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THE IMPACT OF U.S. FAMILY PLANNING PROGRAMS ON FERTILITY AND MORTALITY: EVIDENCE FROM THE WAR ON POVERTY AND TITLE X

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Abstract:
Over forty years ago, the U.S. government adopted a policy of funding domestic family planning services, and the effects of these programs have been debated ever since. Within an event-study framework, I exploit community-level variation in the timing of federal grants for family planning services under the Economic Opportunity Act (1965 to 1974) and Title X (1970 to 1980) to evaluate their impact. The results provide robust evidence that federal family planning grants reduced birth rates in funded communities by four percent within six years. I find no evidence that family planning grants reduced maternal or infant mortality rates.

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Over forty years ago, the U.S. government adopted a policy of funding domestic family planning services. Federal grants for family planning began under the Economic Opportunity Act (EOA, 1964), the cornerstone legislation of President Johnson's "War on Poverty," and family planning received its own authorizing language in Title X of the Public Health Service Act (1970). These programs continue today. In 2009, the U.S. government appropriated over $255 million for domestic family planning and related health services for low-income families (Office of Population Affairs 2009).

The initial justification for using public funds for family planning relied upon the logic of a 1963 National Academy of Sciences report. It argued that "low-income families do not want more children than do families with higher incomes, but they have more because they do not have the information or the resources to plan their families effectively according to their own desires." To proponents of these programs, it followed that subsidizing family planning would expand access to lower-income families to enable them to achieve their desired number of children. Public family planning programs would, therefore, reduce unwanted childbearing and, by increasing spacing and reducing the number of children ever born, improve maternal and infant health.[1]

The evidence for this argument was and remains remarkably thin. Although the Center for Disease Control (1999) named "family planning" one of the top ten public health achievements of the twentieth century, the fertility and health effects of these programs have been debated by academics and policy makers since the 1960s.[2] This debate has been reflected in the dueling theoretical paradigms used by economists and demographers as well as the results of their empirical evaluations (Pritchett 1994a, 1994b; Bongaarts 1994, Knowles et al. 1994). Even forty years after family planning programs began, nonrandom assignment of participants to programs and of family planning programs to communities presents a formidable challenge to causal inferences about these programs' effects. Different methods of accounting for nonrandom assignment lead to strikingly different conclusions. Joshi and Schultz (2007)

[1] This logic still permeates the policy discussion today. In February 2009, the Congressional Budget Office estimated that a proposed family planning provision of the "Stimulus Package" would save over $200 million over five years. This calculation, of course, relied upon the presumption that funds for family planning reduce births.

[2] A series of provocative articles in *Science* with titles like "Population Policy for Americans: Is the Government Being Misled?" (Blake 1969) and rebuttals, "Family Planning and Public Policy: Who is Misleading Whom?" (Harkavy, Jaffe and Wishik 1969) featured the 1960s controversy among prominent population scientists.

summarize this literature saying that "few studies have identified the impact of these policies on the fertility and health of women" due to the rarity of estimates "based on sources of variation in fertility induced by policies that are independent of parent preferences and preconditions" (1). Although recent quasi-experimental studies have made progress in evaluating the longer-term effects of family planning programs in developing countries (Miller 2005, Joshi and Schultz 2007, Salehi-Isfahani et al. 2008), the impact of family planning programs in the U.S. remains an open and important question.

This paper uses the rapid increase in U.S. domestic family planning grants under the Economic Opportunity Act and Title X as a laboratory for evaluating their effects. Central to this paper's empirical strategy is the "wild sort of operation" of making grants in during the late 1960s and early 1970s (Gillette 1996). This arose for several main reasons. First, the EOA transformed the federal government's relationship with U.S. communities. Rather than making grants through states or local governments, the EOA funded community organizations and programs directly. Second, the large budget of the EOA and the waning popularity of the Johnson administration put enormous political pressure on administrators to spend money rapidly. The absence of guidelines, federal-to-community granting precedents, and current information on community characteristics make a prima facie case for treating family planning grants as exogenous shocks to the local supply of family planning services—a case that is bolstered by empirical evidence that 1960 county characteristics fail to predict the timing of these awards (section III). In addition, newly-compiled information on grants to other EOA programs show that family planning awards were not typically packaged with other federal, community-level spending (section V). In short, federal family planning grants under the War on Poverty and Title X provide a local shock to the supply of family planning services that is plausibly independent of local changes in the demand for children.

Using an event-study framework (Jacobson et al. 1993), the analysis links year to year changes in communities' fertility and mortality outcomes in the ten years before and after its *first* federal family planning grant. Considerable within-state variation in the timing of family planning grants allows the event-study specification to include state-by-year effects to account for shifts in state policies like the expansion of Medicaid and abortion legalization. The results provide robust evidence that federal family

planning grants had a significant and lasting effect on U.S. childbearing (section IVA and B). Although birth rates in eventually-funded communities had evolved no differently from those in never-funded communities prior to receiving a family planning grant, the general fertility rate fell by an average of 1.6 births per year within six years of the first federal award—a four percent reduction from the date of the award. These average effects reflect changes in childbearing for younger and older as well as white and nonwhite women. In contrast, the results provide no evidence that family planning grants reduced maternal or infant mortality (section IVC and D).

These results have broad relevance for theoretical formulations of economic and population growth, many of which implicitly ignore the implications of changes in the costs of regulating births. Lower cost regulation of the number and timing of births may impact the evolution of the age distribution, family size and structure, and the size of the labor force. It may also affect the well-being and human capital accumulation of children through well-known "quality"-quantity channels. As having fewer or better timed children allows parents to invest more time and resources in each child, the effects of family planning policy may have longer-term, inter-generational implications for inequality and economic growth.

I. A Brief History of U.S. Family Planning Policy

A. From Legalization to Subsidization: Improvements in Medical Contraception in the 1960s

Today, the most effective contraceptive methods are scientifically tested, U.S. Food and Drug Administration approved, and medically prescribed. A variety of nonprofit and public organizations make family planning information, services and supplies available to women without means. But historically, contraception was deemed obscene material and banned under federal and most state statutes.[3]

State bans on the sales of contraceptives became especially important in the late 1950s and 1960s (Tone 2001, Bailey 2010). Although these laws were outdated and had been difficult to enforce, their salience grew with the U.S. Food and Drug Administration's approval of the birth control pill, *Enovid*, in

[3] The Comstock Act, an anti-obscenity bill passed by Congress in 1873, defined contraception as obscene. In the aftermath of this federal Act, states passed Comstock laws as well to regulate the manufacture, sales and distribution of information about obscene material (Tone 2001).

1960. The "extraordinary immediate enthusiasm" surrounding the introduction of "the Pill" (Weinberg 1968:1, citing a 1966 U.S. Public Health Service National Fertility Study) turned into public controversy as state laws prohibited physicians and pharmacists from prescribing and selling it. Shortly after the Pill's appearance on the U.S. market, the 1965 U.S. Supreme Court's decision, *Griswold v. Connecticut*, limited states' rights to restrict the use of contraception. In the aftermath of this decision, legislatures across the country revised their obscenity statutes, and family planning advocates turned their attention to expanding government-supported "family planning" programs.

The argument for subsidizing family planning was based upon the premise that birth rates were higher among lower income families *because* they lacked access to information about reliable contraceptives (Becker 1960 picks up on this argument) and the money to purchase supplies. This was especially true for the Pill. In the early 1960s, the monopoly producer of *Enovid* sold a prescription for roughly $750 per year (in 2008 dollars, Tone 2001: 257)—roughly three times the cost of birth control pills today without factoring in the cost of doctor visits. Another perspective on the cost is that an annual prescription would have cost more than three weeks of full-time work at the 1960 minimum wage.

B. The Expansion of Federally-Funded Family Planning Programs, 1965 to 1980

Although language about "family planning" was not included in the Economic Opportunity Act (EOA) passed in 1964, family planning was regarded as a poverty prevention program and fit well with the EOA agenda.[4] With the quiet endorsement of Sargent Shriver, the head of the Office of Economic Opportunity (OEO), the agency began funding family planning programs through the Community Action Program as early as 1964 (Levitan 1969).

Figure I shows gradual increases in federal outlays for these programs between 1965 and 1967 and two large increases in funding corresponding to two important policy changes. The first change came with the 1967 amendment to the EOA, better known as the "Green Amendment" (Public Law 90-222,

[4] According to 1967 estimates, expenditures for family planning through the Maternal and Child Health programs (started in 1942; DHEW 1974:3, citing Memorandum from Surgeon General Thomas Parran to State Health Departments, 1942) and the Maternal and Infant Care programs under the 1963 Social Security Amendment were small (DHEW 1974: 3, citing House Appropriations Hearings).

Title II, Section 222a), which designated family planning as a "national emphasis" program. From fiscal year 1967 to 1970, federal allocations to family planning increased by over 13 times their 1967 level to roughly 400 million dollars (2008 dollars). The second change in federal outlays occurred under the administration of President Richard Nixon. In his 1969 State of the Union Address, he advocated that Congress "establish as a national goal the provision of adequate family planning services within the next five years to all those who want them but cannot afford them." In November 1970, his effort culminated in the passage of Title X of the Public Health Service Act (also known as the Family Planning Services and Population Research Act, P.L. 91-572).

Exactly how family planning grants were allocated from this budget is not well documented. EOA files (memos and written correspondence) housed at the National Archives in College Park contain very little information about how administrators made funding decisions for any of the War on Poverty programs. An alternative source, Gillette's compilation of oral histories of Johnson administration officials (1996), provides retrospective accounts of these decisions. Donald Baker, chief counsel of the OEO, recalls: "It was a wild sort of operation in those early days, making the first grants. We didn't have any guidelines and didn't have the time really to draft them to start out…As a practical matter, Sarge[nt Shriver, director of the OEO,] and [Jack] Conway[, head of the Community Action Program,] and many others in the Congress were pressing the program people to get the money out and to go, go, go and make the grants and make the contracts" (Gillette 1996: 193). Edgar Cahn, an attorney who worked closely with the OEO, described OEO administrators' attempt "to move fast to shovel out the money, because a few precious, perfect projects won't do anybody any good" (199). Indeed, with midterm elections looming and the escalation in Vietnam eroding the popularity of President Johnson, the main difficulty faced by the OEO was finding ways to spend the money so that the effects of the programs could be felt.[5] Empirical evidence supporting this alleged haphazard granting process is presented in sections III and sections VI.

[5] This is also noted by Ludwig and Miller (2007). They exploit the fact that grant writing assistance was provided to the poorest U.S. counties to jump-start the application process in the case of Head Start.

One feature of this federal-direct-to-applicant approach to funding family planning is that the implementation of programs varied considerably. Not only were grants made to a variety of administrators (health departments or neighborhood centers, hospitals, and nonprofit providers such as Planned Parenthood), but grantees differed considerably in their interpretation of "family planning." Some programs focused exclusively on "population control" and distributed the Pill to *any* woman walking through their doors. Others like Planned Parenthood embraced a more holistic approach to reproductive health and provided comprehensive physicals and counseling for women desiring contraception (Bailey 1999: ch. 4). In fact, a broad range of services could be called "family planning" including "medical services (medical examination, instruction, and prescription), educational services (such as patient recruitment and discussion of the relative merits of different methods [of birth control]), and social services" (Cutright and Jaffe 1977: 3). The unifying feature of these programs—and the feature that distinguished them from other medical services funded under the War on Poverty—was the provision of free or subsidized information, services and supplies relating to contraception.

The political and popular support for funding family planning waned with two events in 1973. First, *Roe v. Wade*'s legalization of first trimester abortions put family planning providers at the center of a national debate about restrictions on federal funds for this purpose. Second, the involuntary sterilization of two girls, Minnie Lee and Mary Alice Relf (ages 12 and 14), called to national attention the abuses of local "family planning" programs. As the OEO was phased out under the Nixon and Ford administrations, the total federal appropriations fell to an average of roughly 400 million per year (in 2008 dollars) from 1974 to 1981. In fiscal year 1981, appropriations fell again to an average of 300 million per year (in 2008 dollars) and have remained close to this level for the last 25 years.[6]

[6] It is important to note that state and local dollars were increasing over this period, but I have found only rough estimates of these changes. Before 1977, the bulk of funds were federal (Cutright and Jaffe 1977: 3). By 1980, the Alan Guttmacher Institute (2000) estimated that fifty percent of public support of family planning came from Title X. By 1994, however, Title X provided only twenty percent of public support (13).

II. THE EXPECTED EFFECTS OF FAMILY PLANNING ON CHILDBEARING AND HEALTH

The primary stated objective of federally-funded family planning programs was to provide low-income individuals with greater choice over the number and spacing of their children (OEO 1969: 3). A second objective was to improve maternal and infant health.[7] Whether or not these programs achieved these objectives is a matter of debate. It is worth noting that obtaining these predictions from a general equilibrium, dynamic model of fertility is difficult. As a result, most economic models focus on the "demand for children" and neglect the "supply of children" altogether. Common (implicit) assumptions are that fertility control is costless (contraception is free and requires no effort) and that the number of children is chosen deterministically (no infertility or contraceptive failure).[8] Even though family planning may still affect childbearing choices in these simplified models, its role is more limited.[9]

A model developed by Michael and Willis (1976) integrates this demand-side framework with a "supply side." This approach relaxes the assumption that fertility regulation is costless, and couples choose a cost-minimizing contraceptive strategy j, that is associated with a shadow price, π_j. Because the choice of a contraceptive strategy determines an ex ante possible distribution of births (characterized by its mean, μ; variance is ignored for simplicity), the model treats ex ante the number of children born as a random variable.

Contraceptive strategies have both fixed and marginal costs. A marginal cost (incurred per averted birth) could be a behavioral cost (as with abstinence or withdrawal), the inconvenience or discomfort of barrier methods during intercourse (diaphragms or condoms), or the necessity of purchasing supplies (as with condoms or the birth control pill). Fixed costs would include the cost of searching for a supplier or learning about a particular method. Therefore, if contraceptive strategy j entails a fixed cost, α_j, and marginal cost, β_j, the total cost of using this strategy to avert an expected $\mu_N - \mu$ births, where μ_N is the expected number of children born in the absence of any contraceptive method, is $\pi_j(\mu)=\alpha_j+\beta_j(\mu_N-\mu)$.

[7] A third objective was to help families escape from poverty. Discussion of this third objective is omitted here, because it is not evaluated in this paper.
[8] Some notable exceptions include Michael and Willis (1976), Heckman and Willis (1976), Easterlin, Pollak and Wachter (1980), and Hotz and Miller (1988).
[9] The demand-side model of Becker and Lewis (1973: S283), for instance, shows that an improvement in "contraceptive technique" may increase the shadow price of child quantity and, thus, induce a reduction in the number of children born.

To illustrate how this framework relates to the choice of contraceptive strategy, figure II plots the total costs for a given number of births averted for four strategies. Depending upon the number of births a couple wishes to avoid (given by the demand for children and not discussed here), different contraceptive strategies may be optimal. For instance, if a couple wishes to avoid one birth, then a strategy that entails a negligible fixed cost but higher marginal cost (like withdrawal, represented by line Π_1) may be optimal. A couple wishing to avoid two births may choose the strategy associated with Π_2; the high fixed but low marginal cost of strategy 3 would make it the lowest cost option for preventing three to five births. Couples wishing to have six or fewer births, however, would choose strategy 4. As pointed out by Michael and Willis (1976), the total cost function for achieving an expected number of births, μ, is given by the bolded, lower envelope, or $C(\mu)=\min_j\{\alpha_j+\beta_j(\mu_N-\mu)\}$.

