ARAŞTIRMA MAKALESİ / RESEARCH ARTICLE

THE POST-2008 PRONATALIST RHETORIC IN TÜRKİYE: THERE IS NO ROBUST CAUSAL EFFECT ON ACTUAL FERTILITY!

TÜRKİYE'DE 2008-SONRASI DOĞUM-YANLISI SÖYLEM: GERÇEKLEŞEN DOĞURGANLIK ÜZERİNDE SAĞLAM NEDENSEL ETKİ YOK!

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ABSTRACT

On March 8, 2008, President Recep Tayyip Erdoğan, who was the prime minister at the time, said that women in Türkiye should have at least three children. Since then, a pronatalist rhetoric has been sustained in Türkiye. Today, there is a large multidisciplinary social science literature on the post-2008 pronatalist rhetoric, but no study has investigated the causal effects of the rhetoric on actual fertility. To fill this gap in the literature, this paper investigates whether the post-2008 pronatalism in Türkiye did create any robust causal effect on actual fertility (the period Total Fertility Rate). The paper uses the synthetic control method to identify the causal effect associated with the post-2008 pronatalism. An inspection of population policies across the globe identifies 26 countries as potential donors for the synthetic Türkiye, and the predictor variables for actual fertility are GDP per capita, infant mortality rate, population density, and the share of young population (15 to 24 ages). Using the state-of-the-art methodological principles of the synthetic control method, the paper demonstrates that the post-2008 pronatalist rhetoric in Türkiye did not create any robust causal effect on actual fertility. From the viewpoint of optimal population policy, this paper underlines that the rhetoric only, i.e., without generous programs creating sufficiently strong incentives, would not even boost period fertility outcomes.

KEYWORDS: pronatalism, population policy, causal inference, synthetic control

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ÖZET

8 Mart 2008'de, o zaman başbakan olan Cumhurbaşkanı Recep Tayyip Erdoğan, Türkiye'deki kadınların en az üç çocuk doğurmaları gerektiğini söyledi. Türkiye'de, o günden bu yana, bir doğum-yanlısı retorik sürdürüldü. Bugün, bu 2008-sonrası doğum-yanlısı retorik hakkında geniş bir çok-disiplinli sosyal bilim literatürü bulunuyor, ancak hiçbir çalışma retoriğin gerçekleşen doğurganlık üzerindeki nedensel etkilerini araştırmadı. Literatürdeki bu boşluğu doldurmak için, bu makale Türkiye'deki 2008-sonrası doğum-yanlısı retoriğin gerçekleşen doğurganlık (dönemsel Toplam Doğurganlık Hızı) üzerinde sağlam bir nedensel etki yaratıp yaratmadığını araştırıyor. Makale, 2008-sonrası doğum-yanlılığının nedensel etkisini belirlemek için sentetik kontrol yöntemi kullanıyor. Dünya genelindeki nüfus politikalarının bir incelemesi sentetik Türkiye için 26 aday ülke belirliyor ve kişi başına GSYH, bebek ölüm oranı, nüfus yoğunluğu ve genç nüfus (15-24 yaş) oranı, gerçekleşen doğurganlığın açıklayıcı değişkenleri oluyorlar. Makale, sentetik kontrol yönteminin en gelişmiş metodolojik ilkelerini kullanarak, Türkiye'deki 2008-sonrası doğum-yanlısı retoriğin gerçekleşen doğurganlık üzerinde sağlam bir nedensel etki yaratmadığını gösteriyor. Bu makale, optimal nüfus politikası açısından, yeterince güçlü teşvikler yaratan cömert programlar olmadan sürdürülen retoriğin dönemsel doğurganlık çıktılarını bile yükseltmeyeceğinin altını çiziyor.

ANAHTAR KELİMELER: doğum-yanlılığı, nüfus politikası, nedensel çıkarsama, sentetik kontrol

INTRODUCTION

Demographic transition in Türkiye is at its final stage of low mortality and low fertility, and it continues with typical transitional patterns observed in many countries (Koç et al., 2010; Keskin & Koç, 2023). According to the latest official statistics published by the Turkish Statistical Institute (TurkStat) for the year 2023, total (period) fertility rate (TFR) is 1.51 children per woman, and infant mortality rate is 10 deaths per thousand live births (TurkStat, 2024). Official demographic statistics also show that the mean age of mother at first birth is 27 years, life expectancy at birth is around 78 years, and population growth rate is 1.1% per annum for the year 2023 (TurkStat, 2024).

Global demographic history shows us that demographic transitions may have political consequences. Governments and political leaders have responded to population levels and demographic changes across different times and regions—both in the past and present, and across the east and west (Attar, 2020; Bergsvik et al., 2021). The intellectual pursuit of an optimal (and policy-relevant) population level actually dates back to ancient Greek philosophers Platon and Aristotle (Mulhern, 1975). Various oppressive

regimes of the 20th century, ranging from the Nazi Germany to Ceauescu's Romania, are associated with pronatalism, eugenics, and other illiberal forms of population policies.

