Television and the Labor Market: Evidence from Natural Experiments in West and East Germany

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This version: December 9, 2024

Abstract

Television is a major spare-time activity with the potential to lower economic activity but also to manipulate behavior by changing preferences and social norms through role models. To provide a comprehensive investigation into the impacts of television on the labor market, we study two natural experiments providing variation in access to television broadcasts. First, we leverage a setting in West Germany, where individuals in some regions could watch commercial television via terrestrial frequencies while others could only watch public TV. By analyzing rich panel data, we provide evidence inconsistent with the notion of negative impacts on labor market outcomes. Instead, we find positive effects on the labor supply among females. This employment premium has limited monetary consequences for females, which could be due to gender-specific occupational choices. To better understand the mechanisms and to examine long-run effects, we exploit a setting in East Germany, where for decades, citizens in most areas had access to Western public TV with its emphasis on conservative and family-oriented values, except for those areas where only state-run socialist television with a focus on full employment was available. By analyzing several datasets, we provide evidence on the beliefs of East Germans about the role of women in the labor market, which could explain the persistent effects of TV on the female labor supply and gender equality in labor market participation. It appears that Eastern socialist TV shares a surprising similarity with today's dominant form of Western free-market TV: they both encourage women to work.

JEL Classification: D90; J22; J01; J16

Keywords: Television; Labor Supply; Occupational Choice; Income; Gender Inequality; Germany; Social Norms

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Acknowledgement: The authors are grateful for discussions and comments by Elias Papaioannou, Iris Bohnet, the participants of the 14th Labour Economics Meeting, and seminar participants in Boston and Ghent.

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1. Introduction

Television consumption is a substantial human activity only rivaled by sleep and work (Aguiar and Hurst 2007). While a substantial body of research shows that television consumption can alter preferences and subsequent behavior on the consumer side, such as consumer demand (Bursztyn and Cantoni 2016) and subsequent debt accumulation (Baker and George 2010), far less is known about the implications of TV on the producer-side relevant input factor labor. As an important component of leisure, watching TV should be welfare increasing based on the canonical labor-leisure model, whereas work requires costly effort that is exerted for the purpose of consumption. At first glance, one could expect that TV leads to a reduction in the labor supply due to changes in the time available for work. Alternatively, TV watching may lead to an increase in the labor supply if consumption preferences are altered due to advertisements of luxury products or the display of expensive lifestyles. TV could also have more direct effects on the individual willingness to supply labor by changing social norms about work. Therefore, it is unclear whether TV and labor market outcomes are substitutes or complements, and it becomes evident that the labor market consequences from TV consumption are a complex issue, requiring an in-depth investigation.

The complexity further increases when acknowledging potential differences in the roles of men and women in the labor market. Across the world, working-age men are usually full-time employed but women are not necessarily, which results in substantial differences in the labor supply and, hence, labor market outcomes for women (Blau and Kahn 2013, Goldin 2014, Olivetti and Petrongolo 2016, Blau and Kahn 2017, Antonie et al. 2020). Phenomena such as the gender-pay gap, the gender gap in leadership, and the gender gap in labor force participation are a reality in many Western countries and are of great relevance for both policymakers and the public alike. In many countries, those gaps remain large, while in some cases, gender gaps have narrowed over the years. One may hypothesize that the display of different family models on TV may have contributed to reducing gender inequality through a change in labor market behavior in women. This idea aligns with research showing that TV can affect women in several ways, including their fertility choices (La Ferrara et al. 2012), the likelihood of divorces (Chong and La Ferrara 2009), and ultimately their autonomy (Jensen and Oster 2009). All these findings are consistent with the idea of changes in the role of women in society and indicate that TV may stimulate women to make a living by joining the labor force.

To study the consequences of TV on labor market outcomes with a focus on the role of gender, Germany is an ideal country: it has a large economy with striking inequalities between males and females. Shortly after the country's reunification in 1991, the gap in labor force participation was at 21.4 percent (German Federal Statistical Office, 2021). This number has dropped substantially but remains still at 7.7 percent in 2019. Interestingly, the gender pay gap was 21% in 1995 and has barely changed over time, with gender differences in pay of 19% in 2019 (Statista 2021). Germany is also a particularly interesting country due to its historical divide pre-1990 into West and East Germany, with the East experiencing a socialist planning system instead of a market economy. The reunification has been intensely studied in previous research to understand better different politico-economic regimes and their impact on, among others, changes in well-being, preferences, and social capital (Frijters et al. 2004, Alesina and Fuchs-Schündeln 2007, Boenisch and Schneider 2013, Campa and Serafinelli 2019, Lippmann et al. 2020). In this paper, we study a related divide, namely along the lines of TV. The occurrence of two separate natural experiments allows us to analyze the causal effects of TV on the labor market comprehensively.

In a first step, we exploit a natural experiment on TV that took place in West Germany. We focus on the labor market consequences of the proliferation of commercial TV. After World War II, Germany built an infrastructure of transmitter stations to provide access to public TV via terrestrial frequencies. For several decades, it was legally impossible for private companies to broadcast TV, which changed in the 1980s after Germany's Supreme Court lifted the ban. For several years, however, most Germans could still not watch any of the new TV programs, contrary to those living in areas where coincidentally, still available frequencies from existing public media stations could be used for commercial TV. Thereby, the setting allows for quasi-experimental evidence on the effects of TV by comparing Western commercial TV to the baseline of Western public TV (see Chadi and Hoffmann 2021). Arguably, it is essential to take possible forms of endogeneity into account when analyzing the complex role of TV in society. This is also true for our objective to study the effects of TV on the labor market, given that there could be sorting into labor and leisure activities. For example, unemployed individuals can watch more TV than those with a job and, thus, have less free time. Quasi-random access to commercial TV allows us to circumvent sorting issues to identify the labor market consequences by providing unbiased estimates.

We analyzed data from a rich household panel for West Germany. In contrast to the idea of labor and TV being substitutes, we find an increase in employment due to commercial TV. This increase is entirely driven by a rise in the female labor supply and accompanied by reductions in time spent on child care. As a result of TV, we observe that women join the labor force and take up jobs that require low qualifications, which implies that they do not end up in high-income jobs or leadership positions. Step-by-step, we inspect potential mechanisms, such as changes in material aspirations, partner preferences, and role models on TV. Our findings are consistent with role models shown on TV that attract women into the labor market where they follow their job preferences, such as working in the health services sector, instead of choosing more economically lucrative occupations.

In a second step, we leverage a natural experiment in East Germany, allowing us to understand the long-run labor market consequences of TV and to provide complementary evidence for the potential mechanism of role models. Prior to the fall of the Wall, all East Germans could watch state-run socialist television programs. Additionally, many East Germans watched Western public TV if they lived close enough to a West German transmitter station near the border. This was impossible for individuals living in regions where only socialist TV was available due to the longer distances to the Western TV stations. The regional variation in TV signals allows for an ideal research environment to study the impact of TV on society, as discussed in other work (e.g. Kern and Hainmueller 2009, Hyll and Schneider 2013, Hennighausen 2015, Bursztyn and Cantoni 2016, Friehe et al. 2018). We exploit this setting to investigate the impact on the labor market by comparing Eastern socialist TV to our baseline of Western public TV. Since a key mantra of socialist regimes is equality, we expect that stronger exposure to only East German TV could affect individual labor market behavior due to social norms shaped by role models on TV.

Surprisingly similar to the evidence on the effects of West German commercial TV, we find that socialist TV encourages women to work when we draw a comparison to the mutual baseline of West German public TV. Survey evidence from East Germany shows changes in beliefs about the role of women in the labor market, which supports the role-model mechanism to explain our evidence on the labor market effects of TV. Remarkably, when we use household panel data, the impacts of socialist TV appear to affect the labor supply for roughly two decades after the end of socialism in Germany. As a result of the increased female labor supply, we observe modest income

effects, which implies that TV does increase female labor market earnings more positively in the long run, as compared to our short-run evidence from West Germany. In contrast, we find increases in qualified work among East German women but again no effects on the likelihood of obtaining leadership positions. Finally, we inspect the implications of TV for gender inequality by analyzing administrative data post-reunification. This analysis shows a diminishing effect on the gender gap in labor market participation, which goes beyond the overall effect of exposure to socialism when we compare the East and West German labor market.

Our study highlights that TV can be a powerful and effective manipulator of economic and social outcomes. The findings further show that TV from completely opposite economic systems can modify labor market behavior in the same direction. With our investigation, we contribute to several strands of research, including the discussion on the role of media in society (DellaVigna and La Ferrara 2015). We are able to provide an explanation for decreases in gender inequality via increased female labor force participation. We further contribute to the discussion on the gender pay gap and the leadership gap as we demonstrate that women entering the labor market is only a necessary but not sufficient condition to narrow those gaps. TV exposure did not result in women obtaining leadership positions. In other words, television programs modified women's willingness to start a job, but television could not modify the outcomes of their efforts.

In the following Section 2, we discuss relevant explanations how individual labor market behavior could be affected by watching TV. We inspect the effects of TV on the labor market and discuss evidence on relevant mechanisms in Section 3 by analyzing the natural experiment in West Germany. In Section 4, we analyze the natural experiment in East Germany to provide complementary evidence on the long-run effects of TV on women's role in the labor market, including the implications for gender inequality and the mechanisms. In Section 5, we discuss our results and draw conclusions.

2. TV and the Labor Market

TV could affect labor market outcomes in several ways. Intuitively, one may expect a negative impact of TV on labor market behavior through a reduction in the labor supply. This could then lead to economic impairments, such as lower income from work. A first and straightforward justification is that increased time spent on watching TV reduces the available time budget that can be allocated to the most important non-leisure activity: work. Second, one may expect indirect

effects from TV consumption on labor market activity through individual health status. Negative impacts of TV on health have been discussed for decades in the medical literature concerning problems like obesity in children (e.g. Dietz and Gortmaker 1985). If health is impaired by watching TV, then the labor supply could also be negatively affected, assuming that health problems reduce labor market activity, as measured, for example, by the number of work hours (e.g. Schurer 2017).

While both ideas concerning adverse effects of TV-related to time-use and health could be true in principle, there are reasons to expect countervailing effects. Recent evidence for Germany shows no negative impact of TV on health in a population of adults (Chadi and Hoffmann 2021). To the contrary, there could even be positive effects of television if more joyful free time facilitates a higher work effort due to a more effective recovery. Potential positive effects of recovery on individual work lives are discussed, for example, in organizational psychology (see e.g. Fritz and Sonnentag 2005). Similarly, changes in time allocation due to TV could entail more positive effects on the labor supply for individuals with children. Nieto (2021) argues that attractive TV offers might reduce parenting time by keeping the children busy, allowing parents to spend more time on labor market activities. If true, this could particularly affect the labor supply of mothers in countries with high gender inequality in child care obligations.

Apart from changes in time-use and well-being, TV could also affect the labor supply by altering preferences. There are a plethora of studies showing that TV is effective in manipulating individual preferences, as in the context of politics (Gentzkow 2006, DellaVigna and Kaplan 2007, Enikolopov et al. 2011, Durante and Knight 2012, Durante et al. 2019, Xiong 2021). Of particular relevance for our research aims are those preferences that may induce meaningful changes in labor market outcomes. Apart from work preferences, at least two domains could have indirect effects on labor market behavior: consumption and partnership.

One idea is that TV affects consumption preferences, for example through exposure to advertisements. Preferences for consumption could plausibly trigger individuals to increase their income levels, thereby indirectly affecting their labor market behavior since work is the main path to higher income. Baker and George (2010) provide evidence in support of effective manipulation of consumption preferences by showing that individuals with exposure to TV increase purchases of consumer durable goods by analyzing the introduction of cable TV in the United States

(Gentzkow 2006). Using the same setting from East Germany as we do in Section 4, Hyll and Schneider (2013) provide evidence that TV can affect material aspirations, whereas Bursztyn and Cantoni (2016) show that individuals follow through on their aspirations by purchasing goods that have been advertised via TV.

TV could also alter individual partner preferences. Role models displayed on TV can affect social norms, which may reflect how a happy man or happy woman should lead their life. For example, there is evidence that watching soap operas affects views on partnership and, subsequently, family outcomes in Brazil (Chong and La Ferrara 2009, La Ferrara et al. 2012). If TV increases aspirations to find the perfect partner, this could reduce the likelihood of having a partner, and it may affect the desire to be more autonomous. Especially for women, one could imagine that through different partner preferences and overall concerns of less strong relationships, it becomes more important to be independent via a sufficiently large income. While many women relied on their husbands as breadwinners prior to the proliferation of TV, this has changed in many counties. Research shows that partner preferences have changed over the last decades, with assortative mating increasing (Eika et al. 2019). This aligns with the idea that individuals search longer for a partner that is a better fit. As a possible result of exposure to different role models on TV, changing partner preferences could, therefore, indirectly affect the work-life of women.[1] Another idea is that views about partnership may affect labor market behavior in a more direct way if the search for a partner changes. As mentioned in Corneo (2005), socializing at work might replace socializing in private life due to the reduction of social capital caused by TV (Olken 2009). Hence, this societal change could increase the attractiveness of having a job for partner-seeking individuals if the marriage market shifts from leisure activities to the workplace.

