# Women's Autonomy and Abortion Decision-Making*

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June 24, 2024

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**Abstract**

Even when abortion is legal, women face numerous barriers to access: proximity, stigma and, crucially, affordability. We investigate the determinants of young women's autonomy in abortion decision-making. We develop a model that accounts for bargaining over parental support. We test the model's predictions using Israeli administrative data and an exogenous abortion funding policy. Young women's autonomy is determined by their parents' aversion to abortion, but a policy that covers the monetary cost of abortion can increase autonomy for women who are less averse to abortion. This empowerment delays early parenthood and marriage. We show the model's predictions hold with empirical extensions to US abortion policies, which suggests that abortion access policies might bolster young women's reproductive autonomy in diverse legislative and cultural landscapes.

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# 1 Introduction

The legal status of abortion remains a contested and emotionally charged issue around the world. However, even when abortion is legal, women face numerous barriers to access: proximity, stigma and, crucially, affordability. The financial barriers encountered by young women extend beyond the monetary, since informal borrowing implies disclosing sensitive information about the pregnancy and the intention to have an abortion, especially when the pregnancy is outside of marriage. Revealing this information could impede the decision-making autonomy of women, depending on the aversion of the people who might help a young woman pay for an abortion. Policies that provide funding for abortion may increase young women's autonomy to make independent reproductive choices.[1] Alternatively, such policies might trigger a standard price effect and not have any influence on the autonomy of young women.

This paper examines the determinants of young women's autonomy in abortion decision-making and assesses the impact of funding policies on their autonomy, both theoretically and empirically using Israeli administrative data on abortion and an exogenous policy change. We find that young women's autonomy in making decisions regarding abortion is determined by their parents' aversion to abortion. However, a policy that covers the entire monetary cost of abortion, even when that value is small relative to the lifetime cost of raising a child, can increase autonomy for young women with a lower aversion to abortion than their parents. We then show how this increase in autonomy has implications for delaying early parenthood and marriage among affected women. Finally, we demonstrate empirically the generalizability of the abortion autonomy model outside of the Israeli context.

We begin by developing a game-theoretical model to examine young women's decisions regarding abortion and parental involvement that accounts for bargaining dynamics over parental support.[2] We consider a young unmarried woman (the daughter) who is pregnant and faces a trade-off between the opportunity cost of carrying the pregnancy to term (forfeited current and future earnings due to childrearing) and the abortion cost, both monetary and psychological. In the first stage of the game, daughters decide whether to involve their parents early, which dictates their autonomy in the abortion decision. We say that a daughter is autonomous in her abortion decision if she comes to a decision on her own and informs her parents late in the pregnancy, once the decision is final (autonomy equilibria). In the

[1] In the US context, the availability of government funding for abortion and the impacts on fertility have been widely studied using expansions and restrictions of Medicaid funding (Blank et al., 1996; Levine et al., 1996; Cook et al., 1999). However, the role of government funding with respect to autonomy in decision-making has not been addressed in this literature.

[2] Another important player is the young woman's partner (the potential father). From a modeling point of view, the same bargaining process between the young woman and her parents could be extended to the potential father instead. However, since the potential father isn't observed empirically, we abstract from that player. Remark 2.1 discusses this alternative interpretation via the marriage market more formally.

second stage, daughters make their abortion decision, and parents decide on the magnitude of the support they are willing to offer under each scenario (i.e., abortion funding or childrearing help). The order of the abortion decision and the parents' support decision depends on whether the parents were involved early enough (the first stage). If the daughter decides autonomously, she makes her abortion decision first, knowing how much financial support for abortion or childrearing support her parents are willing to offer when they are involved late. Conversely, a daughter might involve her parents early in the decision, since she knows that after doing so they will change the support they are willing to offer her, with enough time to affect her abortion decision (persuaded equilibria).

Using the model, we derive empirical predictions of the daughter's autonomy in the abortion decision and the effect of an abortion funding policy on her autonomy as a function of her socioeconomic status (SES) and the difference between her own and her parents' aversion to abortion. Families with greater resources find it easier to fund the abortion cost, and those daughters are more likely to have an abortion. Following the same logic, an abortion funding policy will have smaller effect on their decision and a larger effect on the decision of daughters from low-SES families. Both predictions are independent of any distributional assumptions.

Given the unobservable nature of aversion to abortion (henceforth "abortion disutility"), population-level empirical predictions require specific distributional assumptions, which can be informed by the data. We therefore introduce three key assumptions regarding the joint distribution of abortion disutility among parents and daughters. First, we assume a daughter is randomly born with some ability, to parents from a specific SES and some abortion disutility, which implies that these three innate parameters are independent. Importantly, we allow the daughter's and parents' abortion disutility to be correlated. Second, we assume that this correlation, which we name the intergenerational transmission of abortion disutility (ITAD), is relatively low. We test the validity of the low-ITAD assumption in the empirical section of the paper and find that the data are consistent with a low ITAD.[3] Third, we assume that in a religious household the parents' abortion disutility is mechanically mean-shifted upwards and, due to the ITAD, the abortion disutility of daughters is mean-shifted as well.

These distributional assumptions allow us to derive predictions with respect to religiosity—our proxy for a shift in abortion disutility. Daughters from more religious backgrounds are less likely to have an abortion and are more likely to be affected by an abortion funding policy.[4] An abortion funding policy has no effect among families in which both daughters and parents strongly oppose abortion, since the monetary cost plays no role in the decision of daughters.

[3] Although most of the testable implications of the model do not require making assumptions about the ITAD, it is useful for interpreting the results of an abortion funding policy.

[4] As in any model, we might observe the same patterns just because SES and abortion disutility are negatively correlated, yet the model predicts these patterns even if they are uncorrelated (see Remark 3.1 for a discussion and Section 4.3 for the corresponding empirical tests).

Similarly, daughters with similarly low opposition to abortion as their parents always choose to have the abortion and thus are also unaffected by an abortion funding policy. Therefore, the affected daughters are those who are marginally constrained by the monetary cost of having an abortion because the wealth losses associated with childrearing compensate for the abortion disutility.

Importantly, the model demonstrates under what conditions an abortion funding policy affects young women's autonomy in contrast to a standard price effect. First, the "autonomy-affected" daughters can have an abortion without involving their parents, who strongly oppose abortion. Second, daughters paired with similarly minded parents with moderate opposition to abortion will also change their decision and have an abortion due to government funding, since it removes the monetary cost of the abortion (henceforth the "price-affected" daughters). The ITAD is informative to determine whether the effect of the policy is driven by autonomy- or price-affected daughters. Under the low-ITAD assumption, the policy reduced the ability of numerous parents to convince their daughters to carry pregnancies to term. In particular, among the compliers, a higher fraction would have kept the child because the intervention of the parents surpasses that of the daughter's autonomous decisions.

To empirically test the model's predictions of the role of autonomy in reproductive decision-making, we turn to the Israeli context—a setting in which abortion is legal and observed in administrative records—to study a massive expansion of a subsidy that fully covers the cost of abortion for eligible women. We use unique administrative data on the universe of individual pregnancies (abortions and births) in Israel from 2009 to 2016 linked to census and tax records on women's ethnicity, religion/religiosity, marriage, education, and earnings, as well as the corresponding characteristics of their parents. We then leverage the 2014 policy that eliminated the monetary cost of abortion for eligible young women. Previously, abortion was free for women aged 19 and under in Israel, which was expanded to eligible older women in 2014. Using a difference-in-differences identification strategy and comparing a narrow bandwidth of the "newly funded" women aged 20-21 (treated) to "always funded" women aged 18-19 (control), before and after the 2014 policy change, we first examine what happens to abortion utilization when the monetary cost is eliminated. We find a 4.5%-7% increase in abortion ratios due to the funding policy. These results are robust to a wide range of specifications, time trends, triple differences and an alternative explanation for the effect via the illegal abortion market.

Consistent with our model's predictions, we find that even when abortion is legal, young women's decision-making autonomy over abortion is constrained if they require parental support to pay for an abortion and their parents oppose it. Furthermore, through the lens of the model, we find that the effect of removing the monetary cost of abortion is driven by the autonomy-affected daughters rather than the price-affected daughters. First, we test the empirical predictions of the model according to SES. We find that daughters from higher-SES families are more likely to have an abortion when government funding is not available and less likely when the funding is introduced relative to their lower-SES counterparts. These results hold even when we condition on the daughter's education and religiosity and regardless of the SES proxy used: the daughter's own earnings, her mother's earnings, or her father's earnings. Second, we test the empirical predictions of the model by religiosity, our proxy for a mean-shift in abortion disutility. Consistent with the model's predictions, we find that daughters from religious-Jewish families are less likely to have an abortion when government funding is not available and are more likely when the funding is introduced. Again, the results hold even when we condition on the daughter's education and SES. We show that these results extend to the Israeli-Arab population, who generally have more conservative views regarding abortion compared to the religious-Jewish population (Shapiro, 2014). Finally, we examine the intersection of religiosity and SES and find the effect of the policy is higher for low-SES Arabs and religious Jews. The combination of these empirical results, along with the results by ability level (see Appendix C), support the low-ITAD assumption, which in turn implies the effect of the abortion funding policy is driven by the autonomy-affected daughters.

Our model also yields insights into the fertility, family formation, and human capital decisions of young women. To illustrate this, we present medium-term effects of the abortion funding policy, which are consistent with an autonomy effect. Intuitively, in the absence of the abortion funding, autonomy-affected daughters carried their pregnancies to term because they could not afford it and their parents strongly opposed abortion. Indeed, we find that the abortion funding led to a delay in parenthood in the subsequent three years post conception. The delay in parenthood is consistent with widely documented delays in fertility—and reductions in teen parenthood in particular—linked to abortion access in the United States (Myers, 2017), Norway (Mølland, 2016), Romania (Pop-Eleches, 2010), Spain (González et al., 2022), Mexico (Clarke and Mühlrad, 2021), and Uruguay (Gentile and Ravizza, 2018).

We might expect that a delay in parenthood of the autonomy-affected daughters would also imply a delay in marriage and family life altogether. To formalize this intuition, we present an alternative interpretation of how the parents' childrearing support might be realized via the marriage market. Under this interpretation, childrearing help is not offered by the parents directly but by the young woman's partner, who can be a more helpful partner if her parents intervene in the marriage market to help identify a suitable partner. In this case, in the absence of abortion funding the autonomy-affected daughters were more likely to marry, and when abortion funding becomes available, marriage is deferred. Indeed, we find a reduction in the probability of marriage in the subsequent three years due to the abortion funding policy. This finding echoes evidence that confidential access to abortion reduced shotgun marriages for young women in the US (Myers, 2017).

Finally, because the daughter's abortion decision revolves around the trade-off between the opportunity cost of raising the child and the monetary and psychological costs of abortion, we examine what the daughters who terminated the pregnancy did with their time. Our results suggest that removing the cost of abortion resulted in an investment in human capital, substitution toward more flexible work arrangements, and a shift toward better-paying jobs in the medium term. All of these results are stronger among daughters from low-SES, religious households, which implies that higher human capital and economic returns accrued to the more economically disadvantaged population. These findings are consistent with studies in the US that attribute higher educational attainment and labor force participation among low-income or Black women to greater abortion access (Angrist and Evans, 2000; Kalist, 2004; Pop-Eleches, 2006; Ananat et al., 2007; Mølland, 2016; Lindo et al., 2020; González et al., 2022).

To demonstrate the external validity of the theoretical and empirical results beyond the unique Israeli context and focus on young women, we extend our analysis in two ways. First, we test for effects of the Israeli abortion funding policy on older women. While the model focuses on young women who bargain with their parents, it does not specify how young these women are. We might expect that similar behavior would extend to other age groups if the daughters are still dependent on their family's financial support. Our primary empirical test of the model restricts the analysis to women aged 18-21 at the time of conception and focuses on the younger age cutoff of the subsidy expansion to strengthen the causal interpretation of results. To extend our empirical analysis to other age groups, we compare first-differences two years before and after the policy change by age at the time of conception. We find that the abortion funding policy increased the probability of abortion among women aged 20-27—the common age for college attendance in Israel when economic independence has not yet been achieved. The effect then tapers off for older women closer to the 32-year-old cut-off. Furthermore, we find that these patterns are stronger for low-income women from religious/conservative families. Thus, this confirms that the abortion funding policy also affected autonomy in abortion decision-making for older women.

Then we demonstrate the generalizability of the abortion decision model outside of the Israeli context by empirically testing the predictions using two US policy changes that influenced abortion access, albeit with much coarser data. First, we use the empirical design of Myers (2017), who finds that granting daughters greater autonomy via confidential access to abortion decreased teen births. We show that these effects are larger in regions that report greater opposition to abortion. Second, we replicate the analysis in Venator and Fletcher (2021), which shows that abortion clinic closures in Wisconsin decreased abortion rates. We extend their analysis and find that the magnitude of the effect is increasing in the religiosity of the affected county. Taken together, these applications demonstrate that two US policies that affect abortion access result in similar heterogeneity along cultural and religious lines. While the analysis in these extensions is much coarser, given the aggregated nature of the available data, the results are consistent with the autonomy model's empirical predictions and our corresponding empirical results.

Our paper advances the literature in several ways. A large body of literature documents the effects of barriers to abortion access on abortion and fertility rates, such as parental consent laws (Myers, 2017; Bitler and Zavodny, 2001; Joyce and Kaestner, 2001; Myers and Ladd, 2020; Haas-Wilson, 1996; Levine, 2003; Kane and Staiger, 1996); mandatory waiting periods (Altındağ and Joyce, 2022; Joyce and Kaestner, 2001; Lindo and Pineda-Torres, 2019; Bitler and Zavodny, 2001), targeted restrictions on abortion providers (TRAP) laws (Colman et al., 2011; Fischer et al., 2018; Lindo et al., 2020); and changes in Medicaid funding (Blank et al., 1996; Bitler and Zavodny, 2001; Levine et al., 1996; Cook et al., 1999; Kane and Staiger, 1996). This literature finds that reductions (expansions) in access reduce (increase) abortion across a range of contexts, with lower-income and socioeconomically disadvantaged women particularly affected. The results on fertility are less consistent, with some studies documenting short- or long-term reductions and others finding no evidence of fertility effects. We build on and extend this literature by developing and empirically validating a model of the determinants of young women's autonomy in abortion decision-making.[5] Our paper sheds light on why and under what conditions an increase in abortion access via funding would increase abortion, by developing a framework to understand what influences young women's autonomy in abortion decision-making that considers the potential involvement of their parents in the decision.

First, the model contributes nuance to the literature on the financial barriers to abortion access. Research, exclusively in the United States, has consistently found that reductions in the availability of funding for abortion through Medicaid reduces abortion rates (Blank et al., 1996; Bitler and Zavodny, 2001; Levine et al., 1996; Cook et al., 1999; Kane and Staiger, 1996). Most of these papers found a greater effect among the US Medicaid-eligible population, which is a more economically disadvantaged population. At first glance, these findings can be interpreted as either due to a standard price effect or to eliminating financial constraints. We show that the financial barriers encountered by young women extend beyond the monetary, because informal borrowing implies disclosing sensitive information about the

[5] The canonical "abortion as insurance" model within the economics literature also models the decision to have an abortion but crucially—through backward induction, theorizes a moral hazard response to reducing the cost of abortion that results in an increase in conception rates (Kane and Staiger, 1996; Levine and Staiger, 2002, 2004; Levine, 2007; Ananat et al., 2009). We take a different approach by setting up the decision in a game-theoretical model to examine young women's decisions regarding abortion and parental involvement account for bargaining dynamics over parental support. Nonetheless, we are able to test the moral hazard theory with our empirical analysis and find no evidence that conceptions increased in response to the abortion funding (see Table A.3).

pregnancy and the woman's intention to have an abortion. Revealing this information could impede the decision-making autonomy of women, depending on the aversion of the person who might help them pay for an abortion. The theoretical framework we present helps us distinguish between autonomy and price effects empirically; our empirical analysis shows that a policy that provides funding for abortion may increase young women's autonomy to make independent reproductive choices.

