Centres of power
US capitals' location and ability sorting of legislators

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Abstract

I exploit a novel and rich data-set with biographical information of US state legislators to investigate their sorting based on remoteness and attractiveness of the state capital. The main finding of the paper is that in more remote US state capitals the legislators are on average less educated and experienced. The results are robust to using different measures of remoteness, based on the spatial distribution of the population, and controlling for other characteristics of the legislatures. To identify the causal effect of capitals' remoteness, I use instrumental variables relying on proximity of capitals to the state centroids. Finally, I also find that legislators' education affects public good provision and corruption.

Keywords: Isolation, US capitals, State legislatures

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1 Introduction

Good politicians are fundamental to the well-functioning of the state in democracies and non-democracies alike. A large body of literature has sought to identify the determinants of politicians' selection, such as salary, media coverage, political systems and term limits.[1] Since Glaeser et al. (2001) a smaller and seemingly unrelated literature in urban economics and economic geography has focused on the role of cities' amenities in attracting highly skilled and educated workers.[2] An important yet unexplored question lies at the intersection between these two literatures: does the location of political institutions matter for their composition? In particular, does the location of the legislative bodies determine the average competence of legislators and, in turn, their performance?

In this paper I use novel and rich data on the biographical characteristics of the whole population of US state legislators to show that members of legislatures located in more remote, less attractive state capitals exhibit, on average, less and lower quality education and experience. Drawing upon the relative centrality of US state capitals I am able to use instrumental variables based on state centroids to identify the causal effect of remoteness. I interpret the results as evidence that legislators sort based on the attractiveness of the capital city: a remote capital has lower market access and imposes a larger cost of commuting, making a legislative seat less appealing to individuals with a better outside option. I also show that legislators' education affects public good provision and corruption.

The empirical strategy relies on the fact that US state capitals are often located close to the centre of the state. While the location of a capital city is endogenously determined,[3] the centroid of a state is a mechanical construct that only depends on the shape of the state's political boundaries.[4] This creates the perfect setting to test my hypothesis as I am able

[1]See Caselli and Morelli (2004); Besley (2004); Snyder Jr and Strömberg (2010); Besley and Reynal-Querol (2011); Smart and Sturm (2013); Dal Bó, Finan, Folke, Persson, and Rickne (2017).

[2]See also Glaeser and Gottlieb (2006); Carlino and Saiz (2008).

[3]Campante, Do, and Guimaraes (2019) show that non-democracies tend to set capitals in more isolated locations so that the elite is able to extract larger rents without increasing the risk of a revolution.

[4]Namely, the centroid of a two-dimensional figure is the arithmetic mean position of all points in the shape.

to exploit the exogenous variation in the location of state centroids for identification, as in Campante and Do (2014).

I measure the quality of legislators with proxies for ability that are widely used in the political economy literature: the level of educational attainment and previous experience in local government (Dal Bó, Dal Bó, and Snyder, 2009; Ferraz and Finan, 2009; Besley and Reynal-Querol, 2011; Galasso and Nannicini, 2011). I also devise variables that capture the quality of legislators' education, based on the the academic institution attended and the subject of the degree pursed.

There are two ways in which a remote capital is unattractive to legislators. First, the state's districts are on average relatively further away from a remote capital.[5] Far away districts are less appealing than closer ones as they impose a higher cost of commuting. I find that the distance of a district from the state capital is a negative predictor of the level of education and experience of the legislator as well as the probability of having a Master's degree, a degree in public policy or politics and being a woman. Second, a remote capital is a less attractive city to work or live in. I use different population-based indicators of remoteness[6] such as density,[7] population potential and the isolation measure formulated by Campante and Do (2010). I test them all and find that remote capitals are associated with less educated and less experienced legislators who also have less relevant education from lower ranked academic institutions. More precisely, depending on the measure used, a standard deviation decrease in remoteness is associated with a 0.1 to 0.39 standard deviations increase in legislators' educational attainment and a 0.27 to 0.44 standard deviations increase in the quality of education. The effect is significant when estimated using instrumental variables based on state centroids.

Legislators' level of education affects political outcomes. For example, there is an asso-

[5]Districts are drawn to represent an equal amount of people within state boundaries (Kurtz, 2010). For a given number of districts, when more people live far away from the capital, the districts are more distant.

[6]I use density and population potential as measures of remoteness. Higher density and population potential indicate a *less remote* capital.

[7]Population density is a classic measure used in the urban economics and economics geography literature because of its correlation with urban amenities (Glaeser and Gottlieb, 2006; Rappaport, 2008)

ciation between a higher level of educational attainment and lower corruption at state level (Glaeser and Saks, 2006).[8] More educated politicians are also associated with faster economic growth (Besley, Montalvo, and Reynal-Querol, 2011) and higher efficiency in the use of government resources (Gagliarducci and Nannicini, 2013). I devise a simple test to check how remoteness and the composition of the legislature in terms of education affect public good provision and the level of corruption in the public sector. My results show that higher level and relevance[9] of education are associated with more public good and less corruption. The findings also suggest that not all of remoteness' effect on outcomes is carried through the sorting mechanism,[10] and that the type of education received by legislators affects outcomes more than their average educational attainment.

Related literature: This paper contributes to a number of literatures. First of all, it is closely related to Campante and Do (2014) who show that isolated capital cities are associated with higher corruption and lower public good provision. They produce evidence of isolation reducing accountability as state politics receives less news coverage and voters are less interested in it when they live further away from the capital. This paper, however, focuses on a different mechanism: legislators' sorting. More remote capitals attract a different pool of legislators, less educated and less experienced. Accordingly, I employ different measures of remoteness such as density and population potential aimed at capturing capitals' attractiveness rather than the salience of legislative politics within the state.

A vast literature in political economy has discussed different aspects influencing politicians' characteristics and behaviour, such as media coverage (Ferraz and Finan, 2008; Snyder Jr and Strömberg, 2010; Repetto, 2018), salaries (Besley, 2004; Mattozzi and Merlo, 2008; Gagliarducci et al., 2010) and term limits (Ferraz and Finan, 2011; Smart and Sturm, 2013). This paper is closely related to those focusing on legislators' selection based on abil-

[8] One potential explanation is that educated individuals tend to be more civic-minded (Milligan, Moretti, and Oreopoulos, 2004; Besley and Reynal-Querol, 2011).

[9] I consider relevant education a degree in public policy or administration, political economy or government studies.

[10] Plausibly legislators' sorting coexists with the incentive mechanism identified by Campante and Do (2014).

ity (Dal Bó, Dal Bó, and Snyder, 2009; Ferraz and Finan, 2009; Besley and Reynal-Querol, 2011; Galasso and Nannicini, 2011; Dal Bó, Finan, Folke, Persson, and Rickne, 2017) and, consistently with these works, uses measures of education and previous political experience as proxies for unobserved ability. It differentiates from the rest of the literature by studying the otherwise overlooked role of geographical location in political selection.

Since Carey, Niemi, and Powell (1998), a related strand of literature has focused specifically on US state legislators. A majority of works[11] relies on a data-set of legislators' demographic characteristics deriving from responses to two surveys run in 1995 and 2002 (Carey, Niemi, and Powell, 1998; Carey, Niemi, Powell, and Moncrief, 2006).[12] The composition of state legislatures is studied in relation to electoral competition (Squire, 2000), term limits (Wright, 2007; Carey et al., 2009), compensation (Hoffman and Lyons, 2018) and campaign contributions (Powell, 2012). This paper differs from the others by pointing out the importance of capitals' location and using a richer data-set comprising information on all state legislators.[13]

Urban economists studying the spatial distribution of activity, resources and people across cities have overwhelmingly focused on the private sector (Becker, Heblich, and Sturm, 2018). This paper, instead, provides evidence of sorting in the public sector. It contributes to an extensive literature on agglomeration in cities (Combes and Gobillon, 2015), in particular supply-side agglomeration driven by the role of cities as consumption centres (Glaeser, Kolko, and Saiz, 2001). I also focus on a special set of cities, capitals, that has been understudied despite some distinctive characteristics: their *special status* is often embroidered in the country's constitution;[14] they are often the cultural and economic centre of the country, the most

[11]An exception is Bratton and Haynie (1999) who collect data from 6 states over a 3-year period. More recently, Kurtz (2015) lead a joint study from NCLS and Pew (NCSL, 2015b) to analyse the demographic composition of state legislators and compare it to population baselines.

[12] The 1995 survey collected information on 3,542 legislators (47% response rate on a fraction of the population), the 2002 survey on 2.982 (40% response rate on the whole population). The 2002 survey, in particular, has been the only source of information on state legislators for years and it has been used in Kurtz et al. (2006); Powell (2012); Powell and Kurtz (2014); Hoffman and Lyons (2018) among others.

[13]Moreover, the data I use is collected by a third party, hence less prone to selection bias due to non responses or miss-reporting.

[14]Notable counterexamples are France and India that have no official capital. In the US, instead, moving

populous city[15] and host the government seat.[16] Studying capital cities is complicated by the endogeneity of their location or relocation choices,[17] with only specific exceptions (Becker, Heblich, and Sturm, 2018; Faggio, Schluter, and vom Berge, 2019). In this context, instead, I am able to use the proximity to state centroids to address the endogeneity problem.

Finally, in terms of its methodological contribution, this papers more generally lies with a transversal set of works that addresses the problem of endogenous regressors by using geographical location to build instrumental variables. These could take the form of distances (Acemoglu, Johnson, and Robinson, 2001; Card, 2001; Neumark, Zhang, and Ciccarella, 2008; Becker and Woessmann, 2009; Oster, 2012) or distribution-based measures (Campante and Do, 2014). I, instead, use concentration variables such as population density.

The rest of the paper is organised as follows: Section 2 provides some background on the US State Legislatures; Section 3 presents the data; Section 4 discusses the empirical strategy; Section 5 discusses the results; Section 6 concludes.

2 US State Legislatures

This paper focuses on the US State legislatures and the profiles of current state legislators.[18] Each of the 50 US States has its own legislative, executive and judicial powers that interact with each other in a similar fashion to what happens at national level. The legislatures are composed of two chambers: a Lower House called either House of Representatives, Assembly or House of Delegates and a Upper House called Senate. The exception is Nebraska where

the federal capital to another state would require amending the Constitution, as well as returning the land of the District of Columbia to the State of Maryland and carving a new federal district out of the receiving state (Bomboy, 2014).

[15] This does not hold true for US state capitals, where in only 17 of the 50 states the capital coincides with the largest city.

[16] There are many exceptions worldwide: for example, the Netherlands where Amsterdam is the capital, but the government sits in the Hague; or Bolivia, where La Paz hosts the government and Sucre is the official capital.

[17] In this spirit, Campante, Do, and Guimaraes (2019) show that in non-democracies there are incentives to move the government seat to an isolated place to reduce the threat of rebellion.

[18] The data captures the composition of state legislatures at the beginning of 2019.

the legislature is made of a single (non-partisan) body whose members go by the title of senators.[19] On par with the US Congress structure, states' Lower Houses are more numerous, usually have less restrictive access rules in terms of age and residency, and a shorter term (CSG, 2018). Also, the legislative process closely resembles the national level's one. Bills make their way from inception through legislative committees first, then to both houses to finally be handed over to the state governor whose signature is needed for them to become law (NCSL, 2019). However, these are just highly general characterisations. Since all regulations are set at state level, there is a large variability in terms of institutional design across states: in the structure of the legislature, the size, compensation, staff availability and legislative requirements for legislators, as well as in the rules of the legislative process.[20]

Historically, most state legislatures were born as citizen legislatures. However, over time most have professionalised: salaries have more than doubled in real terms and aggregate full time staff has exploded from 500 units to around 30,000. In 1933 only 5 states had annual sessions, compared to 46 nowadays.[21] In the same time period sessions became longer[22] as well as the amount of constituents per legislators increased, since population growth in the US was matched by a decrease in the total number of legislators. At the same time, the legislative capacity of legislators is now higher following devolution policies pursued by the Nixon and Reagan administrations (Kurtz, 2010). The evolution has not been the same across the US. Figure 1 categorises 5 groups based on the average time spent on the job

[19] This paper focuses only on the 50 US states. It is worth noting, however, that also the District of Columbia and the territories of Guam and the US Virgin Islands have unicameral legislatures, while the others (American Samoa, the Commonwealth of the Northen Mariana Island and Puerto Rico) follow the canonical bicameral legislature (CSG, 2018).

[20] There are two main authoritative sources reporting frequently updated and detailed information on the plethora of different state regulations: the Council of State Governments who publish the Book of States (CSG, 2018) and the National Conference of State Legislatures (NCSL, 2019), who provide information and documentation to state level legislators and legislative staff. Excellent sources on the history, evolution and functioning of state legislatures are: Montès (2014); Squire (2012); Squire and Moncrief (2015); Moncrief and Squire (2017).

[21] Only Montana, Nevada, North Dakota and Texas still have bi-annual sessions. In 1933, 42 states used to meet bi-annually and Alabama every four years , in 1961 the number had increased to 19 and exploded up to 41 in the 70s following the great wave of legislative reforms in the 60s and early 70s (Kurtz, 2010; NCSL, 2018).

[22] Half of the states with session limits increased them, while the others spend more time in session.

by legislators, their salary and the size of the staff employed. We can see that the least populated, rural Midwest states are among the ones with lowest pay and workload and the most populous and urban states such as California, New York and Pennsylvania have the most professionalised legislatures. These states, however, entail greater remuneration yet a higher cost of living and a larger workload: despite legislatures being larger and with more staff, individual legislators have more constituents to serve (Kurtz, 2010). Irrespective of the pay and amount of resources, recent studies have found that all legislators tend to spend more time on the job than they expected *ex-ante*, with the highest discrepancies for part-time legislators (Kurtz, Moncrief, Niemi, and Powell, 2006).

There are other dimensions that can influence individuals' ability and willingness to run for state legislative seats. For example, most states offer additional pay for legislative leaders and committee members.[23] The requirements to run for office vary dramatically across the US. The minimum legal age to run ranges from 18 to 25 for the Lower House and 18 to 30 for the Upper House. States also have different rules in terms of residency, US citizenship, voter registration and for how long before the elections these conditions need to be met. Most states require US citizenship, all states but Washington demand district residency, although without restrictive temporal constraints.[24] The state residency condition is sometimes more limiting, going as far as 7 years for the New Hampshire Senate. In some cases, state citizenship is also formally required.[25]

Finally, there is variation in the length of terms and the existence of term limits. Most frequently, a term lasts for two years in the Lower House (with four exceptions: Alabama, Louisiana, Mississippi and North Dakota that have a 4-year term) and 4 years in the Upper Hours, with 14 exceptions.[26] Term limits, instead, are present in 15 states. In six of these

[23] All states that provide compensation for committee members also have additional pay for legislative leaders. The compensation is often limited to committee chairs and to specific committees. See Tables 3.11 and 3.12 in the Book of States (CSG, 2018) for state by state specific provisions.

[24] Often the requirement is as little as 30 days before elections.

[25] In Tennessee, for example, a candidate must have been a state citizen for three years to run for the House of Representatives. For more information on electoral requirements see Table 3.5 of the Book of States (CSG, 2018).

[26] For 12 states the term is two years as it is in the Lower House. Two states, Illinois and New Jersey, are

states the limits are lifetime: it is not possible to run for the same office once serving the maximum allowed amount of terms, while for the others the ban is only on consecutive spells (NCSL, 2015a).[27] Figure 2 provides an overview. Six states used to have term limits but repealed them. In two of these cases, it was the legislators' themselves who enacted the repeal.[28] Term limits in state legislatures have been the object of a number of studies that found no particular effect on the composition of the legislature, while they tend to affect the way legislators use their time, the balance between state legislative and executive power and the relevance of legislative leaders and committee chairs (Carey et al., 2009). It is important to note that legislators have the capacity to modify some of the regulations that directly affect them, as it happened in some states with term limits. This is also the case for the salary, which is sometimes set by the state constitutions but often requires a much less burdensome process to be amended.[29] All the features discussed in this section are potential determinants of legislators' sorting choices. As such, they need to be controlled for to be able to identify the effect of remoteness alone.