Finally, there are preferences related to work that could affect labor market behavior directly and be changed by TV if it can shift social norms about the importance of work. A large body of work in economics discusses the significance of work norms for labor market activity (Stutzer and Lalive 2004, Chadi and Hetschko 2017, Furtado et al. 2021). In our context, it is plausible that TV affects social norms for labor market participation by displaying role models that the viewers may imitate. Just like TV is capable of manipulating partner preferences, TV might be an effective

[1] Note that economic motives could be a channel for an increase in the labor supply, independent of partnership and related norms, if TV affects an individual's concerns about the economic situation in a direct way. For example, this could be due to media coverage of economic crises.

manipulator of individual beliefs about the work life, which could, in particular, affect women. Campa and Serafinelli (2019) provide evidence for effective manipulation of (gender-specific) beliefs about work and point to the potentially crucial role of television. While their focus is on East Germany, there are many examples of Western TV shows that can also be interpreted as promoting societal ideas relevant to labor market behavior. As an example of a popular 1980s television show from the United States, the sitcom "Who's the Boss?" displays non-traditional role models with completely reversed gender roles, where the woman is the career-oriented breadwinner and the man is the homemaker. In stark contrast, the sitcom "Married… with Children" uses anti-heroes as negative role models by portraying a dysfunctional family with a low level of education that was founded through marriage at a very young age. It indirectly promotes the idea that it is better to delay marriage and fertility decisions, invest in education and a career, or otherwise, one may just end up like one of the characters on the show. As a consequence of watching such popular programs, women may feel encouraged or even pressured to work to comply with a new norm dispersed by TV, which portrays women who are successfully participating in the labor market while rarely presenting a positive image of the traditional female homemaker.[2]

3. Evidence from a Natural Experiment on TV in West Germany

3.1 Background and Empirical Strategy

The historical setting of the proliferation of new TV channels by commercial broadcasters in West Germany has recently been introduced to the research on TV (Chadi and Hoffmann 2021). While we describe the setting in more detail in the aforementioned paper, we highlight several facets of this natural experiment that are particularly important for our research aims in the following. First, the quasi-random reception of a TV signal via terrestrial frequencies promises credible evidence on the effects of TV. Left-over frequencies on public transmitter stations that were established decades prior to the introduction of private TV channels allow us to distinguish between exogenously determined treatment regions with access to novel TV programs and control regions without (see Figure A1). Due to legal restrictions, it was not possible for private TV providers to

[2] As an interesting anecdote, these two sitcoms with two completely opposite family displays were broadcasted together for many years on Germany's number one commercial TV channel, yielding high ratings and as result of the enormous popularity of these shows even a spin-off with actors from Germany.

expand the public network of transmitter stations, creating a treatment window of several years starting in the late 1980s, in particular, before satellite TV became universally available in German households in the 1990s. Second, the proliferation of new TV programs on top of public TV provides an ideal natural environment to study the consequences of TV on the labor market. In particular, TV shows from the United States, as our "commercial TV" treatment, were the dominant content and likely to affect (gender-related) norms compared to more traditionally orientated public German TV programs.[3]

While West German public TV was displaying a more traditional role of women, the societal role of the women as the homemaker was a reality for many families in West Germany. During the 1980s, the traditional breadwinner model was very prevalent, with the mother being responsible for child care and the father being active in the labor force.[4] The breadwinner model, as shown on TV, was also in line with institutional policies. For instance, joint taxation of household income incentivized traditional marriages by significantly reducing the taxation burden for married couples. The German Supreme Court underscored this idea with an important ruling in 1982 by legitimizing the taxation policy to give "special recognition to the role of the married women as a homemaker and mother" (BVerfGE 61, 319). Hence, child care in West Germany was mainly considered a private task, whereas paid child care work as well as institutions such as kindergarten and pre-K care were not very widespread (Rosenfeld 2004). Taken together, these policies conform to the female role model displayed on Western public TV.

To analyze the effects of TV on the labor supply, we use longitudinal data from the German Socio-Economic Panel (SOEP). As shown in Table A1, the SOEP contains rich information about individual work lives and provides us with several labor supply indicators. We use the number of work hours across all individuals and work hours conditional on being employed.[5] As a separate

[3] As an example on the most successful commercial TV channel RTLplus, the TV show „Bionic Woman" was a prototypical television series from the United States, which was literally translated into the "7-Million Dollar Woman" in German and was broadcast in a prime-time slot during the treatment phase of our historical setting. It was a spin-off of the "Six Million Dollar Man" being aired on the same channel. The "7-Million Dollar Woman" shows a woman who received extraordinary abilities after an accident with the idea that she is not only as successful as her male counterpart but also worth more in monetary terms. This program was very different from shows on Western public TV, such as the hit series "Diese Drombuschs" that started in 1983 and had a very large prime-time viewership for many years. Germany's second public TV channel ZDF broadcasted this show about a family with the father being a shoemaker and the wife a homemaker who takes care of her three children.

[4] For empirical evidence on the male breadwinner model in West Germany, see Sprengholz et al. (forthcoming).

[5] By focusing on the number of work hours as the dependent variable, we follow other SOEP-based studies to analyze the determinants of the individual labor supply (Chadi 2017, Schurer 2017, Doorley and Pestel 2020). Our main indicator of the labor supply considers individuals who are not employed as having zero work hours. To supplement

indicator, the employment status informs us whether an individual is inside or outside of the labor force. The former includes individuals in full-time and part-time employment, as well as vocational training. Thanks to the richness of the panel data, we are then able to consider the consequences of changes in the labor supply by analyzing, among others, income effects and subjective perceptions to understand the mechanisms.

As we focus on two experiments with Germans, we exclude non-German citizens and individuals with a migration background across both investigations when using SOEP data to ensure consistency. By concentrating on Germans only, we ensure that differences in migration do not play a role in the analysis since the number of migrants differs between East and West Germany in this respect. While many migrants with diverse cultural backgrounds entered the West German labor market over decades, this sample restriction affects a rather small number of respondents in our investigation in East Germany.[6]

Our empirical strategy exploits the longitudinal nature of the data by leveraging individual differences over time for West Germans who either received commercial TV or not. Since cable- and satellite-TV were negligible at the time of our investigation, we compare the treated individuals to those in the control regions who did receive Western public TV only (Figure A1). Via the SOEP time-use data from the 1980s, we confirm an increase in television consumption due to the reception of commercial TV in the last year (Figure A2). This reproduces the finding of a significant manipulation of TV consumption due to regionally restricted access, which is discussed comprehensively in Chadi and Hoffmann (2021).[7] In general, we employ the same empirical strategy by focusing on reduced form estimates with individual fixed effects and without region fixed effects, which are not needed as we exclude cases of individuals moving between counties within our investigation period. Our investigation period starts in 1985, which is the first year for which county information is available in the SOEP, and it ends in 1993, when the

our analyses of actual work hours, we also inspect contractually agreed upon work hours. As some individuals are employed in contractual arrangements with flexible work hours, the sample size becomes smaller when we analyze this measure.

[6] Note that excluding foreigners from studying a comparison of East and West Germans is in line with related SOEP-based research (Campa and Serafinelli 2019). We use the sample cohort information by focusing on West Germans in SOEP sample A and we consider information on nationality and migration background of the respondents. To study a homogenous East German population, we proceed in the same manner in our analysis of the GDR-TV experiment (Section 4) where we additionally exclude individuals who did not live in East Germany in 1989 and SOEP sample A respondents (who most likely migrated from West German to East German regions after 1989).

[7] Note that the main SOEP time-use battery includes no item reflecting media consumption since the wave of 1990.

distinction between control and treatment regions became more and more difficult due to the proliferation of cable- and satellite-TV. When using the information on regional TV access to study the labor market consequences of television, we employ a lag of one year for our treatment to plausibly affect individual behavior. Respondents who are considered as treated by receiving commercial TV usually had the opportunity to watch the program for more than a year, as we identify individuals in their counties before and after the start of the treatment in our longitudinal analysis.

3.2 TV and the Labor Supply

In the following, we inspect changes in the labor supply due to TV consumption in our West German sample. We start our investigation by linking the TV variable from the time-use battery (used in Figure A2) to the labor supply for a first analysis.

--- Table 1 about here ---

Panel A in Table 1 displays reductions in work hours when individuals increase TV watching in column 1. Like all our results based on regression analyses with individual fixed-effects, this cannot be explained by time-invariant characteristics of the individuals surveyed across the years. Furthermore, the finding does not change when adding a set of covariates in column 2. These capture time-variant differences in individuals' lives, which may explain some of the within-individual variation in labor supply. According to the results in the rest of the columns, the main finding on reductions in labor supply is not driven by changes in the work hours of the employed (columns 3 and 4) but rather by those changing the employment status (columns 5 and 6). If interpreted causally, this could imply that TV consumption crowds out the labor supply. One may conclude that TV consumption could lead to a substantial change in employment which alters work hours, while it does not affect individuals who are already in the labor market. However, our initial evidence is likely plagued by negative sorting and reversed causality. Individuals who become unemployed or leave the labor force for other reasons than television are likely to watch more hours simply because they have more time.

When we leverage quasi-random variation in regional TV access in Panel B of Table 1, we observe that the direction of the effects reverses. As shown in column 1, an exogenous increase in

TV consumption goes along with increased work hours, which is inconsistent with the idea of a substitution effect between leisure and labor. The increase in work hours caused by receiving commercial TV amounts to roughly one hour in our full sample, which does not change much when adding covariates in column 2.[8] The positive labor supply effect is not driven by the employed (columns 3 and 4). In line with this, the effect of TV on employment is significantly positive in column 5, which reveals that the overall positive impact on the labor supply is due to individuals deciding to take up a job. The result does not change when adding covariates (column 6).

--- Figure 1 about here ---

To complement our evidence on the effects of TV on labor supply and to learn more about the idea of substitution between labor and leisure, we make use of the SOEP time-use data. Figure 1 shows the effects of regional TV access on a set of five time-use items. We analyze the activities that are consistently available in the SOEP for our investigation period. While regional access to commercial TV increases television consumption, as shown by Figure A1, it does not reduce time spent on work, which conforms to our previous findings in Table 1. To understand why the effect is not significantly positive, one has to consider the wording of the item that reflects work in general, not just salaried employment in the form of the main job that is the focus of the other variables on labor.[9] We find a reduction in housework, child care, and repairs with significant reductions in the latter two activities. Those activities can be summarized as home production. While we do not have a complete measure of home production, and a very general time-use measure of work, Figure 1 indicates that increases in paid work due to TV go along with reduced home production. A common phenomenon is women allocating more time towards home production instead of market work (Hersch 2009, Burda et al. 2013, Ngai and Petrongolo 2017), while avoiding earning more than their husbands (Bertrand et al. 2015). Based on the insights from

[8] Note that by adding covariates, the sample changes slightly due to item-nonresponse in the SOEP. An additional check reveals that the change in statistical significance when comparing results in columns 1 and 2 is due to the changing sample size, not due to the inclusion of covariates in the regression model. When interpreting the evidence based on regional TV access, one has to be cautious about covariates that could be affected by the treatment itself. However, we are not concerned about it since the coefficient barely changes.

[9] The original wording of the work item in the SOEP time-use battery does not distinguish between salaried or non-salaried work. Respondents are thus free to report any work that they think belongs into this category, which could include side jobs or non-market work.

our time-use analysis as well as our discussion in Section 2, we therefore analyze heterogeneous treatment effects of the labor supply by gender.

