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The effects of TV content on entrepreneurship: Evidence from German unification

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ABSTRACT

This paper empirically analyzes whether television (TV) can influence individuals' decisions to start businesses. To identify TV's effects, we rely on a unique quasi-natural experiment related to the division of Germany after WWII until 1990 into West Germany with a free market economy and the socialist East Germany where starting one's own business was not permitted. Despite this division, Western TV was exogeneously available since the 1960s in some, but not all East German regions and conveyed images and attitudes conducive to entrepreneurship. We use both regional-level and geo-referenced individual-level data and show that since starting a business in East Germany became possible thanks to the reunification in 1990, entrepreneurship incidence is higher in East German regions that had Western TV signal. This indicates a first-order effect on directly exposed individuals. We show that this is due to the effects of Western TV on attitudes and value orientations associated with entrepreneurship, particularly independence. We find no indication that the differences in the entrpreneurship incidence of East German regions with and without Western TV disappear. Instead, we find that successive cohorts and descendants of directly exposed individuals who were not directly exposed themselves more frequently wish to become entrepreneurs. The latter findings are consistent with second-order effects due to inter-generational transmission of an entrepreneurial mindset and suggest that a self-sustaining entrepreneurial culture can be formed. This can cause long-lasting differences between treated and non-treated population groups or regions.

1. Introduction

Entrepreneurship is considered a key driver of growth and development in free market economies. Entrepreneurs address unserved demands, introduce new products or create new markets, eventually deploying resources more efficiently. Productive entries will deploy further production factors, exhibit growth, and challenge other firms. However, even entries that turn out to be less productive, do not grow or even exit, can have positive effects on the economy, e.g., by disciplining competitors or showing what works versus what does not. Along this line of reasoning, each entering cohort has a positive impact at the aggregate level. Overall, the entrepreneurial process—through continuous trial and error and discovery—increases variety, stiffens competition, amplifies innovation, accelerates change and development, and improves resource allocation, which ultimately results in productivity gains, job creation,

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and welfare increases in the long run (Decker et al., 2014; Fritsch et al., 2005; Fritsch et al., 2010; Schumpeter 1912, 1942; Baumol 1990, 2010; Baumol et al., 1988; Baumol et al., 2007). However, the entrepreneurial act itself is not always self-evident but requires a proactive mindset and cannot be fully explained within the standard economic framework (Schumpeter 1912). Thus, understanding what determines entrepreneurial identity is crucial for understanding growth and development and designing policies.

In this paper, we empirically analyze whether individuals' decisions to start businesses can be influenced by television (TV). TV can shape career choices by conveying information and pointing to business opportunities or showcasing entrepreneurship as an alternative to dependent employment. Moreover, TV can influence career decisions by transmitting images that affect viewers' preferences and the esteem of occupations. On the one hand, the empirical literature on the determinants of entrepreneurship shows that personality characteristics (i.e., attitudes, values, preferences, and aspirations) play a significant role in the decision to start a business (Arenius and Minniti 2005; Hamilton 2000; Hyytinen et al., 2013; Berglann et al., 2011; Croson and Minniti 2012; Benz and Frey 2008a, b; M. van Gelderen and Jansen 2006). Akerlof and Kranton (2000) argue that an individuals' identity, namely their self-perception or sense of self, influences their behavior and preference toward a specific occupation. Individuals reap utility not only from monetary outcomes but also from acting in a certain way, in particular, according to their ideal view of themselves and what they should or should not do to live up to their ideal concept of the self (Akerlof and Kranton 2000; Benz and Frey 2008a, M. b). Accordingly, values, preferences, status, and esteem attached to different occupations and career paths shape individuals' decisions. On the other hand, research has also indicated that TV can shape—deliberately or not—individuals' view of the self while transmitting images that create specific attitudes, values, and preferences. Specifically, TV viewers can identify with fictitious or real media characters and role models and adopt (parts of) their personality and behavior (A. Bandura 2001; Rosengren and Windahl 1972; Cohen 2001; Adams-Price and Greene 1990; Hoffner and Buchanan 2005). The identification process can extend well beyond the viewing situation (i.e., sharing emotions while watching). It can lead to durable changes in attitudes, values, or aspirations and, therefore, identity and behavior (Rosengren et al., 1976; Bandura 1986; A. 2001; v. Feilitzen and Linne 1975; Hoffner 1996; Hoffner and Buchanan 2005).

To identify the effect of TV on entrepreneurship, we utilize an exogenous variation in the exposure of East German regions since the 1960s until 1989, where entrepreneurship was demonized, to West German public TV that conveyed images generally conducive to entrepreneurship. We apply econometric techniques to analyze whether the differential West German TV exposure until 1989 "translates" to regional differences in the entrepreneurship incidence in the period after the reunification of the two German states in 1990, when starting an own business in East Germany became possible again. Specifically, after WWII and until the reunification in 1990, Germany was divided into West Germany (Federal Republic of Germany, FRG), which had a free market economy, and East Germany (German Democratic Republic, GDR), which had adopted socialism. In West Germany, according to the official doctrine, TV conveyed the notion that individuals were free and responsible for their own lives and that experimentation, self-discovery, self-realization, and proactive behavior were desirable from an individual and social point-of-view. In East Germany, per socialist doctrine, private capital and entrepreneurship were banned and socially stigmatized; the economy was state-driven, and starting a business became possible only after the reunification with West Germany in 1990 and the concomitant adoption of the free market system. However, despite the division, the West German public TV signal was available to most East German regions since the 1960s. A few East German regions never had access to West German TV solely due to topological reasons.

We are interested in whether entrepreneurship incidence is higher among individuals exposed to West German TV ("treated") than among those non-exposed ("non-treated"). West German TV's impact on entrepreneurial success or performance is not clear. There is no evidence that West German TV impacted the entrepreneurial abilities of individuals, for instance by informing them how to start and run a company successfully. Instead, evidence suggests that West German TV promoted attitudes conducive to entrepreneurship. We are interested in whether the potential differences between treated and non-treated groups of individuals or regions fade or endure over time and the underlying mechanisms. On the one hand, the effects of the temporary TV treatment will disappear if these are confined to only directly exposed individuals and the last exposed cohort exceeds a certain age. On the other hand, there may be second-order effects due to an intergenerational transmission of an entrepreneurial mindset, which may trigger a self-sustaining entrepreneurial culture and cause long-lasting differences between population groups or regions. For instance, individuals becoming entrepreneurs may signal to subsequent cohorts that entrepreneurship is a viable alternative to dependent employment (Halaby 2003). A higher incidence of entrepreneurship may remove biases and stigma, stimulate its societal legitimacy, and pave the way for future cohorts (Etzioni 1987; Kibler et al., 2014). Subsequent generations notice their ascendants' behaviors and likely view them as role models, consciously or not, adopting their norms, values, and preferences (Bandura 1986). Moreover, individuals may deliberately exert effort to disseminate their attitudes to future generations (i) if they believe their value system to be superior and reap benefits from their descendants' behavior and well-being (Bisin and Verdier 2000; A. 2001), or (ii) because of bounded rationality and subjective biases over occupational alternatives (Chakraborty et al., 2016; Corneo and Jeanne 2010). We use both data at the level of NUTS3 regions (i.e., counties) as well as geo-referenced individual-level data that allow us to illuminate the underlying mechanisms.

Our analysis shows that TV exposure influences individuals' decisions to start businesses. We regress the annual number of new businesses per working-age population in East German regions from 1993–2016 on a binary time-invariant indicator for the regional availability of West German public TV signal before the reunification in 1990. We find that entrepreneurship incidence is more than 10 percent higher in East German regions exposed to West German TV than in regions without exposure. As detailed in the identification strategy below (cf., Section 4), we use various identification strategies and robustness checks to alleviate concerns of confounded and inconsistent estimates potentially due to unobserved regional characteristics correlated with local entrepreneurship and TV availability. Individual-level data analysis confirms that the residents of East German regions exposed to West German TV are more likely to start businesses after the reunification in 1990. Moreover, we find that, in 1990, the residents of East German regions exposed to West German TV valued independence more than those of East German regions not exposed to West German TV. These findings are consistent with Western TV's promotion of attitudes that shape the entrepreneurial identity of individuals. This points to the micro-

level mechanisms underlying TV's effects and further helps alleviate concerns that unobserved regional factors confound the results, thus generally strengthening a causal interpretation.

We find that the differences between treated and non-treated regions remain significant even after 25 years, though initially they slightly increase and later slightly decrease. Then, based on individual-level data, we document that the strength of TV's effect measured at a certain point of time depends on individuals' age. The TV effect is most substantial for the cohort of individuals who, at the time of exposure, were young and likely more susceptible to TV influences and, in the period of analysis, at the age at which the (age-induced) probability of starting a business was comparably high. Within this cohort, we also find the most significant difference in the valuation of independence. We find no statistically significant differences for individuals that were "too old" to start a business during the analysis period. These findings indicate that the hump-shaped temporal pattern of TV's effect is an artifact of different age cohorts "moving" throughout the period of analysis. The findings further suggest that, if only directly exposed individuals are more likely to become entrepreneurs, the differences in the entrepreneurship incidence of East German regions with and without Western TV will disappear when the last directly treated individuals exceed a certain age.

However, we also find evidence consistent with second-order effects due to the intergenerational transmission of a pro-entrepreneurial mindset. In particular, using the individual-level data, we show that individuals born in 1985 or later, who/whose parents lived in 1989 in East German regions with West German TV signal, are more likely to want to start a business than their peers, who/whose parents lived in 1989 in East German regions without TV signal. As differential treatment for this cohort is arguably less likely, finding a TV effect is consistent with a transmission of a mindset conducive to entrepreneurship from one generation to the next. This suggests the development of a self-sustaining entrepreneurial culture that can cause long-lasting differences in the entrepreneurship incidence of treated versus non-treated population groups or regions and explains why the level of entrepreneurship in treated regions remains significantly higher than in non-treated regions.

In conclusion, promoting entrepreneurial identity can increase the entrepreneurial incidence and trigger the formation of an entrepreneurial culture with sustainable effects due to intergenerational transmission. Policies that promote entrepreneurial identity can complement other instruments such as promoting entrepreneurial/managerial skills and financial support (Lerner 2009, 2020). TV can play a role here.

The remainder of the paper is organized as follows: Section 2 outlines how this research relates to the existing literature. Section 3 describes the conditions for entrepreneurship in East Germany and the geographical availability of West German public TV signal. Section 4 outlines empirical setting and the identification strategy, and describes the data. Section 5 presents the results of the empirical analysis. Section 6 summarizes and concludes.

2. Literature review

This study contributes to the discussion on what drives individuals to become entrepreneurs, how an entrepreneurial mindset is formed, and how it can be influenced. For instance, in recent decades, many countries around the world have aimed to improve general framework conditions conducive to entrepreneurship through modifying taxes (Bruce and Mohsin 2006; Djankov et al., 2010), financial conditions (Jha and Bhuyan 2020), bankruptcy law (Armour and Cumming 2008; Prusak et al., 2022), medical insurance (Fossen et al., 2021), or have committed significant resources to directly encourage entrepreneurship, mainly through promoting skills to start and successfully run a company and through direct financial support (Lerner 2009, 2020; European Commission 2004; OECD 1998). However, in many cases, the measures are not considered sufficiently effective in raising the entrepreneurship incidence, and the demand for support is considered too low (Lerner 2009, 2020). We provide evidence that promoting specific values, preferences, attitudes, and aspirations can significantly influence the entrepreneurship inclination. We also allude to the broad literature on the importance of role models in entrepreneurship (Nanda and Sorensen 2010; Giannetti and Simonov 2009; Stuart and Sorenson 2005; Bauernschuster et al., 2010; Falck et al., 2012; Lerner and Malmendier 2013). However, the strong influence that watching TV can have on entrepreneurial attitudes indicates that the effects of role models are not confined to close, personal interactions. We also broadly touch upon the existing literature on TV edutainment that aims, similarly to traditional classroom entrepreneurship education, at transferring hard skills as to how to start and run a business successfully (Bjorvatn et al., 2015; Berg and Zia 2013; Banerjee and Duflo 2011; Singhal and Rogers 1999).

This study emphasizes the importance of values, norms, and preferences in becoming an entrepreneur and forming a self-sustaining entrepreneurship culture essential for long-term economic development. For instance, in Chakraborty et al. (2016), growth is endogenous and driven by individuals' occupational choice, which is influenced by the transmission of values, norms, and preferences from one generation to the next. Similarly, in Doepke and Zilibotti (2014), growth depends on the fraction of the population choosing an entrepreneurial career. The number of entrepreneurs in a society is endogenous and hinges on the transmission of attitudes, values, norms, and preferences between generations. Also, Corneo and Jeanne (2010) show that symbolic values can shape occupational choice and economic development. They propose a model of endogenous growth in which occupations carry symbolic values that make them more or less attractive. Occupational choice is driven not only by the income the different occupations yield but also by the esteem they confer. The evolution of symbolic values is endogenous and determined by the transmission of value systems between generations.

Our study contributes to the literature on the influence of media in general, and specifically TV, on the mindset of individuals and their behavior by adding a further dimension—occupational choice, specifically entrepreneurship. Regarding TV, studies have analyzed possible effects on individuals' material aspirations as measured by the importance attached to consumption, wealth and income (Hyll and Schneider 2013), the demand for advertised products (Bursztyn and Cantoni 2016), self-reliance (Hennighausen 2015), savings, debt and financial literacy (Berg and Zia 2013; Baker and George 2010), health care (Ramafoko et al., 2012), status in the society, family planning and fertility (Rogers et al., 1999; La Ferrara et al. 2012; Jensen and Oster 2009), political preferences and voting behavior (McMillan and Zoido 2004; Gentzkow 2006; DellaVigna and Kaplan 2007; Enikolopov et al., 2011; Durante and Knight 2012), xenophobia (Hornuf and Reiger 2017), sexual orientation, gender schemata/roles (Calvert and Huston 1987; Signorielli 1990; Rivadeneyra Lebo 2008).

3. Historical background: entrepreneurship and West German TV in the GDR

3.1. Entrepreneurship in the GDR

Starting an own company and nearly all opportunities for self-employment were banned in the GDR since they were incompatible with socialist ideology. This ideology was fundamentally based on the belief that a free market economy fails to provide a fair distribution of the value added between capital owners and workers and that the majority are not free whenever only a few own capital, yet wealth defines well-being and prospects. Such a system generates tensions and ultimately breaks down. It follows, then, that the nationalization of private assets and capital and the establishment of a redistributive and more "social" state should help create an egalitarian society, which would guarantee the independence of economic restraints, equality of opportunities, and social peace.

With the establishment of the East German state after WWII, starting a company was banned, and self-employment was restricted to only very few small-scale personal services and creative industries. An expropriation (or nationalization) of private wealth was launched, which forced private companies to flee "head over heels" to the West (Pickel 1992). Although East and West Germany had nearly identical shares of self-employed individuals before WWII, East Germany's levels dropped sharply to 1.65 percent and stayed at this level until 1989; West Germany's levels, by comparison, were at 10.5 percent in 1989. In East Germany, only a handful of private businesses existed, solely in cases where the central state could not provide a "solution" (e.g., retail such as greengrocery, handicrafts such as shoe repair, dressmaking and alteration, and in arts and entertainment). However, prices were centrally defined, which significantly restrichted entrepreneurial/managerial decision making (e.g., investment, innovation) (Brezinski 1987).