The expected impact of a federal family planning grant would be to lower both the fixed and marginal costs of using contraceptives. Grants that established family planning programs reduced the need to search for contraceptive information and locations to obtain supplies.[10] Grants to existing family planning programs would tend to reduce the marginal costs of purchasing contraceptive supplies and visiting the doctor. This could occur directly (through the family planning program itself) or indirectly by affecting the prices of medical contraceptives and doctors visits available through private providers. In the simple illustration of figure II, family planning grants would alter the curvature of the lower cost envelope by reducing the intercepts and slopes of the total cost lines by $(1-s_{\alpha j})$ and $(1-s_{\beta j})$ with $0\leq s<1$ for many contraceptive strategies. As a result, the minimum, total cost for achieving an ex ante distribution of births in a community with a family planning grant would be no greater than the cost in a community not receiving a grant, or $C^{fp}(\mu)=\min_j\{\alpha_j(1-s_{\alpha j})+\beta_j(1-s_{\beta j})(\mu_N-\mu)\}\leq C(\mu)=\min_j\{\alpha_j+\beta_j(\mu_N-\mu)\}$. It is also worth highlighting that the reduction in prices need not be equal across strategies, because family planning grants probably reduced the costs of medical contraceptives by more than other methods.

[10] During this period, not all physicians believed contraception was ethical to prescribe. Accounts relate that many physicians were reluctant to prescribe contraception to women with fewer than a certain number of children or below a certain age or who were unmarried. Federally-funded family planning programs may have equalized access to information and supplies.

Holding the demand for children fixed, the resulting fall in prices may have increased the adoption of contraceptive strategies requiring information and supplies (like the Pill or the Intra-Uterine Device, IUD). Theoretically, these reductions in the fixed costs of using medical contraceptives and in the marginal costs of preventing births should reduce both *intended and unintended* births over the lifecycle. Intended births would fall, because family planning lowers the costs of achieving ex ante birth distributions with lower means. Unintended births may fall because medical contraceptives have lower failure rates (the Pill and IUD).

Observed contemporaneous outcomes may not change as predictably for several reasons. First, federal family planning grants may not affected the fixed or marginal cost of averting births if other nonprofit providers were already subsidizing family planning services. That is, federal funds may have crowded out alternative funding for family planning (investigated in section V). Second, period birth rates (not completed fertility as in the model) can be closely linked to the timing of federal grants, but the dynamics of fertility responses to family planning are more complex than the model's static predictions. For instance, lifetime fertility could fall even as shorter-term fertility rises if, for instance, longer-birth intervals are no longer necessary to avoid having too many births. A general equilibrium framework may imply an increase the frequency of intercourse among previously abstinent groups due to the reduced bargaining power of younger (unwed) women (Akerlof et al. 1996), which may increase pregnancies. In short, these factors suggest that fertility may fall little in the shorter run and could even increase. Although conventional wisdom asserts that an increase in federal funding for family planning should reduce the birth rate, economic theory provides no definitive answer that it does.[11]

The impact of family planning grants on maternal and infant health is more difficult to model, but the expectation that grants improved health are closely related to the arguments above. Federal family planning grants may have increased contact with primary caregivers. Both birth control pill and the IUD required visits to a physician for refills and check-ups. These more frequent visits to a healthcare

[11] In the 1990s, Kearney and Levine (2007) discuss how expansions in Medicaid eligibility that were introduced at the state-level during the 1990s increased contraceptive use and reduced birth rates among teens by roughly 4 percent and non-teens by 2 percent. This is empirical evidence suggests that the *reduction* in births may be expected to dominate in the 1960s as well.

provider imply that health conditions may have been identified and treated before they became critical.[12] Frequent contact with a physician may have also encouraged women to seek prenatal care if they became pregnant.[13] Family planning services reduced the cost of preventing risky pregnancies for women with pre-existing health conditions, which lowered health risks to the mother and also to the infant. Consequently, family planning grants may have induced more women to obtain general health and medical services beyond those relating directly to pregnancy.

III. Using The Roll-Out of Family Planning Grants as a Quasi-Experiment

A. Previous Research on the Effects of U.S. Family Planning and Its Limitations

Previous research on U.S. family planning programs under the War on Poverty has relied upon cross-sectional comparisons of states (Weingarden 1974, Moore and Caldwell 1977, and Brann 1979) or cross-sectional comparisons of counties (Damey 1975; Udry, Bauman, and Morris 1976; Cutright and Jaffe 1977; Forrest, Hermalin, and Henshaw 1981) to make inferences about program impacts. Mellor (1998) reviews the findings of each these studies and documents conflicting estimates. For instance, Damey and Moore and Caldwell find that measures of family planning use and availability, respectively, are associated with *reduced* birth rates among black women. While Moore and Caldwell do not find a significant correlation between family planning use and fertility rates for white teens, Damey reports that the use of family planning *increases* birth rates among white women. On the other hand, Forrest et al. find no relationship between program enrollment in family planning programs and birth rates among black teens, but conclude that enrollment *reduces* birth rates among white teens. County-level studies of roughly the same period come to apparently contradictory conclusions: Udry et al. find no significant relationship between average dollars spent per recipient of family planning services and births, whereas Cutright and Jaffe report that enrollment in family planning programs is associated with reductions in birth rates among black and white women.

[12] Jaffe et al (1973) estimated that among patients in all organized family planning programs (not just federally-funded programs), 60 percent received a medical examination (not pelvic or breast).

[13] This prediction is consistent with the 50 percent increase in the proportion of low-income women seeing a physician in the first trimester of pregnancy from 1960 to 1980 (Hemminki et al. 1987).

These studies evaluate programs in different years in the late 1960s or 1970s, use different levels of aggregation (county or state), and emphasize different measures of family planning. Their differing conclusions, however, reflect two main limitations. The first relates to program "vintage." Especially during the 1965 to 1975 period when so many programs were just getting established, averaging outcomes of more established programs with those just beginning to operate may lead to downward bias in the estimates. Alternative approaches that account for differences in the number of family planning patients, however, potentially conflate differences in the demand for family planning with its supply. This is closely related to a second limitation. Because program locations were not randomly assigned, communities with family planning programs may differ in their demand for children. Cross-sectional comparisons may, therefore, confound differences in the demand for children with differences in the supply of family planning services even after controlling for differences in observable characteristics.[14] The following subsections describe the creation of a new dataset on the timing of federal family planning grants that can be used, in conjunction with an updated methodology, to address both limitations.

B. New Data on the Roll-Out of Federal Family Planning Grants

To address concerns about program vintage and nonrandom location, I compiled new data on the rollout of federal family planning grants to roughly 700 U.S. communities from 1964 to 1980. Information on family planning grants funded under the OEO is drawn from the National Archives Community Action Program (NACAP) files. Information on family planning grants funded under Title X is culled from the National Archives Federal Outlay (NAFO) files.

Together, these files provide two pieces of information crucial to the analysis. The first is information about the local community (city, county, and state) where the funded services were delivered. This allows each federal family planning grant to be matched to the annual, county-level observations on fertility and mortality outcomes. The second is the date that each community received its *first* federal family planning grant. I use only the timing of a community's first federal award to avoid potentially

[14] In unreported results, I find that accounting for different sets of observable characteristics in cross-sectional, county-level regressions can alter significantly the sign and the magnitude of the estimated "effects" of family planning.

endogenous refunding decisions or endogenous differences in funding amounts. This date allows this analysis to relate local changes in fertility and health outcomes to the precise timing of changes in funding for family planning.

The main limitation of the data is that they provide little documentation explaining the purpose of each grant or the many dates associated with each record.[15] In addition, the grant records for 1969 are missing. To minimize measurement error in the date of the first federal award and the location of service delivery, I compared the NACAP and NAFO data to printed, county-level OEO reports covering the universe of family planning programs in fiscal year 1968, calendar year 1969, and fiscal year 1971 (OEO 1969, 1971, 1974).[16] This comparison allowed me to add 285 communities that received their first funding in 1969. Only 23 of the remaining 422 grants were revised to reflect the earlier date in the OEO reports. Overall, the electronic records and printed reports agreed in 95 percent of cases.

As an additional check, the dates and grant amounts in my database are compared to Title X appropriations published by the Office of Population Affairs (OPA, 2009). Because the OPA figures omit allocations through the Community Action Program, figure I shows that my series—which includes both OEO and Title X grants—is larger than the OPA Title X series before 1974, when both Title X and the OEO funded family planning. The similarity of my data to the OPA figures after 1973, when the OEO was disbanded, lends confidence that my approach captures the bulk of federal family planning awards.

C. The Expansion of Federal Family Planning Grants, 1965 to 1980

Figure III presents a map of the expansion of federal family planning grants for U.S. counties. County is the unit of analysis, because it is the lowest level of aggregation available for outcomes (in most cases, county or local governments were *not* grantees). Counties that received federal funds for family planning are shaded (unfunded counties are not shaded). Roughly 60 percent of the U.S.

[15] Documentation for the program codes is missing. After search printed documents at the National Archives, I settled on using string searches of grant titles to identify the potential set of family planning grants.

[16] The analysis likely misses some communities receiving their first grant before 1968. This is because family planning did not have its own authorizing language, grant titles did not always include "family planning," and the OEO reports used to verify the electronic records begin in fiscal year 1968. By necessity, these communities are grouped with unfunded communities in the analysis. Under the assumption that these early, unobserved grants had similar effects to the ones I observe, this measurement error should lead the analysis to understate the effects of family planning programs.

population of women ages 15 to 44 lived in the shaded 705 counties that eventually got federal family planning grants.

Gradations in shading indicate the period when funded counties received their first award. The lightest gray shades communities first receiving grants between 1965 and 1967 during the early OEO program period; the next darkest gray shades communities first receiving grants between 1968 and 1969 during the expansion of family planning as a "national emphasis program;" the darkest gray shades communities first receiving grants between 1970 and 1973 during the expansion under Title X; black denotes the handful of communities first receiving grants from 1974 to 1980.

The OEO achieved wide geographic coverage in the initial wave of grants. Family planning grants were awarded to communities in each of the lower 48 states, and the timing of these grants differed considerably—even for communities within the same state. For instance, the first community in Texas to receive a grant was Corpus Christi in 1964; Ector and Gonzales, Texas, received their first grants in 1974. In 46 states, at least one county was first funded in at least two of the four policy periods; counties in 39 states first received funding in at least three of the four different periods.

Consistent with communities with and without family planning programs differing in their demand for children, panel A of table I uses county characteristics from the 1960 census to demonstrate key differences between funded (defined here as communities receiving a federal family planning grant between 1965 and 1980) and unfunded communities (defined here as communities never receiving a federal family planning grant between 1965 and 1980 or communities that received funding but with an unknown starting date).[17] Counties receiving family planning grants were located in each census region but were concentrated in urban areas. The populations of counties receiving grants averaged over 184,000, but the populations of unfunded counties averaged just over 25,000. These more urban counties had slightly more educated and affluent residents. Funded counties also had more of their population above the 1960 poverty line for a family of four ($3000 in 1960 dollars). If, for example, counties with more educated and affluent residents were more likely to receive family planning grants and also to

[17] County-level characteristics are from the 1960 County and City Databooks (Haines 2005).

experience more rapidly falling fertility rates and improving health outcomes, then cross-sectional comparisons may overstate the impact of family planning programs on both measures.

Rather than comparing counties receiving family planning grants to those that did not, this analysis relies upon the variation in the timing of when communities received their first federal grants. Panel B of table I shows that 1960 characteristics of communities first funded in different periods appear quite similar with one exception: more populous counties received first grants sooner. This is not surprising because, for a variety of reasons, more "urban" areas may have been more likely to apply or be funded first.[18] Because county fixed effects will be included in regression specifications, this correlation need not be a threat to the internal validity of the analysis.[19] More concerning would be funding patterns that relate to past fertility rates (proportion of residents under age 5), as these could indicate funding patterns related to the demand for children.

Table II presents both weighted and unweighted estimates from least-squares regressions of the year each funded county got its first grant on 1960 characteristics in table I and state fixed effects (see Hoynes and Schanzenbach 2009 for a similar exercise).[20] Aside from differences in population concentration, only the proportion of the population above age 64 significantly predicts getting a grant sooner (columns 1 and 3). This only appears to be the case, however, for counties funded after 1970, because this effect disappears in columns 2 and 4 when only counties funded before 1970 are considered (unweighted: 0.007, s.e. 0.034, weighted: -0.078, s.e. 0.064). Notably differences in lagged fertility measures have no predictive power. The failure of these characteristics to predict the timing of adoption differs from results in Hoynes and Schanzenbach (2009), who report statistically significant relationships between many of these characteristics and the timing of food stamps program initiation.[21] Consistent with oral history accounts of a haphazard application for and allocation of federal grants, 1960 characteristics

[18] Complaints about the initial "urban bias" of funding led administrators to direct funds to more rural areas in later years.
[19] Nevertheless, this urban bias should be kept in mind when considering the external validity of the results, especially if cities and rural areas have heterogeneous responses to family planning grants.
[20] Unweighted estimates treat each county as a separate experiment, and weighted estimates use 1960 county population.
[21] Two limitations of the power of my study relative to theirs should be noted. I do not have information on the month of program initiation and not all of the counties in the U.S. got federal family planning grants.

are poor predictors of when communities received their first family planning grant. Section V of the paper further examines the independence of family planning grants from other federal programs.

D. Data and Event-Study Methodology: Using the Timing of First Grants to Identify Their Impact

The main outcomes of interest are taken from published and electronic Vital Statistics data for 1959 to 1988. As my main fertility outcome, I use the general fertility rate, defined as the number of births by county of mother's residence per 1000 women of childbearing age (15 to 44). For the 1959 to 1968 period, I hand-entered the number of births from published volumes by the county of residence of the mother. For the 1968 to 1988 period, I supplemented this information with publicly available microdata on births aggregated by mother's county of residence. Denominators were constructed by linearly interpolating information between the 1950 and 1960 censuses (Haines 2005) and the 1969 to 1988 Surveillance Epidemiology and End Results (SEER) data. I additionally construct the general fertility rate by race and age-group for 1968 forward. The evolution of the general fertility rate in my sample is plotted for funded and unfunded counties in panel A of figure IV.

As my main health measures, I use annual, county-level counts of maternal and infant mortality for the 1959 to 1988 period. These are drawn from publicly available micro-data of all registered deaths from 1959 to 1980 (NCHS 2008) and contain information on the age, race, and county of residence of the decedent. From these data, I construct maternal mortality rates (mother died at the time of birth from birth complications per 10,000 live births) and infant mortality rates (number of deaths before one year of age per 1000 live births). Race-specific infant and maternal mortality rates require county-level denominators of births and are, therefore, only constructed from 1968 forward. Panels B and C of figure IV describe the evolution of these mortality outcomes in funded and unfunded counties from 1959 to 1988.

