Copy thy neighbour: Spatial interdependences in the democracy-repression nexus

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Abstract:

How does spatial interdependence between countries affect domestic levels of repression? The current literature on state repression focuses on unit-level/common shocks explanations and treats countries interdependence as statistical nuisance. This paper relaxes the null hypothesis of policy independence in state repression and examines the theoretical and empirical implications of spatial interdependence in the democracy-repression nexus. Combining spatial-econometric analysis with latent measures of democracy and repression in 138 countries between 1947 and 2007, the paper shows that (1) there is a robust diffusion effect of repression at a regional level, (2) previous literature has over-estimated the suppressing effect of democracy (when spatial interdependence is not accounted for), and (3) trade relations and security alliances are the main drivers of regional diffusion of repression.

Keywords: repression; diffusion; interdependence; spillover; democracy.

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Introduction

This paper examines the spatial interdependence in the democracy-repression nexus by relaxing the assumption that democracy and repression are the sole product of domestic factors (Davenport 1999, 2007a; Davenport and Armstrong 2004; De Mesquita et al. 2005; Fein 1995; Henderson 1991; Poe and Tate 1994; Richards, Webb, and Clay 2015). While scholars are not naïve about observations being independently observed, few of the studies examining explanations of state repression[1] address the theoretical significance of spatial interdependence and try to unpack its empirical implications (Richards et al., 2015). The literature prioritizes explanations of repression based on *common shocks*, such as unit-level factors (e.g. democracy, economic development, etc.), contextual characteristics (e.g. end of Cold War) and context conditional (e.g. the reaction of autocracies at the collapse of the Soviet Union), over (potentially) meaningful spatial *interdependence* (i.e. diffusion or spill overs) in the outcome and/or covariates. This leads to one empirical and one theoretical issue in current understanding of state repression.

Empirically, the failure to model spatial interdependence processes leads scholars to exaggerate the importance of common shocks explanations (unit-level, contextual or context-conditional) over spatial interdependence ones (Franzese & Hays, 2008), also known as Galton's problem (Braun & Gilardi, 2006; Buhaug & Gleditsch, 2008; Plümper & Neumayer, 2010). This makes our estimates of common shocks explanations inefficient at best, and often biased and inconsistent as they over-estimate the effects of those factors that corelate most spatially (Franzese & Hays, 2007). Since previous research finds that democracy strongly corelates spatially (Gleditsch and Ward 2006; Brinks and Coppedge 2006; Houle, Kayser, and Xiang 2016; Zhukov and Stewart 2013), then there should be reasonable expectations that previous literature might be over-estimating the suppressing effect of democracy in the absence of accounting for spatial interdependence in repression. Next, determining the source of this

spatial interdependence is an important theoretical question for which we need an explanation (Cook et al., 2018; Richards et al., 2015).

Against this background, the paper develops theoretical propositions on the spatial interdependences in the democracy-repression nexus and tests their empirical implications. The paper proposes that variation in domestic repression is a function of altered conditions in countries' geographic neighbourhood. Precisely, countries adjust their domestic levels of repression as a strategic adaptation to levels of repression and democracy in their geographic region (Elkins & Simmons, 2005; Simmons, 2009). Firstly, the paper proposes that countries located in the same geographic region adjust their domestic level of repression based on regional levels of repression for two reasons: (1) perceived similarity in structural conditions between countries facilitates the cooperation and coordination in policy issues (Simmons 2009; Bunce and Wolchik 2011), and (2) the standard of accountability against which countries are judged is shared regionally (Bell et al., 2019). The strategic adjustment takes place because countries do not want to be singled out and shamed as regional troublemakers. By adjusting to regional norms, countries can maintain their reputation, trust and credibility amongst regional and international partners. Secondly, the paper proposes that countries' level of repression decreases relative to an increase in the average level of democracy in the region. Democracies, as purported champions of human rights, have a lower tolerance for human rights violations in their neighbourhood, offer support to monitors in documenting human rights abuses and seek to press offenders in changing their behaviour. This in turn, leads countries to lower their levels of repression in more democratic regions to avoid condemnation and being singled out as pariahs (Whitehead, 2001).

These propositions are tested with a series of spatial lag models (S-OLS) (Franzese & Hays, 2007, 2008; Hays et al., 2010) that are estimated using a procedure that accounts for the measurement uncertainty in latent measures of repression and democracy for 138 countries

between 1947 and 2007. The results indicate previous literature has over-estimated the suppressing effect of democracy, as the unit-level coefficient for democracy drops once spatial interdependence is accounted for in the models. Next, the results show that there is consistent and robust interdependence in repression (i.e. diffusion) between countries located in the same region. Probing further into the regime connections that matter for repression interdependence at a regional level, the results indicate that besides geographic proximity (i.e. contiguity), economic (i.e. trade volume) and political linkages (i.e. security alliances) serve also as networks of diffusion. Finally, the results cast doubt on the argument that democracies pressure human rights abusers as the results show that higher levels of democracy in a country's region does not exert a statistically significant effect on domestic levels of repression. The results are robust when using different measures of repression and democracy, across different model specifications, across single and multiple spatial-temporal autoregressive (m-STAR) models (Hays et al., 2010) estimated using OLS and Maximum Likelihood approaches, and when controlling for a battery of common shocks and spatially correlated unit level factors (i.e. controlling for regional conflict).

This research has important implications for our understanding of countries' use of repression and policy diffusion more generally. The finding of a robust interdependence effect of repression at a regional level contributes to the vast literature on the state repression (Davenport 2007a; Hill and Jones 2014) that has thus far focused mostly on common shocks explanations of state repression. Yet, these results indicate that interdependence is more than a simple statistical nuisance, a warning that has been largely ignored by existing literature (Richards et al., 2015). With respect to policy diffusion and spatial econometric analysis, this research makes three key contributions. Firstly, while there is some evidence that there are regional dynamics of human rights protection (Simmons, 2009) and accountability avoidance for repression (Bell et al., 2019), this is the first study to provide systematic evidence of the

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strategic adjustment between states to avoid accountability. Moreover, this offers support to existing arguments about the role that international norms play in shaping human rights at a domestic level (Finnemore & Sikkink, 1998). More simply, institutions are not the only determinant of human rights violations. From a policy perspective, these results highlight the importance of promoting strong regional norms of human rights as a complement to strong democratic institutions. This could be achieved by supporting organizations whose activity have positive regional externalities on human rights (Bell et al., 2012). Secondly, the literature on democratic diffusion has identified several networks through which democracy diffuses internationally, but there is less evidence of the networks that matter for the diffusion of human rights. This research complements the work on the role of IGOs on diffusing human rights globally (Greenhill, 2010, 2016), and shows that political and economic linkages seem to matter more for the regional diffusion of human rights practices. Finally, the integration of spatial econometric models (Franzese & Hays, 2007, 2008) with models that account for uncertainty in the latent measurement of repression (Schnakenberg & Fariss, 2014) indicates the usefulness of such an approach in obtaining efficient and unbiased estimates of the spatial relations in the data.