Entrepreneurship in the GDR was neither seen as an expression of fundamental individual freedom, nor as a mechanism to create jobs and foster innovation and economic development. Entrepreneurs were seen as capitalists who would exploit workers, so they were stigmatized in public life and referred to as unsocial. Education in East Germany was instrumental in teaching the official state doctrine and inculcating socialist individuals with a critical attitude toward liberal economies, the role of capital, and entrepreneurship (Latsch 2015; Falck et al., 2016; Fuchs-Schuendeln and Masella 2016). The alleged exploitation of workers by entrepreneurs was implemented into school curricula (a discipline called Social Studies, *Staatsbuergerkunde*), and students were taught that entrepreneurs "pocket" the value created by workers (Grammes et al., 2006).

The socialist ideology in the GDR had devastating effects on a broad set of individual characteristics distinctive to entrepreneurs. It implied removing differences in all respects and equalization of socioeconomic conditions in order to ensure equal opportunities and prospects for everybody, everywhere. Accordingly, the role of the central state in private, social, and economic life was extended. Specifically, a paternalistic and redistributive state was established, which guaranteed everyone a right to work, a retirement pension, medical care, and various social services. The equal economic and social treatment, irrespective of individual efforts, and the fact that the central state decided on and provided for its citizens' needs undermined individual responsibility and discouraged creativity, initiative, and proactive behavior. Alesina and Fuchs-Schuendeln (2007) found that, even after the reunification, East Germans still believed less than West Germans that personal well-being is determined by own initiative and effort rather than by the state or mere luck. East Germans also remain more in favor of redistribution and state interventions. The effects of the GDR socialization appear especially strong for cohorts who lived under communism longer. Alesina and Fuchs-Schuendeln (2007) estimate that the effects of the socialist regime will last for generations, perhaps 20 to 40 years. Bauernschuster et al. (2012) document that socialization in the GDR resulted in a lack of self-reliance and differences in the behavior and economic prospects of former GDR citizens compared to former West Germans. Falck et al. (2016) show that East German students, irrespective of whether they received education during the GDR era until 1990 or after the reunification, have lower entrepreneurial intentions than students who grew up in West Germany. Friehe et al. (2015) find significant differences between former GDR and FRG residents regarding personality traits such as locus of control, neuroticism, conscientiousness, and openness, which are also related to entrepreneurship (Parker 2009; Acs and Audretsch 2010).

3.2. West German TV in the GDR

Despite the division of Germany from WWII until 1990 into a capitalist West Germany (FRG) with a free market economy and a socialist East Germany (GDR) with a state-directed, centrally-planned economy, many regions of the GDR still had access to West German public TV starting as early as the 1960s. Until the Basic Treaty in 1972 (*Grundlagenvertrag*), West Germany refused to officially

recognize the existence of another German state. Even after 1972, the official West German doctrine only recognized a reunification of the two German states. Accordingly, the FRG was politically motivated to make Western TV available to all East German citizens to influence public opinion. The first West German public TV channel, *ARD,* started regularly broadcasting on Dec 25, 1952. The second, *ZDF*, started on April 01, 1963.[1] By 1960, West German TV transmitters were purposely located along the inner German border and in West Berlin to cover as much GDR territory as possible. Starting in 1961, various West German public TV programs broadcasted by *ARD* and later *ZDF* were designed for GDR consumption. For instance, "The Morning Show" (*Vormittagsprogramm*) consisted of a summary of West German news and social and political topics, and aimed at enticing GDR viewers (*ARD* 1962; Oltmanns, 1991).

Historical records indicate, however, that few East German regions in the very North-East of Western Pommerania and the South-East of Saxony around the city of Dresden (also known as the "Valley of the Clueless") were never able to receive public West German TV signal due to purely geographical and topological reasons (Hesse 1988; Buhl 1990; Etzkorn and Stiehler 1998; Stiehler 2001). These areas were too far from West German TV transmitters or surrounded by mountains, and the strength of the West German public TV signal was below the threshold required for reception.

To map the availability of West German public TV signal in East Germany at the level of the NUTS3 regions (i.e., counties), for which entrepreneurship data are available, we follow Bursztyn and Cantoni (2016), who apply the Irregular Terrain Model, which predicts the strength of a radio signal at different locations depending on transmitter characteristics such as height, power, and frequency, as well as location information such as distance from the transmitter, geography, and topology (ITM version 1.2.2; Hufford 1995). In particular, the GDR territory was divided into 1×1 kilometer cells (ca. 52 arc-seconds), and the signal strength of the first public West German TV broadcaster, *ARD*, was predicted at altitude of 10 m above the ground. The unweighted average signal strength for each NUTS3 region was then calculated, and a region was classified as having been able to receive West German public TV if the signal strength exceeded -86.8 dB, the average signal strength in the city of Dresden. The choice of this particular discontinuity threshold is based on anecdotal evidence that the West German public TV signal was too weak in Dresden, apart from a few areas located on hills (Bursztyn and Cantoni 2016). This is strongly supported by official GDR survey data anonymously collected before the reunification by the *Zentralarchiv fuer Empirische Sozialforschung* (ZA 6073; ZA 6008), according to which less than 6 percent of the inhabitants of Dresden watched Western TV daily and ca. 68 percent never. In neighboring regions, in which, according to the ITM, the TV signal was strong enough, 90–95 percent of the inhabitants watched Western TV daily or several times per week, and only 1–2 percent never (cf., Table 1 and Table A2 in the Appendix). Overall, we identified 71 East German NUTS3 regions with West German public TV signal and 5 NUTS3 regions without signal (Fig. 1).[2]

The existing evidence provides several arguments for effectively no spatio-temporal variation in the availability of West German TV across East German regions. Not all West German TV transmitters aimed at the East were set up in the same year. However, this alone does not appear sufficient to assume spatio-temporal variation in the treatment. First, the transmitters were erected in a comparably short time window (1952–1960) relative to the subsequent period of "full" treatment (1961–1989). Second, the first Western TV broadcaster, *ARD*, started broadcasting at the end of 1952, but the second, *ZDF*, started in 1963 after transmitters were erected. Yet, during the first few years of transmission, *ARD* only broadcasted for a few hours each day. West German TV shows, specifically aimed at influencing East Germans, started to appear along with "The Morning Show" no earlier than 1961 when transmitters directed eastwards had already been erected. Not least, the availability of private TV receivers in the GDR improved gradually: in 1954, only around 1 percent of East German citizens had a TV receiver at home, and in 1961, less than 30 percent (cf., Table A1 in the Appendix). Hence, it appears justified to assume that Western TV treatment started effectively in all exposed East German regions around the same time in the early 1960s.

West German TV was hugely popular in the GDR: more than 90 percent of inhabitants of East German regions that were able to receive West German TV watched it regularly (*Zentralarchiv fuer Empirische Sozialforschung* ZA 6073 and ZA 6008; cf., Table 1 and Table A2 in the Appendix). The massive popularity of Western TV in the GDR became widely known as the "enduring subscription" of East German citizens to West German TV or a "collective desertion from the Republic every evening" (Dohlus 1991; Braumann 1994; Holzweissig 2002). Western TV's popularity with East Germans resulted from its content, which was essentially antipodal to East Germany's. East German TV had a politically motivated objective to inculcate socialists. This implied that the collective, not the individual, was fundamental, and it was heavily biased in its representation and discussion of social, political, and economic topics. Even entertainment had to serve the official state agenda in "lulling" the public. To guarantee this mission was accomplished, the central state put forth tremendous effort to guarantee the availability of TV signal and the supply of TV receivers throughout the country, despite initial technological backwardness, material shortages, and production difficulties (Norden 1965; Honecker and Lamberz 1977). As a result, East German TV signal was ubiquitously available at every location in the GDR, and there is no evidence of regional differences in the availability of private TV receivers (Meyen 2003; Holzweissig 2002).[3] Still, East German TV was perceived as drab and dreary, which led East German citizens to identify with it less and less (Braumann 1994; *Zentralarchiv fuer Empirische*

[1] Private West German TV started much later and could be received almost exclusively by satellite or cable, both technologies that were unavailable in the GDR until 1990.

[2] NUTS3 regions without West German public TV signal were: *Vorpommern-Ruegen, Vorpommern-Greifswald, Dresden, Saechsiche Schweiz-Osterzgebirge* and *Goerlitz*. In all other NUTS3 regions, West German public TV signal was available. Berlin is not included in our analysis because entrepreneurship data are not separately available for East and West Berlin. We obtain the same results when we use distance to the transmitter as the only regional factor in the ITM.

[3] TV signal coverage, TV receivers availability and the overall penetration rate of TV in the GDR were comparable to that in West Germany and other Western countries (cf., Table A1 in the Appendix as well as Meyen 2003; Holzweissig 2002).

Table 1
Characteristics of East German regions with and without West German public TV signal from the 1960s until 1990.

	Regions without West German public TV ($N = 5$)	Regions with West German public TV ($N = 71$)	Regions with West German public TV bordering regions without West German public TV ($N = 9$)	Regions with West German public TV not bordering regions without West German public TV ($N = 62$)
Sector employment in total employment in 1989 (%)				
Construction	6.04	6.52	6.88	6.47
Energy	3.27	2.78	5.50	2.39
Chemicals	1.80	4.21	3.54	4.31
Metals	1.04	1.71	1.77	1.70
Engineering	18.44	17.76	12.22	18.57
Light	6.93	6.65	6.12	6.73
Textiles	1.76	2.35	2.29	2.35
Food	4.63	4.10	4.57	4.04
Agriculture	12.54	13.09	14.14	12.94
Share of employment in working-age population in 1989 (%)	80.67	81.04	83.23	80.72
Qualification of employees in 1989 (%)				
Tertiary education	7.66	7.02	7.14	7.00
Technical college (*Fachschule*)	14.31	13.83	13.99	13.81
Master craftsman diploma	4.15	4.31	4.77	4.25
Secondary education with full degree (*Facharbeiter*)	59.82	61.92	61.50	61.99
Secondary education without full degree	3.21	3.53	3.34	3.56
Without above education	10.85	9.38	9.27	9.39
Residents watching West German public TV in 1988/89 (%)				
Daily or several times per week	15.12 [a)]	92.50 [b)]	95.28 [c)]	91.38 [d)]
Never	67.85 [a)]	1.84 [b)]	1.88 [c)]	1.82 [d)]
Self-employed in working-age population, year 1989 (%)	1.87	1.71	1.50	1.74
Self-employed share, year 1925 (%)	11.72	11.81	11.93	11.79

Notes: Information about industry structure, employment, and qualification stems from official East German data processed at the Institute of Employment Research (*IAB*) and is available at the NUTS3-level (*Kreise*, definition 2012) (cf., Rudolph 1990). The GDR definition of the working-age population includes students, disabled individuals, self-employed and family workers, service members, and retired women between 60 and 64 (the retirement age for women in the GDR was 60), which explains the low share of employment in that age category. Information about the intensity of watching West German TV by residents of East German regions stems from high-quality data collected by the Central Institute for Youth Research (*Zentralinstitut fuer Jugendforschung*) using anonymous and unmarked individual questionnaires from 1988 to 1989, immediately prior to the fall of the Berlin Wall. Watching intensity was measured using five categories: *daily, several times per week, once per week, seldom,* or *never*. Here, only the share of residents that watched West German TV daily or several times per week/never was reported. The regional assignment is possible only at the level of GDR districts (*Bezirke*), which are significantly larger than the NUTS3 regions that we use in the empirical analysis and may comprise both NUTS3 region with and NUTS3 regions without West German TV. This explains the comparably large share of individuals that watched West German TV daily or several times per week in the Dresden district and, therefore, the figure for all regions without West German TV. Data have been collected for the districts of Schwerin, Magdeburg, Berlin, Cottbus, Leipzig, Karl-Marx, and Erfurt, in which West German TV was available, and the district of Dresden, where West German TV was only partly available. Data from other districts with West German TV access (Neubrandenburg, Potsdam, Frankfurt Oder, Halle, Gera, Suhl) and the second district (Rostock), parts of which had no access to West German TV, are not available.
a) Figures based on information from the district of Dresden; information from the second district without West German TV, Rostock, is unavailable.
b) Average of the districts of Schwerin, Magdeburg, Berlin, Cottbus, Leipzig, Karl-Marx, and Erfurt.
c) Average of the districts Karl-Marx and Cottbus.
d) Average of the districts Schwerin, Magdeburg, Berlin, Leipzig and Erfurt.
Data on self-employment in East Germany in 1989 were initially collected by the GDR Statistical Office and then translated to the NUTS3 regional definition (Kawka 2007).
Self-employment in 1925 is the share of self-employed males in non-agricultural private sector industries to all male employees. Self-employment/entrepreneurship by women was not typical in Germany in 1925 (Fritsch and Wyrwich 2014). Data stem from *Statistik des Deutschen Reichs* (1927).

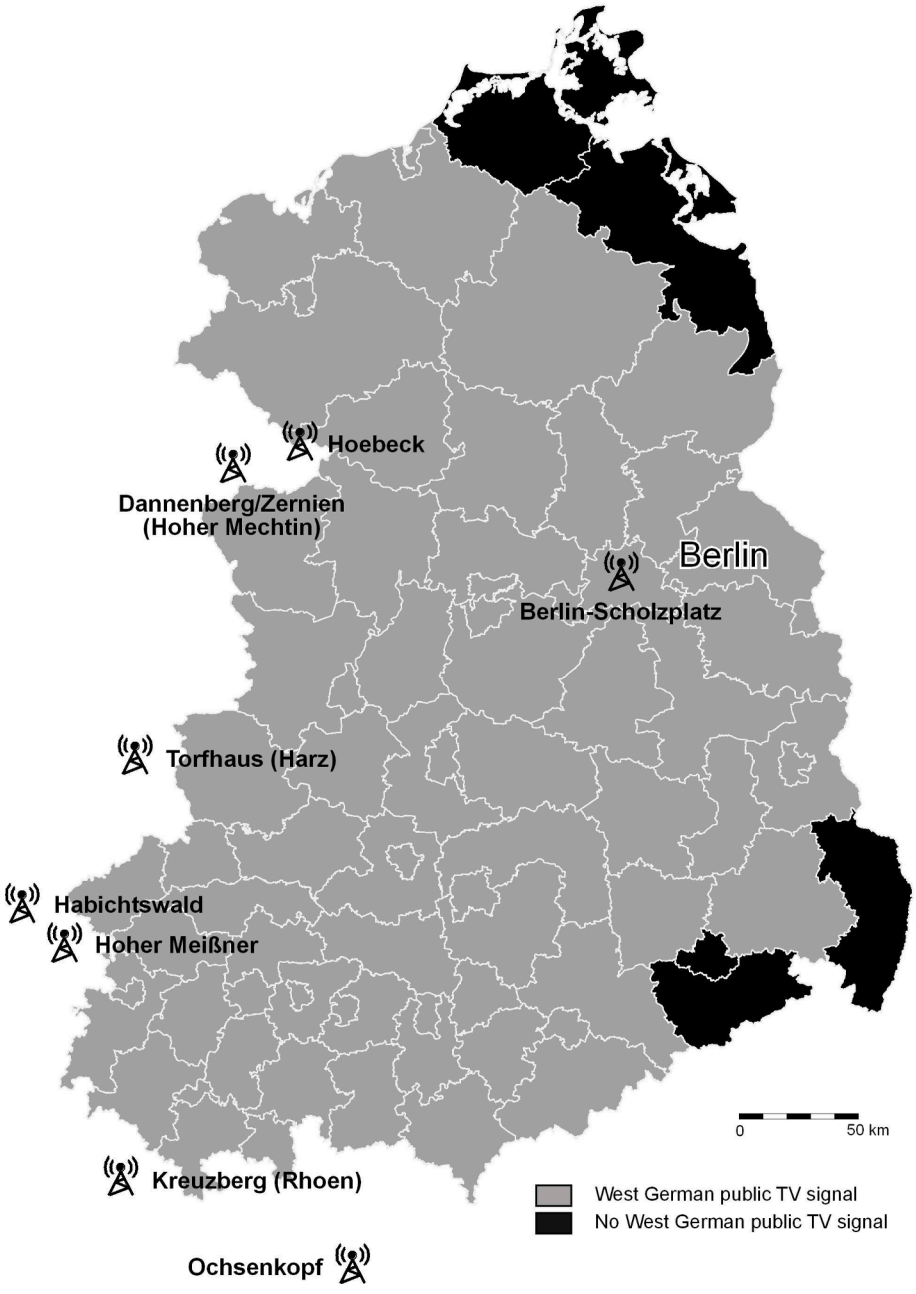

Fig. 1. East German regions with and without West German public TV signal.

