

Women's murders and the interaction between gender (in)equality and economic development: A subnational analysis in Turkey

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Why are women's murders (femicide) more common in some localities than in others? This paper addresses this question in the context of Turkey, a country with a high and rising number of women's murders. It uses province-level data between 2010-2017 and the Negative-Binomial estimator to explore the importance of several socio-economic, cultural, and political factors. It finds that a province's ethnic composition, divorce rate, gender equality in education, and level of economic development are significant predictors of women's murders. The main result is that whether economic development reduces femicide depends on other factors: in poorer provinces, there is a strong positive correlation between women's murders and equality in education and divorce rates, but in richer provinces, these associations are significantly weaker. These results are consistent with the idea that economic development may not reduce women's murders by itself, but it can mitigate the effects of male backlash against women who challenge the status quo. The main policy implication of this study is that pro-development policies may save more lives if they target those poorer provinces that also carry these additional risk factors.

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ABSTRACT: This paper conducts the first systematic analysis on why women's murders (femicide) are more common in some localities than in others across Turkey, a country with a high and increasing number of women's murders. I use province-level data from 2010-2017 and explore the importance of several socio-economic, cultural, and political factors. I find that a province's ethnic composition, divorce rate, gender equality in education, and level of economic development are significant predictors of women's murders. My main finding is that whether economic development reduces femicide depends on other factors: in poorer provinces, there is a strong positive correlation between women's murders and equality in education and divorce rates, but in richer provinces, these associations are significantly weaker. These results are consistent with the idea that economic development may not reduce women's murders by itself, but it can mitigate the effects of male backlash against women who challenge the status quo. The policy implication of this study is that pro-development policies may save more lives if they target those poorer provinces that also carry these additional risk factors.

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Women's murders and the interaction between gender (in)equality and economic development: A subnational analysis in Turkey

Violence against women is unfortunately a common problem around the world. Although comparable cross-national studies are rare, one survey covering 10 countries found that the percentage of women who reported suffering physical or sexual violence by an intimate partner ranged between 15-70% across countries (Garcia-Moreno et al., 2005). The true level of violence is certainly even higher considering the possibility of underreporting by respondents and the fact that perpetrators of violence are not limited to intimate partners. The most extreme form of violence against women is women's murders. According to the United Nations Office on Drugs and Crime (UNODC), "gender-related killings of women and girls remain a grave problem across regions, in countries rich and poor", where "gender-related killings" (also called femicide) means the murder of women committed "because of the gender roles assigned to women." (UNODC, 2018, 3, 24).

Violence against women is common in Turkey as well. According to a 2015 survey conducted in Turkey, 38% of women who were married reported experiencing physical or sexual violence from their partner at least once (Yüksel-Kaptanoğlu, Çavlin and Ergöçmen, 2015). Again, considering that the survey relies on self-reports and asks only about violence by intimate partners, the true level of violence against women in Turkey should be higher. Turning to women's murders, although reliable statistics are difficult to find, both government officials and civil society organizations agree that hundreds of gender-related killings are committed in Turkey every year and this number has been increasing.¹ Understanding the factors that contribute to this problem

¹ For instance, the Turkish Minister of Interior declared that the number of women's murders was 279 in 2018 and 332 in 2019. In contrast, according to the *We Will Stop Femicide Platform (Kadın Cinayetlerini Durduracağız Platformu)*, 440 women were killed in 2018 and 474 in 2019. One

and why more women are murdered in some places than others can help us combat the problem effectively.

This paper conducts the first systematic analysis on why more women are killed in some provinces of Turkey than in others. Although there are many studies on violence against women in Turkey, systematic studies on its most extreme form, murder, are rare. This is an important omission, because there are good reasons to suspect that the determinants of murder and other forms of violence are different. Moreover, Turkey displays high geographic variation in several factors such as economic development, religiosity, gender equality and exposure to political violence. To give one example, in 2017 the GDP per capita of the richest provinces in Turkey (e.g. Kocaeli) were five times higher than the poorest provinces (e.g. Şanlıurfa). Thus, Turkey gives us an opportunity to study women's murders across places that are heterogeneous in socioeconomic and cultural terms, but fall under the same legal system. This paper takes advantage of this opportunity and investigates the associations between various socio-economic, cultural and political factors and the frequency of women's murders across Turkey. Data on women's murders come from the Male Violence Tally (*Erkek Şiddeti Çetelesi*) compiled by Bianet and include the years 2010-2017.

The results show that a province's ethnic composition, level of economic development, divorce rate, and gender equality in education have statistically significant associations with the number of

explanation for the discrepancy in numbers is differences in definitions. It is not clear whether the Minister was referring to all female murder victims or only victims of gender-related killings. For the Minister's statement, see [https:// haberglobal.com.tr/gundem/icisleri-bakani-soyly-bu-yil-332-kadin-cinayeti-yasandi-21335](https://haberglobal.com.tr/gundem/icisleri-bakani-soyly-bu-yil-332-kadin-cinayeti-yasandi-21335). For the Platform's statement, see <http://kadincinayetlerini-durduracagiz.net/veriler/2889/kadin-cinayetlerini-durduracagiz-platformu-2019-raporu>.

women's murders.² Starting with cultural factors, the percentage of people of Kurdish ethnicity is positively related to the number of women's murders. However, after controlling for other factors, there is not a strong relationship between women's murders and religiosity or past exposure to civil war.

This paper's main finding is that economic development can mitigate the negative effect of other risk factors. In poorer provinces, a higher divorce rate or greater gender equality in education is associated with a greater number of women's murders. However, in richer provinces these factors do not seem to have an effect. In other words, all else equal, the greatest number of women are murdered in poorer provinces with a high divorce rate or greater gender equality in education.

The paper proceeds as follows. The next section provides a brief overview of the related literature and highlights this paper's contribution to the literature on violence against women, and more specifically, women's murders. Section 3 presents the theoretical framework and hypotheses. Section 4 describes the data and research design. In section 5 the statistical results and robustness checks are presented. The final section concludes with a discussion of the limitations and implications of the paper.

Related Literature

This paper is most closely related to the literature on violence against women, and more specifically, women's murders. It deviates from the previous literature in two ways, one methodological, and the other, substantive.

The dominant approach in the literature on violence against women is to use survey data. Most systematic studies on this topic, both global ones (e.g. Heise, 1993; Bachman and Saltzman, 1995; Watts and Zimmerman, 2002; Devries et al., 2013), and those conducted in the Turkish context (e.g. Altınay and Arat, 2009; Jansen, Uner and Kardam, 2009; Yüksel-Kaptanoğlu, Çavlin and Ergöçmen, 2015; Gulesci, 2017; Erten and Keskin, 2018) are based on survey data. These studies have provided valuable insights on the prevalence of violence against women and the attitudes that

² The analyses correct for province population size.

people hold about violence. However, since they are based on nationally representative samples, they are not suitable for analyzing within-country variation in violence against women.

This paper's first contribution to this literature is to study variation across geographical space within a single country. For policymakers, understanding the local characteristics that make women more vulnerable to violence is important. Geographically disaggregated analyses can help policy-makers better select which programs to implement in an area given its characteristics. Moreover, a baseline model of femicide can help in evaluating the effectiveness of new policy interventions. In other words, it is important to complement studies on individual predictors of violence with studies on its local determinants.³

A second contribution of this paper is to conduct an analysis focused specifically on women's murders. Certainly, all forms of violence against women are destructive and should be addressed. However, murder and other forms of violence are qualitatively different and, for this reason, separate studies focusing specifically on the correlates of women's murders are needed. Existing works on femicide are few in number and limited in their scope. They mostly describe broad trends in its frequency over time or the shared characteristics of victims (e.g. Frye et al., 2005; Abrahams et al., 2013; Stöckl et al., 2013) and do not explain why some places experience more femicide than others. The dearth of studies on femicide applies to the Turkish context as well. There are no studies on why more women are murdered in some parts of Turkey than in others. Until recently, researchers were hindered by the lack of systematic data on women's murders. However, recent efforts by civil society organizations to compile lists of women's murders from the news media (discussed below) have overcome this limitation. This paper benefits from one such novel dataset and addresses an important gap in the literature by conducting an analysis specifically focused on the determinants of women's murders and their geographic variation.