Galton's problem in the state repression literature

The paper aims to investigate the empirical implications of ignoring Galton's problem in the state repression literature. This problem arises when there is spatial autocorrelation (also referred as interdependence) between observations that is not appropriately accounted for empirically when testing explanations of state repression. In turn, this threatens valid statistical inferences as it over-emphasize one set of explanation (domestic) over the other (interdependence) (Cook et al., 2018; Franzese & Hays, 2008). The state repression literature is concerned with "the actual or threatened use of physical sanctions against individuals or organizations, within the territory of the state, with the purpose of imposing a cost on the target

and deterring specific activities or beliefs perceived to be challenging or subversive to the government" (Goldstein 1978, xxvii).

The current literature on state repression explains variation in domestic repression under the null hypothesis of policy independence: domestic conditions affect the outcome while disregarding the possible variation produced by interdependence between observations and countries (Simmons et al., 2006). One of the central and most often cited findings of the literature on state repression, is that increased domestic levels of democracy are associated with lower levels of repression (Henderson 1991; Fein 1995; Poe and Tate 1994; Davenport 1999, 2007a; Davenport and Armstrong 2004; De Mesquita et al. 2005; Richards, Webb, and Clay 2015). Democracy reduces state repression because (1) the democratic process focuses on compromise and bargaining, hence offering a meaningful alternative to political conflicts (Davenport, 1999; Henderson, 1991); (2) voters preference for repression is low, and political leaders are accountable for their repressive behaviour through elections (Davenport & Armstrong, 2004; Poe & Tate, 1994); (3) political and social participation in a democracy develops norms of toleration, communication and deliberation without the need to resort to violence (Davenport 2007b); and (4) the checks and balance system inherent to democratic governance can block and hamper repressive actions (Davenport, 1999).

While this literature offers compelling theoretical arguments and sound empirical analysis of the suppressing effect of democracy on repression, it rests on a crucial assumption: repression and democracy are treated as independent observations from adjacent countries.[2] Richards, Webb, and Clay (2015) indicate that observations in states' repressive behaviour might not be as independent as assumed by most regression models, thereby causing problems in generating valid inferences as it affects calculations of standard errors and leads to false rejections of the null hypothesis. Autocorrelation has long been a statistical nuisance that threatened statistical inference (Beck & Katz, 1995), yet most of the empirical work on human

rights practice is focused on dealing with temporal rather than spatial autocorrelation (Poe & Tate, 1994). If spatial autocorrelation (i.e., interdependence) in repression exists at the regional level, then previous findings on the suppressing effect of democracy on repression might be over-estimated. This happens when the spatial lag (i.e. regional levels of repression) correlates with non-spatial covariates (i.e. democracy), which is highly likely when domestic conditions correlate spatially (Franzese & Hays, 2008). This is likely to be the case in the democracy-repression nexus because there is a set of consistent findings that democracy strongly clusters geographically (Beissinger 2007; Brinks and Coppedge 2006; Gleditsch and Ward 2006; Houle, Kayser, and Xiang 2016), while also being one (i.e. democracy) of the strongest predictors of state repression (Hill & Jones, 2014; Hill Jr, 2016).

Geographic clustering and spatial relations

The potential for multiple, overlapping spatial and non-spatial processes between democracy and repression is exemplified by looking at the distribution of democracy and repression across the world. Figure 1 below summarizes global levels of repression and democracy in the world between 1947 and 2007.[3] The spatial distribution of repression and democracy shows strong spatial clustering within more democratic regions as they seem to have also lower levels of repression. We test whether this spatial autocorrelation is more systematic with a Moran I's test which indicates whether variables of interest cluster spatially. More simply, a positive and statistically significant Moran's I indicate that these variables cluster spatially as higher values of variable of interest in connected countries (e.g. located in the same geographic region) leads to higher values of the variable in the country under observation. Using a W connectivity matrix for countries located in the same region[4] we find a positive and statistically significant Moran's I for democracy and repression in Table 1.