Sozialforschung ZA 6073 and *ZA 6008*). In contrast, Western TV, was welcomed and appreciated due to its diversity and authenticity. Free journalism was regarded as a source of unbiased information and alternative points of view which stimulated critical thinking, opinion, and discussion (Braumann 1994; Holzweissig 2002; Kuschel 2016). Prime-time political shows on Western TV, such as *Kennzeichen D* and *Konstraste,* had higher viewing rates in East Germany than in West Germany (Kuehn et al., 2020). Evidence suggests that many learned about the true nature of the socialist state from Western TV (Braumann 1994; Holzweissig 2002). However, the

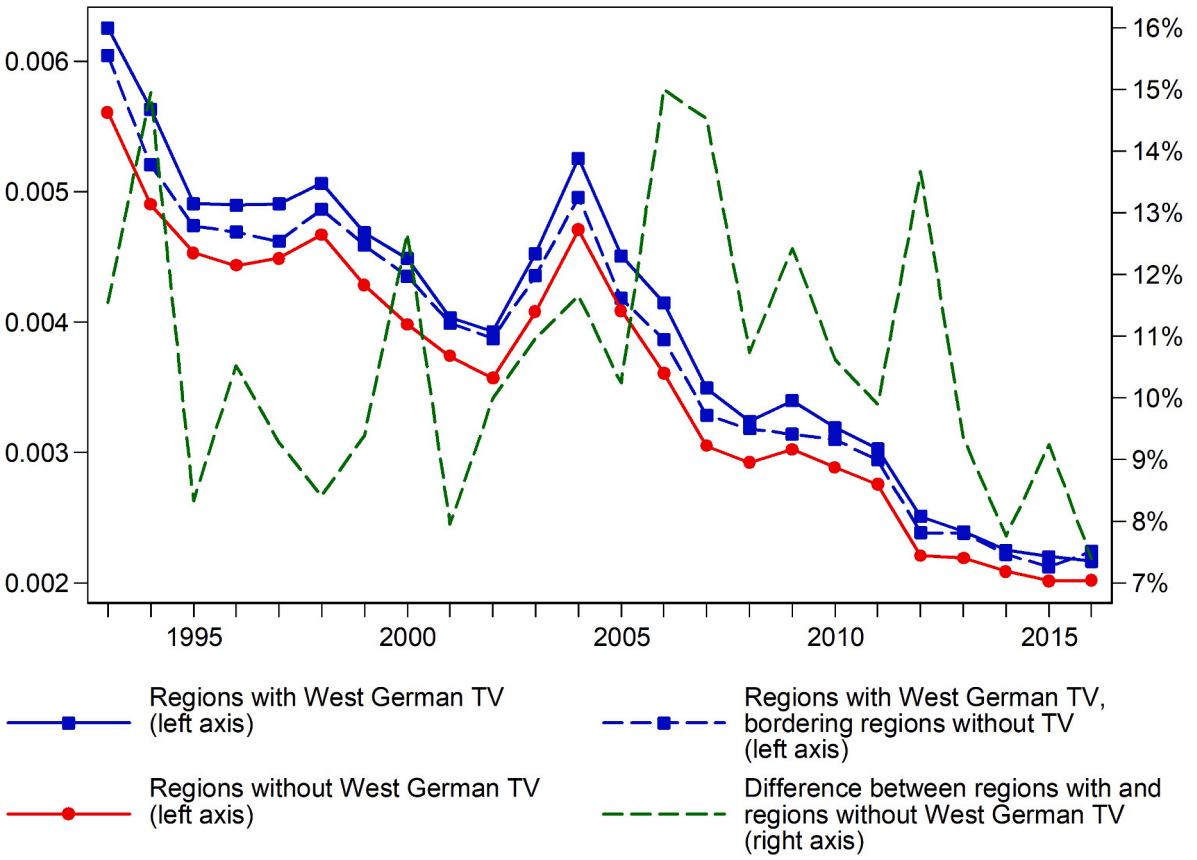

Fig. 2. Entrepreneurship in East German regions with and without West German public TV signal from the 1960s until 1990.
Notes: This figure plots the entrepreneurship incidence in East German regions that had West German public TV signal since the 1960s until 1989 and regions that had not as measured as the number of new businesses startet each year in working-age population. The difference in the entrepreneurship incidence of regions with West German TV and regions without West German TV is measured in percent of the entrepreneurship incidence in reginos without West German TV. Entrepreneurship data stem from the "Mannheim Foundation Panel" (*MUP*) of the Center for European Economic Research (*ZEW*) and include the yearly number of both original firm entries and persons becoming self-employed. Working-age population is population aged 18–64 from the Federal Statistical Office (*destatis*). Regions are NUTS3 (definition 2012). There were 71 East German regions with West German public TV signal since 1960s until 1989, of which 9 regions bordered East German regions without West German TV ($N = 5$); Berlin is excluded.

primary effect of Western TV was on the mindset of East Germans (Liebernickel and Schwarz 1992; Braumann 1994; Lettke 1996; Enquete-Kommission 1997; Holzweissig 2002; Kuehn et al., 2020). Individualism was fundamental to West German TV and was in line with the Zeitgeist of Western civilization in general, as well as with the post-WWII West German social model and official state doctrine.[4] It conveyed images and messages suggesting that self-reliance, self-determination, and experimentation are desirable from an individual and social perspective.

4. Empirical setting, data and identification

The empirical setting can be summarized as follows: starting a business in East Germany was banned by the establishment of the socialist state in 1949. It became possible only after the reunification with capitalist West Germany and the adoption of the free market system in 1990 (for details, see Section 3). For forty years, entrepreneurship was stigmatized in East Germany, and the formal and informal institutions discouraged initiative and proactive behavior. However, since the 1960s, West German public TV, which conveyed values and images conducive to entrepreneurship, was available in 71 of the 76 East German NUTS3 regions (Berlin excluded, cf., Section 3.1 and Footnote 2). In 5 East German regions, Western TV was unavailable due to geographic/topological reasons (i.e., regions were too far away from Western TV transmitters or surrounded by mountains) rather than selection (cf.,

[4] Individualism, humanism, and better education were fundamental in the post-WWII denazification strategy in West Germany.

Yanagizawa-Drott 2014).

In our primary analysis of TV's effects, we use entrepreneurship data available on German NUTS3 regions (i.e., counties) from the 'Mannheim Foundation Panel" (*MUP*) initially collected by the *Creditreform*, Germany's largest credit rating agency and managed by the Center for European Economic Research (*ZEW*) (Engel and Fryges 2002). The data on East Germany are available from 1990 onwards and contain information on both original firm entries and solo entrepreneurs.[5] This is particularly important since a non-negligible fraction of newly started businesses in East Germany occur in retail, handicraft, and personal services. Another advantage of the data is that they allow us to identify and sort out firms that are not de novo entrants, in particular East German firms that were privatized after the reunification in 1990. We use data from 1993–2016. The period from 1990–1992 is dominated by privatization (Engel and Fryges 2002). We stopped in 2016 for two reasons. On the one hand, new businesses are recorded in the data with a time lag, sometimes up to three years. This is especially true for small and unregistered new businesses in specific industries as they enter the *Creditreform* database only when they demand a credit that exceeds a certain amount that requires a check of creditworthiness (Engel and Fryges 2002). On the other hand, we want to avoid potential effects due to the COVID-19 pandemic in 2020 and the associated economic downturn. To address the underlying micro-mechanisms, we use geo-referenced individual-level data from the German Socioeconomic Panel (*GSOEP*); we will describe these data in Section 5.3 below.

A first look at the data (Fig. 2) reveals that, from 1993–2016, entrepreneurship incidence was higher in East German regions that had West German public TV signal from the 1960s through 1990 (solid blue line, squares) than in regions that had no signal (solid red line, circles). The difference (green dashed line) increases slightly by 2007, then decreases somewhat, but remains sizeable. We find the same pattern even if we compare regions without West German TV signal to directly neighboring and arguably more similar regions with West German TV signal (blue dashed line, squares).

There is no evidence that before 1990 there has been a systematic spatial sorting of individuals with characteristics related to West German views and entrepreneurship in East German regions with Western TV signal. The major reason is that interregional mobility in the GDR was very limited. Specifically, the guaranteed right to employment in the GDR came at the expense of heavy regulation of the quantity and quality of labor, which reduced both job and interregional mobility (Mohs 1980). Higher education, professional training, and job supply and allocation were centrally planned and coordinated so that people typically worked all their lives at the first job that they were given, usually provided at their birthplace or in close vicinity. Evidence suggests that inter-firm mobility in the GDR dropped sharply with the establishment of the socialist state and then continued decreasing to about 9 percent in 1979 and 7 percent by the regime's collapse in 1989. For a comparison, inter-firm mobility in West Germany was 17 percent at its lowest during the global economic crisis of 1983 and 24 percent in the years prior to the reunification in 1990 (Gruenert 1997a, H. b). Interregional mobility in the GDR, which is naturally lower than job mobility, was particularly low due to centrally planned housing allocation and shortages (Ehmer 2013). Between 1970 and 1988, the interregional mobility in the GDR was about 2.5 per 100 citizens on average per year, half of the respective figure in West Germany (various Statistical Yearbooks of the GDR; Ehmer 2013).

Furthermore, official GDR data from 1989 show that at the end of the socialist era, East German regions without Western TV, though located peripherally, were on average very similar to East German regions with Western TV concerning a number of observable characteristics and the share of self-employed individuals (cf., Table 1). In particular, regions with and without West German TV show a similar industry structure as indicated by employment shares in different sectors. Also, we find virtually no differences in employment levels and qualification structure. We find very similar shares of self-employed persons in the working-age population despite differences in the availability of Western TV and the intensity of watching it, which is in line with the fact that, during the 40 years of GDR existence, starting a new firm was a central state decision and not an individual one. Moreover, we also find virtually identical self-employment shares in the year 1925. As to the degree to which self-employment shares can be considered a catch-all proxy for general entrepreneurial conditions in a region, these findings indicate that treated and non-treated East German regions have been, on average, historically similar. Along this line of reasoning, regional differences in entrepreneurship after the reunification are unlikely to be a legacy of unobserved historical differences that are inherent to a region. A pronounced degree of similarity is also found for East German regions with Western TV bordering non-TV regions and non-TV regions, which further supports the exogeneity of the treatment.

Moreover, existing evidence and historical records indicate no regional differences in West German radio signal availability throughout East Germany, which could have had effects similar to Western TV (Braumann 1994; Holzweissig 2002; Meyen 2003). Most Western radio stations used *ultra short waves* (Ultra High Frequency carrier range, UHF) and covered parts of the East German territory, similar to Western TV as it also used UHF broadband. However, while Western TV had a broad repertoire, including entertainment, news, and social and political topics, the typical radio stations were primarily popular among East German youth as they broadcasted mainly Western music (described as "vital/indispensable for life") and very little news. Very few Western radio stations broadcasted social, economic and political topics, and were, similar to Western TV, aimed to influence opinion in East Germany (e.g., Radio Liberty/Radio Free Europe). However, since coverage increases with wavelength, they used *short waves* (High Frequency carrier range, HF) and mostly *medium* and *long waves* (e.g., the upper part of the so called AM band), which allowed them to

[5] For instance, in the Establishment History Panel *(Betriebshistorikpanel, BHP)* of the Institute for Employment Research (*IAB*), new businesses can be identified only if they have at least one employee subject to social insurance.

guarantee their mission and ensure signal availability over the entire GDR territory. This is supported by the ITM that predicts coverage over all of Eastern Germany for radio stations using short and especially medium/long waves.

We start our analysis with an assessment of TV's average effect on entrepreneurship from 1993–2016 by estimating the following specification:

$$Y_{rt} = \beta TV_r + \gamma' X_{rt} + \delta' Z_r + \mu_t + \varepsilon_{rt}. \tag{1.1}$$

Y_{rt} is (the log of) the number of new businesses started each year t from 1993–2016 per working-age population (18–64 years old) in an East German NUTS3 region (county), r. TV_r is a binary, time-invariant treatment indicator for the availability of West German public TV signal in a region r from the 1960s until 1990 (cf., Fig. 1 and Footnote 2). The β provides us with an estimate for the average post-treatment difference in entrepreneurship incidence between East German regions that had and did not have West German public TV signal.

X_{rt} is a set of time-variant region-specific characteristics (in logs) identified by prior research as essential determinants of local entrepreneurship (for an overview, see Acs and Audretsch 2010; Fritsch and Storey 2015). We include the (log) employment shares in 16 NACE macro-sectors (A-Q) as well as the (log) shares of local firms in different size classes to account for arbitrary sectoral, technological, and further structural differences across regions. We also include the (log) local unemployment rate to account for local business cycles, labor market effects, and differential entrepreneurship propensity from unemployment. We add the (log) shares of local residents that in- and out-migrate to account for that (i) (in-/out-)migration might be related to more or less favorable local conditions affecting entrepreneurship, (ii) not all current local residents might have lived in the region prior 1990, or (iii) individuals exposed to Western TV might have moved to West Germany. We also include the (log) shares of local residents in different age categories to account for entrepreneurship propensity differences that occur with age. Similarly, we add the (log) shares of local workforce with different qualification levels.

The set Z_r contains time-invariant region-specific controls. We include the (log) distance to the next West German NUTS3 region to account for (i) the proximity to large(r) or (more) sophisticated West German markets that might stimulate entrepreneurship, or (ii) lower costs of production (e.g., wages and public subsidies) in East Germany that might have attracted West German entrepreneurs to start their firms in East Germany, particularly in regions along the former inner German border. We also include the (log) share of self-employed individuals in the working-age population in 1989 as a catch-all proxy for regional characteristics and conditions at the end of the socialist regime, which might influence subsequent development. We also include the (log) share of self-employment in 1925 as a catch-all proxy for deeply rooted regional factors that might influence entrepreneurship in the very long term. μ_t is a full set of year dummies that control for yearly shocks common to all regions.

We also estimate further specifications to alleviate concerns that unobserved regional characteristics confound the results. The causal interpretation of β in (1.1) rests on the strong exogeneity of the TV signal availability. As discussed in greater detail above, Western TV had to cover as much GDR territory as possible, and (i) TV signal availability was a function of geography, predominantly distance to transmitters. Moreover, we found (ii) no evidence for spatial sorting and (iii) no systematic differences between TV and non-TV regions in 1989 immediately preceding the analysis regarding both self-employment shares and several important observables related to entrepreneurship and self-employment (cf., Table 1). Similarly, (iv) differential entrepreneurship trends before 1990 can be ruled out since starting an own business was banned during the communist era. We also found (v) no evidence for historical differences as indicated by the virtually identical self-employment shares from 1925. However, it could be argued that, because TV availability is time-invariant and introducing regional fixed effects would make it impossible to identify TV's effect, not all unobserved time-invariant regional factors that might be correlated with the availability of Western TV signal and local entrepreneurship can be accounted for in (1.1). It could also be argued that there is a possibility that as free market conditions are restored, treated regions find themselves—for some unobserved reason(s)—on a higher entrepreneurial level, and that this possibility is not fully accounted for by the controls in X_{rt}, nor by the historical entrepreneurship rates. To alleviate such concerns, we proceed as follows.