³ Heise and Kotsadam (2015) is an example studying cross-national variation in gendered violence.

In short, this paper makes an empirical contribution to the literatures on violence against women and women's murders by conducting the first systematic analysis on why more women are murdered in some parts of Turkey than in others.

Theoretical Framework

This section presents the paper's theoretical framework and draw testable hypotheses on the socio-economic, cultural, and political factors that may affect the number of women's murders.

The Role of Socio-Economic Factors

Economic factors certainly have a strong but complicated effect on violence against women. Theoretically, an increase in a woman's economic opportunities can reduce violence: a woman who earns more has greater ability to leave an abusive relationship, which, in turn, should lower her abuser's willingness to use violence (Tauchen, Witte and Long, 1991; Farmer and Tiefenthaler, 1997). However, women with higher earnings may experience a backlash and *more* violence. A husband or boyfriend who feels that his masculine identity is threatened by his partner's employment may resort to violence to reclaim this status and feel better (Macmillan and Gartner, 1999). More importantly, even after leaving an abusive relationship, a woman may be targeted by former partners or family members who seek to punish her for breaking social norms. There are several examples of such revenge or honor killings of divorced women in Turkey (Sev'er and Yurdakul, 2001). In other words, women who challenge the status quo risk violent male backlash. Better economic opportunities for women may result in more murders if women who dare to assert their independence do not have the means to escape their abusers completely.

These arguments suggest the following relationship between economic development and the frequency of women's murders. *Fewer murders* are expected under two conditions: (1) women do not challenge the status quo and there is nothing for men to lash back at, and (2) women do challenge the status quo, but economic development is high and allows women to escape male

backlash. In contrast, a *higher number of women's murders* are expected when women challenge the status quo, but economic development and women's means of escape are low.

What are the indicators of women challenging the status quo? Unfortunately, there does not exist a direct measure of how many women are threatened by men.⁴ For this reason, this paper uses proxy variables. One indicator is a high divorce rate. Holding constant the percentage of woman-initiated divorces, a higher divorce rate means a higher number of disgruntled former spouses. If divorced women are unable to escape their abusers due to a lack of economic means, then a higher number of women's murders will happen.

Another correlate of women challenging the status quo is equality in job opportunities proxied by gender equality in education. Places where the average level of education is similar between men and women may offer women more job opportunities. Across Turkey women are less educated than men are, but in some provinces this gender gap is small and in others it is high. For instance, in 2017 the difference between men and women in terms of finishing high school or university varied between 4% and 17%. Moreover, equality in education is not strongly correlated with either (logged) GDP per capita or the percentage of women who finished high school or university. In other words, there is considerable variation in gender equality in education, which may serve as a useful proxy for women's job opportunities and the risk of male backlash.

Based on these arguments this paper will explore whether there are interactive effects between the strength of local economy, the effects of divorce rates and gender equality of education.

The Role of Cultural Norms

Culture, and more specifically, norms about gender relations, is another important determinant of how women are treated in a society. Norms that assign men primary power over women in the

⁴ Although there are help lines for domestic violence victims, the state does not release information on how many calls are made and from which locations.

society and normalize the use of violence for norm enforcement will legitimize violence against women. Under such norms, murder will occur more frequently as well. For example, honor killings are often committed by a woman's relatives to punish her for an alleged sexual impropriety (Sev'er and Yurdakul, 2001, 965). Women's status and attitudes toward violence against women vary across groups. In the Turkish context, several studies have found that attitudes toward and levels of violence against women vary dramatically across the country (e.g. Altınay and Arat, 2009).

Ideally, one would measure attitudes toward women and violence directly using survey data, but such data does not exist at the province level in Turkey. In its absence, this paper uses indicators of the level of religiosity in a province and its ethnic composition. Consistent with this approach, Sarigil and Sarigil (2020) report that in Turkey, Kurdish people and more religious people hold more strongly patriarchal attitudes.⁵ Other researchers have also highlighted ethnicity as an indicator of gender attitudes. According to Altınay and Arat (2009, 66), in Turkey there is a widespread assumption that Kurdish women are more oppressed than Turkish women are. Kırdar (2009) reports that in Turkey, all else equal, girls are less likely to be enrolled in school and this gender gap is wider among Kurdish children than among Turkish children. Turning to women's control over fertility, Him and Hoşgör (2011) conclude, based on interviews with Kurdish women, that high fertility rates in the Kurdish-dominant parts of Turkey are closely related to the domineering form of patriarchy exercised in the region.

Based on these ideas this paper will explore whether number of women's murders varies with the ethnic composition and the level of religiosity in a province.

⁵ Of course, ethnic groups are diverse, but to the extent that there are commonly held views within a group, it is possible to test for statistical relationships between cultural groups and outcomes of interest.

The Role of Political Violence

The final factor to consider is the legacy of political violence. The civil war in Southeastern Turkey has caused thousands of casualties, many more thousands of internally displaced people, and economic destruction. Scholars have found increased levels of mental health problems and domestic violence in post-civil conflict countries (e.g. Østby, Leiby and Nordas, 2019).⁶ Although there should be a positive relationship between civil war exposure and women's murders, in the period under study there was a temporary ceasefire (2013-2015) between the Turkish state and the PKK. The effect of past exposure to conflict may be weaker in this period of relative calm.

Data and Methods

Dependent variable

To analyze why some localities in Turkey experience more women's murders than others, a dataset is constructed where the unit of analysis is a province-year. The dependent variable is the number of women's murders. The data come from the Male Violence Tally (*Erkek Şiddeti Çetelesi*) compiled by a team of reporters at the online publication Bianet.^{7 8}

⁶ Gurses (2018, 49-70) argues that Kurdish women's participation in the insurgency has raised their status among people who support the insurgency. If this factor overcomes the negative effects of war, then war-stricken places may experience fewer women's murders.

⁷ Information on this dataset and how it was collected comes from the author's personal communication with Cicek Tahaoglu, who led the team of reporters collecting this data at Bianet during the period under study, and the Bianet website (<http://bianet.org/kadin/bianet/133354-bianet-siddet-taciz-tecavuz-cetelesi-tutuyor>). I thank Tahaoglu for her help.

⁸ The data were downloaded from the Women's Murders Project (*Kadın Cinayetleri Projesi*) website (<http://kadincinayetleri.org/>), which presents Bianet's data in an easily accessible format.

Bianet's Male Violence Tally is compiled from news reports of women's murders that appeared in national and local press. The Bianet team used a professional media monitoring company and a large number of keywords to obtain all relevant reports of women's murders.⁹ The team removed duplicate reports and coded which murders were gender-related.¹⁰ Most cases of "gender-related" killings are those in which the murderer kills the victim, because the murderer feels that the victim, as a woman, does not have a right to do something such as get a divorce or lose her virginity.¹¹ To ensure consistent application of the criteria, the team leader checked every case before it was included in the dataset. In some cases, reporters were uncertain if a murder was gender-related. For instance, this could be the case if the killer was not captured or the court case was not concluded. These cases were kept out of the database until more information became known. The Bianet team searched for more information on such cases at the end of the year and included them in the database only if new information (from police reports or court decisions) showed that the murder was gender-related. In short, due to the Bianet team's exhaustive search for relevant articles and the consistent application of criteria for categorization, there is a low probability of relevant cases missing from the database.

Bianet's tally has important advantages over alternative data sources in terms of scope and coverage. Firstly, consistent with related literature, it strives to include only those murders that are gender-related killings and exclude other types of female deaths. For instance, it does not include women murdered by people with mental illness or in an incident where they were not the primary target. Likewise, as explained above, the tally does not include deaths where it is not clear that the

⁹ Although the Bianet team collected information on non-lethal violence against women (e.g. rape), these cases are not included in the current analysis.