--- Table 2 about here ---

Table 2 reveals substantial gender differences in the effects of TV on the labor supply, reflected in significant interactions. Column 1 of Panel A shows that women work 2.7 hours more in comparison to men when receiving commercial TV (the total effect for women is 2.4 hours). This implies that the labor supply effect observed in Table 1 is entirely driven by women, as the effect for males is close to zero. Column 2 shows that the increase in work hours results only to some extent from employed individuals changing their labor supply. By disentangling the overall increase in actual work hours using other labor supply variables in columns 3 and 4, we find that the effect is completely due to changes in contractual work hours and not due to changes in overtime. It indicates that women do not work harder conditional on having a job with a fixed contractual agreement, but rather that they are signing new work contracts to increase their labor supply either by working longer hours or by entering the labor force. In line with this, Panel B shows a significant employment effect, which again is only observed among women. The likelihood of women taking up a job increases by more than five percentage points, compared to a zero effect for men, according to column 1. When we investigate different types of employment by comparing full-time and part-time jobs, we observe similar effect sizes in columns 2 and 3. This implies that at least some women enter the labor market by signing a part-time work contract, which indicates that females triggered by TV to work are not fully conforming to the concept of a career-orientated woman.[10] As another result, we find that TV does not entail any changes in the likelihood of being registered as unemployed (column 4). This implies that women who were

[10] Note that the total effect for women, as the combination of both effects shown in column 3 of Panel B in Table 2, is weakly significant with a coefficient of 0.031 (standard error: 0.018). In additional analyses, we do not find a significant interaction effect in the likelihood of an apprenticeship. In line with this result, we can redefine the employment dummy used in column 1 and treat apprentices as non-employed, which does not change our main finding. The same is true if we also treat irregularly employed part-time workers as non-employed. As can be seen in Table A1, these workers are a small group in the labor market who are separate from the larger group of regularly employed part-time workers analyzed in Table 2.

outside of the labor force start working after TV exposure, which aligns with the notion of females increasingly refusing to take the role of the homemaker.[11]

We analyze our main results deeper by first inspecting alternative treatment region definitions. In Table A2, we allow for a lower minimum level of frequency power than our default and thereby add further possible treatment areas in Germany. Panel A shows that the TV effect on work hours becomes stronger when we move from a larger set of treatment regions with low-powered frequencies to the high-powered frequency regions only. This is consistent with the findings in Chadi and Hoffmann (2021) and points to technical problems with TV access in areas with low-powered frequencies. Another interpretation is that changes in social norms (for example, about the role of women in society) are more likely to take place in one coherent region, such as in our main treatment area in the West of Germany receiving TV on the most powerful frequency, contrary to smaller and separated treatment areas where not everybody could get the TV signal. In line with this, Panel B of Table A2 shows that the effects are robust when we focus on an increasingly smaller set of counties within the main treatment area in West Germany by varying the minimum signal strength threshold. Finally, we complement our sensitivity analyses by considering covariates in our regressions, which does not change the results.[12] Given that most of the available variables, such as marital status, could be seen as endogenous in the context of a television treatment, we do not make use of these covariates in the following analyses where we shed light on the mechanisms.

3.3 *Further Evidence on the Labor Market Effects of TV*

In this subsection, we broaden our focus on the effects of television on labor market outcomes for women by using SOEP information beyond the labor supply. This allows us to discuss possible mechanisms like material preferences that may or may not have contributed to the increased female labor supply. While women are significantly more likely to work when being exposed to commercial television, the broader question is to what extent this has economic consequences for them and for the labor market in general. To find out more, we analyze the occupational choices

[11] In additional analyses, we do not observe any significant effects from TV on the likelihood of self-employment, which can be seen as another piece of evidence against the idea of TV increasing chances of top careers for women.
[12] The covariate results are available upon request.

of women when they take up a job and thereby address the question whether these jobs were high paying or not.

--- Table 3 about here ---

Table 3 Panel A shows that the TV treatment increases the likelihood for women to work in a job that requires low qualification levels by roughly five percentage points (column 1) while there is no effect on jobs with high qualification levels (column 2). We observe a similar TV effect for the likelihood that women have jobs with low autonomy (column 3) while there is no change for high autonomy leadership positions (column 4). Table 3 Panel B shows in which income groups women are working after TV exposure. Based on four income quartiles, we observe a weakly significant effect on the chance for women to be in the fourth and hence highest income quartile (column 4). The strongest effect of about five percentage points, however, is observed for the lowest income quartile (column 1). At the same time, there are no significant changes for the second quartile (column 2) and even a reduction in the likelihood to work in the third income quartile (column 3).

Our results from Table 3 are broadly in line with further evidence on the occupational choices of women, for which we use information on industry sectors. Based on the aggregated NACE-1 classification for all the sectors, the illustration in Panel A of Figure A4 reveals no clear picture in terms of statistically significant effects. On closer inspection, it seems that women were more likely to prefer the manufacturing and service sectors as a result of the TV treatment. When zooming into service sectors using NACE-2 information, the illustration in Panel B of Figure A4 shows that women with exposure to commercial TV are significantly more likely to end up doing health and social work. Given that typical jobs in this context, like nurses in hospitals, are not very well paid, we conclude that women often did not enter the most lucrative jobs and, in most cases, did not earn a lot of money for their work. While all this evidence is inconsistent with the idea of material motives behind a woman's labor market entry, it raises the question whether our finding is due to the relatively short-run setting with only a few treatment years when commercial TV is available in some regions and not others. As a possibility, the effects of TV on labor market outcomes for women may be more favorable in the long run. For example, investing in university degrees could enable women to enter high-paid jobs, but for changes in educational participation

to affect labor market outcomes, we benefit from studying a longer treatment phase, as in the case of TV in East Germany (see Section 4).[13]

--- Table 4 about here ---

To learn more about the mechanisms how TV affects the labor market behavior of women, we exploit a set of different subjective indicators, which, among other things, reflect income-related perceptions. Columns 1 and 2 of Table 4 confirm that women do not seem to benefit from earning more money for the purpose of reducing economic concerns or satisfying material desires since the commercial TV impacts on economic worries and income satisfaction are far from significant. The recovery story also appears to be implausible, as indicated by the non-positive TV effect on free-time satisfaction in column 3.[14] Evidence in favor of a relevant mechanism underlying the effect of TV on the female labor supply arises from the item on the importance of work. Column 4 of Table 4 shows a positive effect of TV, which we interpret as evidence for a change in social norms and changing perceptions about the role of women in the labor market.[15]

In another analysis, we conduct subsample splits to inspect alternative explanations for increases in the female labor supply by focusing on family-related motives. Assuming that TV affects partner preferences particularly in younger women, we would expect heterogeneity in the labor supply effects along the lines of age if that was a relevant mechanism. However, columns 1 and 2 show that both old and young women appear to be affected by TV.[16] Another possible family-related explanation for an increased female labor supply could be a change in the need for child care thanks to the TV set taking over this role. We conduct another heterogeneous-treatment effect analysis of a subgroup that should be particularly affected if this mechanism was relevant: women with children. In column 3 of Table A5, we present the TV effect for mothers having young

[13] The short-run perspective in our West German analysis could be an explanation why the variation in occupational choices in Figure A4 is relatively high. Perhaps, some women entered jobs for a while before realizing that their occupational choice was not optimal. In a long-run analysis, this might not be an issue, making it easier to detect significant effects.

[14] Since men may constitute a suitable counterfactual for women in the short run, we mirror Tables 3 and 4 in Tables A3 and A4 using subsamples with males only. With regard to free-time satisfaction, Table A4 shows a significantly negative effect of TV for men, which completely runs counter to the idea of improving leisure for the benefit of individual recovery from hard work.

[15] Interestingly, the same question does not reveal any positive effect for men (Table A4), which supports the idea of gender-specific changes in the social norms about women in the labor market.

[16] In another analysis, we identify single women based on information from prior to the start of the TV treatment phase. We again find effects of TV on labor supply in both subgroups, including women who were not single.

children born in the 1980s. The effect of TV is insignificant in this subgroup, in contrast to the rest of the female sample, where we find a significant increase in labor supply, as shown in column 4. Notably, the share of mothers with young children is small, which in itself is further evidence against the idea that changes in child care could explain why women work more after exposure to TV.[17]

In a concluding analysis, we leverage information from a SOEP survey battery on various self-reported attitudes about the importance of a plethora of aspects in life. The items on attitudes range from family to work and are available for 1990. To analyze heterogeneity in labor supply effects, we extrapolate the responses to all other waves and run interaction analyses. The idea is to understand better which types of women drive the increase in the female labor supply due to commercial TV. Table A6 shows that the work hours increase is stronger for women who consider their job to be important. A one-point increase in the score for individuals that care about job success increases the labor supply effect by more than one hour. We find similarly strong interaction effects for women who value personal fulfillment and travel. As another result, we observe that the work hours effect increases for women who value helping others, which is in line with their socially orientated occupational choices (as shown in Figure A4). The only negative, albeit insignificant, coefficients can be found on family-related items for marriage and partnership or the value of having children. Thus, the results in Table A6 are consistent with our previous evidence on the social norm mechanism underlying the impact of TV: Increases in the labor supply are driven by women who score high on attitudes about their role in the labor market and self-fulfillment, whereas other aspects such as materialistic desires are insignificant and thus seem to play no role in understanding the increase in the female labor supply.

We arrive at the conclusion that changes in the beliefs about women's role in society are the most plausible mechanism, based on our deep analysis of the available data. We now turn to an empirical setting in which we arguably can rule out all other mechanisms discussed in Section 2 by design.

[17] Our time-use analysis provides additional evidence against this idea, since the overall reduction in child care should be more important for women and not men if the demand for child care affects labor supply opportunities of women. However, we do not observe such gender differences in the impact of TV on child care (Figure A3).

4. Evidence from a Natural Experiment on TV in East Germany

4.1 Background and Empirical Strategy

The historical case of East Germans not being able to watch Western public TV in some regions of the former German Democratic Republic (GDR) has been investigated in numerous studies, many of which focus on political outcomes (Kern and Hainmueller 2009, Kern 2011, Crabtree et al. 2015, Hornuf et al. 2018, Friehe et al. 2020). For the sake of brevity, we highlight the most important aspects of this empirical setup in the following, where we focus on the broader literature in economics on the case of East Germany and the role of television in this context.

In fact, the East German TV experiment was an experiment within an even larger experiment of state socialism in Germany. There is a plethora of research interpreting the implementation of socialism in East Germany after World War II as a treatment, with West Germany as the control group, to study the effects on preferences and behavior (e.g. Alesina and Fuchs-Schündeln 2007, Heineck and Süssmuth 2010, Boenisch and Schneider 2013, Friehe and Mechtel 2014, Necker and Voskort 2014, Friehe et al. 2015). Of particular importance for our discussion are studies on the labor market effects and gender differences in this context. Previous research has revealed positive effects on the female labor supply through exposure to the East German socialist system, which may be linked to differences in institutional policies, education, and beliefs (Beblo and Görges 2018, Campa and Serafinelli 2019, Lippmann et al. 2020). In contrast to West Germany, East Germany focused on full employment for both men and women by establishing policies that promoted and demanded equal constitutional rights to work and equal pay across gender, such as providing child care facilities and work hour reliefs for working mothers (Trappe 2006, Rosenfeld et al. 2004, Bauernschuster and Rainer 2012). An open question is to what extent TV contributed to the overall socialism effect on labor market outcomes, especially when focusing on women.

To learn more about the impact of TV on the female labor supply, we exploit regional variation in TV consumption, which can be identified within the former GDR territory. While public television networks began broadcasting in both West Germany and East Germany in 1952, there have been differences in access for millions of East Germans since then. In contrast to socialist TV that could be received in the entire area of East Germany, the reception of West German public TV channels was only possible in some regions. Individuals living in areas far from the West German TV transmitters could only watch socialist television. In line with other studies on the

effects of TV in the GDR, we focus in our empirical analysis on the so-called 'valley of the innocent' as the core region in the Southeast (Hyll and Schneider 2013, Hennighausen 2015) while noting that the existing studies commonly refer to this area in Saxony as the control region with no access to Western TV. To use a comparable baseline to our analysis of the natural experiment in West Germany, we instead define the rest of East Germany as the baseline in our analysis, so that the valley of the innocent serves as the "socialist TV" treatment region in the Southeast. The idea is that Western public TV crowds out the consumption of socialist TV in our baseline, so that the impact of socialist TV is stronger in the Southeastern treatment region.

Note that in addition to the valley of the innocent with major cities like Dresden, Bautzen, and Görlitz, some of the East Germans in the Northeast also could not watch Western television.[18] However, it is not clear which regions were actually affected in the Northeast since GDR survey data typically used for manipulation checks only corroborate the TV signal reach (or lack thereof) in the GDR district of Dresden, but not for Northeastern areas.[19] In fact, in our subsequent analysis of survey data from the GDR, we investigate the consequences of TV by comparing East Germans living in the district of Dresden with those who lived in areas where access to West German public TV programs was more likely.

This setting in East Germany is ideal to study the female labor supply. First, we leverage a well-studied natural experiment in East Germany using cross-sectional post-treatment labor market indicators to identify the long-run effects of a TV treatment. For this setting, researchers, such as Bursztyn and Cantoni (2016), have already checked and argued against major empirical concerns like migration. The previous research also has shown that the setting allows us to study long-run effects of socialist TV many years after the reunification. Similarly, the broader literature on the effects of socialism has shown that gender differences in the labor supply attributed to exposure to the GDR system can be found even in data from recent years (Wyrwich 2017). Second, there is a striking contrast in the aims and the profile of the different types of TV programs that we compare in our analysis, with regard to the role of women in the labor market. While West German public TV propagated traditional role models where the employment of women played only a minor role (Küchenhoff 1975, Kotelmann and Mikos 1981, Cornelissen 1993), we suppose

[18] Anecdotal evidence comes from the East Germans themselves who jokingly translated the abbreviation for West Germany's first public TV channel ARD into "Außer Rügen und Dresden" meaning that everyone in the GDR could watch Western TV except for people on the island of Rügen, in addition to those in the Saxon areas without TV signal.
[19] Overall, the territory of the GDR was divided into 14 districts, each of which consisted of several counties.

that East Germans who lived in areas without West German TV reception were more frequently exposed to the ideals of state socialism with female characters on TV being portrayed as part of the workforce. In line with the political agenda of the socialist government, state television in East Germany propagated an image of great importance to the employment of women (Dölling 1993). Indeed, a content-analysis of television shows in the GDR reveals that all female characters on TV were working (Trültzsch 2009).