We account for unobserved arbitrary differences in region-specific entrepreneurial trends by estimating specifications in which the time-fixed effects (μ_t) that apply equally to all regions are replaced by region-specific flexible (quadratic) time trends:

$$Y_{rt} = \beta TV_r + \gamma' X_{rt} + \delta' Z_r + time\_trend_r + time\_trend_r^2 + \varepsilon_{rt}. \tag{1.2}$$

We further estimate specifications that include dummies for the Federal States (*Bundesland*) $\zeta_{FS(r)}$, and Federal States times year dummies $\zeta_{FS(r)} \times \mu_t$:

$$Y_{rt} = \beta TV_r + \gamma' X_{rt} + \delta' Z_r + \zeta_{FS(r)} + \mu_t + \varepsilon_{rt}, \tag{2.1}$$

$$Y_{rt} = \beta TV_r + \gamma' X_{rt} + \delta' Z_r + \zeta_{FS(r)} \times \mu_t + \varepsilon_{rt}. \tag{2.2}$$

Since the Federal States comprise relatively similar NUTS3 regions r and constitute economic and political decisions making units, introducing $\zeta_{FS(r)}$ reduces unobserved heterogeneity somewhat and rules out that the results are confounded by arbitrary Federal State level factors affecting entrepreneurship, e.g., entrepreneurship support policies. Because the availability of Western TV varies across

Table 2
TV and entrepreneurship – General effects (1993–2016; average).

Dep : NEW_BUSINESSES/$POP_{18–64}$ (log)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
TV $_r$ (yes=1; no=0)	0.133***	0.129***	0.167***	0.158*	0.105***	0.112***	0.117***	0.100***	0.111***	0.113***	0.095*	0.124	0.131*
	(0.030)	(0.030)	(0.038)	(0.093)	(0.030)	(0.030)	(0.037)	(0.030)	(0.031)	(0.038)	(0.052)	(0.075)	(0.073)
IND_SHARES $_{rt}$ (log)	+	+	+	+	+	+	+	+	+	+	+	+	+
μ_t	+	+	+		+	+	+				+		
time_trend $_r$				+									
time_trend ^{2} $_r$				+									
$\zeta_{FS(r)}$					+	+	+						
$\zeta_{FS(r)}$ * μ_t								+	+	+		+	+
DIST_KM_TO_WEST $_r$ (log)	+	+	+	+	+	+	+	+	+	+	+	+	+
POP_*_AGE_SHARES $_{rt}$ (log)	+	+	+	+	+	+	+	+	+	+	+	+	+
EMPL_*_QUALI_SHARES $_{rt}$ (log)	+	+	+	+	+	+	+	+	+	+	+	+	+
FIRMS_*_EMPL_SHARES $_{rt}$ (log)	+	+			+	+		+	+		+	+	
UNEMPL / POP_18–64 $_{rt}$ (log)	+	+			+	+		+	+		+	+	
IN_MIGRATION / TOTAL_POP $_{rt}$ (log)		+				+			+				
OUT_MIGRATION / TOTAL_POP $_{rt}$ (log)		+				+			+				
Self-employed / WORKING_POP 1989 $_r$ (log)	+	+	+	+	+	+	+	+	+	+	+	+	+
Share of self-employed males 1925 $_r$ (log)	+	+	+	+	+	+	+	+	+	+	+	+	+
Constant	+	+	+	+	+	+	+	+	+	+	+	+	+
R^2	0.881	0.878	0.864	0.888	0.883	0.880	0.870	0.894	0.890	0.880	0.942	0.957	0.951
Observations (NUTS3 regions * Years)	1824	1672	1824	1824	1824	1672	1824	1824	1672	1824	336	336	336
NUTS3 regions	76	76	76	76	76	76	76	76	76	76	14	14	14
Years	1993–2016	1995–2016	1993–2016	1993–2016	1993–2016	1995–2016	1993–2016	1993–2016	1995–2016	1993–2016	1993–2016	1993–2016	1993–2016

Notes: This table reports the results of OLS estimations of various specifications of Eqs. (1.1)-(2.2) for the effect of the availability of West German public TV signal on the entrepreneurship incidence in East German NUTS3 regions (definition 2012) on average from 1993-2016; there are 71/5 regions with/without West German public TV signal; Berlin is excluded. Standard errors are clustered at the NUTS3-region level and are reported in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$. Full results (incl. control variables) are reported in Table A3 in the Appendix.
The dependent variable, *NEW_BUSINESSES / POP_18–64*, is (the log of) the yearly number of new businesses from the Mannheim Foundation Panel (*MUP*) of the Center for European Economic Research (*ZEW*) in the working-age population (18–64 yo) from the Federal Statistical Office (*destatis*). *IND_SHARES* are the (log) shares of employment in 16 NACE macro-sectors (A-Q) from the Establishment History Panel (*Betriebshistorikpanel, BHP*) of the Institute for Employment Research (*IAB*). *DIST_KM_TO_WEST* is the distance (in log km) to the next West German NUTS3 region. *POP_*_AGE_SHARES* are the (log) shares of employment in different age categories (18–24. 25–34, 35–44, 45–54, 55–64, younger/older than 18/65 serve as reference group) from the Federal Statistical Office (*destatis*). *EMPL_*_QUALI_SHARES* are the (log) shares of employment with different qualifications (low(reference group), middle, high, unknown) from the Establishment History Panel (*Betriebshistorikpanel, BHP*) of the Institute for Employment Research (*IAB*). *FIRMS_*_EMPL_SHARES* are the (log) shares of firms in different size classes (1–19(reference group), 20–49, 50–199, 200+) from the Establishment History Panel (*Betriebshistorikpanel, BHP*) of the Institute for Employment Research (*IAB*). *UNEMPL / POP_18–64* is (the log of) the number of unemployed persons in the working-age population (18–64 yo) provided by the Federal Employment Agency (*BA*) and available at the Federal Statistical Office (*destatis*). *IN_MIGRATION / TOTAL_POP* and *OUT_MIGRATION / TOTAL_POP* are the (log) shares of individuals that in- and out-migrated across NUTS3 regions' borders in total regional population from the Federal Statistical Office (*destatis*). Migration data are available only from 1995 onwards. *Self-employed 1989/WORKING_POP* is the (log) share of self-employed in the working-age population in 1989, initially collected by the GDR Statistical Office and then translated to the NUTS3 regional definition (Kawka 2007). *Share of self-employed males 1925* is the (log) share of self-employed males in non-agricultural private sector industries in all male employees in 1925 from the Statistik des Deutschen Reichs (1927) (cf., Fritsch and Wyrwich 2014).
We obtain virtually identical results from Conley (1999) OLS estimations with spatial standard errors (cf., Table A3 in the Appendix).

Table 3
TV and entrepreneurship – Temporal pattern of the effects.

Dep: NEW_BUSINESSES / POP_18–64 $_{rt}$ (log)	(1)	(2)	(3)	(4)	(5)	(6)
1993*TV $_{r}$ (yes=1; no=0)	0.103*	0.079	0.023			
	(0.058)	(0.058)	(0.054)			
1994*TV $_{r}$ (yes=1; no=0)	0.160***	0.130**	0.066			
	(0.056)	(0.053)	(0.060)			
1995*TV $_{r}$ (yes=1; no=0)	0.115*	0.084	0.060	0.129*	0.111*	0.076
	(0.066)	(0.063)	(0.065)	(0.065)	(0.064)	(0.072)
1996*TV $_{r}$ (yes=1; no=0)	0.170	0.141	0.112	0.174	0.158	0.123
	(0.119)	(0.114)	(0.100)	(0.115)	(0.111)	(0.104)
1997*TV $_{r}$ (yes=1; no=0)	0.113*	0.087	0.054	0.115**	0.101*	0.064
	(0.058)	(0.055)	(0.049)	(0.057)	(0.055)	(0.056)
1998*TV $_{r}$ (yes=1; no=0)	0.101	0.074	0.058	0.096	0.081	0.061
	(0.062)	(0.059)	(0.062)	(0.063)	(0.061)	(0.069)
1999*TV $_{r}$ (yes=1; no=0)	0.101**	0.071	0.101**	0.094*	0.078	0.107**
	(0.048)	(0.050)	(0.044)	(0.052)	(0.052)	(0.047)
2000*TV $_{r}$ (yes=1; no=0)	0.117***	0.088***	0.135***	0.114***	0.098***	0.139***
	(0.029)	(0.029)	(0.032)	(0.029)	(0.030)	(0.034)
2001*TV $_{r}$ (yes=1; no=0)	0.086**	0.055	0.111***	0.080**	0.063*	0.113***
	(0.033)	(0.034)	(0.037)	(0.032)	(0.032)	(0.036)
2002*TV $_{r}$ (yes=1; no=0)	0.122***	0.092*	0.108**	0.119***	0.103**	0.114**
	(0.045)	(0.050)	(0.051)	(0.043)	(0.047)	(0.047)
2003*TV $_{r}$ (yes=1; no=0)	0.135***	0.107**	0.117**	0.134***	0.119**	0.124**
	(0.041)	(0.044)	(0.048)	(0.044)	(0.046)	(0.049)
2004*TV $_{r}$ (yes=1; no=0)	0.142***	0.114***	0.079*	0.142***	0.127***	0.087**
	(0.037)	(0.040)	(0.046)	(0.034)	(0.038)	(0.043)
2005*TV $_{r}$ (yes=1; no=0)	0.128***	0.101**	0.058	0.131***	0.117***	0.072
	(0.040)	(0.041)	(0.048)	(0.040)	(0.042)	(0.050)
2006*TV $_{r}$ (yes=1; no=0)	0.169***	0.142***	0.107**	0.174***	0.160***	0.125***
	(0.046)	(0.046)	(0.048)	(0.042)	(0.044)	(0.047)
2007*TV $_{r}$ (yes=1; no=0)	0.172***	0.146***	0.144***	0.174***	0.160***	0.157***
	(0.032)	(0.034)	(0.036)	(0.032)	(0.034)	(0.037)
2008*TV $_{r}$ (yes=1; no=0)	0.145***	0.119***	0.151***	0.148***	0.134***	0.166***
	(0.040)	(0.042)	(0.043)	(0.038)	(0.041)	(0.042)
2009*TV $_{r}$ (yes=1; no=0)	0.167***	0.142***	0.144***	0.165***	0.151***	0.156***
	(0.047)	(0.047)	(0.035)	(0.043)	(0.044)	(0.034)
2010*TV $_{r}$ (yes=1; no=0)	0.151***	0.125***	0.098**	0.146***	0.131***	0.107**
	(0.043)	(0.046)	(0.044)	(0.039)	(0.042)	(0.041)
2011*TV $_{r}$ (yes=1; no=0)	0.110***	0.083**	0.101**	0.101***	0.084**	0.104**
	(0.034)	(0.036)	(0.039)	(0.036)	(0.039)	(0.044)
2012*TV $_{r}$ (yes=1; no=0)	0.164***	0.135**	0.173***	0.154**	0.135**	0.176**
	(0.061)	(0.060)	(0.064)	(0.065)	(0.065)	(0.069)
2013*TV $_{r}$ (yes=1; no=0)	0.122**	0.092*	0.103**	0.113**	0.093*	0.108**
	(0.048)	(0.050)	(0.048)	(0.053)	(0.055)	(0.053)
2014*TV $_{r}$ (yes=1; no=0)	0.117***	0.086**	0.089**	0.098**	0.078*	0.082*
	(0.040)	(0.042)	(0.043)	(0.046)	(0.047)	(0.046)
2015*TV $_{r}$ (yes=1; no=0)	0.146***	0.114***	0.093*	0.119***	0.099**	0.080
	(0.041)	(0.041)	(0.055)	(0.044)	(0.044)	(0.054)
2016*TV $_{r}$ (yes=1; no=0)	0.146**	0.114*	0.112	0.121*	0.101	0.101
	(0.065)	(0.065)	(0.070)	(0.072)	(0.070)	(0.071)
IND_SHARES $_{rt}$ (log)	+	+	+	+	+	+
μ_t	+	+		+	+	
$\zeta_{FS(r)}$		+			+	
$\zeta_{FS(r)}$ * μ_t			+			+
DIST_KM_TO_WEST $_{r}$ (log)	+	+	+	+	+	+
POP_18–24_SHARE $_{rt}$ (log)	+	+	+	+	+	+
EMPL_UNKNOWN_QUALI_SHARE $_{rt}$ (log)	+	+	+	+	+	+
FIRMS_20–49_EMPL_SHARE $_{rt}$ (log)	+	+	+	+	+	+
UNEMPL / POP_18–64 $_{rt}$ (log)	+	+	+	+	+	+
IN_MIGRATION / TOTAL_POP $_{rt}$ (log)				+	+	+
OUT_MIGRATION / TOTAL_POP $_{rt}$ (log)				+	+	+
Self-employed / WORKING_POP 1989 $_{r}$ (log)	+	+	+	+	+	+
Share of self-employed males 1925 $_{r}$ (log)	+	+	+	+	+	+
Constant	+	+	+	+	+	+
R^2	0.881	0.883	0.894	0.879	0.880	0.890
Observations (NUTS3 regions * Years)	1824	1824	1824	1672	1672	1672
NUTS3 regions	76	76	76	76	76	76
Years	1993–2016	1993–2016	1993–2016	1995–2016	1995–2016	1995–2016

Notes: This table reports the results of OLS estimations of various specifications of Eq. (3) for the temporal pattern (1993–2016) of the effect of the availability of West German public TV signal on the entrepreneurship incidence in East German NUTS3 regions (definition 2012); there are 71/5

regions with/without West German public TV signal, Berlin is excluded. Standard errors are clustered at the NUTS3-region level and reported in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$. Full results (incl. control variables) are reported in Table A4 in the Appendix.
The dependent variable, *NEW_BUSINESSES / POP_18–64*, is (the log of) the yearly number of new businesses from the Mannheim Foundation Panel (*MUP*) of the Center for European Economic Research (*ZEW*) in the working-age population (18–64 yo) from the Federal Statistical Office (*destatis*). *IND_SHARES* are the (log) shares of employment in 16 NACE macro-sectors (A-Q) from the Establishment History Panel (*Betriebshistorikpanel, BHP*) of the Institute for Employment Research (*IAB*). *DIST_KM_TO_WEST* is the distance (in log km) to the next West German NUTS3 region. *POP_*_AGE_-SHARES* are the (log) shares of employment in different age categories (18–24. 25–34, 35–44, 45–54, 55–64, younger/older than 18/65 serve as reference group) from the Federal Statistical Office (*destatis*). *EMPL_*_QUALI_SHARES* are the (log) shares of employment with different qualifications (low(reference group), middle, high, unknown) from the Establishment History Panel (*Betriebshistorikpanel, BHP*) of the Institute for Employment Research (*IAB*). *FIRMS_*_EMPL_SHARES* are the (log) shares of firms in different size classes (1–19(reference group), 20–49, 50–199, 200+) from the Establishment History Panel (*Betriebshistorikpanel, BHP*) of the Institute for Employment Research (*IAB*). *UNEMPL / POP_18–64* is (the log of) the number of unemployed persons in the working-age population (18–64 yo) provided by the Federal Employment Agency (*BA*) and available at the Federal Statistical Office (*destatis*). *IN_MIGRATION / TOTAL_POP* and *OUT_MIGRATION / TOTAL_POP* are the (log) shares of individuals that in- and out-migrated across NUTS3 regions' borders in total regional population from the Federal Statistical Office (*destatis*). Migration data are available only from 1995 onwards. *Self-employed 1989 / WORKING_POP* is the (log) share of self-employed in the working-age population in 1989, initially collected by the GDR Statistical Office and then translated to the NUTS3 regional definition (Kawka 2007). *Share of self-employed males 1925* is the (log) share of self-employed males in non-agricultural private sector industries in all male employees in 1925 from the Statistik des Deutschen Reichs (1927) (cf., Fritsch and Wyrwich 2014).
We obtain virtually identical results from Conley (1999) OLS estimations with spatial standard errors (cf., Table A4 in the Appendix).