Together with the newly-compiled information on the dates of the first federal family planning grants, this balanced panel allows me to evaluate the effects of federal family planning grants within an event-study framework (Jacobson, LaLonde and Sullivan 1993). Using the following linear model (cf. McCrary 2007), I exploit variation in the *timing* of first federal family planning grants,

$$(1) \qquad Y_{j,t} = \theta_j + \gamma_{s(j),t} + \sum_{y=-8}^{-1} \pi_y D_j 1(t - T_j^* = y) + \sum_{y=1}^{16} \tau_y D_j 1(t - T_j^* = y) + \boldsymbol{X}_{jt}'\boldsymbol{\beta} + \varepsilon_{jt} \,,$$

where $Y_{j,t}$ is a fertility or health outcome in county *j* in year *t* = 1959,…,1988 (for race and age estimates, *t* = 1968,…,1988); θ_j is a set of county fixed effects; $\gamma_{s(j),t}$ is either a set of year fixed effects or state-by-year fixed effects; and $\boldsymbol{X}_{jt}$ is a column vector including a constant, the interaction of 1960 census characteristics (proportion of population in urban area, proportion nonwhite, proportion over 64 years of age, proportion of households with income under $3000, and the proportion of the county's land that is rural or a farm) with linear time trends, and annual, county-level per capita measures of government transfers using data from the Bureau of Economic Analysis Regional Information System (REIS) (cash public assistance benefits such as Aid to Families with Dependent Children, Supplemental Security Income, and General Assistance; medical spending such as Medicare and military health care; and cash retirement and disability payments).[22] For my purposes, these controls are comprehensive because the OEO administrators had limited information about counties beyond what was available in the 1960 census or federal accounting office. D_j is a dummy variable equal to one if the county ever received a family planning grant, and the indicator function, $1(\,)$, is equal to one when the year of observation is *y* = -8,-7,…,15, 16, years from the date, T_j^*, when county *j* first received a family planning grant (*y* = 0 is omitted). All values of *y* < -7 take on the value -8 and all values greater than 15 take on the value 16. Because the indicator for *y* = 0 is omitted ($t = T_j^*$), the point estimates of interest, π_y and τ_y, describe the evolution of outcomes in *funded* counties before and after their first family planning grant.[23] π_y is interpreted as the average difference in outcomes *y* years *before* the grant was received, and τ_y is the average difference in outcomes *y* years *after* the grant was received. Because not all counties are observed more than -6 years before or more than 10 years after first funding, the presentation of the estimates in event-study figures corresponds to the years with a balanced sample of counties.

[22] The county characteristics in $\boldsymbol{X}$ are comparable to specifications in Almond et al. (2008: 15). I am grateful to Doug Almond, Hillary Hoynes, and Diane Schanzenbach for sharing the 1959 to 1977 REIS data.
[23] This is slightly different from many applications that omit y=-1 but makes sense because childbirth occurs with a nine month lag.

This methodology confers several benefits over alternative approaches. First, the inclusion of county fixed effects implies that estimates of π_y and τ_y will be consistent *even* in the presence of pre-existing, permanent *unobserved* differences between funded and unfunded counties. Because adjusting for unobserved differences in the demand for children is key to identifying the impact of a shock in the supply of family planning services, the inclusion of county effects is an important improvement over cross-sectional studies. Second, the event study relaxes several important assumptions in the standard differences-in-differences framework. Rather than assuming that $\pi_y = \pi$ for $y<0$, estimates of π_y allow a visual and statistical evaluation of the *evolution* of pre-treatment unobservables in funded communities. In this sense, they allow an assessment of whether the effect preceded the treatment –a standard falsification test in the differences-in-differences literature—and also permit an evaluation of the importance of differential pre-trends in funded communities. Similarly, the analysis relaxes the standard differences-in-differences assumption the treatment with a family planning grant is associated with a one-time, level shift in outcomes. Rather than assuming that $\tau_y = \tau$ for $y<0$, the post-treatment outcomes can change gradually and non-linearly, which eliminates the potential downward bias associated with "vintage effects." Finally, a county-level panel allows the inclusion of a rich set of covariates. County-level REIS covariates and linear trends in 1960 county characteristics may be *more* exhaustive than the statistical information that would have been available to OEO administrates. Moreover, the panel allows me to use both the funded and unfunded counties in each state to absorb time-varying, state-level changes in the legality and availability of abortion in the late 1960s and early 1970s, changes in Medicaid policy, and changes in family planning funds in Title V of the 1967 Amendment to the Social Security Act.[24] The paucity of funded counties within some states limits my ability to account for state-by-year effects in specifications that exclude unfunded counties, but I report these results for comparison for my key results.

One final point is that this analysis recovers potentially important policy parameters. Over 40 percent of the funded communities had family planning programs before they received their first federal

[24] In 1967, Title V of the Social Security Act mandated that at least six percent of funds appropriated to child and maternal health at the state level be earmarked for family planning services (Public Law 90-248, Title V, Secs. 502, 505a, 508a; Title IV, Sec. 201a). These programs were directed toward rural areas and areas suffering from "severe economic distress."

grant, and more than 50 percent of unfunded counties had a family planning program that was not federally funded in the 1968 to 1972 period. Estimates of τ, therefore, represent the effects of receiving a first federal grant net of crowd-out in a context where other non-profit and private providers were already operating.

IV. The Relationship between Family Planning Grants, Fertility and Mortality

A. The Relationship between Federal Family Planning Grants and Fertility

Panel A of figure V plots weighted event-study estimates of pre-trends, π_y, and treatment effects, τ_y, for three specifications of equation (1). Weights are the 1970 population of women ages 15 to 44. Event-study estimates of "model 1," which includes county and year effects (assumes $\gamma_{s(j),t} = \gamma_t$), are plotted as a solid line with no markers; "model 2," which includes state-by-year effects, is plotted with circle markers; and "model 3," which adds trends in 1960 census characteristics and REIS controls, is plotted with square markers. Heteroskedasticity-robust standard errors clustered by county are used to construct 95-percent, point-wise confidence intervals, which are presented as dashed lines for models 2 and 3.

In the decade before the first family planning grant, the three models capture the evolution of the general fertility rates in the funded counties quite well. In each of the models, the pre-treatment estimates are close to zero and statistically insignificant. Consistent with nine months of gestation and with the fact that most grants initiated programs, the fertility rate did not change sharply in the calendar year the first grant was received in any specification. Three years following the award, the general fertility rate in funded counties had fallen by roughly one birth per 1000 women of childbearing age. The effects continue to grow, albeit more slowly from year four to year ten. Table III summarizes these estimates by replacing the individual indicators in equation 1 with indicators for five-year groups. Specifically, I estimate variants of the following specification,

$$(2) \qquad Y_{jt} = \theta_j + \gamma_{s(j),t} + \tilde{\pi} D_j 1(t - T_j^* < 0) + \sum_g \tilde{\tau}_y D_j 1(t - T_j^* \in g) + \boldsymbol{X}_{jt}' \boldsymbol{\beta} + \varepsilon_{jt} \,,$$

where all notation remains as previously defined and *g* indexes each of four five-year periods for 1 to 5, 6 to 10, 11 to 15, and 16 or more years past the date of the first grant. The columns of table III correspond to models 1 to 3; panel A presents the estimates for a dependent variable in levels and panel B for a dependent variable in logs. Each of the three models show that six to ten years after first receiving a family planning grant, the general fertility rate had fallen a statistically-significant 1.5 to 1.6 births per 1000 women, a 4 percent drop from the year of the first family planning grant. It is also worth mentioning that these effects are relative to the level of fertility in the year of the award and, therefore, implicitly assume that it would have remained constant in the absence of a grant.

Differences in the magnitudes of the estimates between models are modest—particularly given the extensive controls (almost 1500 additional dummy variables and other county covariates) added in models 2 and 3. It is not obvious, however, which estimates better capture the effects of interest. Because model 1 does not account for year-to-year changes in states' support for family planning, maternal and infant health policies, Medicaid, or abortion policies, it may falsely attribute differential, state-wide declines in fertility due to these or similar policy changes to the family planning grant. Models 2 and 3, however, may understate of impact of federal grants, if women in unfunded counties (used to estimate the state-by-year effects) also benefitted from family planning grants to neighboring counties. The similarity of estimates between model 1 and model 2, however, suggests that close proximity to a family planning program was important for the targeted population.[25]

Lastly, I run three specification checks to examine the robustness and heterogeneity of the results (not reported in table III). First, I reweight my sample of unfunded counties to resemble the observable 1960 census characteristics of funded communities using the methodology of DiNardo, Fortin and Lemieux (1996) and estimate model 2 using these weights. In this specification, the general fertility rate fell by an average of -1.537 (s.e. 0.663) and the log general fertility rate fell by an average of -0.0482 (s.e. 0.013) by years 6 to 10. Second, I limit my sample to only funded communities only. This leaves

[25] For brevity, I omit results from the paper's tables that broaden the definition of communities "treated" with family planning awards to include adjacent counties. Consistent with proximity mattering, estimates for 6 to 10 years after the grant from equation (2) fall to -0.854 (s.e. 0.994) in model 1 and -0.817 (s.e. 0.758) in model 3.

me with roughly 700 communities from 1959 to 1988 and very few county observations with which to estimate state-by-year effects. Using model 3, the general fertility rate fell by an average of −1.287 (s.e. 0.772), and the log general fertility rate fell by an average of −0.0346 (s.e. 0.0135) in years 6 to 10.[26] Third, I examine heterogeneity in the effects for communities funded after 1970 by interacting the leads and lags from the date of the first grant with a binary variable equal to 1 if the community was funded after 1970. Using model 3, the effects among counties funded after 1970 for years 6 to 10 are slightly smaller but not significantly so (estimate −0.704, s.e. 1.070). In summary, each of these checks yields estimates that are indistinguishable from the results presented in table III.

B. The Relationship of Federal Family Planning Grants and Fertility by Race and Age Group

To evaluate heterogeneity in the responses to family planning awards, I examine also these effects separately by age and racial group. This bears on who was treated as well as differences in responses to reduced cost family planning services. Using Vital Statistics information on age and race from 1968 forward, I construct a shorter county panel from the natality microdata from 1968 to 1988. In addition, comparisons of counties using race are restricted to a balanced panel of counties where births to both groups are observed in each year. These specifications omit counties receiving their first family planning grant before 1968.

Unlike the estimates of π in panel A, estimates of π from this shorter panel (panel B of figure V) rely upon an unbalanced set of counties. For instance, only 94 counties funded after 1971 can be used to estimate π_{-4}. The pre-grant outcomes in the shorter panel reflect compositional changes and are, therefore, omitted from subsequent figures using the short panel. Estimates for $y>0$, however, use a balanced panel of counties and, notably, estimates of τ are very similar to those using the longer panel. Overall, the change from the longer to the shorter panel and omitting counties funded before 1968 has a negligible impact on the estimates.

[26] This roughly 50 percent increase in the size of the standard error is due to the paucity of funded counties within some states.

Estimates of π for model 3 for different age groups are presented in panels A and B of figure VI and summarized in table IV. In the first five years following a family planning grant, birth rates to each age group decreased. Six to ten years from the first grant, the largest absolute drop in birth rate levels was approximately 4 births per 1000 women among 25 to 29 year olds (table IV, panel A, column 3)—a 4.2 percent reduction (table IV, panel B, column 3). A reduction of 2.7 births per 1000 20 to 24 year olds followed (panel A, column 2)—a drop of 6.5 percent (panel B, column 2). The failure of birth rates among teens to fall immediately (figure VII, panel A) may be due to differences in minors' legal ability to consent (Bailey 2006) or general equilibrium effects in bargaining power (Akerlof et al. 1996).

Figure VI also reveals that family planning grants allowed women to delay and prevent births. As shown in table IV panel B, the relative reductions in birth rates among teens was substantial. Six to ten years after a community's first federal family planning grant, birth rates had fallen by 6.5 percent among 15 to 19 year olds. Moreover, the waning of the effects among older women roughly seven years after the family planning grant are consistent with substitution of childbearing to later ages. For instance, the pregnancy reduction among women ages 20 to 24 may have been a delay to the later twenties and early thirties. But the effects also reflect the prevention of higher-order births. Birth rates had fallen by 5.9 percent among 35 to 39 year olds and 8.7 percent among 40 to 44 year olds in years 6 to ten after receiving the grant (table IV, panel B, columns 5 and 6).

Panel C of figure VI examines the effects of family planning grants on racial differences in fertility by estimating model 3 for whites and nonwhites separately; table V summarizes these estimates for three, five-year groups. For both groups, the pattern of point estimates is similar: the fertility of whites and nonwhites dropped sharply in the first five years following the first family planning award. Six to ten years from the date of the first award, model 3 estimates that the general fertility rate was roughly 1.2 births lower among white women and 1.1 births per 1000 women lower among nonwhite women, but these estimates are not statistically different from one another.

In summary, the results are consistent with U.S. family planning grants reducing fertility rates. Not only do the estimates fail to exhibit a pre-trend, but they fall for most groups abruptly in the years

following the grant and remain lower. The general fertility rate remains 4 percent lower in funded counties even 11 to 15 years after the first award. These patterns are consistent across specifications and persist even after adjusting for annual, county-level per capita measures of government cash public assistance, medical spending, and cash retirement and disability payments.

C. The Relationship between Federal Family Planning Grants and Mortality

Figure VII plots event-study estimates for infant and maternal mortality for models 1, 2, and 3 (equation 1) and 95-percent, point-wise confidence intervals for models 2 and 3; table VI summarizes these estimates for five-year periods using the specification in (2). Although figure IV shows that neonatal infant mortality (which comprises the largest share of the infant mortality rate) fell more quickly in locations receiving family planning grants, panel A of figure VII shows that adjusting for year and county fixed effects eliminates this impression. In the years after the first family planning grant, infant mortality changed little. Using the two-year pre-award trend to infer the counterfactual increase in infant mortality would suggest that the increase may have been more dramatic in the absence of a family planning award—an impression that is most dramatic in model 3, which shows no change in infant mortality in the first seven years of the award. On the other hand, using the six-year pre-award trend to infer the counterfactual change in infant mortality rate suggests that it should have decreased in the absence of a family planning award. In short, different modeling assumptions lead to radically different inferences. Because there is no information that could be used to discern between these different assumptions, I interpret the estimates as providing no evidence that family planning grants reduced infant mortality.

Because family planning grants affected fertility, the denominator in the infant mortality rate, it is difficult to interpret these results. To examine possible changes in the composition of mothers, I examine neonatal and post-neonatal infant mortality separately in unreported results. Although neonatal mortality is slightly lower following a family planning grant, this appears to be the continuation of a pre-trend about four years before the grant was awarded. On the other hand, post-neonatal mortality appears to *increase* following the receipt of a family planning grant. Although the inclusion of control variables in model 3

reduces the magnitudes of these positive estimates, the magnitudes imply a substantial effect: an increase of approximately 0.1 deaths per 1000 live births, or roughly 1.5 percent, over the 1965 level. This is consistent with more advantaged of disadvantaged households using family planning programs to delay or prevent births and, consequently, an increase in the proportion of infants living in poorer household environments. It is hard to know whether this compositional change masks a family planning induced reduction in infant mortality, but that is a possibility.

Similarly, panel B shows no evidence that maternal mortality improved following a family planning grant. Not only are the post-grant point estimates statistically indistinguishable from zero, the model fails to reject the equivalence of trends before and after the first family planning award. This is true for models 1, 2 and 3, which are remarkably similar in the four years before and after the grant. Panel B of table VI summarizes these estimates showing that they are jointly statistically indistinguishable from zero. Unlike the strong effects of family planning grants on fertility outcomes, these models provide no evidence that family planning reduced maternal mortality.

D. The Relationship of Federal Family Planning Grants and Mortality by Race

Although the impact of family planning grants on the entire population may be too small to detect, the impact may be discernible among women more likely to be affected. Because average household incomes differed considerably by race in the 1960s, the panels of figure VIII present the estimates obtained from separate regressions for whites and nonwhites for model 3; table VII summarizes these estimates for models 1 to 3. For whites, there is no evidence of a pattern consistent with family planning grants reducing infant mortality (panel A). For nonwhites, model 3 suggests a reduction of in infant mortality of roughly 0.32 in years 6 to 10 in the nonwhite neonatal mortality rate—a reduction of 1.6 percent over the nonwhite average of 20 in funded counties. The imprecision of the estimates, however, does not allow me to reject that there was no effect of family planning grants. In panel B,

neither the pattern nor the statistical significance of the estimates provides evidence of reductions in maternal mortality.[27]

In summary, the mortality estimates provide little information on the effect of family planning on health. One interpretation of these estimates is that family planning grants had no impact on infant or maternal health, but this conclusion is stronger than warranted by the results. Because mortality is an extremely limited measure of health, family planning grants could have had important effects on maternal and infant health through the variety of mechanisms without reducing mortality. Unfortunately, other measures of infant and maternal health are unavailable in Vital Statistics for the 1960s.[28] Caution is also in order when using these estimates to infer the health effects of family planning programs today. Although family planning programs today provide a menu of reproductive and gynecological health services, many programs in the 1960s were focused on "controlling population" and some provided no health services at all (Bailey 1999). Because I have no information on the availability of health services, my estimates by necessity average the health effects of family planning programs providing health services with those that did not. As a result, these estimates may understate the impact of family planning grants on mortality for programs that did provide health services.

