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The Fertility Gap and Economic Freedom

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Abstract

According to recent surveys, the average woman in the United States believes she would be happiest having about 2.5 children. Yet, the total fertility rate is 1.7 children. The difference between desired fertility and achieved fertility is called the fertility gap. This paper investigates the policy determinants of the fertility gap across the U.S. states, focusing on variation in economic freedom. We argue that greater economic freedom empowers women to choose work that better fits their family life. We test this hypothesis using state-level measures of fertility preference (2020-23) from a nationally representative survey of reproductive-aged women, state-level total fertility rates (2020-23), and economic freedom scores (2000-20) from the Fraser Institute. Even with controls, we find a consistently negative and statistically significant relationship between a state's economic freedom score and its fertility gap. Specifically, a one standard deviation increase in economic freedom is associated with a 0.053 decrease in the fertility gap, which amounts to nearly a 30% standard deviation decrease in the gap.

Keywords: Fertility Gap; Economic Freedom; Family Economics

JEL Codes: D10; J13; H70

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"The family is the test of freedom"
– G.K. Chesterton

1 Introduction

The expansive economic growth of the past few centuries has benefited women in many ways. Life expectancy and female educational attainment have grown considerably during this period, while infant and maternal mortality have decreased (Hill and King, 1995; Weil et al., 2014; Dalgaard and Strulik, 2014). Increased standards of living may also have contributed to the recognition of women's economic and political rights (Doepke et al., 2022). At the same time, global fertility has fallen below what the average reproductive-age woman says is her personal ideal number of children. For women entering their reproductive years in 2010, Stone (2019) estimates 270 million missing-but-desired births (if current fertility ideals and birth rates remain constant) for the world on the whole. These trends have also recently captured the attention of policymakers, as an increasing number of countries face below-replacement rates of total fertility (2.1 children per woman) and are experiencing (or about to experience) population decline.[1] This difference between desired fertility and achieved fertility – the fertility gap – seems to be largest for highly educated women in developed countries (Beaujouan and Berghammer, 2019).

This project brings together research on the fertility gap, advances in family and gender economics, and the literature on economic freedom. While past research on the fertility gap has largely been descriptive or focused on demographic differences across women, we take an institutional approach by investigating how policy environments which give women more control over their economic choices relate to the gap between women's desired and actual fertility. In particular, the literature on family and gender economics has established that work-family compatibility is an important influence on fertility in developed countries today (Adsera, 2005; Goldin, 2021; Doepke et al., 2022). Although this compatibility is determined by many variables, economic freedom may improve the matching of people to jobs and the variety of work opportunities available, especially related to compensating differentials connected to family and work compatibility. If this is the case, then economic freedom may make it easier for women to find jobs with flexible schedules (for example), which would reduce the marginal cost of childbearing and childrearing, increasing the quantity of putatively "desired" children she in fact has. Because average fertility desires are well above actual fertility, we predict that areas with greater economic freedom would have a narrower fertility gap. In societies where average fertility desires are appreciably below actual fertility rates, however, changes in economic freedom might actually reduce fertility. For example,

[1] See, for example: https://www.nytimes.com/2023/01/16/business/china-birth-rate.html.

weakening norms of women's economic seclusion almost definitionally increases economic freedom and would increase women's employment opportunities. Strong seclusion norms are most common in societies where fertility rates are very high, at or above the numbers women report desiring. And indeed, prior research shows that when seclusion norms are eroded, women's employment rises and fertility falls (Kabeer et al., 2018).

We test our hypothesis using survey-based cross-sectional data on stated fertility preferences across the fifty U.S. states (2020-2023), the total fertility rates in each state (2020-2023), and economic freedom scores (Gwartney et al., 2022). First, we document fertility desires across the fifty states and explore their relationship to religiosity, household income, and economic freedom. Next, we estimate regressions and show that even after controlling for median household income, share of married households, share attending weekly religious services, and the foreign-born share of the population, the relationship between economic freedom and the fertility gap remains negative and significant. That is, more economic freedom is associated with fewer women falling short of their desired fertility. In particular, a one standard deviation increase in economic freedom is associated with a 0.053 decrease in the fertility gap, amounting to a 30% standard deviation decrease in the fertility gap. We also use other state policy indices (Ruger and Sorens, 2021) to show that it is not overall freedom, but economic freedom in particular, which contributes to a smaller fertility gap. Finally, we include two robustness checks using alternative measures of our main variables of interest.

2 Background

An individual might end up with a different number of children than they report desiring for a variety of reasons. First, it may be difficult to find a partner who shares one's fertility goals. Since the production of a child generally requires cooperation from both a man and a woman (Doepke and Kindermann, 2019), individuals must expend resources to first discover and then bargain with one another. While in principle women could pursue child-bearing without a partner, in practice the difficulty of child-rearing is such that partnership remains a key part of the fertility decisionmaking process, even if partnership may not always imply formal marriage. Given that the status quo is not having a child, such coordination issues tend to bias fertility downward relative to desires and increase the fertility gap.

Second, an individual may encounter unexpected infertility constraints. Relatively few women are aware of any possible biological impediments to fecundity prior to attempting to conceive, and as a result, individuals may only discover over time that they are unable to raise the number of children for which they had originally planned. Perhaps the most binding infertility

constraint for the average contemporary woman is age. As Goldin (2021) points out: "the timing [of modern job promotions] is brutal. For women who want to have a family, waiting to their mid-thirties to have their first child is stacking the deck against succeeding at the family part and having the children" (p. 8). This would again bias fertility downward relative to fertility plans.

Third, there may be unexpected fertility, i.e., the failure of contraceptive methods. Men and women may discover that they are more fertile than they expected, and unplanned births may occur even though (or perhaps because) forms of contraception are widely used (Beauchamp and Pakaluk, 2019). This would bias fertility upward and decrease the fertility gap.

Finally, new information may cause individuals to change their minds. An extensive literature has studied patterns of change in fertility preferences. Overall, although fertility preferences do change over the life course, decades of longitudinal demographic research has found that stated fertility preferences are the strongest extant predictors of actual fertility behavior (Cleland et al., 2020). Even in those studies which most emphatically highlight the variability and biases in stated fertility preferences, such as Müller et al. (2022), stated preferences remain extremely strongly correlated with subsequent behaviors and very stable across time at the population average.[2] Although economists tend to prefer measures of "revealed preference," in practice women's stated preferences in surveys are stronger predictors of actual behavior than other variables like current contraceptive usage or current marital status.