2.1 The location of US state capitals

In this analysis, the attractiveness of US state legislatures does not depend on the large variation in the many different legislative features enshrined in law but on one that is rather based on convention. In the US, state capitals often occupy a geographically central position in the state. This is due to the long-standing tendency of US legislators to place government seats in the middle of the jurisdiction, based on the idea of equal representation of all citizens (Engstrom et al., 2013).[30] Often capitals do not correspond with the main centre of economic

on a 10-year cycle made of two 4-year terms and a 2-year one CSG (2018).

[27]With consecutive term limits a legislator could, in theory, cycle indefinitely between the two houses.

[28]In the other four cases they were repealed by the respective State Supreme Courts that objected the method of imposition, not the limits *per se* (NCSL, 2015a).

[29]See Table 3.8 in the Book of States CSG (2018) for individual states' methods of setting legislative compensation.

[30]For some of the older states the reason for moving the capital inwards was different (for example, for defence puroposes) than purely choosing a central location in the spirit of equal representation (Squire, 2012; Montès, 2014).

activity: in only 17 out of 50 states the capital is also the largest city, only one state capital features among the top 10 largest cities in the US (Phoenix, Arizona) and almost half of all capitals (24/50) have a population of less than 150,000.[31]

The reason why the central location of US capitals is important has to do with the severe endogeneity problem faced by anyone willing to determine the effects of the location of institutions, such as government or legislative bodies. Even if the location of a specific institution is arguably exogenous, the underlying spatial distribution of the population may depend on it. A potential solution would be exploiting the variation generated by changes over time in the location of institutions. However, such events are rare and, above all, the expression of institutional choices, which unless determined by an uncorrelated event, such as Germany's partition at the end of WWII in Becker, Heblich, and Sturm (2018), is endogenous as well. The centrality of US state capitals provides a reasonably exogenous instrument to address the endogeneity issue. The central point in a state is a mere geographical construct that cannot possibly influence the spatial distribution of population, above all since US state borders have been stable over the last 100 years.[32] Later, I use the exogenous variation generated by the location of state centroids as a source of identification of the effect of state capitals on the composition of the legislature.

3 Data

This paper uses a newly assembled, rich and unique data-set with biographical information on 7366[33] members of US state lower and Upper Houses in 2019 from all 50 states. The data-set combines the biographical data with geographical data, including measures of capital city remoteness, and state legislatures' characteristics. The following sections describe the main

[31] When considering only the contiguous US States, the capital is the largest city in 16 out of 48 states (excluding Honolulu, Hawaii) and 23 capitals out of 48 (excluding Juneau, Alaska) have a population of less than 150,000. City population data is taken from 2017 population estimates (U.S. Census Bureau, Population Division, 2018).

[32] See Squire (2012); Montès (2014) for the historical administrative evolution of the US.

[33] 7231 once excluding Alaska and Hawaii.

variables used for the analysis. For a more detailed discussion on the data collection process and the variables' construction see Appendix A.

3.1 Biographical data

The biographical data was obtained from the Vote Smart (2019) online platform and includes indicators on personal characteristics, family members, religion, education, political career, political affiliation and work addresses. Vote Smart is a free to access platform curated by volunteers who gather and compile information on US candidates and elected officials at all levels from Federal Government to city councils, with the aim of informing voters. Vote Smart staff members are mostly volunteers who collect biographical data, public statements, votes as well as legislative information and input it on the website. The biographical information reported on Vote Smart is collected from legislators' official profiles and copied without being transformed or standardised, thus it can be considered self-reported. The data is not organised in a unified data-set but available in text entries under politicians' profiles, that are free to access through the Vote Smart website. Figure 3 provides an example for a newly elected Utah Representative. However, upon purchasing access, it is possible to use an API that queries individual observations and provides them in XML or JSON format.[34]

Personal information: I obtain information on age, gender, relationship status, whether the legislator has any children, the number of children and the gender of the partner from the legislators' personal and family information. Age is computed from the birth-date until Jan, 1st 2019. The remaining variables are extracted using algorithms that analyse the text strings containing information on the family members.

Education: I build two main indicators of educational attainment: the level of education and whether a legislator has obtained a Master's degree or above; and four indicators measuring the quality of education: having a policy or politics-related degree, a continuous score variable based on the ranking of the academic institutions attended, and a dummy

[34]These are later converted into delimited text files that constitute the raw data.

indicating whether the legislator has a Master's degree from a top 20 or a top 50 university. Starting from the individual biographical entries, I use an algorithm that first separates degree, field(s) of study and school from the text and then uses the information to attribute the best match in terms of level of education, using the official United States education levels mapping into the UNESCO ISCED 2011 classification,[35] which is based on a 0-8 increasing scale. The second attainment measure is a dummy variable indicating if the highest degree received is a postgraduate one. The median level of education is a Bachelor's degree (ISCED level 6) and the average is 6.3 with more than 25% of the population having completed at least a 2-year Master's degree. However, such measures treat all degrees with the same qualification as equal regardless of the effective difficulty in obtaining them, the type of degree and the quality of education received. To be able to better differentiate legislators I introduce measures of *quality* of education. The idea is that admission and completion of a degree in a prestigious, highly ranked academic institution is a good proxy for talent. First, to control for the type of degree, I build a dummy variable indicating if the person has received any policy or politics-related 4-year undergraduate or higher degree.[36] As a proxy for education quality I use the score from one of the three most influential international ranking systems of academic institutions: the Times Higher Education (2019a) World University Rankings (THE).[37] I am able to attach a score to all reported institutions,[38] by assigning the lowest score to those not included in the ranking.[39] Also, for each legislator, I record if they have

[35]International Standard Classification of Education (UNESCO Institute for Statistics, 2011). The individual country specific mapping from national qualifications to standardised equivalent international levels can be found at `http://uis.unesco.org/en/isced-mappings`.

[36]They include, among others, Bachelor's and Master's in Public Policy, Public Administration, Political Economy, Government.

[37]The other two are the Academic Ranking of World Universities by ShanghaiRanking Consultancy (2018) and the QS (2019) World University Rankings. I prefer the Times Higher Education ranking because it provides a cardinal score out of a 100 rather than just a ranking position. I choose to adopt an international ranking as some of the legislators in the data set attended top institutions abroad. The choice of one ranking over another is not of particular importance; the main goal is to distinguish the few most prestigious academic institutions from the majority of colleges and graduate schools.

[38]Times Higher Education ranks the best 1258 universities in the world. I collect the score for all 172 US-based institutions and the international schools in the top 50.

[39]I consider the score of the highest ranked institution, regardless of the level of the degree. For robustness, I use another version of this variable based the score of the highest degree obtained.

received a postgraduate degree from any academic institution included among the top-20 or top-50 in the ranking.

Political experience: I introduce two measures of political experience, one is *resume length*, based on the number of different political roles a legislator held in their career; the second is length of tenure, measuring the number of years since the start of the political career. I also register in two dummy variables: whether the legislator has held legislative leadership positions in the past[40] and whether they had some role in their party.[41] I am able to categorise every single role held by each legislator so that the resume length and tenure variables can be adjusted to include all political and government roles, including work in public administration, membership of public boards, electoral campaigns and leadership positions in the party and in the legislature or only focus on legislative and executive positions, such as town mayor, county councilor, state representative and state governor. Length of tenure is computed as the numbers of years since the first appointment.

Congressional information: I also collect information on the main party affiliation, whether a legislator is affiliated with more parties and whether they are running for office in 2019.[42]

3.2 Population distribution

In the next section I show how I compute different measures of capital city remoteness. To be able to do so, I need to closely approximate the population distribution. For this purpose, I use the American Community Survey 2012-2016 population estimates at block group and census tract level. The block group is the second smallest census unit, falling in between census tract and census blocks. Data at block group level generate a better approximation of the population distribution. However, for computational reasons, I use census tract level

[40] For example, president, speaker, majority or minority leader and whip.

[41] One such instance is being a party delegate to the national convention.

[42] There are only 26 such instances in my data set. Among those, 18 legislators are running for the exact same office, while 4 are State House members running for the State Senate, 3 are running for a governor position and 1 for district attorney.

data for deriving the isolation variables.

3.3 District controls

For each lower or Upper House district I compute: population density using average population estimates and land area in m^2; the district average per capita income in the last 12 months (averaged over 2012 to 2016) in 2016 inflation-adjusted dollars; the share of 25+ years old population with at least a bachelor's degree.[43] The above variables are useful to control for baseline candidates' characteristics, as legislators must be district residents in almost all states. Moreover, they are also proxies for voter turnout and political knowledge at district level. Education is correlated with political involvement and, in the US, strongly correlated with higher turnout (Milligan, Moretti, and Oreopoulos, 2004). Both education and income levels are also positively correlated with newspaper readership (Snyder Jr and Strömberg, 2010).

3.4 State controls

I introduce two state-level sets of control: measures of legislatures' characteristics, such as salary and compensation structure, level of professionalism, terms limits, residence requirements to run for office; and state characteristics such as the size of the state, population, average education level, measures of voters' engagement. I borrow the data on legislators' salaries and length of the legislative session from Bowen and Greene (2014a), who compute *ex-post* 2010-2014 averages. The Book of States publishes every year the information required to compute legislative salaries and the length of the session *ex-ante*.[44] However, the effective number of days in session is impossible to forecast in advance as well as salaries since, in some cases, they depend on the former. Using a lagged average value for salaries

[43] Data from the American Community Survey (ACS) 2012-2016 average, in U.S. Census Bureau, Geography Program (2016).

[44] Table 3.9, Legislative Compensation and Living Expense Allowances During Sessions, combined with the information from Tables 3.19 and 3.20 on regular and special sessions, since in some states legislators' pay is per session or calendar day (CSG, 2018).

has two benefits. First, while legislators in many states cannot predict the exact amount of compensation they will receive for their service, they are aware of what the prevailing salaries are and use those to inform their decision whether to run for office. Second, since in some states legislators have the power to set their own compensation, the current or future level of remuneration is endogenous. The real salary is computed by dividing the average nominal 2010-2014 compensation by the average gross median rent for the same time period.[45] To measure the level of professionalism of a legislature, I employ the index developed by Squire (2017) that assigns a score from 0 to 1 to state legislatures comparing them across different features (such as pay, length of sessions, size of staff, available resources) to the US Congress.[46] Information on term limits is derived from the NCSL (2019). I record if a state has term limits in place, when they were introduced and if the limit is only on consecutive terms or lifetime. I build additional variables that can influence individuals candidates' choice to run for office. First, I build two dichotomous indicators that report for each house and state if there is a provision for additional pay for legislative leaders and committee members. Then, I construct six different variables capturing the minimum requirements to be able to run for office at state and house level (minimum age, length of citizenship in the US, length of state residency, length of district residency, state citizenship, voter registration).[47]

I introduce a set of variables to control for the characteristics of the pool of candidates and voters in the state. To measure the *ex-ante* level of education of potential legislators, I measure educational attainment at state level, using the ISCED classification for comparability with the individual legislator's level of educational attainment. Similarly, I also compute for each state the share of the population over 25 that has obtained at least a 4-year

[45] Gross median rents data from ACS 2010-2014 Census Bureau estimates. The salary data from Bowen and Greene (2014a) is expressed in 2010 US dollars, the rent is converted to 2010 US dollars using the ACS 2010-2014 Census Bureau suggested inflation value.

[46] The index is an update of the original version from Squire (1992). It assigns a score of 1 to Congress, which means the index is interpreted as follows: a legislature with a score 0.5 is half as *professional* as the US Congress. Bowen and Greene (2014b) while favouring a multi-dimensional approach over a uni-dimensional measure, find that the index performs well at capturing the difference between amateur and professional legislatures.

[47] All these variables are derived from the Book of States (CSG, 2018).

college or university degree (Bachelor's degree or higher).[48] I use two types of variables to proxy voters' engagement. First, I borrow measures of newspaper political coverage from Campante and Do (2014).[49] Then, I compute average voter turnout as a fraction of all voters in the last 3 presidential elections 2008, 2012 and 2016.[50] To capture the size and shape of the state, I compute the state area and the maximum distance between the capital and the state boundaries.

Finally, to test for the effect of legislators' characteristics on outcomes, I use three different measures of performance. First, from the Book of States (CSG, 2018) I calculate the average number per bills per legislator per day of session.[51] Then from Campante and Do (2014) I borrow a measure of public good expenditure, namely, the share of state expenditure assigned to education, public welfare, health, and hospitals from US Statistical Abstract 2012. Also, I borrow a measure of corruption from Glaeser and Saks (2006): the number of federal convictions for public corruption per capita in the state.[52]

4 Empirical strategy

The empirical analysis presented in this paper consists of three parts. In each of the first two, I address one of two mechanisms for the effect of capitals' remoteness on the ability sorting of state legislators: first, the fact that a district far away from the capital is unappealing and then, the unattractiveness of the capital *per se*. In the third, I provide a link between legislators' sorting and some outcome measures.

[48] Education data from US Census Bureau 2012-2016 American Community Survey estimates of the resident population over 25 per level of education.

[49] The variable is based on principal component analysis of search terms related to state politics from the webiste NewsLibrary.com, see Campante and Do (2014).

[50] Turnout data are taken form CSG (2018).

[51] Bills data are 2014-2017 averages, to smooth out potential increased activity in a specific year due to idiosyncratic factors. The number of legislators is also taken from CSG (2018). Session length data are from Bowen and Greene (2014a) and refer to 2010-2014.

[52] Average from the period 1976-2002, data are derived from the 1989, 1999 and 2002 issues of the Report to Congress on the activities and operations of the Public Integrity Section, issued by the Department of Justice, see Glaeser and Saks (2006).

4.1 Remote districts

The first of the two closely related mechanisms studied in this paper relates to the fact that remote capitals are relatively further away from a larger number of districts that are unattractive to potential legislators. Following the principles set by successive Supreme Court rulings on re-districting Kurtz (2010), state districts tend to be drawn to represent roughly the same amount of people. Accordingly, states in which large masses of the population live further away from the capital city have more *remote* districts. I study how the distance between the capital and an electoral district affects the type of candidates being elected in the same district. As briefly explained in Section 2, legislators running for office in a district need to reside there. Therefore, the pool of candidates eligible for a seat - or willing to relocate just to run for one - is limited in size. A remote district may be more unappealing for two main reasons: first, there is a hefty psychological cost of commuting;[53] second, a remote district could mean lower visibility for the legislator. We should then expect that, after controlling for local characteristics, in districts further away from the capital the individuals from the eligible pool with a better outside option are less likely to run for office. This is due to their net benefit being lower compared to equally talented candidates who live closer. To test this hypothesis, I employ the following model:

$$Y_{ids} = \beta_0 + \beta_1 \delta_{ds} + \beta_2 w_d + \boldsymbol{\beta_3} \mathbf{X_i} + \gamma_s + \epsilon_{ids} \tag{1}$$

Y_{ids} is a biographical characteristic of legislator i elected in district d of state s. It can be the level of education measured on the ISCED scale or a continuous measure of political experience. δ_{ds} is the distance between state s' capitol building and the centroid of the district d of election.[54] w_d is the logarithm of districts d's income per capita, $\mathbf{X_i}$ is a vector

[53]The monetary cost is already covered by the legislature. Almost all states have a mileage cost and a session *per diem* allowance, see Table 3.9 in the Book of States (CSG, 2018) for a state by state breakdown.