The questions about pronatalist policies are ever more significant in the 21st century since high income societies of the Western world do not generally exhibit optimistic signs of a post-transitional return to replacement levels. Governments in some of these societies, especially in the Scandinavian countries, implement various programs that provide strong and continuous financial support to those parents that have a child under three years of age. Besides, these governments implement such programs without additionally promoting a nationalistic or religious discourse about more babies and large families. But there are also examples, both from the past and present, where a government's pronatalist ideals (and rhetoric) do not align well with its actual policy frameworks (Leeuw & van de Vall, 1984; Thévenon, 2011; Sobotka et al., 2019). Czechia, Hungary, Italy, Japan, Poland, Slovakia, and Spain have been listed as the OECD countries that provide a long maternity leave but limited cash benefits to new parents for the year 2011 (Thévenon, 2011). Since then, some of these countries such as Hungary, Japan, and Poland have implemented pronatalist policy reforms. Similar reforms have also been observed in countries such as Russia and Iran, and the 2015-2019 policy stance on fertility is "raising fertility" even in China (United Nations, 2021).

In a public address delivered in Uşak province on March 8, 2008, President Recep Tayyip Erdoğan, who was the prime minister at the time, said that women in Türkiye should have *at least three children* to keep the country's population young and thereby prevent the adverse economic effects of population aging (Çetik et al., 2008). Since then, Türkiye has been in a curious regime of *pronatalist rhetoric*. President Erdoğan keeps emphasizing the "problem" of low fertility and low population as well as increasing divorce rates in various occasions such as marriage ceremonies he attends as the guest of honor and the *Family Council* meetings of the *Ministry of Family and Social Services* (Ateş Dereli, 2023).

This is definitely a form of pronatalist *rhetoric* because the politician advancing the notion of at least three children for all women in the country is one of the most influential political leaders this country ever raised, dominating every single election with remarkable success in terms of vote shares except the most recent local elections. But Türkiye's pronatalism is also curious because there has not been a systematic and significant policy shift towards a formal, planned, actively-promoted, and generous pronatalist population policy or strategy. In fact, a regulation has been adopted in 2015, promising one-time baby bonuses for new mothers and mothers giving birth

to new babies, but the bonuses indicated in that regulation were extremely modest (Attar, 2016). What is really needed in Türkiye from the perspective of permanently higher fertility is a set of policies that would create *sufficiently strong* incentives for working women with two children to have the third one (Greulich et al., 2016). Without significant policy changes in this direction, the current norm of two children per woman may be replaced by a new norm of one child in the future (Keskin & Çavlin, 2023).

One primal question is whether we should take the post-2008 pronatalist rhetoric as a serious object of scientific inquiry, given that there has not been an accompanying policy change. From the viewpoint of historiography, the post-2008 period is an entirely new era (Eryurt et al., 2013), and some could even argue that the post-2014 period, including the 2015 regulation mentioned above, truly represents a regime change (Can, 2023). Besides, Dildar's (2022) estimates show that, in Türkiye, a woman's religiosity is positively (and statistically significantly) associated with her acceptance of the pronatalist rhetoric in 2013 but, *crucially*, not in 2008. Contextualizing this religiosity-fertility link, Aksoy and Billari (2018) use a regression discontinuity design to show that higher district-level vote share of Erdoğan's neoconservative party in 2004 local elections is positively associated with higher nuptiality and fertility. There is also micro-level statistical evidence showing that religiosity increases, and female education decreases fertility in Türkiye, acting as distinct secularization and modernization channels respectively (Hatun & Warner, 2022).

These together imply another, more profound question: How would pronatalism affect a woman's ideal, intended, and actual fertility levels in a Muslim-majority country? This is a difficult question and requires an identification strategy on its own. What we know for sure from Abbasoğlu Özgören and Türkyılmaz (2023) is that, in Türkiye, recent decades have witnessed *an increase in ideal fertility but a decrease in intended fertility*. Hence, the recent rise of pronatalism in Türkiye is most likely to alter women's reproductive ideals without any significant effect on actual fertility outcomes. These, however, would not help us resolve the empirical question of *whether the post-2008 pronatalism did or did not affect actual fertility in Türkiye*. Even when we disregard political, cultural, and social repercussions in the context of gender equality and reproductive justice, the post-2008 pronatalism is an intriguing (perhaps peculiar) aspect of Turkish demography in the 21st century; we need to build a definitive, evidence-based position regarding its actual demographic impact.

The main objective of this paper is to present a formal analysis of the pronatalist rhetoric adopted in Türkiye since 2008. The focal point of this analysis is the investigation of whether there was any robust causal effect on

period TFR in Türkiye; an identification task not attempted in previous studies on the post-2008 pronatalism. To properly attack this research question with some rigor, the paper builds on a research design that tries to estimate a counterfactual Türkiye scenario in which there is no switch to pronatalism. More specifically, the paper uses the Synthetic Control Method (SCM) of Abadie and Gardeazabal (2003) and Abadie et al. (2010) for the estimation of counterfactual TFR in Türkiye for the post-2008 period. Hence, the SCM is being applied with a fertility indicator as the outcome and with countries as the cross-section units. Recent examples of this approach can be found, for example, in Gietel-Basten et al. (2019) and Reich (2024).

The SCM implemented for Türkiye's pronatalism requires the inclusion of donor countries not having been subject to a pronatalist policy agenda or rhetoric. The donor countries satisfying this criterion are selected through the country-level information obtained from the World Population Policies Database. Implementation also requires a set of good predictor variables that would have explanatory power for TFR. Following de la Croix and Gobbi (2017), real GDP per capita, infant mortality rate, and population density are added as the predictors of TFR. The set of predictor variables also includes the share of the 15-24 population, motivated by the notion that the age distribution of the society should matter for actual fertility outcomes.