Whereas past studies discuss autonomy of young women or disutility of abortion or opposition to abortion, these concepts are often implicit. For example, the evidence on state-level parental consent laws in the United States finds reductions in abortion when minors must gain consent from their parents (or increases when those laws are repealed) (Myers, 2017; Bitler and Zavodny, 2001; Joyce and Kaestner, 2001; Myers and Ladd, 2020; Haas-Wilson, 1996; Levine, 2003; Kane and Staiger, 1996), which may be attributable to the inability to make these choices in private and the requirement to involve parents. Ananat et al. (2009) find that in the US, abortion legalization had weaker effects in more conservative states—which can be thought of as another proxy for abortion disutility—and might seem to contradict our results. However, our model formalizes these concepts by introducing the notion of autonomy and bargaining with parents, which can help to explain the mechanisms behind these seemingly contradictory findings. First, we illustrate the importance of the joint distribution of abortion disutility to make empirical predictions, which can differ across contexts. Second, similar to what Levine and Staiger (2004) argue, abortion legalization represents a large policy change—which is likely a greater barrier to access than parental consent laws or financial barriers—so it operates on daughters and parents with much lower abortion disutility. Indeed, we confirm that in the same US context, the removal of parental consent laws had larger effects in states with higher opposition to abortion.

Lastly, our empirical analysis not only serves to validate the theoretical predictions but is also a contribution in and of itself. Data on individual-level abortion decisions made by women are rare (Blank et al., 1996), which leads researchers to rely on survey data or aggregated administrative data. Also, causally identifying the impacts of abortion access requires plausible counterfactuals that eliminate as many omitted variables as possible. Much of the economics literature on abortion uses state-level variation in the timing of abortion laws or restrictions in the United States, which may suffer from omitted variables that are correlated with the outcomes (e.g., changing social attitudes) (Kane and Staiger, 1996; Clarke, 2023). Our unique individual-level data on the universe of abortions and births in Israel, along with exogenous variation in abortion access due to the 2014 expansion of an abortion subsidy, allows us to overcome these two challenges.

Our empirical analysis contributes to understanding how the decision to have an abortion is driven by economic factors. Evidence from the U.S. suggests that women who seek abortions have lower-income, are less likely to have health insurance, and generally are more disadvantaged than the general population (Kavanaugh and Jerman, 2018; Jerman et al., 2016). Likewise, the Turnaway Study establishes that women seek abortions primarily for financial or economic reasons (Biggs et al., 2013). And, in our setting specifically, we document that the effect of eliminating the cost of abortion is greatest among poor and religious women.

By theoretically connecting the abortion decision to later choices in parenthood and marriage, we contribute to the literature that examines the effects of abortion policy on these outcomes. We show that eliminating the monetary cost of abortion increases abortion utilization among autonomy-affected young women, which in turn reduces early parenthood and early marriage in the short-term. These empirical results are consistent with the findings of González et al. (2022), Chang (2020), Myers (2017), and Angrist and Evans (2000), but we also provide a theoretical justification for why we would expect these effects. Finally, the majority of studies occur in countries and time periods in which fertility is close to the replacement rate (around 2 births per woman over her lifetime). We show these results hold in a context with a high fertility rate: higher than three births per woman (Clarke, 2023).

## 2 A model of women's autonomy in abortion decision-making

In this section we develop a simple, game-theoretical model to understand what influences young women's autonomy in abortion decision-making and consider the potential involvement of their parents in these decisions. Consider a young woman (henceforth "the daughter") who is pregnant and faces a key trade-off between the opportunity cost of carrying the pregnancy to term (forfeited current and future earnings due to childrearing) and the abortion cost (both monetary and psychological). In the first stage of the game, the daughter decides whether to involve her parents early, which affects her autonomy in the abortion decision. We say that a daughter is autonomous in her abortion decision if she comes to a decision on her own and informs her parents late in the pregnancy, once the decision is final. In the second stage, the daughter makes her abortion decision and the parents decide on the kind and magnitude of the support they are willing to offer. The order of the abortion decision and the parents' support decision depends on whether the parents were involved early enough (the first stage). If the daughter decides autonomously, she makes her abortion decision first, knowing how much support for childrearing or financial support for abortion her parents are willing to offer her when they are involved late. Conversely, a daughter might involve her parents early in the decision since she knows that after doing so, they will change the support they are willing to offer her, with enough time to influence her abortion decision.

The section is structured as follows: We begin by explaining the model's setup, then describe the equilibrium and comparative statics of the daughter's abortion decision as a function of a few key parameters that affect her abortion decision-making: her socioeconomic background, abortion cost, and ability. To test the model empirically, we derive empirical predictions from the model in Section 3, given an additional set of distributional assumptions. All formal derivations and proofs are described in Appendix B.

## 2.1 Setup

### Agents

There are two agents in this economy: daughters and parents, who together define a household $i$. Daughters vary in their characteristics, $\Omega = (\theta, \alpha)$, where $\theta$ represents her ability level and $\alpha \in [0, 1]$ is her utility cost of having an abortion (henceforth "abortion disutility"). Similarly, parents vary in their characteristics, $\Omega^P = \left(\zeta, \alpha^P\right)$, where $\zeta$ represents the parents' socioeconomic status (SES) and $\alpha^P \in [0, 1]$ is the parents' abortion disutility.

A daughter is randomly born to parents from a specific SES, with some ability, and some aversion to abortion $\left(\zeta, \theta, \alpha^P\right)$, which implies that these three innate parameters are independent. Importantly, we allow the daughter's and parents' abortion disutility to be correlated. In Section 3 we take a stronger stand on the distributional assumptions of these parameters so that we can derive empirical predictions. However, these assumptions are not necessary to illustrate the forces that influence women's autonomy in this game-theoretical model.

Furthermore, all daughters face the same losses associated with becoming pregnant during early adulthood, $\Omega_0 = (\overline{h}, \pi)$, where $\overline{h}$ and $\pi$ represent the time spent on childrearing and the monetary cost of having an abortion, respectively.

### Choices and Timing

Daughters and parents bargain over the type and magnitude of help the parents are willing to provide, which affects the daughter's abortion decision (see Figure 1). The daughter faces two decisions: (1) whether to involving the parents $(I)$ and (2) whether to have an abortion $(a)$. Parents decide how much money for an abortion $\left(s^I\right)$ and how much childrearing help they are willing to offer $\left(k^I\right)$, which both vary based on whether they were involved early in the decision $(I = 1)$ or not $(I = 0)$. We focus solely on households in which daughters become aware they are pregnant (outside of marriage).[6] Choosing to have an abortion $(a = 1)$ requires

[6]While the model does not require the pregnancy to be outside of marriage, there are two conceptual reasons to focus on this population. First, out-of-marriage conceptions among young women are more likely to be unplanned,which renders the abortion decision more relevant (Buckles, 2019). Second, the institutional context for the empirical tests of the model only apply to out-of-marriage pregnancies, for reasons that are explained in Section 4.1. Therefore, we describe the model for these out-of-marriage pregnancies for consistency.

paying the monetary cost $\pi$ of the procedure and keeping the child $(a = 0)$ entails dedicating $\bar{h}$ hours to childrearing.

To make the abortion decision, a daughter first has to decide whether to involve her parents in the abortion decision ($I$), which affects the sequence of later choices and governs her autonomy. If she keeps her autonomy, and thus involves her parents ex post, after making the choice ($I = 0$) she still receives help from her parents $(s^0, k^0)$. This represents the share of the monetary cost of the abortion they will cover $(0 \leqslant s^0 \leqslant 1)$ and the share of childrearing time they will provide if she does not have the abortion $(0 \leqslant k^0 \leqslant 1)$. When parents are told about their daughter's abortion decision late, they offer some level of support that is unaffected by their own abortion disutility (only the direct monetary cost of abortion), since they understand they can no longer influence their daughter's decision.[7] However, if she disregards her autonomy and involves her parents early ($I = 1$), her parents make her an offer $(s^1, k^1)$, which *may* differ from their offer under non-involvement $(s^0, k^0)$.

In the model, household members share all information about individual and family characteristics $(\Omega, \Omega^P)$ and make their decisions sequentially. We assume perfect information, so in both the parental support and abortion decision moment, agents observe and have perfect memory of all actions that have been taken before. Consequently, daughters anticipate the parents' response and make their involvement decision accordingly.

**Daughter's Problem**

We start with the daughter's decisions. If a daughter chooses to have an abortion $(a = 1)$, she needs to cover a fraction of the monetary cost $(1 - s)\pi$ and faces a disutility cost $u^{-1}(\alpha)$ of having an abortion, so the total cost of abortion is:

$$\mathcal{C}^D(a = 1; k, s, \Omega_0, \Omega, \Omega^P) = \pi \cdot (1 - s) + u^{-1}(\alpha).$$

Daughters who choose to become young mothers $(a = 0)$ have to commit $(1 - k)\overline{h}$ hours to childrearing, which results in the following opportunity cost of keeping the pregnancy:

$$\mathcal{C}^D(a = 0; k, s, \Omega_0, \Omega, \Omega^P) = \overline{h} \cdot (1 - k) \cdot \omega(\theta),$$

where $\omega(\theta)$ is her opportunity cost of carrying the pregnancy to term (forfeited current and future earnings due to childrearing). Although we focus on a simple two-stage game, giving birth has long-term consequences via human capital accumulation and wage growth, which are captured by $\Omega(\theta)$. Specifically, we simplify the setting by assuming that abortion implies

[7]An alternative interpretation of $s^0$ in this case is the share of the cost the daughter can raise from her parents or social network more generally, independent of the abortion disutility of the funding source (e.g., without specifying the reason).

an opportunity cost of time, which is an increasing concave function of abilities $\theta$. We abstract from the decisions that govern this opportunity cost, which might involve optimal choices related to education, labor, and other productive activities. Therefore, the daughter's abortion decision revolves around the trade-off between the opportunity cost of keeping the child and both the monetary and psychological cost of the abortion:

$$\overline{h} \cdot (1-k) \cdot \omega(\theta) \lesseqgtr \pi \cdot (1-s) + u^{-1}(\alpha).$$

**Parents' Problem**

We simplify the problem by assuming that parents derive utility directly from minimizing the daughter's loss of wealth due to becoming pregnant during early adulthood, but face increasing convex cost functions associated with the help they can offer—namely, $\mathcal{C}^P(k)$—when she opts to have the child, and $\mathcal{C}^P\left(s;\alpha^P,\zeta\right)$ when she carries out the abortion. In particular, we assume $\mathcal{C}^P(1) \to \infty$, so no parent takes on the entire burden of childrearing themselves. Furthermore, we make two additional assumptions about the monetary aid cost function. First, we assume the monetary aid cost function is a decreasing function of $\zeta$, which implies that it is easier for higher-income families to cover a larger fraction of the abortion's monetary cost. Second, we assume for simplicity that $\alpha^P$ shifts the function upwards, so parents could potentially have an incentive to influence their daughter's decision to avoid the abortion disutility. Therefore, we can represent the parents' decision as follows:

$$\begin{aligned} \min_{k(I),s(I)} \quad & \mathcal{C}^D\left(k(I), s(I), a(I); \Omega_0, \Omega, \Omega^P\right) + \mathcal{C}^P(a(I)) \\ \text{s.t.} \quad & \mathcal{C}^P(a(I)) = \begin{cases} \mathcal{C}^P\left(s;\alpha^P,\zeta\right) & \text{if} \quad a(I)=1 \\ \mathcal{C}^P(k) & \text{if} \quad a(I)=0 \end{cases} \end{aligned}$$

Notice that the parents' involvement in the abortion decision affects the sequence of the succeeding choices. Suppose a daughter decides to keep her autonomy $(I=0)$. Then, from her parents' viewpoint, $a^0$ becomes fixed and cannot be affected by their help. Therefore, they can only offer childrearing help $k^0\left(a^0=0\right)$ or financial aid $k^0\left(a^0=1\right)$. In contrast, when a daughter chooses to involve her parents in the decision, the help they offer $(s^1,k^1)$ can still influence her decision whether to have an abortion $a^1$.

**Remark 2.1.** Here we discuss another interpretation of how the parents' childrearing support $k$ might be realized via the marriage market. Although the model was not designed to explore marriage decisions, it can easily accommodate a different interpretation that considers marriage opportunities among young women. In the alternative interpretation of the model, parents do not offer childrearing help. Instead, daughters engage in a costly search for a partner to help with childrearing and/or bring in additional income. To accommodate the initial framework, we posit that $k^D$ describes help from the chosen partner and that the searching costs for someone offering $k$ assistance equals the parents' cost to offer the same childrearing support as in the original version—namely,

$$\mathcal{C}^D(a=0; k^D, s, \Omega_0, \Omega_i, \Omega_i^P) = \overline{h} \cdot (1-k^D) \cdot \omega(\theta_i) + \mathcal{C}^P\left(k^D\right)$$

Notice the daughter's minimization problem is equivalent to that of her parents in the original version. Therefore, when a woman does not involve her parents in the abortion decision, she seeks a partner who offers assistance $k^0$.

To remain consistent with the original setting, we allow parents to involve themselves in the marriage decisions of their daughters. For simplicity, we assume that parents only intervene when they are willing to face a search cost $\mathcal{C}^P\left(k^P\right)$ and introduce their daughter to a partner who offers assistance greater than $k^D$, as a means of influencing her abortion decision. If the daughter selects that partner, she stops looking for options and incurs no search cost, since $k^D = 0$. Otherwise, she continues looking herself. Since there is *perfect information*, the parents would only consider looking for a partner when the abortion utility cost $\alpha_i^P$ more than compensates for the effort and they can secure a more appealing partner for their daughter, $k^P > k^0$. If that is not the case, parents do not involve themselves in arranging a marriage and allow their daughter to settle for a partner $k^0$.[8]

## 2.2 Best Responses

The solution of the model consists of all *subgame perfect Nash equilibria*, which we obtain by backward induction (see Appendix B.1 for details and derivation). There are four potential equilibria, which are based on the combination of the daughter's abortion decision $a$ and her decision to involve her parents $I$. Each of these equilibria depends on the disutility of carrying out an abortion, holding fixed the set of parameters and characteristics $\left(\Omega_0, \Omega, \Omega^P\right)$. The potential equilibria are a function of two thresholds for the daughter:

$$\underline{\alpha} \equiv u\left((1-k^0)\overline{h} \cdot \omega(\theta) - \pi \cdot (1-s^0)\right)$$
$$\overline{\alpha} \equiv u\left((1-k^0)\overline{h} \cdot \omega(\theta)\right);$$

[8]Beyond the simplification, we chose not to include innovations in the model—alternative proposals would yield similar interpretations as long as it is more costly for parents to find a partner offering assistance $k^P > k^0$ than it is for a daughter to find someone offering assistance $k^0$. Otherwise, parents would always have incentives to get involved in their daughter's relationships, even when they do not intend to persuade her to keep the child. Consequently, the model would incorrectly predict that there are no marriages or decisions made against abortion with autonomy.

and two for her parents:

$$\underline{\alpha}^P \equiv \mathcal{C}^P\left(k^0\right) - k^0\overline{h}\omega\left(\theta\right) - \mathcal{C}^P\left(s^1;\zeta\right)$$
$$\overline{\alpha}^P \equiv \mathcal{C}^P\left(k^1\right) - \mathcal{C}^P\left(s^0;\zeta\right) + \pi s^0.$$

The interpretation of these figures is straightforward. $\underline{\alpha}$ is the utility equivalent of the opportunity cost of childrearing net of the monetary cost of the abortion she will have to pay for out of pocket. Similarly, $\overline{\alpha}$ is the utility equivalent of the opportunity cost of childrearing. For parents, the thresholds represent both the additional cost they incur to influence their daughter's choice and the loss they impose on her by doing so.

#### Daughter's Best Response

The daughter's abortion utility cost implies different potential abortion decisions. First, daughters with $\alpha < \underline{\alpha}$ would generally prefer an abortion unless their parents persuade them otherwise by offering increased childrearing support or reduced financial aid for the abortion cost. Second, daughters with $\underline{\alpha} \leqslant \alpha < \overline{\alpha}$ would prefer to have the child if not convinced by their parents otherwise. Finally, daughters with $\alpha \geqslant \overline{\alpha}$ would never carry out an abortion (see Proposition B.5 in the Appendix).

