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ORIGINAL PAPER

Cultural attitudes, economic shocks and political radicalization

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Abstract

The present paper focuses on the emergence and consequences of the so-called 'Dogville Effect', i.e., the negative socioeconomic and spatial impacts caused by radicalization of cultural attitudes in a region. After a conceptual and historical outline of this phenomenon, we present an empirical case, viz. the rise of the ultra-right-wing party in Greece, Chrysi Avgi. We analyze the party's spatial dispersion and its aftermaths in the period 1993–2015, using both local and regional election results. Spatial-economic controls are derived from the EUI (European University Institute, Florence) regional database. We employ a 2SLS approach (with historical voting results from 1974 as an instrumental variable) and a difference-in-differences approach with a propensity score matching. Our findings show that there exists a cultural persistence in the local share of ultra-right-wing support. The growth in this radicalization, however, is predominantly determined by the shrinking regional household welfare caused by exogenous forces in our model. Finally, the 'Dogville Effect', i.e., a further impoverishment of more radicalized localities, seems to be present in Greece, in the vein of the notion of Myrdal's vicious circles.

JEL Classification R32 · R38 · Z10 · N44 · P16

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1 Introduction

Negative macro-economic developments (such as banking crises and other economic shocks) have across Europe—and elsewhere—led to a tendency toward political radicalization among the local population. This is often accompanied by a bias toward political preferences in favor of extreme right-wing parties. The triggers of this radicalization and the local economic aftermaths from it are addressed in this paper from the perspective of the so-called 'Dogville Effect'.

The widely celebrated and memorable movie 'Dogville'[1] can be retold as the story of a village that was ultimately radically put on fire by an individual over whom the place had exercised severe austerity. Therefore, we propose the metaphor 'Dogville Effect' to summarize the negative economic impact (more precisely, an accelerated decline in local productivity) due to the local radicalization as an answer to economic perturbation. As observed by Harmgart and Huck (2009), the movie 'Dogville' describes essentially an illustrative neoclassical equilibrium behavior in a society devoid of moral sentiments. We will reinterpret 'Dogville' here as an illustration of a loss of equilibrium triggered by an initial exogenous dramatic decline in consumer welfare and a consecutive change in moral sentiments (i.e., polarization and radicalization of local attitudes), due to which the locality enters a negative development spiral.

The aim of this paper is to analyze the joint impact of economic factors (i.e., economic perturbation) and of historical political-cultural attitudes (i.e., cultural persistence) on the formation of current political preferences (or voting behavior) and their future economic consequences for regions or localities. First, we want to find out whether economic shocks or local cultural persistence—or both—play a role in the local radicalization. Put differently, our first interest is in identifying the source triggering the 'Dogville Effect'. Second, our interest is in tracing evidence for economic consequences from radicalization, which is the essence of the presence of a 'Dogville Effect'.

After a conceptual framing of our research, we will present evidence from a case study on Greece during the period 1993–2015. This country was affected by a serious external economic shock (a forced reduction of its governmental budget) in this

[1] The renowned Lars von Trier's movie 'Dogville' has a particularly economically interesting plot that has the following storyline. A young foreign woman, who has her origins in a society with anti-village attitudes but does not share these attitudes, arrives in a small closed world – a village named Dogville. Initially, the woman provides her labor in exchange for food and shelter in a classical supply and demand model. However, her bargaining power on the labor market decreases due to distorted information about her being an outlaw person (actually the truth is she is being chased by her anti-village past associates). The market responds to the shock from this information and her salary is decreased. Over time, her economic and, gradually, also her social rights deteriorate. Ultimately, the basic minimum of human dignity is breached – the young woman is brought to bartering her body in exchange for shelter under complete loss of personal freedom (she agrees to be kept chained, as part of the transaction). This shocking marginalization of the woman leads her to take a radical turn in her choices. She decides to cooperate with her own old enemies (from whom she was trying to escape at her first place when coming to seek shelter in Dogville). Together with them, she sets on fire and completely destroys the place 'Dogville' which had impoverished her beyond the minimum threshold of acceptability.

period. Meanwhile, it was also among the first European countries to experience remarkable growth rates in terms of ultra-right political support. To test our main hypotheses about the relationship between the latter two facts, we have compiled a unique dataset for the Greek ultra-right movement (Chrysi Avgi) at the regional NUTS3 level. As radicalization is hypothesized by the *Dogville Effect* to be endogenous to local economic development, we use two-stage least-squares (2SLS) and instrumental variables (viz., the pro-monarchy voting in the National Referendum of 1974) to separate cultural persistence from the economic factor of local political radicalization.

The structure of the remaining part of the paper is as follows. Section 2 discusses briefly the existing empirical evidence and theoretical settings that shape the foundations of the 'Dogville Effect'. Section 3 sketches the testable Dogville mechanism proposed in this paper. Next, Sect. 4 describes our unique database for the local outcomes of national and European elections in Greece for the period 1993–2015 and provides a description of the estimation strategy. Section 5 offers an interpretation of our empirical findings, while Sect. 6 concludes.

2 Cultural persistence and economic shocks: consequences for local development

2.1 Radicalization as a function of cultural persistence and economic adversity

2.1.1 Radicalization and cultural persistence

Recent literature has documented the existence of political voting 'strongholds', namely certain geographical areas have a historical cultural affiliation toward a particular type of voting. An example of this phenomenon is the spatial pattern of the outcomes of the presidential elections in the USA for the period 1980–2012 (see for details Pérez et al. 2015).

We will offer here a concise overview of the most researched historical illustrations of the link between culture and radicalization. The existing literature on the reasons for the pre-WWII radicalization of Germany is a topic that received extensive attention in the economic literature and offers some outstanding contributions of relevance for our analysis. This literature suggests a cultural persistence in radicalization. On the one hand, radicalization is often found to arise with a relatively higher intensity in those areas which historically had exhibited anti-Jewish tendencies and prosecutions (see Voigtländer and Voth 2012). On the other hand, it was also found that places with a higher culture of cooperation and actual social capital were the ones that were speeding up the growth of the radicalization movement, in particular since they were culturally predisposed to facilitate any social process occurring locally. This was intentionally utilized by the leading party in that area and it was only the heterogeneity of the local institutions that could eventually successfully filter this effect out in the federal states with more stable governments (see Satyanath et al. 2017).

Alternatively, radicalization is also sometimes explained as a product of the politics of hatred whose only purpose is power accumulation over the masses (see Glaeser 2005). Yet, given the historic dependence of cross-cultural stereotypes, this leaves considerable room for cultural persistence playing a leading role in the success of fueling politics of hatred between certain social groups or localities that are culturally predisposed to conflict. This will be further tested for the case of Greece.

It is noteworthy that radicalization per se is not necessarily destructive either and it can be simply anti-status-quo motivated behavior. Comparing individuals with violent and non-violent radical engagement, Bartlett and Miller (2012) show empirically that the harmful side of radicalization is often triggered in particular by emotional, social status and other cultural aspect-related motivations beyond the rational disagreements with the status-quo. Thus, the question which regions will radicalize—why and how fast—seems to be likely culturally predetermined.

2.1.2 Radicalization and economic adversity

Though often related to stable conditions caused by cultural persistence, human preferences have also been found to be shaped by economic policy interventions. A non-historic concept for radicalization based on economic perturbation is the concept for radicalization due to love for the people and protest against inequality. According to Marx (1844) there is a positive effect of schisms since through them power is being decentralized and more flexibly redistributed. Numerous studies for the USA, UK and other Western countries have confirmed a link between inequality and quantitative easing on the one hand and local increase of populism on the other hand (see Kapetanios et al. 2012; Baumeister and Benati 2013; Mumtaz and Theophiopoulou 2017; Fetzer 2018). Some of the researched examples relate again to the famous historical case of the Nazi party in Germany (Feinstein et al. 2008; Galofre-Vila et al. 2017). Yet, these studies involve the economic policies which perturbed the local German population before it started radicalizing. In the same vein, Ferrero (2002, 2005) show that Islamic radicalization and radical behaviors can be theoretically shown to be motivated by a clear economic rationale.

Economic shocks can also be viewed in the Marxian tradition as causes for the formation of culture (see for example Marx 1844). Voigtländer and Voth (2012) have found that the educational programme of the Nazi party in Germany has contributed massively to the emergence of anti-semitic attitudes. And this external exogenous stimulus even created a new persistent effect, where people who were educated under this educational programme were exhibiting their anti-semitic views stronger than any generation before the start of—or after the end of the exposure of the population to—the particular educational curriculum. This means that an exogenous shock can significantly alter local culture and create a new cultural persistence path. Thus, such systemic shocks might be more powerful determinants of development than cultural persistence per se.