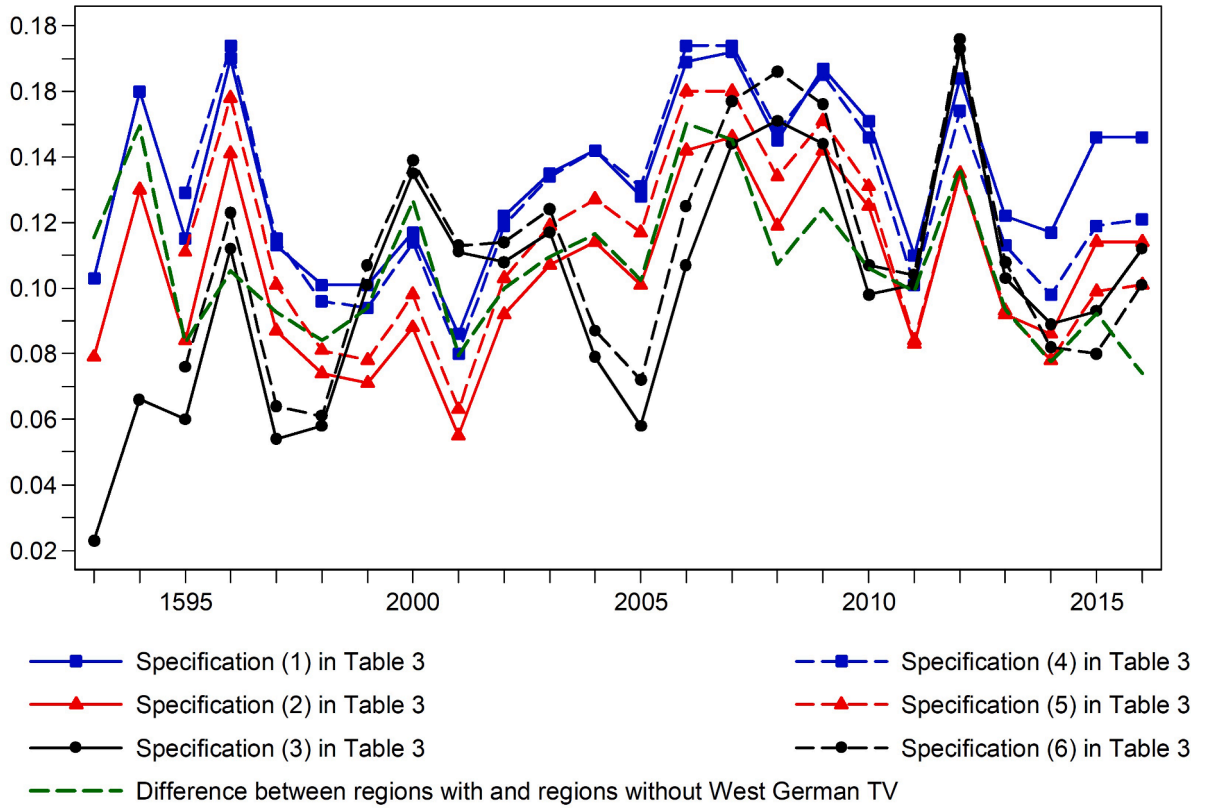

Fig. 3. TV and entrepreneurship – Temporal pattern of the effects.
Notes: This figure plots the estimated coefficients (from Table 3) for the effects of the availability of West German public TV singnal on the entrepreneurship incidence in East Germany. The difference in the entrepreneurship incidence of regions with West German TV and regions without West German TV is measured in percent (divided by 100) of the entrepreneurship incidence in regions without West German TV. Entrepreneurship data stem from the "Mannheim Foundation Panel" (*MUP*) of the Center for European Economic Research (*ZEW*) and include the yearly number of both original firm entries and persons becoming self-employed. Working-age population is population aged 18–64 from the Federal Statistical Office (*destatis*). Regions are NUTS3 (definition 2012). There were 71 East German regions with West German public TV signal since 1960s until 1989, of which 9 regions bordered East German regions without West German TV ($N = 5$); Berlin is excluded.

Table 4
Effect of West German public TV exposure on entrepreneurship/self-employment and the importance of independence by directly exposed individuals in different cohorts (first-order effects).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Dep: Entrepreneurship / Self-employment in 1990–2016 (yes=1; no=0) Probit, marginal effects at the mean of the explanatory variables				OLS				Dep: Importance of 'independence' in 1990 (0=low; 10=high) Ordered probit			
	All birth cohorts 1927–1972	Birth cohort 1927–1945	Birth cohort 1946–1960	Birth cohort 1961–1972	All birth cohorts 1927–1972	Birth cohort 1927–1945	Birth cohort 1946–1960	Birth cohort 1961–1972	All birth cohorts 1927–1972	Birth cohort 1927–1945	Birth cohort 1946–1960	Birth cohort 1961–1972
TV (yes=1; no=0)	0.021*	0.007	0.017	0.046*	0.030*	0.031	0.007	0.067*	0.211***	0.183	0.284***	0.352**
	(0.011)	(0.007)	(0.018)	(0.027)	(0.018)	(0.024)	(0.032)	(0.035)	(0.078)	(0.165)	(0.108)	(0.173)
Controls (see Notes)	+	+	+	+	+	+	+	+	+	+	+	+
Constant					+	+	+	+				
R^2					0.124	0.214	0.175	0.106				
N (Individuals)	2331	849	838	640	2331	853	838	640	2414	808	981	625
Avrg. age in 1990	39.2	53.2	36.5	23.9	39.2	53.2	36.5	23.9	38.6	52.2	36.5	24.2

Notes: Entrepreneurship/self-employment is binary, with unity if an individual started a business from 1990 to 2016. The importance of independence is measured in 1990 and ranges from 0 (low) to 10 (high). *TV* is binary, with unity if an individual lived in 1989 in an East German region with a West German public TV signal. In all specifications, we account for age (in years), gender (1=female; 0=male), and schooling (in years). In specifications (9)-(12), occupation dummies (2-digits *KldB* 1988) are included. In specifications (1)-(8), industry dummies are included since *KldB* 1988 information is not collected between 1990 and 2016. Heteroscedasticity robust standard errors. *** $p<0.01$, ** $p<0.05$, * $p<0.1$. Data: German Socioeconomic Panel (*GSOEP*).

Table 5
TV and entrepreneurial/self-employment aspirations of not-directly exposed individuals born in 1985 or later (second-order effects).

Dep: Wish to become entrepreneur / self-employed (yes=1; no=0)	(1) Probit, marginal effects Birth cohort 1985+	(2)	(3) OLS (linear probability) Birth cohort 1985+	(4)
TV $_i$ (yes=1; no=0)	0.166*	0.180***	0.149*	0.161**
	(0.084)	(0.070)	(0.085)	(0.074)
New businesses/Population 18–64yo $_{r(i)}$		69.55		57.89
		(106.3)		(90.68)
Age $_i$ (years)	-0.003	-0.003	-0.006	-0.006
	(0.036)	(0.036)	(0.034)	(0.033)
Gender $_i$ (1=female; 0=male)	-0.140	-0.142	-0.125	-0.125
	(0.116)	(0.115)	(0.105)	(0.104)
Entrepreneurial parents $_i$ (1=yes; 0=no)	-0.093	-0.086	-0.088	-0.080
	(0.106)	(0.104)	(0.100)	(0.100)
Education level dummies $_i$		+		+
D $_t$		+		+
Constant			0.046	-0.228
			(0.620)	(0.797)
R^2			0.152	0.154
N (Individuals)	127	127	135	135

Notes: This table reports marginal effects from probit estimations as well as the results from linear probability model estimations by OLS of the probability of individuals born in 1985 or later that wish to become an entrepreneur or self-employed as a function of the regional availability of West German public TV signal before 1990. The dependent variable is binary, with unity if an individual wishes to start a business. *TV* is binary, with unity if parents have lived by 1989 in an East German region with West German public TV signal. The entrepreneurship rate in region *r* is measured as the number of new businesses per 18–64 yo population in the year of becoming entrepreneur/self-employed (for those who start a business) and in the last survey year (for those who do not). Alternative entrepreneurship rate definitions (e.g., change since 1993) and alternative specifications (log) lead to the same conclusions. Standard errors in parentheses are clustered at the regional level. *** $p<0.01$, ** $p<0.05$, * $p<0.1$. Data: German Socioeconomic Panel (*GSOEP*).

NUTS3 regions belonging the same Federal State, β can be identified.

We also estimate variants of (1.1) and (2.2), where we compare the entrepreneurial incidence in East German regions without West German TV signal to that in directly geographically neighboring regions exposed to West German TV signal. As treatment and control groups in this setting are arguably even more similar, this approach further minimizes concerns of unobserved systemic regional differences confounding the results.[6] A comparison of the results of the different specifications, i.e., the estimates of β according to (1.1)-(2.2), will give us a sense of the robustness and reliability of the results.

To understand whether TV effects fade with time, we estimate a specification similar to (1.1), in which TV_r is interacted with year dummies μ_t:

$$Y_{rt} = \xi_t^{'}(TV_r \times \mu_t) + \gamma^{'} X_{rt} + \delta^{'} Z_r + \mu_t + \varepsilon_{rt}. \tag{3}$$

The ξ_t's indicate whether and how the impact of TV on entrepreneurship changes over time.

5. Results

5.1. Can entrepreneurship be influenced by TV?

Table 2 reports the results from OLS estimations of different specifications of Eqs. (1.1)-(2.2) for the average effect of West German public TV signal availability in East German regions (from the 1960s until 1989) on the entrepreneurship incidence in these regions from 1993–2016.

In specification (1) in Table 2, the TV effect is estimated conditional on industry structure, firm size structure, residents' age, workforce qualification, unemployment rate, distance to the next West German NUTS3 region, self-employment shares in 1989 and 1925, and time dummies. In specification (2), we add the shares of local residents that in- and out-migrate.[7] In specification (3), we aim at avoiding potential "bad controls" issues and include only control variables that are arguably strongly exogenous to West German TV such as industry structure, year effects, distance to West Germany, and self-employment in 1989 and 1925 (Angrist and Pischke 2008).

In specifications (4) – (13), we even more thoroughly consider potentially confounding effects due to arbitrary unobservable regional factors. Specification (4) is based on specification (3) but includes region-specific time trends (flexible, second order/

[6] Further approaches to identifying the effects of time-invariant regressors include Hausman and Taylor (1981), correlated random effects (Mundlak 1978; Wooldridge 2010), and hybrid models (Allison 2009). However, since these approaches yield similar results, we do not report these here.

[7] We lose two years, 1993 and 1994 because migration data are available only from 1995 onwards.

quadratic polynomial) instead of year dummies. Specifications (5) – (7) are essentially variants of specifications (1) – (3) but include Federal State fixed effects to account for further unobserved, arbitrary time-invariant effects common to NUTS3 regions belonging to the same Federal State (recall that the Federal States constitute economic and political decisions making units). Specifications (8) – (10) are more flexible as the Federal State fixed effects are interacted with year dummies. Finally, in specifications (11) – (13), we compare the entrepreneurship incidence in regions without West German TV signal to that in directly neighboring regions with West German TV signal, which are more similar.

Overall, the OLS estimates of Eqs. (1.1)-(2.2) for the effect of TV reported in Table 2 are of similar magnitude across different specifications. They indicate that, on average, between 1993 and 2016, the entrepreneurship incidence in regions with West German public TV signal from the 1960s until 1990 was 10–12 percent higher than in regions without signal.

5.2. *Does the TV effect change over time?*

Table 3 reports the results from OLS estimations of different specifications of Eq. (3), where we interact the binary time-invariant indicator for the availability of West German public TV signal with year dummies to better understand whether and how the TV effect changes over time. In specification (1), we control for distance to West Germany, industry structure, age, qualification, firm size structure, unemployment, and self-employment from 1989 and 1925, as well as year effects. In specification (2), Federal State dummies are added to account for arbitrary unobserved time-invariant effects common to NUTS3 regions belonging to the same Federal State. In specification (3), the Federal State dummies are interacted with the year dummies. Specifications (4) – (6) are based upon (1) – (3) but account additionally for in- and out-migration.

Overall, the OLS results in Table 3 reveal that, throughout the entire period of analysis from 1993–2016, entrepreneurship incidence was higher in East German regions with West German public TV signal than in regions with no TV signal. However, the differences tend to slightly increase until 2007 and then slightly decrease afterwards. Nevertheless, the differences are still pronounced even by the end of our analysis period, i.e., even a quarter of a century after the end of the differential treatment. For convenience, Fig. 3 plots the estimates for the effect of Western TV on entrepreneurship from the different specifications in Table 3. A more definitive conclusion on whether this hump-shaped pattern indicates a fade-out requires lifting the underlying micro-mechanisms, a subject of Section 5.3.

5.3. *Fade-out or intergenerational transmission of entrepreneurial mindset: micro-level mechanisms*

In this section, we deploy individual-level data that help us corroborate the results from the regional-level analysis (Section 5.1) and better understand the individual-level mechanisms underlying the TV effect and whether the hump-shaped temporal pattern of the TV effect indicates fade-out (Section 5.2). The individual-level data stem from the German Socioeconomic Panel (*GSOEP*), an annual longitudinal survey of a representative panel of individuals aged 18 or above, including comprehensive information on various characteristics of the surveyed individuals and their households.[8] In particular, the data contain information about entrepreneurship and self-employment and the importance of independence, an attitude distinctive of entrepreneurs/self-employed persons (Rauch 2014). Uniquely, the first survey in East Germany in 1990 collects information about the place of residence immediately before the opening of the inner German border in 1989, which we use to identify East German citizens that lived in regions with West German public TV signal. Since interregional mobility in the GDR was very low (cf., Section 4), it seems justified to assume that the place of residence in 1989 is typically where individuals lived or spent a significant part of their life. For individuals that entered the *GSOEP* after 1990, residential information is available only for the current survey year. However, information about residency in 1989 can be inferred as long as these individuals can be linked to households surveyed in 1990.

