Clueless?
The Impact of Television on Consumption Behavior

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Abstract

This paper examines the impact of television on consumption behavior, i.e., consumers' (stated) preferences and (actual) consumption decisions. We focus on a natural experiment, given by the geographically explained differential access to Western television in former East Germany. Based on previously unavailable surveys from the early 1990s, we find that individuals not exposed to Western TV reported to attribute significantly lower importance to consumerist values. Furthermore, using data from the German income and expenditure survey (EVS), we observe that after 1990 those individuals consumed significantly less of goods with high intensity of advertisement. This effect vanishes by 1998.

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1 Introduction

Are people's preferences and behavior endogenous to the environment or to the information set they have been exposed to? In particular, what is the effect of advertisement on consumer decisions? This paper attempts to answer these questions by exploiting a natural experiment: the differential access to West German television broadcasting in East Germany (henceforth, GDR) during the communist regime. Most of the GDR regions had access to Western television except for a few regions either in the northeast or in the southeastern corner, around the city of Dresden (see Figure 1). These regions, which made up for approximately 10% of the East German population, were either too distant from the Western or West Berlin's border, or located in valleys. This was particularly true for the large and important district of Dresden, situated in the Elbe valley, which became popularly known as the "valley of the clueless" (Stiehler, 2001). We look at those regions as the treatment group of an "experiment" of not having been exposed to Western television for almost four decades, and find substantial effects on people's stated preferences as well as on their actual consumption behavior.[1]

Several recent studies have addressed empirically the departure from the usual premise of exogeneity of preferences in standard neoclassical economics by the use of "natural experiments." Most of these works have studied the impact of the environment and/or the information set available to individuals on political preferences. Della Vigna and Kaplan (2006) analyze the effect of the entry of Fox News (a channel considered to be significantly to the right of all the other mainstream television networks) on voting behavior, exploiting the difference in the timing of entry of the channel in local cable markets. Other studies have addressed the impact of media market expansions on other types of political behavior, such as voter turnout (George and Waldfogel (2006)) for the impact of the New York Times' expansion in the 1990s, Gentzkow (2006) for the expansion of television between 1940 and 1972, Prior (2006) for the expansion of cable in the 1970s, and Stromberg (2004), regarding radio entry between 1920 and 1940. Alesina and Fuchs-Schündeln (2007) analyze the impact of several decades of exposure to Communism on former

[1] Other authors have used the same natural experiment to analyze other effects of the exposure to the Western media (see for instance Kern and Hainmueller, 2007, for the impact on political attitudes).

Figure 1: Access to Western TV (Dark=no access)

East Germans' preferences for redistribution and state intervention, exploiting the experiment of the German separation and reunification. All these studies have presented evidence of the existence of a non-trivial impact of an individual's environment and her media exposure on her political preferences.

Some other studies have recently addressed non-political outcomes. Jensen and Oster (2009) look at the impact of access to TV on the perception of women's status in India, whereas Olken (2007) tests Putnam's (2001) hypothesis that television decreases social capital, by studying the effect of exogenously explained variation in Indonesia. Finally, Chong, Duryea, and La Ferrara (2008) examine the impact of soap operas on fertility in Brazil.

The current paper is related to the above described literature to the extent that it exploits a "natural experiment" in order to assess the impact of the exposure to a different information set on people's preferences and actions. However, our focus is on consumption attitudes, values and decisions. The objective is to evaluate how different agents, assumed to be similar in all dimensions except for their exposure to different information sets (media), can have different perceptions regarding materialistic values, which would then lead them to choose different levels and patterns of consumption. If the information set to which an individual is exposed has a nontrivial impact on her consumption levels and patterns, then a theory of consumption would need to take this phenomenon into account for an accurate understanding and analysis of its object of study.

In order to analyze the effect of (Western) television on consumption behavior, we first study its impact on consumers' preferences. Our claim is that Western TV would make people more consumerist. By that, we mean that exposure to it would increase people's marginal utility of consumption vis-a-vis other decisions, thus implying a higher general level of consumption all else equal. Using East German values survey data from the late 1980s, we show that individuals exposed to Western television reported to assign significantly higher importance to consumerist values than those not exposed to it.

Prior to the 1990 German Reunification, any differences in preferences between individuals exposed or not to Western TV could translate into different consumption behavior, since the goods

seen on West German TV were not available in communist East Germany. However, after Reunification, this obstacle was no longer impeding the consumption of desired goods by East Germans; any good that had been previously seen on TV could now, at least in theory, also be purchased in East Germany. If television does indeed influence people's attitudes towards consumer goods, we should therefore find higher levels of consumption in the years right after 1990 for the individuals that had been exposed to Western television previously. Over the course of time, however, after several years in which both parts of East Germany were integrated in a capitalist market economy, we expect the difference between the two areas to fade away. Using data from the German consumer expenditure survey (EVS), conducted every five years, we document that there are indeed significant differences in consumption behavior in 1993, and no longer in 1998.

We thereby focus on two specific channels through which television could affect the consumption levels and patterns of the individuals exposed to it. The first one is advertisement. The theoretical literature has addressed it by either considering advertisement as a taste shifter (Dixit and Norman (1978)) or simply as a good that would increase the demand for the (complementary) good for which it is designed (Becker and Murphy (1993)). On the empirical side, however, the economic literature has to our knowledge not yet studied the effect of advertisement using a well-identified approach, which disentangles the endogeneity of advertisement targeting and thereby gives a causal estimate of its impact. Understanding this latter effect is, obviously, an economically important question. Just to illustrate this statement, total world expenditures on ads in 2008 amounted to about US$ 491,634 million (Zenithoptimedia, 2008), or about 0.9% of the world total GDP. If we restrict our attention to TV advertisement solely, the numbers are still impressive: US$ 184,487 million.

Our setting allows for a well-identified analysis of the causal impact of advertisement on consumption behavior. This is because the East Germans that could watch West German TV were not, by any means, the targeted audience of the ads. Using a dataset containing the average number of minutes of advertisement of different categories of goods on West German TV channels before Reunification we show that, for 1993, the positive effect of exposure effect on consumption was stronger the more the category of good has been advertised before the Reunification. As expected,

this effect was lower up to the point of vanishing in 1998.

The second channel we focus on the actual exhibition of goods on TV shows, and the information this conveys about the desirability of such goods in a capitalist society (e.g. as status symbols). This effect could be independent from the level of advertisement for those goods. To this purpose, we use a survey-based index of the visibility of goods constructed by Heffetz (2007).