A further advantage of this well-studied experiment within an experiment in East Germany is that a multitude of mechanisms that are potentially relevant in the West German setting to explain increases in female labor supply can now be ruled out. In particular, material preferences cannot be the driver for positive effects of socialist TV on female labor supply. Evidence from the same setting shows that the availability of only socialist TV lowers income aspirations and correspondingly changes the consumption behavior of individuals who could not watch Western public television in the GDR (Hyll and Schneider 2013, Bursztyn and Cantoni 2016). Similarly, changes in partner preferences and a corresponding desire to become economically autonomous as a woman cannot explain positive impacts on the female labor supply since socialist TV promoted the idea of the traditional family with children rather than opposing this concept (Boenisch and Hyll 2015). Empirical evidence confirms this by revealing increases in marriages and fertility in regions with only socialist TV regions, as well as reductions in divorces (Hartmann 2021).

In contrast to those ideas, changes in work preferences could explain an increase in labor supply if socialist TV was capable of shifting social norms towards female employment, possibly via role models on television, which could change the attitudes of women towards work. In this context, Campa and Serafinelli (2019) provide initial evidence on the potential impact of socialist TV on attitudes towards career success for women using the regional variation within the former GDR. While they cannot rule out positive effects of socialist TV on attitudes after reunification, we investigate this idea deeper in the next step by analyzing data on gender-relevant labor market attitudes in the GDR.

4.2 TV and the Labor Market: Evidence from a GDR survey

We start our analysis of the East German TV experiment by using survey data from the GDR. As discussed intensely in previous research, GDR surveys have been established as a credible

source of information thanks to anonymous data collection procedures with the organizers not being present (Hyll and Schneider 2013), which has been shown to result in responses that were critical of the political system (Kern and Hainmueller 2009).[20] While there is a large number of such GDR surveys conducted over the years and available to researchers today, many have already been used in other research on the effects of socialism and specifically on the role of TV in this context. In the following, we exploit two survey questions from 1987 that have not been analyzed before to study the idea of different attitudes toward women's role in the labor market.[21]

The 1987 GDR survey contains two statements about the attitudes towards the compatibility of work and motherhood by referring to household and child care duties. Attitudes toward household duties are obtained via the statement "*a woman can achieve something in her job when everyone in the household takes on duties*," while child care duties are obtained via the statement "*a woman can achieve something in her job if her husband sees the upbringing and care of children as his task."* The interviewees were asked to report their level of agreement on a four-point Likert scale. We display the full set of responses to these two questions in Figure 2.

--- Figure 2 about here ---

The data from the GDR survey reveals several findings. Figure 2 shows a highly skewed distribution of answers for both statements on female achievements in the labor market. This lends empirical support to the notion of female employment being the norm in the GDR, which is consistent with the research on women's role in this socialist country and a severe contrast to the situation in West Germany at the time (Campa and Serafinelli 2019). Despite the overwhelming majority of respondents fully agreeing with the statements and thereby exhibiting very high egalitarian norms, the data also provides us with first evidence on a potential role of TV in this context. We split the data between treatment respondents who most likely received only socialist

[20] We do not expect a substantial reporting bias due to the nature of the surveys but even if there was reporting bias, it is highly unlikely to play a role in our study since we are mainly concerned with treatment effects where reporting errors would be the same across treatment and control regions will be differenced out by design.

[21] The GDR survey was carried out by the "Institut für Soziologie und Sozialpolitik an der Akademie der Wissenschaften der DDR" in four districts of the GDR in the period from March to September 1987. The districts of Berlin, Frankfurt, Neubrandenburg, and Dresden were covered. Following Hyll and Schneider (2013) and Hennighausen (2015), we assume that the inhabitants of the Dresden district were unable to receive West German TV and therefore represent our socialist TV treatment group. This assumption can be verified via a different GDR survey, which was conducted by the "Zentralinstitut für Jugendforschung" in 1989. In this survey, respondents were asked about their TV consumption (see Figure A5).

TV and a control group of respondents who could also watch Western public TV. The former are all the survey respondents in the GDR district of Dresden. When we focus on those who *fully agree* with the statements about women's role in the labor market, we observe that the manipulation of individual beliefs could be driven by socialist TV. For both variables, full agreement with the statement increases by more than five percentage points in the treatment area compared to the control regions, despite the level of full agreement already being very high across the entire GDR population. Table A7 presents regression results and reveals another finding, according to which these treatment differences in the likelihood to fully agree that women can achieve something in their jobs are in fact driven by women.[22]

We conclude that socialist TV could have been a crucial vehicle to increase egalitarian attitudes towards women in the GDR relative to more traditional gender attitudes. Since we find evidence for the manipulation of gender-specific work attitudes through socialist TV, we focus on the labor market consequences for women in the next step.

4.3 TV and the Labor Market: Evidence from SOEP

To provide evidence in support of the idea that socialist TV positively affects the female labor supply, we again make use of SOEP data and inspect available labor market outcomes from the time after reunification. Since 1990, the SOEP interviews individuals in the former GDR regions, allowing us to study the long-run effects of socialist TV on female labor supply and to learn more about the mechanisms. In this context, it is essential to note that several studies have shown for German data, including the SOEP (e.g. Alesina and Fuchs-Schündeln 2007), that the effects of socialism are long-lasting, implying differences in preferences and, hence, individual behavior many years after the reunification. The same is true for the effects of TV, which is plausible since the treatment period in which East Germans were separated into viewers of only socialist TV and those who mainly watched Western public TV spans several decades and is hence similarly long. In our research context, societal preferences about work are a crucial mechanism and long-lasting behavioral impacts are very likely since social norms do not disappear quickly.

[22] In Table A7, we present the regression results for both questions and both genders. In line with female role models, we do not find any evidence of an effect of socialist TV among GDR men, which does not change when we include covariates. Furthermore, our findings hold when we draw random subsamples of 1,300 women to allow for an even sample size across men and women.

We exploit SOEP information on the region where East Germans lived during the interview. This allows us to distinguish between counties with only socialist TV and those with Western public TV prior to reunification. Relying on calculations by Crabtree et al. (2015), we identify all the counties in the valley of the innocent as our treatment area. Similar to the effects of commercial TV in the West, we expect that socialist state-run TV was inducing women to seek employment, in line with the evidence from the GDR survey, and, hence, we focus initially on the labor supply before we turn to other labor market outcomes. We also pay attention to the question how long socialist TV was relevant after the end of the GDR in 1990. While we present our main results based on a time window of two decades, we inspect this issue deeper as part of complementary analyses presented in the Appendix.

--- Table 5 about here ---

Table 5 Panel A shows a significantly positive effect of East German TV on the female labor supply, which amounts to 2.4 hours of work. This effect does not seem to be driven by women in employment working longer hours, but rather TV changes the overall propensity to be employed. While this generally aligns with the evidence from the experiment on commercial TV in the West (Table 2), we again do not observe any changes in overtime but an increase in contractual work hours. According to Panel B, socialist TV increases the propensity to be employed for women by more than five percentage points, which is very similar to the evidence from the West German TV experiment. In contrast, however, the employment effect seems to be driven by women on full-time work contracts, whereas the likelihood of being part-time employed is not affected.[23] Finally, we again observe no effect of TV on the likelihood of being registered unemployed, which means that the employment increase is due to women deciding to join the labor market rather than staying outside of the labor force.[24]

After confirming that exposure to socialist TV positively affects female employment, we now discuss additional analyses. In a first step, we inspect the timing of the treatment effects and use data after 2009. Dynamic analyses from comparing different decades in Table A8 reveal that the

[23] In additional analyses, we find no significant increase in the probability of working as an apprentice due to socialist TV. Hence, the results do not change if we exclude apprentices from our definition of being employed. The same is true if we treat irregularly employed part-time workers as non-employed.

[24] For the probability of self-employment, we find a weakly significant decrease for those women living in the socialist TV treatment areas, in line with the findings by Slavtchev and Wyrwich (2017).

effects fade away after the first two decades following reunification. In comparison to related research on the impact of TV on consumption behavior (Bursztyn and Cantoni 2016), this is a comparatively long-lasting effect. However, it is plausible that consumption preferences are more malleable than preferences in other contexts, as shown for politics (Alesina and Fuchs-Schündeln 2007) and employment (Campa and Serafinelli 2019) in previous SOEP-based studies on the East German experiment. Hence, our evidence aligns well with the notion of persistency in work norms affecting labor market behavior many years after the end of the treatment phase.

In another additional analysis, we consider that the TV treatment was a treatment within a larger treatment since not only individuals in the main treatment region, but all the people of East Germany received socialist TV. Since exposure to socialism itself increases the female labor supply significantly, it is plausible that we underestimate the effect of socialist TV. To find out more, we add the entire territory of West Germany to our sample, and we also consider state-fixed effects in this context. Table A9 shows that the coefficient of socialist TV hardly changes when we introduce state fixed effects (column 2) relative to when we do not (column 1) when using only data for East Germany. When we add West Germany to the control group in column 3, the East German socialist TV coefficient becomes twice as large. This increase in the effect size reflects the fact that socialist TV now represents both: the additional effect from receiving only socialist TV and the overall socialism treatment effect. By controlling for the enormous differences in labor market participation between East and West Germany via state fixed effects in column 4, we observe that the socialist TV coefficient is roughly halved in our analysis, which conforms to the main result in column 1 and Table 5. This exercise indicates that the overall socialist TV effect on labor supply may have been even larger than the separately identified socialist TV effect in our analysis. While we cannot disentangle the overall socialism effect further, it is plausible that socialist TV may have substantially increased the affinity to work for East German women since a majority of the population in East German regions with access to Western public TV could and did watch socialist TV.[25]

[25] If it was not the media that was mainly responsible for manipulating East Germans' views on female employment being the norm, there has to be at least one other credible explanation. However, it is not obvious what other vehicle could substantially affect work norms in society, except maybe education. To examine this idea, Campa and Serafinelli (2019) use the time when the GDR transitioned towards a socialist education system and leverage the primary school admission cutoff policy with those born before the cutoff being exposed an additional year to the GDR education system in comparison to those born after the cut-off date. Their approach does not reveal any significant difference

In a final step, we conduct another regional analysis where we expand the control and treatment regions beyond the core regions. Similar to the evidence from the commercial TV experiment in the West, we find that the main effect of TV on work hours becomes weaker when we expand the treatment region. In particular, we do not observe clear evidence on effects of socialist TV in possible treatment regions in the Northeast that are far away from the core region of the valley of the innocent. A possible explanation for this lack of long-lasting treatment effects in regions other than the main treatment region could lie in the role of social norms, which may be less likely to persist in the northeastern areas, assuming that these are correctly assigned as socialist TV treatment regions.[26] Finally, when we conduct analyses in which we exclude these regions, the effects are statistically the same as for our main specification.

--- Table 6 about here ---

We complete our SOEP-based analysis of the East German TV experiment by investigating the broader economic impact of socialist TV on the labor market. Analyzing the same labor market outcomes as in Section 3, we observe a rather similar pattern, albeit with some differences compared to the experiment on commercial TV in West Germany. As a novel insight, Table 6 Panel A shows a significantly positive effect of socialist TV on the likelihood that women enter jobs with high qualification level (column 2), while there is no effect on jobs with low qualification requirements (column 1). This difference in the effects could be due to the longer study horizon compared to our West German setting analyzed in Table 3. Arguably, after many decades of treatment, the evidence on labor market effects becomes more economically favorable to women, as they benefit from investments in education. In line with this, Table 6 Panel B shows no effects of socialist TV on the likelihood of having a low-paid job (column 1). Generally, however, we do not observe any clear-cut effects when comparing the different income quartiles, which is true also for the highest-paid jobs (column 4). This aligns with another result, as we confirm that women who are pushed into the labor market by TV do not enter the highest positions but rather take up

between cohorts regarding work attitudes post reunification, which speaks against an important role of education in forming work norms.

[26] When we focus on the island of Rügen in the far northeast of the East German territory, we find evidence of increased female labor supply in the first decade following reunification.

lower-level jobs (Panel A, columns 3 and 4).[27] Since women are more often observed in jobs with high qualification level, the evidence indicates a higher willingness to obtain a high level of education among women, but this effort ultimately does not pay off through leadership positions or a high pay.