#### Parents' Best Response

The parents' abortion utility cost will imply different actions they will take to change their daughter's abortion decision if involved. First, parents with $\alpha^P < \underline{\alpha}^P$ would have incentives to offer a higher level of abortion funding support $s^1 > s^0$ to influence their daughter toward having the abortion, whenever she would have opted to have a child. Second, parents with $\underline{\alpha}^P \leqslant \alpha^P < \overline{\alpha}^P$ offer optimal levels of childrearing help $k^0$ and financial aid $s^0$, making their daughter's decision unaffected. Finally, parents with $\alpha^P \geqslant \overline{\alpha}^P$ would have incentives to offer $k^1 > k^0$ to influence their daughter towards having the child whenever she would have opted to have an abortion (see Proposition B.6 in the Appendix).

## 2.3 Autonomy equilibria vs persuaded equilibria

Figure 2a illustrates the four equilibria described in Proposition B.7 in the Appendix, based on the relationship between the daughter's utility costs on the support $\alpha_i \in [0, 1]$ and the parents' abortion utility cost on the support $\alpha_i^P \in [0, 1]$.

### Autonomy equilibria

The first equilibrium outcome results in the daughter having the child *with autonomy* (late involvement of parents), as illustrated in the dark blue boxes in Figure 2a. However, each of the boxes illustrates a different reason why the model ends in this equilibrium. Trivially, daughters who oppose abortion strongly will not have an abortion and will not involve their parents in the decision (top blue row of Figure 2a). Similarly, daughters with moderate opposition to abortion, paired with parents who strongly oppose it (middle right blue box of Figure 2a), would know they will not receive a substantial parental financial support for an abortion and thus would find it difficult to raise the funds for the abortion. Therefore, they will not have an abortion and will not involve their parents in the decision, since involving them would not result in any change in the decision (keeping the child) or support, but they would lose their autonomy in the decision. Finally, daughters paired with similarly minded parents with moderate opposition to abortion (center middle blue box of Figure 2a), will keep the child without involving their parents early. Intuitively, since her parent's incentives are perfectly aligned with hers, she will not gain from involving them early. Furthermore, her parents will offer her exactly the childrearing help that will overcome the abortion utility and financial costs.

The second equilibrium outcome is daughters who have an abortion *with autonomy*, as illustrated in the dark orange boxes in Figure 2a. This equilibrium describes daughters who want to have an abortion and their parents moderately or weakly oppose abortion. Therefore, they will not involve them and will have the abortion, since involving them would not result in any change in the decision (having the abortion) or monetary support, other than losing their autonomy in the decision.

### Persuaded equilibria (with parental involvement)

The third equilibrium outcome is having an abortion with early parental involvement, as illustrated in the light orange boxes in Figure 2a. This equilibrium occurs with daughters who moderately oppose abortion and parents who would prefer their daughter to have the abortion. These daughters will involve their parents in the decision, since it will result in higher monetary support for the abortion, which will enable them to have it.

The fourth equilibrium outcome is having the child with parental involvement as illustrated in the light blue box in Figure 2a. This equilibrium describes daughters who want to have an abortion but their parents strongly oppose abortion. Therefore, these daughters will know that involving their parents after deciding to have an abortion, will result in low monetary support from their parents (if any), and so they will find it difficult to fund the abortion. As a result, they will involve them early, get higher childrearing support from the parents, and decide to keep the child (see Proposition B.7).

**Remark 2.2.** Notice that the alternative interpretation of childrearing support via the marriage market (Remark 2.1) does not affect the characterization of the equilibria, except for two details. First, in the same way as an increase in the rate of abortions implied a reduction in childrearing help from parents (endogenously), this interpretation would predict a reduction in the number of marriages among young women.[9] Second, parents cannot reduce $k$ when involved early, as they did with childrearing help, since proposing a worse candidate than their daughter's expectation, $k < k^0$, does nothing. As a result, the $\underline{\alpha}^P$ threshold would be higher.

## 2.4 Can policy influence young women's autonomy?

Figure 2a suggests that two types of policies will give daughters autonomy in abortion decision-making: abortion funding and universal childcare. An abortion funding policy will give autonomy to daughters who want to have an abortion but their parents strongly oppose it (the light blue box in Figure 2a). Conversely, universal childcare will give autonomy to daughters who moderately oppose abortion and have parents who would prefer that their daughter have an abortion, since it eliminates the need for childrearing support from parents (the light orange boxes in Figure 2a). However, we limit our attention to the abortion funding policy for two reasons. First, it is hard to imagine a policy that provides universal childcare such that daughters' time is completely free, and thus do not need any childrearing support from their parents.[10] Second, our empirical analysis in Section 4 focuses on a specific abortion funding policy in Israel that eliminated the monetary cost of an abortion.

The introduction of an abortion funding policy determines that the monetary cost associated with the abortion procedure becomes zero ($\pi = 0$), which consequently implies that $s^0 = s^1 = 0$ in equilibrium. In other words, daughters no longer need financial assistance from parents to have an abortion, so parents can no longer influence the decision by offering

[9]The prediction is mechanical, since we have connected the whole process of looking for a partner to the decision to carry out the abortion. Nevertheless, an easy extension would be to consider the marriage market separately, in which women draw $k$ from a distribution $K$ of partners every period they are still single. Intuitively, every woman holds a threshold $\bar{k}$ that establishes the minimum partner she is willing to settle for, or else she rejects the candidate and postpones marriage. As shown, becoming pregnant in early adulthood negatively affects the intertemporal wealth of women, which reduces the threshold and renders them less likely to postpone marriage than their non-pregnant counterparts. Therefore, the introduction of the policy shifts $\bar{k}$ upward, so the number of marriages falls. Moreover, we should expect a larger effect among daughters who have a higher cost associated with the abortion procedure, $\alpha_i$, given that they experience a larger increase in their intertemporal wealth.

[10]For example, even in Denmark, where childcare is universally covered from 6-12 months after birth and parental leave covers the time until then, we see women's earnings' drop by approximately 20% from the time of birth, a phenomenon knows as the "child-penalty" (Kleven et al., 2019). Furthermore, childcare expansion in Austria seemed to have a very limited effect on these child penalties (Kleven et al., 2021).

additional financial resources. However, parents may still try to dissuade their daughter from carrying out the abortion by offering additional childrearing help.

From the viewpoint of daughters, $\pi = 0$ requires that $\underline{\alpha} = \overline{\alpha} = u\left(\left(1-k^0\right)\overline{h}\omega\left(\theta\right)\right)$, which implies that a larger share of women would prefer to have an abortion if their parents do not propose a better deal by overextending their childrearing support by deviating from the efficient level and offering more. From the perspective of parents, families can no longer convince their daughters to have an abortion since the policy is strictly better than any financial aid parents might offer—i.e., $\underline{\alpha}^P \to 0$. Furthermore, Proposition B.8 in the Appendix shows that, due to the policy, $\overline{\alpha}^P$ increases to

$$\overline{\alpha}^P \to \overline{\overline{\alpha}}^P \equiv \mathcal{C}^P\left(k^1\right) - \mathcal{C}^P\left(0;\zeta\right)$$

so overextending on childrearing help becomes harder for some families as $\overline{\alpha}^P$ increases.

Therefore, we can characterize the share of compliers ($C$) with the policy as follows (shaded area in Figure 2b):

$$C\left(\theta,\zeta\right) = \int_{\underline{\alpha}^P}^{\overline{\alpha}^P}\int_{\underline{\alpha}}^{\overline{\alpha}} dG\left(\alpha,\alpha^P|\theta,\zeta\right) + \int_{\overline{\alpha}^P}^{\overline{\overline{\alpha}}^P}\int_{0}^{\overline{\alpha}} dG\left(\alpha,\alpha^P|\theta,\zeta\right)$$

In other words, the abortion funding policy has no effect on families in which the abortion disutilities $\left(\alpha,\alpha^P\right)$ are sufficiently high, since the monetary cost plays no role in the daughters' decision. Similarly, families with low abortion disutilities always opt for having the abortion, and thus the policy should also have no effect on them.

The model predicts that two types of daughters will be affected by an abortion funding policy, and thus switch their abortion decision (i.e., compliers). First, the "autonomy-affected" daughters will now have an abortion without considering their parents' opinion, who strongly oppose abortion (the diagonal lines in Figure 2b). Second, daughters paired with similarly minded parents with moderate opposition to abortion (the dotted area in Figure 2b) will also change their decision and have an abortion due to the government funding, simply because since it removes the monetary cost of abortion (henceforth the "price-affected" daughters).

We should be able to identify an effect of the funding policy on abortion decisions if there is sufficient density in any of the shaded regions in Figure 2b. But, in order to understand whether the effect of the policy is driven by autonomy-affected or price-affected daughters, we need to understand the joint distribution of the abortion disutility of parents and daughters (the "intergenerational transmission of abortion disutility" or ITAD). We explore these distributional assumptions in the next section.

# 3 Empirical predictions of the autonomy model

In Section 2, we examined the equilibria in the abortion autonomy model and how they will vary due to eliminating the monetary cost of abortion. In this section, we derive empirical predictions from our model and consider variation across several key parameters. However, given the unobservable nature of abortion disutility, population-level empirical predictions require specific distributional assumptions. We therefore introduce these assumptions regarding the joint distribution of abortion disutility among parents and daughters. We then test these empirical predictions in Section 4. All formal derivations and proofs are provided in Appendix B.

## 3.1 Distributional assumptions: Intergenerational transmission of abortion disutility

The theoretical model on its own does not provide insight into which types of daughters will have an abortion (autonomy-affected versus price-affected) without additional distributional assumptions that can be informed by the data. For example, as we will show later, 66% of pregnancies end in abortion among young unmarried women in Israel. This implies, through the lens of the model, that more than half of households' $\alpha$ distribution is concentrated in the orange region in Figure 2a ($\alpha_i < \overline{\alpha}$ and $\alpha_i^P < \overline{\alpha}^P$). However, this alone does not determine whether parental involvement influences daughters' choice between abortion or childbirth and, if so, whether it is due to autonomy effects or price effects.

To make further empirical predictions, the model requires additional assumptions regarding the joint distribution of daughters' and parents' abortion utility costs ($\alpha$), which can be partially determined from the data. Specifically, we need to understand whether the joint distribution of $\alpha$ is concentrated in the dotted or diagonal regions of Figure 2b.

**Assumption 1.** *The joint distribution of abortion disutility $G\left(\alpha_i, \alpha_i^P\right)$ is independent of SES $\zeta_i$ and ability $\theta_i$:*

$$G\left(\alpha_i, \alpha_i^P\right) \perp \zeta_i, \theta_i$$

Intuitively, Assumption 1 could be justified, since the fact that a daughter is randomly born to parents from a specific SES background, with some ability, and some aversion to abortion $\left(\zeta_i, \theta_i, \alpha_i^P\right)$ implies that these three innate parameters are independent. Importantly, we allow the daughter's and parents' abortion disutility to be correlated in the following way:

$$\alpha_i = \begin{cases} 0 & \text{if } \rho\alpha_i^P + \varepsilon < 0 \\ \rho\alpha_i^P + \varepsilon & \text{if } \rho\alpha_i^P + \varepsilon \in [0, 1] \\ 1 & \text{if } \rho\alpha_i^P + \varepsilon > 1 \end{cases}$$

where $\rho \in [0,1]$ is the intergenerational transmission of abortion disutility (ITAD) and $\varepsilon$ follows some distribution $F(0, \sigma^2)$. In this way, we can focus solely on the distribution of $\alpha_i^P$, which we generalize as $\alpha_i^P$ following some distribution $G(\mu, \sigma_P^2)$.

Although most of the testable implications of the model do not require making assumptions about $\rho$, we show that the Israeli administrative data are consistent with low intergenerational transmission of abortion disutility for households with young pregnant daughters.

**Assumption 2.** *The intergenerational transmission of abortion disutility (ITAD) is relatively low, such that*

$$\rho < \frac{\underline{\alpha}(\underline{\theta}, \zeta_i)}{\overline{\alpha}^P(\underline{\theta}, \zeta_i)}$$

*where $\underline{\theta}$ represents a daughter with the lowest level of skill, and the density of parents' disutility toward abortion $g\left(\alpha_i^P | \theta_i, \zeta_i\right)$ weakly increases in $\alpha_i^P$ and concentrates in the region spanned by*

$$\alpha_i^P \in \left[\overline{\alpha}^P(\underline{\theta}, \Omega_0, \zeta_i) - \underline{\eta}, \overline{\alpha}^P(\underline{\theta}, \Omega_0, \zeta_i) + \overline{\eta}\right]$$

*for some arbitrary $\left(\underline{\eta}, \overline{\eta}\right)$.*

In Appendix C we discuss the validity of Assumption 2 and suggest an empirical test for it. We then identify several empirical justifications for it in the Israeli context and data. The empirical tests yield predictions regarding a higher abortion ratio and a larger effect of the abortion funding policy for daughters with higher skill levels. Intuitively, parents offer more optimal childrearing help $k^0$ to highly skilled daughters. Thus, it becomes increasingly difficult for families to overextend themselves on childrearing help, which reduces their ability to convince their daughters to keep the child. Conversely, the additional childrearing help mitigates the loss associated with having the child, which reduces the daughter's incentives to have an abortion. The assumption of a lower $\rho$ implies that we are more likely to observe the former, which we indeed observe in the data (see Table A.2). Similarly, Assumption 2 implies that high-skilled daughters are more likely to be compliers than always-takers. This is because the abortion funding made it hard for parents with high-skilled daughters and a high aversion toward abortion $\alpha_i^P$ to overextend themselves on childrearing help, implying that the daughters had an abortion with autonomy. Again, we find empirical evidence to support that prediction as well (see Table A.2). Appendix C concludes by discussing intuitive justifications for Assumption 2 that depend on the selection into pregnancy due to the daughter's abortion disutility.

## 3.2 Empirical predictions by abortion cost and socioeconomic status

### Abortion decision by SES ($\zeta_i$)

We now shift our focus to the socioeconomic status of families. The model predicts that women from higher-SES families ($\zeta_i$) are more likely to have an abortion. As the following Proposition formalizes, these patterns do not depend on any assumption regarding the joint distribution of utility costs $\left(\alpha_i, \alpha_i^P\right)$:

**Proposition 1.** *For a given set of parameters and characteristics* $(\Omega_0, \theta_i)$*, if the joint distribution of abortion disutility has a positive density in every point,* $g\left(\alpha_i, \alpha_i^P | \theta_i, \zeta_i\right) > 0 \,\forall \left(\alpha_i, \alpha_i^P\right)$*, an increase in the family's socioeconomic status* $\zeta_i$ *increases the likelihood that the daughter would have an abortion.*

*Proof.* See proof B.9 in Appendix B.3.

Figure A.1a presents the intuition behind this result. Parents with higher SES have greater resources and thus a lower cost of funding an abortion for their daughter $\mathcal{C}^P\left(s; \alpha_i^P, \zeta_i\right)$. This could be interpreted as those parents having more savings or a social network with more resources. This in turn increases both cutoffs $\underline{\alpha}$ and $\underline{\alpha}^P$. Since there are dominant strategies above $\overline{\alpha}$ and $\overline{\alpha}^P$ that do not depend on income (due to the envelope theorem), this implies that $\overline{\alpha}$ and $\overline{\alpha}^P$ are independent of $\zeta_i$, which is easy to see in Figure A.1a. Thus, daughters with higher SES are more likely to have an abortion (see Proposition 1).

Conversely, the model predicts the abortion funding policy will have a stronger effect on low-SES households because a larger proportion of low-income young women find themselves marginally constrained by the same monetary cost $\pi$. More importantly, this prediction is general and requires only a minor assumption about the distribution of the abortion disutility $G\left(\alpha_i, \alpha_i^P\right)$—a positive density in every point on the support.