Moreover, a negative economic shock may create a feeling of uncertainty in the locality (i.e., an economically driven perturbation). We know from anthropology that the natural response to uncertainty is the bounded rationality behavior of an individual to instinctively resort to one's own 'herd'. This anthropological observation has

been embraced by psychologists, while the study of homophily bias in social networks is a natural continuation to it (see Hall 1966; Jackson 2011 (esp. pp 22–23); Kets and Sandroni 2016). Thus, a psychological impulse toward an increased need for homophily can be expected to emerge as an illusionary self-defense mechanism. Meanwhile, this, however, points to the interlink between the economic and cultural trigger of human behavior, since common culture is a source of homophily between human beings as recognized from Adam Smith (1759: 1–35) till nowadays.

A negative economic shock may also be related to a feeling of a rising inequality between two groups. The latter is sometimes known in the economic literature as the 'tunnel effect' (see Hirschman and Rothschild 1973; Piketty 1995; Ravallion and Lokshin 2000; Van Cott 2007). We note here that the exogenously emerging, adverse economic shock on the worse-off group in a community leads, according to Hirschman and Rothschild (1973), to a radicalization of the drivers in this group. For example, if there are two blocked lanes of cars trying to pass a tunnel, then the shock of one lane starting to move may prompt the drivers in the still blocked lane to unlawfully pass across the street lines into the row of cars which would allow them to move ahead.[2]

Our first aim here is to clarify whether there is a socioeconomic trigger behind the regional radicalization. Put differently, we are asking what is the prerequisite for the 'Dogville effect' to emerge: cultural persistence, or economic shocks, or the interaction of both?

2.2 Revisiting Myrdal: effects from radicalization on local economic development

The association between radicalization and consecutive regional impoverishment is not a trivial one, neither is it a generally accepted fact of life. Therefore, it has to be clearly documented as a present phenomenon in order to demonstrate evidence for the existence of what is called here a 'Dogville Effect' and to justify further work on eventual mechanisms behind this relationship.

If such a relationship between radicalization and regional impoverishment is documented, it will be particularly important from the view of what is known as Myrdal's vicious circles—i.e., the serial impoverishment of a place due to self-fulfilled prophecy in political choice. The example of self-fulfilled prophecy used by Myrdal (1957) concerns the investment in education and building of human

[2] We assume that the radical response to a negatively changing economic context (e.g., a shock) is morally not sanctioned owing to what is known in behavioral economics as a fudge factor or in Becker's (1968) economic interpretation as a moral cost–benefit analysis. Clearly, the above mentioned local 'tunnel effect' activates the drive (Herzog 2015) for basic survival. And therefore, people may even perceive their increased aggressiveness/hostility as morally justifiable under extreme conditions that previously would have been regarded as excessive (Dharmapala et al. 2009; Becker 1968). The moment that the previously unthinkable moral constraint switches to another level of tolerance or acceptance is an illustration of a classical tipping point (Lamberson and Page 2012). This is the tipping point at which we assume that the mechanism of the above mentioned 'tunnel effect' starts operating. There are other potential mechanism through which radicalization may be affecting negatively local economic productivity.

capital (Becker 1975). In addition, hostile immigration policy (such as forced migration for example) has been well documented to generate an impact in particular on the spatial generation of human capital (see Becker et al. 2018). It is clear from endogenous growth theories (see Romer 1990) that a negative effect on human capital will produce an ultimate long-range effect on local economic development. Furthermore, radicalization may trigger economic decline through a trade channel. The dependence of local productivity and growth on local cultural diversity through the trade channel can be illustrated with the estimated losses from trade that the UK regions can expect as an aftermath from their radicalized Brexit pro-leave choice affecting trade agreements (see Los et al. 2017). Moreover, besides direct trade agreements, trade flows depend also on home bias and ultimately on enclaves of foreign human capital living in a locality. Put differently, the dynamics of both the human capital and trade channel are likely affected by a home bias effect that a radicalizing region may trigger negatively toward itself creating a bigger cultural distance between itself and the other players in trade. The same is valid for foreign direct investments (see Parsons and Winters 2014). That is how a radicalization of a place, as a self-defensive reaction against a negative economic shock, may render this place even more economically weakened in a complex system linking human capital, productivity, trade and investment.

Finally, what is characteristic about this negative effect from radicalization on local development is that it is a negative effect generated on the basis of cultural attitudes about the economic problem at stake, which leads to choices conducive to results opposite to the intentions. Ferrero (2005) shows that over time radical activity has initially positive but then negative outcomes for the radicalizing agents themselves. These findings are also in line with Alesina et al. (2002) who suggest that more fractionalization and divisiveness (which are part of the nature of radicalization) are associated with worse economic development.

Based on the above, we argue here that we can revisit Myrdal's vicious circle hypothesis. Namely, Myrdal (1957) claims that wrong economic policy based on an inequality-favouring cultural attitude (less investment in the education of the Black community) can only turn into a self-fulfilling prophecy and over time causes a worsening of the overall wellbeing of the entire society practicing this radical behavior. We consider this analogical to understanding that economic policy instigating economic perturbation and conditions of inequality can only result in radicalization and less cooperative behavior among the population—thus perpetuating and intensifying the negative economic perspective for the place that has radicalized. The underlying mechanisms might be different. Myrdal's vicious circle passes through radicalization of the supply side, while the our suggested mechanism passes through radicalization of the demand side. Yet, in effect, the global setting is the same—policy that generates economic perturbation and employs hostile cultural bias can only bring deeper detrimental effects for local development. Thus, our second and main aim here is to establish whether there is evidence for such an intensified negative effect on economic development in the radicalized localities. The existence of such evidence will point to the existence of what we shall call here a 'Dogville' mechanism.

3 A testable 'Dogville' mechanism

If existent, the 'Dogville Effect' as a phenomenon presents an interesting example of Myrdal's vicious circle, which is associated with a perpetuous trickle-down effect. The existence of this phenomenon can be easily operationalized and empirically tested through boiling down the above presented conceptual exposition into a general system of two equations, as shown in our model (1) below:

$$\text{Radicalization}_{it} = \beta_1 \text{SHOCK}_t + \beta_2 \text{Culture}_{it} + \beta_3 \text{Controls\_1}_{i(t-1)} + e_{1it}, \quad (1.1)$$

$$\text{Econ}_{it} = \beta_4 \text{Radicalization}_{it} + \beta_5 \text{Empl}_{it} + \beta_6 \text{Controls\_2}_{it} + e_{2it}, \quad (1.2)$$

where $\text{Radicalization}_{it}$ is the propensity to adopt or support ultra-right attitudes; SHOCK_{it} is a negative external shock, which disequilibrates the local economic development; Culture_{it} is the sum of local cultural attitudes creating a milieu with propensity to radicalization the Culture Based Development (CBD) framework (see Tubadji 2012, 2013; Tubadji and Nijkamp 2015, 2016) has explicated how the 'openness to foreigners' attitudes drives migration flows, and how the attitudes to new ideas determine local innovation through the degree of connectedness in the social network, etc., in general, a sum of attitudes from both living culture attitudes or culturally inherited attitudes from past periods may be a relevant factor for the propensity to radicalization of a place; in specific, we are interested here in the degree of readiness to embrace radicalism that the local cultural attitudes carry from the past); Controls_1_{it} is the size of the local economy; Control_2_{it} is a vector of dummy variables on local industrial specialization, approximating the economic structure of the place; *Econ* stands for economic development and is usually approximated with regional gross value added (GVA) and/or its derivations; Empl_{it} is total local employment; e_{1it} and e_{2it} are the error terms; *and t* denotes the current time period, and the index *i* stands for the locality. In a nutshell, model (1) suggests that the economic shock and local cultural predisposition to radicalization determine the degree of radicalization in a place and consecutively this radicalization affects current local economic development.

We will focus in this paper on establishing the two main aspects contained in model (1) that define the 'Dogville Effect' phenomenon: (1) the sources and (2) the aftermaths of regional radicalization. As long as we find that more radicalized places face indeed inferior economic conditions, and if this effect is induced by the negative economic shock on the localities and the local cultural reaction to this shock, the general 'Dogville Effect' hypothesis cannot be rejected. Then, it will be worthwhile in future research to delve empirically and theoretically into the potential complexities and indirect channels through which the cultural effect may be passing.[3] We leave the exploration of these

[3] As mentioned above, one highly plausible such mechanism might be the impact of cultural gravity on the human capital accumulation in a place and migration (see Tubadji and Nijkamp 2015), where the radicalization of the place decreases the attractiveness of a place for footloose human capital. Alternatively, the cultural impact on growth through the six degrees of connectedness in the social network which affects local innovation (see Tubadji and Nijkamp 2016 for an extensive description of this potential channel) might be the way how radicalization decreases the connectedness in the social network and thus makes a place less innovative and therefore less economically prosperous. Also, many other known or novel economic mechanisms sensitive to cultural impact may be affected by radicalization and thus generate a serious impact on local economic development.

alternative potential channels through which the source of radicalization affects local economic development as a secondary question to be dealt with in further research. We aim here to establish the fundament defining the existence of the 'Dogville Effect' phenomenon, i.e., we want to identify the validity of the cultural and economic shock sources and the presence of economic development aftermaths from radicalization.