A possible explanation for not becoming a highly paid leader could be a lack of self-confidence. This seems plausible in the case of socialist television, which has been shown to undermine the belief that effort, not luck, determines career success (Hennighausen 2015). Another explanation may apply to both of our studies, and that is the role of individual job preferences. In fact, when examining occupational choices of East German women via industry sectors, we arrive at remarkably similar conclusions to the West German TV experiment. The left-side illustration in Figure A6 shows that women prefer service jobs, while they are not attracted at all to sectors with more lucrative jobs such as banking, trade, or energy. By zooming into the services sector, the right-side illustration again reveals a significant effect of TV on the likelihood of health and social work. As another subcategory within the services sector, education also appears to be very attractive to women. This finding may not be specific to socialist TV itself, but rather could be due to the longer time horizon of our analysis. While over time East German women in treatment regions are able to obtain the necessary qualification for jobs like teachers, the short time horizon in the West German TV experiment does not allow us to observe women in the labor market after getting a university degree.

In summary, as one of the many similarities between the East and the West German TV experiment, we conclude that women are in each case attracted by jobs in hospitals and similar institutions, which however are generally not very lucrative.[28] Furthermore, women are not entering leadership positions, which may or may not be due to gender-specific preferences. In general, it seems that they view employment as not just a means to earn money but also as an

[27] Table 6 displays even a statistically significant decrease in leadership jobs for women. Note however that the effect size is as small as the effect size in Table 3 for the same outcome variable.

[28] In additional analyses, we even find that the likelihood of working in the private sector increases in both of the two experiments. While this could be due to the fact that many health institutions in Germany are privately owned, this is still a remarkable finding, as it rejects the idea that socialist ideology could play a role in East German women's occupational choices. In this respect, women appear to follow their own preferences, unaffected by the ideological content of the TV program that caused the manipulation of the female work norm.

opportunity to help others, which suggests women are mainly following their (social) preferences rather than economic motives in the labor market.[29]

4.4 TV and the Labor Market: Evidence from Administrative Data

In our final analysis, we inspect the consequences of TV on gender inequality in the labor market at the macroeconomic level. For this purpose, we use administrative data from the Federal Institute for Research on Building, Urban Affairs and Spatial Development and the regional statistical offices. The data inform us about the situation of the entire labor market at the county level for a given year. Since we cannot distinguish between individuals with different backgrounds in such aggregated labor market data, we have to take a possible reduction of the precision in the treatment identification into account. Individuals migrating into a county were not necessarily treated by socialist TV (or subject to intergenerational spillovers of social norms). Migration within Germany as well as migration from and to other countries may attenuate the effects of socialist TV, which implies that we have to consider the following evidence based on the administrative data as being particularly underestimated, beyond the fading-out effect that already plays a role in our SOEP-based analysis. Since county level information about female labor force participation is not consistently available for the beginning of the 1990s, we restrict our analysis to the time since 1995.

--- Figure 3 about here ---

Figure 3 provides evidence on the impact of TV on gender inequality by displaying the employment gap between females and males across treatment and control regions. Each bar shows the distance of the female labor supply relative to gender parity at zero, which reflects 'perfect equality' with a share of 50% employed women. As a first finding, we observe that gender inequality as measured by the distance to parity is relatively small in all regions of East Germany, especially when considering the green dotted line that displays gender inequality in West Germany for the same time period. While this indicates the impact of exposure to socialism for all of East

[29] Our insights are consistent with research in other areas, such as in experimental economics, where gender differences are observed in willingness to compete (Niederle and Vesterlund 2007) and altruism (Andreoni and Vesterlund 2001). This research shows that females have on average stronger other-regarding preferences in contrast to males, starting at an early age (John and Thomsen 2017), which then could explain different occupational choices later on, as one important driver of the gender-wage gap (Sin et al. 2020).

Germany, the labor supply gap is even closer to gender-parity when we focus on regions where only socialist TV and no Western public TV was available in the GDR. This comparison of regions within East Germany provides evidence that socialist TV reduces gender inequality in labor market participation many years after reunification.[30]

5. Discussion and Conclusion

Our paper is the first comprehensive investigation into the effects of TV on the labor market exploiting quasi-experimental setups that emerged in different politico-economic systems. The analysis of various datasets, including a rich survey panel, reveals a variety of findings and insights that are both novel and policy-relevant concerning the role of media in society and debates on the various forms of gender inequality in today's labor markets.

First and foremost, our study questions the idea of negative implications from TV watching, contrasting our first and intuitive reasoning as well as initial evidence presented in our analysis without exogenous variation of TV access. Instead, we show that TV can affect the labor supply in a positive way and, therefore, seems to be a complementary good to the labor supply. While full-time employment is the norm among German men, which may explain why we do not find any change in the male labor supply, the increase in labor market participation is driven by females. We find that TV significantly increases the likelihood of employment among women who otherwise may have preferred the role of the homemaker. Based on various pieces of empirical evidence, we present an explanation that is consistent with discussions in the literature: role models. By investigating the impacts of commercial and socialist TV based on two different natural experiments in West and East Germany, we show that both forms of TV increase the female labor supply relative to conservative and family-orientated Western public TV. Especially in case of the East German experiment, the manipulation of gender-related work norms appears to be the only plausible mechanism. Ruling out other potential explanations for changes in the labor supply, we arrive at the conclusion that role models of working women on TV explain the increased female labor supply. As another feature of the East German setting, we provide evidence that the effects of TV can be long-lasting and thereby extend the labor supply in women for many years after the end of the treatment phase. In fact, while the West German setting reveals positive short-term

[30] Our finding holds in additional regression analyses where we, for example, check the role of potential treatment areas in the Northeast of the East German territory and consider further information at the regional level as covariates.

effects from commercial TV on the female labor supply, we find long-run effects of socialist TV in East Germany that fade away after two decades.

Another set of analyses informs about the economic consequences of the TV treatment for women increasing their labor supply. Overall, our evidence points to limited impacts on income levels which could be due to gender-specific occupational choices. As a striking pattern across both settings, we observe that women prefer less lucrative jobs that could be characterized by having a social component. This evidence aligns remarkably well with other research on gender differences in social preferences. As another important result of our analyses, even in those more socially orientated jobs, women do not enter leadership positions. This is true even for the East German setting where women were encouraged to obtain higher levels of qualification and hence are observed more often in high-qualified jobs.

Taken together, we provide evidence that television is capable of reducing the gender gap in labor force participation, which aligns with the overall trend in the country of Germany. Since the labor force participation gender gap has dropped by 13.7 percentage points over the time from 1990 to 2019. A rough back-of-the-envelope calculation suggests that a substantial amount of about a third of the reduction of the labor force gap could be explained by TV.[31] However, when women are moving into the labor market due to TV exposure, they mainly follow their own preferences in making their occupational choices and often accept to enter jobs with limited perspectives in terms of pay. In this respect, the macroeconomic development of the German labor market also aligns with our evidence on the effects of TV, which could be an explanation why the gender pay gap did not substantially drop over the last decades despite the improvements in labor force participation. It appears that the TV effectively created a norm of female employment that many women in Germany followed to conform to role models displayed in popular shows, but the same TV program was not capable of showing those encouraged women how to actually be successful economically in the labor market.

[31] To arrive at this approximation, we divide the overall gap reduction in percentage points by the effect size of TV on the female labor supply, which is at least five percentage points in each of the two natural experiments.

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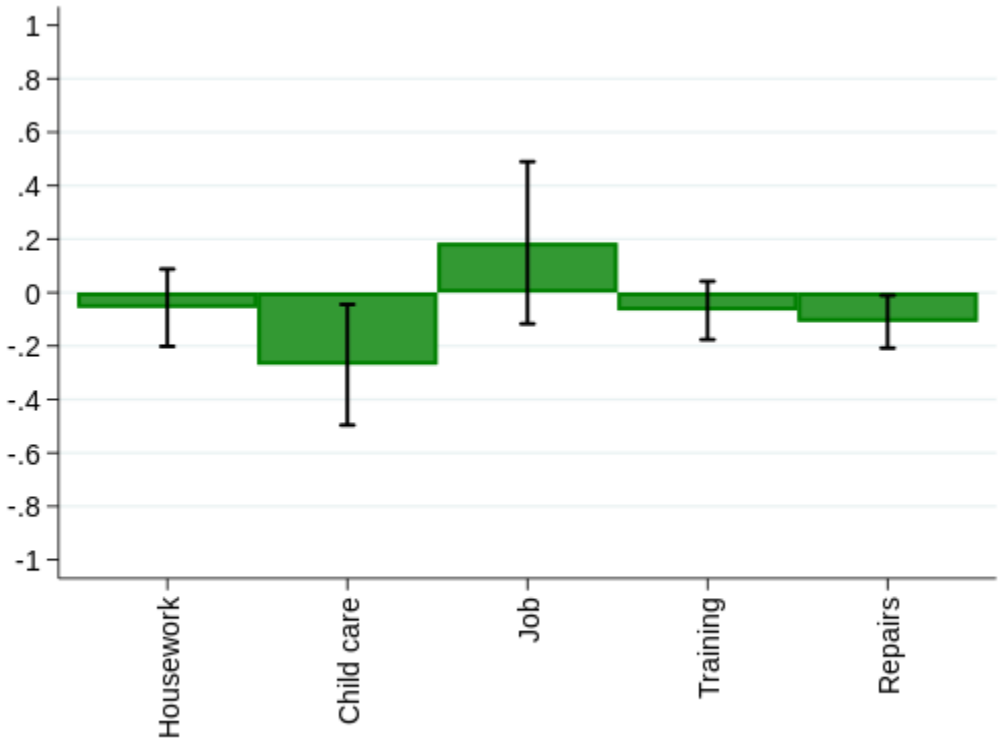
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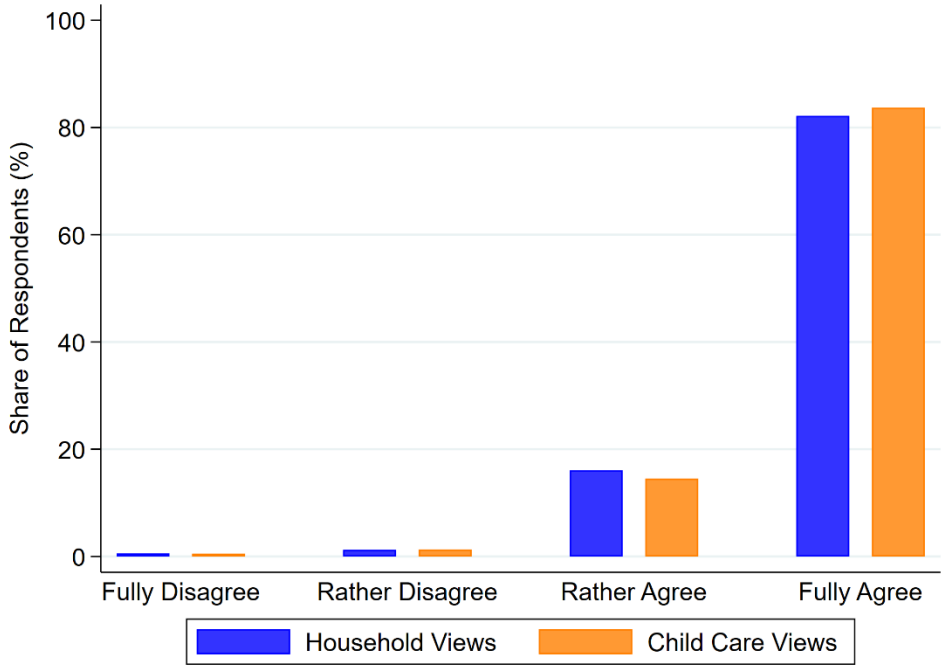
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Figure 1. Commercial TV signal and time-use



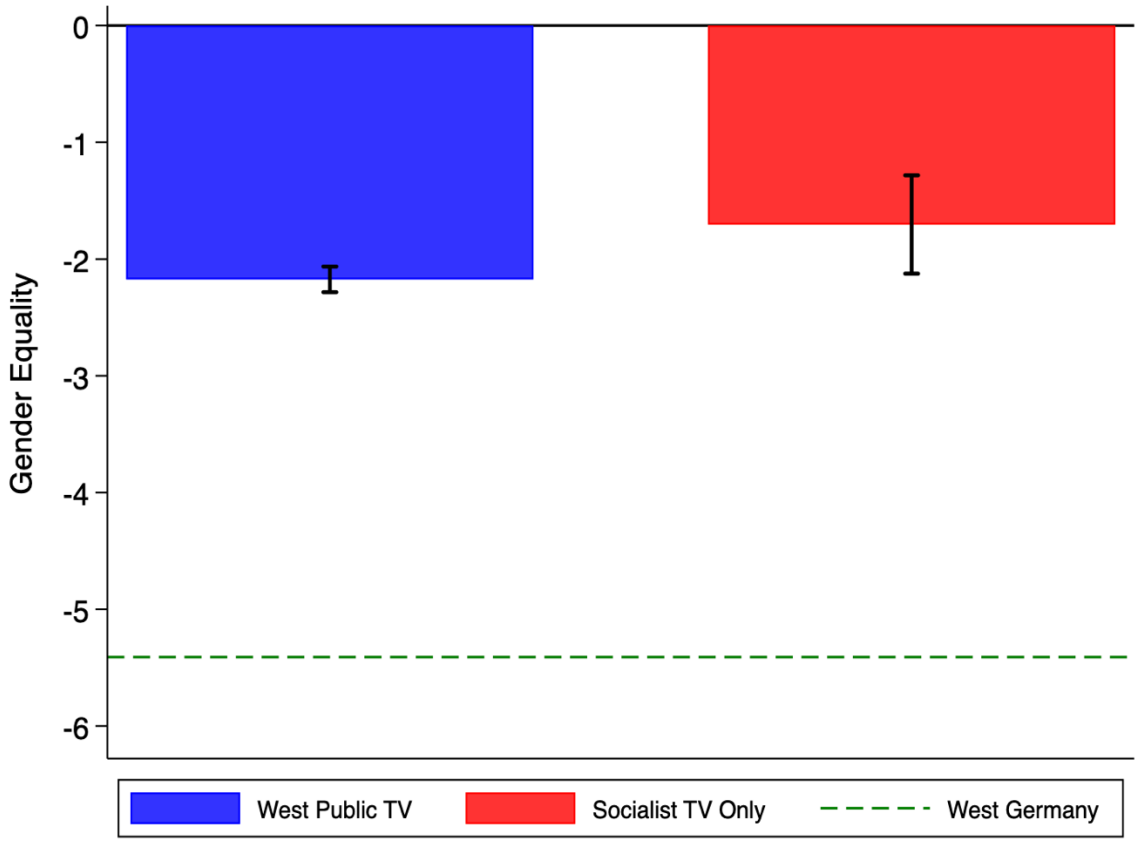
Notes: The figure shows results from separate linear regressions with individual and year fixed-effects. The dependent variables reflect time in hours per week that a person spends on various activities taken from the SOEP time-use battery. The explanatory variable is living in a county that receives the commercial TV signal. Standard errors are clustered at the county level. 95 percent confidence interval levels are displayed.
Source: SOEP data are from 1985 to 1993.