2.1 The fertility gap

The fertility gap is measured using survey data on the fertility preferences and plans of reproductive-aged women and then comparing these responses to a measure of achieved fertility, generally the total fertility rate (TFR) during the same time period. The TFR is a synthetic cohort measure of fertility, meaning it does not in fact measure actual achieved fertility, but likely future achieved fertility. Empirical assessment of the accuracy of this measure has found that although it is not a perfect measure, more sophisticated approaches to forecasting of fertility add relatively little predictive accuracy (Bohk-Ewald et al., 2018). As such, we consider TFR a suitable proxy measure for likely fertility achievements of women in our survey sample (women ages 18-44). Although these responses are one-sided (i.e., they exclude men) and probably understate the true fertility gap in society (Doepke and Kindermann, 2019), women generally bear most of the cost of fertility and so surveys and research have focused more on their preferences. Furthermore, men's fertility

[2] Müller et al. (2022) finds that even in a longitudinal survey population with very high rates of incorrect recall of past stated preferences, average preferences are 3.46, 3.29, and 3.39 across three survey waves in an 11-year range, and that women who reported desiring any additional children were twice as likely to have a child during the follow-up period, which did not cover their entire reproductive future. Even Müller et al. (2022) in fact concedes that finding a statistically strong relationship between stated preferences and subsequent behaviors is "consistent with most studies of reported fertility intentions and later reproductive outcomes."

is not well-measured due to uncertain and unacknowledged paternity.

Depending on which fertility preference indicator from a survey is being used, different fertility gaps can be estimated. There are two main types. First, researchers may assess fertility "desires" or "ideals" relative to achieved fertility, which usually results in the largest fertility gap since it accounts for all the barriers to fertility outlined above. This measure is particularly helpful for the economic approach to fertility because it provides a more complete picture of the demand side – that is, how many more children parents would like to enjoy. Moreover, this question is helpful for policy considerations since it represents the maximum number of children reachable through pro-natal policy if persuasion about family size is undesirable to policymakers or believed to be unlikely, i.e., how many children a couple would welcome without a change of preferences or coercion. The preference for children seems to be largely stable over time in the United States (Hagewen and Morgan, 2005). For example, Gallup polls reveal that Americans have desired 2.5 children (on average) since the 1970s.[3] The variation in this fertility gap, then, will be due to variation in fertility achievement. Second, researchers may assess fertility "plans" or "intentions" relative to achieved fertility, which results in a relatively smaller gap since this accounts for only unexpected barriers to fertility, and also invites respondents to consider "compromises with reality." In other words, this kind of survey question is a weaker proxy for demand. Research has shown that this gap tends to be substantially lower in the United States than in other countries, which may come as a surprise given that the United States offers relatively fewer targeted fertility benefits than other countries (Morgan and Rackin, 2010).

There is substantial variation in the fertility gap across countries and demographic groups. Beaujouan and Berghammer (2019) take a cohort approach to the gap between fertility intentions and completed fertility in Europe and the U.S. and find that the fertility gap is largest (about 0.7 children) in Southern European countries like Spain and Italy, which is driven by a combination of relatively high fertility intentions and below-average mean numbers of children. The fertility gap is smallest (closer to 0.2) in the United States and France, places with average fertility intentions and relatively high fertility achievement. Their measure of excess childlessness – the number of women who plan to remain childless vs. the number of women who actually do – is also generally consistent with this pattern, although of greater magnitude.[4] Finally, they measure differences in the fertility gap across educational attainment, finding that "there is no consistent educational gradient in mean intended family size, although for most countries it is either U-shaped or negative. However, the educational gradient in completed fertility is clearly negative, and highly educated women generally show the largest gap between intended and realized fertility" (Beaujouan and

[3] https://news.gallup.com/poll/164618/desire-children-norm.aspx

[4] For example, "despite a low preference for staying childless, a significant share of women in Spain and Italy will eventually not have any children (around 22%), resulting in the largest excess childlessness in Europe (around 20 percentage points)" (Beaujouan and Berghammer, 2019, p. 527).

Berghammer, 2019, p. 527). Their takeaway is that the fertility gap is largest in those countries where it is hardest to combine career with family.

2.2 Economic freedom and the fertility gap

Much of the economic literature on fertility is focused on its relationship to income (e.g., Jones and Tertilt (2008), Kearney and Wilson (2018), and Gallego and Lafortune (2021)). From the economic perspective, an increase in (earned) income has two effects on fertility: 1) it increases the amount of money available for a couple to spend on children (the income effect), and 2) it increases the opportunity cost of sacrificing working hours to take care of a child (the substitution effect). As female educational attainment and wages rose historically, the substitution effect appeared to dominate. However, recent research suggests that this is no longer true – fertility no longer has a strong relationship with income, and in some cases, it is even positive (Doepke et al., 2022). For example, Adsera (2005) shows that a country's total fertility rate and female labor force participation have been positively correlated since the late 1980s. This didn't occur because women in the formal labor force suddenly valued having children more than those without formal work, but rather because the conditions of some countries became more conducive to individual women achieving their goals (whether that be for careers and/or children).

As the literature on the gender wage gap has illuminated, women (particularly mothers) tend to value temporal flexibility more than men (Bertrand et al., 2010; Goldin, 2014). From the perspective of fertility, temporal flexibility means that work schedules can be arranged around the needs of the child (e.g., gig work or remote work) so that the opportunity cost of a woman's time need not be her full market wage (Alon et al., 2020). For instance, Doepke et al. (2022) point to many ways that the tradeoff between working and caring for children has diminished in recent years, such as with public education or quality childcare/household services available through the market.[5] On the other hand, as Adsera (2006) points out, careers that shelter individuals from the uncertainty of job turnover (e.g., university tenure) may encourage couples to undertake long-term investments, such as children, moving them closer to their ideal family size. For these reasons, economists now recognize that the compatibility between career and family is a key driver of fertility decisions (Goldin, 2021).

Women are more likely to achieve compatibility between career and family when they are offered more flexibility in the economic sphere. One way to estimate the degree of choice in the

[5]Interestingly, immigration has a two-fold effect on fertility rates. First, immigrants generally have higher fertility rates (that more closely match their home countries). Second, immigrants often work in services that allow parents to outsource some aspects of childcare or home production. For instance, Furtado (2016) finds that college-educated native women in US cities with a greater inflow of immigrants respond to the greater availability of childcare by increasing their fertility.

economic sphere is to compare economic freedom scores, which summarize the degree to which the policies and institutions are supportive of economic freedom defined as personal choice, voluntary exchange, freedom to enter markets and compete, and security of the person and privately owned property (Gwartney et al., 2022). A large literature in economics relates economic freedom to a variety of beneficial outcomes: economic growth (Williamson and Mathers, 2011), lower levels of corruption (Goel and Nelson, 2005), higher educational attainment (Sart et al., 2022), greater intergenerational income mobility (Callais and Geloso, 2022), higher labor force participation and lower unemployment rates (Heller and Stephenson, 2014), and even happiness (Gropper et al., 2011). The novel approach of this project is to link the literature on fertility and female labor market participation with the consensus view that economic freedom increases the choice set available to individuals which – importantly for us – includes parents. In other words, if economic freedom increases the number of mutually beneficial trades that can be made, then women who value children and career will have a greater ability to customize their work choices in a way that accords with their desired fertility.