4 Empirical tests on the existence of the 'Dogville Effect' in Greece (1993–2015)

4.1 Database

To test empirically the existence of the 'Dogville Effect', we will analyze the spatial relations between the political and economic development in Greece. This country has an economy that experienced a severe negative economic shock on its aggregate budget in recent years with a consequent fast decline in welfare. The development of the ultra-right-wing party (Chrysi Avgi/Golden Dawn) in this country can be seen as a clear form of political-economic radicalization.

Our dataset relies firstly on voting results across National Elections and European Parliament Elections in Greece from the period 1993 to 2015. This time span constitutes six rounds of National Elections (respectively in 1993, 1996, 2009, 2012, 2015a, b), and four rounds of European Elections (1999, 2004, 2009, 2014). Our analysis is based on election results on NUTS3 level, which means 51 regions in Greece. Our dataset is a pooled cross-section for the 8 years of elections for these regions amounting to a total of 408 observations.

Our data set contains the percentage and the number of voters, for Chrysi Avgi (the ultra-right party) as well as for KKE (the traditional ultra-left party or Communist Party of Greece/Kommounistikó Kómma Elládas), for the two leading political parties: namely, the center-right party (New Democracy/Nea Dhimokratia) and the center-left party PASOK (the Panhellenic Socialist Movement), and all other parties that participated in the elections. Clearly, from this dataset, the growth of Chrysi Avgi is our first dependent variable of interest, approximating the development of radicalization through the rise of general right-wing voting (our variable 'ultra-right (%)').[4]

[4] Alternatively, we re-estimated all tests with the share of voters for the ultra-left party KKE as a dependent variable. The results however, were never statistically significant for the KKE-related variables. The rest of the model was stable and performed similar to the reported results employing the percentage voted for the Chrisi Avgi. On the one hand, a reason for this may be the Greek specific reality, where the origin of the left and right parties and their relation with the Monarchy from the past might be carried further in time by cultural persistence. It could be also that there is something more universal in the ethos of the right and left political ideologies, that can be generalized outside the Greek context. Namely, left ideology might be associated with concern for the common good and right ideology is more concerned with the private interest. There is work related to this matter suggesting that places with less risk-averse attitudes are more prone to develop populist political preferences (see Pastor and Veronesi 2018). This matter is worth further investigation before a definite answer for the reasons behind the different results obtained with ultra-left and ultra-right voting can be stated.

The main triggers for radicalization are hypothesized to be economic shocks and/or the local cultural milieu. The latter is suggested to have cultural historical roots.

To quantify the negative economic shock, we were able to obtain from EUROSTAT the data on the adjusted budget deficit at national level (defined as a percentage change between the actual and the previously predicted by EUROSTAT (based on extrapolation) GDP for this region). This variable is labeled 'adj. budget deficit'. We used this variable to approximate the negative economic shock, as one of the potential sources (triggers) of the regional radicalization.[5] Alternatively, the economic shock is quantifiable by a dummy variable dividing the period under analysis into before and after the austerity used as an economic-political measure with regard to Greece (our dummy variable 'austerity dummy (2010 after)' serves this purpose).[6]

To qualify the local cultural milieu we use the percentage of voters for the pro-center-right oriented party in Greece (Nea Dhimokratia). This corresponds to our variable 'center-right (%)'.

Additionally, we have a measure for the historical local cultural attitude of a right-wing orientation in the local attitudes, which is quantifiable through the pro-monarchy voting in the referendum that took place in Greece in 1974 (available from the State Gazette). This is variable 'pro-monarchy 1974 (%)' which is our instrumental variable for resolving the endogeneity question about the trigger of the 'Dogville Effect'.

Our second dependent variable of interest, as per model (1), approximates the local economic development in a region by the negative change in gross value added (GVA) in the locality (i.e., variable '*decrease lnGVA*'). It is hypothesized to be importantly linked to the level of radicalization ('ultra-right (%)').

Finally, we have a set of control variables. We were able to obtain from the European University Institute (EUI) the European Regional Data set (ERD) (from now on referred to as the EUI data set) data on local population change, local employment in total and by sector of the economy. We used the EUI data set to generate variables for sectoral location quotient in: agriculture; industry excluding manufacturing; construction; wholesale; retail; transport and distribution; communications, hotels, and catering; financial and business services; and non-market services.[7]

[5] We conducted all estimations alternatively using the dummy variable capturing the start of the austerity period as an approximation for the negative economic shock. These results appeared to be very consistent with the ones presented here.

[6] The results obtained with the use of the two alternative measures are consistent. The results using the adjusted budget deficit are only more prominent as magnitudes.

[7] The sectoral location quotient (LQ) is a measure of concentration of a particular industry in a region compared to the national average presence of this industry. We have these calculated on NUTS3 level and they are obtained following Florence (1939) using the formula:

$$IS = (Es/Est)/(Er/Et), \tag{1}$$

where *IS* represents the specialization index; *Es* stands for local employment in the given sector of interest; *Est* represents the employment in this sector in the country; *Er* stands for total local employment in all sectors; and *Et* denotes total employment in the country. We have six LQ variables for every regions for the six sectors: (1) agriculture; (2) energy and manufacturing; (3) construction; (4) distribution, transport and common services; (5) finance and other services; and vi) non-market services. The sectoral location quotients are calculated for every year in each region. They are labeled respectively as variables: 'agriculture', 'industry', 'construction', 'trade and retail', 'finance', 'non-market sector'.

We employed this unique compiled dataset for quantifying the elements of our model (1) in order to test the triggers and aftermaths from regional radicalization. We refer to 'Appendix 1' for a detailed list of the definitions of each variable used in the analysis and their relation to the component of model (1).

4.2 Estimation strategy

The above-stated aims of our study can be summarized in the following two main working hypotheses:

H01 The ultra-right-wing growth is triggered jointly by the economic shock and a locally persistent conservative cultural attitude.

H02 The ultra-right-wing growth is associated with a negative change in local productivity.

4.2.1 Testing H01 regarding the trigger of radicalization

To address empirically hypothesis H01, we test the below-stated model (2), which is the equivalent to the first equation of our model (1):

$$\text{Radicalization}_{it} = \beta_1 \text{SHOCK}_{it} + \beta_2 \text{Culture}_{it} + \beta_3 \text{Controls\_1}_{it} + e_{it}. \quad (2)$$

where the variables are defined as in Eq. (1.1) of model (1). H01 cannot be rejected if we find an effect from the SHOCK_{it} factor and an effect from Culture_{it} as a factor. We operationalize model (2) by regressing the local percentage of radicalized ultra-right voters (variable 'ultra-right (%)')[8] on the economic shock (approximated through 'adj. budget deficit'), and the local conservative cultural milieu, captured by the local percentage of voters for the center-right party (Nea Dhimokratia) (this is variable 'center-right (%)').[9] We use also the interaction of the latter two variables as a potential explanatory factor of interest, since we expect that the cultural and economic triggers might be mutually related.

Testing this model however, has an endogeneity challenge attached to it, since the cultural propensity to radicalization and the economic shock might be causally related. So, we need to disentangle the historic-cultural propensity from the current economically triggered pro-radical attitude.

[8] This includes EPEN voters for the years, before Chrysi Avgi evolved from EPEN and became founded as an official party.

[9] The share of ND voters cannot be assumed directly inversely related to the share of other parties per se, as the number of parties in the different elections varies as well as the number of voting people and the fact that ND sometimes wins and sometimes loses the elections. What however can be reliably expected to be linearly captured by the share of the ND party in a locality, is a proxy for the particular right-minded-political culture in the locality.

We therefore employ a 2SLS instrumental variable approach (IV). Namely, before testing model (2) as described above, we purge the local center-right cultural milieu variable through the use of an instrumental variable. Next, we involve the purged version of the cultural variable in estimating model (2) again, alternatively without and with the interaction term.[10] Put differently, to ensure that we are really capturing the general local cultural pro-right orientation with the percentage of ultra-right voters as a cultural propensity to conservatism, we instrumentalize this variable with a historical variable associated with it. Our instrument is the local share of pro-monarchy votes in the national referendum in Greece in 1974 (labeled 'pro-monarchy 1974 (%)').