[54]In all the geographical measures I construct I always define the location of the capital city based on the coordinates of the capital hill as in Galster et al. (2001). From Vote Smart I also collect information on legislators' work addresses. I am able to compute the exact distance between the capitol hill's office address and a district office address for 4,521 legislator. However, I use the distance between the state capitol and

of individual covariates, such as the legislator's age, party affiliation and type of legislative seat and γ_s a state fixed effect. For dichotomous legislators' characteristics, such as gender, having obtained a postgraduate degrees or having completed policy related studies, I estimate the following model:

$$P(Y_{ids} = 1|X) = \Phi(\beta_0 + \beta_1\delta_{ds} + \beta_2 w_d + \boldsymbol{\beta_3}\mathbf{X_i} + \gamma_s + \epsilon_{ids}) \tag{2}$$

where all the variables on the right-hand side are defined as above.

4.2 Capital city remoteness and composition of the legislature

The second part of the analysis focuses on how capitals' remoteness affects the composition of the legislature. The mechanism is based on the idea that more remote cities are less attractive places where to relocate, even if only temporarily, during the legislative session. Individuals with a better outside option should find remote capitals less attractive, even after controlling for state characteristics and legislative features, such as salary. Hence, we should expect the average level and quality of legislators' education to be negatively correlated at state level with capitals' remoteness. There are two main ingredients in this part of the empirical analysis. The first is the definition of capital city remoteness and the methods employed to measure it. The second is the identification strategy that, following Campante and Do (2014), relies on the relative centrality of US state capitals to build instrumental variables based on the arguably exogenous location of state centroids, addressing the potential endogeneity of the spatial distribution of the population in and around the state capital. In all specifications I restrict the sample to the 48 contiguous US states.[55] To study the effect of remoteness on

the district's centroid to avoid reducing the sample size. I am indeed able to match all 7,350 legislators with their district of election. The measurement error is negligible. Figure C1 shows that the correlation between the two measures is near perfect.

[55] The results are robust to including Alaska and Hawaii. However, it is more reasonable to exclude the two states because of their peculiar characteristics. Alaska is the largest state but the third least populous, with a considerable proportion of the state entirely uninhabited. Hawaii's capital, Honolulu, due to the mechanics of the measures of remoteness that are explained later, is one of the least remote capitals: 25% of the state's population lives there and roughly two thirds of the state population is concentrated in the small

the type of legislators, I use the following model:

$$AvgEdu_s = \beta_0 + \beta_1 Remoteness_s + \boldsymbol{\beta_2}\mathbf{Legi_s} + \boldsymbol{\beta_3}\mathbf{State_s} + \epsilon_s \tag{3}$$

where $AvgEdu_s$ is the average type (measure of education attainment, quality of education or political experience) of legislators in state s. $\mathbf{Legi_s}$ is a vector of state legislatures' characteristics such as the real salary and the level of professionality meant to control for the variation in the attractiveness and difficulty of legislative roles across states. When using measures of political experience as outcome variables, I also control for the existence of term limits in the state legislature and whether they are binding or not. $\mathbf{State_s}$ is a vector of state characteristics. It includes the average educational attainment in the state that is an indicator of the level of education in the pool of potential legislators. It also includes measures of political engagement such as the voter turnout in presidential elections and newspapers' political coverage as well as the geographical size and shape of the state. The main coefficient of interest is β_1, informing on the effect of higher remoteness on the composition of state legislatures. I employ several approaches to measure capitals' remoteness. First, I build three measures of market access using population density in a 30, 50 and 100 km radius around the capital, a commonly used variable in the urban economics literature as it captures well the cities' level of amenities (Glaeser and Gottlieb, 2006; Rappaport, 2008):

$$PopDensity_s = \frac{\sum_j^N pop_{js} \times w_{js}}{area_s} \tag{4}$$

Equation 4 shows the formula used to compute density around state s' capital. pop_{js} is the population of block group j in the circle around state s capital; $w_{js} \in (0, 1]$ is a weight that attributes a share of block group j's population, if not fully included in the circle, equal to the ratio of the area of the intersection between the block group and the circle and the total area of the block group, $w_{js} = 1$ if the block group is fully included in the circle. $area_s$ is

island of Oahu that hosts the state capital.

the total amount of land area in the circle around the capital.

The second variable I introduce is a measure of population potential, widely used in the economic geography literature. I compute population potential at state level using a gravity equation of the type:

$$PopPotential_s = \sum_i \frac{pop_i}{d_{si}} \tag{5}$$

Where pop_i is the population of census tract i in the same state s as the capital city and d_{si} is the distance between state s capital and the centroid of the census tract.

Finally, I borrow the measures of *isolation* used by Campante and Do (2014), measured as:

$$Isolation_s = 1 - \sum_i \left(1 - \frac{log(d_{si})}{log(d_{max})}\right) s_i \tag{6}$$

where d_{si} is the distance between the capital city of state s and the centroid of census tract i, d_{max} is equal to the maximum distance between any state capital and a point in the same state[56] and s_i is the share of state population living in census tract i. A different, *adjusted*, version of the first measure takes into account the size of the state by setting d_{max} for each state as the maximum distance between the capital and a point in that state. A correct formulation of the second variable would be:

$$AdjIsolation_c = 1 - \sum_i \left(1 - \frac{log(d_{si})}{log(d_{max_s})}\right) s_i \tag{7}$$

The different measures of isolation have each advantages and drawbacks. Isolation measures use all the spatial information in the state. On the other side, the first version of the variable is affected by state size,[57] while the second measure assumes that the important of distance varies with state size.[58] Both variables do not take population density in the

[56]This is equal to roughly 900 km between Sacramento, California's capital, and the southern border with Arizona.

[57]However, it is enough to control for it as I will do in all models.

[58]In other words, a population mass 150 km away from the capital is *relatively further away* in New Hampshire than in Texas because the latter is a much larger state.

capital into account, but just its *relative* density.[59] The density variables are better suited to describe the level of economic activity in the area. On the other side, they neglect the information on the spatial distribution of the population away from the point of it. Population potential is somewhere in between, by using the whole spatial distribution in the state, but weighing each point by the population mass. I will test all the different measures of remoteness, but I consider population density as the best variable. This is because the attractiveness of a capital for legislators, and the consequent decision to work there, does not necessarily depend on how the whole state population is concentrated relative to that city but just on what is happening in the immediate proximity of the capital. As a result, if the objective is to capture capitals' attractiveness as closely as possible, it may be better to discard the information on the rest of the spatial distribution of the population. Population potential and isolation, however, may be better suited to capture other mechanisms such as the legislators' accountability, since they could more closely approximate the salience of state politics within the state.

I also look at three alternative *blunt* measures of capital city isolation.[60] The first is the percentage of state population living in the capital city. The second is the ratio between the population of the capital and that of the largest city in the state. The above two variables are highly correlated (0.92) and represent measures of capital primacy, pioneered by Jefferson (1989) and widely used in the economic geography literature, for example in Henderson (2003). The last one is a dichotomous variable indicating if the capital is the largest city in the state. These three variables are appealing because of their intuitiveness but, compared to the ones above, they discard almost all of the information on the population distribution.

[59]Two states with different concentrations of population around the capital but the same relative spatial distribution within the state are assigned the same level of isolation. See Appendix B for a simple graphical example.

[60]From the US Census Bureau 2017 population estimates.U.S. Census Bureau, Population Division (2018) for city level estimates and U.S. Census Bureau, Population Division (2017) for state level values.

4.3 Identification

To identify the causal effect of capital city remoteness on different measures of education and experience, I employ instrumental variables based on the spatial distribution of the population around the centroid of the state. Indeed, the model from Equation 3 suffers from endogeneity: the spatial distribution of the population around the capital city may be affected by the type of the legislators. For each one of the three measures of remoteness discussed in the previous section, I build an instrument constructed in the same way but using the coordinates of the state centroid *in lieu* of those of the capital.[61] The model I estimate is:

$$Remoteness_s = \gamma_0 + \gamma_1 CenRemoteness_s + \boldsymbol{\gamma_2}\mathbf{Legi_s} + \boldsymbol{\gamma_3}\mathbf{State_s} + \xi_s \tag{8}$$

$$AvgEdu_s = \alpha_0 + \alpha_1 \widehat{Remoteness}_s + \boldsymbol{\alpha_2}\mathbf{Legi_s} + \boldsymbol{\alpha_3}\mathbf{State_s} + \epsilon_s \tag{9}$$

Where $\mathbf{Legi_s}$ and $\mathbf{State_s}$ are defined as in Section 4.2 and $CenRemote_s$, the remoteness of the centroid, is the excluded instrument. The relevance of the instrumental variables relies on the relative proximity of capital cities to the centroid of the state. Figure 4 shows that all of the 48 contiguous US states but Wyoming have capitals less than 300 km away from the centroid of the state, with a median value lower than 100 km. There is an inherent trade-off between the precision and the relevance of the instrument. The narrower measures, such as density in a 30 or 50 km radius are better at capturing the attractiveness of capitals, whilst the broader measures ensure a larger spatial overlap between the endogenous regressor and the instrument, hence the instruments are more powerful.[62]

[61] For example, population density in a 100 km radius around the state capital is instrumented by population density in a 100 km radius around the state centroid. Similarly, isolation from Equation 6 is computed with the same formula where d_{si} is the distance between the centroid of state s and the centroid of census tract i in state s; d_{max} is the maximum distance across the continental US between any state centroid and the centroid of a census tract in the same state.

[62] Figure C2 plots the first stage F stats for each measure of remoteness using state level average educational attainment and state size measures as included instruments. As expected, the centroid density in 30 km measure is the weakest instrument, while centroid density in 100 km is the strongest. Isolation measures do not fare as well as, despite taking the whole state into account, they heavily discount information further

In terms of the instruments' exogeneity, given that the centroid of the state is a geographical construct, its location is convincingly exogenous. One may suspect that state boundaries, which mechanically determine the centroid of the state, could change due to factors correlated with the outcome variables. However, contiguous US states' boundaries have not changed in the last century (Squire, 2012).

We could still worry, however, that while the location of the centroid is exogenous, the population distribution around it may still depend on the endogenous distribution of the population around the capital. I argue this is not an issue in this case for two reasons. First, I focus mainly on variables that discard most of the information on the population distribution away from the capital. Second, the outcome variables, legislators' education and experience, are unlikely to be correlated with factors that affect the population distribution around the capital.

However, there are other factors that can lead to the violation of the exclusion restriction. The central location of the capital could be correlated with other variables that affect legislators' characteristics. For example, one reason why some capitals are in central and more remote locations could be the attitude of legislators towards rent extraction.[63] Accordingly, Campante and Do (2014) show that more isolated US capitals display higher level of politicians' corruption. We may then worry that the correct mechanism is that more corrupt legislatures attract less educated and experienced legislators. There is a number of factors mitigating this concern. First, state capitals' location has not changed in more than a century. For it to be endogenous, we would need to believe the same applies to the legislators' characteristics that affected the definitive location. Second, in the US there is a general, country-wide tendency to place government seats at the centre of the administrative unit of interest (Engstrom et al., 2013). Finally, the individual level analysis results, discussed later, provide evidence that the remoteness of the capital city affects the type of legislators, as we learn that further away districts are represented on average by legislators with a lower

away from the point of interest.

[63] A remote capital city would impose less constraints on legislators' ability to extract rents.

level of education and experience.

4.4 Sorting and incentives

In the last part of the empirical analysis I employ a simple test to check if the differences in legislators' education levels across states affect legislative outcomes. The model I estimate is:

$$Y_s = \beta_0 + \beta_1 Remoteness_s + \beta_2 AvgEdu_s + \boldsymbol{\beta_3}\mathbf{Legi_s} + \boldsymbol{\beta_4}\mathbf{State_s} + \epsilon_s \tag{10}$$

where Y_s is an outcome variable such as the intensity of legislative activity, the provision of public good or corruption in state s and all the right-hand side regressors include the same variables presented in the earlier sections. The vector of state level controls $\mathbf{State_s}$ is enriched with the average state income per capita[64] and dummies for macro-regions of the US. I place both remoteness and the education of legislators on the right hand side to check if there is any residual effect of remoteness on outcome variables. If that is the case, then legislators' sorting is the mechanism through which remoteness affects outcomes. Otherwise, if we detect a residual effect of remoteness, that could be interpreted as evidence for another mechanism in place, for example accountability.

5 Results

I start this section by presenting some stylised facts about state legislatures that can inform about the determinants of their composition, which are further investigated later. The great amount of variation in terms of salary, staff, benefits, time on the job, term limits would suggest that there is little room for an effect of ability sorting based on remoteness. In Figure 5 we can see that full-time legislatures in large states like California and New York have higher salaries and, on average, more highly educated legislators. However, when we look at the rest of the distribution, there is no evidence of a strong correlation between

[64] Also from Census Bureau ACS 2012-2016 averages.

professionalism and salaries on one hand and educational attainment on the other. Some full-time legislatures, Wisconsin for example, fare way worse than less professional ones in terms of education.[65] Figure 6 shows the correlation between different measures of remoteness and the residuals from regressing the average legislators' educational attainment on the average state educational attainment measured on the same scale, legislators' real salary and the level of legislative professionalism.[66] We can see that there is a clear positive relationship (negative for isolation) between all measures of remoteness and the unexplained variation in education levels. The strongest correlation is that with the narrower variable, density in 50 km (Figure 6a), while the weakest is that when remoteness is measured using isolation (Figure 6d). This is consistent with the conjecture presented in Section 4.2: density measures are better at capturing the attractiveness of a city.

5.1 Districts' distance from the capital

I proceed to discuss the evidence for the relationship between a district's distance from the capital and the characteristics of the legislator(s) elected. Table 1 shows that different measures of educational attainment and pre-legislative political experiences are negatively correlated with election in a remote districts. For example, columns 1-3 of Panel A show that a 10% increase in the distance to the capital decreases educational attainment by 0.01 to 0.023 standard deviations (σ). The magnitude of the effect is quite small, yet nonetheless significant in Columns 1-2. Similarly, columns 4-6 of Panel A show that being further away from the capital has a significant negative impact on the probability of having obtained a Master's degree.[67] The same negative effect exists when the dependent variable is the score

[65]Figure C3 shows a similar pattern using the percentage of legislators with a postgraduate degree as measure of education, instead of educational attainment on the ISCED scale.

[66]The regression used to compute the residuals in Figure 6d also includes the logarithm of state population.

[67]The magnitude of the effect is harder to interpret for probit models given the log transformation of the explanatory variable of interest. We can say that a 1.7-fold increase in the distance from the capital increases the probability by 1 percentage point in the richest specification.

of the highest ranked university attended.[68] Including controls for the party affiliation, office (legislator or senator) and state fixed effects dampens the effect of distance on the measures of education. The coefficients when political experience is the dependent variable are instead consistent across specifications. Unsurprisingly, the GDP per capita in the district is a strong positive predictor of legislators' quality in almost all specifications. Only in columns 9 we find GDP per capita to be a negative predictor of length of tenure and the coefficient is statistically significant. A potential reasonable explanation is the existence of a larger legislative turnover in states with more highly educated voters, possibly due to the lower cost of acquiring information. The states fixed effects capture the effect of different term limits and levels of remuneration across states. The results are consistent with the hypothesis. A district far away from the capital is unappealing for two main reasons: first, commuting is costly. Even if legislators are compensated for mileage and sitting days away from home, there are significant non-monetary costs of commuting (Small et al., 2005; Van Ommeren and Fosgerau, 2009). Second, electors in far away districts tend to be less involved and knowledgeable about politics (Campante and Do, 2014). Given that roughly half of Congress is made of former state legislators (Kurtz, 2010), indicating that a political career is a clear motive to run for the state house, we could also conjecture that legislators from more remote districts could have lower visibility, weakening their political career prospects.