¹⁰ The perpetrator does not have to be male in order for a woman's killing to be counted a femicide.

¹¹ Although the term "murder" is used in the paper, some cases in the database are voluntary manslaughter in the legal sense.

murder is gender-related. In contrast, the tally kept by the We Will Stop Femicide Platform is more inclusive and includes the latter types of women's deaths. This study chooses to err on the side of caution and uses Bianet's tally, which is strictly a database of gender-related killings. Secondly, Bianet's tally covers a longer time period than its alternatives. Its monthly coverage begins in June 2009, which means that there is complete yearly data starting in 2010. In contrast, the list compiled by the We Will Stop Femicide Platform does not provide province-level data for the years before 2013. Likewise, the recent list published by Taştan and Yıldız (2019) covers only the years 2016-2019. Given its advantages in terms of scope and coverage, this study uses Bianet's tally of women's murders.

Although the dataset includes the precise date of murders and the districts in which they were committed, the analysis has to be conducted at a more aggregate (province-year) level, because sufficiently disaggregated data on the explanatory variables is not available. The dependent variable takes values between 0 and 46.¹² The empirical findings reported below remain similar if the analysis focuses only on those murders committed by an intimate partner (including former partners) or a family member (including in-laws) and the dependent variable is re-calculated dropping murders committed by people who do not belong to these categories. Summary statistics for this variable and the independent variables are in Table A.1 in the appendix.

Figures 1 and 2 and present the temporal and geographical distributions of women's murders in the sample. Figure 1 shows the number of women's murders in Turkey (per 100,000 people) for each year. It confirms the upward trend in women's murders although there was a drop in 2012. Figure 2 shows the number of women's murders (again, per 100,000 people) across Turkish provinces. Although the highest numbers of murders are committed in the most populous provinces, once population is taken into account, provinces that fall in the top quartile are spread across Turkey.

¹² The observation with the highest murders is Istanbul-2014.

[Figure 1 here]

[Figure 2 here]

One concern with this list of women's murders collected from the news media is murderers may attempt to cover up their crime as an accident or suicide. Although it is impossible to compile a perfectly complete list of women's murders, there are reasons to believe that underreporting does not bias the results. Firstly, to the extent that the determinants of frequency of reported and unreported murders are similar, this is a problem of random missing data and will not bias the results. Secondly, there is no evidence that as years pass murderers of women have gotten better at covering up their crimes by disguising them as suicides. Additional analysis was conducted on data from the Turkish Statistical Institute (TSI) to see if there was a suspicious increase in female suicides over the years. There does not seem to be such an upward trend.¹³ In fact, according to official records, in Turkey the number of women committing suicide has fallen in recent years.¹⁴ Given this evidence, a significant bias due to underreporting is unlikely.

Independent variables

The independent variables are measured as follows. The strength of the economy is measured by the (logged) GDP per capita (in inflation-adjusted Turkish Liras, baseline 2003) in a province. The data come from the TSI. As robustness checks, *percentage change* in GDP per capita and *unemployment rate* were added to the models. These variables are not significant and, according to Akaike Information Criteria (AIC), their inclusion does not improve the model significantly.

Gender equality in education attainment is calculated by subtracting the percentage of men who finished at least high school from the percentage of women who finished at least high school. This

¹³ See <http://tuik.gov.tr/Start.do>

¹⁴ Murderers could also disguise their crimes as accidental deaths. Unfortunately, data on accidental deaths of women is not publicly available.

variable, named *Gender Equality in Education*, takes higher values in provinces where women's educational attainment is closer to men. Data on education is obtained from the TSI.

Data on divorce rates also comes from the TSI. For every observation, the average divorce rate (i.e. number of divorces per 1000 people) in the last five years is calculated. The reason for looking at the previous five years is to account for the accumulation of divorced partners.

To capture cultural differences data on ethnicity and religiosity is used. To measure ethnicity, data from the 2008 Demographic and Health Survey (Hacettepe University Institute of Population Studies, 2009) on the percentage of people whose mother tongue is Turkish, Kurdish, Arabic or other is obtained. The latter two categories, which are very small (on average one percent), are combined. Leaving this combined "other" as the baseline category, the percentage of Turkish and Kurdish speakers are included in the models as measures of ethnic composition at province level.

Religiosity is measured by the number of mosques (per 1000 people) in a province.¹⁵ Data on mosques come from the Directorate of Religious Affairs (*Diyanet İşleri*) website.¹⁶ Past exposure to the civil war is measured by the (logged) number of war-related killings that occurred in a province between 1984 and 2010. The data come from the Turkish-Kurdish Conflict Event Dataset collected by Kibris (2020). One limitation of this *Civil War Exposure* variable is it does not take into account people who were exposed to war and then moved elsewhere. For instance, researchers have found that domestic violence is common among internally displaced groups (Gulesci, 2017). In the absence of province-level data on internal displacement, the *Civil War Exposure* measure is appropriate for testing differences between provinces that experienced the conflict directly and those that were exposed to it indirectly.

¹⁵ More precisely, this variable measures Sunni religiosity, which is the largest sect in Turkey. A comparable measure for Alevis would be the number of *cem houses*, but such data is not available.

¹⁶ <https://camiler.diyamet.gov.tr/>

A *Ceasefire* indicator is created. It takes the value of 1 in years 2013 and 2014, and 0 otherwise. This variable is interacted with *Civil War Exposure*. Note that the constituent term *Ceasefire* does not appear in the regression tables, because the year dummies subsume its effect.

Lastly, in all models year dummies are included. These dummies control for factors that affect the whole country simultaneously. For instance, over the years awareness about gender-related violence has increased across Turkey. According to the DHS, whereas in the 2003 survey 45% of women from the Central East Anatolia region listed at least one situation that justifies a husband beating his wife (Hacettepe University Institute of Population Studies, 2004, 195), this number fell to 22% by 2013 (Hacettepe University Institute of Population Studies, 2014, 185). Less tolerance for domestic violence may have reduced the number of women's murders relative to the counterfactual. Although it is not possible to measure nationwide awareness directly, including year dummies reduces the threat of omitted variable bias.

Another factor captured by year dummies is government policy. For instance, in 2011 Turkey signed the Istanbul Convention, which went into effect in 2014. Although the effects of this convention are not the focus of this paper, it is important to control for any changes in state policies after it was signed. Statistical models that include year dummies are able to control for policy changes that apply to the whole country.

Statistical method

The analyses are conducted using the Negative-Binomial estimator, because the dependent variable is a count of events and overdispersed. Since larger provinces are expected to experience more events, province population is used as the “exposure” variable. In all analyses robust standard errors are clustered at province level.

Results

Table 1 presents the regression estimates. Model 1 includes only the constituent terms; Model 2 includes the interaction terms as well. The lower AIC value of Model 2 (relative to Model 1)

suggests that the interaction terms improve model fit and including them is appropriate. Another way to evaluate the model's predictive capabilities is to look at the correlation between the model's predictions and the actual number of women's murders in a given observation. This correlation is 0.93, which again suggests that Model 2 has high explanatory power. Finally, Model 3 uses the same model specification, but a more restricted dependent variable: it includes only those murders committed by an intimate partner or family member of the victim. Many studies on violence against women are focused on violence by intimate partners and family members, which makes it important to show that this paper's findings hold in this subsample. The estimates in Model 2 and Model 3 are similar, which suggests that the findings in Model 2 are not sensitive to the murderer's identity. In short, Model 2 is robust and has high explanatory power in explaining the data. For these reasons, the following discussion of the substantive effects will focus on Model 2.