Figure 2. East German egalitarian views about the role of women in the labor market



Notes: The figure shows the distribution of answers whether or not GDR respondents agree with statements reflecting egalitarian views about the role of women in the labor market. The two statements describe possible conflicts between female labor and household duties and child care duties, respectively. The statement on household duties reads: "A woman can achieve something in her job when everyone in the household takes on duties." The statement on child care duties reads: "A woman can achieve something in her job if her husband sees the upbringing and care of children as his task." The statements were answered on a four-point Likert scale from fully disagree, rather disagree, rather agree, to fully agree.
Source: Institute for Sociology and Social Policy at the Academy of Sciences of the GDR, 1987.

Figure 3. Socialist TV and gender inequality in the labor market



Notes: The figure shows the employment gap between females and males relative to gender parity at zero (i.e. 50% share of women in the labor market) using administrative data for East German counties. Control regions (in blue) were exposed to Western Public TV in the GDR, in addition to socialist TV. Treatment regions (in red) were exposed to socialist TV only. For comparison, the dashed line displays the employment gap in the same time period using administrative data for West Germany. We use robust standard errors. 95 percent confidence interval levels are displayed.
Source: GDR administrative data are from 1995 to 2009.

Table 1. Commercial TV and the labor supply

Dependent variable:	Work hours		Work hours when employed		Employed	
Panel A	(1)	(2)	(3)	(4)	(5)	(6)
Watching TV	-0.068***	-0.062***	0.006	0.009	-0.002***	-0.002***
	(0.011)	(0.011)	(0.010)	(0.010)	(0.000)	(0.000)
N	24,804	24,033	13,375	13,155	24,804	24,033
Covariates		Yes		Yes		Yes
Panel B	(1)	(2)	(3)	(4)	(5)	(6)
Commercial TV	1.166**	0.959*	0.321	0.017	0.036**	0.032**
	(0.550)	(0.545)	(0.402)	(0.432)	(0.016)	(0.015)
N	44,056	42,765	24,328	23,887	44,056	42,765
Covariates		Yes		Yes		Yes

Notes: The table shows results from linear regressions with individual fixed-effects and year-fixed effects. The dependent variables are actual work hours (per week) in columns 1 to 4 and employment status (yes/no) in columns 5 and 6. The explanatory variable in panel A (B) is TV watching in weekly hours (living in a county with commercial TV signals). The set of covariates contains household size, household with children, married, divorced, widowed, education, apprenticeship, health satisfaction, quadratic age, and interview month. See Table A1 for descriptive statistics on the variables used. The sample in columns 3 and 4 is restricted to employed individuals only. The sample is restricted to West German regions. In panel A (B), robust (county-level clustered) standard errors are in parentheses. Levels of significance are * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Source: SOEP data are from 1985 to 1989 (1993) in panel A (B).

Table 2. Commercial TV, the male and female labor supply

Panel A

Dependent variable:	Work hours	Work hours when employed	Contractual work hours	Hours of overtime
	(1)	(2)	(3)	(4)
Commercial TV	-0.327	-0.272	-0.609	0.254
	(0.573)	(0.370)	(0.598)	(0.255)
Interaction:				
Commercial TV	2.745***	1.699*	2.917***	-0.058
X Female	(0.912)	(0.882)	(0.988)	(0.255)
N	44,056	24,328	42,733	22,701

Panel B

Dependent variable:	Employed	Full-time employed	Part-time employed	Registered as unemployed
	(1)	(2)	(3)	(4)
Commercial TV	-0.007	-0.000	-0.014***	-0.002
	(0.015)	(0.015)	(0.004)	(0.008)
Interaction:				
Commercial TV	0.080***	0.039	0.044**	-0.007
X Female	(0.025)	(0.018)	(0.018)	(0.012)
N	44,056	44,056	44,056	43,257

Notes: The table shows results from linear regressions with individual fixed-effects and year-fixed effects. The dependent variables in Panel A are actual work hours (per week) in columns 1 and 2, overtime hours worked (per week) in column 3, and contractually agreed upon work hours (per week) in column 4. The dependent variables in Panel B are employment status (yes/no) in column 1, full-time employment status (yes/no) in column 2, regular part-time employment status (yes/no) in column 3, and registered unemployment status (yes/no) in column 4. The explanatory variable in row one is living in a county with commercial TV signals, which is interacted with a female dummy in row two. The sample is restricted to West German regions. County-level clustered standard errors are in parentheses. Levels of significance are * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: SOEP data are from 1985 to 1993.

Table 3. Commercial TV and labor market outcomes of women

Panel A

Dependent variable:	High job qualification level		Leadership position	
	No	Yes	No	Yes
	(1)	(2)	(3)	(4)
Commercial TV	0.053***	-0.001	0.060***	-0.003
	(0.020)	(0.003)	(0.023)	(0.003)
N	22,123	22,123	22,407	22,407

Panel B

Dependent variable:	Income<p25	p25≤Income<p50	p50≤Income<p75	p75≤Income
	(1)	(2)	(3)	(4)
Commercial TV	0.053**	0.007	-0.025**	0.019*
	(0.024)	(0.015)	(0.012)	(0.011)
N	23,053	23,053	23,053	23,053

Notes: The table shows results from linear regressions with individual fixed-effects and year-fixed effects. The dependent variables in Panel A are working in a job where a high qualification is not required in columns 1 or required in column 2, as well as not working in a leadership position in columns 3 or working in a leadership position 4. High qualification is defined as having a degree from a tertiary education institution, such as a university. Leadership position is defined as one with the highest level of autonomy on a five-point ranking (which includes e.g., managers). The dependent variables in Panel B are employment within different income quartiles. In each specification of the table, the dependent variable is zero if the person is employed differently or not employed. The explanatory variable is living in a county with commercial TV signals. The sample is restricted to females in West German regions. County-level clustered standard errors are in parentheses. Levels of significance are * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: SOEP data are from 1985 to 1993.

Table 4. Commercial TV and perceptions among women

Dependent variable:	Economic Insecurity	Income Satisfaction	Free-time Satisfaction	Meaning of Work
	(4)	(2)	(3)	(4)
Commercial TV	-0.043	-0.076	0.000	0.129***
	(0.034)	(0.094)	(0.083)	(0.042)
N	22,740	22,850	22,956	4,352

Notes: The table shows results from linear regressions with individual fixed-effects and year-fixed effects. The dependent variables are income insecurity, i.e. concerns about economic security (on a scale from 0 "not concerned" to 2 "very concerned") in column 1, satisfaction with household income (on a scale from 0 "completely dissatisfied" to 10 "completely satisfied") in column 2, satisfaction with free-time (on a scale from 0 "completely dissatisfied" to 10 "completely satisfied") in column 3, meaning of work (on a scale from 0 "not very important" to 2 "very important") in column 4. The explanatory variable is living in a county with commercial TV signals. The sample is restricted to females in West German regions. County-level clustered standard errors are in parentheses. Levels of significance are * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: SOEP data are from 1985 to 1993.

Table 5. Socialist TV and the female labor supply

Panel A

Dependent variable:	Work hours	Work hours when employed	Hours of overtime	Contractual work hours
	(1)	(2)	(3)	(4)
Socialist TV	2.448***	0.489	0.063	2.726***
	(0.726)	(0.330)	(0.132)	(0.595)
N	43,199	21,917	20,567	38,845

Panel B

Dependent variable:	Employed	Full-time Employed	Part-time employed	Registered as unemployed
	(1)	(2)	(3)	(4)
Socialist TV	0.057***	0.035*	0.015	-0.010
	(0.017)	(0.020)	(0.012)	(0.015)
N	43,199	43,199	43,199	40,919

Notes: The table shows results from linear regressions with year-fixed effects. The dependent variables in Panel A are actual work hours (per week) in column 1 and 2, overtime hours worked (per week) in column 3, and contractually agreed upon work hours (per week) in column 4. The dependent variables in Panel B are employment status (yes/no) in column 1, full-time employment status (yes/no) in column 2, regular part-time employment status (yes/no) in column 3, and registered unemployment status (yes/no) in column 4. The explanatory variable is living in a county with only socialist TV signals until 1990. The sample is restricted to females in East German regions. County-level clustered standard errors are in parentheses. Levels of significance are * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: SOEP data are from 1990 to 2009.

Table 6. Socialist TV and labor market outcomes of women

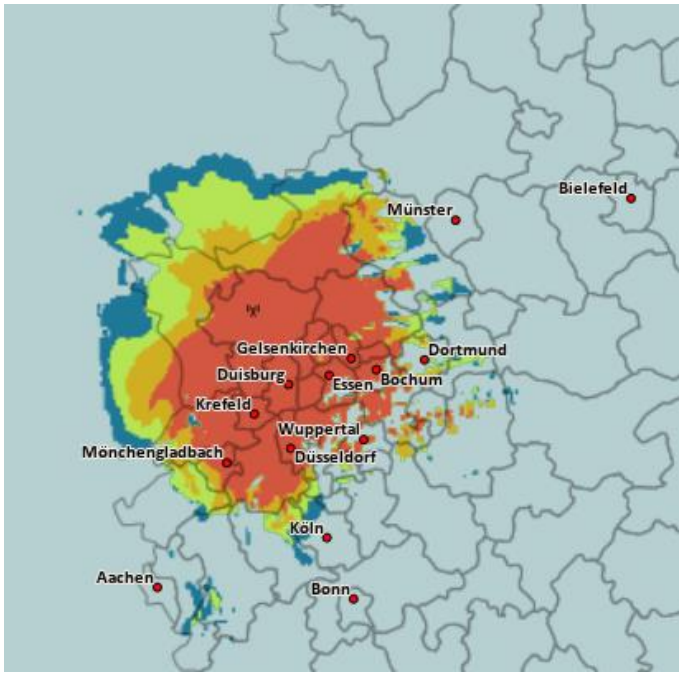
Panel A				
Dependent variable:	High Job Qualification Level		Leadership Position	
	No	Yes	No	Yes
	(1)	(2)	(3)	(4)
Socialist TV	0.011	0.042**	0.059***	-0.003***
	(0.022)	(0.018)	(0.018)	(0.001)
N	41,956	41,956	41,635	41,635

Panel B				
Dependent variable:	Income<p25	p25≤Income<p50	p50≤Income<p75	p75≤Income
	(1)	(2)	(3)	(4)
Socialist TV	-0.029	0.019	0.001	0.010
	(0.018)	(0.029)	(0.014)	(0.035)
N	21,856	21,856	21,856	21,856

Notes: The table shows results from linear regressions with year-fixed effects. The dependent variables in Panel A are working in a job with low qualification necessary and with high qualification necessary in column 1 and 2, as well as working in a non-leadership position and in a leadership position in column 3 and 4. The dependent variables in Panel B are employment in different income quartiles. The explanatory variable is living in a county with only socialist TV signals until 1990. The sample is restricted to females in East German regions. County-level clustered standard errors are in parentheses. Levels of significance are * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: SOEP data are from 1990 to 2009.