After estimating a baseline specification that shows the existence of some small but positive effect on TFR, the analysis implements various robustness checks by utilizing the cutting-edge methodological principles of the SCM (Abadie, 2021). The end result is that the post-2008 pronatalist rhetoric in Türkiye did not create a robust causal effect on fertility.

The next section reviews the related literature to clarify the contribution of this paper. The section following the literature review provides a brief discussion of Erdoğan's pronatalist rhetoric to offer background context. The paper then introduces methodology and data in a section followed by the presentation of econometric results. A concluding section discusses the main finding and some avenues for future research.

RELATED LITERATURE

President Erdoğan's post-2008 pronatalist rhetoric has stimulated scholarly literature with some delay in the early 2010s. This literature is now enlarging with opinion articles and research papers from various disciplines such as economics, sociology, political science, and social anthropology as well as demography.

One strand in this literature discusses the economic relevance and studies the effects of pronatalism in the Turkish case. Economists have argued that (i)

TFR being equal to three children per woman is basically impossible (Gürsel et al., 2010), (ii) the return to higher fertility would require remarkably faster capital accumulation (Açıkgöz, 2012), (iii) higher fertility levels without increased labor force participation in the long run would have adverse effects (Oyvat, 2012), and (iv) a fertility boom would not solve Türkiye's social security problems (Sayan, 2013). In two other studies, economists have constructed structural economic models to analyze higher fertility scenarios for Türkiye. With a model of endogenous technology and endogenous fertility, Attar's (2013) simulations have demonstrated that a permanent shift to high fertility would imply lower GDP per capita levels and higher dependency ratios associated with child population. Using the United Nations' high fertility projections for Türkiye as the pronatalist counterfactual, Georges and Seçkin's (2016) simulations have confirmed that social security problems would persist in the long run.

Another group of studies situates the rise of pronatalism within wider contexts characterized, for example, by the rise of pro-Islamist authoritarian politics, the growing prominence of patriarchal norms and traditional or religious values, and the erosion of reproductive justice (Kocamaner, 2018; Pehlivanlı Kadayıfçı et al., 2020; Kılıçtepe et al., 2022; Saluk, 2023). Arat's (2010) essay, focusing not only on pronatalism, underlines the paradoxical situation of increased religious freedoms accompanied with threats to gender equality. Üstek and Kök (2012) argue that *biopower* (*biopolitics*) is useful in making sense of Erdoğan's pronatalism, especially in relation with sentiments against abortion and Caesarean-section (C-section) practices and those in favor of In Vitro Fertilization (IVF). There are studies showing, by means of qualitative research designs, that pronatalism in Türkiye has been associated with increased difficulty to access safe abortion services (MacFarlane et al., 2016; Telli et al., 2019). Similarly, the C-section has been framed as an antinatalist procedure that eventually limits the number of children a woman can give birth to, especially after 2012 (Erten, 2015). The spread of IVF clinics and other assisted reproduction services across Türkiye and the governmental support for such changes have been associated with patriarchal pronatalism (Gürtin, 2016).

None of the studies cited above has attempted a causal analysis of Türkiye's post-2008 pronatalism on demographic outcomes. One plausible reason for such a lack of interest is that causal inference studies typically focus on *actual policies* that change a policy regime in a discrete way and perhaps unexpectedly (Bergsvik et al., 2021). Without such a regime change in the Turkish case, causal inference has not offered much potential for scientific significance. This, however, does not rule out the possibility that pronatalist rhetoric may have created distinct "psychic" effects on fertility *preferences* in Türkiye (Dildar, 2022), and, hence, plausibly on actual fertility

outcomes. Even though we expect no significant effect as suggested by the evolution of indented fertility (Abbasoğlu Özgören & Türkyılmaz, 2023), the empirical question about any causal effect requires a definitive answer that clarifies whether *rhetoric without policy* could have been successful or not.

A method of inference that credibly isolates any potential causal effect of the pronatalist rhetoric from the effects of confounding, mediating, and collider variables is superior to some other modes of inference such as reduced-form regressions. This is especially important when the researcher is forced to use macro-level data since controlling for individual-level exogenous confounders such as age, sex, and marital status is irrelevant. Fortunately, the post-2008 pronatalist rhetoric in Türkiye is a unique example of 21st-century pronatalism since it emerged suddenly and created an unprecedented discontinuity, thereby providing an opportunity for the use of the SCM.

PRONATALIST RHETORIC IN TÜRKİYE AFTER 2008

Fertility decline is arguably the most significant component of a demographic transition, both as a cause and as a consequence of economic development in the long run (e.g., Galor, 2011). In Türkiye, long-term fertility decline started sometime in the mid-20th century, and it was actually a remarkable decline from around 6 to 7 children to the below-replacement levels. Official statistics show that TFR in Türkiye was exactly equal to the replacement level of 2.1 children per woman in 2009. Interestingly, Erdoğan's pronatalism was just on time, starting exactly when Turkish fertility was decreasing below the replacement level. The "three children" slogan, enigmatic at first glance, was also a meaningful one because the average number of children of Erdoğan's party's parliamentarians (MPs) elected in 2007 was exactly three (Yıldız & Koç, 2008).