The paper proceeds as follows. In the next section, we provide a brief historical account of the historical background of the object of our analysis. Then, in section 3, we introduce our empirical setting, explaining the conditions under which our conclusions are valid. Section 4 is devoted to detecting differential patterns in preferences, while section 5 turns to actual consumption data. Section 6 concludes.

2 Background History

2.1 East German History

Following World War II, Germany was separated into four different occupation zones, roughly corresponding to geographical convenience for the allied powers. While the three Western zones (American, British, and French) united economically and politically to form the Federal Republic of Germany (FRG) in 1949, the Soviet occupation zone took a separate path, transforming itself into the German Democratic Republic (GDR), a socialist economy firmly linked with the Soviet Union and the other countries of the Warsaw Pact. The two parts of Germany did not differ substantially in their economic structure, both sharing industrialized regions, such as Saxony in the West, the Rhineland in the East, as well as rather sparsely populated, mainly agricultural Northern parts.[2] The territory of the GDR was divided into 15 districts (*Bezirke*). The district of Dresden coincided almost entirely with the region lacking TV reception in the South-Eastern corner of the GDR, (cf. figures 1 and 2). The region surrounding Greifswald that had no access to Western TV reception

[2] Alesina and Fuchs-Schündeln (2007) show in their appendix that the two parts were virtually indistinguishable in terms of income per capita before World War II.

was partially located in the district of Neubrandenburg and partially in Rostock. Individually, each of these two provinces had partial access to Western TV.

Reunification occurred rather quickly and, by most accounts, unexpectedly, following the historical events of the fall of the Berlin wall in November, 1989. Economic unification was completed by July, 1990, the political union of the two halves occurred in October, 1990. The German Democratic Republic was at the time of its fall the most advanced economy in the Warsaw pact, but was nonetheless decrepit by Western standards, with a barely competitive industrial structure, severe deficiencies in the production and distribution of goods, and burdened with a high level of external debt, required to keep the living standards of East Germans high.

2.2 Television in the GDR

The main public TV networks from West and East Germany, ARD and DFF respectively, began their broadcasts in the same year, 1952. By that time very few East Germans owned a TV set. However, television gained rapid popularity, and by the end of 1958, there were already over 300,000 TV sets in the GDR. Based on reports from surveys (Müller (2000)) by 1989 an estimated 98% of households had a TV set, and 46% a color TV. By 1988, 1 out of 6 households had more than one TV set (that number was about 1 out of ten in 1980). In 1988, there were 117 TV sets per 100 households. In households with an income of 600 East German Marks (M), there were an estimated number of 96 TV sets per 100 households. In those with an income between 1200M and 1800M, this number was 121 TV sets per 100 households. Finally, for those with an income greater than 2400M, the number was 161 TV sets per 100 households. In few words, the evidence suggsets that by the end of the communist regime, virtually all households were exposed to TV, either just Eastern broadcasting or both Eastern and Western broadcasting. The two production facilities for TV in East Germany were located in Dresden and in Staßfurt (in the district of Magdeburg).

East German TV (DDR-FS) was severely controlled by the state apparatus and this motivated its low acceptance in the population. Its transmissions were not regarded as a serious news source; for instance, the famed show *Der Schwarze Kanal*, a program that was supposed to criticize the

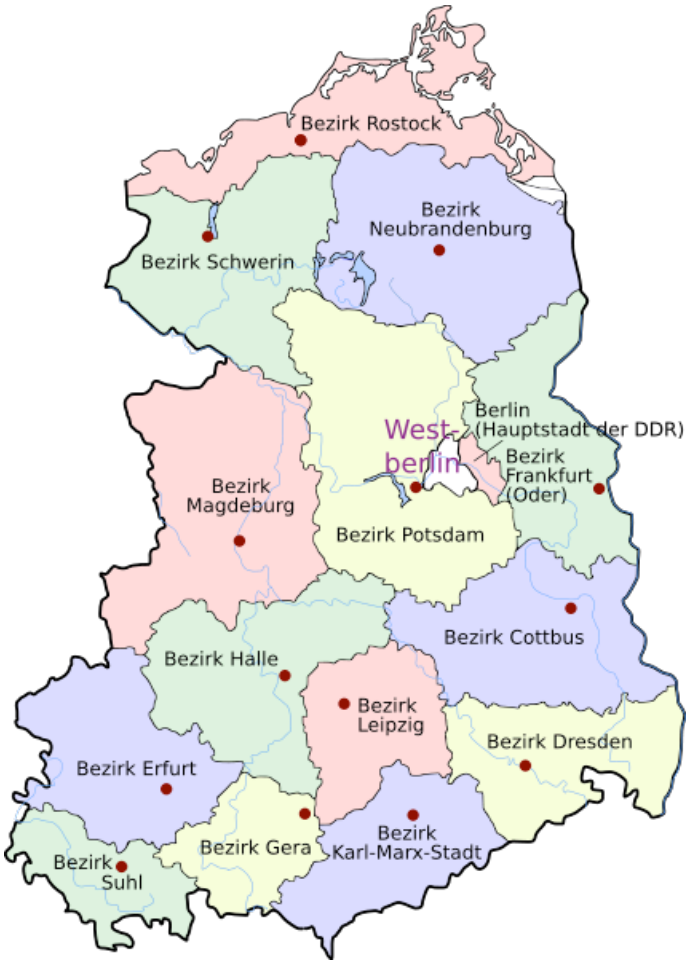

Figure 2: Administrative divisions in the GDR

allegedly false information spread by Western media, was actually watched only to see the state of self-deception in which the GDR autorities lived in.

After the events of November 1989, the GDR's grip on the state media became weaker. DDR-FS became almost completely separate from the state apparatus, starting a number of new program strands, including free and open debates. Upon Reunification on 3 October 1990, DDR-FS ceased to be the state broadcaster of the former GDR. Its frequencies were taken over by Western Germany's main public TV channel, ARD-*Das Erste*, on 15 December 1990.

3 Empirical Setting

Due to the tumultuous events and changes in the years of the transition from the communist system of the GDR to the Federal Republic of Germany, it is difficult to retrieve a single set of indicators that could allow inference on people's attitudes towards consumption over time. Instead, we rely on various different pieces of evidence to construct a comprehensive picture.

To begin with, we want to examine survey data to find out if there are differences in the general attitude and the values of the two different parts of East Germany, the treatment and the control regions. We use a survey that was conducted on East German citizens in April, 1990, by the *Institut für sozialwissenschaftliche Forschung*. The question that we focus our attention on regards the desirability of objectives; people were asked to agree or disagree to statements about whether a certain state (such as the ability to afford a high consumption level, or a harmonic famly life, or success in one's job) was desirable and important to one's life.