[Table 1]

Starting with cultural factors, there is a positive and statistically significant correlation between women's murders and the percentage of people of Kurdish ethnicity in a province. This association between Kurdish ethnicity and women's murders is consistent with previous research finding stronger patriarchal norms among people of Kurdish ethnicity in Turkey (Sarigil and Sarigil, 2020; Kırdar, 2009; Him and Hoşgör, 2011). It is important to note that this finding is only a correlation; despite this paper's best efforts, omitted variable bias could still be the culprit for this correlation. Moreover, this correlation regarding Kurdish ethnicity implies, at best, an overall tendency and it does not mean that every person of Kurdish ethnicity holds strongly patriarchal attitudes.

Since the Negative-Binomial is a nonlinear estimator, the coefficients are not sufficient for interpreting effect sizes. For this reason, the effect size of *Percentage of Kurdish Mother-Tongue* was calculated while holding other variables at their observed values (Hanmer and Kalkan, 2013). As the percentage of people of Kurdish ethnicity rises from 0 to 100, the predicted number of

women's murders increases from 3 to 8.¹⁷ However, since there are few provinces where people of Kurdish ethnicity make up a majority, the confidence interval around the estimates become very large beyond 50%. In other words, although Kurdish ethnicity and women's murders are statistically related, the effect size is uncertain. The other two indicators of culture in the model (*Percentage of Turkish Mother-Tongue* and *Mosques Per 1000 People*) both have positive coefficients, but neither approaches statistical significance. As a result, one cannot say with confidence that there is an association between these variables and women's murders.

What is the relationship between civil war exposure and women's murders? In Model 2, *Civil War Exposure* and *Civil War Exposure x Ceasefire* are both positive, but only the latter is statistically significant. This means that during war years (when there is no ceasefire) there are similar levels of femicide in provinces with low and high exposure to war. However, during ceasefire years, the predicted number of women's murders in a province with high past exposure (e.g. Bitlis) is twice as large relative to a province with very little exposure.¹⁸ One possible explanation for this pattern is misreporting: perhaps, killers are able to cover up women's murders as suicides in provinces that experienced the civil war more heavily. This explanation predicts a rise in women's suicides in war-afflicted provinces after the war reignites in 2015. This possibility was explored using province-year data on suicides (obtained from the TSI) but no evidence was found for it. This paper leaves this puzzle as an area of future research. To ensure that data problems do not bias the other findings in this paper, additional analyses, which exclude provinces that were in the region of state of emergency (known as *OHAL* in Turkish) in 1987-2002, are conducted and reported in the appendix.

What is the effect of the economy on women's murders and is it conditional on gender equality? In Model 2, both *GDP Per Capita* and its interactions with *Gender Equality in Education* and

¹⁷ A graph showing this relationship is presented in the appendix (Figure A.1).

¹⁸ Year dummies for 2013 and 2014 are taken into account when calculating the joint effects of *Civil War Exposure* and *Ceasefire*.

Divorce Rate in Past 5 Years are statistically significant. This implies that the effect of the economy depends on these two factors. To facilitate interpretation, Figures 3 and 4 plot the predicted number of women's murders in provinces with low and high GDP per capita for different values of *Gender Equality in Education* (Figure 3) and *Divorce Rate in Past 5 Years* (Figure 4).¹⁹

In both figures, provinces with low and high GDP per capita differ significantly from each other. According to Figure 3, in poor provinces the predicted number of murders increases as the gender gap in education closes. For a poor province with a low level of equality in education (e.g. Şırnak in 2015, gender equality level -0.14) the predicted number of murders is two, whereas for another poor province with a smaller gender gap in education (e.g. Hatay in 2015, -0.06) this number is six.²⁰ In contrast, in rich provinces, there is only a slight change in the predicted number of murders as gender equality in education changes. In short, all else equal, the highest number of murders tend to happen in poor provinces where gender equality in education is high.

[Figure 3 here]

Likewise, according to Figure 4, in poor provinces divorce rates are strongly correlated with women's murders. In rich provinces, however, the relationship is weaker. The highest number of murders are expected in poor provinces with a high divorce rate. The predicted number of murders in a poor province with a low divorce rate (e.g. Erzurum in 2015, divorce rate 0.6) is two whereas

¹⁹ "Low GDP per capita" corresponds to about 15,300 TL (in 2017 nominal values), which is the GDP per capita of Bitlis in 2017. "High GDP per capita" corresponds to about 41,500 TL, which is the GDP per capita of Yalova in 2017.

²⁰ These predictions are fairly close to the actual numbers; in 2015, Şırnak experienced zero women's murders whereas Hatay experienced five.

this number reaches six for a province with a smaller GDP per capita but a high divorce rate (e.g. Balıkesir in 2015, 1.96).²¹

[Figure 4 here]

So far, the discussion has focused on marginal effects at the province level. Figure 5 uses a different strategy to interpret effect sizes. It shows the predicted total number of women's murders in Turkey if the whole country was one province. Here the value of each variable is set to its national average in 2017.²² Figure 5 shows how the predicted total number varies as one or two variables change at-a-time.²³ The vertical dashed line marks 285, which was the actual number of women's murders in the sample in 2017.

[Figure 5 here]

The top bar shows that, when all variables are at their national mean, the predicted number of women's murders is 291, which is very close to the actual total. The second bar (from the top) shows that if the national GDP per capita rises to the level of a relatively rich province, then the number of murders rises to 311. In other words, promoting development by itself may not prevent women's murders.

The third and fourth bars display the mollifying effect of development. In both scenarios gender equality in education increases, but in one scenario GDP per capita drops, whereas in the other it rises. If equality in education and GDP per capita simultaneously improve, then 285 murders are predicted, but if gender equality improves while GDP per capita falls, then 358 murders are predicted. In other words, development can mollify the effects of other factors and reduce women's

²¹ In 2015 the actual number of women murdered was three in Erzurum and six in Balıkesir.

²² *Ceasefire* is set to zero, the year dummy for 2017 to one, and the rest to zero.

²³ "Higher divorce rate" is 1.9 and "higher equality in education" is -0.08.

murders by about 20%.²⁴ The last two bars show a similar story, but here development has a smaller effect. Again, higher GDP per capita can mitigate the effect of a higher divorce rate, but the effect size is about 10%.²⁵

To summarize, Figure 5 shows that development is unlikely to solve the problem of women's murders by itself. However, it can play a significant role by mitigating the negative effects of other phenomena and save the lives of tens of women every year if addressed effectively.

Robustness Checks

This section reports four sets of analyses that evaluate the robustness of the results. These analyses include rural population ratio and crime rates as additional control variables; test the sensitivity of the results to the exclusion of particular observations; replace *GDP per capita* with alternative economic measures; add party vote shares as controls. The regression tables are in the appendix.

The models in this paper do not include every factor that could affect women's murders in Turkey, which is impossible. Fortunately, according to statistics theory, in order to get an unbiased estimate for an independent variable, researchers have to control for only those variables that are correlated with *both* the dependent variable and the independent variable in question. For this paper, two such variables are identified: a province's rural population ratio and crime rate. Both variables are measured using data from the TSI.²⁶ When these controls are added, only crime rate has a positive and statistically significant association with women's murders. Importantly, the main results do not change.

²⁴ $(358-285)/358 = 20\%$.

²⁵ $(426-382)/426=10\%$.

²⁶ As a crime measure the *non-homicide* crime rate is used to avoid double-counting women's murders in both the dependent variable and the independent variable.

The second set of analyses check if the results are driven by particular observations. The first analysis excludes Istanbul, Izmir and Ankara from the sample, because these provinces are outliers in terms of economic and population size. The next analysis excludes from the sample the 13 provinces that were in the region of state of emergency (*OHAL*) in 1987-2002.²⁷ The third analysis excludes from the sample the three provinces that experienced the highest number of women's murders per capita.²⁸ The results are mostly robust to these changes to the sample. Most importantly, the interactions involving *GDP Per Capita* are robust in all models.