Table 1. Moran's I of democracy and repression

Moran's I Democracy	0.784***
Moran's I Repression	0.726***

Figure 1. Average levels of democracy and repression in the world, 1947-2007.
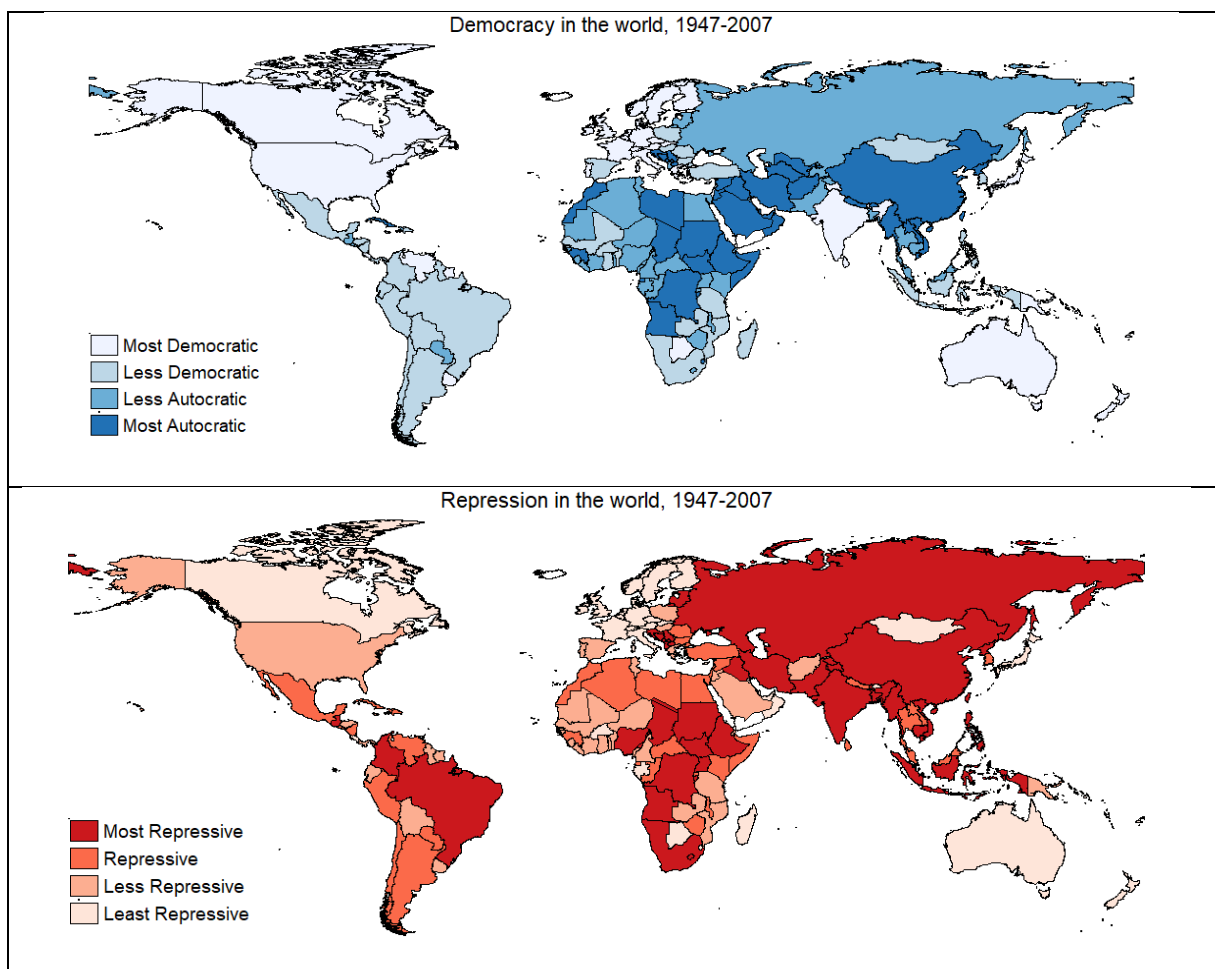
There are a number of underlying spatial processes that lead to spatially correlated outcomes (Anselin, 2003), hence explaining the spatial clustering between democracy and repression. The first process, and probably most common, is due to spatial clustering (or common shocks) as countries with similar characteristics cluster geographically and also have similar responses to policy issues (Elkins & Simmons, 2005). This approach emphasizes the role that unit characteristics play in shaping the outcome: more simply, countries that are more democratic are also less repressive. However, more democratic regimes also tend to cluster

geographically (Gleditsch and Ward 2006), which explains why less repressive regimes (i.e. democracies) are located close to one another. Similarly, external contextual shocks matter as countries with exposure to the same global event (e.g. collapse of the Soviet Union; OPEC oil crisis) have similar reactions to that event, leading to clustered variations in the outcome. Finally, countries' reaction to a contextual event might be conditional on its own characteristics, as for instance, autocracies might react differently to the collapse of the Soviet Union compared to democracies.

The second process, and more theoretically interesting, is that spatial correlations in outcomes are driven by interactions (or spill overs) between countries, where policy choices of one country influence policies of other (connected) countries (Cook et al., 2018). These spill overs could happen in the predictors (i.e. democracy) or in the outcome (i.e. repression) as a change in the input of a country affects not only its outcome, but the outcomes of other (connected) countries. This leads to potential interdependences that need to be empirically and theoretically distinguished from common shocks (or clustering) explanations, as failure to do so would lead to over-estimating one set of explanations over the other (Franzese & Hays, 2008). Then, it is entirely possible that countries located in the same region mimic each other's repressive policies, or that variations in domestic repression could be influenced by levels of democracy in the region. Then, the observed spatial clustering of democracy and repression could explained by several relations in the data: (1) democracies are less repressive in general (*common shocks or exposure*), (2) countries adjust domestic repression based on other countries' repression levels (*interdependence or diffusion*) or (3) more democratic regions exert externalities that reduce repression in their neighbourhood (*spill-over*). This article focuses on the second and third relation.

The interdependence in human rights violations has received some attention in the literature on human rights (Bell et al., 2012, 2019; Neumayer et al., 2014; Olar, 2019;

Simmons, 2009), but there has been less theorizing and empirical testing on the actual spatial interdependence in the outcome (Richards et al., 2015). The studies that examine the effect of regional factors on domestic repression model the impact of covariate spill over on the outcome of interest (Bell et al., 2019; Danneman & Ritter, 2014), but not interdependence in the outcome. Neumayer, Plümper, and Epifanio (2014) show that European democracies with a similar level of threat from terrorist attacks follow each other's counter-terrorist policies, while Olar (2019) shows that repressive behaviour diffuses between autocracies with similar strategic objectives. Yet, both studies focus on a subset of countries and regime types without estimating more general interdependence in repression on a global sample. There is growing theoretical consensus on the role that regional norms play in setting standards of appropriate behaviour of states (Finnemore & Sikkink, 1998), but also empirical evidence showing that regional adoption of human rights treaties is due to norms enforcement (Simmons, 2009). Work on the role of human rights organizations (HRO) indicates that increased numbers of HROs in neighbouring countries can improve domestic human rights practices. Moreover, naming and shaming oriented at countries is not only based on their domestic human rights practices, but also on the practices of their neighbours (Bell et al., 2019). All of these findings indicate there should be some reasonable expectations that there is interdependence in human rights practices as countries perceive conditions to be most similar among neighbours (Bunce and Wolchik 2011).

Democracy and repression spatial interdependence

The explanation of the spatial interdependence in democracy and repression starts from the assumption that repression is used strategically by states to diminish challenging behaviour considering its costs and benefits (Moore, 2000). Then, countries use information from their geographic surroundings to infer about norms of acceptable behaviour, to avoid attracting attention and to camouflage their repressive actions (Bell et al., 2019; Simmons, 2009). In other

words, countries adjust their repressive policies to altered conditions in their neighbourhood (Elkins & Simmons, 2005). There is a cumulative effect of countries abiding by certain norms, which in turn creates peer-pressure among countries to conform to regional norms. Failure to do so would get them the label of rogue states, which in turn entails loss of reputation, trust and credibility in the international arena (Finnemore & Sikkink, 1998) as countries care about their reputation within their peers (Fearon, 1997). The interdependence in repression levels between countries can be understood under the logic of diffusion: the adoption of a practice or policy by a unit (i.e. country) alters the probability of adoption of that practice by another unit (Strang, 1991).