Table 2 focuses on gender. In particular, I use dichotomous indicators indicating if a legislator is a woman and a woman who has children. The results in Panel A unequivocally show that a longer distance between the district and the capital city is associated with a lower probability of a female legislator. Approximately doubling the distance from the capital reduces the probability of the legislator being a woman by 1.44 percentage points in the richest specification (1.17 percentage points increase for the probability of being a woman who has children). The point estimates are robust to controlling for districts' income,

[68]More precisely, the score of the highest ranked university that awarded a Bachelor's or a higher level degree to the legislator.

relationship status[69] and to adding state fixed effects. In Panel B I also include age on the right hand side of the regression. This, however, more than halves the sample size due to lack of date of birth reporting. The marginal effects in the models that include age as a control variable for the same approximately twofold increase in distance from the capital are 1.23 percentage point reduction in the probability of being a woman and a 1.22 percentage points fall in the probability of being a woman with children. The results are consistent with the Clark, Huang, and Withers (2003)' that women tend to commute less than men. One explanation is that the psychological cost of commuting is larger, even if the occupation is the same, because women take the burden of household responsibilities such as childcare and housework, as shown by Roberts, Hodgson, and Dolan (2011). Age is a positive predictor of a woman legislator (see Panel B), indicating that women tend to be on average older the their male peers. My interpretation of this finding is that some of the burden attributed to women by gender norms decreases as they grow older (for example as the children become adults).

5.2 Capital cities' remoteness

This section presents the results of the main part of the empirical analysis, focusing on how the level of remoteness of the capital, a proxy for its attractiveness, affects the average composition of the legislature. Table 3 presents a series of *naive* regressions of all measures of remoteness on educational attainment. All regressions control for the size of the state.[70] The coefficients are significant and the sign is as expected for all the measures of isolation (negative) and market potential (positive). The variables that do use the least amount of information on population distribution, columns 7-9, still display the correct sign for the coefficients although the estimates are not significant at a 10% level. In Tables 4 and 5 I

[69]It is worth noting that being married also displays a statistically significant negative relationship with the probability of being a woman legislator.

[70]The regressions in columns 1-2 and 7-9, using measures that are independent from the population size, also control for the log of the state's population.

introduce a richer set of control variables.

Table 4 uses the density and population potential variables as measures of remoteness and three different educational outcomes variables: average educational attainment of legislators, the percentage with a postgraduate degree and a measure of educational quality based on the score assigned to academic institutions by the Times Higher Education (2019a) ranking. We can see that the coefficients have the expected (positive) sign and indicate the existence of a strong relationship between a capital city's remoteness and the measures of education. The coefficients are significant in almost all specifications and the point estimates are relatively stable upon the addition of control variables.[71] A σ increase in population density in a 100 km radius around the capital city is associated, in the richest model, with: a 0.39σ increase in educational attainment; a 3.45 percentage point increase in the proportion of legislators with a postgraduate degree; and a 0.27σ increase in the average quality of education. The magnitude of the effects is similar when using the *narrower* measures of density (respectively in a 30 and 50 km radius): for example, a σ change in 50 km density brings a 0.39σ change in educational attainment in the same direction; a σ increase in 30 km density is associated with a 0.29σ increase in educational attainment. The coefficient estimates are reported in Panel C. Panel B instead documents the results for the same regressions using population potential as a measure of remoteness. Focusing again on the richest specification, a σ positive variation in population potential is related to: a 0.26σ increase in educational attainment; a percentage point increase in the proportion of legislators with a postgraduate degree; and a 0.44σ increase in the average quality of education. The estimates are robust to using different versions of the same outcome variables.[72] When using density as a measure of remoteness, they are also robust to controlling for other state legislature's regulations, such as the presence of term limits and the restrictions in terms of residence and citizenship on

[71] I perform the same regressions with other, weaker, measures of education quality and quantity. The estimates are reported in Table D1 for the richest specification. The coefficients have all the expected sign, but those for the share with a top 20 or top 50 university Master's degree and population potential as remoteness.

[72] See Table D2. For an explanation on the construction of the original variables and the alternative versions, see Appendix A.

the pool of eligible candidates.[73] Table 6 replicates the models from Table 4 Panel A using measures of political experience instead as the dependent variable. The results show that a σ in density in 100 km around the state capital leads to a 2 percentage point increase in the proportion of legislators with a policy or politics degree; a 0.26σ increase in experience measured as the number of different public sector and political appointments; and an extra year of political/public sector experience. Among the other covariates, the average level of education in the state is positively correlated with the average level of education of state legislators. The professionalism of the legislature is positively correlated with education and political experience. More professionalised legislatures are composed of better educated and more experienced politicians. The coefficient for the real salary is, however, negative in some specifications. This could be loosely interpreted as evidence of monetary incentives crowding out some of the best candidates for a given level of professionalism of the legislature. Table 5 performs the same regressions using the isolation measures for capitals' remoteness.[74] The effect of isolation and adjusted isolation on educational attainment and the quality of education is negative, as expected. However, the estimates are not precise. Panel A of Table 5 shows that, in the richer specifications from columns 2, 4 and 6, a standard deviation (σ) change in isolation is associated with a 0.16σ drop in educational attainment and about 0.38σ drop in quality of education. When the percentage of legislators with a postgraduate degree is used as the dependent variable the estimated coefficient does not have the expected negative sign but it is not statistically different from 0. Similarly, when looking at the adjusted measure of isolation in Panel B, a σ change in isolation is associated with a 0.12σ drop in educational attainment and about 0.29σ drop in the quality of education. Again, we are unable to detect a meaningful effect on the percentage with a postgraduate degree.

[73]Table D3 shows a set of additional regressions where density in 100 km is used as measure of remoteness and the set of control variables is modified.

[74]The models are the same as in Table 4 with the addition of the logarithm of state population on the right-hand side to control for the fact that isolation variables are invariant to it as mentioned in Section 4 and explained in Appendix B.

I interpret the results as evidence of legislators' sorting based on the attractiveness of US state capitals. While the effect is present with all the different measures of remoteness, it is stronger and more significant when discarding the irrelevant information on the distribution further away from the capital. I also estimate the same model introducing different measures of remoteness on the right-hand side. As expected, when I use a density and an isolation measure at the same time, all the variation in legislators' characteristics is explained by the narrower variable.[75]

In Table 7 I estimate the model from Equation 9 where the potentially endogenous measure of a state capital's remoteness is instrumented by the state centroid's remoteness. Panel A shows the estimates from models with density and population potential as measures of remoteness, Panel B with isolation. The point estimates of the 2SLS are consistent with those of the OLS models. Population density and population potential, however, show a strong positive relationship as per the OLS estimates, indicative of the presence of a sorting mechanism. Isolation has a weak negative relationship with educational attainment, while it is positively correlated with years in politics and the public sector. There is no meaningful relationship between the measures of isolation and the percentage of legislators with a postgraduate degree or the number of political and public sector appointments.

5.3 Effect on productivity, public good and corruption

In Table 8 I look for the effect of remoteness together with the average level and quality of education of state legislators on three outcome measures. These are the number of bills initiated per legislator per day of session, a measure of public good provision and a measure of corruption in the public sector. I focus on two measures of remoteness: the density in 100 km around the capital and non-adjusted measure of isolation from Equation 6. All coefficients, when statistically significant, display the expected signs in all models. More density is associated with a larger number of bills initiated per legislator per session, more public

[75]See Table D4 in Appendix D.

good provision and less corruption. Similarly, states with more isolated capitals display lower public good provision and more corruption. Density is strongly associated with bill production while its effects on public good provision and corruption are weaker and vanish when controlling for education. This is expected as density is a strong predictor of the type of state legislators. Isolation is positively associated with bill production but the effect is not statistically significant. In columns 4-9, the coefficient for isolation is significant and robust to controlling for legislators' education. The fact that legislators' education does not affect remoteness measured as isolation is somewhat expected given the weak relationship between the two. This evidence is in line with the incentive mechanisms uncovered by Campante and Do (2014) that use the same outcome variables.[76]

There are two potential interpretations of these findings. The first one is that variables such as public good provision and public officers' corruption are imperfect measures of legislative performance as they depend on a much wider set of actors, whose behaviour or characteristics are correlated with the capitals' isolation. Hence, they are strongly associated with the latter, while there is not a comparable effect of density. The other interpretation is that there is indeed an incentive mechanism which is better captured by the measure of isolation that closely describes the salience of legislative affairs across the state. Switching the focus to legislators' characteristics, one novel finding is that the quality of education is more important than the overall level of education. In this context the quality measure I use is having received education in a policy or politics-related subject. It is reasonable to assume that a legislator with a Master's degree in Public Policy could perform better than one with an O.D. degree[77] or a PhD in Theoretical Physics, despite being *less educated*. This does not only necessarily depend on the subject knowledge acquired during their studies but also on other characteristics that are correlated with the type and overall duration

[76]The robustness of the effect of isolation in Panel B is somewhat surprising given the poor correlation between my measure of isolation and that used by Campante and Do (2014). See Figure C4 and the different set of control variables used.

[77]Doctor of Optometry.

of a person's education as explained by Dal Bó, Finan, Folke, Persson, and Rickne (2017).[78] The same is not necessarily true for legislative initiative measured in terms of bills proposed as legislators may specialise and initiate bills related to subjects where they are experts. The education level, indeed, has a stronger effect than the type of education on this specific outcome variable.

5.4 Discussion

The results of the state level analysis indicate a strong impact of density-based measures on the average characteristics of the legislature, while there is a weaker relationship with the measures of isolation. This is consistent with the hypothesis formulated earlier, the better the measure of capital city attractiveness, the stronger the positive correlation with legislators' education and experience. Isolation variables and population potential include more information on the population distribution further away from the capital that should not be related to the sorting choices of legislators.

There are alternative explanations for the relationship between capitals remoteness and the level of education of legislators. On the demand side, while the analysis controls for the differences in real wages, we may have variation in the cost of commuting across states that affects legislators' location choices. On the supply side, we may worry that remote capitals are associated with a pool of less educated potential legislators. This does not seem to be a significant concern. Even if the local supply of candidates is poorer in a remote capital, legislators reside in their districts of election all over the state. There could still be substantial differences in terms of the availability of education across states but those are accounted using the state average educational attainment. On the other side, the analysis does not control for the variation in access to *quality* education. Indeed, almost all of the North-Eastern states,

[78] One of the points Dal Bó, Finan, Folke, Persson, and Rickne (2017) make is that academics have substantially higher levels of education, perform better in cognitive tests, but lack leadership and would make worse politicians. A different mechanism, instead, is that individuals with a higher *intrinsic motivation* are more likely to choose policy-related studies and perform better as policy-makers.

where there is a large concentration of highly-ranked academic institutions, are among those with the least remote capitals. The regressions where the outcome variable is the quality of education measured using the scores from the Times Higher Education (2019a) ranking could be capturing the effect of proximity to the best schools. However, the highest rated universities are highly selective institutions where students from all over the country (and the world) compete for entry. It is therefore unlikely that proximity could play a big role in determining who ultimately has access to such places.

The coefficients derived from estimating the model from Equation 10 suggest an effect of education, in particular its type, on outcome variables, indicating that remoteness does not only affect the composition of legislature but, indirectly, legislators' productivity, public good provision and corruption, through the sorting mechanism. Remote capitals attract less educated and experienced legislators who are more prone to be corrupt and provide less public good. However, these findings show a richer picture since, after controlling for education, there is still a residual effect of remoteness on outcome measures. This can be interpreted as evidence of the coexistence of the sorting mechanism with the accountability mechanism theorised by Campante and Do (2014): isolation affects legislators' behaviour by providing weak incentives. More remote capital cities are associated with a lower level of media scrutiny and citizens tend to be less engaged when they are further away from the capital, thus reducing accountability.[79] On one hand, population density around the capital and population potential are better at capturing market access and the attractiveness of the capital city. From the other, isolation, based on the distribution of population within the state, can be interpreted as a proxy of state politics' salience within the state. Therefore, it is reasonable to interpret that measures of city attractiveness such as density are strongly

[79] It is worth mentioning the existence of a different potential *selection* mechanism. On one hand, if media coverage influences the average talent of politicians (Ferraz and Finan, 2008; Strömberg, 2015) and remote capitals are subject to lower media scrutiny (Campante and Do, 2014), voters would select less qualified politicians. This is however hard to distinguish from candidates' *self-selection* as voters choose among the options presented to them. Even if more informed voters are better at choosing more qualified candidates (Pande, 2011), the average quality depends on the pool of candidates. Similarly, parties could make less effort in candidate selection when state politics is less salient. However, the benefit of deeper screening is likely small and the average candidate quality depends on *self-selection*.

correlated with legislators' education and political experience, while measures of political salience are not as much. Being able to fully separate the effects of incentives and sorting on outcome variables, however, would require tracking legislators' behaviour over time, as in Snyder Jr and Strömberg (2010).

6 Conclusion

This paper leverages a novel data-set on US state legislators' biographies to show that more remote capitals attract individuals with lower and less relevant education as well as less previous experience in the public sector. I first show that districts further away from the capital tend to be represented by less educated and experienced legislators and less often by women. I then proceed to test at state level the relationship between capitals' remoteness and the average level and quality of education as well as experience, finding that remoteness negatively affects all such variables. I build different measures of remoteness and find that those more closely capturing cities' attractiveness show the stronger effect on the average legislators' type. I identify the causal effect of remoteness using instrumental variables based on the location of the states' centroids, exploiting the fact that US state capitals are often centrally located in the state. Finally, I introduce outcome measures such as the frequency of legislative initiative, public good provision and corruption and provide suggestive evidence that they are affected by capital cities' remoteness through legislators' ability sorting. In particular, I show that the quality of education matters relatively more than the quantity.

The evidence proposed in this paper should inform policymakers at a time where in different parts of the world there are multiple advocates, in and out of the political sphere, proposing the relocation of capital cities towards the geographical centre of the country for better representation. Countries across the world have seen and will keep seeing capital cities moving inwards. This was the case from Brazil and Nigeria while Indonesia has just started the process of relocating the capital city away from Jakarta.[80] We cannot conclude that moving capital cities and, more generally, governmental institutions away from large, congested capitals is surely detrimental. However, the potential benefits of reducing congestion in the current capitals and diminishing inequality across the country[81] should be weighted against the reduction in the quality of policy-making or service provision. Such trade-off should be well kept in mind before making relocation decisions.

[80] Tan (2019). While the official reason for such moves is usually excessive congestion and the new location tends to be closer to the centroid of the county, Campante et al. (2019) show that this may have little to do with overcrowding and equal representation and more with reducing the threat of revolt.

[81] There is, however, evidence that the relocation will have only a modest impact on private sector activity (Becker, Heblich, and Sturm, 2018).

References

Acemoglu, D., S. Johnson, and J. A. Robinson (2001). The colonial origins of comparative development: An empirical investigation. *American economic review 91*(5), 1369–1401.

Becker, S. O., S. Heblich, and D. M. Sturm (2018). The impact of public employment: evidence from Bonn.

Becker, S. O. and L. Woessmann (2009). Was weber wrong? a human capital theory of protestant economic history. *The Quarterly Journal of Economics 124*(2), 531–596.

Besley, T. (2004). Paying politicians: theory and evidence. *Journal of the European Economic Association 2*(2-3), 193–215.

Besley, T., J. G. Montalvo, and M. Reynal-Querol (2011). Do educated leaders matter? *The Economic Journal 121*(554), F205–227.

Besley, T. and M. Reynal-Querol (2011). Do democracies select more educated leaders? *American political science review 105*(3), 552–566.

Bomboy, S. (2014, January). Can the nations capital really be moved to nebraska? `https://constitutioncenter.org/blog/can-the-nations-capital-really-be-moved-to-nebraska`.

Bowen, D. C. and Z. Greene (2014a). Legislative Professionalism Component Scores, V1.1.1. `https://doi.org/10.7910/DVN/27595`.