**Proposition 2.** *For a given set of parameters and characteristics* $(\Omega_0, \theta_i)$*, if the distribution of the utility cost of abortion has a positive density in every point,* $g\left(\alpha_i, \alpha_i^P\right) > 0 \,\forall \left(\alpha_i, \alpha_i^P\right)$*, an increase in the family's socioeconomic status* $\zeta_i$ *decreases the likelihood the household will be affected by an abortion funding policy.*

*Proof.* See proof B.10 in Appendix B.3.

### Abortion decision by utility cost ($\alpha$)

In order to proxy for a mean shift in the key parameter of the model—abortion disutility—we leverage the unique demographic context within Israel and focus on religiosity, which is also captured in the administrative we use (see Section 4.1). We expect the distribution of the abortion utility cost to be higher for women from more religious or conservative communities than for those from secular communities, which results in the abortion disutility being mean-shifted upward for both the daughter and her parents:

**Assumption 3.** *The average disutility for religious households $\mu^R$ is lower than that for secular families $\mu^S$, such that $G^R\left(\alpha_i^P\right)$ first-order stochastically dominates $G^S\left(\alpha_i^P\right)$.*

From Assumption 3 we get that religious women are less likely to have an abortion, as the following proposition formalizes:

**Proposition 3.** *For a given set of parameters and characteristics $(\Omega_0, \zeta_i, \theta_i)$, suppose Assumption 3 holds. Then, daughters from secular families are more likely to have an abortion.*

*Proof.* See proof B.11 in Appendix B.3.

**Remark 3.1.** This comparison varies several elements of the model. As in any model, we might observe the same patterns simply because $\zeta$ and $\alpha$ are negatively correlated, yet the model predicts these patterns even if $\zeta$ and $\alpha$ are uncorrelated. Furthermore, if the empirical test of Proposition 1 holds (abortion ratios increase with SES), this will imply that $\zeta$ and $\alpha$ are unlikely to be positively correlated.

As we discussed in Section 2.4, the policy should have no effect on households in which the abortion disutility $\left(\alpha_i, \alpha_i^P\right)$ is sufficiently high or sufficiently low, since the monetary cost plays no role in the those households' decision. Therefore, if the utility cost among religious households is excessively high (e.g., greater than $\overline{\overline{\alpha}}^P$) we would observe a very low ratio of abortions among the religious populations and also no effect of the policy. Similarly, if the utility cost among secular households is excessively low (i.e., concentrated around $\underline{\alpha}^P$), we would rarely observe secular daughters keeping the child, and thus the policy should not have an effect on them either. Therefore, the compliers are households in which the daughters are marginally constrained by the monetary cost, because the wealth losses associated with child-rearing compensate for the utility cost of having the abortion. This leads us to the following prediction.

**Proposition 4.** *For a given set of parameters and characteristics $(\Omega_0, \zeta_i, \theta_i)$, suppose Assumption 3 holds. Then, religious families are more likely to be affected by the introduction of the policy if one of the following sufficient conditions hold:*

1. *Assumption 2,*

2. $g^R\left(\alpha_i^P|\theta_i, \zeta_i\right) = g^S\left(\alpha_i^P|\theta_i, \zeta_i\right)$ *for some* $\alpha_i^P < \underline{\alpha}^P$.

*Proof.* See proof B.12 in Appendix B.3.

Despite being marginally constrained by the monetary cost of the procedure, the policy can affect the abortion decision of daughters through different mechanisms, depending on the relationship between her abortion disutility and that of her parents. For instance, Assumption 2 implies that the policy will reduce the ability of numerous parents to convince their daughters to keep the child.

**Proposition 5.** *For a given set of parameters and characteristics* $(\Omega_0, \zeta_i, \theta_i)$*, suppose Assumption 2 holds. Then, autonomy-affected—rather than price-affected daughters—are the ones driving the increase in the abortion ratio.*

*Proof.* See proof B.15 in Appendix B.4.

In particular, among families with daughters who have an abortion due to the policy, the fraction of daughters that would have kept the child due to the intervention of their parents surpasses that of daughters who would have made the same decision with autonomy (see further discussion in Appendix B.4).

# 4 Empirical tests

In this section, we empirically test the predictions from Section 3 using unique Israeli administrative data on the universe of abortions and births in Israel that are linked to detailed tax records and education registry data from the Central Bureau of Statistics (CBS) of Israel. We explore the predictions of the autonomy model to understand whether an abortion funding policy can influence women's autonomy in abortion decision-making. We then further test the empirical predictions on baseline abortion ratios and how the policy effect varies across different population groups (by SES and religiosity).

## 4.1 Context and data

### Background on abortion in Israel

Abortion has been legal in Israel since 1977, conditional on approval from a committee composed of two medical professionals and a social worker, one of whom must be a woman. All legal abortions in Israel must go through this committee process, *including* when women opt to have the procedure performed by a private doctor outside the public healthcare system. Although the committee process may seem obstructive, the committee itself effectively serves as a rubber stamp, and in practice many women who would not strictly be approved according to the criteria are "coached" through the process to be approved (Oberman, 2020). Consequently, almost all applications are approved; our data show that 99% of applications are approved and 97% are acted upon. See Appendix D.1 for more details on the abortion committee in Israel.

The committee approves an abortion if at least one of the following conditions is satisfied: (1) the woman is under 18 or over 40 years of age; (2) the pregnancy is outside of marriage; (3) the pregnancy is the result of an illegal act (rape or incest); (4) the pregnancy risks the life or health of the woman; or (5) the fetus suffers from congenital disorders. These criteria, along with approval shares by each criterion, are shown in Table D.1a. By definition, all unmarried women automatically meet the out-of-marriage criterion and are automatically approved, whereas married women must either report that their pregnancy was out-of-marriage (e.g., the result of infidelity) or meet one of the other criteria for approval.

After receiving the committee's approval, women have to pay an out-of-pocket cost (co-pay) for the abortion, in contrast to the majority of healthcare services in Israel. The cost of an abortion in the public health system ranges from NIS 2,100 to 3,500 (USD 600 - 1,000), depending on the procedure, which is determined by the stage of the pregnancy. A woman can choose to have an abortion with a private doctor after receiving approval from the committee, which is quicker but also more expensive. Among private physicians, the cost of an abortion can be as high as 8,000 NIS (USD 2,200). Putting these figures in context, the average monthly earnings for women in Israel in 2014 were NIS 7,666 (USD 2,270), and the average household monthly income was NIS 15,427 (USD 4,565). For the young women we focus on in our analysis, the average monthly earnings were NIS 2,109 (USD 624), conditional on working that month.

The high approval rates could indicate the existence of an illegal market for women whose abortion requests otherwise would not be approved by the committee. Anecdotal evidence suggests that illegal abortions exist in Israel but are rare, and are dominated by high-cost medical providers who operate outside the committee process (Newman, 2017; Oberman, 2020).[11] Given the high accessibility, quality, and low—or in some cases, free—cost of legal abortion, the incentives to have an illegal abortion in Israel are low, particularly since a woman can have the abortion performed by a doctor of her choosing and avoid the wait times in the public sector after receiving committee approval (which are captured in our data). However, some women may avoid the committee process to avoid the bureaucracy or perceived judgment of appearing in front of a committee (Oberman, 2020).[12] Although this suggests that illegal

[11] An article in the Israeli newspaper *Seven-Days* (*Shivaa Yamim*) suggested that there are 15,000 illegal abortions a year in Israel (Newman, 2017). However, the organization quoted in the article as commissioning the study did not know the source of the data or anyone who could confirm the number, and suggested we contact the Central Bureau of Statistics (which is the source of our data). The reporter did not respond to our numerous contact attempts. Therefore, we were unable to verify the veracity of this figure, even as a rough ballpark.

[12] Ordering medication abortion pills online could present an alternative way to evade the committee to obtain an abortion. While we cannot rule out this possibility, abortion pills for purchase online do not appear to be widely available in Israel, which has also been confirmed by abortion advocates in Israel (Oberman, 2020).

abortion may be rare, especially among low-income women, our data on abortion come from the official abortion committee and we do not observe any illegal abortions. The potential existence of an illegal market would complicate the interpretation of our results, because any change in abortion could be due to shifts from the illegal to the legal abortion market. We test this hypothesis directly in Section 4.3 and find no evidence to support it.

**Policy change: Eliminating the cost of abortion**

Before 2014, women aged 19 and under could obtain an abortion free of charge.[13] However, since co-pays are typically rare (and small) in the Israeli healthcare system, women aged 20 or above were often surprised to learn they needed to pay between $600 and $1,000 for an abortion upon arriving at the clinic. According to Dr. Hedva Eyal, head of the Haifa Women's Coalition—a women's rights organization that also helps young women access reproductive health services—women from lower-SES families frequently struggled to come up with enough to cover the co-pay.[14] Religious women in particular faced difficulties because they could not ask friends or family members for financial support for an abortion.[15]

In January 2014, motivated by a letter from a pro-abortion activist and surplus healthcare budget, the Israeli committee for the subsidized healthcare basket (*Sal Hatrufot*) decided to spend the surplus on expanding the abortion funding (Amsterdamski et al., 2021). Specifically, they expanded coverage from the previous cutoff of 19 years of age to include all women up to 32 years of age (see Table D.1b). The coverage also includes the cost of the committee itself (Kelner, 2013). Thus, eligible women no longer had to pay any monetary costs for an abortion. The government decided to use age as a proxy for income and, due to budget constraints, capped the coverage at 32 years of age (Amsterdamski et al., 2021). Thus, after the 2014 policy change all women in Israel up to the age of 32 could obtain an abortion free of charge, once the abortion was approved. The 2014 policy only changed the cost; women still had to go through the same committee process to obtain an abortion. To the best of our knowledge, no other reproductive health, family, or income policies in Israel change discontinuously at 19 or 32 years of age. We use this 2014 policy change as a natural experiment to test the predictions from Section 3 of whose decision-making autonomy should be affected by a change in abortion access and focus on the younger age cutoff of 19 years, as we describe below.

[13] Also, since 1977 abortion has been free in the following cases 1) women aged 17 and under, 2) if the pregnancy results from rape or incest, or 3) if there is a medical risk for the woman or fetus (see Table D.1a, column 3).

[14] Conversation between Tom Zohar and Hedva Eyal, President of the Haifa Women's Coalition, Tel Aviv, Israel, April 2020.

[15] Sharon Orshalimy, Israeli reproductive justice activist and 2013 Young Leader with Women Deliver, Tel Aviv, Israel, July 2019.

### Pregnancy data: Abortions and births

Our administrative data on abortion come from the abortion committee and include every woman who applied to the committee between 2009 and 2016, including those who had abortions with private doctors, and includes information about the woman's pregnancy. To identify all live births registered in Israel as well as demographic information about the women at the time of conception (age, religion, ethnicity, marital status, education, and parents' identifiers), we use 2016 civil registry data. Combined, the abortion committee data and the civil registry data allow us to identify the universe of recorded pregnancies in Israel between January 2009 and March 2016, except for pregnancies terminated without permission of the committee (illegal abortions) and miscarriages that occur early in pregnancy.[16][17] An important advantage of these unique data is that they enable us to examine individual-level births and abortions, rather than relying on aggregated abortion rates.[18]

### Demographic and socioeconomic data

To classify religion, religiosity, and ethnicity for the women in our sample, we rely on data from the census and the Ministry of Education. Ethnicity is reported when citizens are issued their identification cards and is recorded in the census. For Jewish women, we define religiosity level based on the type of school a woman attended. Israel has three types of schools for the Jewish population: secular (*mamlachti*), religious (*mamlachti-dati*), and Orthodox. Then, we classify religiosity-ethnicity into secular Jews, religious Jews, and Arabs. Importantly, we cannot classify religiosity of the Israeli-Arab population based on the available data, but they are mostly traditional and religious (Central Bureau of Statistics (Israel), 2018). Specifically, the Israeli-Arab Muslim population consists of 11% secular, 57% traditional, and 31% religious

[16]Though early miscarriages are not captured in the data, their omission does not undermine the analysis for two reasons. First, we are focused, from a modeling perspective, on the abortion decisions of young women's and we do not view a spontaneous miscarriage to be a decision or choice. Second, for the empirical analysis, there is no reason to believe early spontaneous miscarriages would change differentially for 18-19-year-olds relative to 20-21-year-olds and the timing of the policy change. Thus, this limitation may increase the noise of our estimates but does not introduce any systematic bias.

[17]Late-term abortions and miscarriages (defined as abortion after 24 weeks of gestation) are captured in the abortion committee data; however, they are required to go through a special committee and were fully subsidized during the span of our data. Overall, these are rare (approximately 250 per year among the entire population of Israel) and we exclude them from our analysis. Stillbirths (approximately 1,400 a year) do not show up in either the birth or abortion data.

[18]Throughout our analysis, our primary sample consists of the universe of conceptions in Israel (that is, legal abortions and live births). Thus, when we calculate mean abortion, it should be considered an abortion ratio: the share of pregnancies that end in abortion. This is in contrast to the abortion rate, which refers to the number of abortions per 1,000 women of a given age. While focusing on the abortion ratio implies some selection into pregnancy, we believe this is the relevant population for analysis given that abortion is only a relevant decision *conditional* on pregnancy. Nevertheless, in some cases, we present results in terms of the abortion rate per 1,000 women and it is explicitly noted.

Muslims (Central Bureau of Statistics (Israel), 2018). In general, with respect to abortion attitudes, Islam opposes abortion, except when the fetus's health is compromised (Shapiro, 2014; Bhalotra et al., 2021).

For statistical power, we aggregate religious Jews and Orthodox Jews into a single category (religious Jews) and combine all Israeli Arabs (Muslim and Christian) into a single classification (Israeli-Arabs). Women's religiosity may change before or after completing their schooling, and they may not be as religious as the school they attended. However, the choice of school is a good proxy for the religiosity of a young woman's *parents*, which is the relevant religiosity classification for testing the model's predictions.

Household economic resources and family religiosity are central to the model's predictions. To identify household economic resources, we use data on the young woman's parents' earnings (both father and mother) , which we can link to each woman in the data, with a very high matching rate of 96%. This is due to the unique identification number given to all individuals at birth and follows them across their lives in tax, education, and census records. We construct several classifications of socioeconomic status (SES) based on whether the woman is above or below the median earnings level based on (1) her father's earnings, (2) her mother's earnings, (3) her household's earnings (summing across both parents), and (4) her own earnings.

To proxy for the daughter's ability, we use data from the education registry spanning 2005-2018 that include information on educational enrollment and graduation across several forms: high school completion (*bagrut*), vocational training programs, and university.

**Fertility and family formation data**

To test how a change in abortion decision-making autonomy impacts women's later fertility and family formation, we rely on data from the civil registries. Using 2016 civil registry data, we identify births and marriages that occurred after the index pregnancy. This also allows us to construct other outcomes related to fertility, such as age at first birth and parity (e.g., the total number of children born to a woman).

## 4.2 Empirical strategy

We use a difference-in-differences (DiD) strategy that leverages the timing of the Israeli funding policy change (2014) and the age cutoff (19 years, highlighted in Table D.1b). Our primary analytic sample consists of unmarried 18- to 21-year-old women who conceived between 2009 and 2016. We focus our analysis on unmarried women because they are automatically approved for an abortion by the committee and, given the prior criteria for government funding of abortion, they are the only population for whom the funding coverage actually changed in 2014. We restrict our analysis to young women (18 to 21 years old) because the model describes a bargaining relationship between young women (daughters) and their parents regarding reproductive choices and the implication for autonomous decision-making. Finally, we restrict the sample to conceptions between 2009 and 2016 to avoid contamination of the treatment with past changes in funding. More details on the conceptual and empirical justifications for these choices can be found in Appendix Section E. Ultimately, after restricting our sample to unmarried women aged 18-21, our sample is composed of 24,564 pregnancies across 20,621 women (Table A.1).

