInfo.org: College-Going Rates of High School Graduates—Directly from High School. (n.d.). Retrieved March 6, 2022, from <http://www.higheredinfo.org/dbrowser/?year=2018&level=nation&mode=data&state=&submeasure=63#/-1/>

Jones, K. M., & Pineda-Torres, M. (2021). TRAP'd Teens: Impacts of Abortion Provider Regulations on Fertility & Education. In *IZA Discussion Papers* (No. 14837; IZA Discussion Papers). Institute of Labor Economics (IZA). <https://ideas.repec.org/p/iza/izadps/dp14837.html>

Kearney, M. S., & Levine, P. B. (2012). Why Is the Teen Birth Rate in the United States So High and Why Does It Matter? *Journal of Economic Perspectives*, 26(2), 141–163. <https://doi.org/10.1257/jep.26.2.141>

Levitt, S. D., & Dubner, S. J. (2011). *Freakonomics: A Rogue Economist Explores the Hidden Side of Everything*. Harper Collins.

Lindo, J., Myers, C., Schlosser, A., & Cunningham, S. (2020). How far is too far? New evidence on abortion clinic closures, access, and abortions. *Journal of Human Resources*, 55(4):1137–1160.

McCammon, S., & Hodges, L. (2022, March 1). Doctors' worst fears about the Texas abortion law are coming true. NPR. <https://www.npr.org/2022/02/28/1083536401/texas-abortion-law-6-months>