Bowen, D. C. and Z. Greene (2014b). Should we measure professionalism with an index? a note on theory and practice in state legislative professionalism research. *State Politics & Policy Quarterly 14*(3), 277–296.

Bratton, K. A. and K. L. Haynie (1999). Agenda setting and legislative success in state legislatures: The effects of gender and race. *The Journal of Politics 61*(3), 658–679.

Campante, F. R. and Q.-A. Do (2010). A centered index of spatial concentration: Expected influence approach and application to population and capital cities.

Campante, F. R. and Q.-A. Do (2014). Isolated capital cities, accountability, and corruption: Evidence from us states. *American Economic Review 104*(8), 2456–81.

Campante, F. R., Q.-A. Do, and B. Guimaraes (2019). Capital cities, conflict, and misgovernance. *American Economic Journal: Applied Economics 11*(3), 298–337.

Card, D. (2001). Estimating the return to schooling: Progress on some persistent econometric problems. *Econometrica 69*(5), 1127–1160.

Carey, J. M., R. G. Niemi, and L. W. Powell (1998). The effects of term limits on state legislatures. *Legislative Studies Quarterly*, 271–300.

Carey, J. M., R. G. Niemi, and L. W. Powell (2009). *Term limits in state legislatures.* University of Michigan Press.

Carey, J. M., R. G. Niemi, L. W. Powell, and G. F. Moncrief (2006). The effects of term limits on state legislatures: a new survey of the 50 states. *Legislative Studies Quarterly 31*(1), 105–134.

Carlino, G. A. and A. Saiz (2008). Beautiful city: Leisure amenities and urban growth.

Caselli, F. and M. Morelli (2004). Bad politicians. *Journal of Public Economics 88*(3-4), 759–782.

Clark, W. A., Y. Huang, and S. Withers (2003). Does commuting distance matter?: Commuting tolerance and residential change. *Regional Science and Urban Economics 33*(2), 199–221.

Combes, P.-P. and L. Gobillon (2015). The empirics of agglomeration economies. In *Handbook of regional and urban economics*, Volume 5, pp. 247–348. Elsevier.

Cragg, J. G. and S. G. Donald (1993). Testing identifiability and specification in instrumental variable models. *Econometric Theory 9*(2), 222–240.

CSG (2018). *The Book of the States 2018*. Council of State Governments, Book Of the States. CSG.

Dal Bó, E., P. Dal Bó, and J. Snyder (2009). Political dynasties. *The Review of Economic Studies 76*(1), 115–142.

Dal Bó, E., F. Finan, O. Folke, T. Persson, and J. Rickne (2017). Who becomes a politician? *The Quarterly Journal of Economics 132*(4), 1877–1914.

Engstrom, E. J., J. R. Hammond, and J. T. Scott (2013). Capitol mobility: Madisonian representation and the location and relocation of capitals in the united states. *American Political Science Review 107*(2), 225–240.

Faggio, G., T. Schluter, and P. vom Berge (2019). Interaction of public and private employment: Evidence from a german government move.

Ferraz, C. and F. Finan (2008). Exposing corrupt politicians: the effects of brazil's publicly released audits on electoral outcomes. *The Quarterly journal of economics 123*(2), 703–745.

Ferraz, C. and F. Finan (2009). Motivating politicians: The impacts of monetary incentives on quality and performance. Technical report, National Bureau of Economic Research.

Ferraz, C. and F. Finan (2011). Electoral accountability and corruption: Evidence from the audits of local governments. *American Economic Review 101*(4), 1274–1311.

Gagliarducci, S. and T. Nannicini (2013). Do better paid politicians perform better? disentangling incentives from selection. *Journal of the European Economic Association 11*(2), 369–398.

Gagliarducci, S., T. Nannicini, and P. Naticchioni (2010). Moonlighting politicians. *Journal of Public Economics 94*(9-10), 688–699.

Galasso, V. and T. Nannicini (2011). Competing on good politicians. *American political science review 105*(1), 79–99.

Galster, G., R. Hanson, M. R. Ratcliffe, H. Wolman, S. Coleman, and J. Freihage (2001). Wrestling sprawl to the ground: defining and measuring an elusive concept. *Housing policy debate 12*(4), 681–717.

Glaeser, E. L. and J. D. Gottlieb (2006). Urban resurgence and the consumer city. *Urban* *studies 43*(8), 1275–1299.

Glaeser, E. L., J. Kolko, and A. Saiz (2001). Consumer city. *Journal of economic geography 1*(1), 27–50.

Glaeser, E. L. and R. E. Saks (2006). Corruption in america. *Journal of public Economics 90*(6-7), 1053–1072.

Henderson, V. (2003). The urbanization process and economic growth: The so-what question. *Journal of Economic growth 8*(1), 47–71.

Hoffman, M. and E. Lyons (2018). A time to make laws and a time to fundraise? on the relation between salaries and time use for state politicians.

Jefferson, M. (1989). Why geography? the law of the primate city. *Geographical review 79*(2), 226–232.

Kleibergen, F. and R. Paap (2006). Generalized reduced rank tests using the singular value decomposition. *Journal of econometrics 133*(1), 97–126.

Kurtz, K. (2015, December). Who we elect: The demographics of state legislatures. *State Legislatures Magazine*. Retrieved from `http://www.ncsl.org/research/about-state-legislatures/who-we-elect.aspx`.

Kurtz, K. T. (2010). 75 years of institutional change in state legislatures. *Book of the States 2010 Edition*.

Kurtz, K. T., G. Moncrief, R. G. Niemi, and L. W. Powell (2006). Full-time, part-time, and real time: Explaining state legislators' perceptions of time on the job. *State Politics & Policy Quarterly 6*(3), 322–338.

Mattozzi, A. and A. Merlo (2008). Political careers or career politicians? *Journal of Public Economics 92*(3-4), 597–608.

Milligan, K., E. Moretti, and P. Oreopoulos (2004). Does education improve citizenship? evidence from the united states and the united kingdom. *Journal of public Economics 88*(9-10), 1667–1695.

Moncrief, G. F. and P. Squire (2017). *Why states matter: An introduction to state politics*. Rowman & Littlefield.

Montès, C. (2014). *American capitals: a historical geography*. University of Chicago Press.

NCSL (2015a). The term-limited states. Retrieved from `http://www.ncsl.org/research/about-state-legislatures/chart-of-term-limits-states.aspx`.

NCSL (2015b). Who we elect. Retrieved from `http://www.ncsl.org/press-room/ncsl-releases-in-depth-report-on-state-legislator-demographics.aspx`.

NCSL (2017, June). Full- and part-time legislatures. Retrieved from `http://www.ncsl.org/research/about-state-legislatures/full-and-part-time-legislatures.aspx`.

NCSL (2018). Annual versus biennial legislative sessions. Retrieved from `http://www.ncsl.org/research/about-state-legislatures/annual-versus-biennial-legislative-sessions.aspx`.

NCSL (2019). National conference of state legislatures. Retrieved from http://www.ncsl.org/research.aspxx.

Neumark, D., J. Zhang, and S. Ciccarella (2008). The effects of wal-mart on local labor markets. *Journal of Urban Economics 63*(2), 405–430.

Olea, J. L. M. and C. Pflueger (2013). A robust test for weak instruments. *Journal of Business & Economic Statistics 31*(3), 358–369.

Oster, E. (2012). Hiv and sexual behavior change: Why not africa? *Journal of health economics 31*(1), 35–49.

Pande, R. (2011). Can informed voters enforce better governance? experiments in low-income democracies. *Annu. Rev. Econ. 3*(1), 215–237.

Powell, L. and K. Kurtz (2014). Measuring the power of state legislative leaders. In *APSA 2014 Annual Meeting Paper*.

Powell, L. W. (2012). *The influence of campaign contributions in state legislatures: the effects of institutions and politics*. University of Michigan Press.

QS (2019). Qs world university rankings. Retrieved from https://www.topuniversities.com/university-rankings/world-university-rankings/2019.

Rappaport, J. (2008). Consumption amenities and city population density. *Regional Science and Urban Economics 38*(6), 533–552.

Repetto, L. (2018). Political budget cycles with informed voters: evidence from italy. *The Economic Journal 128*(616), 3320–3353.

Roberts, J., R. Hodgson, and P. Dolan (2011). it's driving her mad: Gender differences in the effects of commuting on psychological health. *Journal of health economics 30*(5), 1064–1076.

ShanghaiRanking Consultancy (2018). Academic ranking of world universities. Retrieved from http://www.shanghairanking.com/Academic-Ranking-of-World-Universities-2018-Press-Release.html.

Small, K. A., C. Winston, and J. Yan (2005). Uncovering the distribution of motorists' preferences for travel time and reliability. *Econometrica 73*(4), 1367–1382.

Smart, M. and D. M. Sturm (2013). Term limits and electoral accountability. *Journal of public economics 107*, 93–102.

Snyder Jr, J. M. and D. Strömberg (2010). Press coverage and political accountability. *Journal of political Economy 118*(2), 355–408.

Social Security Administration (2019). Popular names in 1961. https://www.ssa.gov/cgi-bin/popularnames.cgi.

Squire, P. (1992). Legislative professionalization and membership diversity in state legislatures. *Legislative Studies Quarterly*, 69–79.

Squire, P. (2000). Uncontested seats in state legislative elections. *Legislative Studies Quarterly*, 131–146.

Squire, P. (2012). *The evolution of American legislatures: Colonies, territories, and states, 1619-2009*. University of Michigan Press.

Squire, P. (2017). A squire index update. *State Politics & Policy Quarterly 17*(4), 361–371.

Squire, P. and G. Moncrief (2015). *State legislatures today: Politics under the domes*. Rowman & Littlefield.

Stock, J. H. and M. Yogo (2005). Testing for weak instruments in linear iv regression. *Identification and Inference for Econometric Models: Essays in Honor of Thomas Rothenberg*, 80.

Strömberg, D. (2015). Media coverage and political accountability: Theory and evidence. In *Handbook of media Economics*, Volume 1, pp. 595–622. Elsevier.

Tan, W. (2019, May). Indonesia plans to move its capital from jakarta. heres why. https://www.cnbc.com/2019/05/02/indonesias-joko-widodo-decides-to-move-capital-from-jakarta.html.

Times Higher Education (2019a). World university rankings. Retrieved from https://www.timeshighereducation.com/world-university-rankings/2019/world-ranking#!/page/0/length/25/sort_by/rank/sort_order/asc/cols/stats.

Times Higher Education (2019b). World university rankings 2019 methodology. Retrieved from https://www.timeshighereducation.com/sites/default/files/the_2019_world_university_rankings_methodology_pwc.pdf.

UNESCO Institute for Statistics (2011). International standard classification of education.

U.S. Census Bureau, Geography Program (2016). American community survey 5-year estimates geodatabase format. https://www.census.gov/geographies/mapping-files/time-series/geo/tiger-data.2016.html.

U.S. Census Bureau, Population Division (2017, December). Annual estimates of the resident population: April 1, 2010 to july 1, 2017. https://www.census.gov/data/datasets/2017/demo/popest/state-detail.html#par_textimage.

U.S. Census Bureau, Population Division (2018, May). Annual estimates of the resident population: April 1, 2010 to july 1, 2017. Retrieved from https://www.census.gov/data/datasets/2017/demo/popest/total-cities-and-towns.html#ds.

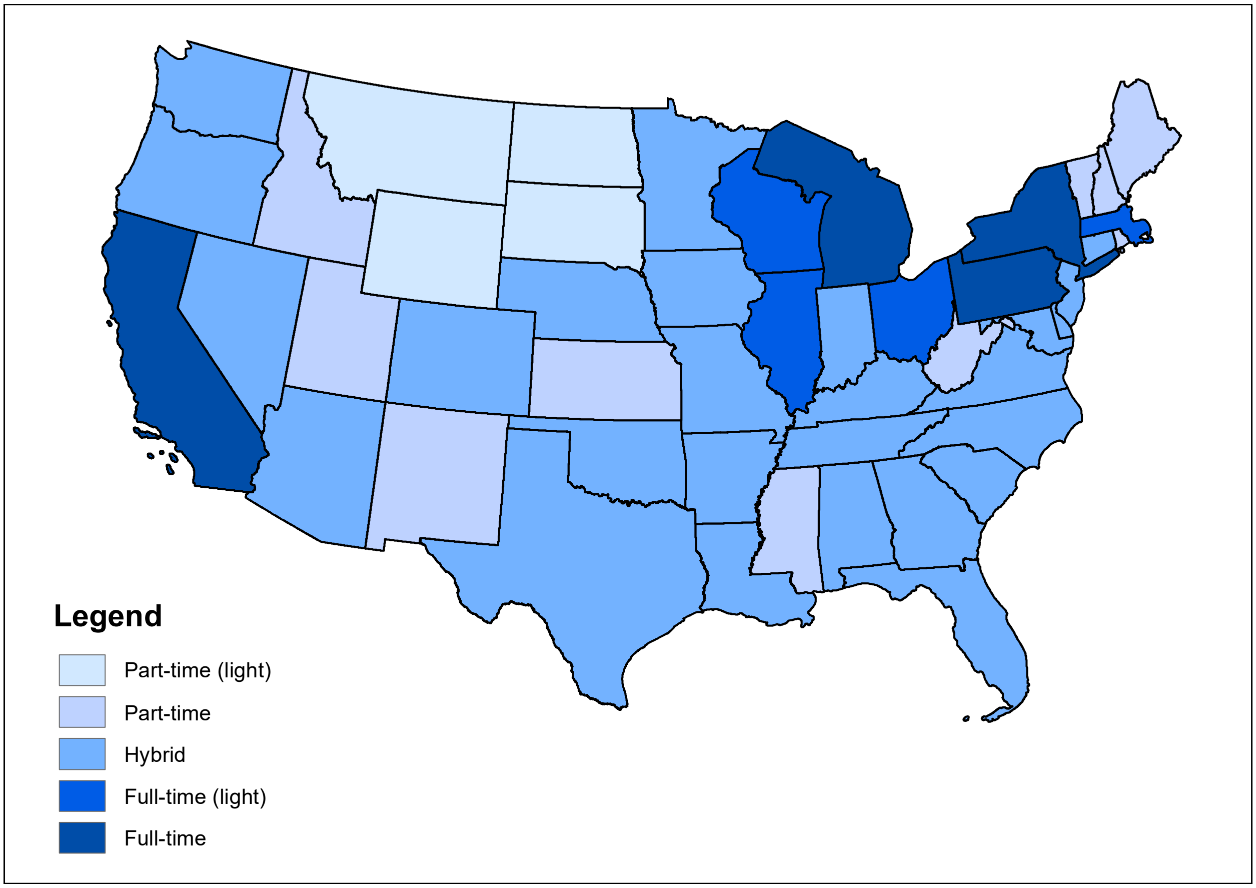
Van Ommeren, J. and M. Fosgerau (2009). Workers' marginal costs of commuting. *Journal of Urban Economics 65*(1), 38–47.

Vote Smart (2019). Vote smart - the voter's self defense system. Retrieved from https://votesmart.org/.

Wright, G. C. (2007). Do term limits affect legislative roll call voting? representation, polarization, and participation. *State Politics & Policy Quarterly 7*(3), 256–280.

Figures

Figure 1: US state legislatures' time on the job



The 5-way classification ranking is taken from NCSL (2017). Legislatures are ranked in terms of the time spent on the job by legislators. The full-time light and part-time light legislatures differ from the full-time and part-time ones by having a lower remuneration and staff size. The estimated average time in 2014 on the job was 84% for the full-time legislatures, 74% for the hybrid and only 57% for the part-time ones. The average salary measured in 2014 US dollars, was respectively around 82k, 41k and 18k; the average size of staff 1250, 469 and 160 (NCSL, 2015b).