V. From Coincidence in Timing to Causal Effects? More Evidence on Internal Validity and Magnitude of the Estimates

In the event-study framework, two types of coincident, local shocks present the most formidable threat to the internal validity of the study. First, the packaging of federal family planning awards with federal grants for *other* programs may confound estimates of τ. This is an important concern, because other OEO programs impacted fertility and health. For instance, Ludwig and Miller (2007) show that Head Start programs reduced child mortality. Almond et al. (2008) report that food stamps programs increased birth weight and decreased neonatal infant mortality. Other programs like Community or

[27] In unreported results, I find evidence of *increases* in post-neonatal mortality among nonwhites which are marginally statistically significant. This is consistent with the view that, among the disadvantaged, the relatively more advantaged households reduced their childbearing with the introduction of family planning programs and, as a result, the number of infants in poorer home environments increased.

[28] The lack of information on birth weight at the county level before 1968 limits my ability to discern an actual effect from a pre-award trend.

Neighborhood Health Centers (CHCs) or Maternal and Infant Health projects often provided services for family planning and also aimed (independently) to improve infant and maternal health (DHEW 1974: 5). If other programs were initiated in the same locations around the same time, estimates of τ may fail to separate the effect of a family planning grant from these other programs.[29]

Although the oral histories discussed in section I provide no indication that OEO administrators deliberately packaged OEO grants, the coincidence of federal family planning grants may have happened inadvertently or because certain communities were more effective at writing proposals. To assess this concern, I compiled information on grants for other OEO programs from the NACAP and the NAFO data. Using grant receipt (=1) for each of eight different OEO program as dependent variables, I estimate equation (1) excluding covariates in $\boldsymbol{X}$ (equivalent to model 2) and present the estimates in figure IX. Because I have no information on grants for other programs in 1969, I omit this year from the sample (failing to do so would favor finding no correlation in timing between a first family planning grant and other programs). Like the event-study figures, these regressions are weighted by the population of women ages 15 to 44 in 1970, so the interpretation of the estimates is the change in the proportion of women of women in counties eventually receiving a family planning grant that get funding for the given program relative to the year of the first family planning grant. Panel A shows that almost all of the counties receiving first family planning grants register receiving a grant in the NACAP and NAFO data (the handful of first grants were obtained from the OEO reports which do not appear in these records account for this figure being less than 100 percent).[30] There is no evidence of this funding pattern for other programs. Panels B through E show little correlation between the timing of the first family planning award and federal funding increases for other programs. Changes in funding for CAP administration (panel B) increased steadily in the years before and decreased in the years after the first family planning

[29]Although differences in the demand for children at time zero are accounted for in the county-fixed effects (internal validity), I will not be able to evaluate how other War on Poverty programs impacted the efficacy of federal family planning programs (external validity). For this reason, caution should be exercised in extrapolating my estimates of federal family planning grants to other periods or contexts without these complementary programs.

[30]The fall in the coverage rate of federal family planning grants indicate that federal refunding did not occur in all cases, but this is not an indication that these programs were discontinued. Unlike other War on Poverty programs, continuation funding from states, local communities, and nonprofits like Planned Parenthood was common in the 1960s and remains the case today. Federal funds subsidized setting up these programs and is one reason why using the first federal grant is important.

grant. Head Start (panel C), jobs programs (panel D), and legal services (panel E) also increased *before* family planning programs began but did not increase over the years when family planning funding was expanding. If the expansion in coverage of these programs were driving the fertility results, one would expect to see effects before the federal family planning grant in figure V, but there is no evidence of this. The next three panels of figure IX examine the coincidence of health grants and family planning. Panel F examines grants for maternal and infant care projects; panel G examines maternity and infant health projects; and panel H examines grants for Community Health Centers under the Community Action Program. The plots show very little evidence of increases in coverage of other health programs. A slight expansion in community health center coverage roughly three years after a first federal family planning award could be cause for concern, but the event study figures in figure V show no evidence of abrupt changes in fertility roughly four to five years (because of the 9 month gestation period) after the first family planning grant. In contrast, the effects of family planning grants stabilize around year four. The only grants that coincide precisely in timing to the first family planning grants are those for legal services. Because it is difficult to envision fertility and health effects of legal services, these figures ameliorate some concerns about coincident and confounding federal grants. Overall these results are reassuring: it seems unlikely that the estimated "effects" of family planning grants are attributable to other programs, because the timing does not work. Lending further credibility to this argument is that family planning appears to have had no effects on infant or maternal mortality, whereas other evaluations of War on Poverty programs have found effects on these margins (Almond et al. 2008, Ludwig and Miller 2007).

The second threat to the internal validity of the study are coincident, nonfederal initiatives of community applicants. For instance, this would be a concern if a community begins a family planning program at the same time it receives a federal family planning grant. If a community initiative, however, is *due* to the increase in federal funds for family planning, the estimates would correctly incorporate the direct effects of the federal grant as well as its indirect effect of the subsequent local spending increases. Independent local initiatives that happen to coincide *on average* with the receipt of a first federal grant, however, would be a problem. Assessing the importance of this concern directly is difficult, because *any*

organization or individual could submit an application directly and bypass state and local governments and there is no data on rejected proposals.[31] The best evidence that this is not what was driving the results is the close correspondence in timing of family planning awards to changes in outcomes. If a grant application were submitted and a local program begun at the same time (consistent with an abrupt change in the demand for children), it is unlikely that the local program effects and the grant *award* would have occurred simultaneously. Many proposals would not have been successful and, therefore, local initiatives would have affected the evolution of the comparison counties (used to estimate the state-by-year effects). Moreover, administrative delays at the OEO or due to the federal budgeting would have made the timing of these awards far from predictable. Especially because roughly 700 communities across the U.S. received grants, it seems unlikely that heterogeneous local initiatives *not due to the first federal family planning award* are driving the results.

A final consideration is the magnitude of the estimates. Specifically, it is worth considering whether the intention-to-treat effects presented in section IV are credible given the induced increase in the number of family planning users and medical methods. Unfortunately, I have no credible administrative on the number of users of federal clinics. Instead, I estimate the increase in the use of family planning services using the 1970 *National Fertility Study* (*NFS*).[32] Because using unadjusted, raw figures will tend to overstate the family-planning-grant induced increase in use (many women used family planning clinics in communities before federal grants arrived, because non-federally funded clinics were operating in this period), I adjust these raw figures using following nonlinear specification,

$$(3) \qquad P(Use_{ij}) = F(\boldsymbol{Z}_{ij}\boldsymbol{\delta} + \theta_1 D_j + \theta_2 1\big(Poverty_{ij}\big) + \theta_3 1\big(Poverty_{ij}\big)D_j),$$

where Use_{ij} is a measure of whether individual *i* in county *j* had ever used a family planning clinic, the birth control pill or the IUD, D_j is a binary variable equal to one if county *j* received a federal family planning grant before 1970 (because only behavior in and before 1970 is observed), and $1\big(Poverty_{ij}\big)$ is

[31] Administrators also report receiving applications from "various and sundry groups" for numerous programs often having little to do with the spirit of the legislation (Gillette 1996: 196 quoting Theodore M. Berry, assistant director of the OEO).
[32] The *NFS* asked ever-married women between the ages of 18 and 44 if they had ever used a family planning clinic (unfortunately, it does not specify whether the family planning clinic was publicly funded), the birth control pill or the IUD. It also contains information city or county of residence, which enables linkages to my database of federal family planning grants.

a binary variable equal to 1 if the annual household income was below the poverty line.[33] Because the data do not permit county fixed effects to be included (as in equations 1 and 2), I include a rich set of covariates in the row vector, $\boldsymbol{Z}_{ij}$, including state fixed effects, dummy variables for ages educational achievement, population size of the county, and for Catholic religion (see table VII for details on the coding of these variables). In addition, one specification includes dummy variables for the "number of children most desirable" for the respondent to capture further differences in the demand for children.

Table VIII reports average partial effects estimated from a probit specification and bootstrapped standard errors (1000 replications). Receiving a federal grant for family planning was not associated with greater use of a family planning clinic for respondents above the poverty line in 1970 (panel A). Women below the poverty line in communities receiving grants were 20 percent more likely (~4 percentage points) to have used a clinic, but this relationship is not statistically significant. Federal grants are associated with a larger and statistically significant increase in the use of medical contraceptives (Pill or IUD, panel B) for women regardless of household income.[34] They were also associated with increased use of the Pill for women above and below the poverty line, but the magnitude of the impact was significantly larger among women below the poverty line (panel C). The effect on women above the poverty line may be direct or operate through general equilibrium reduction in the prices of medical contraceptives in communities receiving federal grants. To the extent that these grants affected unmarried women (not sampled in the NFS) differently, the *NFS* may under- or overstate the induced increase in the use of family planning services.

These estimates provide a benchmark for evaluating the magnitudes of the effects in table III. If use of family planning grants increased the use of clinics only among women in poverty by roughly 4 percentage points (table VIII, panel A, column 3) and 20 percent of women ages 15 to 44 in 1970 were in poverty, the use of family planning clinics changed by roughly 8 per 1000 women of childbearing age.

[33] Inclusion of the *Poverty* lowers the sample to 5747 respondents, because income information is missing for the remainder. This interaction is included, because Jaffe et al. (1993) report that 90 percent of all patients in organized family planning programs had household incomes no greater than 200 percent of the federal poverty line.

[34] The differential effect of a federal family planning grant on the use of medical contraception for women below the poverty line is positive but statistically indistinguishable from zero. The magnitude is roughly the size of the difference in use between women above and below the poverty line (about 6.6 percentage points) in locations without federal grants before 1970.

The intention-to-treat estimates for one to five years in column 3 of panel A of table III imply a reduction of roughly 2.5 births per 1000 women ages 15 to 44 over three years, the average time since receiving a federal family planning award. Together with table IX these estimates can be used to approximate a treatment effect on the treated (TOT): they imply that a federal grant induced a delayed or prevented birth among 30 percent of the new users of family planning services. Using, instead, the increase in the fraction of women ever using the Pill (panel C, column 3) as the "treated" group reduces the estimate of the TOT to one child for 10 percent of the women served. In summary, table IX's estimates suggest that the magnitudes of the fertility results seem realistic.

VI. CONCLUSION

The effects of U.S. family planning programs have been debated by policy makers since their initiation over forty years ago. Understanding effects of family planning programs bears importantly on the dueling theoretical paradigms used by economists and demographers to model fertility decisions and also on social science explanations for why fertility has declined so sharply in recent years in all developed (and some developing) countries. As having fewer or better-timed children allows parents (and society) to invest more in each child, these results also have implications for the intergenerational transmission of inequality and models of economic growth.

This analysis provides robust, new evidence that federal grants for family planning under the Economic Opportunity Act and Title X reduced fertility by roughly 4 percent within six years. Consistent with fertility delay among the young and stopping among the older, the largest relative reductions in period birth rates occurred among women under age 25 and over age 40. Over the course of ten years, women in communities with federally-funded family planning programs had roughly 476,500 fewer births.[35] These numbers in conjunction with estimates of the number of women served from the 1970 *National Fertility Survey* imply that 10 to 30 percent of new users of family planning had one fewer children within the first three years of the program. An alternative perspective on the magnitudes of the

[35] This estimate is obtained by multiplying the mean population of women ages 15 to 44 in funded counties in 1970 (35,049) by the event-study estimates for model 3 and summing over years 1 to 10.

estimates is that the upper and lower confidence intervals (table III, model 3) imply that the federal government paid roughly $5200 to $7200 in 2008 dollars per birth averted in the first 10 years of this program.[36]

In contrast, I find no evidence that family planning grants reduced infant or maternal mortality. The absence of health effects may be for several mutually reasons: First, changes in the composition of births may mask mortality improvements. Second, mortality rates may fail to register improvements even though other dimensions of women's and infant health improved. Finally, federal family planning programs in the 1960s and early 1970s may have provided few health related services. This final reason is consistent with historical accounts of the narrow population focus of many public family planning programs of the 1960s (Bailey 1999). The absence of mortality effects, however, lends credibility to the paper's empirical strategy. Especially because other studies of War on Poverty programs document reductions in mortality (Almond et al. 2008, Ludwig and Miller 2007), the absence of mortality effects in this study supports interpreting the fertility estimates as arising from a shock to the supply of family planning services (rather than a coincident shock to the supply of other War on Poverty services).

In conclusion, this paper provides new evidence that federal grants expanding access to family planning services contributed to the post-1960 decline in U.S. fertility. The results do not discount the importance of demand-side factors in encouraging the use of family planning during the 1960s and 1970s—in fact, this paper's estimates suggest that federal grants account for roughly only 3 percent of the dramatic fertility decline in the 1960s. Consistent with other work suggesting that the introduction of the Pill accounted for an important part of the decline in fertility during the 1960s (Bailey 2010), these results suggest that models integrating both the demand and the "supply" of children may have traction in explaining the second demographic transition. Future work should consider how these changes in shorter-term period fertility rates contributed to longer-term changes in completed childbearing, women's human

[36] This range is surprisingly consistent to Kearney and Levine (2008), who estimate that state-level Medicaid policy changes that expanded eligibility for family planning services between 1993 and 2007 cost approximately $6800 per birth averted.

capital investments and labor-force outcomes, union formation and separations, and the resources available to children.