Ideally, we would then want to track actual consumption in East Germany right from the beginnings of the market economy in 1990, i.e. from the point in time in which "Western" consumption goods were available to the broad mass of the population. No such indicator exits. Thus, we rely on the German Income and Expenditure Survey (*Einkommens- und Verbrauchsstichprobe, EVS*) conducted every five years by the German federal statistical office.

Before starting the empirical analysis, we need the following three conditions to hold for the identification strategy to be valid:

Condition 1 The inhabitants in the treatment regions were not already less inclined to materialistic values before the treatment started.

While there was a fairly large amount of regional specialization across the fifteen districts of the GDR, we contend that, crucially for our identification, no substantial differences existed between the treatment and control regions as defined for the purposes of our work. Both regions contained industrial parts, with a fairly high level of technological development and cultural sophistication, such as Dresden in the treatment, Leipzig and Halle in the control; as well as more agricultural and less densely populated parts, such as the treatment region in the North-East around Greifswald, and the districts of Schwerin or Potsdam in the control.

Even though no precise data exist to explicitly compare materialistic values and consumption attitudes in the region of Dresden compared to the rest of future East Germany before the communist rule started, the available anecdotal evidence suggests that, if anything, the city and its surroundings were more consumerist than the rest of the country. Before World War II, Dresden was the seventh largest German city with a population of over 600,000 inhabitants. Apart from being described as "one of the foremost industrial locations of the Reich" in 1942 (Taylor, 2004), Dresden was, during the first decades of the 20th century, an important artistic and cultural pole in Europe and became popularly known as "Florence on the Elbe". According to Taylor (2004, p. 33), in parallel to the fast economic development of the city, that period "witnessed a rapid expansion of the modern consumerist industries, which Dresden not only adopted but also, in a disproportionate number of cases, actually originated." Among many consumerist inventions from the early 20th century created in Dresden were the brasserie, the cigarette, the coffee filter, the tea bag, squeezable toothpaste and the latex condom. It was also a key center of the typewriter and camera industries, with the headquarters for large companies such as Erika and Zeiss. According to the same author (p. 33), "the common element was affordable luxury, artifacts conceived to provide pleasure to the

Table 1: Regional characteristics, 1955

	Percent Agric.	Percent Industry	Retail sales p.c.	Total Population
Treatment (3 districts)	27.83	28.71	1.69	2455
Control	21.97	33.73	1.78	13978

Population-weighted averages.

vastly increased number of relatively ordinary people who had money, leisure, and taste." The description of the city in the pre-treatment period was one of a prosperous location with a particular taste for consumption.

With respect to the other region not exposed to Western TV in East Germany, the one surrounding the cities of Greifswald and Stralsund in the North, we do not have similar accounts of the perceptions of materialism and consumption attitudes in the first decades of the 20th century. Stralsund and Greifswald were middle-sized cities of Hanseatic tradition, with important though not preeminent ports on the Baltic sea; furthermore, Greifswald was characterized by its old university and its characteristic intellectual life. The surrounding agricultural areas were sparsely populated.

We show some statistics of important social and economic indicators, comparing their means for the treatment and control groups, drawn from the GDR Statistical Yearbook of 1955 (the first one published after the war). The two groups seemed virtually indistinguishable, as reported on table 1.

Condition 2 The individuals in East Germany that could watch West German TV did actually watch it.

Available evidence suggests an affirmative answer to this question. Despite the inherent danger it would have posed to the stability of the autocratic regime, East German authorities mostly closed an eye on the installation of antennas suitable for watching West German TV channels. The frequencies of West German TV broadcasts were not jammed, either, even though this was technically feasible and practiced in the case of radio stations (Hesse, 1988). For instance, a survey of

Table 2: Regional characteristics, 1990

	Savings p.c.	Percent Agric.	Percent Industry	Retail sales p.c.	Cars per 1,000	Total Pop.
Treatment (3 districts)	9145	15.28	31.37	11.01	235	3474
Control	9377	11.22	37.99	13.00	238	14359

Population-weighted averages.

East German youths in 1985 reported that respondents watched on average more than two hours of West Germany TV each weekday (Zentralarchiv fur Empirische Sozialforschung ZA 6073). The evidence also suggests that they were used to watching entertainment shows and their advertisements (Stiehler (2001) and Buhl (1990)). Based on a survey with emigrees from East Germany in the refugee camp of Giessen, West Germany, Hesse (1988) reported that 40% of the East German women polled and 21% of the men watched the TV series *Dallas* regularly, whereas *Dynasty* each week attracted 37% of the female viewers and 18% of the males. According to Shepard Stone, former director of the Berlin Aspen Institute, the fascination for these series were due to the fact that "East German women were just overwhelmed by the elegant dresses worn in these series, and the men loved the wonderful cars been driven around Dallas and Denver" (Buhl (1990)).

Condition 3 The treatment and control units were comparable at the time of our measurements

We show some statistics comparing the districts in 1990, shortly before the dissolution of the GDR, in table 2. A more detailed breakup of all districts can be found in figure 3. The treated districts, Dresden, Neubrandenburg, and Rostock, are not particularly evident in these figures, where the only outlier is consistently represented by East Berlin.[3]

Condition 4 No spatial mobility that could have allowed individuals to self-select into the treatment and control units was possible.

[3]Sources of our data: Density, *Statistisches Jahrbuch* (1990); Share of agricultural population, *Statistisches Jahrbuch* (1990); Savings per capita, *Handbuch* (1989); Purchasing power, *Statistische Meßbarkeit* (1990); Cars per 1,000 inhabitants, *Statistische Meßbarkeit* (1990); Life quality, *Statistische Meßbarkeit* (1990).