The third set of analyses explore if using alternative economic measures can produce additional insights. New models are run in which *GDP Per Capita* is replaced by, first *Change in GDP Per Capita*, and then, *Unemployment*.²⁹ Data for both measures come from the TSI. These variables are included initially by themselves and then interacted with other variables. These alternative economic measures do not have significant estimates in any of the models and including them together with *GDP Per Capita* does not change the main results.

The last robustness check is to add main political party vote shares in the model. This test is conducted as a robustness check, because party vote shares are endogenous to deeper factors such as religiosity, ethnicity, and economic development. Vote shares of AKP, CHP and MHP in the 2007 general election are used.³⁰ None of the party vote shares are statistically significant and the main results remain similar.

²⁷ These provinces are Adıyaman, Batman, Bingöl, Bitlis, Diyarbakır, Elazığ, Hakkari, Mardin, Muş, Siirt, Sırnak, Tunceli, Van.

²⁸ These provinces are Adana, Iğdır, and Karaman.

²⁹ Unemployment data are available only at the NUTS-2 (*Nomenclature of Territorial Units for Statistics-2*) level, which divides Turkey into 26 units.

³⁰ The Kurdish ethnic party HDP did not participate in this election with a party list.

Conclusion

This paper presents the first systematic study on why more women are murdered in some places than others in the Turkish context. It contributes to the literatures on femicide, and more broadly, violence against women. To summarize the findings, there are statistically significant correlations between the number of women's murders in a province and its ethnic composition, level of economic development, gender equality in education, and divorce rate. After controlling for these factors, there do not seem to be significant effects for religiosity or past exposure to civil war. Importantly, the effects of divorce rate and equality in education are conditional on economic development. In poor provinces, greater equality in education and higher divorce rates are associated with more women's murders, but these effects are largely ameliorated by higher GDP per capita. These results are consistent with the idea that economic development may not reduce women's murders by itself, but it can mitigate the effects of male backlash against women who challenge the status quo.

This paper's main policy implication is that effective interventions against femicide need to consider multiple factors simultaneously. Policies that address poverty can save more lives if they are implemented in places that carry additional risk factors such as a high divorce rate. In other words, although nationwide economic development is desirable, all poor provinces are not equally dangerous for women. It is possible to design pro-development policies that have a bigger impact on the problem of femicide.

This study opens several avenues for future research. One, future studies can test the effectiveness of state policies or civil society campaigns designed to prevent violence against women and women's murders. For instance, Turkey accepted the law number 6284 in 2012, which aims to prevent violence against women. Among other things, this law requires the establishment of Violence Prevention and Monitoring Centers around the country to implement preventive and protective measures. Future work can investigate whether these centers reduce the number of women's murders in their locality building on this paper and its research design. Two, several civil society organizations conduct campaigns in Turkey to prevent violence against women and

women's murders. Analyzing the effectiveness of these campaigns systematically can accelerate progress on this urgent issue.

Future research should also try to conduct analyses at more disaggregated levels and establish causal relationships. In this paper, the unit of analysis is province-year, even though more precise data on women's murders exist. Currently the limitation is that most of the covariates are available at province-year level. It is difficult to conduct studies that establish causality without access to more detailed data on the explanatory variables. Overcoming data limitations and, ideally, using individual-level data will open the door to more innovative and useful research.

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Table 1: Determinants of Women's Murders in Turkey

	No interaction terms (1)	Includes interaction terms (2)	Killer is intimate partner or family member (3)
Percentage of Turkish Mother-Tongue	0.005 (0.004)	0.006 (0.005)	0.006 (0.005)
Percentage of Kurdish Mother-Tongue	0.006* (0.004)	0.011** (0.005)	0.011** (0.005)
Mosques Per 1000 People	-0.000 (0.071)	0.029 (0.060)	0.035 (0.060)
Civil War Exposure	-0.013 (0.030)	0.026 (0.034)	0.027 (0.037)
Civil War Exposure * Ceasefire	-	0.061** (0.029)	0.055* (0.029)
GDP Per Capita	-0.402 (0.272)	-1.068** (0.436)	-0.985** (0.482)
GDP Per Capita x Divorce Rate	-	-0.365** (0.173)	-0.399** (0.180)
Divorce Rate in Past 5 Years	0.413** (0.129)	2.123** (0.795)	2.270** (0.826)
GDP Per Capita x Divorce Rate	-	-0.365** (0.173)	-0.399** (0.180)
Gender Equality in Education	2.781 (2.243)	76.190** (21.023)	74.647** (22.891)
GDP Per Capita x Equality in Educ.	-	-16.389** (4.515)	-15.992** (4.935)
Constant	-11.688** (1.106)	-8.940** (1.888)	-9.351** (2.057)
Year dummies	Yes	Yes	Yes
N	648	648	648
AIC	2211.1	2176.3	2154.2

Province-clustered s.e. are in parentheses. * $p < 0:1$, ** $p < 0:05$.

Estimator: Negative-Binomial. *Total Population* is the **exposure variable**.

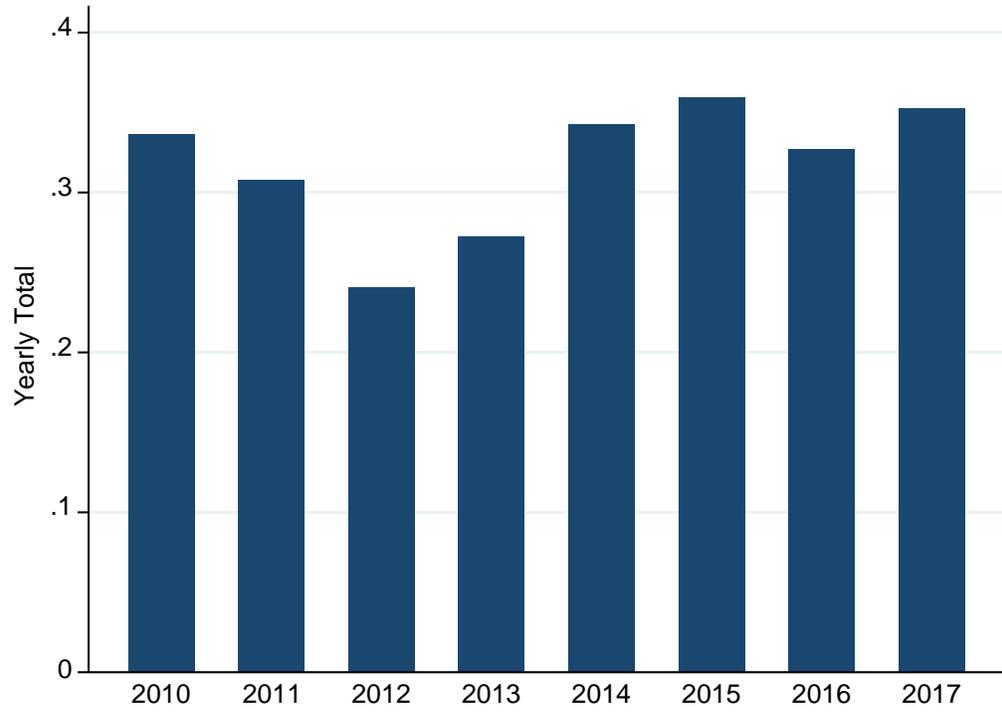


Figure 1: Number of Women's Murders across Turkey (per 100,000)