In the 2000s during which TFR gradually approached its replacement level, Türkiye experienced remarkable political changes as well; the newly-established *Justice and Development Party* (AKP) won the 2002 elections in the aftermath of a devastating economic crisis (2001) and ended the long history of coalition governments. AKP and its "charismatic" leader Recep Tayyip Erdoğan rose to power with conservative and liberal principles and initially adopted a reformist agenda promising the end of poverty and corruption as well as the promotion of civil liberties. In the last two decades, AKP and Erdoğan exhibited unprecedented electoral success by obtaining the majority of votes in virtually all of the elections and referendums (except the latest local elections). In the meantime, Türkiye became an increasingly more authoritarian country under Erdoğan administrations, eventually transitioning to a presidential regime in 2017. Recep Tayyip Erdoğan was elected as the first president of the new regime in 2018 and reelected in 2023.

The rise of pronatalism in Türkiye should be viewed within the contexts of (i) a Muslim-majority society gradually moving to a less democratic (more authoritarian) political structure with a dominant party that kept winning the elections, (ii) growing economic hardship and instability and persistent policy failures and confusions, not adequately addressing the structural problems of the society and the economy as a whole, especially after mid-2010s, and (iii) Erdoğan's remarkable success in sustaining the legitimization of his governments' *not-really-successful policies* in almost all domains.

The Global Financial Crisis of 2008 was a turning point in this regard, marking the end of the so-called golden years of AKP governments. Türkiye recovered from the global economic downturn faster than many other countries, but the economy eventually entered a period of less impressive performance, with the central bank gradually losing its independence for sound monetary policy (Gürkaynak et al., 2022). On the political front, Erdoğan and the AKP governments shifted away from the democratic and liberal reforms that marked the early 2000s, particularly concerning the European Union accession. Erdoğan and his party instead turned towards a more centralized and authoritarian political stance (Öniş, 2015). The Gezi Park events in the summer of 2013 escalated into nationwide protests against the AKP government, and this was perhaps the last large-scale bottom-up political warning signal in Türkiye. Since 2013, Erdoğan administrations faced and survived other devastating crises and challenging processes including the inflow of millions of irregular refugees, a coup attempt that left many dead and injured, a serious conflict with the United States over a detained pastor, the COVID-19 pandemic, the "glorious" return of very high inflation as a result of economic policy failures, and the February 2023 earthquakes (Esen & Gümüşçü, 2023; Aydın-Düzgit et al., 2023).

Korkut and Eslen-Ziya (2016) offer the term *discursive governance* to describe the post-2008 pronatalism in Türkiye. As discussed above, this is a type of pronatalism characterized with almost no serious change in actual policies concerning fertility but constant efforts by the government to control the public with pronatalist and normative ideas, *rhetoric without policy* in short. Erdoğan and other figures sharing his rhetoric have indeed used various legitimization strategies to promote higher fertility and larger families (i) as rationalized responses to population aging, (ii) as social-cultural demarcation devices between responsible women who have many children versus the other women, (iii) as weapons of national security protecting the future of Türkiye, and, last but not least, (iv) as normative obligations to sustain Islamic morality (Akkan, 2018; Dildar, 2022; Saluk, 2023).

METHODOLOGY AND DATA

This paper uses the SCM to properly investigate whether pronatalist rhetoric had any causal effect on actual fertility in Türkiye. Here, the main text introduces the method without going into technical details, and the interested reader can find a brief technical discussion in Appendix A.

Developed by Abadie and Gardeazabal (2003) and Abadie et al. (2010), the SCM is applied in contexts where one among many units is treated with a particular event at a particular time. Abadie and L'Hour (2021: 1817) summarize the essence of the SCM by underlining that

"[a] *synthetic control estimator compares the outcome of a treated unit to the outcome of a weighted average of untreated units that best resembles the characteristics of the treated unit before the intervention.*"

In our case, Türkiye is treated with pronatalist rhetoric after the year 2008. SCM constructs a *synthetic control* for an outcome variable to approximate what would have happened to the treated unit in the absence of the treatment (in the post-intervention period). The synthetic control acts as a *counterfactual*, representing the hypothetical scenario of no intervention. Hence, it becomes feasible for the researcher to compare actual post-treatment outcomes with this counterfactual to estimate the treatment effect. The outcome variable in our case is TFR.

Constructing a synthetic control requires predictor variables. Predictors are the variables explaining the outcome variable and are used to ensure that the synthetic control closely mirrors the treated unit's characteristics before the intervention. In our case, there are four predictor variables that have explanatory power for the evolution of TFR:

- Real GDP per capita (in natural logarithm)
- Infant mortality rate
- Population density
- 15-24 population share

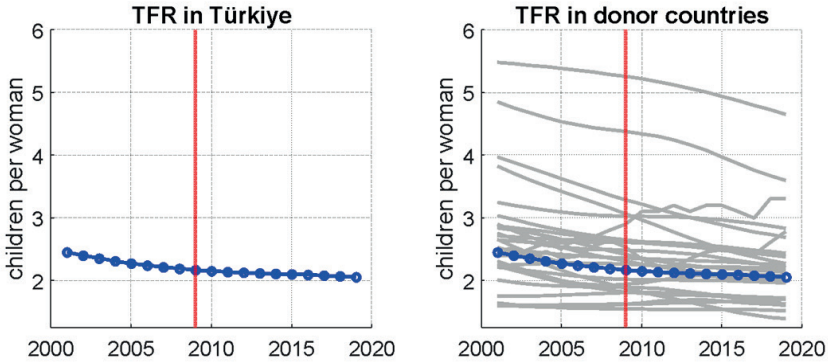
The first three of these variables are statistically significant predictors of fertility outcomes for a large number of developing countries as demonstrated by de la Croix and Gobbi (2017). These authors also show that mean age and its square are also significant, implying that the age distribution of a society would have explanatory power for fertility outcomes. In our case, the sample of donor countries that experienced (fast) fertility declines return a small, negative, but significant correlation between the 15-24 population share and TFR (p *value* = 0.0432). Additionally, the common approach in the literature, starting with the classic paper of Abadie et al. (2010) and recently reiterated

by Abadie (2021), suggests that a few (but not too many) pre-intervention values of the outcome variable should be added as potential predictors. Hence, the TFR values of 2001, 2004, and 2007 are added to the set of predictors for satisfactory pre-intervention matching. For both the outcome variable and the predictor variables, World Bank's World Development Indicators is the main data source (World Bank, 2024).