The way the Argentine military junta conducted its secret 'Dirty War' against dissidents and left-wing activists is an example of a country adjusting its repressive tactics based on their geographic peers. More specifically, the international uproar and isolation of the Pinochet regime in light of its repressive actions after the 1973 coup, indicated to the Argentinian junta that they need hide their repressive actions as they wanted to keep a moderate international image of their regime (Keck & Sikkink, 1998). Similarly, Colombia's egregious human rights record in the 1990s made it stand out in relation to its neighbours, which pressured its government to attempt improving its human rights record despite facing the FARC insurgency (Bell et al., 2019).

There are two reasons as to why countries located in the same geographic region follow their neighbours in adjusting domestic levels of repression. Firstly, Simmons (2009) proposes that countries strategically ratify human rights treaties based on a regional dynamic (see also Hathaway 2007). Countries located in the same region cooperate to keep group members in step with one another, have structures that facilitate intense cooperation over multiple policy issues, which in turn improves their ability to coordinate their policy choices. Then, this coordination leads to countries practicing social camouflage as they choose policies not much

different from their neighbours, as they would like to avoid looking like illiberal pariahs (Whitehead, 2001). By following the crowd of neighbours, countries can reduce the increment of criticism they incur from international monitors of human rights. To maintain their legitimacy and gain cover from criticism, countries adjust their repressive practice based on what their regional peers are doing. In other words, since repression is seen as an illegitimate practice of governance, countries attempt to obtain some degree of immunity from condemnation by adopting practices similar to their neighbours. Then, the degree of criticism directed at any country decreases with the number of adopters of the same practice (Simmons, 2009), but also because international organizations and NGOs monitoring the situation are stretched in their ability to monitor offenders (Bell et al., 2019).

The logic of reducing criticism from international organizations and NGOs points to the second reason as to why we should expect a regional interdependence in repression. Bell, Clay and Murdie (2019) show that the level of attention countries receive for their human rights violations is mediated by the level of repression in their neighbouring countries. The reason is that human rights monitoring by international organizations and NGOs is organized based on regional logistic and expertise. For example, Amnesty International country reports are broken down by geographic areas and each yearly report produced by Amnesty starts with a regional overview by each regional director (Bell et al., 2019). Similarly, United Nations Office of the High Commission for Human Rights is organized around regional offices that rely on regional intergovernmental bodies and activists with regional expertise to monitor and respond to human rights abuses. Since countries are aware of the mechanism underlying monitoring, they adjust their level of repression to regional norms to decrease the amount of attention they receive compared to their neighbours. Countries camouflage their repressive behaviour within the broader regional context to avoid the spotlight of condemnation and criticism:

Hypothesis 1: Domestic levels of repression are positively influenced by levels of repression from countries in the same geographic region.

There is a second potential source of spatial interdependence between repression and democracy that manifests through spill overs in democracy as neighbouring levels of democracy can change the inputs that influence the cost-benefit analysis of domestic repression. While the empirical implications of this type of spatial interdependence do not threaten previous inferences on the effect of democracy on repression, there are theoretical reasons to expect such a relationship. This claim has its origin in the literature on democratic diffusion that speculates that democratic neighbours create a regional environment that galvanizes reformers, supports opposition movements abroad and demonstrate that authoritarian regimes are not impervious to change (Houle et al., 2016). Then, it follows that democratic neighbourhoods can influence countries' domestic repression. One avenue through which democracies can impact human rights in their region is by offering support to activists and monitoring human rights violations across borders (Bell et al., 2012). For example, the Lima Group was formed in 2017 by 12 Central and South American countries (plus Canada) to call for the end of human rights abuses, free elections and criticize the breakdown of democratic order in Venezuela (Deutsche Welle 2018). The subsequent report by the United Nations Human Rights Office of the High Commission in 2019 was able to document the human rights violations of the Venezuelan regime through interviews conducted over nine visits with Venezuelan refugees and migrants in Argentina, Brazil, Chile, Colombia, Ecuador, Mexico or Peru, documentation that would have not been possible without the acknowledged support of these democratic governments. This example is indicative of the role that democracies can play in offering a base for monitors with enough freedom of communication and movement to ensure successful monitoring of human rights practices in the region (Bell et al., 2019). Democracies norms for toleration and non-violent resolution of conflicts provide

these "monitoring havens" against violators of human rights (Barry et al., 2015; Bell et al., 2012). Then, it follows that countries' ability to camouflage their human rights violations will be greatly diminished by increased monitoring opportunities offered by democracies in the region.

Also, democracies' norm for toleration and non-violent resolution of conflicts spill over in the region as they would be less likely to accept gross human rights violations close to their borders. For example, several European Union member countries, both individually and as a block, were quick to react to the violence of the security forces of Ukraine during the Euromaidan protests of 2013. For example, members of the European Parliament warned of serious consequences for state violence, while the Swedish Prime Minister decried the repression against EU protesters as deeply worrying. Higher levels of democracy in the region can serve as a signal to other countries that the non-violent resolution of conflicts is the accepted norm in the region. For example, the series of military takeovers in Latin America in the 1970s and reversal of democracy in the region served as an signal to the other countries in the regional norm changed to the use of force to silence the opposition (Brinks & Coppedge, 2006). Ultimately, repression levels are affected by higher levels of democracy in the region because the costs of comparison changes for countries not democratizing or with low human rights performance. The improvements in the standards for judging human rights behaviour improved over time (Fariss, 2014, 2018), which in turn lead to more isolation of repressive leaders and countries started liberalizing not to look bad relative to comparable states (Gleditsch and Ward 2006). Then, the second hypothesis follows:

Hypothesis 2: Higher levels of democracy in the region decrease domestic levels of repression.

Research design

The hypotheses are tested using spatial econometrics models with data on repression and democracy for 138 countries for the period 1947-2007.

Dependent Variable

The dependent variable is measured using Fariss' (2014) dynamic measure of human rights practices. Precisely, Fariss (2014; 2018) uses a dynamic ordinal item response theory model to measure the latent level of violations of physical integrity rights with events and standards based human rights measures. The paper uses this measure of repression as a dependent variable because it accounts for the bias inherent in human rights monitoring over time (Fariss, 2014, 2018; Schnakenberg & Fariss, 2014) and it provides a continuous measure appropriate for estimating spatial models under known model assumptions that recover efficient, unbiased estimates (Franzese, Hays, and Cook 2016; Ward and Gleditsch 2008). The dependent variable ranges between -3.54 and 5.08, positive values indicating better human rights performance (less repression) while negative values indicate worse human rights performance (more repression).