Figure 2: US state legislatures' term limits

The information on term limits in different states is taken from NCSL (2015a). States with a lifetime ban do not allow running for the same position once the term limit has been hit. All the other states with term limits ban only consecutive legislative spells. Term limits repealed indicates states that had term limits which have later been repealed by the legislature or the State Supreme Court.

Figure 3: Example of Vote Smart Biography

Suzanne Harrison's Biography

Office: State House (UT) - District 32, Democratic

Contact Information

Capitol Email
sharrison@le.utah.gov

Capitol Website
http://house.utah.gov/rep/HARRIS/

Capitol
Utah State House of Representatives
350 North State, Suite 350
Post Office Box 145030
Salt Lake City, UT 84114
Phone: 801-538-1029

District
1192 Draper Parkway 573
Draper, UT 84020
Phone: 801-999-8047

(+) Expand All (–) Collapse All

– Personal

Full Name:
Suzanne Harrison

Gender:
Female

Family:
Husband: John; 3 Children

Birth Place:
Provo, UT

Home City:
Sandy, UT

– Education

MD, University of Utah, 1997-2001
BA, Human Biology, Stanford University, 1993-1997

– Political Experience

Representative, Utah State House of Representatives, District 32, 2019-present
Candidate, Utah State House of Representatives, District 32, 2018

+ Current Legislative Committees

+ Caucuses/Non-Legislative Committees

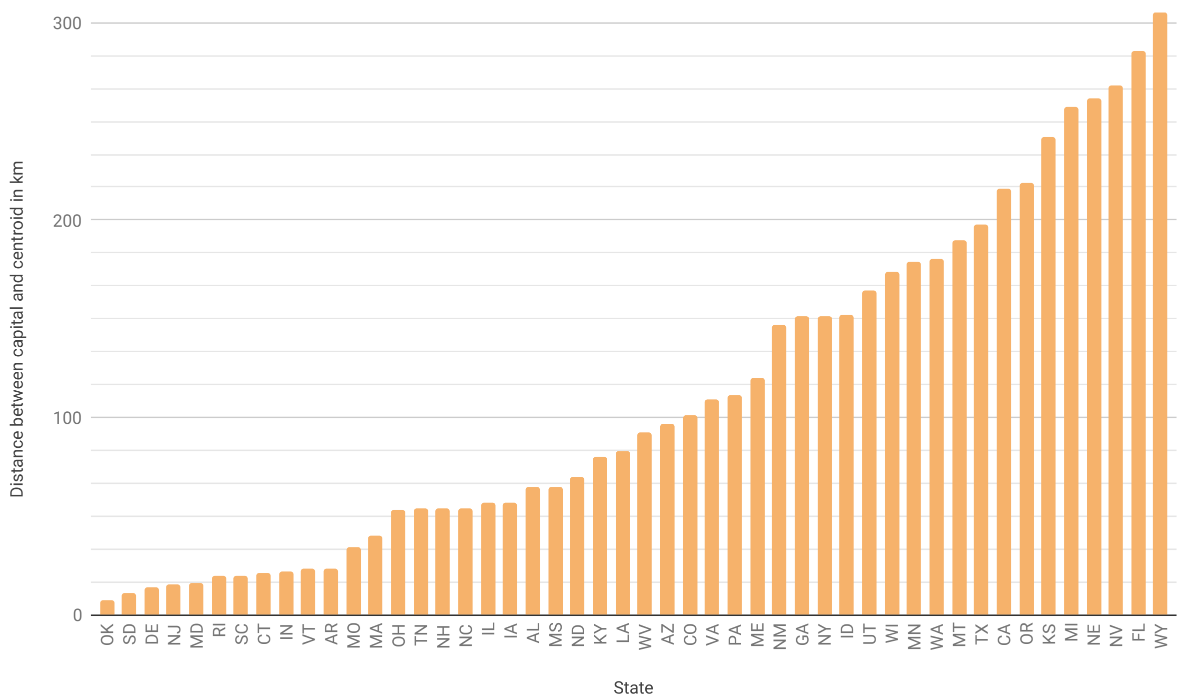
+ Professional Experience

+ Religious, Civic, and other Memberships

+ Additional Information

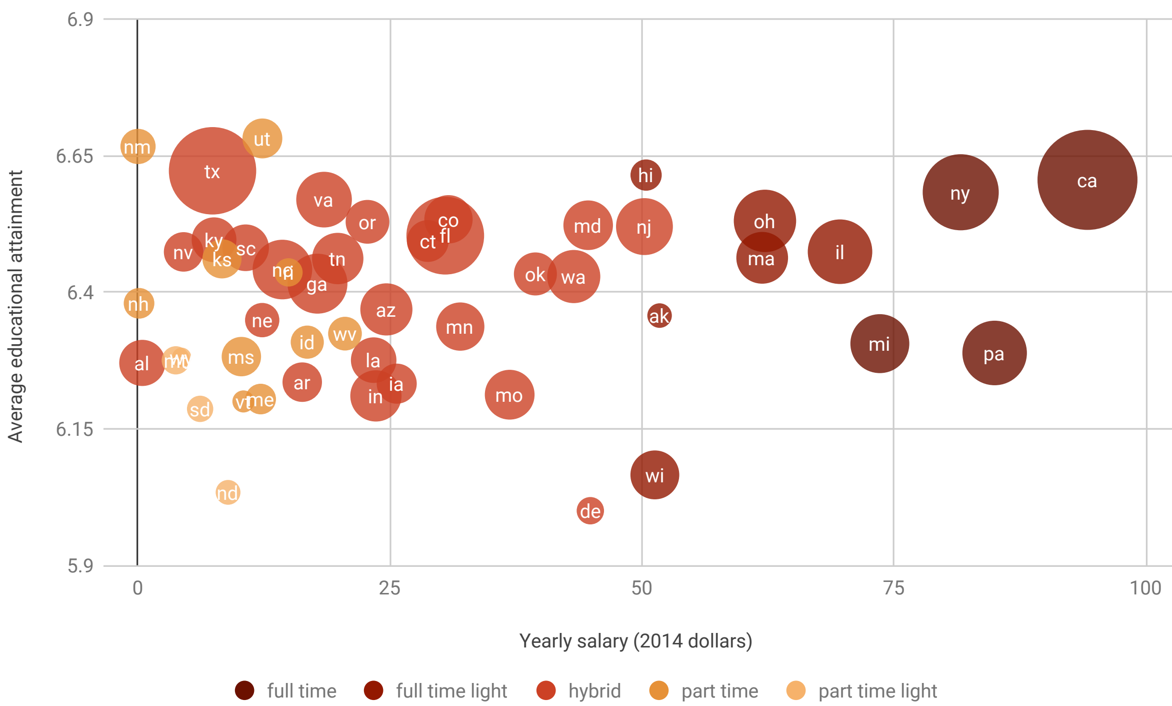
Biography from Vote Smart (2019) for Utah Representative Suzanne Harrison. The Personal, Education and Political Experience sections, containing the data used in this paper, are expanded.

Figure 4: Distance between capital cities and centroids



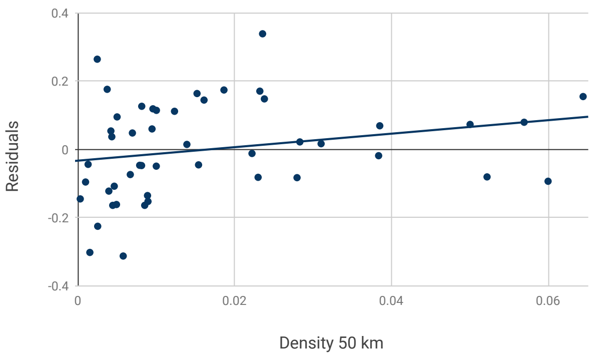
US states ranked according to the geodesic distance in km between the state capital (using the coordinates of the legislature' hall) and the centroid of the state.

Figure 5: Education level by legislature

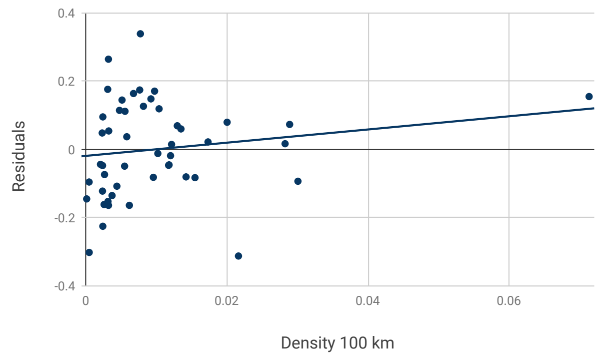


On the horizontal axis: average 2010-2014 legislators' yearly salary measured in 2014 US dollars from Bowen and Greene (2014a). On the vertical axis: average educational attainment using UNESCO ISCED ranking (UNESCO Institute for Statistics, 2011). The size of the bubble represents the US Census Bureau 2017 population estimates of the state from U.S. Census Bureau, Population Division (2017). States are ranked using 5 categories in terms of legislators' time on the job from NCSL (2015b).

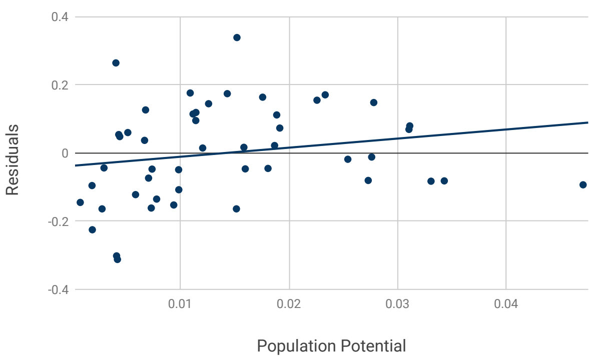
Figure 6: Remoteness and average legislators' education



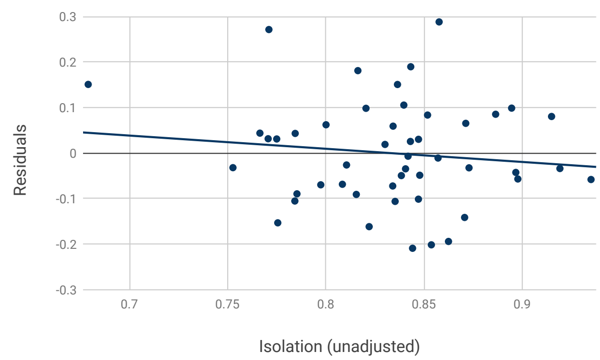
(a) Remoteness = Density 50 km



(b) Remoteness = Density 100 km



(c) Remoteness = Population Potential



(d) Remoteness = Isolation

On the vertical axis: residuals from OLS regressions of average state legislators' educational attainment measured on UNESCO Institute for Statistics (2011) ISCED 1-8 scale on the average level of education in the state on the same scale, legislators' real salary and Squire (2017) index of legislative professionalism. On the horizontal axis: different measures of remoteness. Density measures indicate the population density around the state capital in a 50 or 100 km radius (measured in 10,000 people per km^2). Population potential is computed as in Equation 5 and measured in 10,000 people per km. Isolation is calculated as described in Equation 6 and measured on 0-1 scale.

Tables

Table 1: Legislators' education, political experience and district remoteness

	Dependent variable:								
	ISCED			Master's			Edu quality		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A									
Log distance	-0.0391***	-0.0258***	-0.0155	-0.0720***	-0.0514***	-0.0312*	-1.521***	-0.982***	-0.683**
	(0.0091)	(0.0091)	(0.011)	(0.015)	(0.015)	(0.018)	(0.28)	(0.28)	(0.32)
Log income per capita		0.273***	0.385***		0.433***	0.580***		11.12***	11.92***
		(0.033)	(0.036)		(0.054)	(0.063)		(1.02)	(1.10)
Observations	6063	6063	6063	6063	6063	6063	5720	5720	5720
	Dependent variable:								
	Edu politics			Experience			Years politics		
Panel B									
Log distance	-0.0166***	-0.0118**	-0.0193***	-0.0334**	-0.0139	-0.0238	-0.340***	-0.361***	-0.397***
	(0.0049)	(0.0049)	(0.0058)	(0.015)	(0.015)	(0.017)	(0.11)	(0.11)	(0.14)
Log income per capita		0.0996***	0.0688***		0.382***	-0.0224		-0.418	-1.469***
		(0.018)	(0.021)		(0.059)	(0.061)		(0.41)	(0.43)
Observations	6069	6069	6069	7205	7205	7205	7205	7205	7205
Party & office			✓			✓			✓
State FE			✓			✓			✓

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors in parentheses. *Panel A:* OLS with dependent variable=educational attainment measured on ISCED scale (1-3), Probit with dep. var. dummy=1 if legislator has obtained a Master's degree (4-6), OLS with dep. var.=legislators best graduate or postgraduate institution score (7-9). *Panel B:* Probit with dep. var. dummy=1 if legislator has obtained graduate or postgraduate education in public policy or politics (1-3), OLS with dep. var.=number of different public sector and political appointments excluding those as state legislator (4-6), OLS with dep. var.=years from the first appointment in the public sector or as elected official (7-9). Log distance is the logarithm of the distance in km between the centroid of the district of election and the legislative hall. Log income per capita is the logarithm of the 2012-16 average district income per capita measured in 2016 inflation adjusted dollars. Models in columns 3, 6, 9 include dummies for Democratic party and Republican party main affiliations, for being a state senator and state fixed effects.

Table 2: Women in state legislatures

	Dependent variable:					
	Woman			Woman who has children		
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A						
Log distance	-0.108***	-0.113***	-0.0493**	-0.103***	-0.0990***	-0.0434**
	(0.014)	(0.020)	(0.021)	(0.017)	(0.021)	(0.021)
Log income per capita		0.350***	0.463***		0.306***	0.400***
		(0.072)	(0.072)		(0.075)	(0.073)
Observations	6998	5401	5401	5401	5401	5401
Panel B						
Log distance	-0.120***	-0.113***	-0.0482	-0.121***	-0.114***	-0.0530
	(0.024)	(0.033)	(0.033)	(0.027)	(0.034)	(0.034)
Age	0.0115***	0.0128***	0.0115***	0.0161***	0.0142***	0.0128***
	(0.0022)	(0.0027)	(0.0027)	(0.0026)	(0.0028)	(0.0029)
Log income per capita		0.217*	0.398***		0.0913	0.261**
		(0.12)	(0.11)		(0.12)	(0.12)
Observations	2745	2491	2491	2491	2473	2473
Relation		✓	✓		✓	✓
Party & office			✓			✓
State dummy		✓	✓		✓	✓

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors in parentheses. Probit regressions where the dependent variables is: a dummy=1 if the legislator is female (1-3), a dummy a dummy=1 if the legislator is female and has children (4-6). Log distance is the logarithm of the distance in km between the centroid of the district of election and the legislative hall. Log income per capita is the logarithm of the 2012-16 average district income per capita measured in 2016 inflation adjusted dollars. Age is measured in calendar years on Jan, 1st 2019. *Relation* is a set of dummies to control for relationship status: *partnership*, *married*, *single*, *widowed*, *divorced* or *no status*. Models in columns 2-3, 5-6 include state fixed effects.

Table 3: Education and different measures of remoteness

	Dependent variable: Educational attainment ISCED scale								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Isolation	-1.074*								
	(0.54)								
Isolation (adj.)		-1.048**							
		(0.50)							
Density 30km			2.212***						
			(0.71)						
Density 50km				4.225***					
				(1.12)					
Density 100km					6.051***				
					(1.63)				
Pop potential						5.802***			
						(1.78)			
Capital Large							0.0359		
							(0.041)		
Capital/Largest								0.0276	
								(0.050)	
Capital share									0.155
									(0.29)
R^2	0.367	0.371	0.259	0.304	0.257	0.262	0.323	0.316	0.315
Observations	48	48	48	48	48	48	48	48	48

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors in parentheses. OLS regressions where the dependent variable is average state legislators' educational attainment measured on UNESCO Institute for Statistics (2011) ISCED 1-8 scale. All regressions include as controls the average level of education in the state, the log of the maximum distance between the capital and a point in the state, the log of the state land area. columns 1-2 also include the log of state population from average 2012-2016 ACS Census Bureau estimates. Each model uses a different measure of remoteness. Isolation measures are built as described in Equations 6 and 7. Density measures indicate the population density around the state capital in a 30, 50 or 100 km radius (measured in 10,000 people per km^2). Population potential is computed as in Equation 5 (measured in 10,000 people per km). Capital Large is a dummy=1 if the capital is the largest city. Capital/Largest is the ration of state capital population over the population of the largest city. Capital share is the fraction of the state population living in the state capital (from Census Bureau 2017 population estimates).