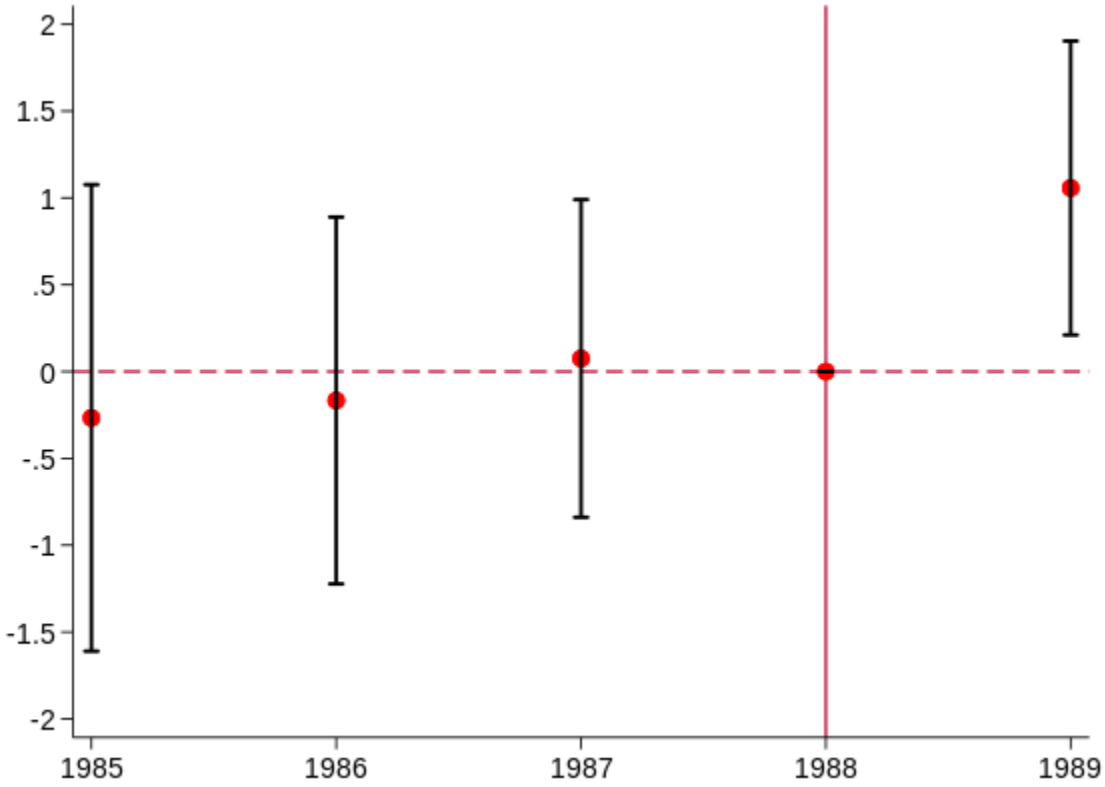
Appendix A

Figure A1. Commercial TV treatment regions in West Germany



Notes: The map illustrates the main TV treatment area in 1989 in West Germany. Colors reflect commercial TV reception via terrestrial frequencies from the transmitter station Wesel based on the Longley-Rice propagation model and is taken from ArcGIS using the Communication System Planning Tool. The map shows an onion structure, from inside out from a minimum signal threshold of 65 dbuV/m in red in five unit increments to a minimum signal threshold of 50 dbuV/m in blue.

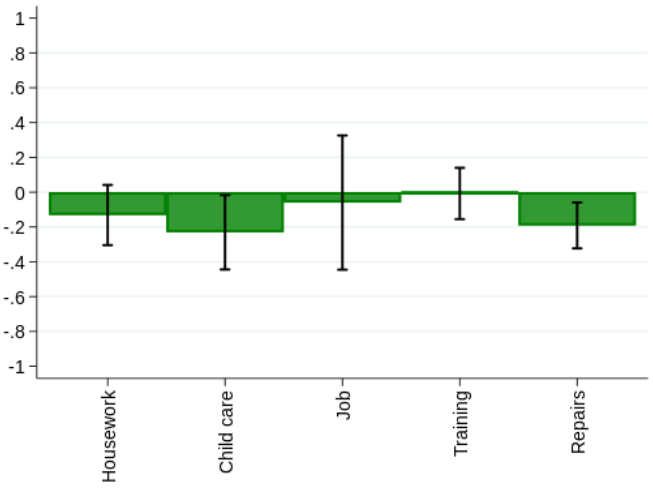
Figure A2. Commercial TV and TV consumption in West Germany



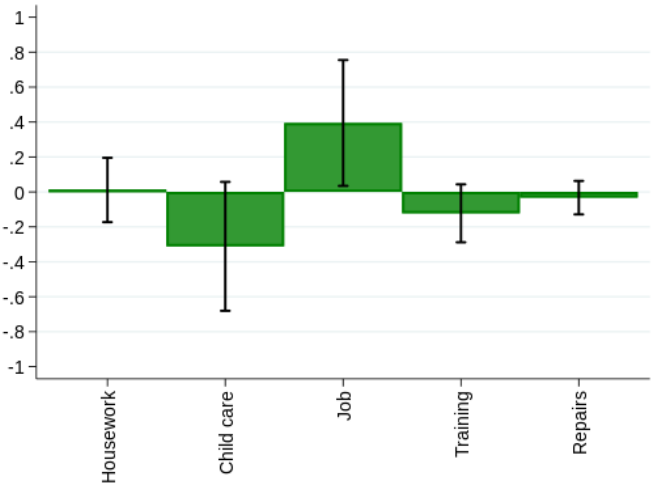
Notes: The illustration is based on a regression model with individual and year fixed-effects showing the effect for living in regions that receive the commercial TV signal relative to Western public TV in 1989. The dependent variable is TV watching in hours (per week). Standard errors are clustered at the county level. 95 percent confidence intervals are shown.
Source: SOEP data are from 1985 to 1989.

Figure A3. Commercial TV, male and female time-use in West Germany

A. Male



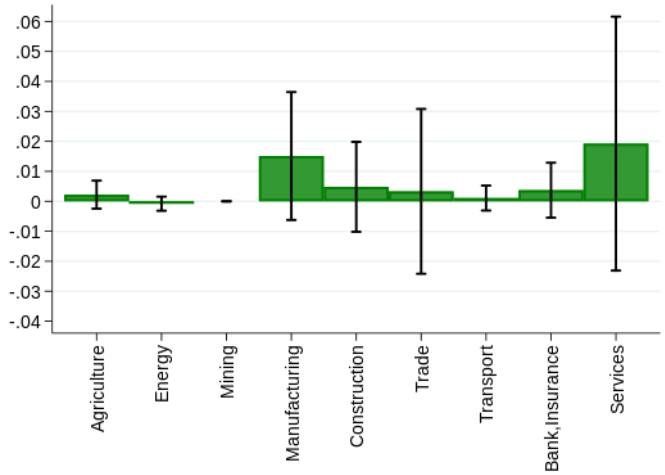
B. Female



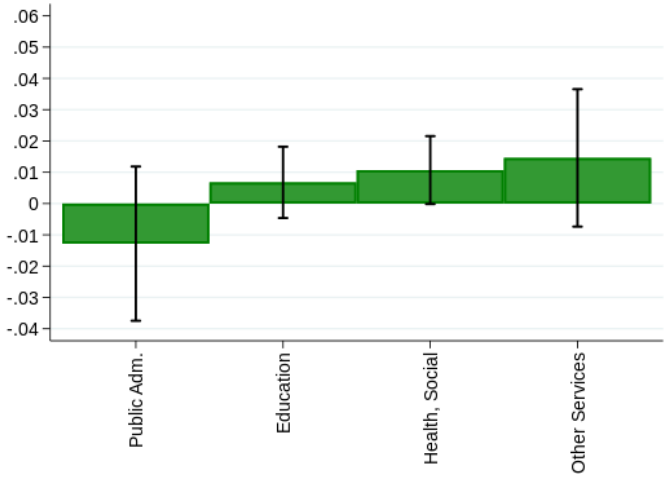
Notes: The figure shows results from separate linear regressions with individual fixed-effects and year fixed-effects. The dependent variables reflect time in hours per week that a person spends on various activities taken from the SOEP time-use battery. The explanatory variable is living in a county that receives the commercial TV signal. Standard errors are clustered at the county level. 95 percent confidence interval levels are displayed. The sample analyzed on the left (right) side is restricted to male (female) respondents.
Source: SOEP data are from 1985 to 1993.

Figure A4. Commercial TV and industry sector of females in West Germany

A. All industry sectors (NACE 1)

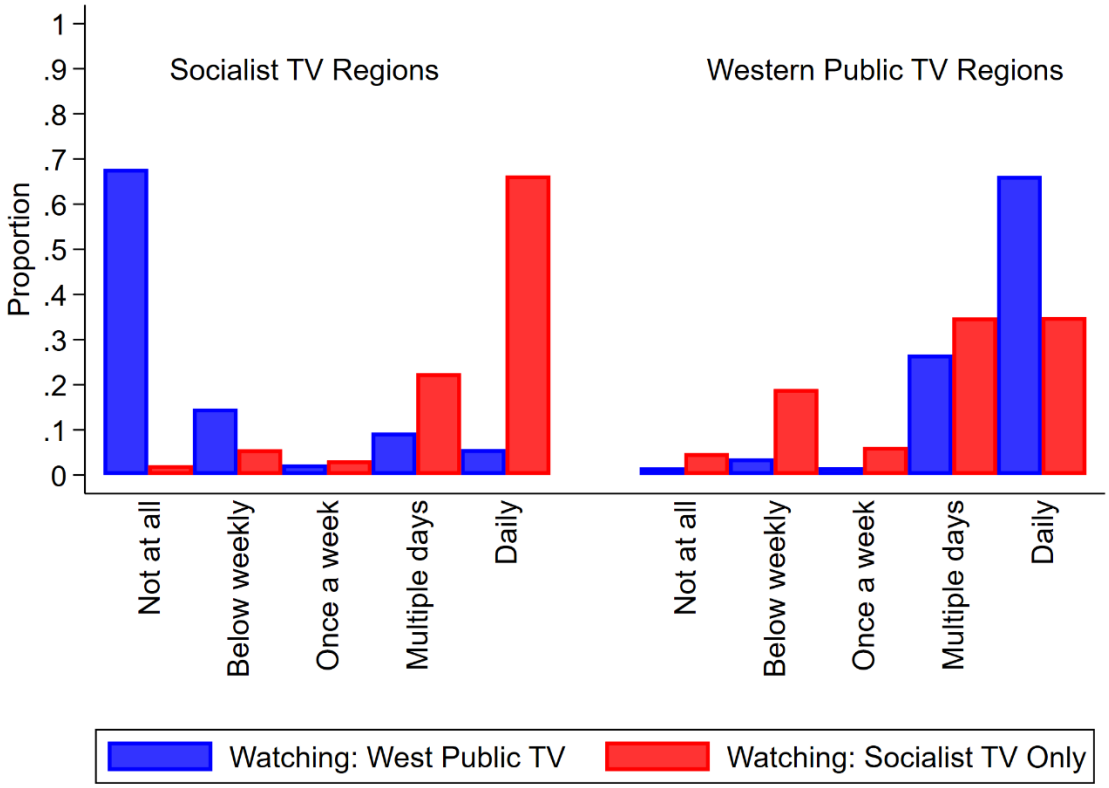


B. Only Service sectors (NACE 2)



Notes: The figures show results from separate linear regressions with individual fixed-effects and year fixed-effects. The dependent variables reflect the industry sectors where a female person works (with the baseline of being non-employed). The explanatory variable is living in a county where individuals receive commercial TV. The sample is restricted to females in West German regions. Standard errors are clustered at the county level. 95 percent confidence interval levels are displayed.
Source: SOEP data are from 1985 to 1993.

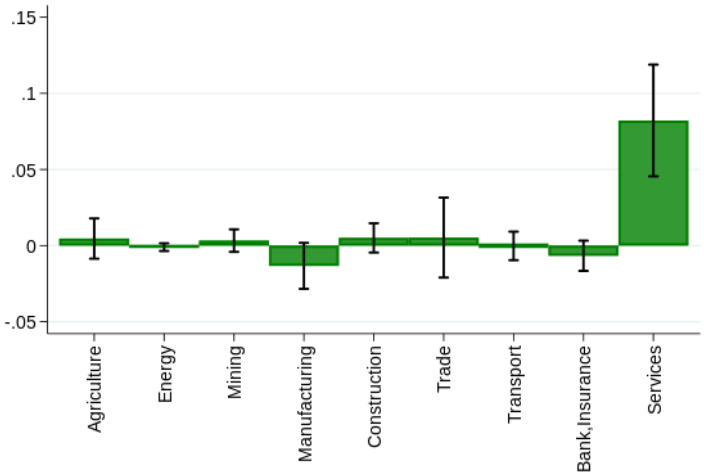
Figure A5. Socialist TV vs. Western Public TV viewing behavior in East Germany



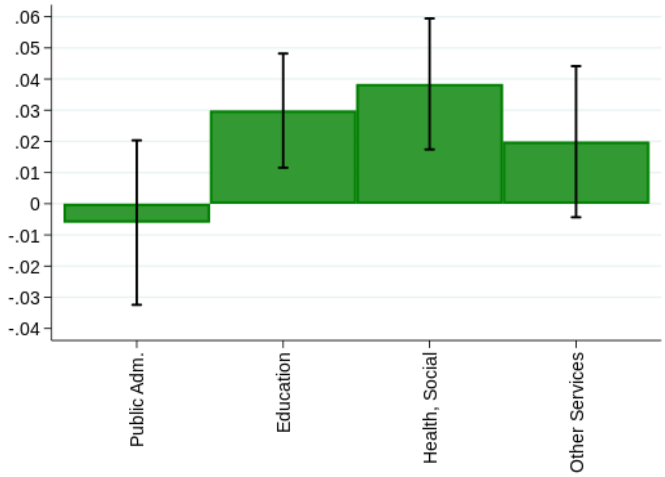
Notes: The illustration shows the amount of time individuals spend on watching western public TV or socialist TV in the main socialist TV regions of the valley of the innocent (left-side illustration) and the rest of the GDR (right-side illustration).
Source: Central Institute for Youth Research, 1989.