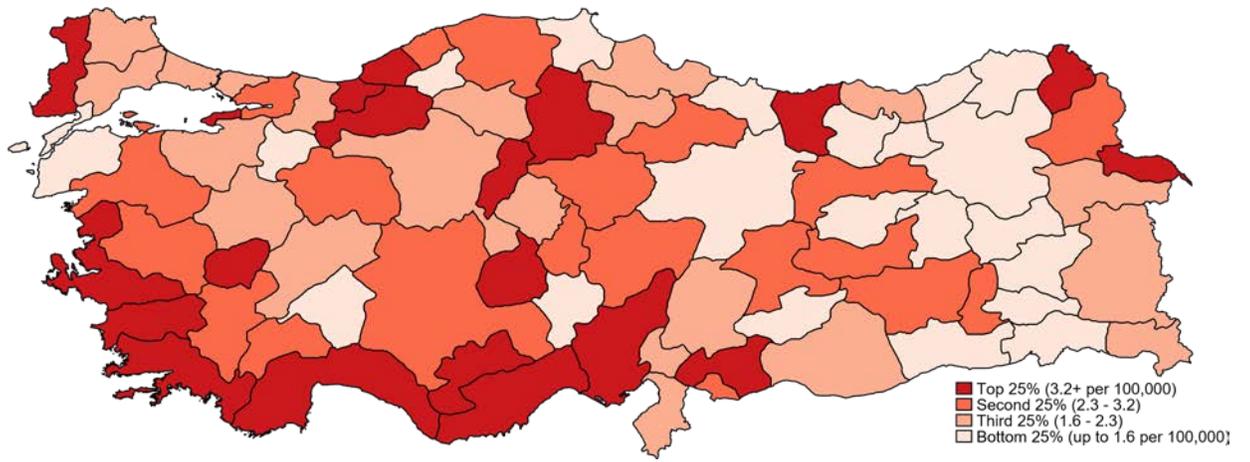


Figure 2: Number of Women's Murders per 100,000 (2010-2017 total)