Table 4: Education and capital city attractiveness

	Dependent variable:					
	Edu attainm		Postgrad		Edu quality	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A						
Density 100km	5.847***	5.316***	3.334***	2.953***	28.53*	19.72*
	(1.71)	(1.12)	(0.71)	(0.69)	(15.5)	(10.4)
State education	0.0474	0.0555	0.0212	0.0406	0.809	0.694
	(0.099)	(0.11)	(0.058)	(0.059)	(0.49)	(0.53)
Real salary		-3.696**		-2.383**		-7.686
		(1.54)		(0.94)		(5.91)
Professionality		1.079***		0.719***		2.155
		(0.39)		(0.24)		(2.09)
Panel B						
Pop potential	5.603***	4.070*	2.456**	0.983	37.43***	35.12**
	(1.89)	(2.26)	(1.06)	(1.20)	(12.8)	(16.1)
State education	0.0572	0.0752	0.0356	0.0649	0.737	0.558
	(0.098)	(0.11)	(0.059)	(0.058)	(0.47)	(0.55)
Real salary		-3.615**		-2.397**		-6.471
		(1.61)		(0.97)		(6.40)
Professionality		0.978**		0.741***		0.557
		(0.43)		(0.26)		(2.53)
Panel C						
Density 50km	4.167***	3.451***	1.798**	1.297	23.86**	18.86**
	(1.20)	(1.21)	(0.81)	(0.90)	(10.9)	(8.91)
Density 30km	2.138***	1.701**	0.757*	0.424	14.53**	11.96*
	(0.74)	(0.82)	(0.44)	(0.47)	(6.60)	(6.11)
Accountability		✓		✓		✓
State size	✓	✓	✓	✓	✓	✓
Observations	48	47	48	47	48	47

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors in parentheses. OLS regressions where the dependent variable is average state legislators' educational attainment measured on ISCED 1-8 scale (1-2), the share of legislators with a postgraduate degree (3-4), the average legislators' best graduate or postgraduate institution score (5-6) from Times Higher Education (2019a) ranking. In Panel A and C density indicates the population density around the state capital respectively in a 30, 50, 100 km radius (measured in 10,000 people per km^2). In Panel B population potential is computed as in Equation 5 (measured in 10,000 people per km). All regressions include as controls the average level of education in the state, the log of the maximum distance between the capital and a point in the state, the log of the state land area. Models 2, 4 and 6 also include the real salary, Squire (2017) index of legislature's professionalism, newspaper political coverage from Campante and Do (2014), voter turnout from in the last 3 presidential elections from CSG (2018). In 2, 4 and 6 Montana is excluded as there is no political newspaper coverage data.

Table 5: Education and capital city isolation

	Dependent variable:					
	Edu attainm		Postgrad		Edu quality	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A						
Isolation	-0.856	-0.522	0.00338	0.134	-5.670	-6.615*
	(0.53)	(0.59)	(0.33)	(0.38)	(5.12)	(3.86)
State education	0.103	0.141	0.0897*	0.114*	0.921*	0.596
	(0.080)	(0.11)	(0.051)	(0.063)	(0.53)	(0.50)
Real salary		-4.006**		-2.451**		-9.825
		(1.56)		(0.98)		(5.87)
Professionality		0.631		0.519*		1.191
		(0.42)		(0.28)		(2.23)
Panel B						
Isolation (adj.)	-0.850*	-0.490	-0.00706	0.137	-5.259	-6.304*
	(0.50)	(0.56)	(0.31)	(0.36)	(4.83)	(3.67)
State education	0.0997	0.142	0.0888*	0.115*	0.933*	0.597
	(0.080)	(0.11)	(0.051)	(0.063)	(0.52)	(0.50)
Real salary		-4.001**		-2.449**		-9.778
		(1.56)		(0.98)		(5.87)
Professionality		0.630		0.518*		1.191
		(0.42)		(0.28)		(2.23)
Accountability		✓		✓		✓
State pop & size	✓	✓	✓	✓	✓	✓
Observations	48	47	48	47	48	47

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors in parentheses. OLS regressions where the dependent variable is average state legislators' educational attainment measured on ISCED 1-8 scale (1-2), the share of legislators with a postgraduate degree (3-4), the average legislators' best graduate or postgraduate institution score (5-6) from Times Higher Education (2019a) ranking. In Panel A remoteness is measured as isolation on a 0-1 scale from Equation 6. In Panel B remoteness is adjusted isolation on a 0-1 scale from Equation 7. All regressions include as controls the average level of education in the state, the log of the maximum distance between the capital and a point in the state, the log of the state land area, the log of state population from average 2012-2016 ACS estimates. Models 2, 4 and 6 also include the real salary, Squire (2017) index of legislature's professionalism, newspaper political coverage from Campante and Do (2014), voter turnout from in the last 3 presidential elections from CSG (2018). In 2, 4 and 6 Montana is excluded as there is no political newspaper coverage data.

Table 6: Political experience and capital city remoteness

	Dependent variable:					
	Edu Politics		Experience		Years politics	
	(1)	(2)	(3)	(4)	(5)	(6)
Density 100km	3.355***	2.135***	22.29***	15.77***	114.3***	91.08***
	(0.92)	(0.52)	(3.69)	(3.75)	(20.7)	(28.8)
State education	0.105**	0.117***	0.733**	0.774**	-1.673	-3.683**
	(0.048)	(0.037)	(0.34)	(0.35)	(2.06)	(1.76)
Real salary		0.0455		2.624		-12.45
		(0.49)		(4.38)		(16.6)
Professionality		0.492***		1.226		9.290*
		(0.14)		(1.17)		(4.66)
Accountability		✓		✓		✓
Term limits				✓		✓
State size	✓	✓	✓	✓	✓	✓
Observations	48	47	48	47	48	47

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors in parentheses. OLS regressions where the dependent variable is the share of legislators with a graduate or postgraduate degree in public policy/administration or politics (1-2), the number of different public sector and political appointments excluding those as state legislator (3-4), the years from the first appointment in the public sector or as elected official (5-6). The explanatory variable of interest is population density around the state capital respectively in a 100 km radius (measured in 10,000 people per km^2). All regressions include as controls the average level of education in the state, the log of the maximum distance between the capital and a point in the state, the log of the state land area. Models 2, 4 and 6 also include the real salary, Squire (2017) index of legislature's professionalism, newspaper political coverage from Campante and Do (2014), voter turnout from in the last 3 presidential elections from CSG (2018). Models 4 and 6 also include a dummy=1 if the state has term limits, a dummy=1 if the state has binding term limits and the interaction between the two. In 2, 4 and 6 Montana is excluded as there is no political newspaper coverage data.

Table 7: 2SLS Centroid remoteness as instrument for capital city remoteness

	Dependent variable:							
	Edu attainm		Postgrad		Experience		Years politics	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A								
Density 100km	5.890***		3.563***		20.85***		106.9***	
	(1.23)		(0.49)		(3.78)		(17.8)	
Pop potential		11.50***		4.944**		30.69***		104.6
		(3.90)		(2.07)		(11.6)		(66.0)
Panel B								
Isolation	-1.497		-0.155		-0.590		26.23**	
	(0.94)		(0.62)		(2.65)		(11.9)	
Isolation (adj.)		-1.430		-0.0905		0.678		10.79
		(1.10)		(0.77)		(2.97)		(13.9)
Controls	✓	✓	✓	✓	✓	✓	✓	✓
Observations	47	47	47	47	47	47	47	47

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors in parentheses. 2SLS regressions where the dependent variable is the average state legislators' educational attainment measured on ISCED 1-8 scale (1-2), the share of legislators with a postgraduate degree (3-4), the number of different public sector and political appointments excluding those as state legislator (5-6), the years from the first appointment in the public sector or as elected official (7-8). In Panel A remoteness is measured as population density around the state capital respectively in a 100 km radius (measured in 10,000 people per km^2) and population potential computed as in Equation 5 (measured in 10,000 people per km). In Panel B remoteness is measured as isolation on a 0-1 scale from Equation 6 and adjusted isolation on a 0-1 scale from Equation 7. Each measure of remoteness is instrumented in the first stage by the equivalent variable built with respect to the centroid of the state. All regressions include as controls the average level of education in the state, the log of the maximum distance between the capital and a point in the state, the log of the state land area, real salary, Squire (2017) index of legislature's professionalism, newspaper political coverage from Campante and Do (2014), voter turnout from in the last 3 presidential elections from CSG (2018). Models 5-8 also include a dummy=1 if the state has term limits, a dummy=1 if the state has binding term limits and the interaction between the two. Panel B also includes the log of state populations in all regression. In 2, 4 and 6 Montana is excluded as there is no political newspaper coverage data. Olea and Pflueger (2013) first stage robust F-stat is 60.299 for Density 100km, 14.130 for Pop potential, 22.083 for Isolation, 14.130 for Isolation (adj.).

Table 8: Remoteness and legislative outcomes

	Dependent variable:								
	Bills initiated			Public good			Corruption		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A									
Density 100km	14.34***	13.22***	13.75***	1.214**	0.434	0.0799	-1.482	-1.977	0.0887
	(4.12)	(4.61)	(4.33)	(0.54)	(0.49)	(0.56)	(1.42)	(1.55)	(1.46)
Edu attainment		0.248			0.172**			0.109	
		(0.22)			(0.063)			(0.14)	
Edu Politics			0.404			0.773***			-1.071**
			(0.50)			(0.19)			(0.41)
Panel B									
Isolation	0.540	0.763	0.560	-0.552*	-0.514*	-0.532**	1.238**	1.427***	1.197**
	(0.71)	(0.68)	(0.71)	(0.28)	(0.29)	(0.24)	(0.54)	(0.50)	(0.51)
Edu attainment		0.382*			0.0653			0.323***	
		(0.22)			(0.073)			(0.11)	
Edu Politics			0.602			0.614***			-1.221**
			(0.73)			(0.19)			(0.46)
Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	48	48	48	48	48	48	48	48	48

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors in parentheses.
OLS regressions where the dependent variable is bills per legislator per day of session (1-3), public good expenditure from Campante and Do (2014) (4-6), Glaeser and Saks (2006) measure of state level corruption (7-9). In Panel A remoteness is measured as population density around the state capital respectively in a 100 km radius (measured in 10,000 people per km^2). In Panel B remoteness is measured as isolation on a 0-1 scale from Equation 6. *Edu attainm* is the average state legislators educational attainment measured on ISCED 1-8 scale. *Edu politics* is the share of legislators with a graduate or postgraduate degree in public policy/administration or politics. All regressions include as controls the average level of education in the state, the log of the maximum distance between the capital and a point in the state, the log of the state land area, real salary, Squire (2017) index of legislature's professionalism, log of state income, voter turnout from in the last 3 presidential elections from CSG (2018), census region dummies. Panel B also includes the log of state populations in all regression.

Appendix A Data

Gender and age: Almost for all legislators gender is reported. Only 2784, in the final data-set excluding Alaska and Hawaii, report the date of birth. I compute the age on January 1st, 2019, so that I am able to include also those who report only the year of birth.

Children: The number of children was extracted from a text string using an algorithm using keywords such as *child(ren)*, *daughter(s)*, *son(s)* to identify the position in the string. If the singular form was used a number of children equal to one is assumed. In the few cases when the plural is used and the number was not specified I assume a number of children equal to two, which coincides to the mean and mode of the distribution. In any case when the number of children was larger than zero, I record in a dummy variable that the legislator has children.

Relationship: I build an algorithm to extract the type of relationship from the text string with information on the family. I am able to categorise if a legislators is: *divorced*, *married*, in a *partnership*, including those who report themselves as engaged, *single*, *widowed* or *no status*. I determine if the legislator is in a same-sex couple by comparing their gender to that of the partner. In case there was no specific indication such as *wife* or *husband*, I used the following strategy to trace the gender of the partner of all those that reported being married, engaged or having a partner. I used the Social Security Administration top 1000 names for babies born in 1961.[82] The chosen year is the median year of birth for the population of interest. If the official reports the name of the partner and such name coincides to a *top female name* they are reported as female, the opposite for males. If the gender of the partner coincides with that of the candidate, the latter is reported to be in a same-sex relationship. There are cases in which the partner's name is on both the male and female lists. In such instances, I record how high the name is ranked on both list and assigned the gender with the highest rank. There are only 56 legislators that according to the variable I built are in a same-sex relationship, not offering enough variation to be able to study the effect of remoteness on it.

Education: The education data-set contains 12209 entries for 6194 legislators, close to an average of 2 per person, in text strings containing information on the degree, the field and the name of the institution attended, which I extract and separate using algorithms. I start by eliminating the entries that constitute on-the-job training or honorary positions or

[82] The sample is taken from Social Security card application data (Social Security Administration, 2019).

just professional entry exams. For example, residency for nurses and doctors. This does not generate any data loss since the education section of the biography would also include the relevant degree - respectively categorised as Master of Science (in nursing) and Medicinae Doctor. The same holds true for licenses (law, accounting), fellowships and honorary degrees. The above process eliminates 51 observations, representing approximately 0.42% of the total. In certifications (ISCED level 4) I include all sorts of professional certifications and military academies that are not colleges. For some legislators the text did not explicitly indicate whether the degree pursued was obtained or not. If it is a college or a university I assume a Bachelor's degree (ISCED level 6), the median degree. That potentially introduces some measurement error as some of such candidates could actually have a Master's degree (ISCED level 7) or have not finished their degree or obtained an Associate's degree. Given that the number of legislators with a Master's degree is larger than that of those with an Associate's degree, the bias is likely to be upwards. For robustness, I generate two other versions of the ISCED education level variable that correct for this. In the first, I attribute to all such individuals the next lower level of education. The underlying assumption is that if someone has attended an undergraduate degree without completing it they must have at least obtained a high school diploma. In the second, I discard from the sample all such cases. The results are unaffected by using any of the three measures, suggesting that the non-reporting of the degree is not correlated with remoteness. I keep in the data-set short programmes such as summer school or executive programmes or leadership programmes. These short-term degrees are not accounted for when building the level of education variables as well as the academic institution is not considered for the quality of education variables. I use them to build dummy variables. However, very few legislators have obtained such degrees - only 34 attended an executive course - not providing enough variation for this variables to be used in the analysis. I create a dummy variable indicating if the legislator has attended a Bachelor's degree or higher in Public Policy, Public Administration, Policy, Politics, Government. Joint degrees are also taken into account. I am able to match 182 US schools[83] with their Times Higher Education (2019a), abbreviated THE, ranking plus the international institutions in the top 50 of the ranking.[84] 35% of the 11930 reported college or university degrees have been obtained in one of the institutions included in the THE ranking, with an average score of 53.6.out of 100.[85] For the analysis I approximate the scores to integers. I also attach

[83]A total of 1,258 US universities are ranked.

[84]In the data-set at least one alumnus form each of the following: Cambridge University, Oxford U, the London School of Economics and the U of Edinburgh in the UK; U of Toronto, U of British Columbia and McGill U in Canada; Peking U; Hong Kong U and Heidelberg U.