3 Data

3.1 Data sources

To estimate state-level fertility preferences, we use proprietary access to responses from seven waves of a nationally representative online survey of women ages 18-44 (the Demographic Intelligence Family Survey or DIFS, n = 13,000), pooled across the years 2020-2023, which collected numerous different fertility preference measures.[6] We use a novel measure of fertility desires, which we refer to as *happiest parity*, to estimate the desire for children in a given U.S. state during this time period. For this question, respondents report how happy they would be across family outcomes of 0 to 6 children, and these happiness levels are used as weights to assign their weighted *happiest parity* outcome.[7] Because respondents describe their expected utility from a range of possible outcomes, this question provides a very granular view of demand for children, allowing us to observe not only the mean number of children desired, but the slope of women's expected loss of happiness as expected parity deviates from their peak-desired parity, either higher or lower. Crucially, this means our estimate of childbearing desire does not arise from women simply reporting a

[6] Co-author Lyman Stone is a partner at the firm Demographic Intelligence, which funds and fields the survey to collect market research for a range of for-profit entities producing infant and maternity products. Survey waves of variable sizes are fielded in March/April and September/October each year. Survey and question design is by Lyman Stone. Data is the property of Demographic Intelligence. Data used for this publication can be shared upon reasonable request.

[7] Exact question wording and response options are provided in our Appendix.

social norm of a two child family, but instead requires women to evaluatively consider a range of non-normative family outcomes. The resulting assessment then is resilient to many conventional critiques of stated fertility preferences, and is considerably less volatile across survey waves at the population mean than other fertility preference measures in the survey waves utilized for this paper. We compare this to the standard measure of expected fertility outcomes, the average total fertility rate (TFR) in each state over the years 2020-23.[8] We also use another measure of the fertility gap – the gap between intended births and the TFR – as a robustness check.[9]

Our primary measure of economic freedom comes from the well-known "Economic Freedom of the World" report from the Fraser Institute (Gwartney et al., 2022). We use the average score of an individual state over the years 2000-2020 (the most recent year available) to estimate the experience of economic freedom enjoyed by the average woman in that state during her reproductive years. The subnational index assigns scores to jurisdictions based upon three different areas of economic freedom – government spending, taxation, and labor market freedom.[10] Government spending and taxation certainly impact the resources at the disposal of households, while labor market freedom may be particularly important for flexibility in career-family arrangements. For robustness checks, we also use measures of policy variation from the "Freedom in the 50 States" report of the Cato Institute, encompassing more than 200 policy variables (Ruger and Sorens, 2021).[11] This comprehensive index of freedom across the fifty U.S. states is comprised of three components: 1) regulatory policy, 2) fiscal policy, and 3) personal freedom, from both a pro-life and pro-choice perspective.[12] Because we draw from different sources, we scale all index values for ease of comparison.

Past research has shown that income, marriage, religiosity, and immigration status are also determinants of fertility and fertility preferences. In particular, the majority of births in the United States still occur within marriage, and rates of marriage and marital fertility have a large impact on population-level fertility (Hayford, 2013; Stone and Spencer, 2022). We control for the share of married households and median household income in each state using data from the American Community Survey (2020, 5-year estimates). Religiosity is controlled for using data on weekly religious service attendance from the American Values Atlas (2020).[13]

[8] The total fertility rate (TFR) is the average number of children a woman would give birth to during her lifetime if she were to pass through her reproductive years (15-49 years) experiencing the current age-specific fertility rates.

[9] We also include this question wording in the Appendix.

[10] A more detailed description of each measure can be found in the Appendix.

[11] We document the variables captured by each freedom dimension in the Appendix.

[12] The pro-life personal freedom index considers more state restrictions on abortion as pro-freedom (including the lack of state subsidies for abortion through Medicaid), while the pro-choice personal freedom index views all limits on abortions as anti-freedom. We include both perspectives not only because there are always diverging views on what constitutes “true freedom," but because of the relevance of abortion policy for questions of fertility.

[13] Although the COVID-19 pandemic impacted the usual functioning of religious organizations during part of our sample period, we still favor behavior-based measures of religiosity over membership estimates. When we

3.2 Descriptive Statistics

We begin by summarizing our variables of interest. Table 1 reports the minimum, mean, standard deviation (SD), and maximum of each variable.

Table 1: Summary Statistics

Variable	Minimum	Mean (SD)	Maximum
Happiest Parity Gap	0.30	0.79 (0.18)	1.42
Intentions Parity Gap	−0.87	0.31 (0.36)	1.28
Economic Freedom Score	−2.27	0.00 (1)	1.91
Regulatory Policy Score	−2.76	0.00 (1)	1.26
Fiscal Policy Score	−2.63	0.00 (1)	2.45
Personal Freedom Score (Pro-Life)	−1.79	0.00 (1)	2.69
Personal Freedom Score (Pro-Choice)	−1.87	0.00 (1)	3.38
Median Household Income	$46,511	$64,529 ($10,525)	$87,063
Married Households Share	43.00	48.47 (2.91)	60.90
Share Attending Weekly Religious Services	11.00	27.26 (7.93)	52.00
Foreign-Born Share	1.60	9.32 (6.13)	26.60

Sources: Demographic Intelligence Family Survey (2020-23), Fraser Institute's Economic Freedom of the World report (2000-2020), Cato Institute's Freedom in the 50 States report (2000-2019), American Values Atlas (2021), and the American Community Survey (2020, 5-year estimates). All index values are scaled for ease of comparison.

Using our preferred measure of fertility desires, the average *happiest parity* gap from 2020-2023 ranges from 0.3 children (South Dakota) to 1.4 children (Rhode Island). Wisconsin, with a fertility gap of 0.77 children, represents a middling case. Economic freedom varies across the United States from New York (least free) to New Hampshire (most free). Regulatory and fiscal policy environments also find New York at the bottom with Kansas and New Hampshire at the top, respectively. Finally, North Dakota is the most free state (and Illinois the least) including a pro-life perspective on abortion policy, while Nevada is the most free state using a pro-choice

substitute for religious affiliation share in 2020 as a control instead, the results are not substantially different.

perspective on abortion policy (and Illinois the least). There is also significant variation across our controls for income, marriage, religiosity, and immigration status.

We now turn to investigating cross-sectional variation in fertility and fertility preferences. Figure 1 compares state-level fertility desires using the *happiest parity* measure. Figure 2 shows the average fertility rates (TFR) across the U.S. during this same time period (2020-23).