We estimate the following DiD model on a repeated cross-section of all conceptions among unmarried 18-21-year-olds that occurred in Israel between January 2009 and March 2016, based on the time (month-year) of conception:

$$abort_{it} = \delta Post_t \times T_i + \gamma_{a_i} + \gamma_{y_t} + \gamma_{m_t} + X_i' \gamma_i + \epsilon_{it}. \tag{1}$$

The dependent variable ($abort_{it}$) equals one if woman *i* who conceived in year-month *t* had an abortion. On the right-hand side, $Post$ is an indicator for the policy's being in effect ($\mathbb{1}\{t \geq$ Dec-2013$\}$)[19] and $T_i$ indicates that woman *i* is eligible for the subsidy ($\mathbb{1}\{20 \leq age \leq 21\}$).[20] The coefficient on the interaction between $Post$ and $T$ is the standard DiD effect ($\delta$), which can be interpreted as a percentage-point change in the probability of abortion due to the policy. We include age at conception fixed effects ($\gamma_{a_i}$) to control for common characteristics at different ages that affect fertility choices, while conception-year fixed effects ($\gamma_{y_t}$) and conception-month fixed effects ($\gamma_{m_t}$) are used to control for age-invariant time trends and seasonality that affect abortion and fertility. Lastly, $X_i$ represents a set of pre-pregnancy controls that had been shown to affect fertility decisions (Kearney and Levine, 2012; Eckstein et al., 2019; Almond et al., 2019) and are assumed, based on our theoretical model, to impact abortion decisions: ethnicity and religiosity, education, and family's earnings. We control for these nonparametrically in some specifications as a robustness test. Standard errors are clustered at the age-at-conception level.

Our DiD approach assumes parallel trends: Women eligible for the subsidy would have experienced changes in abortion over time similar to those of ineligible women in the absence of the 2014 subsidy. To assess the validity of this assumption, in Figure 3 we plot the mean

[19] The policy went into effect in January 2014. However, women who conceived at the end of 2013 would be eligible for the subsidy if they applied to the committee in 2014 (and met the age requirements). In Israel, most legal abortions occur by the 8th week of pregnancy. Therefore, we move the treatment timing a month back to account for pregnancies that were conceived in December 2013, but may not have been discovered until January 2014, when the policy was already in place, and thus should be considered treated.

[20] A potential concern is that the policy may also induce changes in the fertility decisions of 18- to 19-year-olds if, by backward induction, they know that they will continue to be eligible for a free abortion after the age of 19 (though this seems somewhat implausible as a real-world response). We therefore estimate a specification that drops women aged 20 and uses 21- to 22-year-olds as the treated group instead (see Appendix Figure F.4). Indeed, we find very consistent results. Finally, we see no evidence for a change in abortion utilization among the always-eligible (18 to 19 years old; see Figure 7).

abortion by age group and year and the corresponding 95% confidence intervals around each point estimate. Fitted lines represent the estimated linear pre-trend for each group (and extrapolated post-policy). Intuitively, this serves as a visual illustration of the treatment effect, taking into account differential pre-trends (a la Agha and Zeltzer (2022)). In the pre-period, the trends in abortion for the treated (20- to 21-year-olds) and untreated (18- to 19-year-olds) are quite parallel, although there is a narrowing of the difference for the years closer to 2014. Nevertheless, in 2014 we observe a significant increase in abortion beyond the pre-trends for the treated 20- to 21-year-olds and no substantive difference relative to pre-trends for the untreated 18- to 19-year-olds, as would be expected if the subsidy expansion affected the probability of abortion among newly eligible women.

Appendix F presents additional parallel trends assessments for the 18- to 19-year-old sample and for two alternative populations: 30- to 35-year-olds, where the other age cutoff for funding eligibility (33 years old) is used to determine treatment, and the full sample of women aged 18-40 with both age cutoffs (19 years old and 33 years old) used to define treatment. We also present parallel trends assessments for the various subgroups of interest, which are relevant for testing the predictions from Section 3.2.

## 4.3 Empirical results

### Effect of the abortion funding policy

The model predicts that two types of daughters will gain from government financial support for abortion (autonomy-affected and price-affected daughters), as illustrated by the shaded regions in Figure 2b. Indeed, we find that removing the abortion cost increased the probability of abortion by 3-4.6 percentage points relative to younger women who were already subsidized (Table 1). This is equivalent to an increase of approximately 4.5%-7%, compared with the baseline abortion ratio of 66% among unmarried women aged 18-21 who conceived.[21]

The results in Table 1 follow our baseline specification in Equation 1 and two other robustness tests. Estimating Equation 1 without controls ("DiD"), we find a 4.6-percentage-point increase in the probability of abortion. To address concerns regarding the differential pre-trends discussed above, we estimate three alternative specifications and find similar results across all three (columns 2-4 in Table 1). First, we include pre-pregnancy controls and find a 3.2-percentage-point increase in the probability of abortion ("DiD + controls" in Table 1). Second, to address the differential time trends more directly, we run a specification following Agha and Zeltzer (2022) in which we first residualize the abortion outcome on separate pre-trends for control and treated groups and then run the standard DiD (Equation 1) on the residualized

[21] This main result, as well as the following heterogeneous results, hold when we restrict our sample to the population of first pregnancies.

abortion (see Appendix F for more details on this approach). This specification results in a 3-percentage-point effect size (third column of Table 1) and is statistically indistinguishable from the "DiD + controls" specification.[22] Third, we estimate a triple-differences approach, using married women aged 18-21 as the third difference. The magnitude (3.9 percentage-points) and significance of the effect in the triple difference specification (column 4) are statistically indistinguishable from any other specification in Table 1, and thus serves as stronger evidence for the strength and consistency of the policy effect. The 3-4.6 percentage-point effect is the average effect across all 3 post-policy years. The initial increase in 2014 doubled in 2015 and 2016 (Figure F.1), which is consistent with a lag in awareness of the policy.[23]

An advantage of the individual-level microdata on abortion is that we can analyze effects on abortion as a share of women who become pregnant (the abortion ratio). Though the population of pregnant women is the most relevant for studying abortion decision-making, as abortion only becomes a relevant choice conditional on pregnancy, selection into pregnancy may be a concern, since pregnancy is potentially endogenous to the abortion funding policy. To address this concern, we explore an aggregated version of our analysis in which we estimate the DiD on the abortion rate out of all women, as well as on pregnancies and births. To estimate specifications in log-levels, we first collapse the micro-data by year-month-age to get aggregate numbers, then take the natural log. For the log rate specifications, we divide the aggregate levels by the total population of women in that age-year-month group and take the natural log of the rate. The results from both the log-levels and log-rates specifications suggest that abortion increased due to the policy change (Table A.3). Furthermore, we repeat the analysis for births and pregnancies, and find, as expected, that birth rates were significantly lower, but pregnancies were unchanged, which helps to alleviate concerns about selection into pregnancy due to the policy

Finally, these results could also be partially driven by spillover from the illegal to the legal market. If so, we should expect to see an increase in the total number of pregnancies recorded, since the increase in abortion rates would be greater than the decrease in birth rates.[24] We test for this hypothesis in two ways. First, we construct a similar sample of the universe of young women in Israel and test for a change in the probability of conception; we find no effect on conceptions across specifications (Figure A.2). Second, to test for a magnitude change, we

[22]As an additional test, we implement the "Honest DiD" approach (Rambachan and Roth, 2020) and find our results are robust to allowing for violations of parallel trends up to 40% of the maximum possible violation in the pre-treatment period (see Figure F.3).

[23]Appendix Section D.2 discusses this further and presents an analysis of Google search trends for the Hebrew word for abortion, *hapala*). This also address the concern that the effect of the policy is operating via a change in perceptions about abortion. As shown in Appendix Section D.2, the change in the policy was not as salient.

[24]As noted in Clarke (2023), measuring illegal abortion is challenging. While several noisy measures have been used, such as mortality associated with abortion complications, these measures are more relevant in a context in which abortion is illegal.

construct a data set of pregnancies, abortions, and births in levels, after collapsing the data by year, month, and age. We estimate our baseline specification in Equation 1 and find a reduction in births that is proportional to the increase in abortions (see Table A.3). We conclude that spillovers from the illegal markets, if they exist, are relatively small.

### Baseline abortion ratios and policy effects by SES

To test the model's empirical predictions, we split the sample according to the SES classifications described in Section 3.2 and estimate the baseline abortion ratios and Equation 1 separately within each subgroup.

Proposition 1 predicts that women from higher-SES families ($\zeta_i$) are more likely to have an abortion, as illustrated in Figure A.1a. Indeed, Figure 4a shows that baseline levels of abortion are higher among daughters from higher-earning households. Through the lens of the model, this result implies that parents with higher SES have greater resources and thus face a lower cost of funding an abortion for their daughters. As discussed in Remark 3.1, we could observe the same patterns simply because $\zeta$ and $\alpha$ are negatively correlated, yet the model predicts these patterns even if $\zeta$ and $\alpha$ are uncorrelated. To further test this, we control for the daughters' religiosity–which captures a mean-shift in $\alpha$—yet, daughters from lower-earning households still abort less, regardless of religiosity (see Figure 6a).

Moving to the effect of the abortion funding policy, we expect a larger effect among daughters from lower-income families since it removed the implied cost of raising money for the abortion, which was more binding for daughters from lower-income families (see Proposition 2). In Figure 5a we proxy for women's disposable resources using three SES classifications: the woman's own earnings, her mother's earnings, or her father's earnings. Across all of these SES proxies, we find the effect of the policy is larger and statistically significant for women with fewer disposable resources (e.g., the below-median group), which confirms the predictions from Proposition 2.

### Baseline abortion ratios and policy effects by proxies for abortion disutility

In order to proxy for a mean-shift in the key parameter of the model—abortion disutility—we leverage a feature of the Israeli administrative data that allows us to classify the religiosity of households (see Section 4.1). Using this proxy for a mean-shift in the distribution of abortion disutility, Proposition 3 concludes that abortions are more likely among daughters from secular families relative to religious or conservative families. This prediction aligns with patterns observed in the Israeli administrative data. For instance, among unmarried young women who become pregnant, 86% of secular and 56% of religious Jewish women have an abortion (see Figure 4b). This is true even conditional on SES (see Figure 6a).

As another test of Proposition 3, we repeat this exercise for the Israeli-Arab population. Indeed, we see in Figure 4b that 29% of pregnancies are aborted among the Israeli-Arab population, which is the lowest among the three groups.

Moving to the effect of the abortion funding policy, Proposition 4 predicts the abortion funding policy will have a larger impact among religious households if Assumption 2 holds—specifically, that the intergenerational transmission of abortion disutility is low.[25] Consistent with Proposition 4, we find a larger effect of the policy among the religious Jewish population, relative to the secular Jewish population. Furthermore, as another test of Proposition 4, we find a large increase among the Israeli-Arab population (Figure 5b), although the effect is much noisier.

To provide additional supporting evidence for the role of abortion utility cost, we use an additional proxy for $\alpha^P$. Mothers might have a lower $\alpha^P$ relative to fathers, because they expect to carry more of the offered help in childrearing $k$ or because they can relate more to the future experience of their daughters.Therefore, we use the relative earnings of the mother to the father as an indicator of the mother's bargaining power within the household, and therefore her ability to exert her preferences over the abortion decision of her daughter. Indeed, we find an increase in the effect of the policy when fathers are the higher earners (see Figure A.3).

**Policy effect by abortion disutility and SES**

Proposition 2 predicts a larger share of compliers among low-SES households, while Proposition 4 proposes conditions under which religious households would be more likely to be affected by the policy. Together, these suggest that the policy effect should be driven by low-SES and religious households.[26] To test this prediction we split our sample by household SES and religious/ethnic group and estimate the treatment effect of the policy for each subgroup (Figure 6b). Consistent with the prediction, the effect of the policy is higher for low-SES religious Jews and Arabs. Moreover, these are the only two groups for whom we see a statistically significant positive effect.

The magnitude of these effects is also quite large. Among poor religious Jewish women removing the cost of abortion increased abortion by 15 percentage points, which is equivalent to a 28.3% increase relative to the baseline mean for this population; among Israeli-Arabs

[25]As discussed in Proposition 4, there exists another sufficient condition for the model to yield the same prediction. However, Appendix C demonstrates that Assumption 2 is the only sufficient condition that matches the empirical predictions by skill level with the empirical patterns we see in the Israeli data.

[26]Note that both Propositions could simultaneously hold true if the composition among Israeli households were such that the policy affected low-income secular families and high-income religious families. Nonetheless, the first-order stochastic dominance assumption in Proposition 4 eliminates this possibility. As a result, low-income religious households have a higher probability of being among the compliers with the abortion funding policy.

the 16.2 percentage-point increase is equivalent to a 56.4% increase. These magnitudes are in line with the 17%-68% reduction in abortion in response to reductions in funding access for abortion that others have found using fluctuations in state Medicaid funding (Cook et al., 1999; Meier and McFarlane, 1994; Morgan and Parnell, 2002).

# 5 Does autonomy affect women's family formation?

In this section we explore whether the empirical results in Section 4.3 have implications for the daughters' subsequent family formation and if so, whether they operate through autonomy or price effects.[27] Despite being marginally constrained by the monetary cost of the procedure, the policy can affect the abortion decision of daughters through different mechanisms, depending on the relationship between her abortion disutility toward abortion and that of her parents. For instance, Assumption 2 implies that the policy will reduce the ability of numerous parents to convince their daughter to keep the child.[28] While Proposition 5 shows that among families with daughters who have an abortion due to the funding policy, the fraction of daughters that would have kept the child due to the intervention of their parents is larger than that of daughters who would have made the same decision with autonomy.

To shed more light on the discussion of price and autonomy effects, we present medium-term effects of the abortion funding on the fertility and family formation decisions of young women that are consistent with an autonomy effect.

### Empirical strategy

We use the 2014 Israeli policy—which eliminated the monetary cost of abortion—as a natural experiment to estimate the causal effect of avoiding an early birth on early parenthood, age at first birth, parity (the total number children women have), and marriage. We report the results for two populations of interest: the subpopulation of women from low-SES religious-Jewish families (for whom the largest policy effect was observed),[29] as well as for the entire population of unmarried 18- to 21-year-olds. We estimate the intention-to-treat (or, reduced form, henceforth "RF") effect of the policy using the following specification:

[27] As a reminder, "autonomy-affected" daughters are those who switch have an abortion due to the abortion funding once they no longer need to involve their parents, who strongly oppose abortion. The "price-affected" daughters come from households with where daughters and parents have aligned, moderate abortion disutility. Daughters in these households also have an abortion due to the policy, simply because it removed the monetary cost of the abortion.

[28] In Section C we discuss the validity of Assumption 2 and suggest an empirical test for it. We then show several empirical justifications for it in the Israeli context and data.

[29] While we also identified a large and statistically significant effect of the policy for low-SES Israeli-Arabs in Section 4.3, for this analysis we do not group them with the low-SES religious-Jewish women, since we do not have a direct measure of religiosity and family formation norms differ by religion.

$$Y_i^{Post} = \theta \cdot Post \cdot T_i + \rho \cdot Y_{c_i}^{Pre} + \gamma_{a_i} + \gamma_{c_i} + X_i'\gamma_i + \epsilon_i \tag{2}$$

As in Equation 1, $Post$ is an indicator for the policy's being in effect ($\mathbb{1}\{c_i \geq$ Dec-2013$\}$) and $T_i$ indicates woman *i* is eligible for the subsidy ($\mathbb{1}\{20 \leq age_{c_i}\}$). $Y_i^{Post}$ is the mean outcome of woman $i$ in the year of and through 3 years post-conception year $c_i$; $Y_i^{Pre}$ is the mean outcome of women $i$ in the three years prior to the conception year $c_i$; $\gamma_{a_i}$ are age at conception fixed effects; $\gamma_{c_i}$ are year-month-of-conception fixed effects, and $\epsilon_i$ is the error term.[30] We include the same pre-pregnancy controls specified in Equation 1.

**Delaying parenthood**

Intuitively, in the absence of the abortion funding, the autonomy-affected daughters only continued the pregnancy because their parents strongly opposed abortion but they required support. With the introduction of abortion funding, we should expect to see that these daughters are more likely to delay parenthood in the subsequent several years. The results in Table 2 are consistent with this prediction. First, we find a reduction in the probability of parenthood in the medium term by 3.3 percentage points. Moreover, for the population of low-SES religious Jewish women, the probability of parenthood in the medium term is reduced by 11.7 percentage points. Similarly, conditional on giving birth in the subsequent 3 years, women's age at first birth increased on average by 0.41 years in the overall population of 18- to 21-year-olds and 0.56 years in the low-SES religious Jewish young women, respectively. These magnitudes are meaningful, particularly considering that this outcome is censored because we are only able to consider fertility 3 years after the index conception.