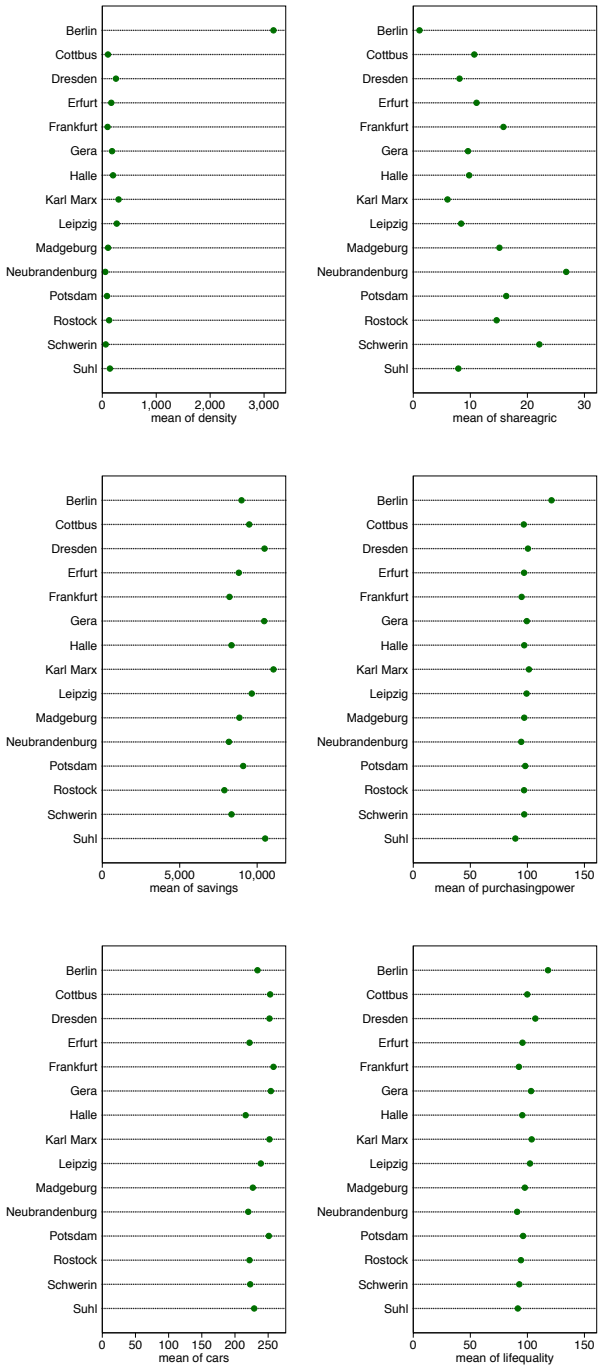

Figure 3: Comparison of GDR districts

In a centrally planned economy such as the GDR, spatial mobility was seriously hampered; the allocation of labor as a factor of production had to follow the overarching social and economic objectives set by the planning committees. Mobility of labor across occupations and across space was therefore considerably lower than in any free-market economy, and was additionally reduced by the serious housing shortages that affected the GDR over the whole 40 years of its existence.

4 Materialism and Western TV

For this section, we use survey data collected by the *Institut für sozialwissenschaftliche Forschung* (Institute for Sociological Research) in April 1990. This institute was related to the GDR government.[4] The surveys collected by the institute are now made available to researchers by the *GESIS-ZA, Zentralarchiv für Empirische Sozialforschung* (Central Archive for Empirical Social Research) at the University of Cologne.

The survey under consideration (UF904)[5] was mainly directed at collecting evidence on the East German population's feelings and expectation towards the upcoming political and administrative changes. It had 1029 respondents from all 15 districts in East Germany. Several questions were asked about characteristics that will be used as control variables: age, income range, and sex. We add addtional controls at the district level, such as population density and share of workers in different occupations.

Most crucially, this survey includes an indicator for the district (*Bezirk*) of residence. This allows us to create indicators for the treatment region based on the information about the district. As mentioned before, the district of Dresden coincides almost perfectly with the region lacking TV reception in the South-Eastern corner of the GDR; we therefore consider this district as our treatment area in the baseline case (cf. figures 1 and 2).[6]

[4] It was later renamed Concret Berlin and filed for bankruptcy in 2004.

[5] Classified as Study # 6416 by GESIS-ZA.

[6] The region in the northeast that had no access to Western TV is located across the districts of Neubrandenburg and Rostock, without being coterminous to any of them. We will first consider these two districts as part of the control group. In table 6, instead, we presents results using all three districts (Dresden, Neubrandenburg, and Rostock) as treatment area. Note that due to the imperfect matching of the TV coverage areas with administrative boundaries, either definition of

Table 3: Desirable life goals

1	Not working/having fun
2	Traveling
3	Buying everything you want
4	Having a job that fulfills you
5	Having a harmonic family life
6	Having a well paid job
7	Having a car
8	Having modern electronics
9	Being top in your job
10	Being politically active
11	Helping others
12	Protecting the environment
13	Having hobbies

The set of questions in this survey we are interested in regards life goals. Respondents were asked to evaluate the importance of 13 different goals in life.[7] The list of life goals asked in the survey is found in table 3. Some categories of goals are particularly interesting given our research objective: *consuming everything you want, having a well-paid job, having a car,* and *having modern electronics*.

We run regressions one by one for each category, on a dummy variable for the treatment region and on a set of controls (age, age squared, log of net income,[8] sex, population density, share of workers in agriculture). Standard errors are robust and clustered by district. As observed in the previous section, there are no significant differences in the district-level variables (population density, share of workers in agriculture) across the two groups. Similarly, no differences arise in the sample of households interviewed with respect to the variables income and age, as evidenced in table 4.

The analysis proceeds as follows: in Table 5 we present baseline results from linear regressions using only Dresden as the treatment unit; then we proceed to different robustness checks based on varying definitions of the treatment and control areas (Table 6); finally we present alternative econometric approaches for the baseline specification (Table 7).

treatment would lead to attenuation bias in our estimation strategy, biasing our findings toward zero if the hypothesis is true.

[7]The exact wording was: "To what extent do you consider the following items important and worth achieving?" For each objective, respondents could answer: totally desirable, partly desirable, not desirable at all. To facilitate interpretation, we collapsed the three levels of answers for each life goal into two (important=1/not important=0).

[8]In the original survey dataset, the variable net income was presented in categories instead of continuous values. To avoid running a regression on categories, we replaced each category number (ranging from 1 to 10) by the mean value of income of the category to construct our variable of net income and then computed their logs.

Table 4: Summary statistics

Variable	Obs	Mean	St.Dev.
Dresden, district (Treatment group)			
log(Net income)	110	6.54	0.47
Age	110	45.59	16.35
All other districts (Control group)			
log(Net income)	887	6.59	0.42
Age	887	45.53	16.13

Our baseline case in Table 5 contains OLS regressions with only Dresden as the treatment unit. Inhabitants in Dresden seem to be significantly less materialistic than elsewhere. For the life goal *Buying everything you want*, Dresden respondents were 16.2% less likely to report that such a goal was important than elsewhere (significant at the 1% level). Interestingly, this is the only significant coefficient in the regression. For the life goal of *Having a well-paid job*, respondents from the treatment district were 5.2% less likely to report that such a goal was important than elsewhere (significant at 5%). For the life goals of *Having a car* and *Having modern electronics*, once again, the treatment dummy is highly significant: Dresden respondents were respectively 7% and 9.6% less likely to report them as important life goals.