First, we analyze the effect of the availability of West German public TV signal at the place of residence by 1989 on both the importance East German individuals attribute to independence in 1990 and their post-1990 entrepreneurship/self-employment propensity using the sample of all East German individuals surveyed in 1990 (i.e., born not later than 1972 and at least 18 years old in 1990) (Table 4). However, we also utilize the information about the age of the individuals contained in the data to divide the whole sample into different birth cohorts and analyze the effect of West German TV on these different cohorts separately in order to better understand whether and how age at the time of exposure and during the period of analysis could shape the findings. On the one hand, age during exposure defines the susceptibility of individuals to the treatment. For instance, research suggests that children and young adults are particularly at risk of being influenced by TV (Wright et al., 1995). On the other hand, empirical research documents that the relationship between the likelihood of starting a business and age is inversely U-shaped, with a maximum of around 40 years old (Parker 2009). Thus, the hump-shaped pattern we found in Section 5.2 might be due to differently influenced and differently entrepreneurship-"likely" cohorts "moving" throughout the analysis period. Along this line of reasoning, one would expect the differences between treated and non-treated regions/groups to inevitably disappear in finite time, specifically after all individuals of the last impacted cohort, which are at risk, become entrepreneurs/self-employed or "too old" to start a business.

Overall, we find that individuals that resided in regions with West German public TV signal by 1989 were, on average, more likely to start a business after the reunification in 1990 than individuals that resided in regions without West German public TV signal (specifications 1 and 5 in Table 4). This supports the regional level results (cf., Table 2 in Section 5.1). We also find that inhabitants of

[8] The panel is kept as stable as possible, with updates only to reflect changes in the socio-economic and demographic structures at the aggregate level.

regions with West German TV before 1990 attribute, on average, a higher importance to independence (specification 9 in Table 4). Since independence is an essential motivator for becoming an entrepreneur/self-employed, these findings also point to the mechanisms by which the effects of West German TV unfolded. The results are consistent with how Western TV promoted—deliberately or not—attitudes generally conducive to entrepreneurship/self-employment, thus shaping the entrepreneurial identity of individuals. Interviews with early East German entrepreneurs confirm that independence, self-determination, and self-reliance are indeed major motivators for starting a business, more so than earnings (Liebernickel and Schwarz 1992; Lettke 1996; Enquete-Kommission 1997; Kuehn et al., 2020). Thus, these findings alleviate some concerns that the results at the regional level are driven by unobserved regional factors.

However, the TV effect on entrepreneurship/self-employment appear particularly pronounced within the 1961–1972 birth cohort (specifications 4 and 8 in Table 4). For these individuals, we find the most potent effect on the importance of independence (specification 12 in Table 4). During the treatment period (from the early 1960s until 1989), these individuals were young and arguably relatively "susceptible" to influences, so exposure to West German TV could have had a measurable impact on their mindset. Moreover, from 1990–2016 they were at an age where the likelihood of entrepreneurship/self-employment was comparably high. By 1990, they were, on average, 24 years old, and by 2006, 40 years old—an age where the statistical probability for entrepreneurship is highest (cf., last row in Table 4). Around this time, we find the most significant differences between exposed and non-exposed regions (see Fig. 2). Within the 1927–1945 birth cohort, we find no differences in the entrepreneurship incidence of individuals from regions with and without West German public TV signal (specifications 2 and 6 in Table 4). Individuals born from 1927–1945 were, by 1990 (when starting a business became possible again), relatively old (on average 53 years old; cf., last row of Table 4), which implies a relatively low entrepreneurship/self-employment propensity during the analysis period. For the 1946–1960 birth cohort (specifications 3 and 7 in Table 4), we find that individuals with access to West German TV attribute higher importance to independence, but a significant number of them are, in the analysis period from 1990–2016, relatively old for entrepreneurship/self-employment (20% were older than 40 already by 1990), which results in the comparably small and statistically insignificant estimate. Thus, the findings for the different cohorts, while providing a plausible explanation for the hump-shaped pattern documented in Section 5.2, suggest indeed that the differences in entrepreneurship incidence of regions with West German TV signal and regions without will disappear when the last impacted cohort exceeds a certain age.[9]

Secondly, we also analyze potential second-order effects due to intergenerational transmission of an entrepreneurial mindset, which could stimulate the formation of a self-sustaining entrepreneurial culture that could counteract fade-out and lead to long-lasting differences between treated and non-treated population groups or regions. As discussed above, when treated individuals become entrepreneurs, this might signal to subsequent cohorts that entrepreneurship is a viable alternative to dependent employment. Moreover, there might be a deliberate transfer of values, norms, and preferences between generations (Bisin and Verdier 2000; A. 2001; Chakraborty et al., 2016; Corneo and Jeanne 2010). Hence, we focus on East German residents born in 1985 or later that can be linked to East German households (i.e., parents) surveyed in 1990, for which information about their residence region in East Germany in 1989 is available.[10] For such individuals, it seems reasonable to assume no differential direct exposure to West German TV prior 1990 based on residence and signal availability. By 1990, when Western TV became available everywhere in East Germany, some were not born yet, and those that were would have been arguably too young to watch West German TV. Even if they did, it seems plausible to assume that they were exposed to only selected parts of West German TV aimed at very young children and, therefore, unlikely to convey any social, political, or economic messages. Hence, it could be argued that an association between their or their parents' residency in a region with West German TV and their entrepreneurship inclination would be consistent with a pass-through of mindset conducive to entrepreneurship by their exposed parents/closest peers, which implies an interpersonal and intergenerational identity transfer. As these individuals are fairly young during the analysis period, we hardly observe actual new firm formations and use instead information about their entrepreneurial aspirations (i.e., wishes).

We find that those, who/whose parents lived in 1989 in regions with West German TV signal, wish more often to start an own business than those, who/whose parents lived in 1989 in regions without Western TV signal (cf., Table 5). Since nearly all individuals in this sample were living at the time they were surveyed in the same region as their parents had in 1989, our measure (i.e., parents' residence in 1989) covers two dimensions of the intergenerational transmission that can stimulate the formation of a self-sustaining entrepreneurial culture: the transfer of entrepreneurial identity influencing norms, values, attitudes, and preferences, most likely within the family, and the more general influences gained through observing and learning from the environment. In specifications 2 and 4 in Table 5, we control for influences of the local environment proxied by the entrepreneurship rate in the region but we still find a positive association between being a non-directly treated descendant of directly treated parents and the wish to start a business, which point to the importance of the mindset transfer channel. To rule out direct firm successorship effects, we control for parents' entrepreneurial status.

6. Summary and conclusions

In this paper, we empirically analyze whether the entrepreneurial inclination of individuals and, therefore, the entrepreneurship

[9] An analysis based on narrower age definitions for the cohorts genuinely supports these conclusions but comes at the expense of a smaller sample size and reduced statistical power of the estimates.

[10] We are aware that the choice of this conservative 1985 threshold, while allowing a more robust interpretation, comes at the expense of a small sample size.

incidence within specific population groups or regions can be influenced by TV (through images and messages that shape attitudes and mindset). We also analyze whether potential effects fade or can cause long-lasting differences between population groups or regions and seek to identify the underlying mechanisms. Thereby, we connect to two strands of the literature. On the one hand, the literature discusses how subjective values and their intergenerational transmission can affect occupational choice and, therefore, economic development and growth in the long run (Chakraborty et al., 2016; Doepke and Zilibotti 2014). On the other hand, the literature discusses how individuals' choice of a particular occupation depends not only on expected monetary outcomes but on their attitudes and identity (Akerlof and Kranton 2000; Benz and Frey 2008a, b).

Empirically, we utilize the fact that during Germany's division, West German public TV signal was exogenously available from the 1960s until 1989 in some, but not all, regions of socialist East Germany. While in East Germany entrepreneurship was stigmatized and banned, Western TV conveyed attitudes generally conducive to entrepreneurship, particularly the notion that individuals were free and responsible for their own lives and that experimentation, self-discovery, self-realization, and proactive behavior were desirable from an individual and social point-of-view. We apply econometric techniques to analyze the effect of Western TV on entrepreneurship incidence after 1990, when starting an own business in East Germany became possible again. We use both regional-level data and geo-referenced individual-level data to illuminate the underlying mechanisms driving the magnitude and durability of the overall TV effect. We perform various robustness checks and use different identification approaches to strengthen causal inference.

We show that entrepreneurial incidence is higher among the inhabitants of East German regions exposed to West German TV signal than among those not exposed. The results of the individual-level analysis reveal that exposure to West German TV influences individuals' attitudes, with exposed ones valuing independence significantly more than non-exposed, which is characteristic of entrepreneurs/self-employed persons. We find that the overall effect is driven by specific cohort(s) of individuals that were (i) relatively young and susceptible at the time of exposure and (ii), in the period of analysis, at the age at which the (age-induced) probability of starting a business was comparably high. This suggests that the differences between treated and non-treated population groups/regions would inevitably disappear with the last impacted cohort, if the effects of TV were confined to only directly exposed individuals. However, we find also evidence for indirect, second-order effects as descendants of directly exposed parents, who were not directly exposed themselves, wish more often to become entrepreneurs/self-employed. These findings are consistent with a mechanism for intergenerational transmission of an entrepreneurial mindset, which can cause long-lasting differences between treated and non-treated groups or regions.

Regarding policy, the results point towards the relevance of further measures to stimulate entrepreneurship in addition to more traditional instruments. Indeed, existing entrepreneurship policies are typically aimed at supporting entrepreneurship by (i) providing hard skills conducive to successfully starting and running a business and (ii) improving the general framework conditions relevant for entrepreneurship (e.g., infrastructure, finance, and regulation). Only relatively recently, pro-entrepreneurship policy started realizing the cultural dimensions of the entrepreneurship phenomenon, considering measures based on entrepreneurial role models. Our results suggest a role for instruments aimed at promoting an entrepreneurial mindset. Overall, the findings are a stimulus for further research to better understand how subjective factors shape individuals' occupational choices and long-term aggregate economic development.

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Appendix

Table A1
TV spread in East and West Germany.

year	Share of households with TV receiver (in%) East Germany	West Germany
1954	1	4
1956	5	11
1958	17	24
1962	31	37
1964	42	50
1966	54	61
1968	64	71
1970	69	77
1974	80	76
1978	87	80
1982	90	92
1986	94	97

Source: Meyen (2003).

Table A2
Availability and intensity of watching West German public TV and listening to West German radio in East German regions in 1988/89.

	West German public TV Watched daily or several times per week / never (%)	Signal available	West German radio Listened daily or several times per week / never (%)	Signal available
Schwerin	91.62 / 1.05	Yes	93.68 / 0.53	Yes
Magdeburg	95.57 / 1.11	Yes	91.70 / 1.66	Yes
Berlin	93.03 / 0.24	Yes	89.45 / 2.40	Yes
Cottbus	96.67 / 1.67	Yes	91.67 / 1.67	Yes
Leipzig	82.48 / 5.47	Yes	82.78 / 2.20	Yes
Dresden	15.12 / 67.85	No	60.60 / 17.17	Yes
Karl-Marx	93.89 / 2.09	Yes	89.90 / 2.40	Yes
Erfurt	94.22 / 1.25	Yes	92.69 / 1.56	Yes

Notes: Information about the intensity of watching West German TV and listening to West German radio by residents of East German regions stem from high-quality data collected by the Central Institute for Youth Research (*Zentralinstitut fuer Jugendforschung, Zentralarchiv fuer Empirische Sozialforschung* ZA 6073 and ZA 6008) by means of anonymous and unmarked individual questionnaires from 1988 to 1989, immediately prior to the fall of the Berlin Wall. The intensity of watching TV and listening to the radio was measured in five categories: *daily, several times per week, once per week, seldom,* and *never*. Here, only the share of residents that watched West German TV/listened to West German radio daily or several times per week/never is reported. The regional assignment is possible only at the level of the GDR districts (*Bezirke*), which are larger than the NUTS3 regions that we use in the empirical analysis. Precisely due to this relatively large size, some parts of the Dresden district had access to West German TV, which explains the comparably large share of individuals that watched West German TV daily or several times per week. Data have been collected for the districts of Schwerin, Magdeburg, Berlin, Cottbus, Leipzig, Karl-Marx and Erfurt, in which West German TV was available, and the district of Dresden, where West German TV was only partly available. Data from the other districts with West German TV access (Neubrandenburg, Potsdam, Frankfurt Oder, Halle, Gera, and Suhl) and the second district (Rostock), parts of which had no access to West German TV, are not available.

Table A3
TV and entrepreneurship – General effects (1993–2016, average).

Dep: NEW_ BUSINESSES / POP_18–64 $_{rt}$ (log)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
TV $_{r}$ (yes=1; no=0)	0.133***	0.129***	0.167***	0.158*	0.105***	0.112***	0.117***	0.100***	0.111***	0.113***	0.095*	0.124	0.131*
	(0.030)	(0.030)	(0.038)	(0.093)	(0.030)	(0.030)	(0.037)	(0.030)	(0.031)	(0.038)	(0.052)	(0.075)	(0.073)
	(0.031)	*(0.030)*	*(0.042)*	*(0.095)*	*(0.031)*	*(0.030)*	*(0.038)*	*(0.032)*	*(0.030)*	*(0.038)*	*(0.035)*	*(0.054)*	*(0.058)*
IND_SHARES $_{rt}$ (log)	+	+	+	+	+	+	+	+	+	+	+	+	+
μ_t	+	+	+		+	+	+				+		
time_trend $_{r}$				+									
time_trend ^{2} $_{r}$				+									
$\zeta_{FS(r)}$					+	+	+						
$\zeta_{FS(r)} * \mu_t$								+	+	+		+	+
DIST_KM_TO_WEST $_{r}$ (log)	0.022	0.023	0.042*	0.054	0.008	0.006	-0.006	0.016	0.014	-0.002	-0.047	-0.287**	-0.427***
	(0.021)	(0.020)	(0.022)	(0.041)	(0.026)	(0.025)	(0.031)	(0.027)	(0.025)	(0.032)	(0.103)	(0.104)	(0.112)
	(0.020)	*(0.018)*	*(0.021)*	*(0.042)*	*(0.029)*	*(0.026)*	*(0.033)*	*(0.028)*	*(0.025)*	*(0.033)*	*(0.080)*	*(0.073)*	*(0.112)*
POP_18–24_AGE_SHARE $_{rt}$ (log)	-0.116	-0.106			-0.132	-0.102		-0.176	-0.132		-0.428	-0.226	
	(0.118)	(0.113)			(0.109)	(0.106)		(0.116)	(0.117)		(0.272)	(0.275)	
	(0.117)	*(0.107)*			*(0.103)*	*(0.098)*		*(0.115)*	*(0.116)*		*(0.244)*	*(0.263)*	
POP_25–34_AGE_SHARE $_{rt}$ (log)	-0.105	-0.209			-0.063	-0.159		-0.093	-0.227		0.479	0.495	
	(0.149)	(0.153)			(0.147)	(0.153)		(0.169)	(0.173)		(0.303)	(0.395)	
	(0.150)	*(0.160)*			*(0.145)*	*(0.167)*		*(0.181)*	*(0.198)*		*(0.292)*	*(0.292)*	
POP_35–44_AGE_SHARE $_{rt}$ (log)	0.349**	0.326*			0.299	0.327*		0.148	0.132		0.286	-0.850	
	(0.168)	(0.165)			(0.180)	(0.182)		(0.202)	(0.200)		(0.350)	(0.625)	
	(0.148)	*(0.149)*			*(0.165)*	*(0.171)*		*(0.153)*	*(0.151)*		*(0.288)*	*(0.509)*	
POP_45–54_AGE_SHARE $_{rt}$ (log)	0.083	0.218			0.079	0.235		0.141	0.361*		0.162	0.051	
	(0.128)	(0.137)			(0.136)	(0.151)		(0.181)	(0.197)		(0.223)	(0.235)	
	(0.126)	*(0.139)*			*(0.142)*	*(0.160)*		*(0.186)*	*(0.193)*		*(0.194)*	*(0.199)*	
POP_55–64_AGE_SHARE $_{rt}$ (log)	0.011	-0.086			-0.030	-0.085		-0.170	-0.295*		-0.252	-0.340	
	(0.154)	(0.146)			(0.148)	(0.143)		(0.173)	(0.171)		(0.326)	(0.486)	
	(0.177)	*(0.164)*			*(0.161)*	*(0.160)*		*(0.165)*	*(0.170)*		*(0.257)*	*(0.392)*	
POP_REST_SHARE $_{rt}$ (log) (reference)													
EMPL_UNKNOWN_QUALI_SHARE $_{rt}$ (log)	0.139***	0.136***			0.123***	0.120***		0.120***	0.095**		0.141*	0.127*	
	(0.034)	(0.038)			(0.036)	(0.038)		(0.041)	(0.046)		(0.066)	(0.061)	
	(0.031)	*(0.034)*			*(0.035)*	*(0.038)*		*(0.033)*	*(0.036)*		*(0.063)*	*(0.049)*	
EMPL_MIDDLE_QUALI_SHARE $_{rt}$ (log)	-0.144	0.0368			-0.124	0.0788		-0.202	-0.112		-0.248	-0.461	
	(0.176)	(0.194)			(0.172)	(0.196)		(0.209)	(0.229)		(0.569)	(0.503)	
	(0.204)	*(0.207)*			*(0.173)*	*(0.187)*		*(0.163)*	*(0.186)*		*(0.557)*	*(0.427)*	
EMPL_HIGH_QUALI_SHARE $_{rt}$ (log)	0.151***	0.150**			0.157***	0.156**		0.0939	0.103		0.242***	0.090	
	(0.050)	(0.060)			(0.055)	(0.062)		(0.064)	(0.069)		(0.075)	(0.152)	
	(0.050)	*(0.057)*			*(0.049)*	*(0.053)*		*(0.057)*	*(0.062)*		*(0.070)*	*(0.112)*	
EMPL_LOW_QUALI_SHARE $_{rt}$ (log) (reference)													
FIRMS_20–49_EMPL_SHARE $_{rt}$ (log)	0.108	0.084			0.127	0.094		0.141	0.106		0.040	-0.047	
	(0.086)	(0.093)			(0.085)	(0.093)		(0.090)	(0.095)		(0.164)	(0.144)	
	(0.093)	*(0.102)*			*(0.092)*	*(0.102)*		*(0.095)*	*(0.102)*		*(0.107)*	*(0.108)*	
FIRMS_50–199_EMPL_SHARE $_{rt}$ (log)	0.085	0.062			0.075	0.061		0.122	0.108		0.141	-0.016	
	(0.087)	(0.096)			(0.083)	(0.094)		(0.087)	(0.097)		(0.140)	(0.188)	
	(0.072)	*(0.078)*			*(0.068)*	*(0.078)*		*(0.069)*	*(0.078)*		*(0.107)*	*(0.143)*	
FIRMS_200+_EMPL_SHARE $_{rt}$ (log)	-0.012	-0.029			-0.027	-0.036		0.014	0.004		0.026	0.017	
	(0.061)	(0.064)			(0.059)	(0.065)		(0.065)	(0.070)		(0.051)	(0.093)	
	(0.051)	*(0.053)*			*(0.047)*	*(0.054)*		*(0.052)*	*(0.057)*		*(0.039)*	*(0.067)*	