Independent Variables

The empirical analysis uses two types of independent variables: one at the unit level capturing the level of democracy of a country, and the second is a spatial lag capturing levels of democracy and repression in the geographic region of the country under observation. Most studies testing the effect of democracy on repression used measures derived from the Polity scale (Armstrong II, 2009; Davenport, 1999, 2007b; Davenport & Armstrong, 2004; De Mesquita et al., 2005) or from Freedom House (Fein, 1995). However, most of these measurements rely on the strong assumption that the measure is perfect and without error in capturing the concept of interest (i.e. democracy). However, when investigating the literature on how to conceptualize and operationalize democracy, we quickly realise that there is no

consensus on the topic (Boix et al., 2013; Coppedge et al., 2010) and measurement choices have important implications for the results of the analysis (Pemstein et al., 2010; Treier & Jackman, 2008). While it is beyond the scope of this paper to ascertain the best way to measure democracy, the choice of measurement can have important implications for studying the democracy-repression and its potential interdependencies (Davenport & Armstrong, 2004). We use the Liberal Democracy Index from the Varieties of Democracy project (V-Dem) (Coppedge et al., 2019) as it provides us with uncertainty measures around the democracy measures that can be included in the estimation model[5].

The spatial lags capturing interdependence in repression and spill over in democracy are generated using a measure of transnational linkage between countries. The linkage between countries is captured with a connectivity matrix W given by a NT × NT matrix (with T N × N sub-matrices along the block diagonal) with the element $w_{i,j}$ capturing the relative connectivity of country j to country i. The spatial lag is a weighted average of all other observations of the lagged dependent variable[6] or democracy variable (excluding the country under observation) with each weight specified by $w_{i,j}$. Two countries are considered connected if they are in the same politico-geographic region of the world.[7] The connectivity matrix is row standardized so that the estimated values of ρ reflect the average influence of other states. Row standardization ensures that the spatial lag has the same metric as the dependent variable and its coefficient is directly interpretable as strength of interdependence (Franzese & Hays, 2008; Plümper & Neumayer, 2010). The theoretical assumption behind row-standardization is that the effect of other regimes becomes proportionally smaller the higher the number of countries one is connected with (Plümper & Neumayer, 2010). Furthermore, row standardization follows from the theoretical explanation regarding the diffusion of repression within regions (Neumayer & Plümper, 2016): countries adjust their levels of repression based on their neighbors' levels of repression as a mean to camouflage their repressive practices. In other words, they observe

what the human rights norms are, and adjust that behavior so that they do not step out of line and get (unwanted) international attention for their practices. Similarly, average rather than absolute levels of democracy are more likely to matter in influencing domestic levels of repression. More simply, as there are more democracies in the region there is less acceptance of human rights violations and less of a chance for human rights violators to finds support amongst their neighbors.

Model Estimation

The estimation strategy of interdependence in repression and democracy presents a few challenges due to the dynamics involved and the measurement choices of the dependent and independent variables. The main challenge in estimating spatial dependence models comes from the fact there is a feed-back loop in which the outcome variable is an output for the observed country, but also an input for other units that, in turn, influence directly the output of the observed unit. *Ceteris paribus*, the estimation suffers of simultaneity bias that needs to be directly addressed by the model. The simple way to deal with this problem is to temporally lag the spatial lag (Beck et al., 2006). However, the decision to temporally lag the spatial lags should be guided by theory (besides modelling convenience). In this case, temporally lagging the spatial lags follows from the theoretical explanation: repressive behavior is costly for countries, which in turn, induces incentives to hide it from external actors. Often, documenting abuses requires time and resources, and reports of abuses and human rights violations are not instant, but rather take time to surface (Leyh, 2017). Also, Amnesty International and US State Department's country reports are issued annually for the previous year. Since these reports are used by the international community in evaluating countries human rights performance (Hafner-Burton, 2008), then countries will use that same lagged information to update and inform their understanding of human rights practice in their neighboring countries. Also,

countries' ability to observe and adjust their behavior is being delayed by actions taken by offender states to hide their repressive actions.

Under this assumption of temporal sequencing, a temporally lagged spatial lag in a Spatial Ordinary Least Squares model (S-OLS) circumvents the problem of simultaneity and recovers unbiased and efficient estimates (Franzese & Hays, 2006, 2007, 2008).[8] Since the paper is interested in unpacking the spatial relations in the democracy-repression nexus, it uses several different models that can capture these spatial interdependences. The first model is a non-spatial OLS model that tests the effect of democracy on repression without consider its potential spatial interdependences. This model replicates previous findings in the literature and provides the benchmark to evaluate whether Galton's problem is present in the democracy-repression nexus. Next, a Spatial Autoregressive (SAR) model is used to test the diffusion hypothesis (Hypothesis 1) and a Spatial Lag of X model (SLX) is used to test the effect of neighboring democracies on domestic levels of repression (Hypothesis 2). Finally, a Spatial Durbin model (SDM) is used to simultaneously estimate the diffusion of repression and the effect of neighboring democracy. The SDM model includes a spatial autoregressive term and a spatial lag of at least one of the independent variables as these models ward against spatially correlated omitted variables (Elhorst, 2010; LeSage & Pace, 2009). Table 2 below summarizes the specification of each model:

Table 2: Spatial Models specification

Non-Spatial Linear Model (NS)	$y_t = \phi y_{t-1} + \beta X_{t-1} + \varepsilon$
Spatial Autoregressive Model (SAR)	$y_t = \phi y_{t-1} + \beta X_{t-1} + \rho W y_{t-1} + \varepsilon$
Spatial Lag of X Model (SLX)	$y_t = \phi y_{t-1} + \beta X_{t-1} + \Theta W x_{t-1} + \varepsilon$
Spatial Durbin Model (SDM)	$y_t = \phi y_{t-1} + \beta X_{t-1} + \Theta W x_{t-1} + \rho W y_{t-1} + \varepsilon$

In each model, y_t is the dependent variable, y_{t-1} is the temporally lagged variable, X_{t-1} are the set of control variables and the constant, and ε is the error term. In the SAR model, Wy_{t-1} is the spatial lag with the spatial coefficient ρ capturing the strength of interdependence in repression through the connectivity matrix. In the SLX model, Wx_{t-1} is the spatial lag of democracy with the spatial coefficient Θ capturing the effect of regional levels of democracy. Finally, the SDM model is simply a combination of the SAR and SLX model. To rule out the possibility that changes in repression are due to spatial clustering, the model includes a set of control variables that capture exogenous-external conditions (or common shocks) and spatially correlated unit factors (Franzese & Hays 2007; 2008). The temporally lagged dependent variable accounts for temporal dependence in the data. More importantly, it also imposes a harder test on the interdependence because the lagged dependent variable already contains prior spatial effects and the work is being done by the temporal rather than the spatial lag (Beck, Gleditsch and Beardsley 2006; Franzese and Hays 2008). In other words, if any spatial effect is being capture by the model this is rather a conservative estimate because "*spatial lags may have a strong impact on TSCS models that do not include the lagged dependent variable in the specification*" (Beck, Gleditsch, and Beardsley 2006, 41-42). Country fixed effects account for path dependence and cross-sectional heterogeneity, while year fixed effects account for temporal shocks common to all states in a given year (e.g. collapse of the Soviet Union in 1991) (Ward and Cao 2012).