The motivation for this choice of instrument is the following. First, there is sufficient statistical correlation between the two current percentages of ultra-right and center-right voters (defining the local pro-right cultural milieu) and the referendum pro-monarchy voting (the historical variable)[11] (see Figs. 1, 2, 3 which offer visualization of the percentages of these votes on the map of Greece, documenting the close match of their geographic distribution). Second, the modern center-right and ultra-right-wing preferences seem to be connected ideologically through a link of high levels of conservatism among their voters, not relevant for the ultra-left voters in Greece (see Andreadis 2013, 2015; Hooghe et al. 2002, and Fig. 4 which compare the standing of the ideology of the Greek parties of interest). Therefore, the historic more conservative pro-monarchy vote seems to have both statistical and theoretical foundations suggesting it is a relevant instrument for the right-wing orientation in the Greek regions. We conduct and report in our results section further standard relevant tests for the instrumental variable used.

In search of further precision, controls for local economy size (being approximated by either total number of the electorate (variable 'total electorate') are also used. Sector location quotients are employed as well for the same purpose.

To carry a robustness check of our results obtained by 2SLS and IV methods and gain some further insights, we conduct an alternative test of our H01 by employing propensity score matching and difference-in-differences approach. This test focuses not on the percentage of ultra-right voting, but on the change in the support for the ultra-right party over time. See 'Appendix 2' for the complete estimation strategy of this robustness check.

[10] To use an interaction term in this 2SLS setting, we first obtain the purged predicted value of 'center-right (%)' from a 2SLS for model (2) without interaction term. Then, we multiply this purged value with 'adj. budget deficit' in order to obtained a cleaned from endogeneity interaction term between the economic and cultural triggers.

[11] The variable 'center-right (%)' captures the standard pro-right orientation as opposed to the ultra-right orientation. With the center-right orientation, the radical right party shares the right ideology, but the ultra-right party is an extreme form of ideology and in this sense it might have similarity with extreme left parties. Disentangling which part of the ultra-right motivation is leading (its right orientation or its radical orientation) is important. If the economic shock causes an increase in the extreme votes, we will observe an increase in the share of votes for the ultra-right and ultra-left parties. If the austerity radicalizes only the right oriented voters, we will see an increase among the shares of center- and ultra-right voters, but not of the percentage of ultra-left voters. This clarifies the economic meaning and political ideological and attitudinal difference behind the reaction captured in the increase of the voting for the ultra-right party that we analyze here.

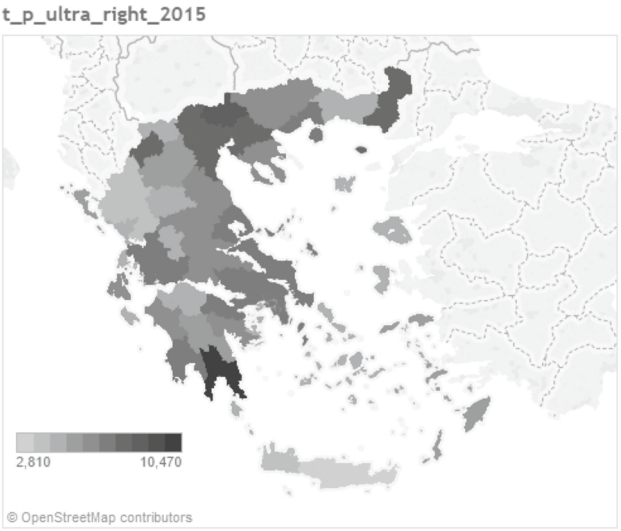

Fig. 1 Ultra-right (%), 2015. *Notes*: The figure presents the spatial distribution of the percentage of voters for the ultra-right-wing party (Chrysi Avgi) in the latest national elections in Greece, 2015. *Source*: Authors' calculations

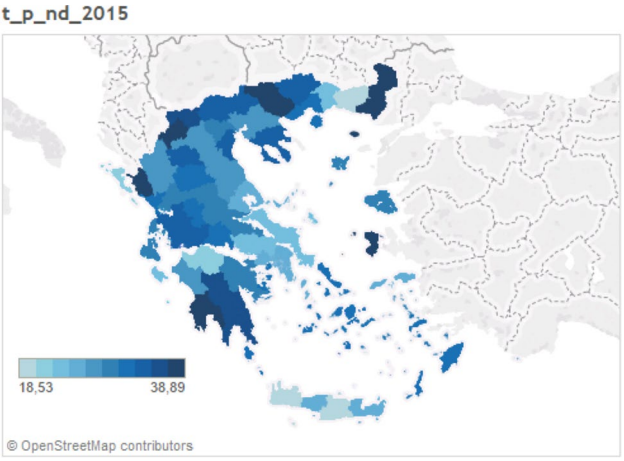

Fig. 2 Center-right (%), 2015. *Notes*: The figure presents the spatial distribution of percentage of voters for the center-right party (Nea Dhimokratia) in the latest national elections in Greece, 2015. *Source*: Authors' calculations

4.2.2 Testing H02 regarding the faster trickle-down of the radicalized localities

To address our second hypothesis (H02) (focusing on the ultra-right preferences as a trigger for the local Myrdal's vicious circle of economic decline), we test model (3) as stated below:

$$\Delta\_\text{Econ}_{it} = \beta_2 \Delta\_\text{Radicalization}_{it} + \beta_9 \Delta\_\text{Controls}_{it} + e_{it}, \tag{3}$$

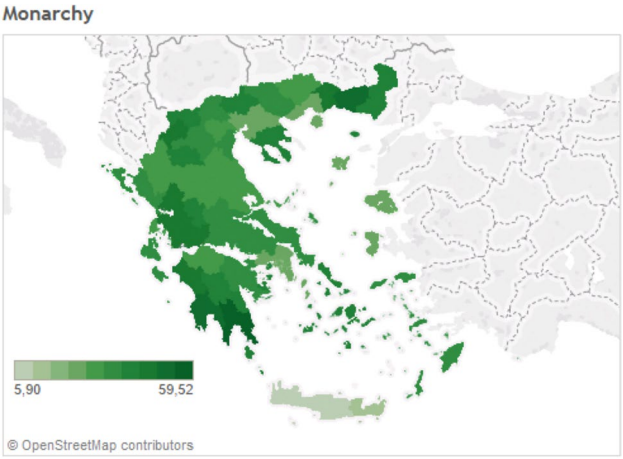

Fig. 3 Pro-monarchy votes (%), 1974. *Notes*: The figure presents the spatial distribution of percentage of pro monarchy voters in the national referendum in Greece, 1974. *Source*: Authors' calculations

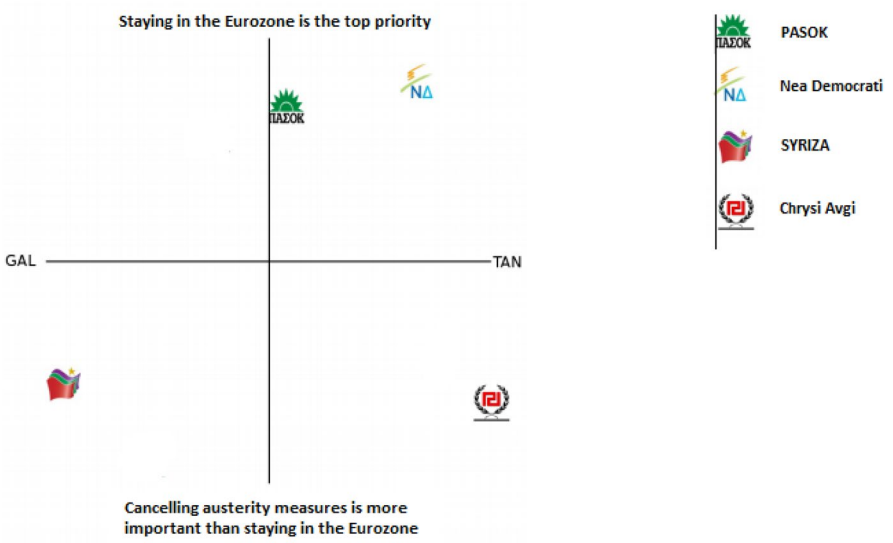

Fig. 4 Ideological proximity between the main leading political parties and Chrysi Avgi. *Notes*: The figure presents a visualization of the Greek political parties in terms of their ideological orientation. This diagram helps to get an impression about the proximity in political platform and ideology between the three main parties in Greece that governed the country in the period 1993–2015 (these are PASOK, Nea Dhimokratia (ND) and SYRIZA, and the platform of the ultra-right-wing party Chrysi Avgi [all parties are annotated on the diagram with their party logos (see the legend to the right of the diagram to match logos and party name)]. The annotation of the horizontal axis capturing right-left is as follows: the scale varies from GAL (which stands for Green, Alternative, Libertarian) to TAN (which abbreviates Traditional, Authoritarian, Nationalist), following (Hooghe et al. 2002). The vertical axis measures the reaction of the party supporters to immediate cancelation of the adjusted budget deficit—the reactions vary from staying in the Eurozone to leaving the Eurozone (for more details about this diagram see Andreadis 2015). The party profiles presented in this diagram are based on a specific set of sociocultural questions asked to all supporters of all parties. The figure shows that Nea Dhimokratia is closest to Chrysi Avgi in terms of TAN (i.e., general conservatism). *Source*: Authors' own calculations

where Δ_Econ$_{it}$ stands for the change in gross value added (GVA) between election periods (more precisely, we focus on the negative effect on local productivity and this is operationalized through our variable 'decrease lnGVA'); Δ_Radicalization$_{it}$ is defined as the change in percentage of ultra-right-wing voters (variable 'change ultra-right (%)') and Δ_Controls$_{it}$, is a vector of the changes over one year in the controls, as defined in model (1).