(*continued on next page*)

Table A3 (*continued*)

Dep: NEW_ BUSINESSES / POP_18–64 $_{rt}$ (log)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
FIRMS_1–19_EMPL_SHARE $_{rt}$ (log) (reference)													
UNEMPL / POP_18–64 $_{rt}$ (log)	-0.036	-0.013			-0.057	-0.031		-0.083*	-0.048		-0.155	-0.113	
	(0.049)	(0.052)			(0.049)	(0.049)		(0.049)	(0.049)		(0.090)	(0.109)	
	(0.044)	*(0.046)*			*(0.046)*	*(0.045)*		*(0.044)*	*(0.043)*		*(0.073)*	*(0.072)*	
IN_MIGRATION / TOTAL_POP $_{rt}$ (log)		0.162***				0.152***			0.155***				
		(0.042)				(0.045)			(0.047)				
		(0.044)				*(0.044)*			*(0.043)*				
OUT_MIGRATION / TOTAL_POP $_{rt}$ (log)		-0.092*				-0.082*			-0.096*				
		(0.049)				(0.049)			(0.050)				
		(0.052)				*(0.052)*			*(0.050)*				
Self-employed / WORKING_POP 1989 $_{r}$ (log)	0.116**	0.115**	0.173***	0.075	0.070	0.074	0.117*	0.056	0.060	0.108	0.123*	0.198	0.252**
	(0.047)	(0.048)	(0.047)	(0.084)	(0.067)	(0.066)	(0.069)	(0.067)	(0.065)	(0.070)	(0.060)	(0.127)	(0.094)
	(0.046)	*(0.044)*	*(0.045)*	*(0.084)*	*(0.070)*	*(0.064)*	*(0.069)*	*(0.069)*	*(0.061)*	*(0.067)*	*(0.052)*	*(0.087)*	*(0.065)*
Share of self-employed males 1925 $_{r}$ (log)	0.313***	0.282***	0.298***	0.424**	0.387***	0.336***	0.343***	0.402***	0.350***	0.359***	0.260	0.0658	-0.0691
	(0.094)	(0.087)	(0.103)	(0.184)	(0.108)	(0.099)	(0.122)	(0.106)	(0.098)	(0.125)	(0.199)	(0.260)	(0.256)
	(0.092)	*(0.084)*	*(0.106)*	*(0.175)*	*(0.099)*	*(0.088)*	*(0.115)*	*(0.095)*	*(0.084)*	*(0.113)*	*(0.148)*	*(0.190)*	*(0.238)*
Constant	-2.425**	-2.501*	-3.225***	-3.702***	-2.329*	-2.202*	-2.934***	-3.207**	-3.246**	-3.113***	-1.214	-1.365	0.313
	(1.149)	(1.185)	(0.596)	(0.683)	(1.195)	(1.269)	(0.575)	(1.281)	(1.332)	(0.621)	(2.241)	(3.635)	(1.137)
	(1.057)	*(1.057)*	*(0.483)*	*(0.555)*	*(1.127)*	*(1.228)*	*(0.478)*	*((1.147)*	*(1.232)*	*(0.503)*	*(1.715)*	*(3.071)*	*(0.912)*
R^2	0.881	0.878	0.864	0.888	0.883	0.880	0.870	0.894	0.890	0.880	0.942	0.957	0.951
Observations (NUTS3 regions * Years)	1824	1672	1824	1824	1824	1672	1824	1824	1672	1824	336	336	336
NUTS3 regions	76	76	76	76	76	76	76	76	76	76	14	14	14
Years	1993–2016	1995–2016	1993–2016	1993–2016	1993–2016	1995–2016	1993–2016	1993–2016	1995–2016	1993–2016	1993–2016	1993–2016	1993–2016

Notes: This table reports the results of OLS as well as Conley (1999) OLS estimations with spatial standard errors of various specifications of Eqs. (1.1)-(2.2) for the effect of the availability of West German public TV signal on the entrepreneurship incidence in East German NUTS3 regions (definition 2012) on average for the period 1993–2016; there are 71/5 regions with/without West German public TV signal, Berlin is excluded. OLS standard errors are clustered at NUTS3-region level and reported in the first line below the coefficients. Conley (1999) errors are corrected for potential serial dependence based on location and reported in italic in the second line below the coefficients. The weight for each term is the product of weight functions in each dimension (length and width) that decline linearly and are zero beyond certain cutoffs. We assume cutoffs of 80 km (between the centrodes of the regions), which ensures that we allow for spatial dependence between directly neighboring regions. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

The dependent variable, *NEW_BUSINESSES / POP_18–64*, is (the log of) the yearly number of new businesses from the Mannheim Foundation Panel (*MUP*) of the Center for European Economic Research (*ZEW*) in the working-age population (18–64 yo) from the Federal Statistical Office (*destatis*). *IND_SHARES* are the (log) shares of employment in 16 NACE macro-sectors (A-Q) from the Establishment History Panel (*Betriebshistorikpanel, BHP*) of the Institute for Employment Research (*IAB*). *DIST_KM_TO_WEST* is the distance (in log km) to the next West German NUTS3 region. *POP_*_AGE_SHARES* are the (log) shares of employment in different age categories (18–24. 25–34, 35–44, 45–54, 55–64, younger/older than 18/65 serve as reference group) from the Federal Statistical Office (*destatis*). *EMPL_*_QUALI_SHARES* are the (log) shares of employment with different qualifications (low(reference group), middle, high, unknown) from the Establishment History Panel (*Betriebshistorikpanel, BHP*) of the Institute for Employment Research (*IAB*). *FIRMS_*_EMPL_SHARES* are the (log) shares of firms in different size classes (1–19(reference group), 20–49, 50–199, 200+) from the Establishment History Panel (*Betriebshistorikpanel, BHP*) of the Institute for Employment Research (*IAB*). *UNEMPL / POP_18–64* is (the log of) the number of unemployed persons in the working-age population (18–64 yo) provided by the Federal Employment Agency (*BA*) and available at Federal Statistical Office (*destatis*). *IN_MIGRATION / TOTAL_POP* and *OUT_MIGRATION / TOTAL_POP* are the (log) shares of individuals that in- and out-migrated across NUTS3 regions' borders in total regional population from the Federal Statistical Office (*destatis*). Migration data are available only from 1995 onwards. *Self-employed 1989 / WORKING_POP* is the (log) share of self-employed in the working-age population in 1989, initially collected by the GDR Statistical Office and then translated to the NUTS3 regional definition (Kawka 2007). *Share of self-employed males 1925* is the (log) share of self-employed males in non-agricultural private sector industries in all male employees in 1925 from the Statistik des Deutschen Reichs (1927) (cf., Fritsch and Wyrwich 2014).

Table A4
TV and entrepreneurship – Temporal pattern of the effects.

Dep: NEW_BUSINESSES / POP_18–64 $_{rt}$ (log)	(1)	(2)	(3)	(4)	(5)	(6)
1993*TV $_{r}$ (yes=1; no=0)	0.103*	0.079	0.023			
	(0.058)	(0.058)	(0.054)			
	(0.056)	*(0.058)*	*(0.046)*			
1994*TV $_{r}$ (yes=1; no=0)	0.160***	0.130**	0.066			
	(0.056)	(0.053)	(0.060)			
	(0.057)	*(0.054)*	*(0.055)*			
1995*TV $_{r}$ (yes=1; no=0)	0.115*	0.084	0.060	0.129*	0.111*	0.076
	(0.066)	(0.063)	(0.065)	(0.065)	(0.064)	(0.072)
	(0.065)	*(0.062)*	*(0.060)*	*(0.063)*	*(0.062)*	*(0.066)*
1996*TV $_{r}$ (yes=1; no=0)	0.170	0.141	0.112	0.174	0.158	0.123
	(0.119)	(0.114)	(0.100)	(0.115)	(0.111)	(0.104)
	(0.135)	*(0.128)*	*(0.107)*	*(0.128)*	*(0.122)*	*(0.111)*
1997*TV $_{r}$ (yes=1; no=0)	0.113*	0.087	0.054	0.115**	0.101*	0.064
	(0.058)	(0.055)	(0.049)	(0.057)	(0.055)	(0.056)
	(0.065)	*(0.060)*	*(0.048)*	*(0.061)*	*(0.057)*	*(0.053)*
1998*TV $_{r}$ (yes=1; no=0)	0.101	0.074	0.058	0.096	0.081	0.061
	(0.062)	(0.059)	(0.062)	(0.063)	(0.061)	(0.069)
	(0.065)	*(0.061)*	*(0.061)*	*(0.064)*	*(0.062)*	*(0.066)*
1999*TV $_{r}$ (yes=1; no=0)	0.101**	0.071	0.101**	0.094*	0.078	0.107**
	(0.048)	(0.050)	(0.044)	(0.052)	(0.052)	(0.047)
	(0.048)	*(0.051)*	*(0.043)*	*(0.052)*	*(0.054)*	*(0.045)*
2000*TV $_{r}$ (yes=1; no=0)	0.117***	0.088***	0.135***	0.114***	0.098***	0.139***
	(0.029)	(0.029)	(0.032)	(0.029)	(0.030)	(0.034)
	(0.029)	*(0.028)*	*(0.031)*	*(0.030)*	*(0.029)*	*(0.031)*
2001*TV $_{r}$ (yes=1; no=0)	0.086**	0.055	0.111***	0.080**	0.063*	0.113***
	(0.033)	(0.034)	(0.037)	(0.032)	(0.032)	(0.036)
	(0.030)	*(0.028)*	*(0.034)*	*(0.031)*	*(0.028)*	*(0.030)*
2002*TV $_{r}$ (yes=1; no=0)	0.122***	0.092*	0.108**	0.119***	0.103**	0.114**
	(0.045)	(0.050)	(0.051)	(0.043)	(0.047)	(0.047)
	(0.044)	*(0.048)*	*(0.049)*	*(0.041)*	*(0.045)*	*(0.044)*
2003*TV $_{r}$ (yes=1; no=0)	0.135***	0.107**	0.117**	0.134***	0.119**	0.124**
	(0.041)	(0.044)	(0.048)	(0.044)	(0.046)	(0.049)
	(0.038)	*(0.041)*	*(0.043)*	*(0.042)*	*(0.044)*	*(0.045)*
2004*TV $_{r}$ (yes=1; no=0)	0.142***	0.114***	0.079*	0.142***	0.127***	0.087**
	(0.037)	(0.040)	(0.046)	(0.034)	(0.038)	(0.043)
	(0.032)	*(0.034)*	*(0.041)*	*(0.030)*	*(0.033)*	*(0.038)*
2005*TV $_{r}$ (yes=1; no=0)	0.128***	0.101**	0.058	0.131***	0.117***	0.072
	(0.040)	(0.041)	(0.048)	(0.040)	(0.042)	(0.050)
	(0.039)	*(0.041)*	*(0.050)*	*(0.039)*	*(0.042)*	*(0.051)*
2006*TV $_{r}$ (yes=1; no=0)	0.169***	0.142***	0.107**	0.174***	0.160***	0.125***
	(0.046)	(0.046)	(0.048)	(0.042)	(0.044)	(0.047)
	(0.049)	*(0.048)*	*(0.048)*	*(0.044)*	*(0.044)*	*(0.045)*
2007*TV $_{r}$ (yes=1; no=0)	0.172***	0.146***	0.144***	0.174***	0.160***	0.157***
	(0.032)	(0.034)	(0.036)	(0.032)	(0.034)	(0.037)
	(0.034)	*(0.036)*	*(0.043)*	*(0.033)*	*(0.035)*	*(0.042)*
2008*TV $_{r}$ (yes=1; no=0)	0.145***	0.119***	0.151***	0.148***	0.134***	0.166***
	(0.040)	(0.042)	(0.043)	(0.038)	(0.041)	(0.042)
	(0.042)	*(0.046)*	*(0.042)*	*(0.040)*	*(0.043)*	*(0.040)*
2009*TV $_{r}$ (yes=1; no=0)	0.167***	0.142***	0.144***	0.165***	0.151***	0.156***
	(0.047)	(0.047)	(0.035)	(0.043)	(0.044)	(0.034)
	(0.049)	*(0.050)*	*(0.041)*	*(0.044)*	*(0.046)*	*(0.038)*
2010*TV $_{r}$ (yes=1; no=0)	0.151***	0.125***	0.098**	0.146***	0.131***	0.107**
	(0.043)	(0.046)	(0.044)	(0.039)	(0.042)	(0.041)
	(0.045)	*(0.047)*	*(0.040)*	*(0.040)*	*(0.042)*	*(0.036)*
2011*TV $_{r}$ (yes=1; no=0)	0.110***	0.083**	0.101**	0.101***	0.084**	0.104**
	(0.034)	(0.036)	(0.039)	(0.036)	(0.039)	(0.044)
	(0.034)	*(0.038)*	*(0.042)*	*(0.036)*	*(0.040)*	*(0.045)*
2012*TV $_{r}$ (yes=1; no=0)	0.164***	0.135**	0.173***	0.154**	0.135**	0.176**
	(0.061)	(0.060)	(0.064)	(0.065)	(0.065)	(0.069)
	(0.047)	*(0.047)*	*(0.052)*	*(0.048)*	*(0.049)*	*(0.051)*
2013*TV $_{r}$ (yes=1; no=0)	0.122**	0.092*	0.103**	0.113**	0.093*	0.108**
	(0.048)	(0.050)	(0.048)	(0.053)	(0.055)	(0.053)
	(0.045)	*(0.048)*	*(0.043)*	*(0.046)*	*(0.049)*	*(0.044)*
2014*TV $_{r}$ (yes=1; no=0)	0.117***	0.086**	0.089**	0.098**	0.078*	0.082*
	(0.040)	(0.042)	(0.043)	(0.046)	(0.047)	(0.046)
	(0.037)	*(0.039)*	*(0.039)*	*(0.039)*	*(0.040)*	*(0.038)*
2015*TV $_{r}$ (yes=1; no=0)	0.146***	0.114***	0.093*	0.119***	0.099**	0.080
	(0.041)	(0.041)	(0.055)	(0.044)	(0.044)	(0.054)