Besides the challenges posed by the estimation of spatio-temporal dynamics, the use of latent dependent and independent variables attracts further complications. Using aggregate indicators such as Polity (Marshall et al., 2010), CIRI Human Rights Data (Cingranelli & Richards, 2010) or the Political Terror Scale (Wood & Gibney, 2010) as done in previous studies (Poe and Tate 1994; Davenport 1999; Davenport and Armstrong 2004; Bueno de Mesquita et al. 2004; Davenport 2007b) implies a level of measurement precision that is simply

not supported by the data (Mislevy, 1991; Schnakenberg & Fariss, 2014; Wood & Gibney, 2010). Then, I follow the approach suggested by Schnakenberg and Fariss (2014) to incorporate the uncertainty around the latent measurement in the estimation model. This approach duplicates the dataset 1,000 times and assigns a random draw from the posterior distribution of the latent variable to each country-year observation for the outcome, temporally and spatially lagged latent variables, with 1,000 models being estimated and results across multiple sets of data are combined to create one set of coefficient and standard error estimates.

Control Variables

Two additional challenges arise when estimating spatial models. Firstly, "Galton's problem" requires correctly specifying the model to distinguish between the variation explained by interdependence (i.e. spatial lag) and by domestic, exogenous-external, and/or context-conditional factors (Franzese and Hays 2008). Secondly, there is a "reverse Galton's problem" that requires us to eliminate the possibility that the spatial clustering of repression is "*due to a corresponding distribution of relevant state characteristics… that may be both spatially clustered and potentially related*" (Buhaug & Gleditsch, 2008: 216). Then, we need to account for unit specific characteristics that affect repression (Hill & Jones, 2014), besides the fixes that eliminate temporal and spatial dependence, and unit heterogeneity. To achieve these, several control variables are included in the model.

The control variables selected to be included in the model are the usual suspects in confounding factors from the democracy-repression nexus literature (Davenport & Armstrong, 2004; Hill & Jones, 2014). The natural log of GDP/capita and GDP growth are included as wealthier countries can afford to pay repressive agents, but they are also more likely to transition to democracy (Przeworski, 2000). Next, the natural log of the population in 1000s is included as more populous countries are more repressive due to higher potential for collective mobilization (Mitchell & McCormick, 1988). Ongoing civil and interstate wars have been

associated with higher violations of human rights as governments use repression to ascertain control over their polity (Carey, 2006; Poe & Tate, 1994). Finally, reliance of natural resources (natural log of income from fuel and metals as percentage of GDP) increase countries reliance on repression and prospects for democratization (Haber and Menaldo 2011). All the control variables are lagged one time period, except civil and interstate war.

Empirical results

Table 3 reports the results of the empirical analysis described above. Before interpreting these models, several caveats, specific to autoregressive models, need to be specified. Firstly, the inclusion of the lagged dependent model makes the effect estimates to reflect only short-term effects for the control variables or the spatial lag (Ward & Gleditsch, 2008). The long-term effects of the spatial lag were estimated using the formula proposed by Plümper, Troeger, and Manow (2005: 336):

$$\sum_{t=1}^{T} (\rho \sum_{j=1} w_{ij} y_{jt-1}) \beta_0^{T-t}$$

where β_0 is the coefficient of the lagged dependent variable, T is the number of periods with t denoting one-time period, and *i* and *j* representing the countries. Secondly, the coefficients of the control variables represent only the pre-dynamic impulses from those variables to the outcome (Ward and Gleditsch 2008; Hays, Kachi, and Franzese 2010). More simply, they show the effect of the covariates on one unit's outcome, rather than reflecting how they affect the diffusion process.[9]

Table 3 below reports the results of the analysis. Model 1 and 2 replicate the effect of democracy on human rights practice (less repression) from previous literature and are used as benchmark for investigation the potential over-estimation bias induced by not modelling interdependence.[10] Model 3 is a Spatial Autoregressive Model (SAR) that estimates the spatial interdependence (i.e. diffusion) in repression between countries situated in the same politico-

geographic region, while Model 4 is a Spatial Lag of X (SLX) model that captures the effect of level of democracy in a country's politico-geographic region. Finally, Model 5 is a Spatial Durbin model (SDM) that includes a spatial autoregressive term and a spatial lag of at democracy level in the region.

The results reported in Table 3 show the importance of accounting for the spatial interdependence in the democracy-repression nexus. Firstly, Models 1 and 2 show that the more democratic a country, the better its human rights practice (i.e. less repression), which is in line with previous findings from the literature. Furthermore, the control variables have the expected signs and statistical significance as reported in previous literature (Hill & Jones, 2014) which reinforces the usefulness of Model 1 and 2's replication as a benchmark. Secondly, once we account for spatial interdependence in repression (Model 3), we observe a drop in the democracy coefficient size of about 7.4 percentage points between Model 2 and Model 3 (from 0.266 to 0.247). Next, the drop in the democracy coefficient size is the biggest for the SLX Model at 138 percentage points (from 0.266 to 0.057) when accounting for regional levels of democracy. Finally, the drop in democracy coefficient size for the SDM Model is about 2.6 percentage points compared to Model 2. Overall, these results support the contention that previous literature might have over-estimated the effect of democracy on repression by failing to account for spatial interdependence and highlights the importance of modelling interdependent relationships in the democracy-repression nexus.

The spatial coefficient ρ from Models 3 and 5 captures the strength of interdependence in repression between countries located in the same region and it is statistically significant, lending support to the first hypothesis. Substantively, this shows that countries in the same region adjust their domestic levels of repression based on the repressive actions of their neighbours. Contrary to the expectation of the second hypothesis, countries' human rights performance is not affected by regional levels of democracy. An explanation for this null effect

could be that being surrounded by democracies is not a sufficient condition to perceive repression as being internationally costly, but it is rather the reaction and the tools democracies use to pressure countries that violate human rights (Bell et al. 2012, 2019).