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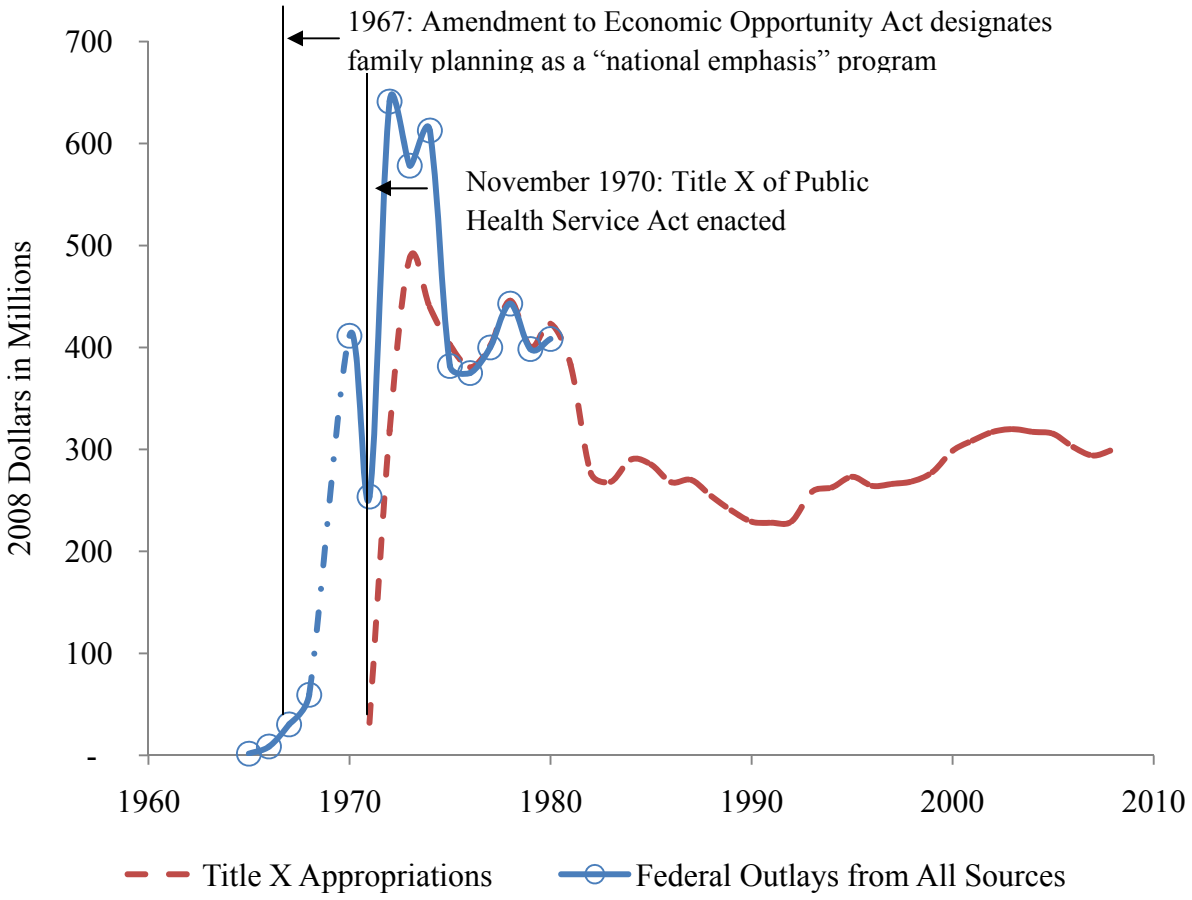
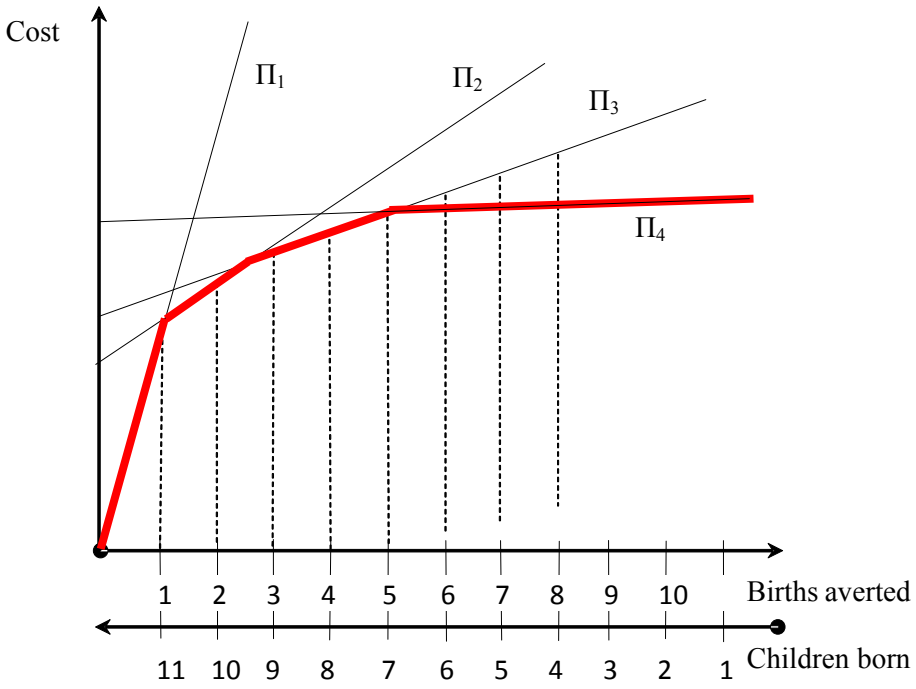
Figure I. Federal Spending on Family Planning, 1965-2008



Notes: No information is available for 1969 in the NACAP or NAFO data, so a dashed line connects the 1968 and 1970 points. Title X appropriations series differs from the inflation adjusted table 14 (p. 47) in Alan Guttmacher Institute (AGI) (2000), because I use the CPI-U and AGI (2000) uses the CPI for medical care.
Source: Title X appropriations are taken from the Office of Population Affairs (2009). *Federal Outlays from All Sources* from 1965 to 1980 are computed by the authors using the National Archives Community Action Program Data (NACAP) and the National Archives Federal Outlays Data (NAFO).

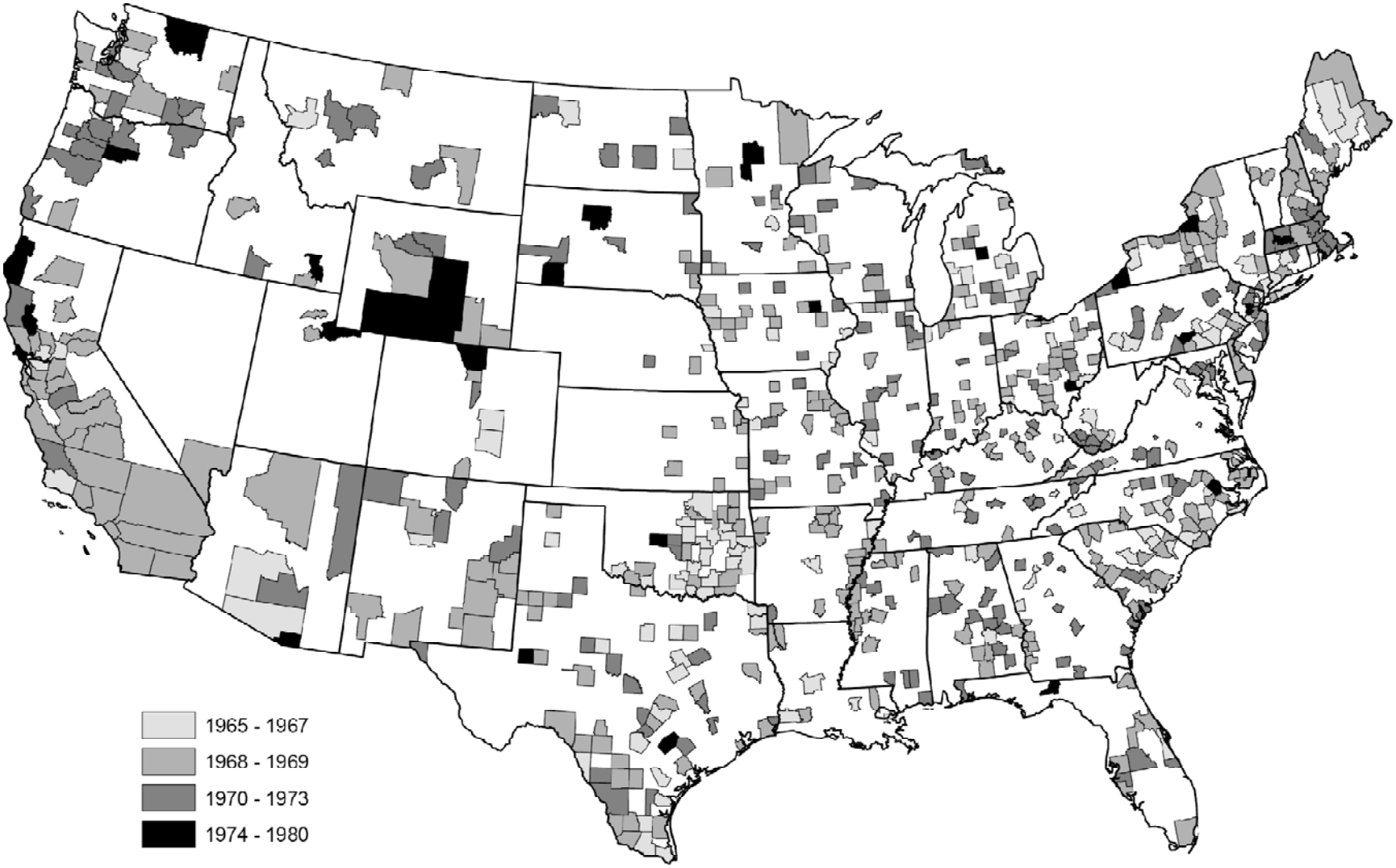
Figure II. A Model of the Fixed and Marginal Costs of Averting Births



Notes: Each line represents a different contraceptive strategy. Strategy j entails a fixed cost, α_j, and marginal cost, β_j, the total cost of using this strategy to avert an expected $\mu_N - \mu$ births, where μ_N is the expected number of children born in the absence of any contraceptive method, is $\pi_j(\mu)=\alpha_j+\beta_j(\mu_N-\mu)$. Depending upon the number of births a couple wishes to avoid (given by the demand for children), different contraceptive strategies may be optimal. Michael and Willis (1976) point out that the total cost function for achieving an expected number of births, μ, is given by the bolded, lower envelope.

Source: Adapted from Michael and Willis (1976).

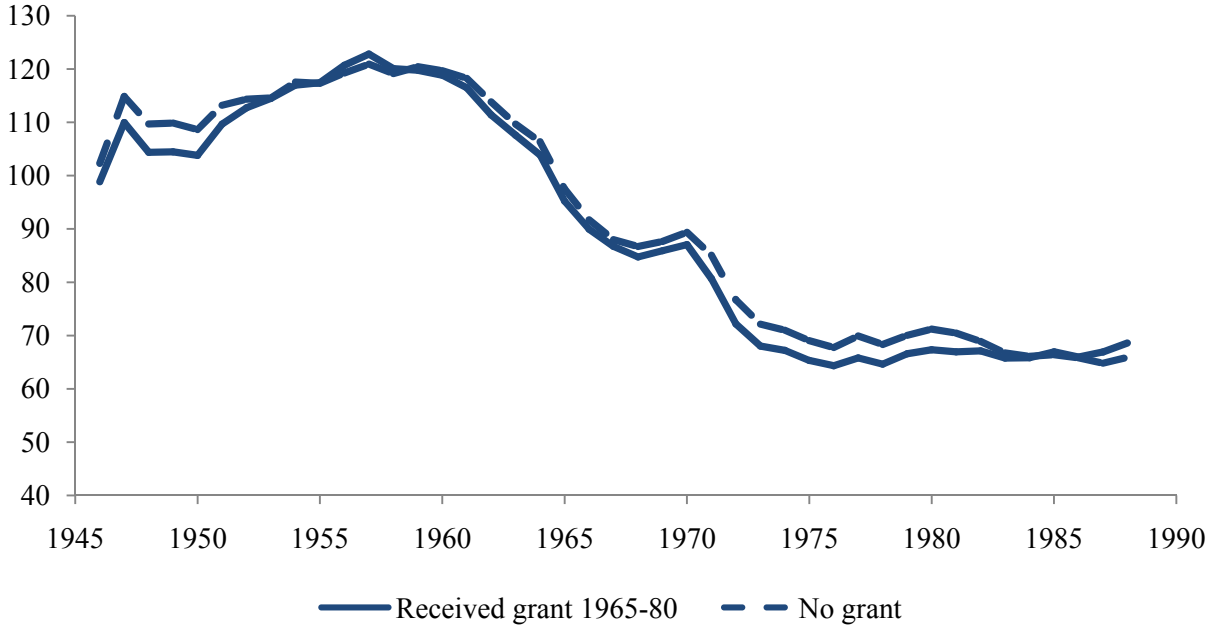
Figure III. The Date of the First Federal Grant for Family Planning, 1965-1980



Note: Dates are the year that the county first received a federal grant.
Source: NACAP, NAFO and OEO (1969, 1971 and 1974).

Figure IV. Fertility and Health Outcomes by Receipt of Federal Family Planning Grant

A. General Fertility Rate (births per 1000 women ages 15 to 44)



B. Infant (IMR), Neonatal (NNMR) and Post-Neonatal (PNMR) Mortality Rates (per 1000 live births)

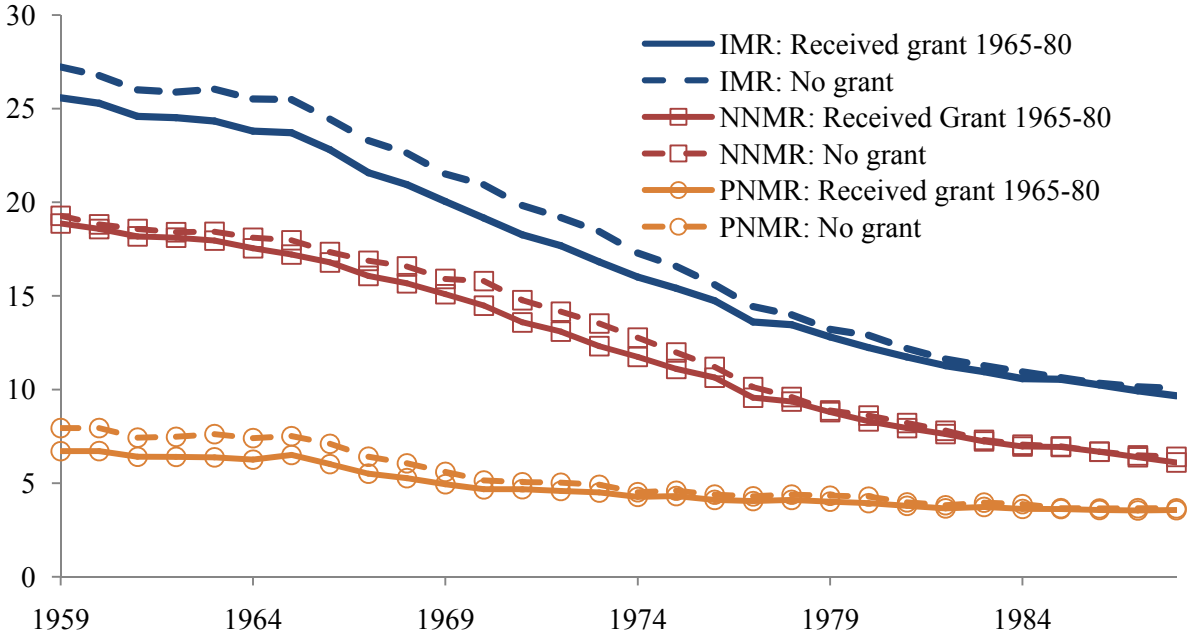
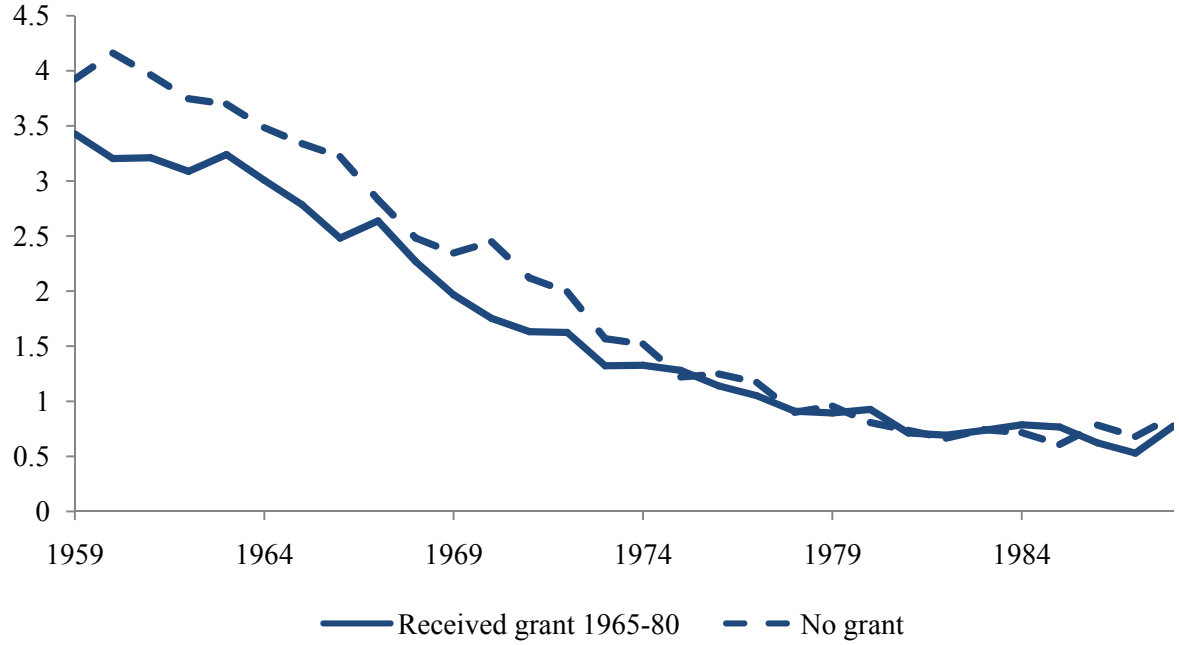