One question that might arise here is: were the inhabitants of Dresden simply less ambitious, so that we are merely capturing the effect of some unobserved factor? This does not seem to be the case. Two other life goals for which the Dresden dummy has a significant coefficient are: *Having a job that fulfills you*, and *Being "top" in you job*, for which people in the city are found to give more importance than elsewhere. In fact, they seem to be more ambitious, just not in material terms. The results are also shown in Table 5: in the treated district, people were on average 9.5% more likely to consider important to have a fulfilling job (significant at 1%) and 13.8% more likely to find important to be "top" in their jobs (1% significance). Interestingly, the only other values for which the treatment dummy was significant were: *Helping others* and *Having hobbies*.

The next set of results in Table 6 checks the robustness of our baseline regressions by varying the area of analysis: we drop Berlin as a possible outlier, control for distance to the western border of East Germany, restrict our analysis to the eastern half of East Germany, or just to the districts

Table 5: Importance of different goals in life — Baseline results

Goal:	no work	travel	buying	fulfilling job	family	well-paid job
Treatment	-0.005	0.001	-0.162***	0.095***	0.004	-0.051**
	[0.007]	[0.013]	[0.026]	[0.022]	[0.016]	[0.024]
log(Net income)	-0.005	0.090*	-0.002	0.131***	0.021	-0.034
	[0.021]	[0.047]	[0.033]	[0.031]	[0.021]	[0.032]
Age	0.001	-0.001	-0.003	0.012	0.004	0.009*
	[0.002]	[0.007]	[0.005]	[0.008]	[0.003]	[0.005]
$Age^2/1000$	-0.003	-0.007	0.038	-0.185*	-0.060*	-0.156**
	[0.025]	[0.075]	[0.051]	[0.090]	[0.032]	[0.055]
Female	0.01	0.017	0.007	-0.036	-0.023	-0.147***
	[0.011]	[0.039]	[0.023]	[0.028]	[0.021]	[0.049]
Pop. Density	-0.007	-0.006	-0.063	0.059	-0.007	0.047
	[0.017]	[0.021]	[0.042]	[0.048]	[0.032]	[0.045]
% Agriculture	-0.004	-0.013***	-0.009	0.011	0.002	0.012
	[0.003]	[0.003]	[0.007]	[0.007]	[0.005]	[0.007]
% Industry	-0.002	-0.002	-0.002	0.008	0.002	0.009**
	[0.001]	[0.002]	[0.005]	[0.006]	[0.004]	[0.004]
Constant	0.169	-0.05	0.506	-0.667*	0.652**	0.281
	[0.171]	[0.272]	[0.395]	[0.366]	[0.252]	[0.375]
Observations	980	981	981	973	980	976

Goal:	car	electronics	top in job	politics	helping	environment	hobbies
Treatment	-0.070***	-0.096***	0.138***	-0.002	0.067***	-0.018	-0.052**
	[0.016]	[0.020]	[0.028]	[0.018]	[0.020]	[0.015]	[0.021]
log(Net income)	0.099***	-0.022	0.148**	0.016	-0.007	0.026	0.111**
	[0.033]	[0.021]	[0.052]	[0.038]	[0.037]	[0.055]	[0.040]
Age	0.011*	0.004	-0.007	-0.003	0.01	0.01	0.021***
	[0.006]	[0.004]	[0.007]	[0.005]	[0.008]	[0.007]	[0.005]
$Age^2/1000$	-0.116*	-0.043	0.06	0.036	-0.079	-0.108	-0.227***
	[0.059]	[0.041]	[0.079]	[0.050]	[0.081]	[0.077]	[0.049]
Female	-0.079**	-0.109***	-0.104***	-0.034*	0.028	-0.04	0.018
	[0.034]	[0.033]	[0.029]	[0.019]	[0.030]	[0.025]	[0.036]
Pop. Density	0.085	-0.007	-0.015	0.005	0.053	0.001	0.086
	[0.048]	[0.037]	[0.067]	[0.045]	[0.054]	[0.043]	[0.055]
% Agriculture	0.013	-0.007	0	-0.002	0.008	0.002	0.004
	[0.007]	[0.006]	[0.011]	[0.007]	[0.009]	[0.007]	[0.008]
% Industry	0.011**	-0.001	-0.002	-0.001	0.003	0.004	0.005
	[0.005]	[0.005]	[0.006]	[0.004]	[0.005]	[0.004]	[0.005]
Constant	-1.041**	0.477	-0.221	0.186	0.195	0.143	-1.014*
	[0.366]	[0.323]	[0.508]	[0.429]	[0.345]	[0.405]	[0.532]
Observations	979	981	974	980	981	981	979

Robust standard errors in brackets, clustered by district.
*** significant at 1%, ** significant at 5%, * significant at 1%

Table 6: Importance of different goals in life — Robustness checks

	Dropping Berlin	Distance to Western border	Restrict sample: Eastern Half	Restrict sample: neighboring districts	Three districts as treatment
Buying everything you want	-0.182***	-0.142***	-0.100***	-0.161***	-0.109**
	[0.0365]	[0.0279]	[0.0198]	[0.00293]	[0.0389]
Having a well paid job	-0.0643**	-0.0586**	-0.0595***	-0.0908***	-0.0125
	[0.0214]	[0.0243]	[0.0146]	[0.00243]	[0.0309]
Having a car	-0.0591***	-0.0749***	-0.0890***	-0.0403***	-0.0261
	[0.0190]	[0.0159]	[0.00424]	[0.00319]	[0.0298]
Having modern electronics	-0.110***	-0.114***	-0.0945***	-0.102***	-0.0569*
	[0.0197]	[0.0201]	[0.00471]	[0.00100]	[0.0270]
Observations	900	980	541	354	980

Each cell reports the coefficient on "Treatment" for one regression. Additional controls included: cf. Table 5. Robust standard errors in brackets, clustered by district. *** significant at 1%, ** at 5%, * at 1%

neighboring Dresden, and add Neubrandenburg and Rostock to the treatment group.

For many reasons, one might think East Berlin would be an outlier in the previous regressions. It was the capital if the GDR, in which a large fraction of the state bureaucracy was located, giving rise to different types of privileges to its inhabitants. It was a commonplace before 1990 that East Berlin's residents never had to suffer the shortages so common in the rest of the GDR, even though their standard of living could hardly impress the Western neighbors. Apart from that, the demographic composition of the East Berlin district seemed highly divergent from the other regions, since it was mainly a city-state, rather than a larger territorial unit. The results for this new set of regressions are found in the first column of Table 6 . The results are, if anything, stronger than before: individuals in the Dresden district were on average 18.2% less likely to consider the goal of buying everything as important (at the 1% significance level), 6.4% less likely to report having a well paid job as important (5% significance).