Table 1: Donor countries for TFR in Türkiye

Argentina	El Salvador	South Africa
Bolivia	Iraq	Sri Lanka
Botswana	Kyrgyzstan	Suriname
Brazil	Libya	Thailand
China	Lebanon	Trinidad & Tobago
Chile	Malaysia	United Arab Emirates
Central African Republic	Myanmar	Uzbekistan
Cuba	Panama	Uruguay
Ecuador	Saudi Arabia	

Figure 1: TFR in Türkiye and in the donor countries



Note: TFR indicator is the annual period fertility rate for all countries. The straight blue line with circles shows the annual TFR series for Türkiye in both panels. Straight gray lines in the right panel show the TFR levels in the full set of donor countries. The list of donor countries is given in Table 1.

Data Source: World Bank (2024).

SCM also requires a set of potential control units for the construction of the synthetic control. These donor units are the ones that did not receive the treatment. By choosing the optimal weights for each donor unit, the SCM estimator is designed to replicate the pre-intervention trajectory of the treated unit as closely as possible for the post-intervention period. In our case, donor countries should be the ones not being influenced by a pronatalist agenda or rhetoric. A detailed inspection of the World Population Policies Database (2005-2015) identifies 26 potential donor countries listed in Table 1.

Figure 1 pictures the evolution of TFR in Türkiye and in these donor countries for the 2001-2019 period. The sample for the analysis is restricted to the 2001-2019 period for two reasons: First, the pronatalist intervention in Türkiye almost equally divides the sample into pre- and post-intervention samples where $T_0=2008$ is the last period of the pre-intervention sample and $T_0+1=2009$ is the first period of the post-intervention sample. Second, and perhaps more importantly, there have been one big global shock (the pandemic) and one big domestic shock (the prolonged economic crisis) after 2019, and these shocks might have affected fertility behavior in ways that we may not uncover adequately.

RESULTS

Synthetic versus Actual Türkiye: The Baseline Estimate

The baseline estimation procedure starts with the optimal selection of donor countries depending on the explanatory power of predictor variables for the full panel. Table 2 lists the optimally-selected donor countries, and Figure 2 shows the evolution of TFR in these. The matching results for predictor variables are presented in Table 3.

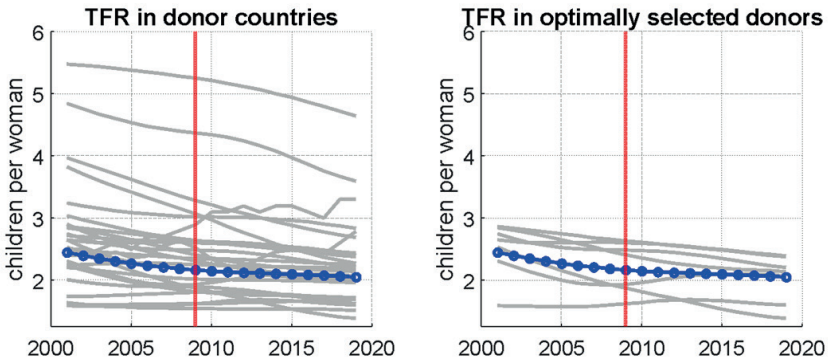
Table 2: Selected donor countries for TFR in Türkiye

Selected Donors	Weights
Cuba	20.0 %
United Arab Emirates	19.0 %
Suriname	16.0 %
Libya	13.7 %
South Africa	12.3 %
Lebanon	9.9 %
Myanmar	9.1 %

Table 3: Treated-Synthetic match for predictor variables

Predictor Variables	Treated	Synthetic
TFR in 2001	2.213	2.213
TFR in 2004	2.310	2.309
TFR in 2007	2.451	2.451
Real GDP per capita (natural log.)	8.901	8.903
15-24 population share	25.504	26.246
Population density	87.558	89.955
Infant mortality rate	23.362	21.630

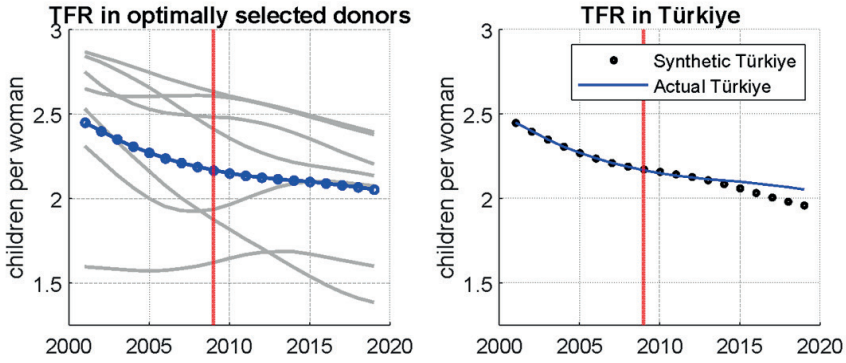
Figure 2: TFR in Türkiye and in the optimally-selected donor countries



Note: TFR indicator is the annual period fertility rate for all countries. The straight blue line with circles shows the annual TFR series for Türkiye in both panels. Straight gray lines in the left panel (respectively, in the right panel) show the TFR levels in the full set of donor countries (respectively, in the optimally selected donor countries). The list of optimally selected donor countries is given in Table 2.