Given that we focus on the negative change in GVA, approximated with a dummy variable equal to 1 when there was a decrease in local gross value added ('decrease lnGVA'), we employ a probit model for estimating model (3). We report the average marginal effects from our estimations.

Finally, it may be noted that right-wing voters may be simply protest voters (at least to some extent): if the economy is under a severe shock, the share of protest voters against the status quo increases per se. To cross-check for this, we re-estimate all our tests of H01 and H02 by substituting the ultra-right share for the ultra-left share of voters, in order to compare if any kind of radicalization leads to the same 'Dogville Effect'. We provide some comments on these results in a footnote.

5 Empirical results

5.1 Disentangling cultural persistence from the economic trigger

To test H01 we have to explore the cultural attitude as a trigger for ultra-right voting and the economic shock as a trigger of this voting behavior. This requires ultimately paying attention to the interlink between these two triggers.

Also, we need to achieve a clear identification and distinction between the cultural and economic trigger, since the cultural trigger might be endogenous to local economic development. To identify clearly the cultural trigger, we need to use a cultural instrument in order to separate the cultural predisposition to right-wing views in the Greek regions (variable 'center-right (%)') from the current economic influence on them ('adj. budget deficit'). We cross-check the relevance of instrumentalizing the current center-right preferences with the historical pro-monarchy votes in the referendum in 1974, by first looking at the correlation coefficient between them. Table 1 shows that this coefficient is sufficiently high. Having in mind also the theoretical justification from Fig. 4, previously discussed, we can accept this historical variable to be a rather reliable instrument for a modern conservative cultural milieu (captured in our analysis by the percentage of voting for the center-right party Nea Dhimokratia).[12]

Thus, we are confident to test our H01 applying the 2SLS IV approach, as described in the previous section with regard to model (2). The results are shown in Table 2.[13]

[12] The relationship of this instrument with the left extreme party KKE is of course opposite in sign.

[13] It is noteworthy that while Table 2a–d presents different quantifications and use different sets of controls, indifferent of measurement alternatives tried, the results obtained are always consistent and lead to a very similar economic interpretation.

Table 1 Correlation between main variables. *Source*: Authors' own calculations

	Ultra-right (%)	Ultra-left (%)	Center-right (%)	Pro-monarchy 1974 (%)	GVA	ln_GVA	Austerity dummy (2010 after)	Adj. budget deficit
Ultra-right (%)	1							
Ultra-left (%)	0.28	1						
Center-right (%)	−0.66	−0.45	1					
Pro-monarchy 1974 (%)	0.09	−0.12	0.37	1				
GVA	0.07	0.08	−0.20	−0.19	1			
lnGVA	0.11	0.00	−0.28	−0.21	0.71	1		
Austerity dummy (2010 after)	0.60	0.38	−0.59	0.00	0.11	0.18	1	
Adj. budget deficit	−0.91	−0.31	0.72	0.00	−0.05	−0.09	−0.77	1

The table presents: (1) the correlation coefficient between the current and historic-cultural milieu approximated with voting preferences ('ultra-right (%)', 'ultra-left (%)', 'center-right (%)', 'pro-monarchy 1974 (%)'); (2) local gross value added in real number and natural logarithm form (GVA; lnGVA), and (3) economic shock measures [ádj. budget deficit; 'austerity dummy' (2010 after)]. The claim for conservatism is based on the political-orientation evaluation model provided by local political scientists (see Fig. 4). The correlation is examined in relation to the intended empirical strategy where the historic variable (variable 'pro-monarchy 1974 (%)') is to be used as an instrumental variable for the current predominant cultural orientation in the value system of a locality

Table 2 shows four specifications, two OLS specifications, respectively, without and with an interaction term between the economic and cultural triggers and two analogical 2SLS specifications, where the cultural trigger is purged from its endogeneity through the use of the historical variable of pro-monarchy voting ['pro-monarchy 1974 (%)'].

We control in these estimations for the size of the locality ('total electorate'), since we know that it varies significantly across the Greek regions.[14] We carried these estimations also involving some economic controls. Namely, we took in account that it is often well argued that poverty and overall growing unemployment and loss of productivity is related also to local sectoral specialization (for Greece this is in specific the construction sector). Therefore, a final battery of control variables, including: gross value added and sectoral location quotients was included.[15]

The initial test of H01 with an OLS explorations, shown in the first column of Table 2, suggests that both the negative economic shock ('adjusted budget deficit') and the local modern pro-right-oriented cultural milieu (captured by 'center-right (%)') influence local radicalization. The specification in the second column of Table 2 shows that if the interaction of these two variables is taken into account, the economic factor loses its significance but the interaction itself also seems insignificant. This result could be interpreted as partially rejecting H01 and showing the cultural milieu as the reason for local radicalization. However, the data requires some more careful handling of the endogeneity of the modern cultural milieu. Our solution to this problem is shown in the third and fourth specifications of Table 2. The first stage equation of the 2SLS approach without interaction (i.e., Specification 3), shows that local center-right orientation is predicted by the historic instrumental variable (the 'pro-monarchy 1974 (%)'). After this purging of the center-right variable with the use of the historic instrument, the structural model shows that actually both the cultural and economic trigger affect local radicalization. However, the cultural milieu variable is associated with higher local radicalization, while the effect from the adjusted budget deficit shows that local measures of austerity were even not highest among the places which radicalized the most. This can be interpreted as radicalization being a reaction not simply of fear of being left behind, but of fear of falling to the last place of the distribution. This is consistent with the model and findings that people avoid, at all costs, being in the last place in their group (Kuziemko

[14] As many countries, Greece experiences strong agglomeration around its capital city—Athens—and its corresponding NUTS3 region—Attika. Also some of the regions such as Crete, Peloponnese and Thessaly also group as an outstanding gear of development different from the rest of Greece (see for example Ioannides and Petrakos 2000) on these topics. Yet, the regional economic disparities and agglomerations regard the GVA (productivity levels) and population concentrated in the NUTS3. We do address these variables directly in our analysis, so basically the disparities between the units are very clearly quantified and their effects are reported. We don't know why the NUTS 3 regions are having disparities, but we clearly learn how their disparities are associated with their radicalization under economic shocks and given their cultural heritage in political conservatism.

[15] The results across all specifications with and without this last battery of controls are consistent. The use of the latter however reduces the number of observations because it is available for a shorter period of years. Thus, we present in Table 2 both types of results. The full list of tables of various tried specifications with diverse lists of controls is available upon request.

Table 2 Economic shock and cultural persistence in ultra-right preferences. *Source*: Authors' own calculations

Dep.var.	OLS				2SLS-IV							
	Spec. 1		Spec. 2		Spec. 3				Spec. 4			
	Ultra-right (%)		Ultra-right (%)		Center-right (%)		Ultra-right (%)		Center-right (%)		Ultra-right (%)	
	Coef.	*t* value	Coef.	*t* value	Coef.	*t* value	Coef.	*t* value	Coef.	*t* value	Coef.	*t* value
Adj. budget deficit	−0.597	−6.13	−0.122	−0.33	1.536	20.23	−0.773	−13.69	2.944	10.9	−1.511	−6.31
Center-right (%)	−0.367	−7.34	−0.466	−5.17			0.104	3.01			0.221	3.48
Pro-monarchy 1974 (%)					0.231	7.32			0.171	4.95		
Interaction: center-right (%) and adj. budget deficit			−1.47E−06	−1.56					−7.13E−02	−5.35	2.83E−02	3.76
Size controls												
Total electorate	−1.47E−06	−1.55	−0.015	−1.32	1.63E−05	3.75	−2.04E−06	−1.59	2.16E−05	3.59	−4.70E−06	−2.01
Gross value added (lnGVA)					−3.231	−6.02	0.524	2.71	−0.005	−4.40	0.001	2.50
Sectoral location quotients												
Agriculture					−0.651	−0.40	0.351	0.86	−2.296	−1.45	0.870	1.72
Construction					−0.550	−0.78	0.201	1.13	−0.398	−0.58	0.220	1.02

Table 2 (continued)