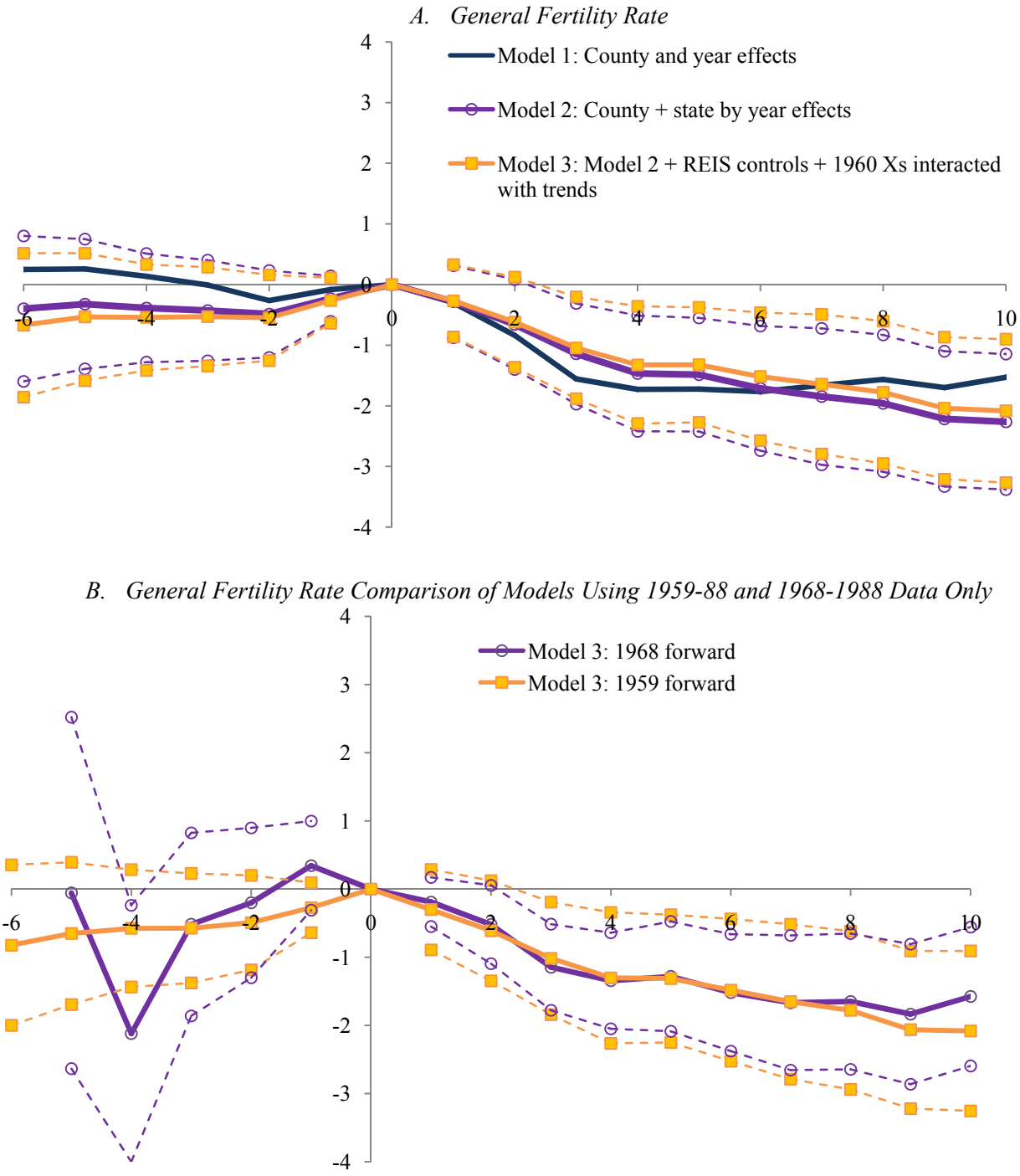
Figure IV (continued)

C. Maternal Mortality Rates (per 10,000 live births)



Notes: "Received grant 1965-80" summarizes outcomes in all counties that received their first family planning grant between 1965 and 1980. "No grant" summarizes outcomes in all other counties. Source: Grant data come from the NACAP, NAFO and OEO (1969, 1971 and 1974). Outcomes rely upon hand-entered 1959 to 1967 county vital statistics, 1968 to 1988 natality microdata, and 1959 to 1988 multiple-cause-of-death mortality microdata (NCHS 2003).

Figure V. Estimates of the Effects of Family Planning Grants on Fertility



Notes: The dependent variable is the general fertility rate. Panels A and B plot weighted, least-squares estimates of π and τ from equation (1). Weights are the county population of women ages 15 to 44 in 1970. Model 1 includes county and year effects. Model 2 adds state-by-year effects to model 1. Model 3 adds 1960 county covariates interacted with a linear trend and REIS controls to model 2. Heteroskedasticity-robust standard errors clustered by county are used to construct 95-percent, point-wise confidence intervals for models 2 and 3 (dashed lines). Source: Hand-entered 1959 to 1967 county vital statistics and 1968 to 1988 natality microdata (NCHS 2003).

Figure VI. Estimates of the Effects of Family Planning Grants on Fertility by Race and Age

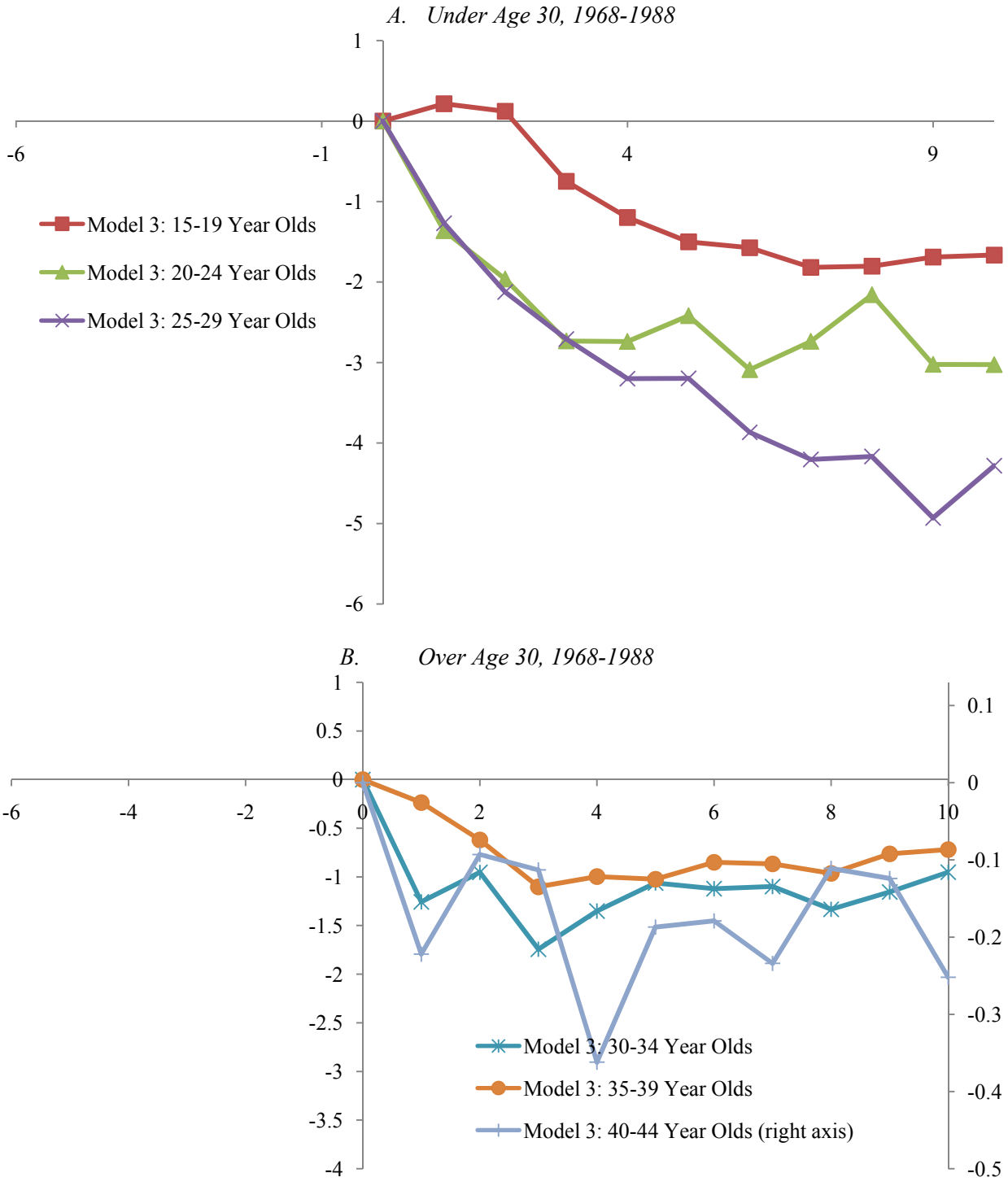
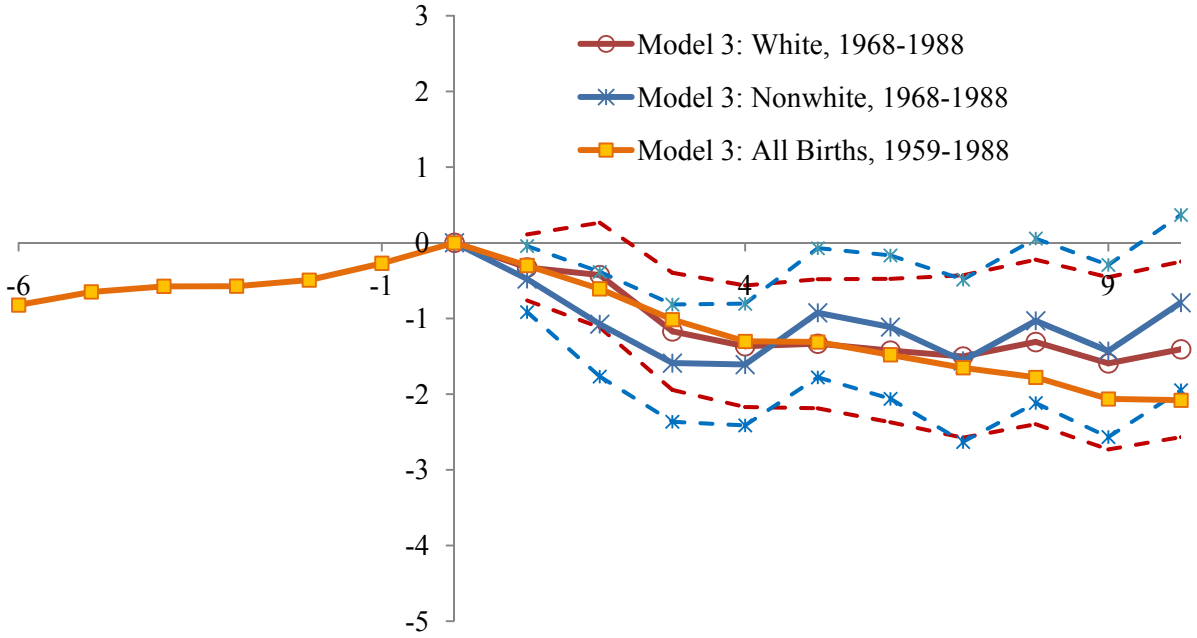


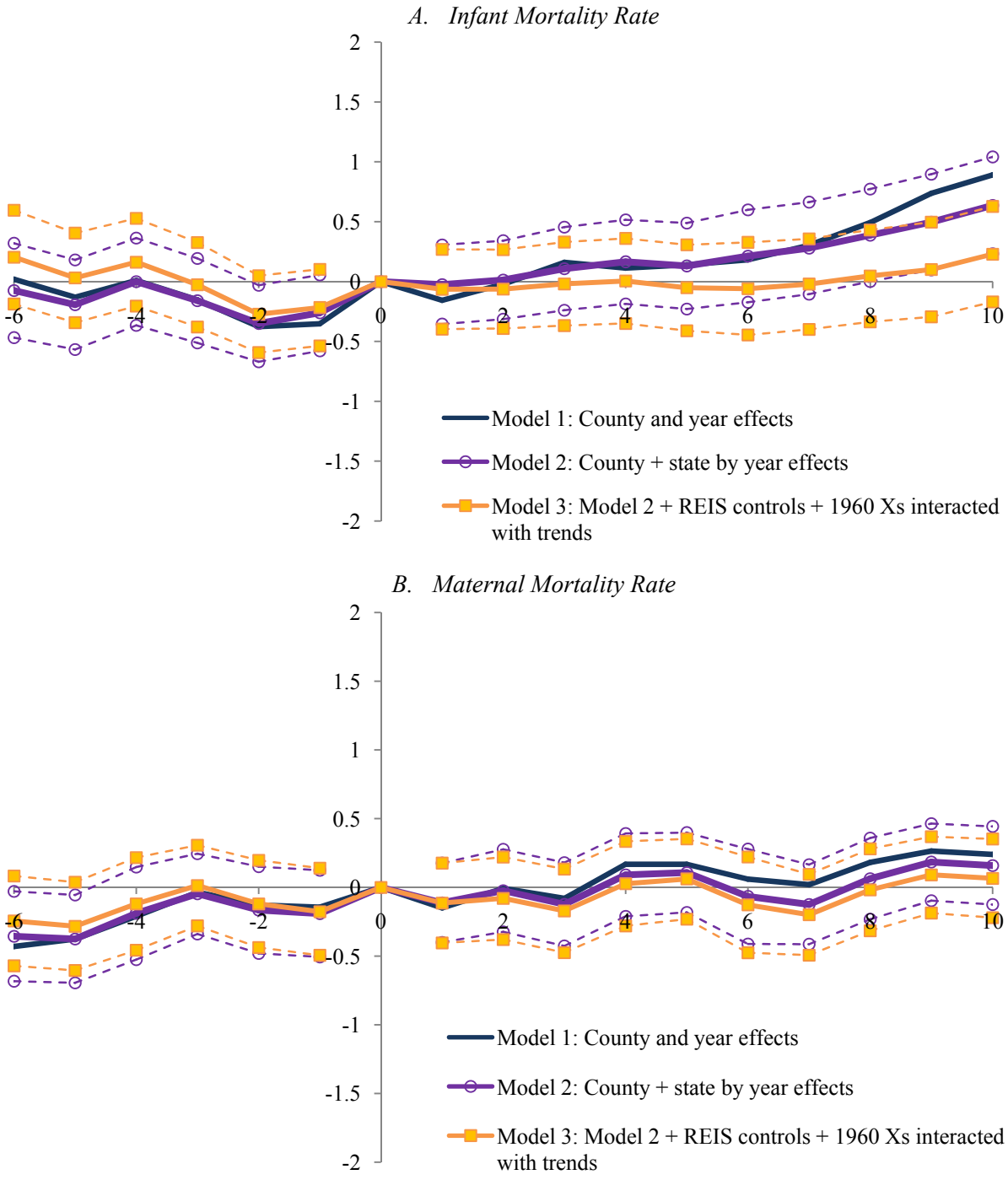
Figure VI (continued)