Data Source: World Bank (2024).

Figure 3: TFR in Synthetic and Actual Türkiye



Note: TFR indicator is the annual period fertility rate for all countries. The straight blue line with circles in the left panel shows the annual TFR series for Türkiye. Straight gray lines in the left panel show the TFR levels in the optimally selected donor countries. In the right panel, black circles show the synthetic Türkiye and the straight blue line shows the actual Türkiye.

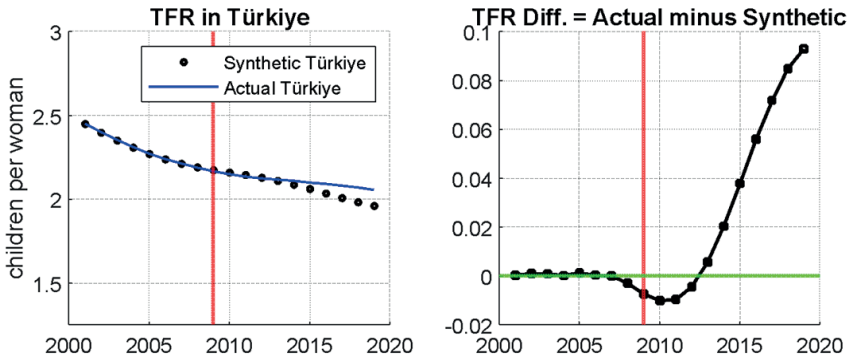
Data Source: World Bank (2024) and the SCM results.

Throughout the sample period, TFR in Türkiye lies within the range defined by the maximum and minimum levels of TFR in the optimally-selected donor countries. Specifically, the baseline estimation excludes all of

the donor countries that record a TFR larger than 3 children in 2001, but some lower fertility countries are also excluded as they turn out to be not really informative in the construction of synthetic Türkiye. Figure 3 pictures the evolution of TFR in actual Türkiye and synthetic Türkiye.

The baseline estimate is formally defined as the TFR difference between Actual Türkiye and Synthetic Türkiye, as derived in the technical appendix. Figure 4 pictures these actual and synthetic figures as well as their difference as the treatment effect for each year in the post-intervention sample. *Interpreted naively*, estimated treatment effects show that pronatalism created a small but positive effect on TFR in Türkiye. The largest effect, according to the baseline estimates, is recorded for the end of the sample in 2019, and it is slightly higher than 0.09 children per woman. For the first couple of years after the intervention, the estimated effect is actually negative and is about 0.01 children per woman in absolute value.

Figure 4: TFR Difference between Actual and Synthetic Türkiye



Note: TFR indicator is the annual period fertility rate for all countries. In the left panel, black circles show the synthetic Türkiye, and the straight blue line shows the actual Türkiye. The right panel shows the (baseline) effect associated with the pronatalist rhetoric.

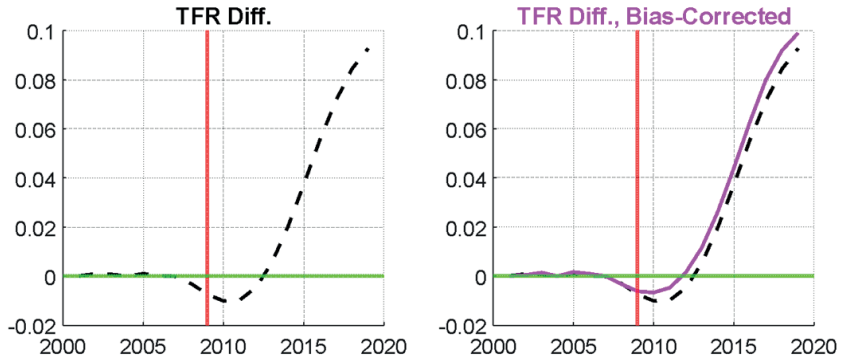
Data Source: World Bank (2024) and the SCM results.

TFR Difference: Baseline *versus* Bias-Corrected Estimates

The first procedure one needs to apply after the baseline estimation is to correct for any potential bias associated with the inexact matching on the predictor variables. Our baseline estimates are generally satisfactory in terms of matching on the predictors as shown above in Table 3. The bias-corrected effect is thus very close to the baseline estimate, but it is slightly larger for the

entire post-intervention period. Figure 5 presents the baseline and the bias-corrected TFR differences.

Figure 5: TFR Differences: Baseline versus Bias-Corrected



Note: TFR difference is the treatment effect for Türkiye. In the left panel, black dashed line represents the baseline treatment effect. In the right panel, the magenta solid line represents the bias-corrected treatment effect.

Data Source: SCM results.

The remainder of the analysis takes the bias-corrected TFR difference as the causal effect and investigates whether this bias-corrected effect is robust or not.