Dep.var.	OLS				2SLS-IV							
	Spec. 1		Spec. 2		Spec. 3				Spec. 4			
	Ultra-right (%)		Ultra-right (%)		Center-right (%)		Ultra-right (%)		Center-right (%)		Ultra-right (%)	
	Coef.	*t* value	Coef.	*t* value	Coef.	*t* value	Coef.	*t* value	Coef.	*t* value	Coef.	*t* value
Finance					−1.781	−1.86	0.580	2.27	−0.866	−0.95	0.540	1.83
Industry					1.617	1.80	0.123	0.51	0.044	0.05	0.438	1.57
Non-market sector					3.530	1.53	−0.844	−1.40	−0.290	−0.13	−0.148	−0.22
Trade and retail					−2.858	−1.32	0.527	0.94	−3.872	−1.83	1.044	1.47
Constant	14.023	6.71	17.400	5.26	50.581	7.04	−9.437	−3.47	39.505	5.88	−12.236	−3.56
F (or chi2)	*F*(3, 404) = 72.34		*F*(4, 403) = 54.78		*F*(10, 239) = 62.53		chi2(10) = 1079.97		*F*(11, 238) = 61.22		chi2(11) = 743.66	
Prob > *F* (or chi2)	0.0000		0.0000		0.0000		0.0000		0.0000		0.0000	
R-squared	0.35		0.35		0.72		0.80		0.74		0.71	
Adj. *R*-squared	0.34		0.35		0.71		–		0.73			
Root MSE	6.651		6.645		4.520		1.145		4.401		1.387	
N	408		408		250		250		250		250	
***D–W–H test for endogeneity												
–					Durbin	chi2(1) = 11.4223	(*p* = 0.0002)		chi2(1) = 21.9964	(*p* = 0.0000)		
					Wu–Hausman	F(1, 237) = 11.3467	(*p* = 0.0003)		F(1, 237) = 22.8643	(*p* = 0.0000)		

Table 2 (continued)

Dep.var.	OLS				2SLS-IV							
	Spec. 1		Spec. 2		Spec. 3				Spec. 4			
	Ultra-right (%)		Ultra-right (%)		Center-right (%)		Ultra-right (%)		Center-right (%)		Ultra-right (%)	
	Coef.	*t* value	Coef.	*t* value	Coef.	*t* value	Coef.	*t* value	Coef.	*t* value	Coef.	*t* value
***Weak instruments test—estat												
–					Robust *F* (1, 238)	Prob > *F*			Robust *F* (1, 238)	Prob > *F*		
					47.9499	0.0000			20.2507	0.0000		

The table presents a test of our H01 in four specifications. Specifications 1 and 2 use an OLS and present exploration of the effect from the economic trigger (ádj. budget deficit') and the cultural trigger ('çenter-right (%)') on the radicalization of a locality (ultra-right (%)'). Respectively, Specification 1 does not include an interaction term between the two triggers, and Specification 2 includes this interaction. Next, Specifications 3 and 4 use 2SLS-IV method to examine the same dependencies. Here, contemporary center-right (therefore more conservative, according to political economists, for Greece) orientation is instrumentalized with historic conservative political preference expressed in the pro-monarchy referendum voting behavior in the 1970s in the country. Again, the two specifications differ in the inclusion of an interaction term between the economic and cultural trigger. We have purged the cultural trigger before interacting it with the economic one for the needs of Specification 4. We have done this purging of the interaction term by keeping the predicted value of the cultural trigger from the first stage in Specification 3 and multiplying this purged value with the ádj. budget deficit'. Thus, we have obtained a cleaned from endogeneity interaction term for Specification 4. A battery of economic controls is used in a variety of combinations. The main results with different combinations of controls remain consistently the same

et al. 2014). Finally, we estimate Specification 4, showing a 2SLS estimation where the cultural trigger is purged from endogeneity and an interaction between it and the economic trigger are examined as factors for local radicalization. The results of Specification 4 clearly show that our H01 cannot be rejected. The both the economic and cultural trigger predicting the local radicalization and their interaction term is a significant predictor in this context as well.

We conduct three post-estimation tests to confirm that our use of an instrumental variable was a valid approach. Two of these post-estimation tests are: the Durbin test and the Wu–Hausman test for the statistical significance of the residual from the first stage when it is integrated as a regressor into the structural model. Both tests refer to the question whether there is evidence for endogeneity in the 'center-right (%)' variable. The tests should be consistent with each other. Across our many different specifications tried, these tests almost consistently agree that endogeneity is present. These tests are sometimes biased toward confirming exogeneity and suggesting an OLS estimation is sufficient when the instrument is weak. There are some traces of such tendency in our results, but overall it seems endogeneity is detectable through the tests at different levels of significance. Also, our third post-estimation test—concerning the question whether our instrument is weak, shows a value of the coefficient of the F-test way above the critical value of 10. This suggests that, statistically speaking, our instrument is not weak. Given its strong historical motivation, we consider the overall performance of the post-estimation tests regarding our instrumental variable sufficient to accept our results as reliable.

In short, our 2SLS and IV test of H01 shows that the level of radialization is more associated with the cultural triggers and it is culture that acts as a multiplier of the effect from the economic shock. We carry a robustness check of these results looking at economic shock and cultural milieu as drivers this time for the growth of the local radicalization in Greece. We employed propensity score matching and difference in differences for this robustness check. The main take from this test of our H01 is that the economic shock is what mainly predicts the growth in the support for the ultra-right party and not the cultural historic milieu. See Appendix 2 for the detailed description of these results. In essence, both the 2SLS (IV) and the propensity-score-matching-based tests cannot reject the first part of the 'Dogville Effect' formulated as our H01.

5.2 Radicalization and local development: empirical evidence

Next, we address the hypothesis (H02) that the economically triggered, culturally sensitive radicalization in a place or region is associated with the activation of a type of Myrdal's vicious circle in the local economy which we call the 'Dogville Effect'. The econometric results are presented in Table 3.

We use a probit model to focus on the impoverishment in the economy (in terms of decrease of GVA). We regress the negative change in local productivity (approximated by dummy variable 'decrease lnGVA') alternatively on the external cause [the economic shock (variable 'adj. budget deficit')], or the culture-affected political support for ultra-right-wing party (Chrysi Avgi) (variable

Table 3 Myrdal's vicious circles driven by economic shocks or ultra-right-wing support. *Source*: Authors' own calculations

Dep. var.	Decrease lnGVA			
	dy/dx	*z*-value	dy/dx	*z*-value
Change adj. budget deficit	−0.247	−3.70		
Change ultra-right (%)			−0.043	−4.01
Change employment	0.000	−1.20	0.000	−1.15
Sectoral location quotients				
Change agriculture	1.147	1.04	1.151	1.04
Change construction	0.241	0.58	0.254	0.60
Change finance	0.200	0.30	0.218	0.33
Change industry	1.451	1.52	1.484	1.56
Change non-market sector	1.999	1.28	1.983	1.27
Change trade and retail	0.258	0.15	0.206	0.12
N	200		200	

The table presents a test for our H02, with regard to the relationship between perpetuous impoverishment and the radicalization of a locality. Average marginal effects from probit estimations are presented. The model examines to what extent the decrease in local gross value added ('decrease lnGVA'), is explained by the economic trigger (ádj. budget deficit') and alternatively by the growth of radicalization itself ('variable change ultra-right (%)'). Thus, the test in this table compares the size of the effect on local perpetuated impoverishment over time caused alternatively by the economic shock and by the growing radicalization in the locality. Controls for economic size change and sectoral specialization (location quotients) are employed

'change ultra-right (%)'). The effect of these two factors exerted on local impoverishment forms the main test of H02, which cannot be failed if these variables are significant regressors. Controls for changes in employment, which are known to have been notable in this period, as well as structural changes in the economy—such as changes in the sectoral location quotients—are also taken into consideration. The shifts in sector specialization captured in the location quotients are an additional aspect of employment in a particular sector; so, if unemployment has relatively more affected one particular sector, this will be recorded in the change in the specialization of the locality.

Our probit estimations appear to indicate a clear dominance of the economic shock over the radicalization factor (namely, the former having an almost five times higher coefficient than the latter) as a driver for the negative local changes in GVA. These results are in support of our 'Dogville Effect' mechanism.

First, they support the H02 proposition that an increase in the ultra-right-wing preference is significantly associated with the decrease in productivity over time. The immediate interpretation of the marginal effects from our probit estimation presented in Table 3 is that the budget deficit governmental interventions stabilized the regions from impoverishment. Places that radicalized however lost about four firth of this stabilization effect of the austerity measures. Thus, higher losses in productivity occurred for those who radicalized more.

Secondly, they confirm the link between the local budget deficit and the local ultra-right-wing support, since both variables seem to have a similar mutually substitutable explanatory power for local loss in GVA. Furthermore, it is of high policy relevance to note that while an economic shock can only be observed as an exogenous perturbation causing an undeniable effect on productivity, in the case of a local rise in ultra-right-wing support we are faced with a locally manageable endogenous factor that can be subject to policy-making and intervention. Governments can prevent the growth of radicalization in culturally predisposed places by trying to direct redistribution toward especially targeted groups and households beyond certain income levels thus not letting people feel left behind. Alternatively, investments in public goods that can generate greater spillovers can be considered in impoverished areas, where individual interventions would be either more costly or more dispersed as an effect. All these interventions could decrease the growth of radicalization in a locality through tackling the economic trigger of it. Yet, people might also be sensitive to redistribution as our results show, thus every intervention considered needs special analysis before implementation.