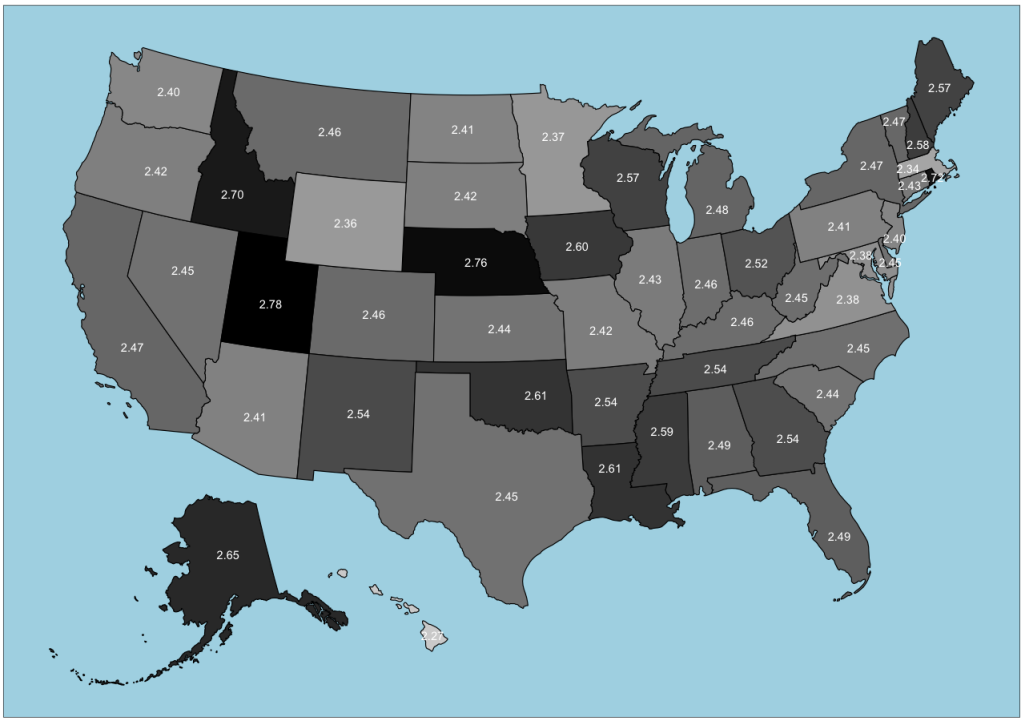

Figure 1: Fertility Desires (*Happiest Parity* Measure) Across the U.S. (2020-23)

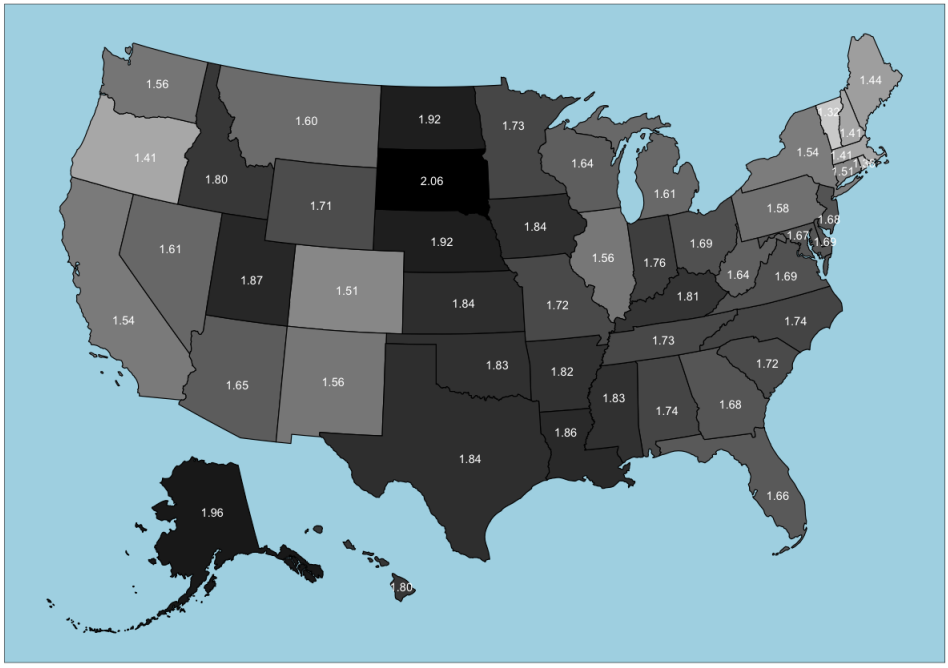

Figure 2: Fertility Rates (TFR) Across the U.S. (2020-23)

On average, respondents stated that they would be happiest with a family size of 2.49 children, while actual fertility was 1.68 children. Fertility desires vary widely across the U.S. states, as does fertility. Interestingly, there is not an obvious geographic pattern to desires, as there is with fertility (higher in the Midwest and the South). The five states with the highest *happiest parity* scores were Utah (2.78), Nebraska (2.76), Rhode Island (2.72), Idaho (2.70), and Alaska (2.65), and those reporting the lowest *happiest parity* scores were Hawaii (2.27), Massachusetts (2.34), Wyoming (2.36), Minnesota (2.37), and Virginia (2.38).

Decades of research on fertility have established that income and religiosity are significant (opposite, generally) influences. However, these metrics have little correlation with the fertility gap due to the fact that they impact fertility desires as well. Figure 3 shows the association between state-level median household income and actual/desired fertility. States with higher median household incomes (2020) saw lower fertility rates and lower desired fertility (2020-23), the raw correlation being about -0.28 for each. Since the impact of both variables is virtually equivalent, income has little effect on the overall fertility gap between desired and actual fertility outcomes.