TFR Difference: Bias-Corrected Placebo Estimates

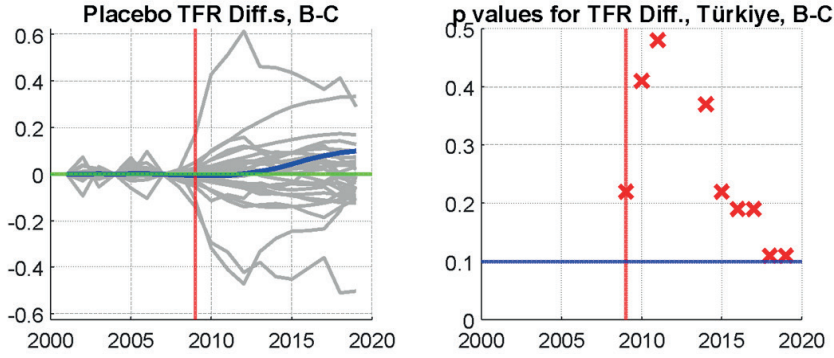
Imagine running the bias-corrected estimation described above for all other countries in the donor pool, separately for each country. What do we expect from such an exercise? Since the countries in the donor pool (other than Türkiye) have not witnessed a shift to pronatalist rhetoric or policy, any treatment effect found for these countries should be attributed to some factor other than pronatalism. This is exactly the sense in which these effects are called *placebo effects*.

In practice, the SCM uses such placebo estimates for statistical inference. That is, for each time period in the post-intervention sample, the estimated placebo effects for units other than the treated one are used to create a *probability* (*p*) *value* for the null hypothesis that the effect is equal to zero for the treated unit.

Figure 6 pictures the estimated bias-corrected placebo estimates (left panel) and the associated *p values* (right panel). Without even calculating

the *p values*, it is visible from the left panel that placebo effects estimated for several countries are larger than the effect estimated for Türkiye for each year. There are also countries for which placebo estimates are negative. Not surprisingly, the estimated *p values* are *all* greater than 10% for the entire 2010-2019 period. Hence, the bias-corrected estimate for Türkiye does not pass the placebo test. Formally, the null hypothesis that pronatalist rhetoric has no effect on TFR in Türkiye cannot be rejected at 10% level of statistical significance.

Figure 6: Placebo Estimates



Note: Placebo TFR difference is the bias-corrected treatment effect estimated for Türkiye as well as for other 26 countries. The left panel shows these bias-corrected estimates where solid blue line is the effect estimated for Türkiye. In the right panel, red crosses show the calculated *p values* for each year for the null hypothesis that the treatment effect (for Türkiye) is zero.

Data Source: SCM results.

"Leave-One-Out" Estimates

Another procedure that facilitates robustness check is to re-estimate the bias-corrected effect for Türkiye by eliminating each one of the donor countries from the donor pool. The purpose of this "Leave-One-Out" procedure is to identify whether any country in the donor pool disproportionately influences the effect estimated for Türkiye.

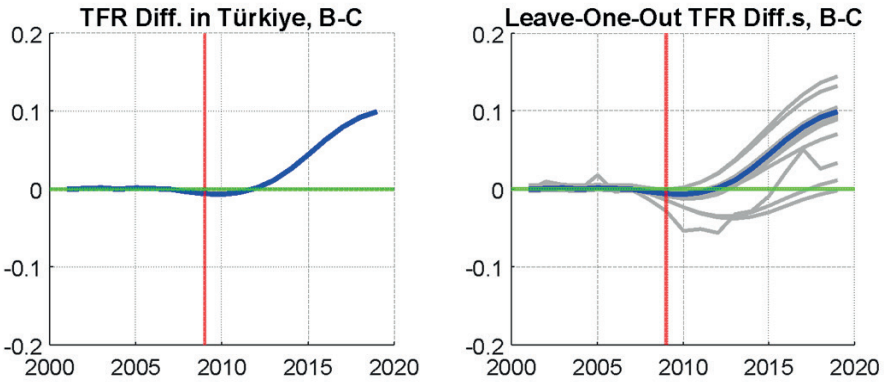
Recalling that the baseline and bias-corrected estimation have 26 countries other than Türkiye, the "Leave-One-Out" procedure is implemented for 26 times. In each of these implementations, a bias-corrected estimate for Türkiye is obtained. Figure 7 presents these 26 alternative estimates for Türkiye in the right panel.

Clearly, if the bias-corrected estimate for Türkiye was robust, the alternative estimates would all be very close to the blue line that represents this effect.

This, however, is true for 20 countries in the sample, and six estimates among the 26 "Leave-One-Out" estimates are significantly different from the bias-corrected estimate. More specifically, some of the "Leave-One-Out" estimates are negative for some years, indicating that the causal effect can be vastly sensitive to the selection of countries.

There is another useful way to interpret these "Leave-One-Out" findings. Imagine that, for some reason, we did not include in our original donor pool the six countries for which we receive divergent estimates. We would have then observed that the included 20 "Leave-One-Out" estimates are sufficiently close to the original bias-corrected estimate, thereby implying the *incorrect inference* that the estimated effect is robust.

Figure 7: "Leave-One-Out" Estimates



Note: The left panel shows the bias-corrected estimate for Türkiye (solid blue line). The right panel shows 26 "Leave-One-Out" estimates (solid gray lines) as well as the estimate for Türkiye (solid blue line). 20 out of 26 "Leave-One-Out" estimates nearly overlap with the estimated effect for Türkiye.

Data Source: SCM results.