One possible concern, given the fact that the the treatment unit is in the Eastern half of the GDR, is the possibility of an "Eastern factor" being driving our results. There could be some differentiation between East Germans that lived closer to the Western border and those living on the other side of the country. To rule out this possibility, we added as a control variable the (air) distance between the capital of each district an the nearest point on the Western border. The results are vir-

tually indistinguishable from the baseline case, as seen in the second column of Table 6. We also reproduce the analysis restricting the sample to the districts that had their capital in the Eastern half of East Germany. As seen in the third column of Table 6, the results are again unchanged. In column 4, we further restrict the sample of our control group to the regions that have borders with our treament area, in the spirit of a regression discontinuity analysis. We therefore compare the treatment district of Dresden to those of Leipzig, Cottbus and Karl-Marx-Stadt. The results are again almost identical to the baseline case.

As mentioned above, only parts of the districts of Neubrandenburg and Rostock had access to West Germany TV broadcasting. For that reason, we consider them here as part of the treatment group and perform the same regressions. The results are very similar to the ones presented above and are reported in the fifth column of Table 6. The only difference here is that significance is lost for the goals of *Having a well paid job* and *Having a modern car*. Given the fact that large parts of these districts actually could watch Western TV, this slight weakening of the estimates is not surprising.

So far, our results have been based on reduced-form regressions on a treatment indicator. Another conceivable setup would use the treatment indicator as an instrument for Western TV audience in a two-stage regression. Unfortunately, there were no questions about TV viewership in the survey used in this section. However, in another survey conducted by the former *Zentralinstitut für Jugendforschung* (Central Institute for Youth Research),[9] collected between November 1988 and February 1989, respondents were asked how often they used to watch Western TV. Unfortunately, the interviews occured in only 8 districts (inclusing Dresden). Nonetheless, by comparing the average percentage of respondents that reported to never watch Western TV in the treatment and control districts, we observe a striking difference: in the treated district, 67.9% never did, whereas in the control districts, only 1.9% never watched it. We therefore use the average per district percentage of respondents that never watched Western TV as the endogenous variable and use our treatment indicator (Dresden district) as the excluded instrument. As we can see in the first column of Table 7, the results of the IV regression are almost identical to the baseline OLS case.

[9]Survey reference: GESIS-Zentralarchiv für Empirische Sozialforschung ZA 6008.

Table 7: Importance of different goals in life — Alternative estimation strategies

	IV	Probit	Ordered Probit	Nearest Neighbor Matching	Non-parametric
Buying everything you want	-0.155***	-0.151***	-0.516***	-0.0646***	-0.150***
	[0.0261]	[0.0218]	[0.0665]	[0.0212]	[0.0253]
Having a well paid job	-0.0771***	-0.0528**	-0.0935*	-0.0208	-0.0309
	[0.0143]	[0.0253]	[0.0551]	[0.0200]	[0.0237]
Having a car	-0.0578***	-0.0693***	-0.0771*	-0.0121	-0.0622***
	[0.0133]	[0.0162]	[0.0455]	[0.0199]	[0.0150]
Having modern electronics	-0.103***	-0.0920***	-0.218***	-0.0414*	-0.0910***
	[0.0105]	[0.0175]	[0.0494]	[0.0233]	[0.0205]
Observations	611	981	981	990	983

Each cell reports the coefficient on "Treatment" for one regression. Additional controls included: cf. Table 5. Probit regressions report estimated marginal effects. Robust standard errors in brackets, clustered by district. *** significant at 1%, ** at 5%, * at 1%

We also reproduce the analysis using probit regressions instead of OLS in our baseline specification. As we can see in the second column of Table 7, where we report the marginal effects, the results remain unchanged. Instead of collapsing the three levels of answers to the life goals questions into two categories, we can look at ordered probit regressions with the original formulation. This is presented in column 3 of Table 7. Although a direct quantitative comparison with the baseline result is not possible (due to the different interpretation of the coefficients here), the qualitative results remain once again unchanged.

We also reproduce the empirical analysis using nearest-neighbor matching techniques; this should minimize concerns about possible heterogeneity in the samples between the treatment and control groups. We compute the average treatment effect for the observations in the treatment group matching on the covariates previously used as regressors (age, log of net income, sex, density and share of workers in agriculture)[10] The results are reported in column 4 of Table 7. Although a direct percentual interpretation cannot be constructed based on the estimated coefficients, the results are very similar to the baseline case. The only differences is that the coefficients on the life

[10]Since the treatment group has many less observations than the control units (112 when only Dresden is considered, 199 when all three districts are taken into account, versus 917 in the control group in the first case, and 830 in the second case), we decided to match each observation in the treatment group to four of them in the control group. The results are robust to changes in the number of matches.

goals *Having a well-paid job* and *Having a car* are no longer significant at standard levels (although they still have the right sign)

Finally, we also repeat the empirical analysis using a less-parametric estimation to allow for a more general effect of the control variables on the dependent variable. We create bins for the values of the individual-level control variables (age and income) and associate each of these bins to a dummy variable that takes value one if the value of the variable is inside the bin of interest and zero otherwise. We use the original 10 bins for the net income variable and create 5 bins for the age variable and run probit regressions using the dummy variables as explanatory variables, in addition to the district-level controls used before. The main results (reported in column 5 of Table 7) remain unchanged (although significance is lost for the coefficient on the treatment dummy for the regression of *Having a well paid job*).

5 Consumption after Reunification (preliminary)

Having assessed that those citizens of the GDR without access to Western media had, in fact, less materialistic and consumerist values at the onset of Reunification, the goal of this section of the paper is to assess the difference in patterns of actual consumption behavior. To this purpose, we recur to the results of the German Income and Expenditure Survey (*Einkommens- und Verbrauchsstichprobe, EVS*) conducted every five years by the German federal statistical office.

It is widely known that the expectation of the availability of Western consumer goods changed the economic behavior of East Germans. As reported by Sinn and Sinn (1992), the three-month savings rate average for the whole region jumped from 12.7% during the last quarter of 1989 to 18.4% (first quarter of 1990) and to 22.4% (second quarter of 1990, and last one before the economic and monetary union on 1 July 1990). After the referred event, the savings rate decreased to 0.8% in the third quarter of 1990, returning to the level of 13.4% in the fourth quarter of that year. As for the monthly averages, the savings rate was 39.5% in June 1990, fell to -9.3% in July and -9.7% in August.