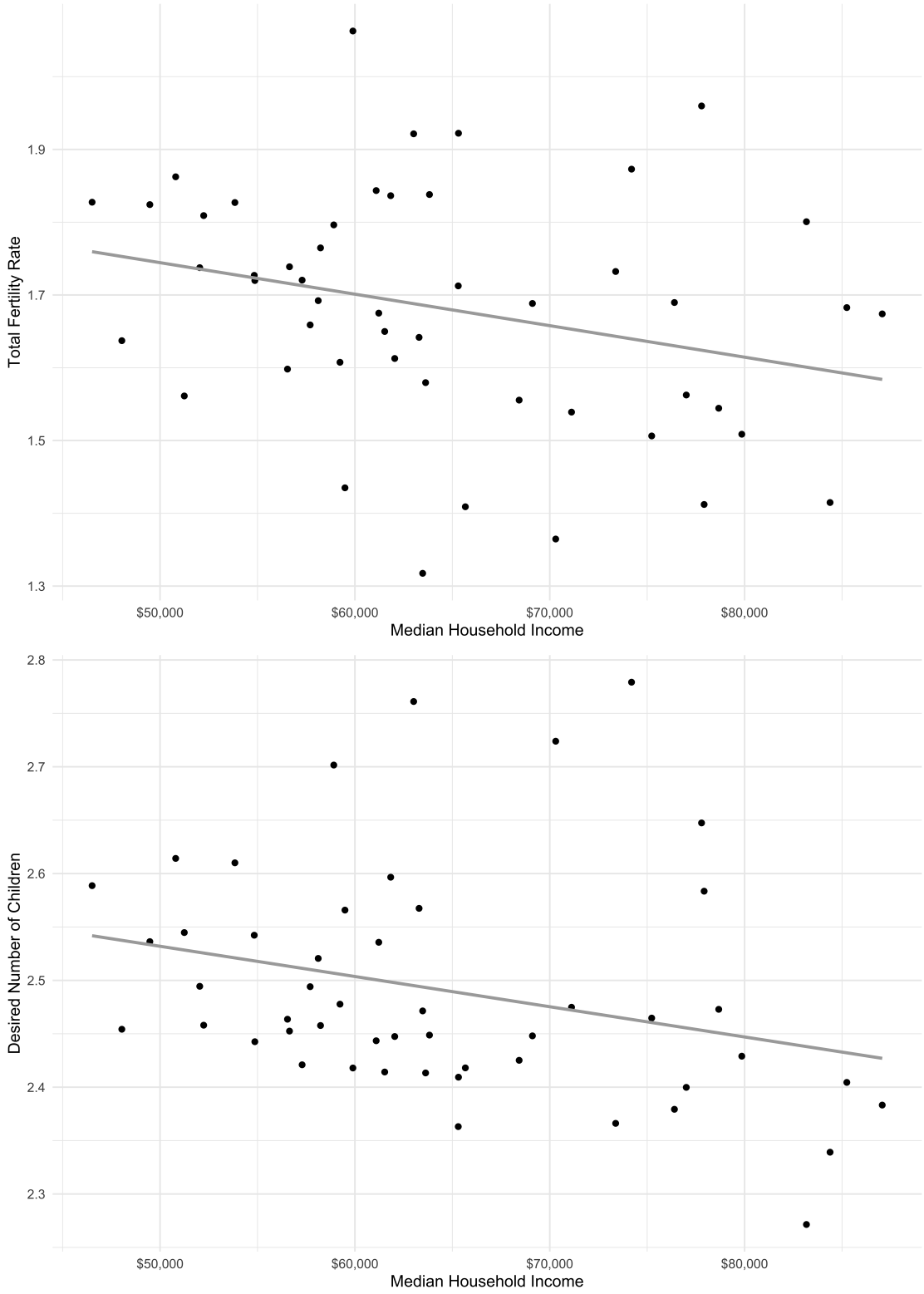

Figure 3: Median Household Income and Actual/Desired Fertility

Sources: Demographic Intelligence Family Survey (2020-23) and the American Community Survey (2020)

Next, Figure 4 shows the association between state-level religiosity (2021) and actual/desired fertility (2020-23). The share of adults who attend religious services weekly is positively correlated with fertility (0.7) and with fertility desires (0.3). In other words, states with more religious participation tend to have much higher fertility but only slightly higher preferences for fertility, narrowing the fertility gap.

On the other hand, economic freedom has little impact on desires while being associated with higher actual fertility. Figure 5 shows the relationship between state-level economic freedom (2000-20) and actual/desired fertility (2020-23).

The raw correlation between economic freedom and fertility is 0.29. The correlation between economic freedom and the *happiest parity* score is nearly zero (-0.05), suggesting women's experience of economic freedom has little impact on their desire for children. However, this is a clue that economic freedom might impact actual fertility, bringing women closer to the number of children they say would make them happiest.

4 Results

4.1 Empirical strategy

We propose a simple empirical test for the hypothesis that the fertility gap is partially determined by the conditions of economic freedom which women experience. Crucially, the economic freedom scores we report are pooled across a 20 year period before the surveys of fertility desires and measures of fertility rates; as reproductive women today are ages 15-50, these historic freedom values reflect levels of economic freedom currently-reproductive-age women might have experienced in their past. An OLS regression is specified as follows:

$$Y_i = \beta_1 X_i + \beta_2 W_i + \beta_3 M_i + \beta_4 R_i + \beta_5 S_i + \epsilon \tag{1}$$

where Y_i indicates our dependent variable, the fertility gap of an individual state, X_i refers to a measure of economic freedom of an individual state, W_i controls for the median household income of an individual state, M_i controls for share of married individuals in an individual state, R_i controls for share of adults attending religious services weekly in an individual state, and S_i controls for the foreign-born share of the population in an individual state.

4.2 Economic freedom and the fertility gap

Our first and primary empirical analysis investigates the relationship between the Fraser Institute's measure of economic freedom (2000-2020) and a state's average fertility gap (2020-2023). We report these results in Table 2.

Table 2: Evaluating the Effect of Economic Freedom on the Fertility Gap

	Happiest Parity Gap		
	(1)	(2)	(3)
Economic freedom	-0.053^{*}	-0.053^{*}	-0.046^{*}
	(0.029)	(0.028)	(0.026)
Median household income		0.226°	0.234
		(0.160)	(0.216)
Married share			-0.0001
			(0.012)
Weekly religious attendance			-0.005
			(0.005)
Foreign-born share			-0.005
			(0.004)
Observations	50	50	50
Adjusted R^2	0.071	0.095	0.082
Note:	$^{\circ}p < 0.2;^{*} p < 0.1;^{**} p < 0.05;^{***} p < 0.01$		

Sources: Demographic Intelligence Family Survey, Economic Freedom of the World Gwartney et al. (2022), American Values Atlas, and the American Community Survey. "Economic freedom" refers to the standardized subnational economic freedom score of each state averaged over the years 2000-2020. "Median household income" refers to the logged median household income of a state in 2020. "Weekly religious attendance" refers to the share of people in each state claiming to attend religious services weekly in 2021. "Married share" refers to the share of married households in a state in 2020. "Foreign-born share" refers to the share of a state's population that were not U.S. citizens at birth in 2020. Standard errors are heteroskedasticity robust.

We begin with a raw regression of economic freedom scores on the *happiest parity* gap, as measured by the difference between the total fertility rate (TFR) and the *happiest parity* indicator of fertility desires (column 1). The coefficient is negative and statistically significant: women in states with greater economic freedom experience a smaller divergence between desired and actual fertility on average. We then introduce our control for (logged) median household income, since we want to understand the impact of economic freedom (i.e., increasing the ability of parents to combine work and family life) apart from its income-enhancing effects (column 2). The coefficient remains virtually unchanged, indicating that a one standard deviation increase in economic freedom leads to a -0.053 reduction in the fertility gap. This is economically significant since this represents nearly a 30% standard deviation (0.18) reduction of the gap. Moreover, the coefficient on income is positive and significant at the 20% level, representing that the independent effect of additional income is toward a larger fertility gap. We interpret this result as additional evidence that the primary (opportunity) cost of children is time, i.e., foregone earnings (Becker, 1991).