**Marriage**

We might expect that a delay in parenthood for autonomy-affected daughters would also imply a delay in marriage and family life altogether. To formalize this intuition, Section 2 presented an alternative interpretation of how parents' childrearing support ($k$) might be realized via the marriage market. Under this interpretation, childrearing help is not offered by the parents directly but by the partner. If the daughter has the child with autonomy, she marries someone who offers some childrearing help $k_0$. Parents can influence their daughters by helping her marry a better prospective candidate (e.g., arranged marriage or providing more time to go on dates—i.e., a partner who offers more childrearing help $k_1$. Importantly, under this

[30]Unlike Equation 1, here the outcomes are defined relative to conception year $c_i$, which is the reason for the change in notation.

interpretation, providing the daughter with a higher $k$ is costly for the parents.

Our results in Table 2 are consistent with this interpretation. First, we find a reduction in the probability of marriage in the medium term by 3.6 percentage points. Moreover, for the population of low-SES religious Jewish women, the probability of marriage in the medium term is reduced by 16 percentage points.

### Human capital and labor supply

The daughter's abortion decision revolves around the trade-off between the opportunity cost of keeping the child and both the monetary and psychological costs of abortion. We can model the decisions that govern the opportunity cost, which might involve optimal choices related to education, labor, and other productive activities. However, in order to keep the model focused on the abortion and parental involvement decisions, we simplified the setting by assuming there exists some opportunity cost of time. A natural question following the autonomy-effect discussed above is what daughters who terminated their pregnancy are doing with their time—or in other words—did they change their human capital investment or labor supply?

Our data limits us in studying this question, since we can only follow these daughters until 2017—up to 3 years after the conceptions affected by the 2014 policy. Nevertheless, for completeness, we report the results of this limited analysis in Appendix G, but we caution any over-interpretation of these findings in light of the short time horizon. Our results suggest that removing the cost of abortion resulted in an investment in human capital, substitution toward more flexible work arrangements, and a shift toward better-paying jobs in the short to medium term for low-SES religious Jewish women (Table G.1). The results for the overall population of unmarried 18- to 21-year-olds are similar but often smaller in magnitude and noisier. This suggests that higher human capital and economic returns accrued to the more economically disadvantaged group of women. This finding is consistent with what researchers have found in studies of the US, that educational attainment and labor force participation increase more for low-income or Black women (Angrist and Evans, 2000; Kalist, 2004).

## 6 External validity

To demonstrate the generalizability of the model and empirical findings beyond young women and the Israeli, we extend our analysis in two ways. First, we provide empirical results for older Israeli women by relaxing the strict identification requirements for our empirical strategy in Section 4. Second, we empirically test the abortion decision-making model's predictions based on two US policy changes. For both the older Israeli women and the US policies, we find evidence consistent with our model's predictions regarding an increase in women's autonomy in the abortion decision due to an increase in abortion access.

## 6.1 Extending the analysis to older Israeli women

Although the model focuses on young women (the daughters) and their bargaining with their parents, it does not specify how young these women are. Our empirical analysis is restricted to women around the age cutoff and focuses on young women aged 18 to 21 at the time of conception. However, we might expect that similar behavior extends to other age groups, if the daughters are still dependent on their family's financial support. To extend our empirical analysis to other age groups, we compare first differences in the probability of abortion two years before and after the policy change by age at the time of conception. The results in Figure 7 provide suggestive evidence that older women are affected, but the effect decreases with age. Specifically, the first differences show a 4-8 percentage-point increase in the probability of abortion among women aged 20-27—the common age group for college attendance in Israel when economic independence has not yet been achieved—then tapers off for older women closer to the 32-year-old cutoff.

To further examine the predictions of the model for this older population, we repeat the before and after by age exercise separately for low-SES women from religious/conservative families (Figure A.4a)[31] and daughters from either secular or high-SES families (Figure A.4b). Although the effect of the policy is largest for younger women in both panels, similar to Figure 7, the magnitudes are as much as four times higher for the women from low-SES and religious/conservative families, consistent with the predictions of Propositions. These findings confirm that for older women the abortion funding policy also affected their autonomy in abortion decision-making.

## 6.2 Autonomy in other US abortion policies

Next, we demonstrate the generalizability of the abortion decision-making model outside the Israeli context by empirically testing the predictions with two US policy changes. First, we use the empirical design of Myers (2017), which shows that granting daughters greater autonomy via a confidential access to abortion decreased teen births. We demonstrate that these effects are larger in regions where public opinion was more opposed to abortion. Second, we replicate Venator and Fletcher (2021), which shows that abortion clinic closures in Wisconsin decreased the abortion rate. We extend their analysis and find that the magnitude of the effect is increasing in the religiosity of the affected county. Taken together, these applications show that US policies that affect abortion access result in similar heterogeneity along cultural and

[31] Note that this figure combines both religious Jews and the Israeli-Arab population.

religious lines. While this analysis is much more coarse, given the nature of the aggregated data in hand, the results are consistent with Proposition 4 and the corresponding empirical results in Section 4, and thus extends our analysis beyond the Israeli context.

#### Application to confidential abortion access laws

Briefly, Myers (2017) uses a difference-in-differences strategy to estimate the effects of introduction of the oral contraceptive pill, the legalization of abortion, and laws that grant young women confidential access to each across US states on first births and marriage occurring before the ages of 16 to 21. Myers finds that granting young women confidential access to abortion resulted in a 5.7-percentage-point decrease in the probability of giving birth before age 19 and a 4.8-percentage-point decrease in the probability of marriage before age 19. These findings suggest that while legalizing abortion also resulted in reductions in teen births and marriage, the largest effects were due to confidential access for minors.

We rely on replication code and the classification of policy environments in Myers (2017) and use 1979-95 Current Population Survey (CPS) June Fertility Supplements from the original analysis along with the 1977 General Social Survey (GSS) data on attitudes toward abortion to test Proposition 4. We assume that young women living in areas with more conservative or restrictive attitudes toward abortion have parents (or social networks) with higher abortion disutility. Therefore, the effect of confidential access to abortion should be higher in these areas.

The left panel of Figure 8 presents data on attitudes toward abortion by region using the GSS. In the South and Midwest of the United States, 29% believed that abortion should be legal in any case; in the Central North, Mid-Atlantic, and Mountain regions of the US, 41%; and in the Pacific and New England states, 58.4%. We estimated Myers' specification within each region and found that the effect of confidential access to abortion mirrors these attitudes but in the reverse: The largest reductions in teen births are seen in regions with the most conservative attitudes toward abortion, while the smallest reductions are in regions with the most permissive attitudes (right panel of Figure 8).

#### Application to abortion clinic closures in Wisconsin

Venator and Fletcher (2021) study a set of abortion laws passed in Wisconsin between 2010 and 2017 that caused two of the five abortion clinics in the state to close. As a result of the closures, the distance to the nearest clinic increased by 55 miles on average and to over 100 miles in the most affected counties. Venator and Fletcher use a difference-in-difference design to estimate the effects of changes in travel distance to the nearest abortion clinic on abortions and births. They find that a 100-mile increase in the distance to the nearest clinic is associated with 30.7% fewer abortions and a 3.2% increase in births.

To test whether our model's predictions hold in this case, we use the Venator and Fletcher's replication code and data from the Wisconsin Department of Health Services on abortions and births. We integrate county-level data on religious affiliation from the InfoGroup 2009 Religion survey (InfoGroup, 2009) along with county-level population counts to calculate a measure of religiosity for each county. We estimate the authors' specifications separately for counties with high and low religious populations.

We use variation in the change in travel time as a proxy for changes in the monetary cost of abortion $\pi$. A slight extension of Proposition 4 predicts that women in religious communities will exhibit a larger effect for small price changes (since they are more autonomy constrained), but a smaller price gradient (since they have a higher abortion disutility). Indeed, we find that small increases in the travel cost lead to a reduction in abortion that is approximately 1.9 times larger (closest clinic is 50-100 miles away) and 1.5 times larger (closest clinic is 25-50 miles away) in more religious counties. But when the largest travel cost is imposed on women seeking an abortion (i.e., the closest clinic is more than 100 miles away), there is a relatively similar effect on the abortion rate for high- and low-religiosity counties (Figure 9).

# 7 Conclusion

Our study offers critical insights into the effects of abortion funding policies on young women's autonomy in abortion decision-making. Abortion access is a pressing policy issue globally and in settings in which abortion is already legal, the financial cost can impose substantial barriers. We examine the determinants of young women's autonomy in abortion decision-making and assess the impact of funding policies on their autonomy, both theoretically and empirically using Israeli administrative data on abortion and an exogenous policy change.

We found that the removal of financial barriers significantly increased the probability of abortion among eligible young women. Notably, financial barriers to abortion extend beyond mere cost considerations, as they often compel women to disclose private information regarding their abortion decision, further compromising their autonomy. This increase is particularly pronounced among those from low-SES and religious or conservative families, confirming that economic constraints and parental opposition play pivotal roles in shaping abortion decisions.

The empirical evidence supports our theoretical model, which posits that young women's autonomy in abortion decisions is determined by her parents' opposition to abortion. The policy's impact was most substantial for autonomy-affected daughters, who could circumvent parental involvement in their reproductive choices due to the elimination of the monetary cost. This finding aligns with broader literature on the socioeconomic determinants of abortion and fertility, extending our understanding of how financial support policies can enhance reproductive autonomy.

Furthermore, our analysis indicates that the policy's effects extend beyond immediate reproductive decisions to influence broader life trajectories, including delays in early parenthood and marriage, and suggestive evidence of investments in human capital. These medium-term outcomes underscore the critical role of economic factors in shaping young women's life choices and the potential for policy interventions to promote greater autonomy and better socioeconomic outcomes.

By validating our model in the Israeli context and demonstrating its applicability to other settings, such as the US policies, our study provides robust evidence of the generalizability of these findings. Thus, our findings are relevant for other settings in which abortion is legal but may be costly and out of reach for low-income populations or those who cannot lean on social networks for support. Expanding financial support for abortion is being discussed both internationally and in many US states following the Supreme Court decision that overturned *Roe v. Wade* (Gutierez, 2021; Heyward, 2022; Denholm, 2018; Bladen, 2022). For example, in the United States some states allow Medicaid-funded abortions for low-income women under certain conditions, and several states have recently mandated that insurance companies fully cover the cost of abortion (Gutierez, 2021; Heyward, 2022). Past studies have shown that interruptions in Medicaid funding cause a reduction in abortion, but the mechanisms—and particularly the role of *autonomy*—have not been investigated in those settings (Kane and Staiger, 1996; Levine et al., 1996; Cook et al., 1999; Meier and McFarlane, 1994; Morgan and Parnell, 2002). Future research should continue to explore the nuanced interactions between economic support policies, parental influence, and young women's reproductive autonomy to inform more effective and equitable reproductive health policies globally.

In summary, our study contributes to the literature by theoretically and empirically demonstrating how covering the cost of abortion can be a powerful policy tool that allows women to time parenthood and potentially increase their human capital investment, while granting them autonomy in making personal reproductive decisions.

# References


Leila Agha and Dan Zeltzer. Drug Diffusion through Peer Networks: The Influence of Industry Payments. *American Economic Journal: Economic Policy*, 14(2):1–33, May 2022. ISSN 1945-7731. doi: 10.1257/pol.20200044.

Douglas Almond, Hongbin Li, and Shuang Zhang. Land Reform and Sex Selection in China. *Journal of Political Economy*, 127(2):560–585, April 2019. ISSN 0022-3808. doi: 10.1086/701030.

Onur Altındağ and Theodore Joyce. Another day, another visit: Impact of Arkansas' mandatory waiting period for women seeking an abortion by demographic groups. *Journal of Public Economics*, 213:104715, September 2022. ISSN 0047-2727. doi: 10.1016/j.jpubeco.2022.104715.

Shaul Amsterdamski, Liel Kyzer, and Riad Agberia. Radio conversation, 2021.

Elizabeth Oltmans Ananat, Jonathan Gruber, and Phillip Levine. Abortion Legalization and Life-Cycle Fertility. *The Journal of Human Resources*, 42(2):375–397, 2007. ISSN 0022-166X.

Elizabeth Oltmans Ananat, Jonathan Gruber, Phillip B Levine, and Douglas Staiger. Abortion and Selection. *The Review of Economics and Statistics*, 91(1):124–136, January 2009. ISSN 0034-6535. doi: 10.1162/rest.91.1.124.

Joshua Angrist and William Evans. Schooling and Labor Market Consequences of the 1970 State Abortion Reforms. In *Research in Labor Economics*, volume 18 of *Research in Labor Economics*, pages 75–113. Emerald Group Publishing Limited, 2000.

Sonia Bhalotra, Irma Clots-Figueras, and Lakshmi Iyer. Religion and abortion: The role of politician identity. *Journal of Development Economics*, 153:102746, November 2021. ISSN 0304-3878. doi: 10.1016/j.jdeveco.2021.102746.

M Antonia Biggs, Heather Gould, and Diana Greene Foster. Understanding why women seek abortions in the US. *BMC Women's Health*, 13(1):29, December 2013. ISSN 1472-6874. doi: 10.1186/1472-6874-13-29.

Marianne Bitler and Madeline Zavodny. The effect of abortion restrictions on the timing of abortions. *Journal of Health Economics*, 20(6):1011–1032, 2001.

Lucy Bladen. ACT government to provide free abortions. *The Canberra Times*, August 2022.

Rebecca M. Blank, Christine C. George, and Rebecca A. London. State abortion rates the impact of policies, providers, politics, demographics, and economic environment. *Journal of Health Economics*, 15(5):513–553, 1996.

Kasey Buckles. Fixing the Leaky Pipeline: Strategies for Making Economics Work for Women at Every Stage. *Journal of Economic Perspectives*, 33(1):43–60, February 2019. ISSN 0895-3309. doi: 10.1257/jep.33.1.43.

Central Bureau of Statistics (Israel). Religion and Self-Definition of Extent of Religiosity Selected Data from the Society in Israel. Technical Report 10, June 2018.

Wei Chang. ABORTION LAWS AND LIFE CHOICES OF YOUNG WOMEN AND GIRLS IN SUB-SAHARAN AFRICA: A CROSS-COUNTRY ANALYSIS. In *PAA*, April 2020.

Damian Clarke. The Economics of Abortion Policy. 2023.

Damian Clarke and Hanna Mühlrad. Abortion laws and women's health. *Journal of Health Economics*, 76:102413, March 2021. ISSN 0167-6296. doi: 10.1016/j.jhealeco.2020.102413.

Sylvie Colman, Silvie Colman, and Ted Joyce. Regulating Abortion: Impact on Patients and Providers in Texas. *Journal of Policy Analysis and Management*, 30(4):775–797, 2011. ISSN 0276-8739.

Philip J. Cook, Allan M. Parnell, Michael J. Moore, and Deanna Pagnini. The effects of short-term variation in abortion funding on pregnancy outcomes. *Journal of Health Economics*, 18 (2):241–257, April 1999. ISSN 0167-6296. doi: 10.1016/S0167-6296(98)00048-4.

Matthew Denholm. Libs cry foul after Shorten promises abortion funding. *The Australian*, February 2018.

Zvi Eckstein, Michael Keane, and Osnat Lifshitz. Career and Family Decisions: Cohorts Born 1935-1975. *Econometrica*, 87(1):217–253, 2019. ISSN 0012-9682. doi: 10.3982/ECTA14474.

Stefanie Fischer, Heather Royer, and Corey White. The impacts of reduced access to abortion and family planning services on abortions, births, and contraceptive purchases. *Journal of Public Economics*, 167(C):43–68, 2018.

Diego Gentile and Catalina Ravizza. The effects of access to safe abortion methods on women's mortality, fertility, employment, and birth outcomes. 2018.