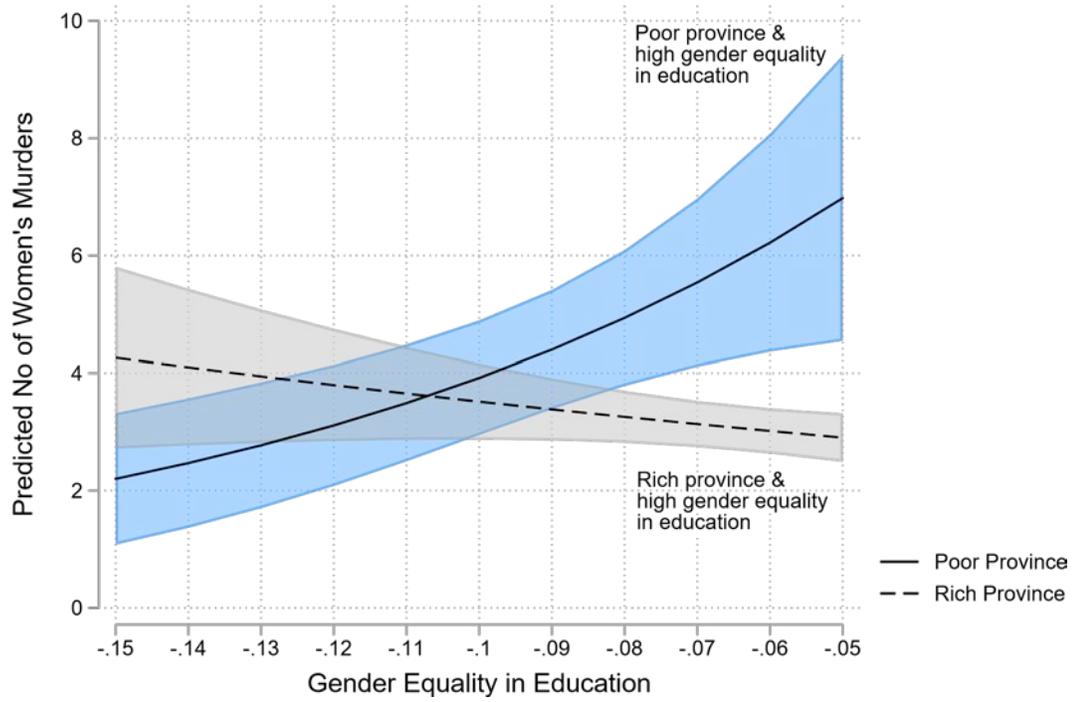


Figure 3: Gender Equality in Education, GDP Per Capita and Women's Murders

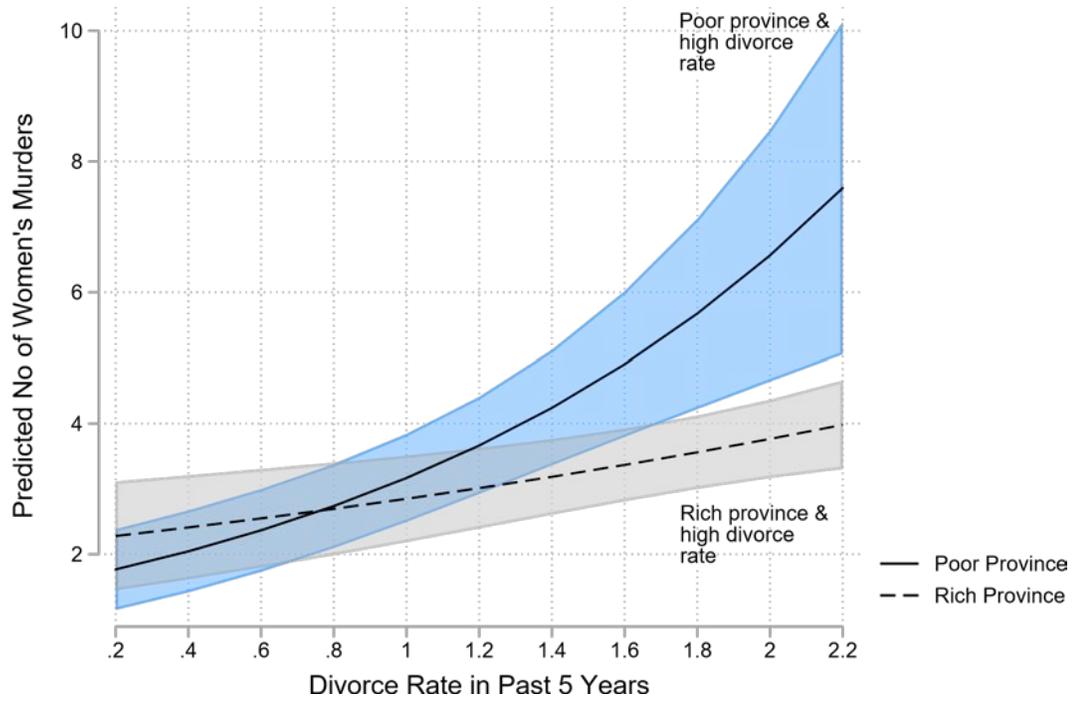


Figure 4: Divorce Rates, GDP Per Capita and Women's Murders

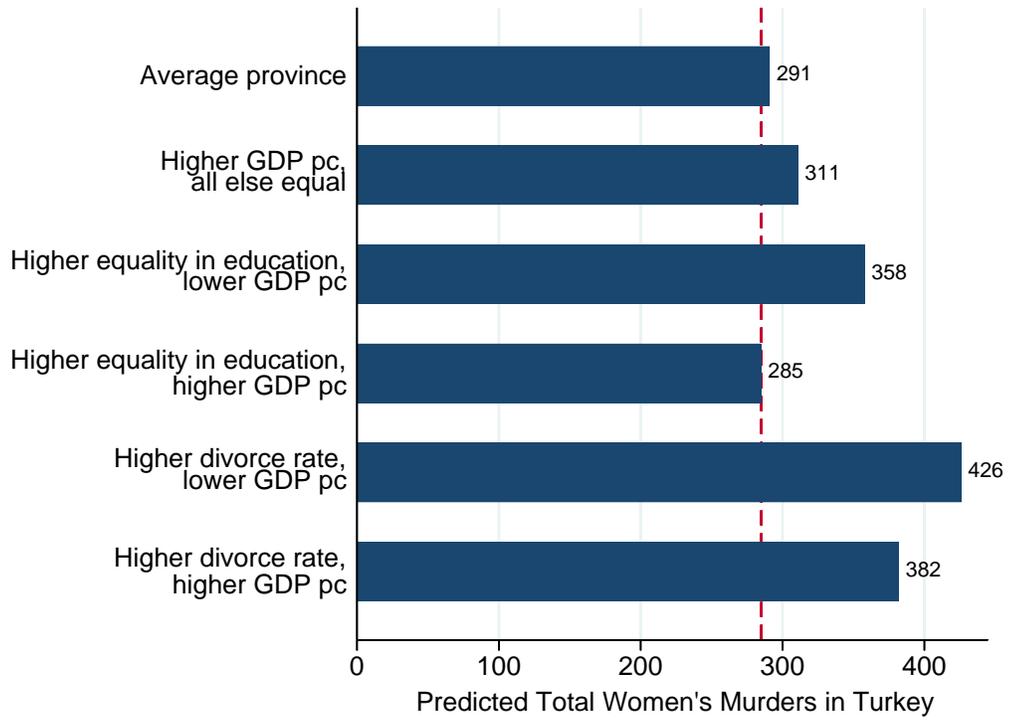


Figure 5: Predicted Number of Women's Murders for Hypothetical Profiles of Turkey

Online Appendix for
“Women’s murders and the interaction between gender (in)equality and
economic development: A subnational analysis in Turkey”
(Not for Print Publication)

Overview of Appendix

This appendix presents summary statistics, graphics, and robustness checks that were mentioned in the main text. More specifically, regarding the results in **Table 1 in the main text**, the following is shown:

- The results are robust to controlling for rural population ratio and non-homicide crime rate.
- The results are robust to the exclusion of the richest and most populous three provinces (İstanbul, İzmir and Ankara).
- The results are robust to the exclusion of the provinces in the region of state of emergency (*OHAL*) between 1987-2002.
- The results are robust to the exclusion of the the three provinces with the highest number of women’s murders per capita between 1987-2002 (Adana, Iğdır, Karaman).
- The results are robust to controlling for the vote shares of the three largest parties in the 2007 election.

Summary Statistics

Table A.1 provides descriptive statistics for the dependent variable and the main explanatory variables.

[Table A.1 here]

Estimated Relationship Between Kurdish Ethnicity and Women’s Murders

This graph shows the estimated number of women’s killings (with 95% CI) for different values of *Percentage of Kurdish Mother-Tongue*. Other variables are set at their observed values. Estimates are based on Model 2 in Table 1.

[Figure A.1 here]

Control for Rural Population Ratio and Crime Rate

In Table A.2, Models 1 and 2 show the results of controlling for *Rural Population Ratio* and *Non-Homicide Crime Rate* (calculated per 1000 people). Importantly, the *non-homicide* crime rate is used to avoid double-counting women’s murders in both the dependent variable and the independent variable. Women’s murders and the homicide rate in a province are positively correlated by definition, which means including homicides as a control will bias the results.

Of these two additional controls, only *Non-Homicide Crime Rate* has a positive and statistically significant association with women’s murders. The main results do not change.

[Table A.2 here]

Exclude the Richest and Most Populous Three Provinces

In Table A.2, Model 3 shows the result of excluding İstanbul, İzmir and Ankara from the sample. These three provinces are the richest and most populous in Turkey, which makes them potential outliers. Their exclusion does not change the main results except for *GDP Per Capita*, which still has a negative effect, but it is no longer statistically significant. This change is not surprising, because this regression excludes the observations with the highest GDP per capita. Importantly, the main results regarding the interaction of *GDP Per Capita*, *Gender Equality in Education*, and *Divorce Rate in Past 5 Years* remain robust.

Exclude the *OHAL* Provinces

In Table A.2, Model 4 shows the result of excluding provinces that were included in the region of state of emergency (*OHAL*) between 1987 and 2002. The rationale for this robustness check is twofold. These provinces are potential outliers, because they have a high percentage of Kurdish population, low GDP per capita, and high past exposure to the civil war. In addition, the war continued in most of the years covered in the analysis, which raises concerns

about the quality of data regarding these provinces. For these reasons it is important to check that the results remain similar if these observations are excluded from the sample. The only result that changes is that *GDP Per Capita* becomes insignificant (but remains negative). This is not surprising, because the excluded regions have very low GDP per capita. Importantly, the main results regarding the interaction of *GDP Per Capita*, *Gender Equality in Education*, and *Divorce Rate in Past 5 Years* remain robust.

Exclude the Provinces with the Most Women’s Murders Per Capita

In Table A.2, Model 5 shows the result of excluding the three provinces that, relative to their population, experienced the highest number of women’s murders. These three provinces are Adana, Iğdir, Karaman. Their relatively high value in the dependent variable makes these provinces potentially influential outliers. All the results remain very similar after excluding these three provinces.

Use Alternative Economic Measures

In Table A.3, the analysis is re-run with alternative economic measures. More specifically, *GDP Per Capita* is replaced by *Change in GDP Per Capita* (Models 6 and 7) and *Unemployment* (Models 8 and 9). For each economic measure the model is run first with and then without the interaction terms. Model 10 includes all three economic measures simultaneously.

To summarize, there is no evidence of a relationship between women’s murders and *Change in GDP Per Capita* or *Unemployment*. These variables and their interactions are not statistically significant (except for *Unemployment* in Model 10). Moreover, according to the AIC values, models including these economic measures have less explanatory power than Model 2 in Table 1. In contrast, in Model 10, including *GDP Per Capita* and its interactions improve the model significantly and their estimates are very similar to the estimates in Model 2 in Table 1. These results suggest that economic development (captured by *GDP Per Capita*) is the appropriate economic measure for explaining subnational variation in women’s murders in Turkey.

[Table A.3 here]

Control for Political Party Vote Shares

Table A.4 includes the vote shares of AKP, CHP and MHP in the 2007 general election as control variables. This is the last general election before the time period covered in this study and the Kurdish ethnic party HDP did not participate with a party list. The purpose of running this analysis as a robustness check is the endogeneity of party vote shares to deeper factors such as religiosity, ethnicity, and economic development.

None of the party vote shares are statistically significant. The main results regarding *GDP per capita* and its interactions do not change.

[Table A.4 here]

Table A.1: Summary statistics

Variable	Mean	Std. Dev.	Min.	Max.	N
Number of women's murders	3.031	5.068	0	46	648
Percentage of Turkish Mother-Tongue	75.425	33.868	0	100	648
Percentage of Kurdish Mother-Tongue	21.467	32.435	0	100	648
Mosques Per 1000 People	1.843	1.161	0.226	7.162	648
Civil War Exposure	2.346	2.624	0	8.324	648
GDP Per Capita	4.344	0.342	3.464	5.339	648
Gender Equality in Education	-0.101	0.029	-0.185	-0.044	648
Divorce Rate in Past 5 Years	1.283	0.617	0.114	2.754	648