Finally, we also control for the share of married households, adults attending weekly religious services, and foreign-born individuals in the state population, since these factors have been shown to independently influence fertility. The coefficient on economic freedom remains significant at the 10% level and of similar magnitude (column 3). With full controls, a one standard deviation increase in economic freedom is associated with a -0.046 reduction in the fertility gap.

However, it is noteworthy that our Adjusted R^2 decreases under this specification (from 0.095 to 0.082). This signals to us that our controls for marriage, religiosity, and immigration are not independently important for explaining variation in the fertility gap, an interpretation which is also suggested by their lack of magnitude or significance. For these reasons, our preferred specification is given in column (2). While at first glance it may seem surprising that variables closely-related to fertility like immigrant origin and marriage would not predict the fertility gap, in fact this result is very easy to explain: marriage and religiosity correlates with fertility but also with fertility desires. The same is true of immigrant status. In the survey data, married people report higher desires than unmarried people, and immigrants report higher desires than natives.

4.3 Economic freedom or just freedom?

In this section, we test the alternative hypothesis that it is freedom per se – not economic freedom – which is related to a smaller fertility gap. We draw data from the Cato Institute's report "Freedom in the 50 States" (2000-2020) which ranks the states according to three policy areas: 1) regulatory policy, 2) fiscal policy, and 3) personal freedom. The report includes both a pro-life and pro-abortion perspective on laws that increase personal freedom, both of which we include

below.

This broader index of freedom also allows us to validate our results that economic freedom is associated with a smaller fertility gap using an alternative measures of economic freedom: regulatory policy and fiscal policy freedom. This is possible because the Fraser Institute's measure of economic freedom (fiscal plus regulatory policy scores) is strongly but not perfectly correlated with Cato's fiscal policy measure (0.75) and regulatory policy measure (0.50), while being less related to their measures of pro-life/pro-choice personal freedom (0.31 and −0.13, respectively). Table 3 presents these results.

Table 3: Evaluating the Effect of Different Freedoms on the Fertility Gap

	Happiest Parity Gap							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Fiscal policy	0.002	−0.001						
	(0.029)	(0.030)						
Regulatory policy			−0.051**	−0.054*				
			(0.025)	(0.030)				
Personal freedom (pro-life)					−0.015	0.010		
					(0.022)	(0.024)		
Personal freedom (pro-choice)							0.050*	0.034
							(0.030)	(0.034)
Full Controls		yes		yes		yes		yes
Observations	50	50	50	50	50	50	50	50
Adjusted R^2	−0.021	0.015	0.064	0.063	−0.013	0.017	0.061	0.046
Note:							°p<0.2; *p<0.1; **p<0.05; ***p<0.01	

Sources: Demographic Intelligence Family Survey, Freedom in the 50 States Ruger and Sorens (2021), American Values Atlas, and the American Community Survey. All policy variables are scaled for ease of comparison. Controls include median household income (2020), share attending weekly religious services (2021), married share (2020), and foreign-born share (2020). Standard errors are heteroskedasticity robust.

Of the three components, only regulatory policy has consistently negative and statistically significant coefficients, meaning states with less restrictive regulatory policies (giving them higher scores) also have smaller fertility gaps. The magnitude of the effect of regulatory policy freedom (0.054) is nearly identical to that of our previous measure of economic freedom, such that a one standard deviation increase in regulatory policy freedom is associated with a 30% standard deviation decrease in the fertility gap. This aligns with our theory of work-life compatibility influencing fertility gaps, since the regulatory policy component includes policies like right-to-work laws and occupational licensing requirements. However, the Adjusted R^2 is lower in both

specifications (columns 3 and 4) which lead us to favor our original measure of economic freedom.

Our other statistically significant result (column 7) shows that greater "pro-choice" personal freedom is associated with a larger fertility gap. Although the statistical significance of pro-choice personal freedom disappears once controlling for income, marriage, religiosity, and immigration, its sign remains positive. Perhaps counterintuitive, we interpret this result to be consistent with the fact that it is economic freedom, not freedom per say, that contributes to a smaller fertility gap. States with more pro-choice policies may see lower overall fertility and thus a larger gap between desired and actual fertility. Neither fiscal policy nor pro-life personal freedom appear to have a statistically significant effect on the fertility gap.

4.4 Robustness checks

To check the robustness of our results, we use an alternative measure of the fertility gap: the gap between personal fertility intentions[14] and the total fertility rate. This measure of the fertility gap is important because it underscores how women may also encounter unexpected fertility constraints when they are trying to fulfill their fertility plans. We hypothesize that economic freedom will still be associated with a smaller fertility gap in this case because it still affords women more flexibility to adjust to unforeseen circumstances.

The results for our regression using the intended parity gap are shown in Table 4.

[14]Implied total intended fertility from parity status and progression intentions.

Table 4: Robustness Check

	Intended Parity Gap		
	(1)	(2)	(3)
Economic freedom	−0.094*	−0.095*	−0.102**
	(0.055)	(0.055)	(0.048)
Median household income		−0.291	−1.358**
		(0.231)	(0.666)
Married share			0.068**
			(0.026)
Weekly religious attendance			−0.018*
			(0.009)
Foreign-born share			0.007
			(0.009)
Observations	50	50	50
Adjusted R^2	0.051	0.049	0.152
Note:	∘p<0.2; *p<0.1; **p<0.05; ***p<0.01		

Sources: Demographic Intelligence Fertility Survey, Gwartney et al. (2022), American Values Atlas, and the American Community Survey. "Economic freedom" refers to the standardized subnational economic freedom score of each state averaged over the years 2000-2020. "Median household income" refers to the logged median household income of a state in 2020. "Weekly religious attendance" refers to the share of people in each state claiming to attend religious services weekly in 2021. "Married share" refers to the share of married households in a state in 2020. "Foreign-born share" refers to the share of a state's population that were not U.S. citizens at birth in 2020. Standard errors are heteroskedasticity robust.

Economic freedom remains both statistically significant as well as negative across all specifications. Our results imply that a one standard deviation increase in economic freedom is associated with a 29% standard deviation (0.36) decrease in the *intended parity* fertility gap. In other words, economic freedom may help women fulfill their current fertility intentions and plans as well as their fertility desires.

Our controls for income, marriage, and religiosity are now statistically significant, perhaps because while these had similar effects on fertility desires and outcomes, their influence on fertility intentions is different. Household income and weekly religious service attendance seem to narrow the fertility gap between intentions and achievement, supporting an intuitive result that in states with higher average incomes and more robust religious communities, couples are better able to fulfil their fertility plans. The share of married households appears to increase the fertility gap, suggesting that frustrated intentions may be concentrated amongst those who are married.

Notably, the Adjusted R^2 measure is 0.152 when we include full controls (column 3), suggesting that we are explaining over 15% in *intended parity* gap variation with our variables.

For the last robustness check, we drop states with the smallest sample sizes to demonstrate that our findings are not unique to the inclusion of all fifty states. This leaves Alaska, Vermont, and Wyoming out of our sample, leaving us with $n = 47$. These results are shown in Table 5.