We also observe that in terms of size, across all estimations conducted (additional results are available upon request), the effect from an economic shock on voting is always bigger in magnitude than the cultural persistence related effect. These are all indirect inferences supporting the economic shock as a main trigger of the radicalization in Greek regions. They support also the suggested 'self-fulfilling prophecy' role of current radicalization as a driver for perpetuated future economic impoverishment through a vicious circle of economic decline (as expected in the spirit of Myrdal). Put differently, when people demonstrate (through voting ultra-right) their feeling of being left behind, this instigates their further being left behind in future economic development.

6 Conclusion

The main aim of this study was to disentangle the trigger—and to capture evidence for the presence—of the 'Dogville Effect' in Greece during the period 1993–2015. This is meant to serve as an empirical illustration of the causes and effects from the recent radicalization movement observed all across modern Europe and elsewhere.

The 'Dogville Effect' has been analyzed in the present study in terms of: (1) why it occurs, (2) where it develops faster from a place-based development perspective; and (3) what its effect is on the economic development of a place in a subsequent period (in terms of one-year periods). Thus, basically the analysis has focused on disentangling the 'Dogville Effect' as a cultural persistence versus an economic shock driven radicalization, leading to a negative Myrdal's vicious circle in local economic development.

Our findings suggest that, while cultural persistence predicts where the coverage of ultra-right-wing support will be higher, it is predominantly the economic shock (quantified through the adjusted budget deficit) which determines the emergence and growth of radicalization in the case of Greece. An interesting additional observation is that places with higher center-right percentages of supporters have a higher

number of ultra-right voters, but over time the number of ultra-right supporters grows significantly more slowly in these localities. This indicates that relatively an average local pro-right orientation extant share seems to exist. The 'pro-right quota' varies only slightly in the different localities, as it characterizes the whole country on the basis of a specific common cultural preference, namely, a particular country-wide level of pro-right orientation.

These findings broaden and deepen our scientific perspective on the significance of cultural persistence in the formation of ultra-right political preferences. They bring to light that this part of the socioeconomic phenomenon is indeed predictable on historical grounds as a result of cultural persistence. But they also identify what genuinely triggers the mechanism of this phenomenon and suggest that no place is culturally immune against radicalizing under a severe negative economic shock. These findings are in line with the general intuition that inequality and past pro-right orientations always exist, but radicalization happens only in times of crisis. And finally, especially for the case of Greece, through its culturally predisposed radicalization the locality actually allows—or even induces—the negative shock to generate an even stronger economic damage spread over time. Thus, past pro-radical cultural persistence acts as a multiplier of the negative economic shock effect in a region.

The 'Dogville Effect' examined here may be regarded in relation to similar upsurges in ultra-right-wing political parties during the recent crisis years (see Rodríguez-Pose 2017 for an overview of the radicalization experienced across different countries). The data used by us have been carefully collected and contain the latest available information about the economic and political development in Greece. Interestingly, such data are easily accessible for solid empirical analysis regarding other European countries which are also experiencing a kind of 'Dogville Effect'. In other words, our research is easily replicable for understanding other regional cases of ultra-right-wing party dynamics in Europe (e.g., Austria, Great Britain, France) or elsewhere, which are likely to have similar cultural-economic origins, with equally adverse economic consequences for local development as in the case of Greece examined here.

Further research, integrating also multidisciplinary information on disappointed voters, might shed new light on the significance of the current local milieu for the development of ultra-right parties on the individual level. Another natural continuation of such intriguing questions might be how a local socioeconomic collapse and marginalisation of a locality may be avoided in the future. Historically, an external shock for a country may also occur as an international community intervention, e.g., by war or by financial institutions. However, external shocks are difficult to generate, and shocks always 'scar' local systems with path-dependence which has a negative record on several local cultural gravity balance sheets. Therefore, preventing the occurrence of a Myrdal circle seems a more effective strategy against economic decline, which is more desirable for a long-run balanced development of regions. Last but not least, now that evidence for the existence of a 'Dogville Effect' link between radicalization and negative vicious circles has been found, future research may deal with a more detailed analysis of human capital data and migration flows as the channels through which the 'Dogville Effect' generates its anticipated spiral effects.

Further analysis might be worthwhile also based on our interesting finding that all here presented results hold consistently only for the ultra-right party in Greece. The significant effects for our analysis do not seem to appear when the ultra-left party is used as a variable of interest. Put differently, the 'Dogville Effect' seems to work only for explaining the behavior of the rise of ultra-right support, but not for the ultra-left one. The reasons for this difference, potentially historic and cultural, are worth further investigation in order to better understand how to handle the populistic wave and its aftermaths around the world.

In short, our study was able to capture evidence for the causal dependence of regional or local radicalization on negative economic shocks, while it also confirms the role of cultural persistence in this process. However, Greece has obviously been so strongly affected by severe economic shocks in the country that the economic trigger in the short run (examined within 1 year time) is clearly dominating all cultural attitude effects. The 'Dogville Effect' system thus seems to be manifest and clearly at stake. Its potential channels of impact are certainly justified as worth of further exploration.

Appendix 1: Definition of variables

Model component	Variable name	Source	Definition	Obs.	Mean	Std. Dev.	Min	Max
Radicalization	Ultra-right (%)	State Database for National and European Elections-YPES.GR	% of voters from total voters in support of the ultra-right party (Chrysi Avgi)	408	5.62	8.21	0	38.95
	Change ultra-right (%)	State Database for National and European Elections-YPES.GR	difference between current and previous year % vote for the ultra-right party (Chrysi Avgi)	408	0.20	0.40	0	1
	Ultra-left (%)	State Database for National and European Elections-YPES.GR	% of voters from total voters in support of the ultra-left party (Kommounistikó Kómma Elládas)	357	5.92	3.27	1.11	24.69

Model component	Variable name	Source	Definition	Obs.	Mean	Std. Dev.	Min	Max
	Center-right (%)	State Database for National and European Elections-YPES.GR	% of voters from total voters in support of the center-right party (Nea Dhimokratia)	408	32.36	8.15	8.44	54.18
SHOCK	Adj. budget deficit	EUROSTAT	Adjusted budget deficit as defined by EUROSTAT, i.e., the percentage change between actual and previously predicted based on extrapolation GDP for the region	408	−6.26	4.15	−12.6	−1.5
	Dummy adj. budget deficit	Generated	Dummy variable equal to 1 when the adjusted budget deficit value is higher than the mean value of this variable	408	0.63	0.48	0	1
	Austerity dummy (2010 after)	Generated	Dummy variable equal to 1 when the year is equal to or later than 2010	408	0.63	0.48	0	1
Culture (conservative attitudes)	Pro-monarchy 1974 (%)	Newspaper 'Rizospastis', Dec. 1974, National Library of Greece	% of voters from total voters in support of the referendum for monarchy which took place in 1974 (historic variable)	408	34.42	10.19	5.90	59.52

Model component	Variable name	Source	Definition	Obs.	Mean	Std. Dev.	Min	Max
	Dummy pro-monarchy in 1974	Newspaper 'Rzospastis', Dec. 1974, National Library of Greece	Dummy variable equal to 1 when the % vote for monarchy was above the mean for variable %vote_monarchy_referendum'74	408	0.61	0.49	0	1
Culturo-economic 'Dogville Effect' trigger	Interaction: ultra-right (%) and adj. budget deficit	Generated	Interaction between (i) a dummy = 1 when the '%vote_ultra_right (Chrysi Avgi)' is above the mean percentage support for this party for the country and (ii) 'adj_budget_deficit' variables	408	−2.29	3.29	−12.6	0
	Interaction: purged ultra-right (%) and adj. budget deficit	Generated	We perched the value of '%vote_ultra_right (Chrysi Avgi)' by using the instrument '%vote_monarchy_referendum'74') and then we generated the same interaction as defined above, but using the perched value instead of the true value of '%vote_ultra_right (Chrysi Avgi)'	408	−4.73	4.67	−12.6	0