(*continued on next page*)

Table A4 (*continued*)

Dep: NEW_BUSINESSES / POP_18–64 $_{rt}$ (log)	(1)	(2)	(3)	(4)	(5)	(6)
	(0.039)	*(0.041)*	*(0.053)*	*(0.036)*	*(0.038)*	*(0.047)*
2016*TV $_{r}$ (yes=1; no=0)	0.146**	0.114*	0.112	0.121*	0.101	0.101
	(0.065)	(0.065)	(0.070)	(0.072)	(0.070)	(0.071)
	(0.058)	*(0.059)*	*(0.057)*	*(0.062)*	*(0.062)*	*(0.055)*
IND_SHARES $_{rt}$ (log)	+	+	+	+	+	+
μ_t	+	+		+	+	
$\zeta_{FS(r)}$		+			+	
$\zeta_{FS(r)}$ * μ_t			+			+
DIST_KM_TO_WEST $_{r}$ (log)	0.021	0.007	0.016	0.023	0.006	0.013
	(0.021)	(0.027)	(0.027)	(0.021)	(0.025)	(0.026)
	(0.020)	*(0.030)*	*(0.028)*	*(0.019)*	*(0.026)*	*(0.025)*
POP_18–24_AGE_SHARE $_{rt}$ (log)	-0.124	-0.140	-0.180	-0.113	-0.108	-0.137
	(0.118)	(0.109)	(0.116)	(0.112)	(0.105)	(0.116)
	(0.116)	*(0.102)*	*(0.113)*	*(0.104)*	*(0.095)*	*(0.114)*
POP_25–34_AGE_SHARE $_{rt}$ (log)	-0.100	-0.057	-0.092	-0.206	-0.156	-0.226
	(0.149)	(0.148)	(0.169)	(0.153)	(0.152)	(0.173)
	(0.150)	*(0.144)*	*(0.180)*	*(0.159)*	*(0.166)*	*(0.197)*
POP_35–44_AGE_SHARE $_{rt}$ (log)	0.344**	0.293	0.151	0.316*	0.317*	0.126
	(0.172)	(0.183)	(0.207)	(0.168)	(0.185)	(0.203)
	(0.149)	*(0.165)*	*(0.155)*	*(0.151)*	*(0.173)*	*(0.152)*
POP_45–54_AGE_SHARE $_{rt}$ (log)	0.082	0.077	0.142	0.216	0.234	0.363*
	(0.129)	(0.136)	(0.183)	(0.138)	(0.152)	(0.199)
	(0.126)	*(0.142)*	*(0.186)*	*(0.140)*	*(0.160)*	*(0.193)*
POP_55–64_AGE_SHARES $_{rt}$ (log)	0.002	-0.039	-0.176	-0.095	-0.093	-0.305*
	(0.155)	(0.149)	(0.175)	(0.147)	(0.145)	(0.173)
	(0.177)	*(0.161)*	*(0.164)*	*(0.165)*	*(0.161)*	*(0.168)*
POP_REST_SHARE $_{rt}$ (log) (reference)						
EMPL_UNKNOWN_QUALI_SHARE $_{rt}$ (log)	0.141***	0.124***	0.121***	0.137***	0.120***	0.096**
	(0.034)	(0.036)	(0.042)	(0.038)	(0.039)	(0.047)
	(0.032)	*(0.036)*	*(0.033)*	*(0.034)*	*(0.038)*	*(0.037)*
EMPL_MIDDLE_QUALI_SHARE $_{rt}$ (log)	-0.138	-0.117	-0.196	0.047	0.092	-0.103
	(0.177)	(0.173)	(0.213)	(0.196)	(0.197)	(0.233)
	(0.205)	*(0.173)*	*(0.165)*	*(0.208)*	*(0.187)*	*(0.189)*
EMPL_HIGH_QUALI_SHARE $_{rt}$ (log)	0.153***	0.160***	0.098	0.153**	0.160**	0.106
	(0.051)	(0.055)	(0.064)	(0.060)	(0.062)	(0.070)
	(0.050)	*(0.049)*	*(0.057)*	*(0.058)*	*(0.053)*	*(0.062)*
EMPL_LOW_QUALI_SHARE $_{rt}$ (log) (reference)						
FIRMS_20–49_EMPL_SHARE $_{rt}$ (log)	0.104	0.123	0.139	0.080	0.090	0.105
	(0.087)	(0.086)	(0.091)	(0.095)	(0.094)	(0.096)
	(0.094)	*(0.093)*	*(0.095)*	*(0.103)*	*(0.103)*	*(0.103)*
FIRMS_50–199_EMPL_SHARE $_{rt}$ (log)	0.083	0.072	0.119	0.061	0.060	0.107
	(0.089)	(0.085)	(0.088)	(0.097)	(0.095)	(0.099)
	(0.073)	*(0.068)*	*(0.070)*	*(0.079)*	*(0.079)*	*(0.079)*
FIRMS_200+_EMPL_SHARE $_{rt}$ (log)	-0.014	-0.030	0.010	-0.030	-0.037	0.003
	(0.062)	(0.060)	(0.066)	(0.065)	(0.066)	(0.071)
	(0.051)	*(0.047)*	*(0.052)*	*(0.052)*	*(0.053)*	*(0.057)*
FIRMS_1–19_EMPL_SHARE $_{rt}$ (log) (reference)						
UNEMPL / POP_18–64 $_{rt}$ (log)	-0.034	-0.056	-0.079	-0.013	-0.031	-0.047
	(0.052)	(0.050)	(0.050)	(0.053)	(0.050)	(0.050)
	(0.044)	*(0.046)*	*(0.045)*	*(0.046)*	*(0.045)*	*(0.044)*
IN_MIGRATION / TOTAL_POP $_{rt}$ (log)				0.164***	0.154***	0.156***
				(0.043)	(0.045)	(0.047)
				(0.045)	*(0.044)*	*(0.043)*
OUT_MIGRATION / TOTAL_POP $_{rt}$ (log)				-0.093*	-0.084*	-0.097*
				(0.050)	(0.049)	(0.050)
				(0.052)	*(0.052)*	*(0.050)*
Self-employed / WORKING_POP 1989 $_{r}$ (log)	0.116**	0.070	0.057	0.114**	0.073	0.060
	(0.048)	(0.068)	(0.068)	(0.048)	(0.066)	(0.066)
	(0.046)	*(0.070)*	*(0.069)*	*(0.044)*	*(0.064)*	*(0.061)*
Share of self-employed males 1925 $_{r}$ (log)	0.312***	0.387***	0.401***	0.281***	0.336***	0.349***
	(0.095)	(0.109)	(0.107)	(0.088)	(0.100)	(0.098)
	(0.092)	*(0.100)*	*(0.095)*	*(0.084)*	*(0.088)*	*(0.084)*
Constant	-2.463**	-2.371*	-3.165**	-2.552**	-2.241*	-3.248**
	(1.156)	(1.207)	(1.296)	(1.199)	(1.286)	(1.342)
	(1.058)	*(1.131)*	*(1.144)*	*(1.062)*	*(1.234)*	*(1.225)*
R^2	0.881	0.883	0.894	0.879	0.880	0.890
Observations (NUTS3 regions * Years)	1824	1824	1824	1672	1672	1672
NUTS3 regions	76	76	76	76	76	76
Years	1993–2016	1993–2016	1993–2016	1995–2016	1995–2016	1995–2016

Notes: This table reports the results of OLS as well as Conley (1999) OLS estimations with spatial standard errors of various specifications of Eq. (3) for the temporal pattern (1993–2016) of the effect of the availability of West German public TV signal on the entrepreneurship incidence in East German NUTS3 regions (definition 2012); there are 71/5 regions with/without West German public TV signal, Berlin is excluded. OLS standard errors are clustered at the NUTS3-region level and reported in the first line below the coefficients. Conley (1999) errors are corrected for potential serial dependence based on location and reported in italic in the second line below the coefficients. The weight for each term is the product of weight functions in each dimension (length and width) that decline linearly and are zero beyond certain cutoffs. We assume cutoffs of 80 km (between the centrodes of the regions), which ensures that we allow for spatial dependence between directly neighboring regions.. *** $p<0.01$, ** $p<0.05$, * $p<0.1$. The dependent variable, *NEW_BUSINESSES / POP_18–64*, is (the log of) the yearly number of new businesses from the Mannheim Foundation Panel (*MUP*) of the Center for European Economic Research (*ZEW*) in the working-age population (18–64 yo) from the Federal Statistical Office (*destatis*). *IND_SHARES* are the (log) shares of employment in 16 NACE macro-sectors (A-Q) from the Establishment History Panel (*Betriebshistorikpanel, BHP*) of the Institute for Employment Research (*IAB*). *DIST_KM_TO_WEST* is the distance (in log km) to the next West German NUTS3 region. *POP_*_AGE_-SHARES* are the (log) shares of employment in different age categories (18–24. 25–34, 35–44, 45–54, 55–64, younger/older than 18/65 serve as reference group) from the Federal Statistical Office (*destatis*). *EMPL_*_QUALI_SHARES* are the (log) shares of employment with different qualifications (low(reference group), middle, high, unknown) from the Establishment History Panel (*Betriebshistorikpanel, BHP*) of the Institute for Employment Research (*IAB*). *FIRMS_*_EMPL_SHARES* are the (log) shares of firms in different size classes (1–19(reference group), 20–49, 50–199, 200+) from the Establishment History Panel (*Betriebshistorikpanel, BHP*) of the Institute for Employment Research (*IAB*). *UNEMPL / POP_18–64* is (the log of) the number of unemployed persons in the working-age population (18–64 yo) provided by the Federal Employment Agency (*BA*) and available at the Federal Statistical Office (*destatis*). *IN_MIGRATION / TOTAL_POP* and *OUT_MIGRATION / TOTAL_POP* are the (log) shares of individuals that in- and out-migrated across NUTS3 regions' borders in total regional population from the Federal Statistical Office (*destatis*). Migration data are available only from 1995 onwards. *Self-employed 1989 / WORKING_POP* is the (log) share of self-employed in the working-age population in 1989, initially collected by the GDR Statistical Office and then translated to the NUTS3 regional definition (Kawka 2007). *Share of self-employed males 1925* is the (log) share of self-employed males in non-agricultural private sector industries in all male employees in 1925 from the Statistik des Deutschen Reichs (1927) (cf., Fritsch and Wyrwich 2014).

Popularity of East and West German TV with East German citizens

The central state in the GDR recognized the role of TV in influencing public opinion and, from the very beginning of broadcasting, heavily instrumented TV for the official doctrine, i.e., to spread socialist ideology and to raise individuals accordingly (Norden 1965; Holzweissig 2002). West German public TV was perceived as a menace to the socialist state, and the state-owned East German TV was used to counteract the enemy's propaganda.[11] Erich Honecker, who was a First/General Secretary of the Socialist Unity Party of Germany since 1971 and ran the GDR until 1989, called TV "the most potent weapon of the socialist state" (Honecker and Lamberz 1977). East German TV often broadcasted extensive political, social, and economic discussions during prime time. Even entertainment on East German TV served the official state doctrine (Braumann 1994; Holzweissig 2002). What could be produced and broadcasted was carefully decided by the central authorities based on two criteria: (i) content, images, and messages had not to be critical concerning official state ideology, and (ii) the political orientation of the actors (Honecker and Lamberz 1977). This further exacerbated the political bias of East German TV, making it even less popular. In the early 1980s, the socialist state tried to eliminate the rising misalignment between its interests and those of the public, and ever since December 1982, East German TV has changed its program (*alternative Programmgestaltung*). Journalistic content was shortened and moved to later times, and East German TV started broadcasting entertainment at prime time. This comprised movies, series, talks, humor, sports, and other shows to "lull" the public (Holzweissig 2002).[12] However, the attempts to keep the public attached came too late. Official data, collected in East Germany before the reunification and classified until 1990, reveal a seriously disturbed and continuously decreasing identification of East German citizens with East German TV (Braumann 1994; *Zentralarchiv fuer Empirische Sozialforschung ZA 6073* and *ZA 6008*).

[11] There were some unsuccessful attempts to prevent East German citizens from watching West German TV, which, however, turned out infeasible and ineffective and were defaulted very soon. For instance, jamming Western TV was infeasible since it could not be restricted to the territory of East Germany and would have impeded TV reception in West Germany too. Hence, a campaign called '*Ochsenkopf*' was started in the early 1960s and aimed to remove aerials able to receive West German public TV, but it was abandoned too soon. Specifically, "voluntary" troops of the Free German Youth (*Freie Deutsche Jugend, FDJ*), the official youth movement of the GDR and the Socialist Unity Party of Germany, were sent out to seek, locate and remove aerials that were able to receive West German TV, which, due to differences in broadcasting frequencies, looked different (*Ochsenkopf*-aerials, after the West German TV transmitter "*Ochsenkopf*" close to the former inner German border). However, this venture failed for a number of reasons. The number of households with *Ochsenkopf*-aerials was too large. Moreover, the vicinity of West German transmitters, for instance, in Berlin and surrounding areas, or along the inner German border, meant that reception was also possible with indoor aerials. In cases where outdoor devices were required, East Germans showed creativity. For instance, the council "Political Agitation" of the Central Committee of the Socialist Party reported in 1966 that citizens often mounted *Ochsenkopf*-aerials on balconies or window ledges just before starting to watch, dismounting them afterward. Not least, such campaigns were considered by the population to be a violation of human rights and the Socialist Party feared larger conflict with the public.

[12] A few West movies supposed to "lull" the public, like the Danish "Olsen Gang" about habitual, non-violent criminals, were imported. However, movies like "Tucker: The Man and His Dream", where an entrepreneur with a vision of a revolutionary vehicle would not give up and run up against incumbent manufacturers and state bureaucracy, were not shown. Similarly, the East German sports show "*Sport Echo*" was timed to allow watching (admittedly) higher quality West German soccer, but actually to detract attention from other West German shows perceived as anti-socialist.

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