Table 5: Robustness Check, pt. II

	Happiest Parity Gap		
	(1)	(2)	(3)
Economic freedom	−0.053°	−0.054*	−0.050°
	(0.032)	(0.032)	(0.030)
Med. household income		0.231°	0.255
		(0.173)	(0.236)
Married share			0.001
			(0.012)
Weekly religious attendance			−0.005
			(0.005)
Foreign-born share			−0.007°
			(0.005)
Observations	47	47	47
Adjusted R^2	0.062	0.086	0.086
Note:	∘p<0.2; *p<0.1; **p<0.05; ***p<0.01		

Sources: Demographic Intelligence Family Survey, Gwartney et al. (2022), American Values Atlas, and the American Community Survey. "Economic freedom" refers to the standardized subnational economic freedom score of each state averaged over the years 2000-2020. "Median household income" refers to the logged median household income of a state in 2020. "Weekly religious attendance" refers to the share of people in each state claiming to attend religious services weekly in 2021. "Married share" refers to the share of married households in a state in 2020. "Foreign-born share" refers to the share of a state's population that were not U.S. citizens at birth in 2020. Standard errors are heteroskedasticity robust.

The sign on economic freedom is once again negative and statistically significant (at least at the 20% level) across each specification. Like before, a one standard deviation increase in economic freedom is associated with about a 30% standard deviation decrease in the *happiest parity* fertility gap in our preferred specification (column 2). This suggests that our results are not sensitive to the inclusion of our smallest sample states.

Finally, we recognize that our small sample size ($n = 50$) and cross-sectional data without a

research design enabling causal inference precludes us from making very strong judgements about the causal effect of economic freedom on the fertility gap. Moreover, because we lack any truly exogenous variation, we cannot infer any specific chain of causality in our data. It would be surprising if reverse causality existed, i.e. if small fertility gaps caused higher economic freedom (especially since fertility gaps were measured at a later date than economic freedom, in some cases decades later), but we cannot rule out the possibility of an omitted third cause of both variables. Unfortunately, state-level fertility preference data is so noisily estimated (due to small cell size for low-population states) and available over such a short time span that panel analysis is not possible yet.

5 Conclusion

Recent work on the economics of fertility has highlighted the significance of the relationship between career and family. We investigate variation in the fertility gap across the United States and find that variation in economic freedom can help explain the difference. In particular, we show that a one standard deviation increase in a state's economic freedom score is associated with a 0.053 decrease in the fertility gap. This difference is economically significant, as it amounts to nearly 30% of a standard deviation decrease in the fertility gap.

Overall, we conclude that greater economic freedom is associated with smaller fertility gaps, and we regard reverse causality as unlikely. We test specific channels through which economic freedom might influence the fertility gap, and find that regulatory policy is strongly associated with smaller fertility gaps, while fiscal policy and personal freedom have little influence. We hypothesize that improved work-family balance related to improved job-matching, especially related to family-related compensating differentials, may be one area for further exploration.

This paper makes two primary original contributions. Ours is the first study to quantitatively link an empirical measure of the policy context to the size of fertility gaps. Very little prior literature has explored fertility gaps at all despite their possible importance to policymakers, and so we expand on that literature. Second, we demonstrate a strong linkage between economic freedom and an unconventional outcome: the extent to which families achieve their not-strictly-economic childbearing objectives. Linking economic freedom to this more distant outcome demonstrates the importance of economic freedom not only for proximate outcomes like growth or employment, but more distal outcomes nonetheless closely tied to basic questions of human flourishing. At the societal level, understanding the constraints to the achievement of desired fertility can help policymakers alleviate the pressures of a declining population. At the individual level, we discover another important benefit to living under economically free conditions, namely, the ability to fulfill

fertility desires and plans.

Being the first study to connect research on economic freedom with that of the fertility gap, we conclude by highlighting some avenues for future research. First, the actual mechanism behind our results merit deeper study. For instance, does economic freedom's effect operate through differences in labor market matching, or differences in employer provision of family-friendly work environments, or something else entirely? As "pro-family" policies become more popular, uncovering the non-economic drivers of the fertility gap will become increasingly important.