Libertad González, Sergi Jiménez-Martín, Natalia Nollenberger, and Judit Vall Castello. The Effect of Access to Legal Abortion on Fertility, Marriage, and Long-term Outcomes for Women. 2022.

Melody Gutierez. California lawmakers prepare to protect abortion access, starting with eliminating copays. *Los Angeles Times*, December 2021.

Deborah Haas-Wilson. The Impact of State Abortion Restrictions on Minors' Demand for Abortions. *The Journal of Human Resources*, 31(1):140, 1996. ISSN 0022166X. doi: 10.2307/146045.

Giulia Heyward. Maryland Lawmakers Expand Abortion Access, Overriding Governor's Veto. *The New York Times*, April 2022. ISSN 0362-4331.

InfoGroup. Religion, 2009.

Jenna Jerman, Rachel K Jones, and Tsuyoshi Onda. Characteristics of U.S. Abortion Patients in 2014 and Changes Since 2008. Technical report, Guttmacher Institute, New York, May 2016.

Ted Joyce and Robert Kaestner. The Impact of Mandatory Waiting Periods and Parental Consent Laws on the Timing of Abortion and State of Occurrence among Adolescents in Mississippi and South Carolina. *Journal of Policy Analysis and Management*, 20(2):263–282, 2001. ISSN 0276-8739.

David E. Kalist. Abortion and female labor force participation: Evidence prior to Roe v. Wade. *Journal of Labor Research*, 25(3):503–514, September 2004. ISSN 0195-3613, 1936-4768. doi: 10.1007/s12122-004-1028-3.

Thomas J Kane and Douglas Staiger. Teen motherhood and abortion access. *The Quarterly Journal of Economics*, 111(2):467–506, 1996.

Megan L. Kavanaugh and Jenna Jerman. Contraceptive method use in the United States: Trends and characteristics between 2008, 2012 and 2014. *Contraception*, 97(1):14–21, January 2018. ISSN 1879-0518. doi: 10.1016/j.contraception.2017.10.003.

Melissa S. Kearney and Phillip B. Levine. 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, May 2012. ISSN 0895-3309. doi: 10.1257/jep.26.2.141.

Yaron Kelner. Basket of medicine 2014: free abortions withour medical reasoning. *Ynet*, December 2013.

Henrik Kleven, Camille Landais, Johanna Posch, Andreas Steinhauer, and Josef Zweimüller. Child Penalties across Countries: Evidence and Explanations. *AEA Papers and Proceedings*, 109:122–126, May 2019.

Henrik Kleven, Camille Landais, Johanna Posch, Andreas Steinhauer, and Josef Zweimüller. Family Policies & the Dynamics of Gender Inequality. January 2021.

Phillip Levine and Douglas Staiger. Abortion as Insurance. Technical Report w8813, National Bureau of Economic Research, Cambridge, MA, February 2002.

Phillip B. Levine. Parental involvement laws and fertility behavior. *Journal of Health Economics*, 22(5):861–878, September 2003. ISSN 0167-6296. doi: 10.1016/S0167-6296(03)00063-8.

Phillip B. Levine. *Sex and Consequences: Abortion, Public Policy, and the Economics of Fertility*. Princeton University Press, July 2007. ISBN 978-0-691-13045-3.

Phillip B. Levine and Douglas Staiger. Abortion Policy and Fertility Outcomes: The Eastern European Experience. *The Journal of Law and Economics*, 47(1):223–243, April 2004. ISSN 0022-2186. doi: 10.1086/380475.

Phillip B. Levine, Amy B. Trainor, and David J. Zimmerman. The effect of Medicaid abortion funding restrictions on abortions, pregnancies and births. *Journal of Health Economics*, 15:555–578, 1996.

Jason M. Lindo and Mayra Pineda-Torres. New Evidence on the Effects of Mandatory Waiting Periods for Abortion. Working Paper 26228, National Bureau of Economic Research, September 2019.

Jason M. Lindo, Mayra Pineda-Torres, David Pritchard, and Hedieh Tajali. Legal Access to Reproductive Control Technology, Women's Education, and Earnings Approaching Retirement. *AEA Papers and Proceedings*, 110:231–235, May 2020. ISSN 2574-0768. doi: 10.1257/pandp.20201108.

K J Meier and D R McFarlane. State family planning and abortion expenditures: Their effect on public health. *American Journal of Public Health*, 84(9):1468–1472, September 1994. ISSN 0090-0036, 1541-0048. doi: 10.2105/AJPH.84.9.1468.

Eirin Mølland. Benefits from delay? The effect of abortion availability on young women and their children. *Labour Economics*, 43:6–28, December 2016. ISSN 09275371. doi: 10.1016/j.labeco.2016.06.011.

S Philip Morgan and Allan M Parnell. Effects on pregnancy outcomes of changes in the North Carolina State Abortion Fund. *Population Research and Policy Review*, 21:20, 2002.

Caitlin Myers and Daniel Ladd. Did parental involvement laws grow teeth? The effects of state restrictions on minors' access to abortion. *Journal of Health Economics*, 71:102302, May 2020. ISSN 01676296. doi: 10.1016/j.jhealeco.2020.102302.

Caitlin Knowles Myers. The Power of Abortion Policy: Reexamining the Effects of Young Women's Access to Reproductive Control. *Journal of Political Economy*, 125(6):2178–2224, December 2017. ISSN 0022-3808, 1537-534X. doi: 10.1086/694293.

Marissa Newman. 15,000 illegal abortions performed in Israel each year, activists claim. *The Time of Israel*, January 2017.

Michelle Oberman. Abortion Talmud: Interrogating the Nature and Purpose of Abortion Laws in the 21st Century. 2020.

Cristian Pop-Eleches. The impact of an abortion ban on socioeconomic outcomes of children: Evidence from Romania. *Journal of Political Economy*, 114(4):744–773, 2006.

Cristian Pop-Eleches. The supply of birth control methods, education, and fertility evidence from Romania. *Journal of Human Resources*, 45(4):971–997, 2010.

Ashesh Rambachan and Jonathan Roth. A More Credible Approach to Parallel Trends. *Review of Economic Studies*, page 83, 2020.

Gilla K. Shapiro. Abortion law in Muslim-majority countries: An overview of the Islamic discourse with policy implications. *Health Policy and Planning*, 29(4):483–494, July 2014. ISSN 0268-1080. doi: 10.1093/heapol/czt040.

Joanna Venator and Jason Fletcher. Undue Burden Beyond Texas: An Analysis of Abortion Clinic Closures, Births, and Abortions in Wisconsin. *Journal of Policy Analysis and Management*, 40(3):774–813, 2021. ISSN 1520-6688. doi: 10.1002/pam.22263.

Table 1: Effect of Removing Abortion Cost on Abortion Utilization

| | DiD | DiD+Controls | LTT | DDD |
|---|---|---|---|---|
| Treatment Effect | 0.046 | 0.032 | 0.03 | 0.039 |
| | (0.013) | (0.016) | (0.013) | (0.017) |
| N | 24,650 | 21,432 | 24,650 | 125,115 |

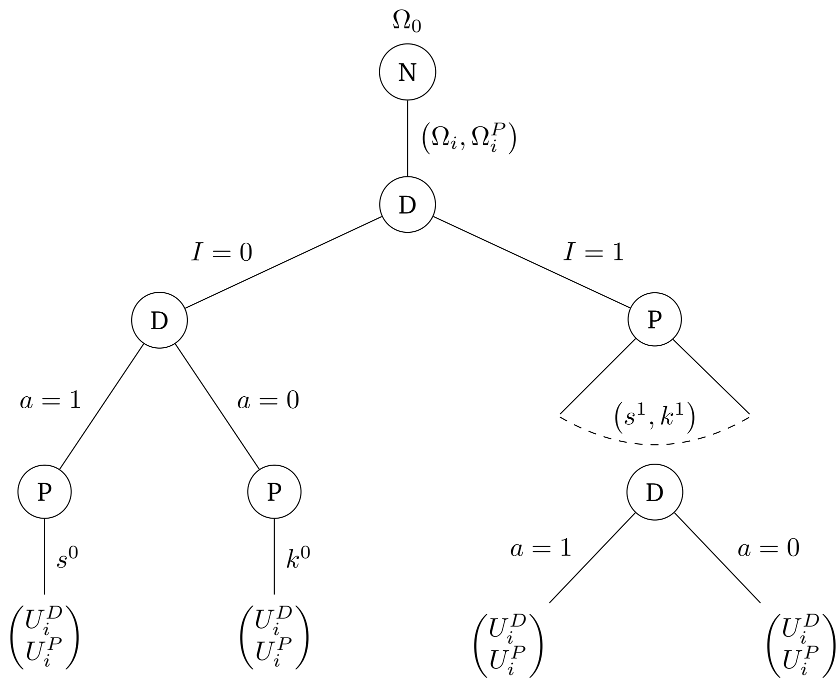
*Notes:* This table presents the primary difference-in-differences results of the 2014 policy on abortion utilization. Our baseline specification in Column (1) follows Equation 1 as described in Section 4.2 – where we compare outcomes before and after the policy change for women who were affected (20-21) and unaffected (18-19) by the expansion of the subsidy. Column (2) includes a set of pre-pregnancy non-parametric controls (ethnicity, religiosity level, education, family's yearly earnings). Column (3) controls for differential time pre-trend as described in Appendix F. Column (4) corresponds to a specification using the married population as a third difference (DDD). Standard errors clustered by age at conception in parentheses.

Table 2: Reduced Form Effect on Fertility & Family Formation Outcomes

| | 18-21 Year Olds | | | Low-SES & Religious | | |
|---|---|---|---|---|---|---|
| | Coef | Mean | N | Coef | Mean | N |
| Is a parent | -0.033 | 37.7% | 24,650 | -0.117 | 60.9% | 1,790 |
| | (0.004) | | | (0.021) | | |
| Age at 1st Birth | 0.41 | 21.27 | 15,369 | 0.566 | 20.53 | 1,578 |
| | (0.062) | | | (0.128) | | |
| Number of children | -0.077 | 0.6 | 24,650 | -0.117 | 1.03 | 1,790 |
| | (0.016) | | | (0.091) | | |
| Married | -0.036 | 18.8% | 24,650 | -0.16 | 39.1% | 1,790 |
| | (0.02) | | | (0.041) | | |

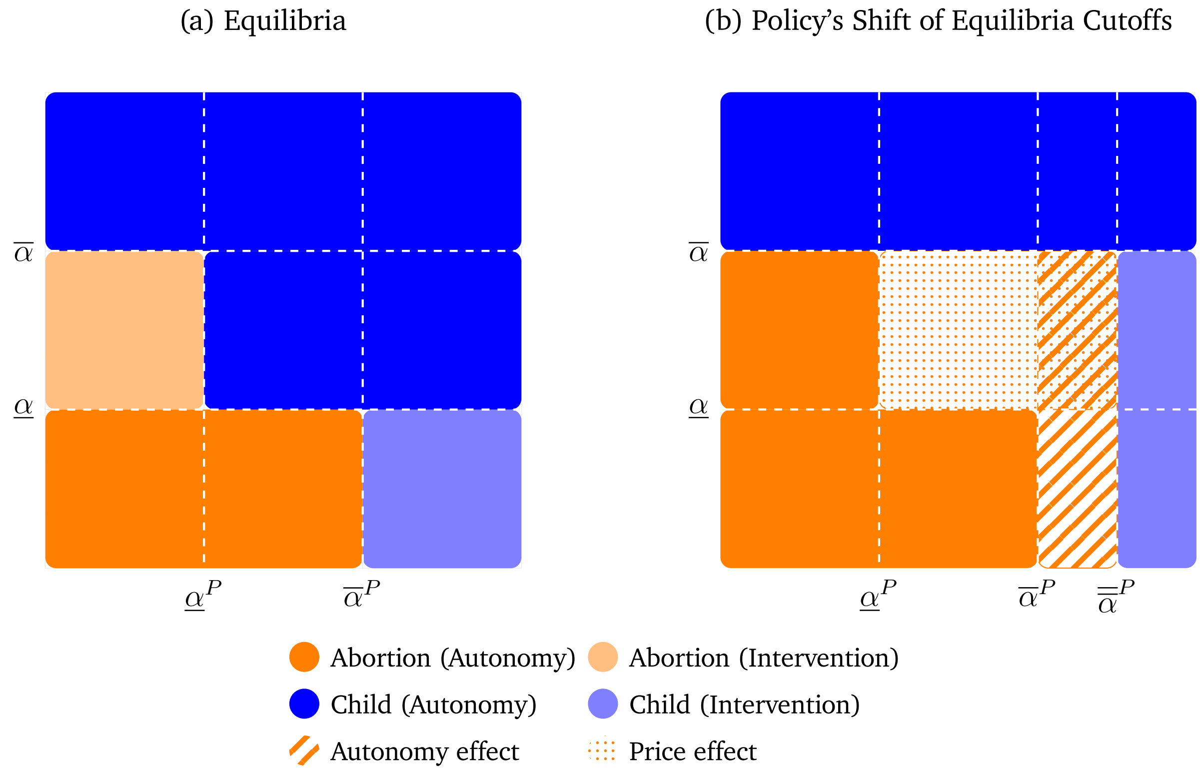
*Notes:* This table presents results for the effect of the 2014 policy on a range of fertility and family formation outcomes (Equation 2). Columns 1-3 presents the results for the entire sample of 18-21 year old, unmarried women who conceived. Columns 1-3 further restrict the sample to women from low-SES and religious background. The means are calculated using the pre-policy data. Standard errors clustered by age at conception in parentheses.

Figure 1: Daughters Abortion and Parental Involvement Decision



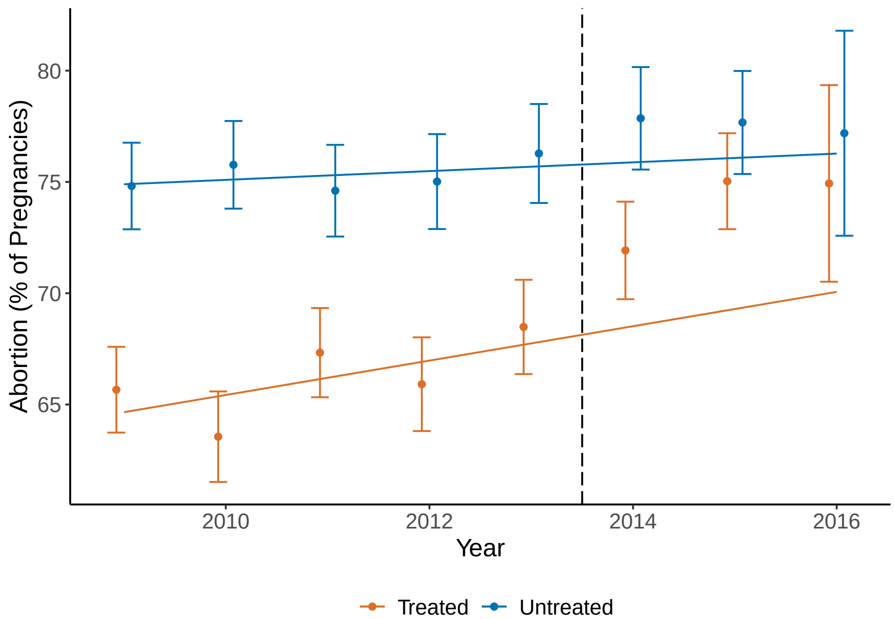

*Notes:* This figure presents the extensive form representation of the game – the decision tree daughters and parents take in the abortion decision-making process. $D$ and $P$ denote the decision taken by daughters and parents, respectively. Daughters decide whether to involve their parents ($I$), and whether to get an abortion ($a$). Parents decide on their offer bundle: monetary support for the abortion if taken ($s$), and their child-rearing support if their daughter decides to give birth ($k$). Both $s$ and $k$ are superscripted based on the daughter's decision to involve her parents $I$. $\Omega$ denote the exogenous parameters as described above.