Data from the Income and Expenditure Survey (EVS) can now help us understanding how exactly access to Western TV changed the consumption behavior of East German citizens. Conducted every 5 years on over 70 000 representative households (approximately 10 000 of which are in our East German subsample), this survey records exact expenditures on a variety of goods over the course of one year. We use two waves of data in our analysis: 1993 and 1998. While 1993 lies already some years after Reunification, this is the first available year with data on East Germany. We expect our hypothesized effects to be, if anything, still present in 1993, while they might have already faded away by 1998, after 8 full years of integration into a market capitalist system. Unfortunately, the *Einkommens- und Verbrauchsstichprobe* is not conducted as a panel, therefore we are not able to estimate the within-household variation from 1993 to 1998.

The EVS data also contain information about the exact municipality of residence of each household; based on this, we can construct our treatment indicator as a binary variable based on the map in Figure 1.[11] Unfortunately, due to data privacy reasons, we are not able to inspect the dataset ourselves; instead, the empirical analyses below are performed on our behalf by the Research Data Center of the German Federal Statistical Office in Wiesbaden.

As a guide to interpret our results, we formulate two (alternative or complementary) priors about how television can impact consumer behavior:

- consumers with access to Western TV are more likely to buy more of goods that are more heavily advertised on television;
- consumers with access to Western TV are more likely to buy more of goods that are more visible (in the sense of Veblen's (1899) theory of conspicuous consumption).

In the first case, we assume that television works by conveying information about "desirable" goods through advertisements; in the second case, we assume that television conveys "materialist" values through the display of goods (in TV shows, series and movies) that are shown to be desirable or associated with success in a capitalist society.

[11] In ongoing work, we are calculating the exact TV signal strength with a three-dimensional GIS (geographic information sytems) approach, based on the Western antennas' locations in 1989, their power, their frequencies, and the topography of the territory.

Table 8: Visible and advertised goods

Most and least advertised goods categories (Minutes of advertising in 1988-89)	
Body care	13.9
Food	13.15
Sweets	9.4
...	...
Clothes, textiles	0.65
Transportation and tourism	0.45
Photo, optics, watches, jewelry	0.3
Most and least visible goods categories (Vindex according to Heffetz 2007)	
Tobacco products like cigarettes, cigars, and pipe tobacco	0.76
Purchase of new and used motor vehicles such as cars, trucks, and vans	0.73
Clothing and shoes, not including underwear, undergarments, and nightwear	0.71
...	...
Homeowners insurance, fire insurance, and property insurance	0.17
Life insurance, endowment, annuities, and other death-benefits insurance	0.16
Underwear, undergarments, nightwear and sleeping garments	0.13

To test the first hypothesis, we use data about minutes of advertising by category of goods on Western German TV stations in the years 1988 and 1989 (*Werbung in Deutschland* 1989, 1990); to test the second hypothesis, we recur to Ori Heffetz' *Vindex* (Heffetz 2007), a survey-based measure of the visibility of different types of consumer expenditures.[12] Table 8 shows the highest and lowest ranking categories for each one of these classifications.

Our basic regression setup can be described as follows:

$$\ln(Exp_{ij}) = \alpha + \beta_0 \cdot Treat_i + \beta_1 \cdot Rank_j + \beta_2 \cdot Treat_i \cdot Rank_j + x_i'\gamma + \varepsilon_{ij} \tag{1}$$

Where Exp_{ij} are expenditures of household i on good j, $Treat_i$ is a treatment indicator equal to one for households *without* access to Western TV, $Rank_j$ is the ranking of good category j according to either intensity of advertising ($Rank_j = Minutes_j$) or the Vindex ($Rank_j = Vindex_j$), and x_i is a set of individual level covariates (the full list of variables is reported in Appendix A). The coefficient of interest is β_2 and relates to the interaction term $Treat_i \cdot Rank_j$. If, for example, people exposed to Western television consume more of the more heavily advertised goods, we expect $\beta_2 < 0$.

In alternative specifications, we do introduce either goods fixed effects ξ_j, in which case we can

[12] Charles et al. (2009) also categorize CEX consumption goods as visible/invisible, albeit in a less detailed manner.

dispense with the direct effect of $Rank_j$:

$$\ln(Exp_{ij}) = \alpha + \xi_j + \beta_0 \cdot Treat_i + \beta_2 \cdot Treat_i \cdot Rank_j + x_i'\gamma + \varepsilon_{ij} \tag{2}$$

Or, in the most general specification, a full set of both individual and goods fixed effects:

$$\ln(Exp_{ij}) = \xi_i + \xi_j + \beta_2 \cdot Treat_i \cdot Rank_j + \varepsilon_{ij} \tag{3}$$

In this case, the inclusion of individual level variables x_i and $Treat_i$ is moot, as their effect will be subsumed under the individual fixed effects.

Table 9 presents the results of estimating our regression models (1)-(3) using minutes of advertising on Western public television to characterize different types of goods (as $Rank_j$); columns (1)-(3) correspond to the EVS survey in 1993, (4)-(6) to the 1998 survey. The results confirm our priors across all specifications: for 1993, we see that individuals in the treatment area consumed relatively less of the more advertised goods, as the coefficient on *Treatment* · *Minutes* is negative and significant. The other coefficients also have the expected signs. Minutes of advertisement, whose effect can only be estimated in models without goods fixed effects, have a positive impact on expenditures, whereas the treatment coefficient is not statistically different from zero; this reinforces the view that the treatment and control areas were not fundamentally different along other lines.

The economic magnitude of the coefficients is not trivial, either. For example, the estimated coefficient in column (3), -0.001791, implies that consumer expenditures for body care products, a rather heavily advertised class of products, were approximately 2.4% higher in areas with access to Western TV. At the same time, the results reported in columns (4)-(6) show that the effect has all but disappeared by 1998. The estimated coefficient for *Treatment* · *Minutes* is now much smaller and clearly insignificant.