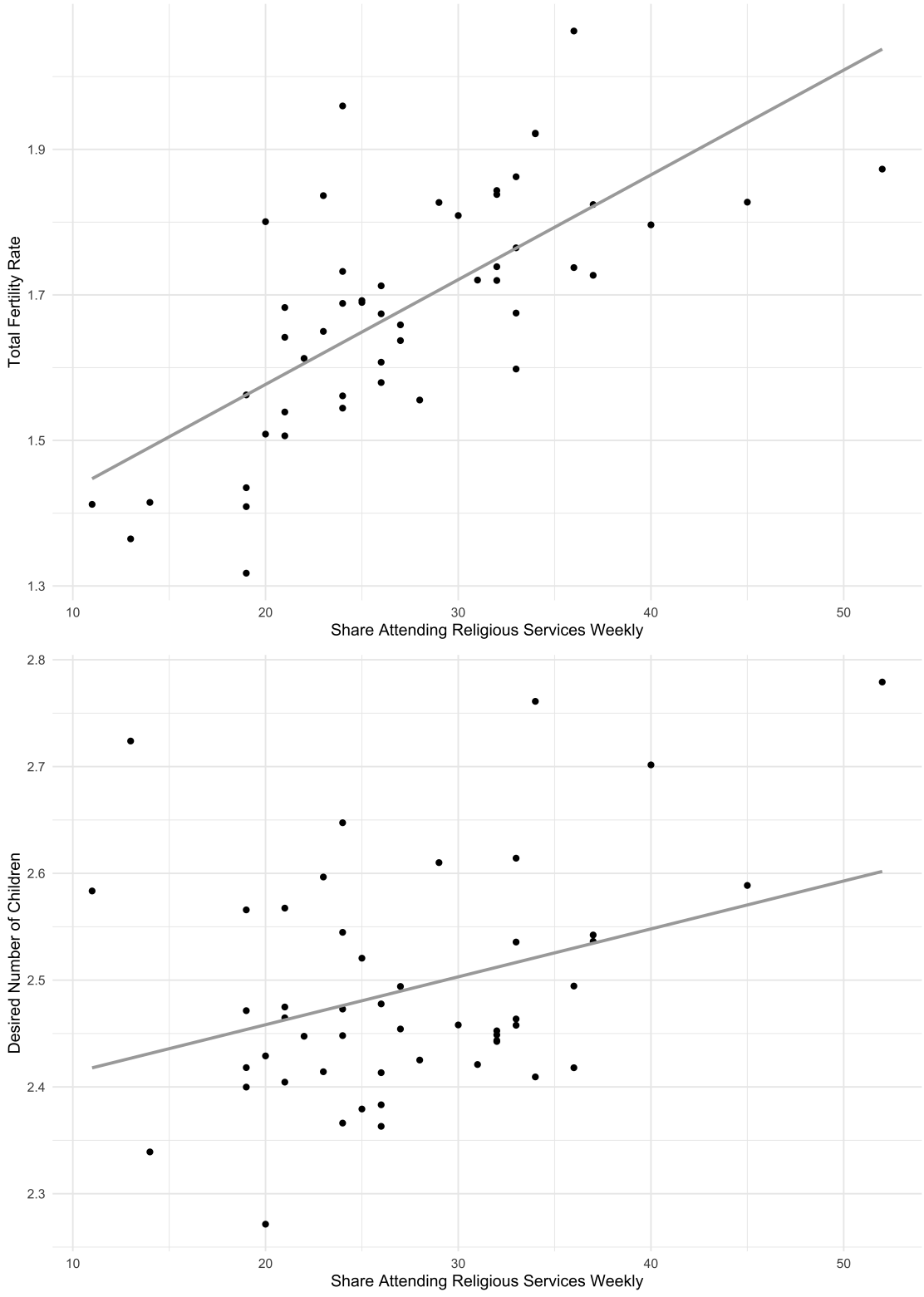

Figure 4: Religiosity and Actual/Desired Fertility

Sources: Demographic Intelligence Family Survey (2020-23) and the American Values Atlas (2021)

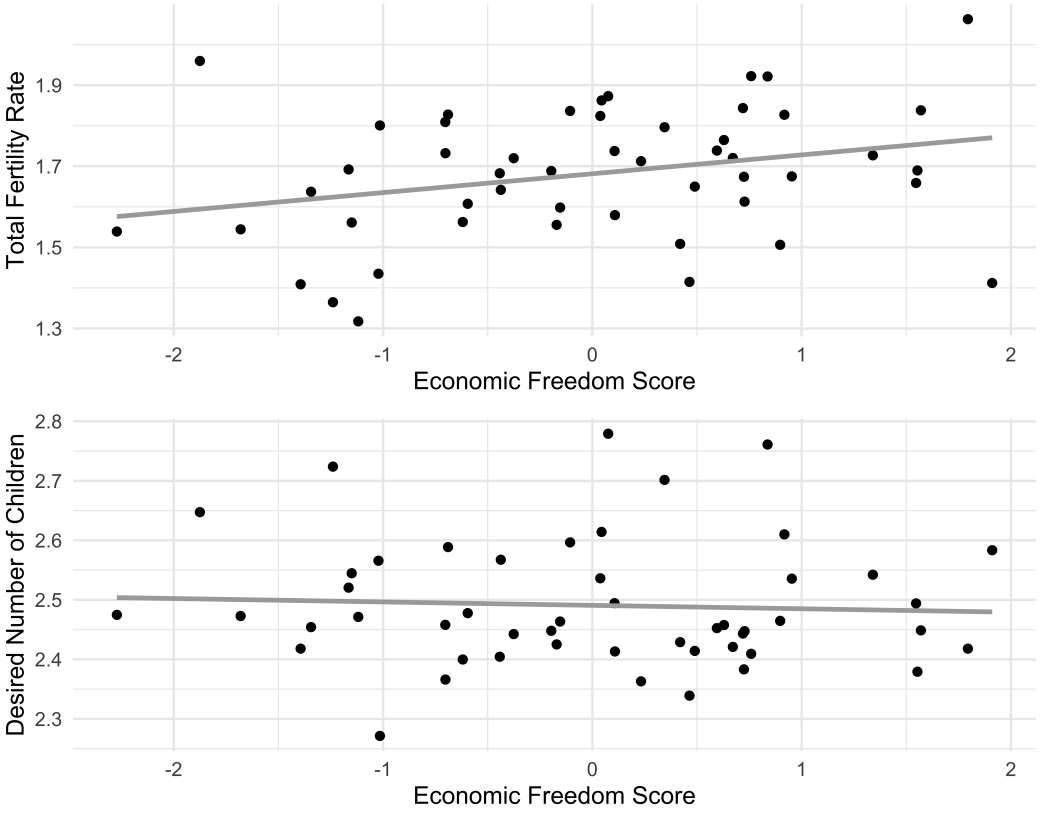

Figure 5: Economic Freedom and Actual/Desired Fertility

Sources: Fertility preference survey data and Gwartney et al. (2022)

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Appendix

5.1 Demographic Intelligence Family Survey (2020-2023) Questions:

- *Happiest Parity* Measure:

  "Often, a decision about how many children someone would like to have is more complicated than just a number. People often do not have exactly the number of children they want to have. So for this question think about what life might be like for you with different numbers of children.

  Then, rate each number of children [1-6] by **how much you would like to have that number of children**, on a scale from 'I would never want to end up with this many children' (zero stars) to 'Having this many children would make me extremely happy'"

- Intended Total Fertility: Biological Children Ever Had + Current Pregnancy + Number More Children Intended.
  - "How many biological children have you ever had? Please select the number below." (Options: 0-20 or more)
  - "Are you currently pregnant?" (Yes or No)
  - "Do you intend to have any (additional) children (beyond your current pregnancy)?" (Options: Yes, No, Not sure; if it happens it happens)
  - "Thinking about your own future plans, how many (more) children do you intend to have, not including any children or pregnancy you may currently have?" (Options: 0-10 more children, or "I'm not sure")

5.2 Economic Freedom of the World Components (Subnational Index, 2022):

1. Government Spending: (a) general consumption expenditures by government as a percentage of income, (b) transfers and subsides as a percentage of income, and (c) insurance and retirement payments as a percentage of income
2. Taxation: (a) income and payroll tax revenue as a percentage of income, (b) top marginal income tax rate and the income threshold at which it applies, (c) property tax and other taxes as a percentage of income, and (d) sales taxes as a percentage of income
3. Labor Market Freedom: (a) full-time minimum wage income as a percentage of per capita income, (b) government employment as a percentage of total state/provincial employment, and (c) union density

5.3 Freedom in the 50 States Components (2021):

1. Fiscal Policy: (a) state tax revenues, (b) government consumption, (c) local tax revenues, (d) government employment, (e) government debt, and (f) cash and security assets

2. Regulatory Policy: (a) land-use freedom and environmental policy, (b) health insurance freedom, (c) labor-market freedom, (d) lawsuit freedom, (e) occupational freedom, (f) miscellaneous regulations that do not fit under another category (such as certificate-of-need requirements), and (g) cable and telecommunications freedom

3. Personal Freedom: (a) incarceration and arrests for victimless crimes, (b) gambling freedom, (c) gun rights, (d) marriage freedom, (e) educational freedom, (f) tobacco freedom, (g) alcohol freedom, (h) marijuana freedom, (i) asset forfeiture, (j) other mala prohibita and miscellaneous civil liberties, (k) travel freedom, and (l) campaign finance freedom