Figure 2: Equilibria Illustration and Policy Change



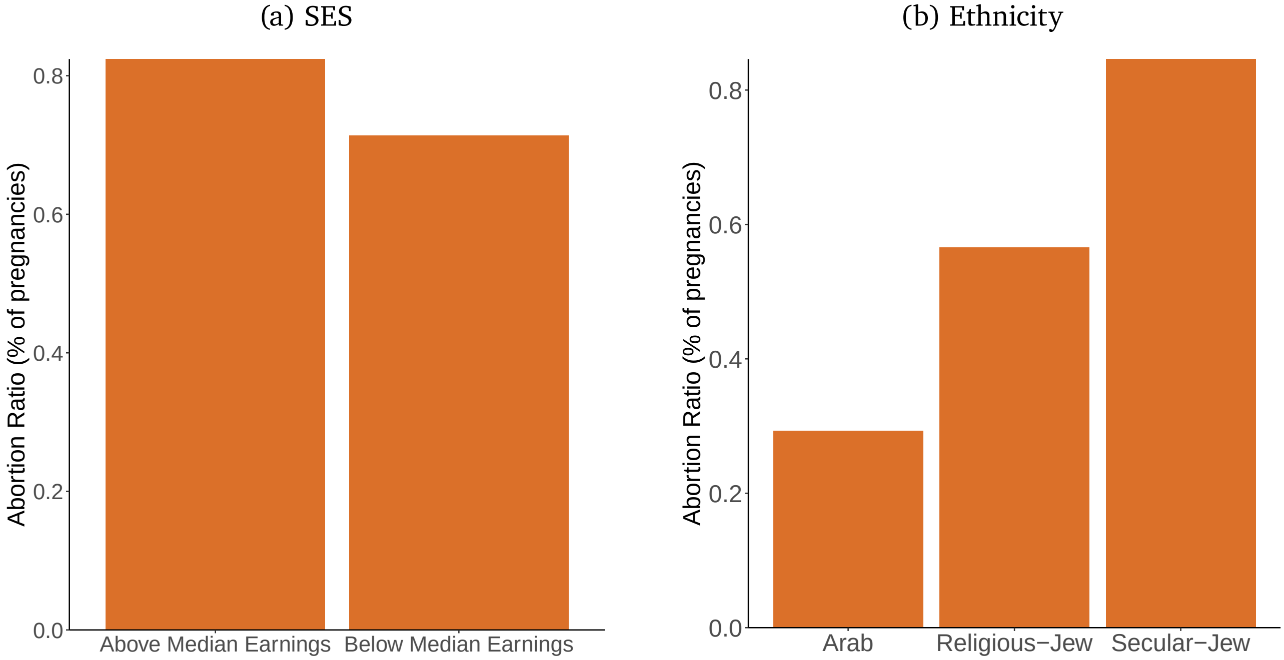

*Notes:* This figure illustrates the four potential equilibria of the abortion autonomy model. Panel (a) presents the baseline equilibria of the model; Panel (b) presents the change in equilibria when abortion funding policy is introduced, emphasizing the price affected daughters (doted area), and the autonomy affected daughters (diagonal lines area). The equilibria are based on the relationship between the daughter's utility costs on the support $\alpha_i \in [\underline{\alpha}, \overline{\alpha}]$, and parents' abortion utility cost on the support $\alpha_i^P \in \left[\underline{\alpha}^P, \overline{\alpha}^P\right]$. $\underline{\alpha}, \overline{\alpha}, \underline{\alpha}^P, \overline{\alpha}^P$ dictate the thresholds of the abortion utility cost that switches the daughters' and parents' decision of involvement, support, and abortion. For example, daughters with $\alpha_i < \underline{\alpha}$ would generally prefer an abortion unless their parents persuade them otherwise, whereas daughters with $\underline{\alpha} \leqslant \alpha_i < \overline{\alpha}$ would prefer to have the child if not convinced by their parents otherwise. Finally, daughters with $\alpha_i \geqslant \overline{\alpha}$ would never carry out an abortion.

Figure 3: Parallel Trends Assessment (18-21)




*Notes:* This figure presents the abortion ratio (the % of pregnancies that end in abortion) for treated (20-21) and control (18-19) women over time (2009-2016). The control population is presented in blue, and the treatment population is presented in orange. The dashed line indicates the timing of the 2014 policy change. Each dot represents the mean abortion ratio in a given year for the treatment and control groups of women, respectively, and the error bars mark the 95% confidence interval around the point estimate. The linear lines are fitted separately before the policy change for each group (and extrapolated post the policy).

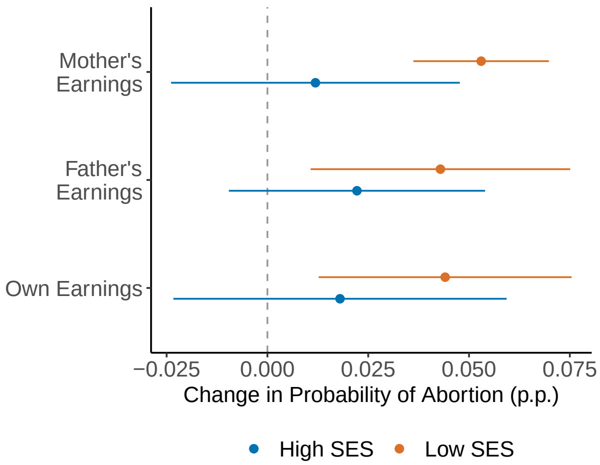
Figure 4: Baseline Abortion by Sub-Group



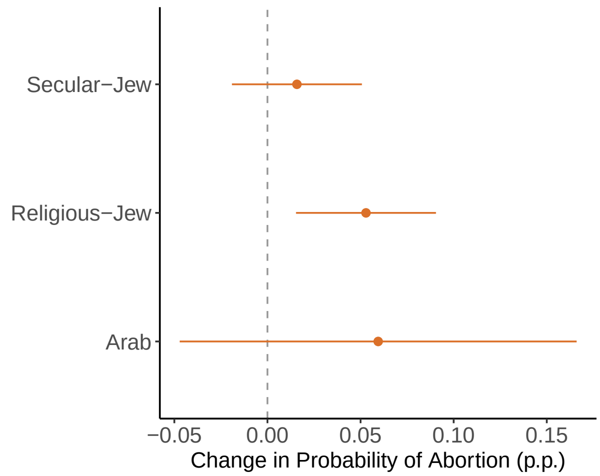

*Notes:* This figure presents abortion ratios (the % of pregnancies that end in abortion) among important sub-groups within Israel before 2014 (the year of the policy change). Each panel shows the proportion of abortions out of all pregnancies (orange) and the sub-population of unmarried 18-21 year olds (blue). Panel (a) presents abortion by the woman's father's earnings. Panel (b) presents abortion by religious-ethnic group.

Figure 5: Effect of the Policy by SES and Ethnicity

(a) Policy Effect by SES Groups

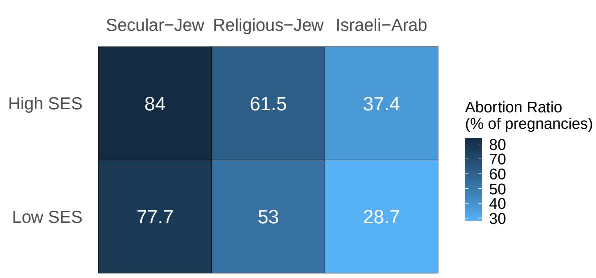



(b) Policy Effect by Ethnicity

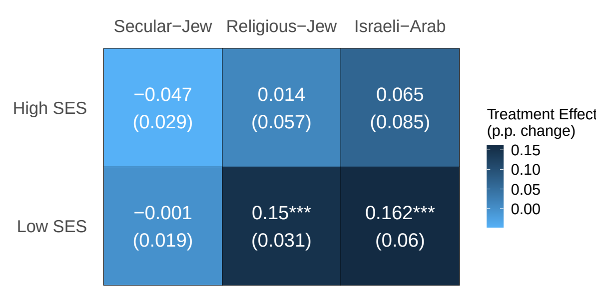



*Notes:* The figure presents the heterogeneous difference-in-differences results, where we split the sample by population groups. Panel 5a is split into two SES groups according to the yearly earnings of the mother/father/daughter who conceived (our proxy for household SES level). Panel 5b is split by ethnic groups. In each row, the dot represents the percentage change in the treatment effect ($\delta \cdot Post_t \times T_i$), and lines mark the 95% confidence interval around the point estimate. The dashed vertical line is at 0, indicating an insignificant result. The sample includes all unmarried women in the country aged 18-21 from 2009-2016 who conceived. Treated women are those aged 20-21.

Figure 6: Baseline and Policy Abortion by SES and Religiosity Level



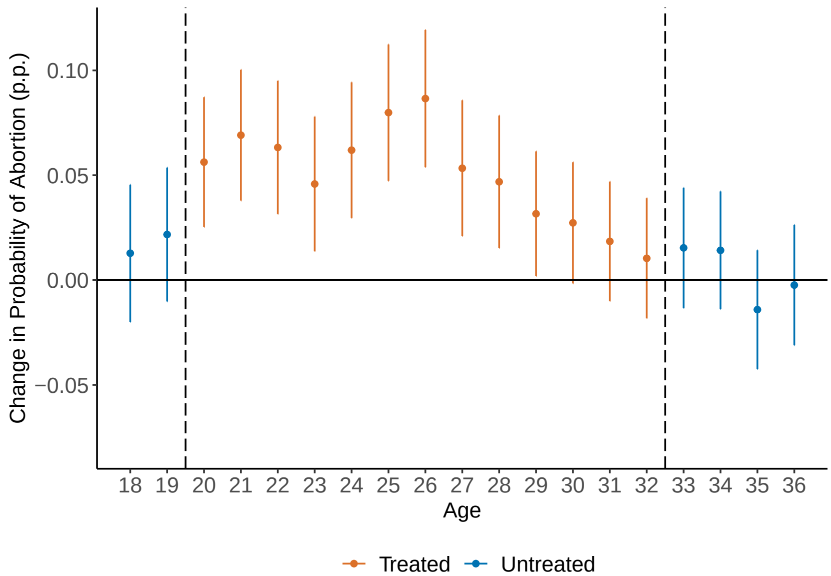

(a) Baseline Abortion by SES and Religiosity




(b) Policy Effect by SES and Religiosity

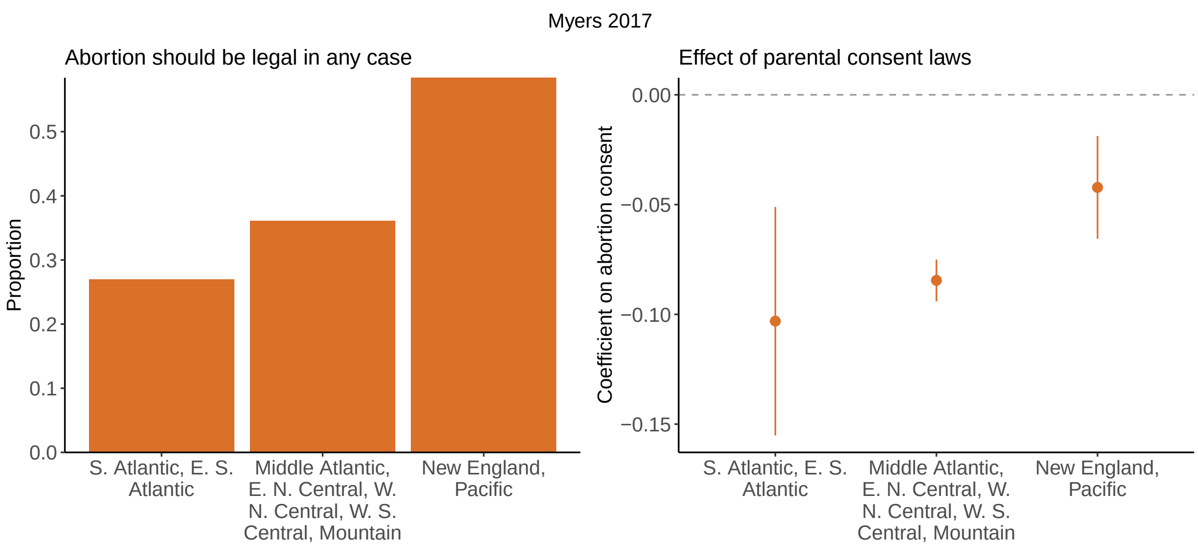
*Notes:* This figure presents the heterogeneous abortion ratios and effect of the abortion funding policy on abortion while splitting the population across two dimensions: religiosity and SES background (based on father's earnings). Panel (a) presents baseline abortion (as a % of pregnancies) within each group; Panel (b) presents the effect of the policy on abortion by each group in percentage points. Darker blue shading corresponds to higher values, while lighter blue represents smaller values. Standard errors clustered by age at conception in parentheses. *p< 0.05, **p< 0.01, ***p< 0.001.

Figure 7: Difference Between Pre and Post Policy Abortion by Age (Raw Data)



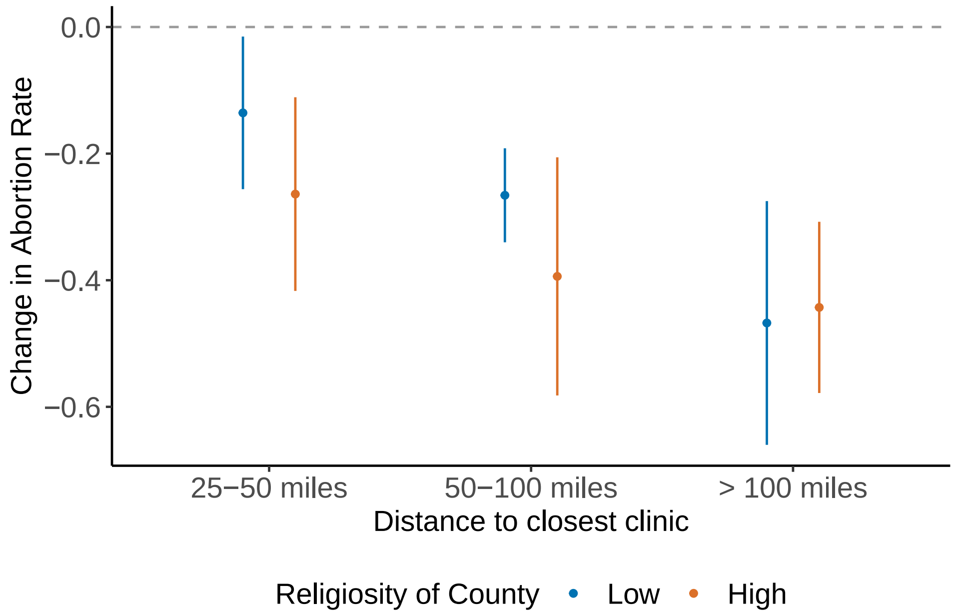

*Notes:* This figure presents the results of a before-and-after exercise in which we restrict the data to two years before and after the 2014 policy change (2012-2015) and estimate the post-policy difference in the abortion separately for each age (18-36). The point estimates can be interpreted as the percentage point difference in the probability of abortion for each age group following the introduction of the 2014 policy. The lines are 95% confidence intervals and the horizontal line marks 0. The ages that were eligible for the 2014 subsidy expansion are indicated in orange (treated), while those ineligible are presented in blue. The dashed vertical lines mark the two age cutoffs for the subsidy change eligibility: 19-years-old and 33-years-old.

Figure 8: Removal of U.S. parental consent laws




*Notes:* This figure presents the heterogeneity in the effects of the confidential abortion access laws in the U.S., by abortion attitudes in the region. The left panel of Figure 8 presents data on attitudes toward abortion by region using the GSS. The right panel presents the estimates from Myers (2017) specification of the effect of confidential access to abortion on teen birth, grouped by the regions in the left panel.

Figure 9: Wisconsin's clinic closers




*Notes:* This figure presents the estimates from Venator and Fletcher (2021) separately for counties with high and low religious populations and by the increase in travel distance. Venator and Fletcher (2021) use a difference-in-difference design to estimate the effects of changes in travel distance to the nearest abortion clinic on abortions and births. We integrate county-level data on religious affiliations from the InfoGroup 2009 Religion survey (InfoGroup, 2009) along with county-level population counts to calculate a measure of religiosity for each county.