Figure A.1: Percentage of Kurdish Mother-Tongue and Women's Murders

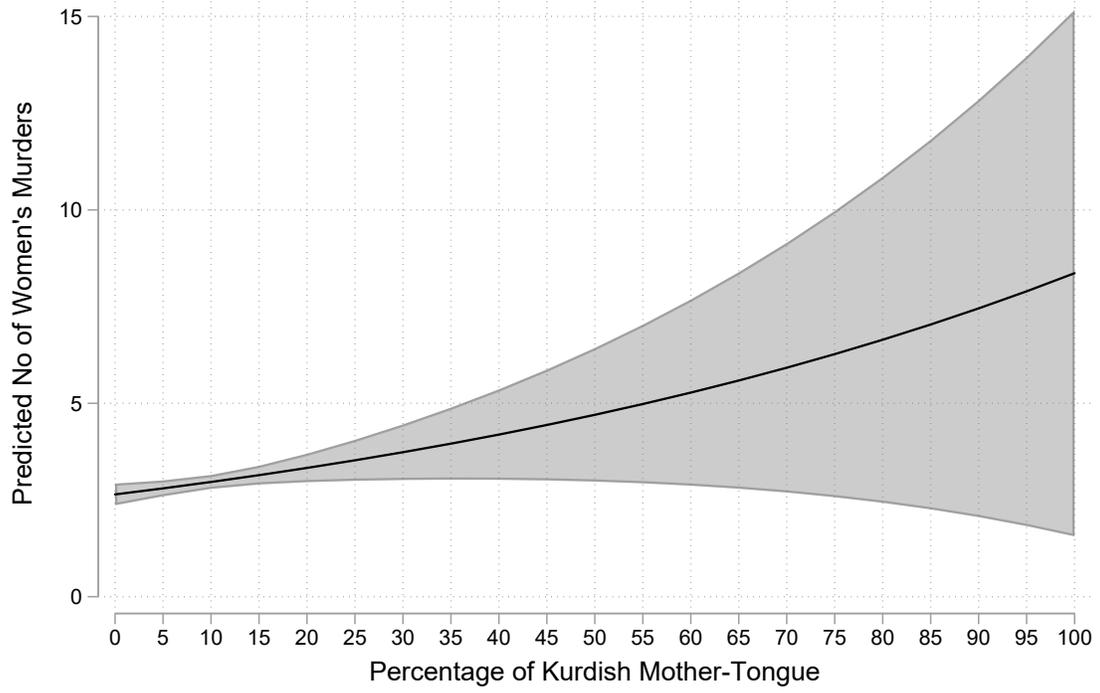


Table A.2: Subsamples and additional control variables

	Additional Controls		Exclude İst/İzm/Ank	Exclude <i>OHAL</i>	Excl. high WM prov's
	(1)	(2)	(3)	(4)	(5)
Percentage of Turkish Mother-Tongue	0.006 (0.005)	0.005 (0.005)	0.005 (0.005)	0.006* (0.004)	0.005 (0.005)
Percentage of Kurdish Mother-Tongue	0.011** (0.005)	0.010** (0.005)	0.011** (0.005)	0.017** (0.004)	0.011** (0.004)
Mosques Per 1000 People	0.042 (0.062)	0.019 (0.059)	0.022 (0.060)	0.046 (0.054)	0.030 (0.061)
Civil War Exposure	0.024 (0.033)	0.024 (0.032)	0.019 (0.034)	0.032 (0.032)	0.012 (0.033)
Civil War Exposure \times Ceasefire	0.060** (0.029)	0.062** (0.028)	0.057* (0.031)	0.047 (0.037)	0.059** (0.029)
GDP Per Capita	-0.874** (0.446)	-0.779* (0.423)	-0.605 (0.649)	-0.553 (0.570)	-0.817* (0.446)
Divorce Rate in Past 5 Years	2.496** (0.810)	2.133** (0.768)	2.190** (0.881)	3.148** (1.058)	2.035** (0.826)
GDP Per Capita \times Divorce Rate	-0.449** (0.177)	-0.396** (0.164)	-0.393** (0.198)	-0.584** (0.227)	-0.349* (0.186)
Gender Equality in Education	71.933** (21.003)	68.342** (21.187)	62.048** (28.040)	69.386** (21.530)	62.829** (21.776)
GDP Per Capita \times Equality in Educ.	-15.434** (4.528)	-14.730** (4.539)	-13.078** (6.249)	-15.035** (4.608)	-13.580** (4.686)
Rural Population Ratio	-0.169 (0.256)				
Non-Homicide Crime Rate		0.116* (0.067)			
Constant	-9.813** (1.913)	-10.157** (1.827)	-10.869** (2.677)	-11.528** (2.525)	-10.121** (1.902)
Year dummies	Yes	Yes	Yes	Yes	Yes
<i>N</i>	648	648	624	544	624
AIC	2177.420	2174.456	2023.343	1881.802	2062.957

Province-clustered robust s.e. are in parentheses. * $p < 0.1$, ** $p < 0.05$.

Total Population is the **exposure variable**.

Model 4 excludes İstanbul, İzmir and Ankara from the sample.

Model 5 excludes provinces in the region of state of emergency 1987-2002.

Model 6 excludes the three provinces that had the highest number of women's murders per capita in the sample (Adana, Iğdır, Karaman).

Table A.3: Alternative economic measures

	<i>Change in GDP pc</i>		<i>Unemployment</i>		<i>All 3 measures</i>
	No interac. (6)	w/ interac. (7)	No interac. (8)	w/ interac. (9)	w/ interac. (10)
Change in GDP Per Capita	-0.075 (1.165)	3.157 (4.375)			1.767 (4.017)
Change in GDP pc × Equality in Educ.		30.078 (31.303)			12.681 (29.653)
Change in GDP pc × Divorce Rate		-0.300 (1.291)			-0.702 (1.242)
Unemployment			-0.004 (0.013)	0.086 (0.077)	0.100* (0.055)
Unemployment × Equality in Educ.				0.616 (0.594)	0.716 (0.493)
Unemployment × Divorce Rate				-0.027 (0.018)	-0.020 (0.014)
GDP Per Capita					-1.141** (0.481)
GDP pc × Equality in Educ.					-17.395** (5.044)
GDP pc × Divorce Rate					-0.388** (0.187)
Percentage of Turkish Mother-Tongue	0.003 (0.004)	0.003 (0.004)	0.003 (0.005)	0.004 (0.005)	0.008* (0.005)
Percentage of Kurdish Mother-Tongue	0.006* (0.004)	0.006* (0.004)	0.006 (0.004)	0.007* (0.004)	0.013** (0.005)
Civil War Exposure	-0.018 (0.033)	-0.018 (0.033)	-0.016 (0.033)	-0.011 (0.033)	0.018 (0.032)
Ceasefire × Civil War Exposure	0.056* (0.029)	0.055** (0.027)	0.057* (0.030)	0.060** (0.029)	0.064** (0.025)
Divorce Rate in Past 5 Years	0.332** (0.120)	0.355** (0.124)	0.340** (0.126)	0.613** (0.183)	2.441** (0.847)
Mosques Per 1000 People	0.043 (0.057)	0.044 (0.056)	0.040 (0.056)	0.042 (0.055)	0.039 (0.054)
Equality in Education	3.159 (2.510)	1.661 (2.763)	3.094 (2.519)	-2.401 (4.670)	73.538** (21.908)
Constant	-13.165** (0.382)	-13.352** (0.407)	-13.109** (0.400)	-14.088** (0.911)	-9.873** (2.038)
Year dummies	Yes	Yes	Yes	Yes	Yes
<i>N</i>	648	648	648	648	648
AIC	2217.7	2220.7	2217.6	2218.7	2184.1

Province-clustered robust s.e. are in parentheses. * $p < 0.1$, ** $p < 0.05$.

Total Population is the **exposure variable**.

Table A.4: Control for political party vote shares

	(11)
Percentage of Turkish Mother-Tongue	0.007 (0.005)
Percentage of Kurdish Mother-Tongue	0.010* (0.006)
GDP Per Capita	-1.079** (0.406)
GDP pc \times Equality in Educ.	-16.333** (4.490)
GDP pc \times Divorce Rate	-0.397** (0.182)
Civil War Exposure	0.027 (0.033)
Ceasefire \times Civil War Exposure	0.060** (0.028)
Divorce Rate in Past 5 Years	2.260** (0.826)
Mosques per 1000	0.015 (0.065)
Gender Equality in Education	76.001** (21.074)
AKP Vote Share	-0.005 (0.006)
CHP Vote Share	-0.004 (0.009)
MHP Vote Share	-0.007 (0.006)
Constant	-8.530** (1.829)
N	648
AIC	2181.6

Province-clustered robust s.e. are in parentheses. * $p < 0.1$, ** $p < 0.05$.
Total Population is the **exposure variable**.