Figure 2. Short and Asymptotic Long-Term Effects of Spatial-Lag Variables, 1947-2007.
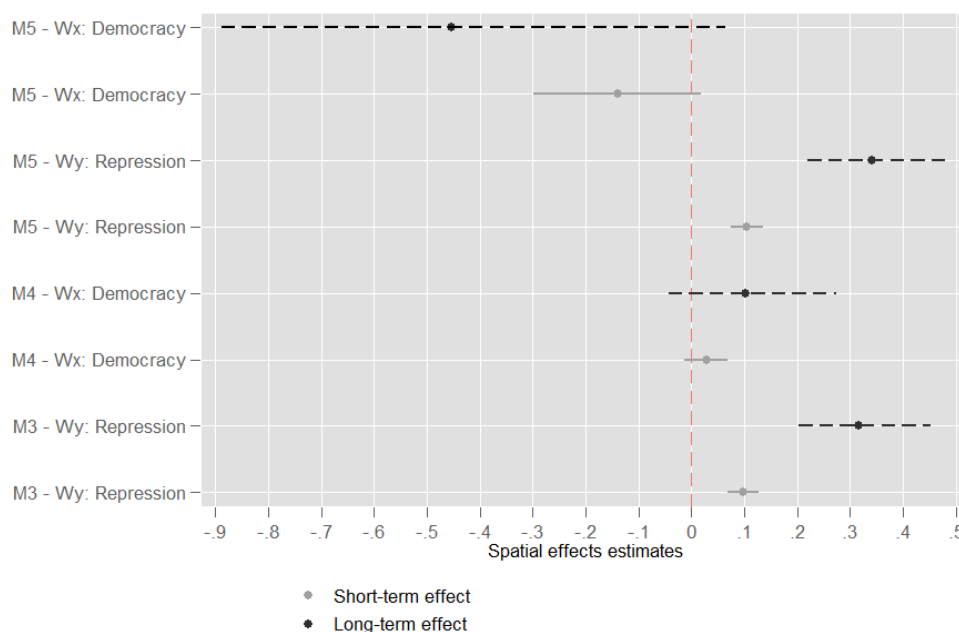

Figure 2 above summarize the short and long run effects of the ρ from Models 3 and 5, and the effect size of the spatial lag of democracy from Model 4. As reported previously, the spatial ρ coefficient has a similar size in the SAR and SDM model at around 0.100 in the short term and about 0.32 in the long run. In other words, there is a change of about 10 percentage points in the level of repression of a country based on one-unit change in regional levels of repression in the previous year. The asymptotic long-run effect is about 31 percentage points. For example, in the sample, the average level of human rights score is about -0.279 which means that if all countries in a region would change their levels of repression by one unit in a given year, there would an equivalent short-term change of 0.100 in the following year and a long-term change of 0.34 points.[11] In the short-run, a one unit change in the level of repression in the region in the previous year would reduce by 35 percentage points human rights violations

in the country under observation in the following year. In the long run, the change in levels of

domestic repression would equate to the equivalent of improvements in human rights brought

about by democratization.[12] Finally, the spatial lag of democracy's effect on domestic levels of

repression does not exert a statistically significant effect on domestic levels of repression.

Table 3. Spatial Models of the Democracy-Repression Nexus, 1947-2007.

VARIABLES	Model 1 NS OLS	Model 2 NS + FE	Model 3 SAR	Model 4 SLX	Model 5 SDM
Electoral Democracy index t-1	0.312***	0.266***	0.247***	0.057***	0.304***
	(0.045)	(0.069)	(0.069)	(0.020)	(0.077)
Spatial diffusion coefficient ρ	--	--	0.097***	--	0.105***
			(0.015)		(0.016)
Spatial lag of democracy t-1	--	--	--	0.028	-0.140*
				(0.021)	(0.081)
GDP growth t-1	0.001	0.001	0.001	0.0004	0.001
	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)
GDP/capita ln t-1	0.044***	0.089***	0.075**	0.095***	0.077**
	(0.011)	(0.032)	(0.032)	(0.031)	(0.032)
Population (1000s) ln t-1	-0.044***	-0.382***	-0.352***	-0.368***	-0.351***
	0.007	(0.062)	(0.062)	(0.063)	(0.062)
Civil war	-0.197***	-0.257***	-0.240***	-0.259***	-0.240***
	(0.043)	(0.046)	(0.046)	(0.046)	(0.046)
International war	-0.082	-0.075	-0.067	-0.074	-0.069
	(0.053)	(0.054)	(0.054)	(0.055)	(0.054)
Resource Dependence t-1	-0.001	-0.001	-0.001	-0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Lagged DV	0.858***	0.724***	0.694***	0.724***	0.692***
	(0.010)	(0.013)	(0.014)	(0.013)	(0.014)
Constant	-0.126	3.105***	2.818***	3.049***	2.804***
	(0.098)	(0.790)	(0.784)	(0.803)	(0.784)
Country and Year FE	No	Yes	Yes	Yes	Yes
Observations	5,870	5,870	5870	5870	5870

Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1

Unpacking regional diffusion

The theoretical argument of regional interdependence in repression levels is based on

the contention that countries will use their political and economic relations to ensure

compliance with norms at a regional level (Finnemore & Sikkink, 1998; Simmons, 2009). Yet,

the current empirical specification of the spatial lag does not allow use to distinguish what type

of (non-geographic) connections matter for the diffusion of repression at a regional level. The

choice of a geographic connectivity matrix may proxy for some alternative causal mechanism (Neumayer & Plümper, 2016), since space can be more than geography (Beck et al., 2006) and the choice of the connectivity matrix has important implications for the sensitivity of our results (Zhukov & Stewart, 2013). Most of the literature on policy diffusion indicates that geographic proximity is a strong predictor of interdependence while other types of connectivity are not as strong (Franzese & Hays, 2008; Zhukov & Stewart, 2013). In this case, the regional connectivity matrix that captures interdependence in repression might proxy for trade relations, alliances or common membership in international organizations[13].