C. White versus Nonwhite, 1968-1988



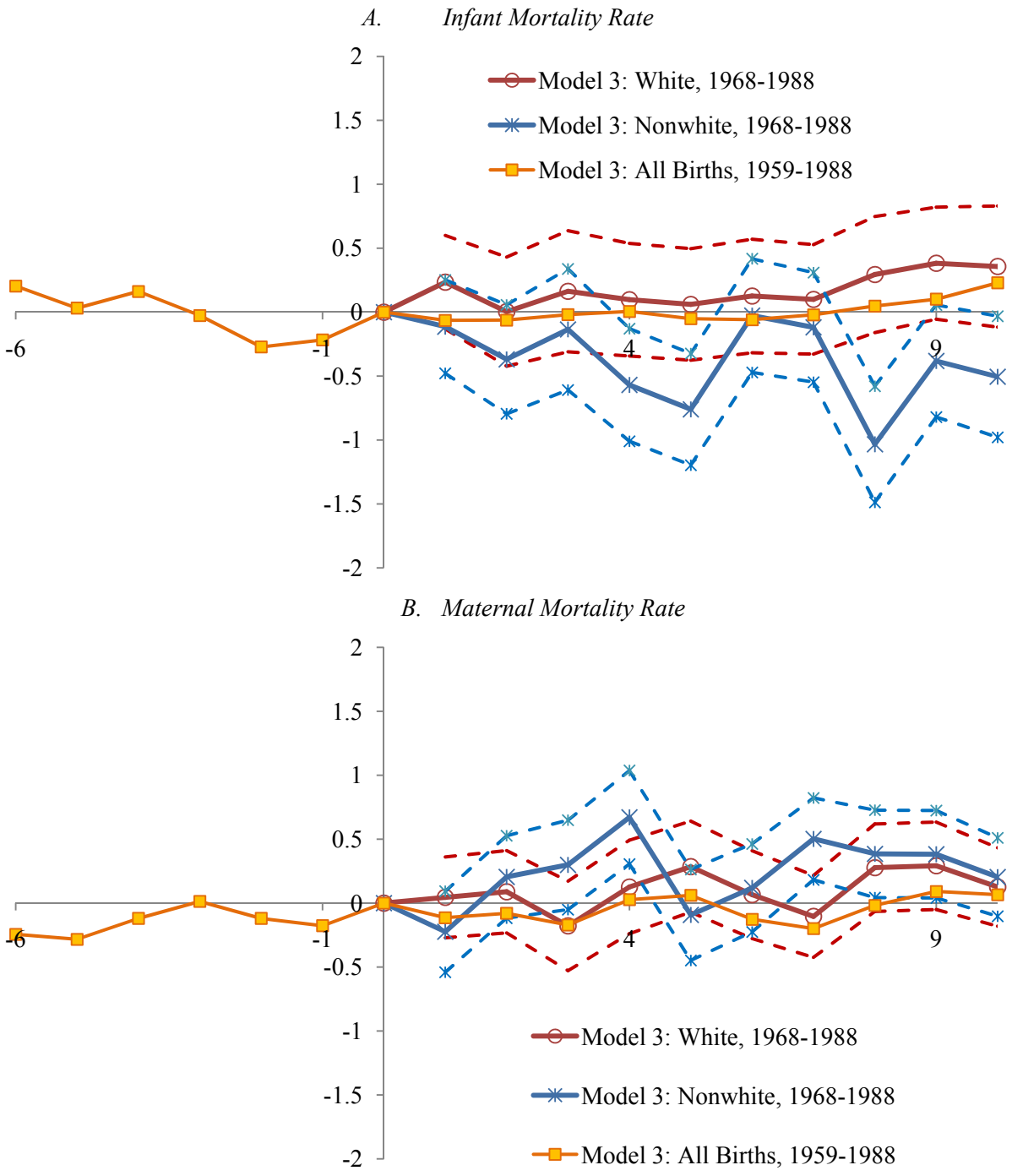
Notes: The dependent variable is the general fertility rate. Panels A to C present weighted, least-squares estimates of τ from separate regressions for each age group and race in the 1968-1988 data. Weights are the county population of women ages 15 to 44 in 1970 of the relevant age or race group. Heteroskedasticity-robust standard errors clustered by county are used to construct 95-percent, point-wise confidence intervals, which are presented in dashed lines. Source: 1968 to 1988 natality microdata (NCHS 2003).

Figure VII. Estimates of the Effects of Family Planning Grants on Mortality



Notes: Panels A and B plot weighted, least-squares estimates of π and τ from equation (1). Model 1 includes county and year effects. Model 2 adds state-by-year effects to model 1. Model 3 adds 1960 county covariates interacted with a linear trend and REIS controls to model 2. Heteroskedasticity-robust standard errors clustered by county are used to construct 95-percent, point-wise confidence intervals for models 2 and 3, which are presented in dashed lines. Source: Numerators are computed from the multiple-cause-of-death mortality microdata, 1959-1988. Denominators use hand-entered 1959 to 1967 county vital statistics data and 1968 to 1988 natality microdata (NCHS 2003).

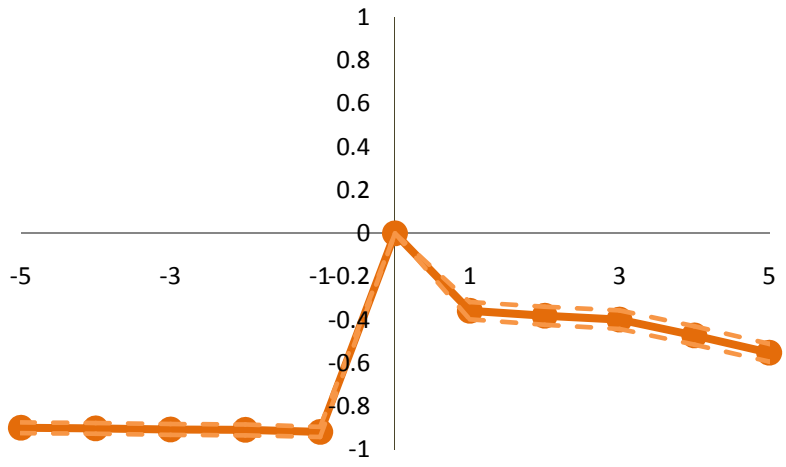
Figure VIII. Estimates of the Effects of Family Planning Grants on Mortality by Race



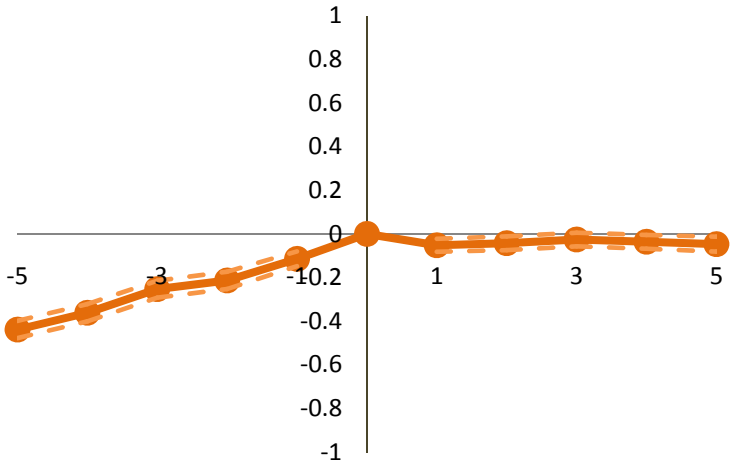
Notes: Each panel plots weighted, least-squares estimates obtained from replacing the individual indicators in equation 1 with indicators for five-year groups. Model 3 and adds 1960 county covariates interacted with a linear trend and REIS controls to model 2. Heteroskedasticity-robust standard errors are used to construct, point-wise 95-percent confidence intervals. Source: Numerators are computed from the multiple-cause-of-death mortality microdata, 1968-1988. Denominators use 1968 to 1988 natality microdata (NCHS 2003).

Figure IX. Correspondence in Timing of First Family Planning Grants and Other Federal Grants

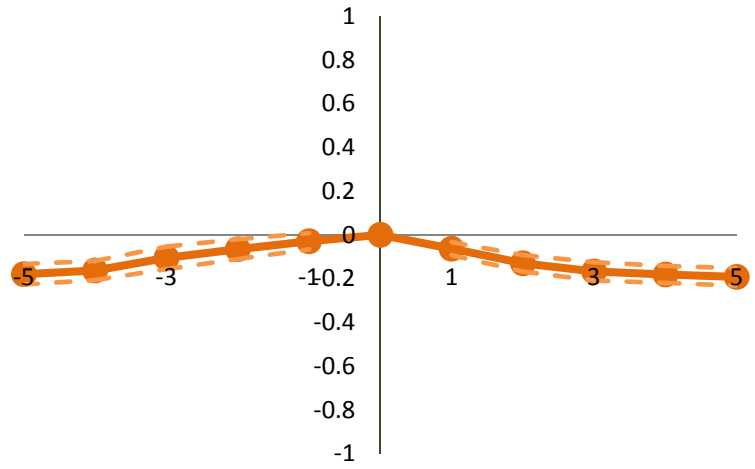
A. Family Planning Spending



B. CAP Administrative Spending



C. Head Start Spending



D. Jobs Programs Spending

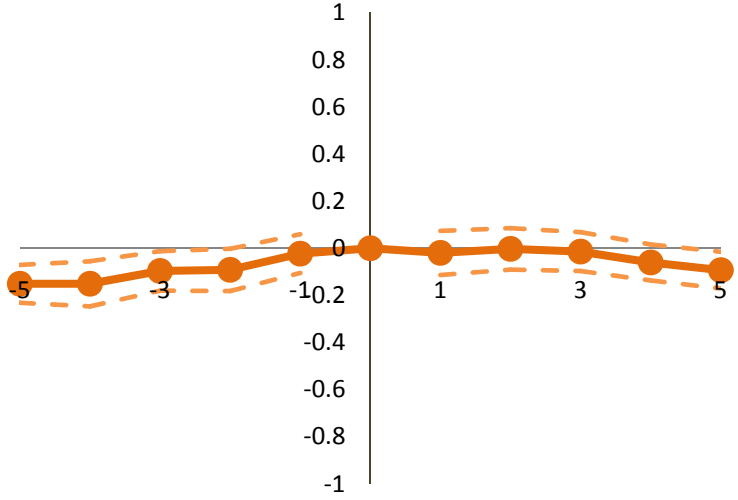
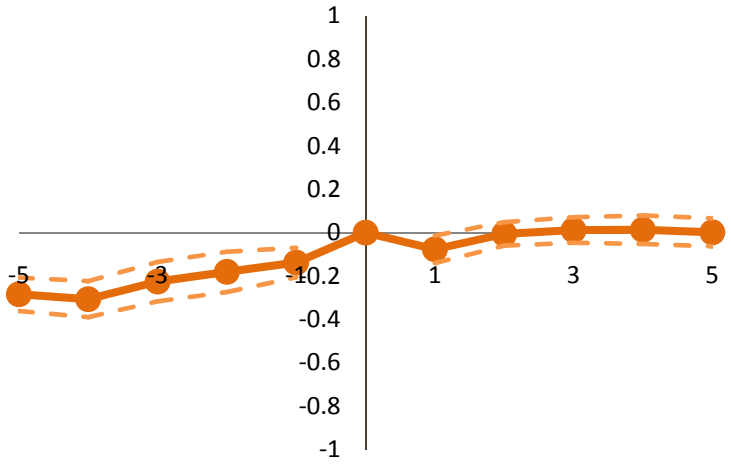
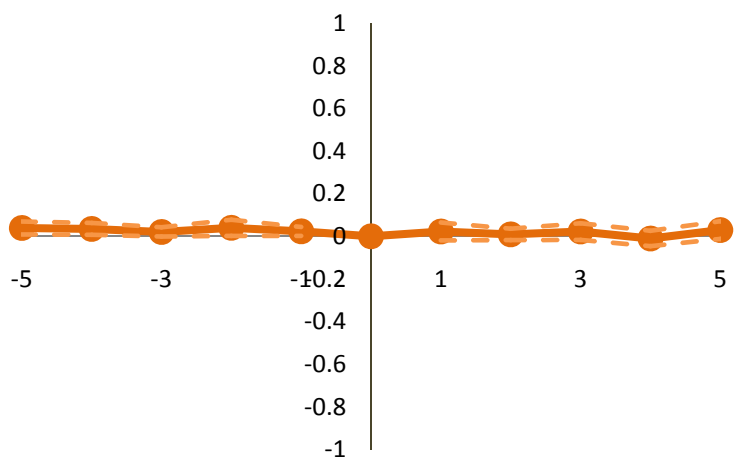


Figure IX (continued)

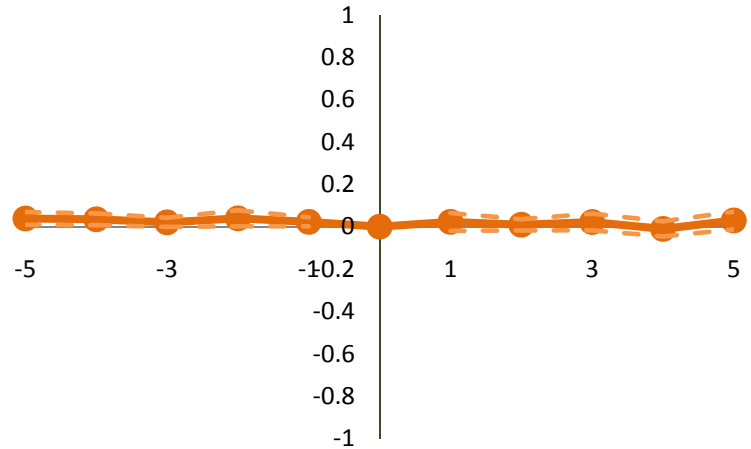
E. Legal Services Spending



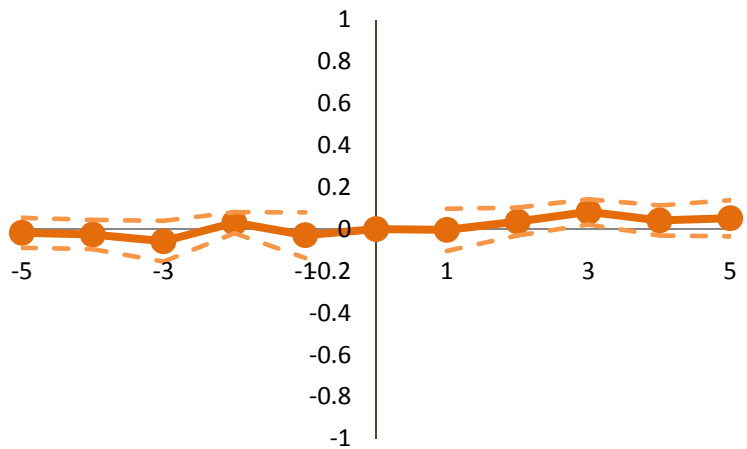
F. Maternal and Infant Care Projects



G. Maternity and Child Health Projects



H. Community Health Centers



Notes: Each panel plots weighted least-squares estimates of π and τ from equation (1) excluding covariates in X (equivalent to model 2). The weights are the 1970 population of women ages 15 to 44. The dependent variable is equal to 1 if the county received *any* federal grant for the indicated program. Heteroskedasticity-robust standard errors clustered by county are used to construct point-wise, 95-percent confidence intervals, which are presented in dashed lines in each panel. Source: NACAP and NAFO.