Model component	Variable name	Source	Definition	Obs.	Mean	Std. Dev.	Min	Max
Economic development (EconDev)	GVA	EUI regional dataset	Gross value added	250	383.58	526.17	33.49	4756.74
	lnGVA	Generated	Natural logarithm of gross value added (GVA)	250	5.56	0.86	3.51	8.47
	Change lnGVA	Generated	difference between current and previous year ln_GVA	200	− 363.53	506.54	− 4748.32	− 29.85
	Decrease lnGVA	Generated	A dummy variable equal to 1 when 'change ln_GVA' < mean of 'change ln_GVA'	200	655.00	0.48	0	1
Control variables	Employment	EUI regional dataset	Total number of employed people in the region	250	56.15	66.30	4.08	528.32
	Change employment	Generated	Difference between current and previous year values of 'employment' in the region	200	− 2862.55	143.39	− 3028.6	− 2304.02
	Total electorate	State Database for National and European Elections-YPES.GR	total number of electorate that voted	408	182612.5	352337.4	1451	2,898,233
	Population	EUI regional dataset	total number of population in the region	255	7062.24	177.18	6783.25	7225.45
	Sectoral location quotients	EUI regional dataset						

Model component	Variable name	Source	Definition	Obs.	Mean	Std. Dev.	Min	Max
	Agriculture	Generated	Dummy variable equal to 1 when the value of the employment localization quotient for the agricultural sector specialization in this region is higher than 1	250	1.161	0.59	0.15	2.51
	Construction	Generated	Dummy variable equal to 1 when the value of the employment localization quotient for the construction sector specialization in this region is higher than 1	250	1.114	0.59	0.18	3.80
	Finance	Generated	Dummy variable equal to 1 when the value of the employment localization quotient for the financial sector specialization in this region is higher than 1	250	0.913	0.48	0.24	4.57
	Industry	Generated	Dummy variable equal to 1 when the value of the employment localization quotient for the industry sector specialization in this region is higher than 1	250	0.902	0.53	0.11	2.67

Model component	Variable name	Source	Definition	Obs.	Mean	Std. Dev.	Min	Max
	Non-market sector	Generated	Dummy variable equal to 1 when the value of the employment localization quotient for the non-market sector specialization in this region is higher than 1	250	0.999	0.23	0.46	1.91
	Trade and retail	Generated	Dummy variable equal to 1 when the value of the employment localization quotient for the trade and retail sector specialization in this region is higher than 1	250	0.918	0.38	0.23	2.19
	Change agriculture	Generated	Difference b/n the dummy variable for sector specialization in agriculture between current and previous year	200	0.004	0.06	−0.18	0.21
	Change construction	Generated	Difference b/n the dummy variable for sector specialization in construction between current and previous year	200	0.011	0.10	−0.28	0.43
	Change finance	Generated	Difference b/n the dummy variable for sector specialization in finance between current and previous year	200	−0.001	0.06	−0.48	0.18

Model component	Variable name	Source	Definition	Obs.	Mean	Std. Dev.	Min	Max
	Change industry	Generated	Difference b/n the dummy variable for sector specialization in industry between current and previous year	200	−0.004	0.04	−0.22	0.12
	Change non-market sector	Generated	Difference b/n the dummy variable for sector specialization in non-market sector between current and previous year	200	0.001	0.03	−0.14	0.07
	Change trade and retail	Generated	Difference b/n the dummy variable for sector specialization in trade between current and previous year	200	−0.004	0.03	−0.11	0.08

Appendix 2: Economic shocks, cultural predisposition and the growth of radicalization

Estimation strategy

We use a propensity score matching and difference-in-differences combination of approaches to compare the effect from the economic and cultural triggers on the growth of the radical vote. Through the difference-in-differences method, we want to find out whether regions that have higher cultural predisposition (i.e., treated with the cultural trigger) suffer higher losses in terms of GVA. Alternatively, we use the same method to find out whether regions that have higher adjusted budget deficit (i.e., treated with the economic trigger) suffer higher losses in terms of GVA. Our matching procedure concerns ensuring that regions in our treated and control groups have comparable levels of local productivity. To ensure this we match the regions local productivity by the size of the local economy and sectoral local quotients.[16]

[16] When we use the cultural trigger as a treatment we include in the matching also the economic trigger as an explanatory variable and the historic cultural variable in order to take away the endogeneity effect; when we use the economic trigger as a treatment, we use the cultural variable as a regressor in the matching model.

We use alternative matching techniques to cross-check the reliability of our results. We try nearest neighbor matching, radius matching, Kernel matching, and stratified matching, as well as a simple *t* test and a regression with treatment and control variables.

Through the above procedures, we can gain some insights about two things. We can learn how different in economic performance the regions are when exposed to an economic shock. We learn how do regions perform over time in terms of radicalization when their cultural history is prone to right-wing preferences compared to regions whose past is not associated with such historic predisposition.

Next, this approach allows us to compare the effect of the economic crisis-related trigger and the historic pro-monarchy voting (i.e., the cultural trigger) on the growth in the percentage of voters for the Chrisy Avgi in the locality. If both triggers are found to be insignificant as treatment effects for local growth in ultra-right support, our H01 can be rejected.

Meanwhile, the matching procedure of this test informs us indirectly whether the ultra-right voting is itself associated with differences in regional economic development or not, which is the question of H02. This latter association, however, has some potential endogeneity to be dealt with more carefully.

Results

We looked separately at the cultural and economic triggers for radicalization, using each trigger as an alternative for defining the treatment effect in our matching and difference-in-differences (DiD) analysis.

The descriptive statistics show that after treating our regions with the two treatments, the treated and control groups result in a division between the regions in a ratio of about 60:40. We drop the observations for which there is no matching counterpart, and the years for which there is no information about the economic controls. Thus, we remain with a smaller number of observations. This dropping of the not well-matching observations, however, is required for a meaningful difference-in-differences causal exploration.[17]

Table 4 presents our most important results from the test. Our DiD estimation shows whether the radicalization in the localities was higher when they were treated with a stronger economic shock or when they had a historic predisposition to right-wing preferences.

We are using here as a treatment: (1) a dummy variable indicating 1 for those regions above average pro-monarchy referendum voting behavior as a proxy for the cultural trigger as a treatment, or alternatively, (2) a dummy variable indicating experiencing above average adjusted budget deficit.

Our main results are as follows. The simple treatment tests, as well as our more sophisticated alternative matching methods used (i.e., nearest neighbor, Kernel matching, radius matching, and stratified matching), generate clearly consistent results per treatment. The two treatments—the cultural trigger and the economic

[17] Tables with these descriptive statistics are available upon request.

Table 4 Economic shock versus cultural persistence in ultra-right party growth *Source*: Authors' own calculations

Est. method	Diff in diff
Treatment—dummy adj. budget deficit	
T test	− 11.337***
Reg., dummy and controls	− 5.980***
ATT nearest neighbor	− 6.315***
ATT radius matching	− 6.069***
ATT Kernel matching	− 6.001***
ATT Stratified Matching	− 6.001***
Common support	
[.63634748, .93180785]	
Treatment—dummy pro-monarchy in 1974	
T test	0.132
Reg., dummy and controls	0.370***
ATT nearest neighbor	− 0.230
ATT radius matching	0.395
ATT Kernel matching	0.198
ATT Stratified Matching	0.186
Common support	
[.11922437, .98478418]	

The table presents the results from the difference-in-differences estimation and the propensity score matching for the change in ultra-right-wing party and its association with local economic growth in the period 1993–2015 (i.e., testing our H01). The ultra-right party growth in the localities has been explained by logarithm of gross value added (ln_GVA) in the locality and the shares of specialization in employment, i.e., the six sectoral location quotients (based on the EUI sectoral employment data) for specialization in: agriculture ('agriculture'); construction ('construction'); financial services ('finance'); industrial activity ('industry'); non-monetary activities and services ('non_monetary_sector'); and trade specialization ('trade and retail'). The differences in ultra-right party growth are examined for two alternative treatments, part of the 'Dogville Effect', namely: (1) the economic trigger—a treatment defined according to the adjusted budget deficit (a dummy capturing its above average value for the country), and (2) the cultural trigger—a treatment using the historic-cultural pro-conservative milieu measure (dummy equal to 1 for regions with above average votes for the monarchy in the 1974 referendum in Greece). Put differently, select through matching closely comparable in economic performance regions and we examine with difference in differences what causes the growth of radicalization in them—the economic trigger or the cultural one. The abbreviation ATT stands for 'average treatment on the treated'—it is a statistical term, indicating that we analyze here the average effect of the treatment on the treated group only (i.e., only on the group that received the treatment). Common support refers to the interval of values within which there are close matches among both treated and control group in terms of their regional economic characteristics

trigger of radicalization—appear to have a completely different impact on the development of ultra-right preferences over time in Greek regions. As Table 4 shows, the effect from the adjusted budget deficit is associated with a strong explanatory power for the growth of ultra-right preferences; meanwhile, the development of the radicalization of a region has no clearly traceable relationship with the local cultural milieu described by the historic pro-monarchy voting. This result is always consistently

obtained, indifferent of the matching procedure used. In conclusion, our results demonstrate that, while the ultra-right orientation is predictably more popular in places with a historically pro-right cultural milieu (as our preceding estimation has shown), the development of the radicalization over time is a purely economically triggered phenomenon.

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