To probe further into the connections driving the diffusion of repression at a regional level, I estimate a m-STAR model that allows the inclusion of multiple spatial lags simultaneously in the same specification (Hays et al., 2010). The $w_{i,j}$ elements of the W matrix are calculated in the following two-step process: firstly, two countries are considered connected if they are located in the same geographic region. Secondly, for countries that share a regional connection, I calculate additional $w_{i,j}$ elements of the W matrix based on the following : (1) trade flows where the importance of state j to state i is given by the volume of dyadic trade between the two as a proportion of a country i's total trade (Beck, Gleditsch, and Beardsley 2006: 33), (2) common security alliance (Gibler, 2008), (3) common membership in international organizations (IGO) (Greenhill, 2010; Pevehouse et al., 2019), common experience with civil conflict (Gleditsch et al. 2002) and contiguity (Stinnett et al., 2002). Model 5 from Table 4 above summarizes the results of the m-STAR model estimating the interdependence in repression at a regional level through alternative connectivity matrices. The results indicate that countries located in the same region that have common IGO membership and similar conflict experience do not follow each other in their repressive behavior. Conversely, repression diffuses at a regional level through countries that are military allies, that have higher levels of dyadic trade and that are contiguous to one another. The results

reported in the paper are robust to alternative explanations for the possible diffusion of repression at a regional level (i.e. regional conflict), to alternative measures of democracy and repression, and to estimation with alternative estimation procedures such as Spatial Maximum Likelihood. [14]

Table 4. Alternative Regional Spatial Weights Matrix connections, m-STAR models, 1947-2007.

VARIABLES	(Model 5) m-STAR Model
Electoral Democracy index t-1	0.230***
	(0.067)
ρ: IGO membership t-1	0.017
	(0.021)
ρ: Trade volume t-1	0.097***
	(0.018)
ρ: Alliance t-1	0.053***
	(0.012)
ρ: Conflict experience t-1	0.014
	(0.019)
ρ: Contiguity t-1	0.107***
	(0.013)
GDP growth t-1	0.001
	(0.002)
GDP/capita ln t-1	0.072***
	(0.031)
Population (1000s) ln t-1	-0.301***
	(0.061)
Civil war	-0.215***
	(0.045)
International war	-0.054
	(0.052)
Resource Dependence t-1	-0.002
	(0.001)
Lagged DV	0.604***
	(0.016)
Constant	2.533***
	(0.773)
Unit and year FE	Yes
Observations	5,654

Standard errors in parentheses: *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Conclusion

The paper developed novel theoretical propositions and empirically tested the implications of spatial interdependence in the democracy-repression nexus by addressing a ubiquitous problem in observational studies: the spatial correlation of observations. The failure to address the spatial correlation in the outcome and/or covariates can lead to over-estimating the effect of unit-level, contextual and context-conditional factors on the outcome of interest (i.e. repression). This paper attempted to solve this empirical problem from the literature on democracy-repression nexus, while also proposing a theoretical explanation as to why we observe spatial interdependence in repression and democracy. Countries strategically adapt to the conditions in their neighbouring region and adjust their domestic repression based on levels of repression in their geographic region to camouflage their own repressive behaviour. Next, it proposed that neighbouring democracies may have lower acceptance of human rights violations in their region, will support opposition movements and provide support for activists fighting for human rights, which in turn should lead countries to reduce their levels of repression.

The results indicate that previous literature has over-estimated the domestic effect of democracy on repression by failing to account and model spatial interdependence in the data. Next, the results showed a consistent and robust interdependence in repression between countries located in the same region. Conversely, there was less evidence that neighbouring levels of democracy matter for countries' use of repression. These results have several implications for the current literature on state repression and future research. Firstly, modelling spatial interdependence should be at the top of researchers concerns when testing explanations of state repression as a failure to do so might lead them to over-estimate the effects of unit-level factors. Secondly, recent advances in measuring difficult political phenomena such as repression (Fariss 2014), democracy (Coppedge et al. 2019), or participation in human rights treaties (Fariss 2018), coupled with the advances in spatial econometric methods (Cook et al.,

2018), opens up avenues for novel theoretical propositions and rigorous empirical testing of spatial dynamics of political processes. Finally, current research on state repression should uncover whether diffusion of repression is conditional on states characteristics given other policy alternatives, and also examine alternative pathways through which repression diffuses between countries.

Endnotes:

1. This is used interchangeably with human rights practice or physical sanctions.

2. The only exception to this, is the paper by Richards, Webb, and Clay (2015) in which they revisit the seminal study on determinants of repression by Poe and Tate (1994). They include a spatial lag of repression in their model to account for potential spatial interdependence as a source of autocorrelation. However, the inclusion of the spatial lag at time t introduces simultaneity bias in their estimates as they use a standard ordinal logistic model that cannot deal with this simultaneity head-on (Franzese et al., 2016; Franzese & Hays, 2007).

3. The democracy data comes from the Unified Democracy Score (Pemstein et al., 2010) and the data on repression comes from Fariss (2014). Darker shades are associated with more democracy and better human rights scores (i.e. less repression). The categories are calculated based on quantiles and they have only descriptive value.

4. Refer to the empirical section and section A5 of the Online Appendix for more information on the creation of the W connectivity matrix.

5. Alternative measures of democracy are used for robustness checks. The results reported remain unchanged and can be found in section A2 of the Online Appendix.

6. The decision to use a temporally lagged spatial lag rests on the assumption that regimes require time to feedback the information they observe in their peers and to react accordingly. Also, the spatial lag is temporally lagged to avoid simultaneity issues in

the spatial OLS model. The models from the main text are also estimated with spatial maximum (S-ML) models in which the simultaneity bias inherent to spatial models is being addressed directly by the model (Franzese & Hays, 2007). The diffusion effect remains unchanged (Table A1).

7. The politico-geographic regions of the world are identified using Varieties of Democracy (V-Dem) data (see section A5 of the Online Appendix).

8. See section A1 and Table A1 of the Online Appendix.

9. This would be given by the effects of the spatiotemporal multipliers which are not calculated given the focus of the paper on the effect of the spatial lags on domestic repression.

10. A potential concern for the drop in the democracy coefficient size might be the inclusion of unit and time fixed effects in the S-OLS model (in addition to the spatial lag of repression). Model 1 and 2 report very similar results, indicating that this is not driving the drop in coefficient size.

11. The term change is used because the ρ coefficient gives us the strength of interdependence in the outcome, meaning that it changes based on whether the average value of repression increases or decreases in the region. More simply, if follows the regional increases or decreases in repression.

12. This is calculated based on the average improvement in human rights violations in the year following democratization in the sample.

13. At the request of one of the reviewers, Table A19 in the Online Appendix summarizes the results of an m-STAR model that uses alliance and democratic inverse distance between countries as alternative measures to the regional W matrix used for the main analysis. The results show that security alliances are one of the main global connectivity

between countries for the diffusion of human rights practices, while democratic or autocratic peers do not seem to influence each other's human rights practice.

14. The Online Appendix that reports all the robustness checks and the replication materials can be found on the journal's Harvard Dataverse page.

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