Table I. 1960 Characteristics of Counties Receiving Family Planning Grants from 1965 to 1980

A. County Characteristics from 1960 Census	All counties (N=3046)	Received Grant from 1965-80 (N=705)*	(N=2341)
Mean population	55,860	184,187	25,378
Proportion of population in counties			
in Northeast	22.0	25.4	16.0
in Midwest	30.1	26.9	36.0
in South	31.9	26.3	41.9
in West	16.0	21.4	6.1
in urban areas	69.6	81.2	48.8
in rural/farm areas	7.4	3.4	14.7
Proportion of residents			
Under 5 years of age	11.5	11.5	11.4
65 or older	9.1	8.7	9.8
Nonwhite	11.2	11.1	11.3
with 12 years of education	42.9	44.0	41.0
with fewer than 4 years of education	8.4	7.5	10.0
of households with income under $3,000	21.5	17.5	28.6
of households with income greater than $10,000	15.0	17.6	10.3

B. Funded Counties by Date of First Award	1965-1967 (N=132)	1968-1969 (N=332)	1970-1973 (N=212)	1974-1980 (N=29)
Mean population	230,995	221,055	125,084	53,967
Proportion of population in counties				
in Northeast	32.8	16.8	37.8	39.8
in Midwest	21.5	27.6	22.1	8.5
in South	28.5	23.1	31.1	19.8
in West	17.1	32.5	9.0	31.9
in urban areas	85.0	80.0	72.6	60.3
in rural/farm areas	2.3	4.0	4.8	7.5
Proportion of residents				
Under 5 years of age	11.5	11.7	11.5	11.5
65 or older	8.8	8.5	8.9	8.4
Nonwhite	11.8	10.6	8.2	6.9
with 12 years of education	43.1	45.2	42.9	45.8
with less than 4 years of education	7.9	7.0	7.9	6.4
of households with income <$3,000	17.4	17.6	19.0	18.8
of households with income >$10,000	17.3	17.9	15.4	15.8

Notes: Characteristics are weighted by 1960 county population. Source: 1960 County and City Databooks (Haines 2005). Information on funding drawn from NACAP, NAFO and OEO as described in text (1969, 1971 and 1974).
*60 percent of women ages 15 to 44 in 1970 lived in the 705 funded counties.

Table II. The Relationship between First Grant Timing and 1960 Characteristics

	(1)	(2)	(3)	(4)
	Dependent Variable: *Year of first federal family planning grant*			
1(25 to 49 percent of population in urban areas)	1.032	0.500	1.438	1.204
	[0.406]	[0.157]	[0.579]	[0.279]
1(50 to 74 percent of population in urban areas)	1.508	0.433	1.682	1.242
	[0.729]	[0.265]	[0.868]	[0.526]
1(75 to 100 percent of population in urban areas)	1.172	1.172	0.272	1.625
	[1.025]	[0.404]	[1.155]	[0.784]
Proportion of residents in				
in urban areas	-0.041	-0.016	-0.056	-0.022
	[0.013]	[0.006]	[0.015]	[0.012]
in rural or farm area	-0.011	0.007	-0.006	0.020
	[0.010]	[0.005]	[0.022]	[0.015]
under 5 years of age	-0.061	0.065	-0.033	0.048
	[0.052]	[0.101]	[0.137]	[0.173]
65 or older	-0.114	0.007	-0.172	-0.078
	[0.063]	[0.034]	[0.088]	[0.064]
Nonwhite	-0.003	-0.002	-0.02	-0.006
	[0.005]	[0.009]	[0.024]	[0.017]
with 12 years of education	0.015	0.028	0.011	0.019
	[0.014]	[0.020]	[0.032]	[0.036]
with less than 4 years of education	0.001	-0.004	-0.050	-0.004
	[0.010]	[0.017]	[0.041]	[0.052]
of households with income <$3,000	0.011	0.003	0.007	0.031
	[0.008]	[0.013]	[0.032]	[0.036]
of households with income >$10,000	0.033	0.002	0.065	0.046
	[0.053]	[0.022]	[0.057]	[0.047]
Funded before 1970		X		X
Weighted			X	X
State fixed effects	X	X	X	X
Observations	705	464	705	464
R-squared	0.254	0.278	0.490	0.340

Notes: Each column reports estimates from a separate linear regression. Heteroskedasticity-robust standard errors are corrected for clustering within state and presented in brackets beneath each estimate. Sources: See table I.

Table III. Summary of the Effects of First Family Planning Grants on Fertility

	(1)	(2)	(3)
	A. DV: General Fertility Rate		
Years 1-5	-1.134	-0.868	-0.829
	[0.404]	[0.361]	[0.367]
Years 6-10	-1.492	-1.656	-1.620
	[0.656]	[0.509]	[0.524]
Years 11-15	-0.363	-1.563	-1.599
	[0.850]	[0.559]	[0.596]
R-squared	0.874	0.908	0.915
	B. DV: Log General Fertility Rate		
Years 1-5	-0.019	-0.017	-0.012
	[0.0077]	[0.0060]	[0.0055]
Years 6-10	-0.043	-0.053	-0.037
	[0.0179]	[0.0121]	[0.0101]
Years 11-15	-0.033	-0.075	-0.044
	[0.0274]	[0.0158]	[0.0132]
R-squared	0.257	0.587	0.697
Observations	92220	92220	91380
Counties	3074	3074	3046
Covariates	C,Y	C,S-Y	C,S-Y,R,X

Notes: Panels A and B display weighted, least-squares estimates obtained from estimating equation 2. Column 1 corresponds to model 1 and includes county, C, and year, Y, effects. Column 2 corresponds to model 2 and adds state-by-year, S-Y, effects to model 1. Column 3 corresponds to model 3 and adds 1960 county covariates interacted with a linear trend, X, and REIS controls, R, to model 2. Heteroskedasticity-robust standard errors clustered by county are presented beneath each estimate in brackets. Source: Hand-entered 1959 to 1967 county vital statistics and 1968 to 1988 natality detail microdata files (NCHS 2003).

Table IV. Summary of the Effects of First Family Planning Grants on Fertility by Age Group

	(1)	(2)	(3)	(4)	(5)	(6)
Age Group	15-19	20-24	25-29	30-34	35-39	40-44
			A. DV: Age-Specific Fertility Rate			
Year 1-5	-0.387	-1.863	-2.252	-1.273	-0.582	-0.184
	[0.390]	[0.694]	[0.558]	[0.426]	[0.362]	[0.132]
Years 6-10	-1.286	-2.411	-3.871	-1.110	-0.550	-0.154
	[0.547]	[0.891]	[0.798]	[0.579]	[0.396]	[0.144]
Years 11-15	-1.123	-2.635	-3.125	-0.412	-0.331	-0.147
	[0.638]	[1.077]	[0.923]	[0.689]	[0.450]	[0.156]
R-squared	0.496	0.791	0.602	0.552	0.595	0.454
			B. DV: Log Age-Specific Fertility Rate			
Years 1-5	-0.0339	-0.0373	-0.0202	-0.0305	-0.0442	-0.0624
	[0.00660]	[0.00591]	[0.00636]	[0.00842]	[0.0153]	[0.0230]
Years 6-10	-0.0610	-0.0615	-0.0415	-0.0364	-0.0530	-0.0719
	[0.0105]	[0.0100]	[0.0117]	[0.0147]	[0.0193]	[0.0268]
Years 11-15	-0.0534	-0.0623	-0.0388	-0.0302	-0.0394	-0.0565
	[0.0131]	[0.0124]	[0.0147]	[0.0187]	[0.0235]	[0.0293]
R-squared	0.576	0.666	0.630	0.767	0.622	0.504
Observations	60739	61337	61294	60589	58648	54323
Counties	2903	2922	2922	2898	2841	2738
Covariates	C,S-Y,R,X	C,S-Y,R,X	C,S-Y,R,X	C,S-Y,R,X	C,S-Y,R,X	C,S-Y,R,X

Notes: The table presents least-squares estimates obtained from estimating equation 2 separately by five-year age groups. The dependent variables are the age-specific fertility rate in panel A and the log of the age-specific fertility rate in panel B. Only specifications for model 3 are presented for parsimony; other results are available from the author upon request. Heteroskedasticity-robust standard errors clustered by county are presented beneath each estimate in brackets. Observations change because births did not occur to women in all age groups in every year in all counties from 1968 to 1988. Source: 1968 to 1988 natality microdata aggregated to the county level (NCHS 2003).

Table V. Summary of the Effects of First Family Planning Grants on Fertility by Race

	(1)	(2)	(3)
	A. DV: General Fertility Rate, White		
Years 1-5	-1.175	-0.645	-0.759
	[0.377]	[0.275]	[0.300]
Years 6-10	-0.726	-1.112	-1.212
	[0.565]	[0.473]	[0.482]
Years 11-15	0.621	-0.613	-0.904
	[0.879]	[0.574]	[0.542]
R-squared	0.690	0.800	0.804
	B. DV: General Fertility Rate, Nonwhite		
Years 1-5	-1.128	-0.760	-0.984
	[1.135]	[0.681]	[0.706]
Years 6-10	0.973	-0.294	-1.068
	[1.686]	[1.057]	[1.059]
Years 11-15	2.247	0.0716	-1.287
	[1.865]	[1.298]	[1.253]
R-squared	0.542	0.652	0.658
Observations	31710	31710	31710
Counties	1510	1510	1510
Covariates	C,Y	C,S-Y	C,S-Y,R,X

Notes: Panels A and B display weighted, least-squares estimates obtained from estimating equation 2 separately for Whites and Nonwhites for the 1510 counties with both race groups represented in each year. Column 1 corresponds to model 1 and includes county, C, and year, Y, effects. Column 2 corresponds to model 2 and adds state-by-year, S-Y, effects to model 1. Column 3 corresponds to model 3 and adds 1960 county covariates interacted with a linear trend, X, and REIS controls, R, to model 2. Heteroskedasticity-robust standard errors clustered by county are presented beneath each estimate in brackets. Information on births for both race groups is only available for 1510 counties in all years from 1968 to 1988. Source: 1968 to 1988 natality microdata aggregated to the county level (NCHS 2003).

Table VI. Summary of the Effects of First Family Planning Grants on Mortality

	(1)	(2)	(3)
	A. DV: Infant Mortality Rate		
Years 1-5	0.0348	0.0644	-0.0655
	[0.151]	[0.137]	[0.138]
Years 6-10	0.457	0.350	-0.0113
	[0.210]	[0.173]	[0.170]
Years 11-15	1.017	0.687	0.143
	[0.227]	[0.188]	[0.179]
R-squared	0.608	0.635	0.646
	B. DV: Maternal Mortality Rate		
Years 1-5	0.0237	-0.00692	-0.0582
	[0.118]	[0.120]	[0.121]
Years 6-10	0.143	0.0280	-0.0679
	[0.125]	[0.130]	[0.130]
Years 11-15	0.250	0.109	-0.0393
	[0.127]	[0.135]	[0.133]
R-squared	0.053	0.073	0.081
Observations	92210	92210	91370
Counties	3074	3074	3046
Covariates	C,Y	C,S-Y	C,S-Y,R,X

Notes: The dependent variable is indicated after DV in each panel. Each panel plots weighted, least-squares estimates obtained from replacing the individual indicators in equation 1 with indicators for five-year groups. Column 1 corresponds to model 1 and includes county and year effects. Column 2 corresponds to model 2 and adds state-by-year effects to model 1. Column 3 corresponds to model 3 and adds 1960 county covariates interacted with a linear trend and REIS controls to model 2. Heteroskedasticity-robust standard errors clustered by county are presented beneath each estimate in brackets. Source: Numerators are computed from the multiple-cause-of-death mortality microdata, 1959-1988. Denominators use hand-entered 1959 to 1967 county vital statistics data and 1968 to 1988 natality microdata (NCHS 2003).

Table VII. Summary of the Effects of First Family Planning Grants on Mortality by Race

	White Women			Nonwhite Women		
	(1)	(2)	(3)	(1)	(2)	(3)
			A. DV: Infant Mortality Rate			
Years 1-5	0.209	0.308	0.146	0.295	-0.288	-0.391
	[0.149]	[0.156]	[0.166]	[0.541]	[0.608]	[0.623]
Years 6-10	0.502	0.551	0.268	1.153	0.228	-0.323
	[0.177]	[0.181]	[0.189]	[0.706]	[0.650]	[0.662]
Years 11 -15	0.908	0.740	0.314	2.108	1.080	0.0451
	[0.228]	[0.200]	[0.202]	[0.800]	[0.702]	[0.659]
R-squared	0.477	0.503	0.507	0.264	0.294	0.300
			B. DV: Maternal Mortality Rate			
Years 1-5	0.175	0.109	0.0759	-0.0619	0.162	0.0833
	[0.124]	[0.137]	[0.139]	[0.491]	[0.687]	[0.692]
Years 6-10	0.261	0.159	0.0956	0.0253	0.484	0.224
	[0.119]	[0.138]	[0.141]	[0.600]	[0.700]	[0.697]
Years 11 -15	0.385	0.260	0.177	0.390	0.582	0.132
	[0.117]	[0.134]	[0.136]	[0.552]	[0.720]	[0.719]
R-squared	0.016	0.039	0.041	0.020	0.041	0.043
Observations	31710	31710	31710	31710	31710	31710
Counties	1510	1510	1510	1510	1510	1510
Covariates	C,Y	C,S-Y	C,S-Y,R	C,Y	C,S-Y	C,S-Y,R

The dependent variable is indicated after DV in each panel. Each panel plots weighted, least-squares estimates obtained from replacing the individual indicators in equation 1 with indicators for five-year groups. Column 1 corresponds to model 1 and includes county and year effects. Column 2 corresponds to model 2 and adds state-by-year effects to model 1. Column 3 corresponds to model 3 and adds 1960 county covariates interacted with a linear trend and REIS controls to model 2. Heteroskedasticity-robust standard errors clustered by county are presented beneath each estimate in brackets. Information for both race groups is only available for 1510 counties. Source: Numerators are computed from the multiple-cause-of-death mortality microdata, 1968-1988. Denominators use 1968 to 1988 natality microdata (NCHS 2003).

Table VIII. The Effects of First Family Planning Grants on Use of Family Planning Services

	Mean DV	(1)	(2)	(3)
		A. DV: 1=Ever Used Family Planning Clinic		
Federal Grant	0.070	0.00341	-0.00731	-0.00692
		[0.00790]	[0.00814]	[0.00788]
In Poverty	0.150	0.0683***	0.0454**	0.0450**
		[0.0211]	[0.0180]	[0.0194]
Federal Grant x In Poverty	0.211	0.0515*	0.0372	0.0409
		[0.0303]	[0.0263]	[0.0277]
Observations		5946	5946	5874
		DV: 1=*Ever Used Medical Contraception*		
Federal Grant	0.651	0.0447***	0.0336**	0.0327**
		[0.0146]	[0.0146]	[0.0146]
In Poverty	0.589	-0.0738**	-0.0808***	-0.0828***
		[0.0324]	[0.0293]	[0.0302]
Federal Grant x In Poverty	0.674	0.0906*	0.0691	0.0712
		[0.0462]	[0.0475]	[0.0439]
Observations		5946	5946	5874
		DV: 1=*Ever Used the Pill*		
Federal Grant	0.629	0.0380**	0.0273*	0.0263*
		[0.0152]	[0.0151]	[0.0148]
In Poverty	0.555	-0.0956***	-0.104***	-0.104***
		[0.0325]	[0.0294]	[0.0286]
Federal Grant x In Poverty	0.645	0.106**	0.0844*	0.0842*
		[0.0490]	[0.0446]	[0.0441]
Observations		5946	5946	5874
State fixed effects		X	X	X
Other covariates			A,C,E,P	A,C,E,P,K

This table reports average partial effects from a probit specification of equation (3). Bootstrapped standard errors (1000 replications) are reported in brackets beneath. Columns 1-3 include state fixed effects. Column 2 adds dummy variables for age categories (A), Catholic (C), educational achievement (E), and PSU size (P). Column 3 adds a set of dummy variables to column 2 for the "ideal number of children" to proxy for other differences in the demand for children (K). See text for more details. Source: 1970 *National Fertility Survey*.