Table 10 performs the same type of analysis using the Vindex as our key to identify categories of goods whose consumption is more or less responsive to TV viewership. As can be seen in columns

Table 9: Results from EVS — Minutes of advertising

Dependent variable:	log(Expenditures)					
	EVS 1993			EVS 1998		
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment	0.006666	0.010215		0.027316	...	
	[0.032045]	[0.031839]		[0.038629]	...	
Minutes of Ads	0.024242***			0.017228***		
	[0.000332]			[0.000322]		
Treatment*Minutes	-0.001641*	-0.001925**	-0.001791***	-0.000532	...	0.000452
	[0.00084]	[0.000823]	[0.000579]	[0.001125]	...	[0.000686]
Individual Covariates	Y	Y	N	Y	Y	N
Goods FE	N	Y	Y	N	Y	Y
Individual FE	N	N	Y	N	N	Y
Number of observations	69554	69554	69554	63201	63201	63201
Number of households	10096	10096	10096	12906	12906	12906

Robust standard errors in brackets, clustered by household. *** significant at 1%, ** at 5%, * at 1%

(1)-(3), the relevant coefficient is now positive, albeit not significant or very weakly so. This means that, if anything, consumers in the treated areas are sightly more likely to consume more visible goods. In general, it does not seem to be the case that television affects people's preferences in terms of more visible versus less conspicuous consumption types. The other coefficients are as expected, with the Vindex being clearly positively related to consumption expenditures, and the treatment indicator being not significant. By 1998 (columns (4)-(6)) all effects have vanished or weakened considerably.

As a whole, the preceding tables seem to draw a picture in which East German households in the control areas (i.e. with access to Western TV until 1990) are particularly susceptible to advertisement when making the choice between different categories of consumption goods. With respect to the visibility of goods, the picture is much less clear, suggesting that this property of goods (and its importance in terms of determining consumption behavior) is not significantly linked to TV viewership.

If there is in fact a substantial impact of advertisement on consumption choices, a related question is whether this effect is a purely compositional effect (which shifts expenditures across consumption goods, leaving the total level of consumption unaffected) or also a level effect (which, apart

Table 10: Results from EVS — Vindex

Dependent variable:	log(Expenditures)					
	EVS 1993			EVS 1998		
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment	-0.072541	-0.080258		0.000155	0.006263	
	[0.060844]	[0.05959]		[0.047985]	[0.048592]	
Vindex	0.682105***			0.193401***		
	[0.042593]			[0.02728]		
Treatment*Vindex	0.13112	0.146781	0.123029*	0.031309	0.032319	-0.042926
	[0.123024]	[0.120543]	[0.070106]	[0.095069]	[0.097256]	[0.061632]
Individual Covariates	Y	Y	N	Y	Y	N
Goods FE	N	Y	Y	N	Y	Y
Individual FE	N	N	Y	N	N	Y
Number of observations	99449	99449	99449	139489	139489	139489
Number of households	10096	10096	10096	12906	12906	12906

Robust standard errors in brackets, clustered by household. *** significant at 1%, ** at 5%, * at 1%

from affecting more advertised goods differently than less advertised goods, changes the overall level of consumption). Our data in Table 9 seem to suggest the presence of a level effect. The coefficient on the *Treatment* dummy, which can be interpreted as the difference in consumption for goods that have zero minutes of advertising, is not significantly different from zero, whereas the interaction term is negative, suggesting less consumption in the treatment area for goods with positive advertisement.

Table 11, instead, shows regressions using aggregate variables (in logs) from the EVS surveys. The regressors are the same set of covariates used in the previous tables and reported in Appendix A.[13] Interestingly, by most accounts East German households without Western TV access before 1990 do not differ from the control group in their aggregate macroeconomic behavior: income, total expenditures, investments (in financial products) and residual savings are not statistically different. The fact that total expenditures are not significantly different, even though our results in Table 9 suggested the presence of a level effect, can possibly be explained by the fact that total expenditures as defined in column (2) also include items that we have not used in our regressions in Table 9; these are items that cannot be matched to any of the categories of advertising for which

[13]Disposable income is not included as a regressor in column (1).

Table 11: Results from EVS — Aggregate Variables

Dependent variable (in logs):	net income	total expenditures	investments	residual savings	repayment of credits	taken out consumer credit? (probit)
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment, 1993	-0.0041	-0.0079	-0.0910	-0.1561	-0.3799**	-0.1894***
	[0.0194]	[0.0226]	[0.1440]	[0.1428]	[0.1920]	[0.0899]
Treatment, 1998	0.0178	-0.0087	-0.0686	-0.1551	-0.1475	.
	[0.0199]	[0.0181]	[0.1507]	[0.1521]	[0.1245]	.

Each cell reports the coefficient on "Treatment" for one regression. Additional controls included: cf. Appendix A. Marginal effects reported in column (6). Robust standard errors in brackets. *** significant at 1%, ** at 5%, * at 1%

we have quantitative data (notably, services).

More interestingly, though, columns (5) and (6) show that East German households across treatment area differed in one important respect: the likelihood of recurring to consumer credit as a mean of household finance. Column (5), line 1, shows the amount of credit repayments of households in the treatment group was 0.38 log points lower, suggesting less credit taken in the past years. This is confirmed by an additional question about whether or not the household has taken advantage of consumer credit in the past year, to which households in the treatment area are approximately 19% less likely to answer affirmatively. In line with our previous results, these effects vanish by 1998. This could be suggestive of more aggressive consumption behavior on the side of East German citizens in the control area, who might have wanted to attain Western-style levels of consumption as soon as possible after Reunification.

6 Conclusion

This paper examines the impact of television on consumption behavior, i.e., consumers' preferences and their consumption decisions. To draw causal inference, we focus on a natural experiment given by the differential access to Western TV in former East Germany during almost four decades under the communist rule. The objective is to measure to which extent individuals exposed to West German TV would become more consumerist and materialist compared to those

not exposed to it, and to which extent those differential values translate into different consumption patterns after the German Reunification in 1990, when the purchase of the goods advertised would actually be possible.

The identification strategy is made possible by the fact that assignment to our "treatment" (non-exposure to Western TV) was due to geographic factors, arguably exogenous to the characteristics of the inhabitants of the treatment regions. We report evidence of a non-trivial effect of the media on people's preferences and decisions. Our results go against the standard neoclassical assumption of exogenous individual preferences and contribute to the growing recent body of literature (both empirical and theoretical) on this departure from that premise.

We are in the process of expanding and improving our work in several directions. Results from the income and expenditure survey (EVS) in section 5 are highly suggestive but still preliminary; we want to to expand on those, taking into account all possibilities of this large dataset. Finally, we want to incorporate better information about the exact availability of TV signal (as mentioned in footnote 11) to improve on our definition of treatment vs. control areas.

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A Data appendix

Individual level covariates used in equation 1	
Net disposable income	Employment dummy (1=employed)
Age	Retirement status dummy (1=retired)
Age squared	State (*Land*) of residence (full set of dummies)
Number of children	Small city dummy
Marital status dummy (1=single)	Foreign nationality dummy (1=German)
Urban/Rural geographic characteristics (full set of dummies)	