DISCUSSION AND CONCLUSION

Economic demography is an exceptionally solid science: Fertility decreased in all societies that exhibited typical patterns of modernization in a sufficiently long run. These patterns include growing living standards, secularization, industrialization, human capital accumulation, and urbanization as well as the sustained expansion of market opportunities for female labor. There is virtually no society benefiting from the blessings of economic modernization but trapping itself into a regime of high fertility. Investing into intangible things such as technological knowledge and productive skills, instead of

creating more and more babies, is perhaps one of the biggest achievements of humanity.

A large literature, with micro-founded structural models, micro-level data on demographic and economic outcomes, and credible research designs, shows that only well-articulated and generous family policies might boost fertility. The key is to endow the urbanized, educated, working people with clear, stable, and strong incentives so that they choose to transit from zero to one child, from one to two, and from two to three if this is also desired. This is simply a depiction of the required balance between *decent work* and *happy family*. Deep historical forces that create the material conditions of low fertility (female emancipation, the rise of education, urbanization, etc.) also raise economic as well as socio-cultural "barriers" against sustaining fertility at the replacement level. Optimal population policy remains a controversial (and perhaps a dismal) endeavor because there is no simple recipe that supports the "decent work-happy family" balance for large segments of the society that evolves under the pressure of the material conditions of low fertility. The pronatalist policy successes recorded so far are limited to a few countries, but increases in period fertility rates do not actually guarantee that policies would also have a permanent effect by altering completed fertility levels in the long run.

Population policy controversies in Türkiye are not there yet! Pronatalist ideals are not supported with explicit and generous family policies, similar to the ones observed in Scandinavian countries for example. One reason is the limited fiscal capacities of the Turkish governments. Another is that Türkiye already has large reserves of young and unemployed people, despite continuing fertility decline. One could also add other complexities such as irregular refugees and their future in Türkiye.

The result presented in this paper is astonishingly simple: The post-2008 pronatalist rhetoric did not create an effect on actual fertility in Türkiye, by the year 2019. To many observers trained in economic demography, this is not a surprising finding at all: No serious pronatalist population policy action, no incentives for more children.

One obvious possibility for future research is to formulate a research design that exploits individual-level variation in actual fertility for estimating the pre-2008 and post-2008 reduced-form fertility models with legitimately merged cross-sections. This would allow the econometrician to infer whether pronatalism significantly altered the effect of a particular explanatory variable "X" on actual fertility. Another possibility is a discrete-choice model of fertility and other endogenous variables such as schooling. With such a theoretical model suitably taken to the data, simulation-based econometric estimates using the pre-2008 and post-2008 micro-data samples would again

shed light on the effects of pronatalism. Sufficiently detailed discrete-choice models could also be used for simulating alternative population policies. For example, it would be nice to know under what conditions a college-educated married woman at the age of 32 who already has a child at the age of 4 would give birth to her second child.

APPENDIX A: THE SYNTHETIC CONTROL ESTIMATOR IN A NUTSHELL

This appendix briefly introduces the SCM estimator by closely following Abadie's (2021) framework and notation.

Let there be $J+1$ units indexed by j. In our case, these units are the countries in the donor pool and Türkiye ($j=1$). Assume that we observe an outcome variable Y (in our case, TFR) and a vector of predictor variables X for all $J+1$ countries for the periods from $t=1$ to $t=T$ with

$$t \in \{1,2,\dots,T_0,T_0+1,\dots,T\}.$$

Here, T_0 denotes the period of intervention, and it divides the sample into two: the pre-intervention sample $\{1,2,\dots,T_0\}$ and the post-intervention sample $\{T_0+1,\dots,T\}$. In our case, T_0 is the year 2008.

With h indexing the predictor variables as in $h \in \{1,2,\dots,k\}$, the estimator looks for the optimal weights $W^*=(W_2^*,W_3^*,\dots,W_{J+1})$ on countries to minimize a distance defined as in

$$\left(\sum_{h=1}^{k} v_h\left(X_{h1}-w_2X_{h2}-w_3X_{h3}-\cdots-w_{J+1}X_{hJ+1}\right)^2\right)^{1/2}$$

by using the data from the pre-intervention sample. In this distance minimization task, weights are restricted to be nonnegative and sum to unity, and the vector $V=(v_1,v_2,\dots,v_k)$ of nonnegative constants is taken as given. These are the terms that specify how relatively important a predictor variable is in the construction of the synthetic control. Clearly, then, any weight vector W depends on V as in $W=W(V)$.

To find a unique W, one needs to have a strategy to find a unique V. While there are different possible ways to do so, the common approach is to minimize the mean squared prediction error (MSPE) for the outcome variable by using the pre-intervention sample. This reads

$$\sum_{t=1}^{T_0}\left(Y_{1t}-w_2(V)Y_{2t}-w_3(V)Y_{3t}-\cdots-w_{J+1}(V)Y_{J+1t}\right)^2$$

Then, we have $W^* = W(V^*)$, and the optimal weights can now be used to compute the synthetic control for the outcome variable for the post-intervention sample. For a generic post-intervention period t, this is defined as in

$$\hat{Y}_{1t}^{N} = \sum_{j=2}^{J+1} w_j^* Y_{jt}.$$

We thus have the estimated treatment effect for t given as in

$$\hat{\tau}_{1t} = Y_{1t} - \hat{Y}_{1t}^{N}.$$

This completes the brief discussion for the synthetic control estimator, and the reader can refer to Abadie (2021) for technical details related with inference, bias correction, robustness, etc.

NOTES

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