Figure A6. Socialist TV and industry sectors of females in East Germany

A. All industry sectors (NACE 1)



B. Only Service sectors (NACE 2)



Notes: The figures show results from separate linear regressions and year fixed-effects. The dependent variables reflect the industry sectors where a female person works (with the baseline of being non-employed). The explanatory variable is living in a region where individuals received only access to socialist TV until 1989. The sample is restricted to females in East German regions. Standard errors are clustered at the county level. 95 percent confidence interval levels are displayed.
Source: SOEP data are from 1990 to 2009.

Table A1. Statistics for main SOEP sample for West Germany from 1985-1993

	Mean	Std. Dev.	Min	Max	N
Female	0.52	0.50	0	1	44,056
Age	45.58	17.47	17	96	44,056
Household size	2.91	1.30	1	9	44,056
Household with children	0.65	0.48	0	1	44,056
Married	0.65	0.47	0	1	43,733
Divorced	0.04	0.19	0	1	43,733
Widowed	0.09	0.28	0	1	43,733
Education	11.11	2.14	7	18	43,733
Apprenticeship	0.04	0.18	0	1	44,041
Health satisfaction	6.71	2.32	0	10	43,992
Time-use variables					
Housework, errands	2.60	2.68	0	84	42,497
Child care	1.25	3.00	0	70	39,648
Job, commuting	5.17	4.83	0	95	40,744
Schooling and training	0.67	2.21	0	70	38,907
Repairs, gardening	1.07	1.35	0	40	41,365
Outcome variables					
Work hours	21.45	21.25	0	80	44,056
Work hours when employed	38.84	11.93	.2	80	24,328
Overtime (hours)	1.99	3.76	0	40	22,701
Contractual work hours	18.49	18.93	0	74	42,733
Employed	0.55	0.50	0	1	44,056
Full-time employment	0.43	0.49	0	1	44,056
Part-time employment (regular)	0.08	0.27	0	1	44,056
Registered unemployment	0.03	0.18	0	1	43,257
Log equivalent household income	6.90	0.45	3.26	10.25	42,129
Concerns about own economic security	0.70	0.68	0	2	43,594
Satisfaction with household income	6.76	2.17	0	10	43,648
Satisfaction with free time	7.13	2.26	0	10	43,893
Meaning of work	1.02	0.49	0	2	11,202

Notes: The table shows means, standard deviations, minimum and maximum values for covariates and outcome variables. Female is a binary that takes the value of 1 whenever a respondent is female. Age contains the age of the respondent in years. Household size contains the number of household members. Married, divorced and widowed are binary variables that take the value of 1 when the respondent's family status is married, divorced or widowed, respectively. Education measures the respondent's amount of education or training in years. Apprenticeship is a binary taking the value 1 when the respondent completed training recently. Health satisfaction measures the satisfaction with the respondent's health. The time-use variables are based on a battery of items that describe important activities pursued by respondents on a typical workday. The respondents are asked how many hours they devote to each of the activities on each of the six workdays. The activities above are shown as a weighted average in hours per week.
Source: SOEP data are from 1985 to 1993.

Table A2. Commercial TV definitions and female labor supply

Panel A: Frequency Power

Dependent variable:	Work hours			
Signal min. ERP	10 kW	20 kW	100 kW	200 kW
	(1)	(2)	(3)	(4)
Commercial TV	0.989*	1.041*	1.460**	1.998***
	(0.548)	(0.566)	(0.685)	(0.737)
N	20,450	20,450	20,450	20,450

Panel B: Signal Strength Threshold

Dependent variable:	Work hours			
Local min. signal strength	50 db	55 db	60 db	65 db
	(1)	(2)	(3)	(4)
Commercial TV	1.998***	1.998***	1.906**	2.348***
	(0.737)	(0.737)	(0.823)	(0.870)
N	20,450	20,450	20,450	20,450

Notes: The table shows results from linear regressions with individual fixed-effects and year-fixed effects. The dependent variable is actual work hours (per week). The explanatory variables are interactions between living in a county with commercial TV signals and year dummies. Panel A varies the explanatory variable by signal power in kW from 10, 20, 100, to 200 kW while Panel B varies the signal strength thresholds from 50, 55, 60, and 65 dBuV/m. The sample is restricted to females in West German regions. County-level clustered standard errors are in parentheses. Levels of significance are * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: SOEP data are from 1985 to 1993.

Table A3. Commercial TV and labor market outcomes of men

Panel A

Dependent variable:	High Job Qualification Level		Leadership Position	
	No	Yes	No	Yes
	(1)	(2)	(3)	(4)
Commercial TV	-0.003	0.009	0.001	0.008
	(0.009)	(0.015)	(0.021)	(0.012)
N	19,849	19,849	20,161	20,161

Panel B

Dependent variable:	Income<p25	p25≤Income<p50	p50≤Income<p75	p75≤Income
	(1)	(2)	(3)	(4)
Commercial TV	0.034***	-0.021	-0.006	0.005
	(0.009)	(0.020)	(0.031)	(0.016)
N	20,999	20,999	20,999	20,999

Notes: The table shows results from linear regressions with individual fixed-effects and year-fixed effects. The dependent variables in Panel A are working in a job with low qualification necessary and with high qualification necessary in columns 1 and 2, as well as working in a non-leadership position and in a leadership position in columns 3 and 4. The dependent variables in Panel B are employment in different income quartiles. The explanatory variable is living in a county with commercial TV signals. The sample is restricted to males in West German regions. County-level clustered standard errors are in parentheses. Levels of significance are * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: SOEP data are from 1985 to 1993.

Table A4 Commercial TV and perceptions of men

Dependent variable:	Economic Insecurity	Income Satisfaction	Free-time Satisfaction	Meaning of Work
	(4)	(2)	(3)	(4)
Commercial TV	-0.040	0.060	-0.183**	0.020
	(0.037)	(0.076)	(0.081)	(0.032)
N	20,854	20,798	20,937	6,850

Notes: The table shows results from linear regressions with individual fixed-effects and year-fixed effects. The dependent variables are income insecurity, i.e. concerns about economic security (on a scale from 0 "not concerned" to 2 "very concerned") in column 1, satisfaction with household income (on a scale from 0 "completely dissatisfied" to 10 "completely satisfied") in column 2, satisfaction with free-time (on a scale from 0 "completely dissatisfied" to 10 "completely satisfied") in column 3, meaning of work (on a scale from 0 "not very important" to 2 "very important") in column 4. The explanatory variable is living in a county with commercial TV signals. The sample is restricted to males in West German regions. County-level clustered standard errors are in parentheses. Levels of significance are * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: SOEP data are from 1985 to 1993.

Table A5. Commercial TV and heterogeneous female labor supply

Characteristic:	Older women		Women with young children	
	Yes	No	Yes	No
	(1)	(2)	(3)	(4)
Commercial TV	1.587**	2.650*	1.360	2.268***
	(0.735)	(1.355)	(1.472)	(0.835)
N	11,701	11,353	4,325	18,725

Notes: The table shows results from linear regressions with individual fixed-effects and year-fixed effects. The dependent variable is actual work hours (per week). The explanatory variable is living in a county with commercial TV signals. County-level clustered standard errors are in parentheses. The sample is restricted to West German regions and further to older women, i.e., females above the mean age of 45.58 years (Y/N) in columns 1 and 2, and mothers with children born in the 1980s (Y/N) in columns 3 and 4. Levels of significance are * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: SOEP data are from 1985 to 1993.

Table A6. Commercial TV, attitudes, and female labor supply

Attitude:	Job success	Personal fulfillment	Travel the world	Helping others	Afford things
	(1)	(2)	(3)	(4)	(5)
Commercial TV	1.759**	1.876**	1.856**	1.841**	1.866**
	(0.826)	(0.814)	(0.791)	(0.804)	(0.815)
Interaction: Commercial TV X Attitude	1.316***	1.645*	1.617***	2.031*	1.138
	(0.448)	(0.840)	(0.619)	(1.179)	(0.893)
N	19,489	20,640	20,769	20,775	20,747
Attitude:	Own home	Marriage and partnership	Having children	Meeting friends	Societal involvement
	(6)	(7)	(8)	(9)	(10)
Commercial TV	1.918**	1.861**	1.885**	1.701**	1.853**
	(0.847)	(0.825)	(0.819)	(0.789)	(0.786)
Interaction: Commercial TV X Attitude	0.085	-0.744	-0.367	1.117	0.767
	(0.488)	(0.462)	(0.496)	(0.781)	(1.192)
N	20,714	20,471	20,541	20,709	20,702

Notes: The table shows results from linear regressions with individual fixed-effects and year-fixed effects. The dependent variable is actual work hours (per week). The explanatory variable in row one is living in a county with commercial TV signals, which is interacted with a variable reflecting attitudes in 1990 reported on a 4-point-scale about what is important in the life of the respondent in row two. The attitudes are demeaned, so that the 4-point-scale always varies around zero and extrapolated to other waves via imputation at the individual level. The domain is shown in the head of the column. Column 1 shows being able to afford things for myself, 2 being there for others, 3 being personally fulfilled, 4 being successful at work, 5 owning my own home, 6 having a happy marriage/relationship, 7 having children, 8 being together with friends, 9 being politically, socially involved, 10 seeing the world and traveling. The sample is restricted to females in West German regions. County-level clustered standard errors are in parentheses. Levels of significance are * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: SOEP data are from 1985 to 1993.

Table A7. Socialist TV and job market gender attitudes

Panel A: Women	Household Views		Child care Views	
	(1)	(2)	(3)	(4)
Socialist TV	0.057**	0.061**	0.051**	0.059**
	(0.017)	(0.020)	(0.016)	(0.019)
Covariates		Yes		Yes
N	2,475	2,475	2,474	2,474
Panel B: Men	Household Views		Child care Views	
	(1)	(2)	(3)	(4)
Socialist TV	0.011	-0.011	-0.016	-0.023
	(0.026)	(0.028)	(0.027)	(0.030)
Covariates		Yes		Yes
N	1,297	1,297	1,297	1,297

Notes: The table shows results from ordinary least square regressions. The dependent variables are dummy variables indicating whether a respondent fully agreed to a statement about shared household and child care responsibilities, respectively. Positive coefficients indicate more egalitarian views about women's role in the labor market. See Figure 2 for the wording. The explanatory variable is living in a district with only access to socialist TV. Panel A (B) is restricted to females (males) in East German regions. Robust standard errors are in parentheses. Levels of significance are * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: GDR Survey from 1987.

Table A8. Socialist TV and dynamic female labor supply

Dependent variable:	Work hours			
	1990-2018	1990-1999	2000-2009	2010-2018
	(1)	(2)	(3)	(4)
Socialist TV	1.768***	1.948*	2.848***	0.629
	(0.639)	(1.088)	(0.940)	(0.808)
N	65,954	18,269	24,930	22,755

Notes: The table shows results from linear regressions with year-fixed effects. The dependent variable is actual work hours (per week). The explanatory variable is living in a county with only access to socialist TV signals until 1990. The sample is restricted to females in East German regions. County-level clustered standard errors are in parentheses. Levels of significance are * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: SOEP data are from 1990 to 2018.

Table A9 Socialist TV and female labor supply in East and West Germany

Dependent variable:	Work hours			
	(1)	(2)	(3)	(4)
Socialist TV	2.234***	2.494***	5.189***	2.558***
	(0.699)	(0.861)	(0.711)	(0.915)
N	44,719	44,719	143,675	143,675
State fixed effects		Yes		Yes
West Germany			Yes	Yes

Notes: The table shows results from linear regressions with year-fixed effects for employed Germans. The dependent variable is actual work hours (per week). The explanatory variable is living in a county with only access to socialist TV signals until 1990. The sample is restricted to females in East German regions in columns 1 and 2. County-level clustered standard errors are in parentheses. Levels of significance are * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: SOEP data are from 1990 to 2009.