[85]The score is based on 5 performance indicators: teaching; research volume, income and reputation; research influence; international outlook; and industry income. See Times Higher Education (2019b) for an explanation of the methodology and the data collection process.

a score to all non-ranked universities, equal to the lower-bound of the last score band.[86] I also record if the legislator has received a Master's degree or higher from one of the top 20 or top 50 universities in the ranking. There are respectively 447 and 648 such cases, representing 7.8% and 11.3% of those with a reported academic institution. We can expect these numbers to be upward biased as legislators attending prestigious institutions are more likely to advertise it. I attach to each legislator the score and ranking of the best university they attend. I create another set of measures in which I only look at the university where they obtained the highest degree. I only consider Bachelor's degree (4-year undergraduate degree) or higher.

Political career The paper uses two types of variables that measure quality in terms of political experience. One is focused on the *lenght of the resume* - looking at how many roles a politician has held in their career. The second looks at the number of years the politician has been involved in politics. The process of building such variables presents an inherent difficulty given by the fact that the data collection results is a series of strings prone to typos and inconsistencies. Moreover, an additional difficulty is given by the fact that different US States use different terminologies for the same *official*'s levels, for example the Lower House at State Level, usually House of Representative as at Federal Level, in some states is called State Assembly (California and New York), in others House of Delegates (Maryland and Virginia). Similarly, county level *officials* are most commonly referred to as *supervisors* but can also be *selectmen* (New England) or *freeholders* (New Jersey) or simply members of the county council. In some states, such as New York, groups of counties use different nomenclatures. As a result, it becomes harder to identify classes of *officials* with the same level of responsibility. Moreover, there is some ambiguity deriving from the overlap of some definitions: an *officials* declaring his job title to be simply *member* could be an Assembly Member (state legislator), a county council member, a city/town council member or just a member of a legislative committee or a local political association. Similarly, a *delegate* could be a state legislator from a State where the Lower House is called House of Delegates or a delegate at the Democratic or Republican National Convention. As a result, job title *per se* is not sufficient to properly classify the different political resume entries (a total of 21,897 observations, an average of 3 per legislator). The task required coupling data manipulation algorithms using job title and organisation information derived from the text strings with careful human observation of the class of data entries. The (self-reported) political career data also includes some events such as the date when someone won a special election or

[86]Universities ranked 200 and lower are attached score and rank bands rather than an exact number and position. For all those included in the ranking, I assume a score equal to the mean of the band.

was appointed to the house or senate. I eliminate these as they do not constitute political experience *per se*. Eliminating such entries does not lead to data loss as the biography also includes the relevant position. For a few representatives (7, representing the 0.08% of the total population), the summary also includes the date when they switched allegiance from the Democratic party to the Republican or the opposite. The political biography also includes positions that do not seem immediately relevant to a political career. This could be due to errors in compiling the Vote Smart profile or observable characteristics of the specific jobs that made them worthy to be included under the political career section rather than the professional career one. I identify 65 such cases (0.3% of total observations) such as: teacher, reporter, police officer, paralegal, solicitor, pastor, served in armed forces, business owner and several cases of employment in the private sector. I discard such entries. The biography also includes positions held during the legislature such as being the majority or minority leader, whip or speaker, party delegate at the national convention or president/chair of county or city level councils as well as roles in legislative committees and public administration boards. These roles are undoubtedly source of additional experience and exposure. Moreover, having been selected for any of the above positions could be a signal of relative stature in the party that may be correlated with quality as well as a measure of the size of the politician's own network and political capital. I exclude from experience the roles held as state legislators or senators as I want to capture the *ex-ante* experience. I count only different positions held: holding the same role for many years it will be counted as one. The other measure instead counts the years since the first appointment in a political role.

Party data I record the party affiliation of legislators. In some states, like New York, it is common to have more than one party affiliation. I record all of them and build a dummy indicating if a legislator is affiliated with multiple parties. I then also record the main party affiliation. Excluding the North Dakota NPL and Minnesota Democratic Farmer and Labor party that are effectively branches of the Democratic party (I record them as such), there are only 73 with a different primary party affiliation, amongst whom 51 have no affiliation at all. There are 128 legislators with multiple party associations. Almost all of them (125) are in the state of New York.

State district: I use an algorithm to extract from the political information the name of the districts of election and re-code them to match them to the Census Bureau lower and Upper House districts IDs to be able to merge them with the Census Bureau Tiger Line geographical data to calculate distances in ArcGIS. The state of New Hampshire uses floterial districts in their lower-chamber (SLDL) plan. Floterial districts are overlay districts

Table A1: Main biographical variables, summary statistics

Variable	Mean	SD	Min	Max	N Obs
Age	58.19	12.34	19	92	2748
Female	0.284	0.451	0	1	6998
Has children	0.849	0.358	0	1	5424
ISCED level (1-8)	6.39	0.863	3	8	6063
Has a postgraduate degree	0.457	0.498	0	1	6063
University score	37.48	22.59	19	96	5720
Has education in policy/politics	0.194	0.395	0	1	6069
Experience (nr different political roles)	1.702	1.370	0	15	7206
Years since first appointment	10.35	9.909	0	62	7206
Democrat	0.466	0.500	0	1	7215

made up of two or more discrete districts.[87] The districts making up floterial districts are close but not necessarily contiguous. In this case I just use the first district (by district name) among those making up the floterial district to calculate the distance to the capital.

Legislatures' characteristics: Variables capturing legislatures' regulations come from a number of sources. Real salary is the ratio between Bowen and Greene (2014a) 2010-2014 average nominal legislative salary and gross median rents data from ACS 2010-2014 Census Bureau estimates, measured in 2010 dollars. Sessions lenght is taken from Bowen and Greene (2014a) 2010-2014 average. Legislative professionalism is Squire (2017) index of professionalism on 0-1 scale, where 0 is non-professional and 1 is as professional as the US Congress. The information on term limits is manually collected from NCSL (2019). It includes a dummy for term limits being in place, when they were in introduced and if they were repealed. The information on requirements to run for office is manually collected from the Book of States (CSG, 2018). It includes required minimum age, length of citizenship in the US, length of state residency, length of district residency and dummies for the presence of a requirement of state citizenship and voter registration.

State and district level variables: Data on educational attainment of the population over 25 and average GDP per capita at state and district level is taken from the American Community Survey 2012-2016 averages (U.S. Census Bureau, Geography Program, 2016). Population data at state, district, census tract and block group level, used to build the remoteness measures also derives from the American Community Survey 2012-2016 averages.

[87]A listing of the floterial districts and their component districts is available as a report. See `https://www2.census.gov/programs-surveys/decennial/rdo/mapping-files/2012/2012-state-legislative-bef/nh-2012-floterial-list.pdf`.

Newspaper coverage is taken from Campante and Do (2014) and is the first principal component of search terms related to state politics from the webiste NewsLibrary.com. Voter engagement is measured using the average voter turnout as a fraction of all voters in the last 3 presidential elections 2008, 2012 and 2016 form CSG (2018).

Remoteness: Population density is measured as:

$$PopDensity_s = \frac{\sum_j^N pop_{js} \times w_{js}}{area_s}$$

pop_{js} is the population of block group j in the circle around state s capital; $w_{js} \in (0, 1]$ is a weight that attributes a share of block group j's population, if not fully included in the circle, equal to the ratio between the size of the intersection between the block group and the circle and the total area of the block group, $w_{js} = 1$ if the block group is fully included in the circle. $area_s$ is the total amount of land area in the circle around the capital. Population potential is measured as:

$$PopPotential_s = \sum_i \frac{pop_i}{d_{si}}$$

pop_i is the population of census tract i in the same state s as the capital city and d_{si} is the distance between state s capital and the centroid of the census tract. Both population density and potential are respectively scaled to 10,000 people per km^2 and 10,000 people per km.

The isolation index is computed as $1 - GCISC$ where the GCISC is the convex version of the Centered Index of Spatial Concentration, developed by Campante and Do (2010).[88] There are two variants of the CISC - a convex one, also known as Gravity-based CISC or GCISC, and a linear one, or LCISC. They both result in a concentration index on a 0 to 1 scale. Following Campante and Do (2014), I focus on the GISC based measure as it assigns more weight to population concentration closer to the point of interest, the capital in this

[88] Campante and Do (2010) argue that the CISC is superior to other measures of spatial concentration because it focuses on concentration around a point rather than over space and guarantees the following three properties: *subgroup consistency* - the overall distribution becomes more concentrated around a point when a subgroup of the population becomes more concentrated around that point; *monotonicity* - the distribution around a point becomes more concentrated if some people move closer to the point; *rank invariance* - difference units of measure for the distance yield the same measure. The *spatial GINI index*, for example, would be unaffected by moving a whole mass of population from one area to another inhabited area of equal size closer to the point of interest, violating monotonicity.

case.[89] $Isolation$ is $1 - Concentration$, the GISC[90] based formulas are:

$$Isolation_c = 1 - \sum_i \Big(1 - \frac{log(d_{ci})}{log(d_{max})}\Big) s_i \qquad AdjIsolation_c = 1 - \sum_i \Big(1 - \frac{log(d_{ci})}{log(d_{max_c})}\Big) s_i$$

d_{ci} is computed using ArcGIS as the geodesic distance between the capitol hill and the centroid of a census tract. To measure the maximum distance in each state, I use ArcGIS to fragment state borders in a series of points, one for each vertex, for a total of roughly 900,000 state vertices. I then compute the distance from each capital to each vertex and find the maximum to use as d_{max} for the unadjusted measure and the maximum within each state to use as d_{max_c} in the state-size adjusted measure. The instrumental variables using the centroids are computed in the exact same way substituting the coordinates of the state capitol with the coordinates of the state centroid. I exclude Alaska and Hawaii. Figure C4 plots my measure of isolation, computed using ACS 2012-2016 population estimates at census tract level, versus that from Campante and Do (2014), that use the average GCISC measure from 1920 to 2000, up to 1970 in their main specifications, computed using population census data at county level. The correlation is poor and the distribution of capitals' isolation has shifted to the right with time. I interpret this as increased agglomeration that is happening faster away from capital cities, other cities are agglomerating more relative to capital cities, that become more isolated with respect to the population distribution.

Table A2: Remoteness, summary statistics

Variable	Mean	SD	Min	Max	N Obs
Density 30km	0.0281	0.0271	0.0007	0.1022	48
Density 50km	0.0168	0.0168	0.0003	0.0644	48
Density 100km	0.0100	0.0117	0.0001	0.0713	48
Population potential	0.0142	0.0104	0.0008	0.0471	48
Isolation	0.8329	0.0480	0.6789	0.9349	48
Isolation (adjusted)	0.8873	0.0387	0.8073	0.9584	48

Bills introduced: I only use bills introduced to measure productivity as some states do not record resolutions. I use an average to avoid yearly fluctuations. I exclude the 2017 record

[89] Campante and Do (2014) claim that another benefit of the GISC is reducing the measurement error induced by approximating the exact spatial distribution of the population. This is not a concern in my case since I use population data at a smaller level - census tract - compared to counties, the smallest administrative unit available for their whole period of interest, 1920 to 2000. They also show that the two resulting measures of isolation are highly correlated and produce the same results.

[90] The linear measure is exactly the same without taking the logarithm of the distance.

for Georgia and Wyoming because bills and resolutions are mixed. The data on bills is derived from Table 3.19, Bills and Resolutions Introductions and Enactments from the 2015, 2016, 2017, 2018 and 2019 editions of the Book of States. Each table provides information on the previous year's session. I compute productivity as the average bills introduced per legislator per day of session. The number of days in session I use Bowen and Greene (2014a) 2010-2014 average. The number of legislators is manually collected from the Book of States (CSG, 2018).

Public good provision: I use Campante and Do (2014)' measure of public good expenditure, the share of state expenditure assigned to education, public welfare, health, and hospitals from US Statistical Abstract 2012.

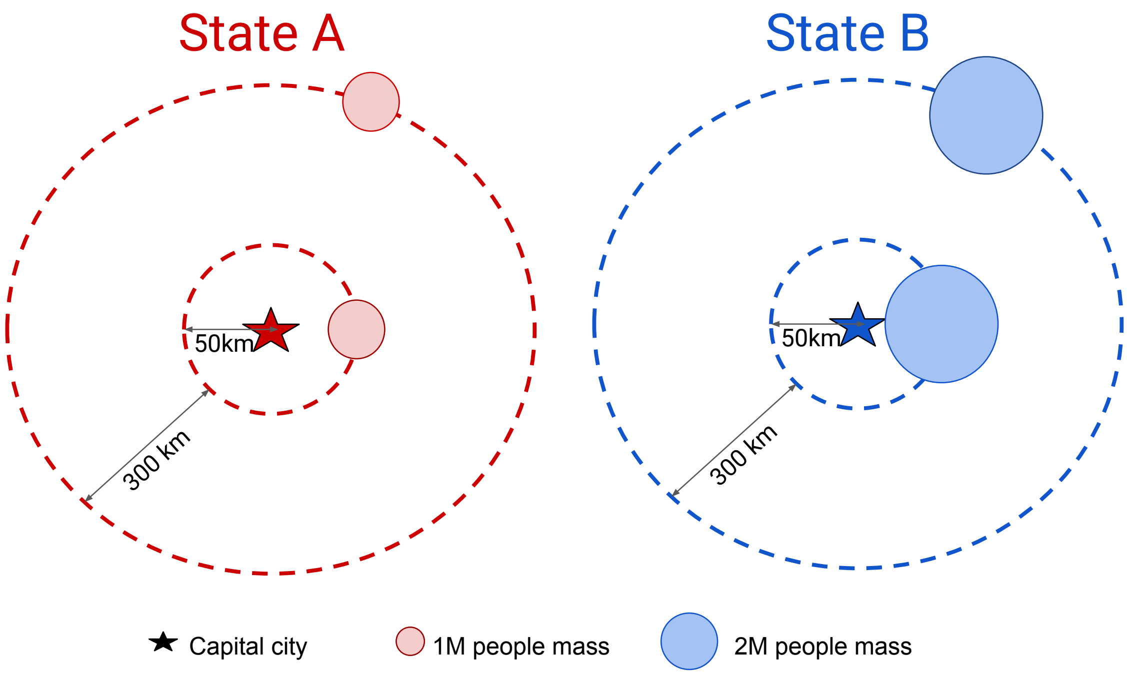
Corruption: I use the measure of corruption built by Glaeser and Saks (2006) and also used by Campante and Do (2014), the average number of federal convictions for public corruption per capita in the state from the 1989, 1999 and 2002 issues of the Report to Congress on the activities and operations of the Public Integrity Section, issued by the Department of Justice.

Table A3: Outcome variables, summary statistics

Variable	Mean	SD	Min	Max	N Obs
Bills introduced	0.182	0.194	0.028	1.287	48
Public good provision	0.660	0.063	0.507	0.766	48
Corruption	0.268	0.125	0.073	0.603	48

Appendix B Measures of isolation and population size

Figure B1: GCISC based isolation and population size



Fictional states with 2 population masses at the same distance from the capital city in each state.

Figure B1 shows two states of the same size, each with too masses of population at the same distance from the capital city. Let us assume for simplicity that the capital city is empty - no people leave there. Let us also assume that the maximum distance from the capital city is 350 km in each state. Both states have the same configuration: a mass of population i close to the capital city and one at the boundary. The size of the population masses is identical within the state, while in State B they are two times as large. Therefore each population mass represents a share $s_i = 0.5$ of total state population. Using the formula to compute Isolation from Equation 6:

$$Isolation_A = 1 - \sum_i \left(1 - \frac{log(d_{Ai})}{log(d_{max})}\right) s_i =$$

$$= 1 - \left(1 - \frac{log(50)}{log(350)}\right) \times 0.5 - \left(1 - \frac{log(300)}{log(350)}\right) \times 0.5 =$$

$$= \frac{log(50)}{log(350)} \approx 0.67$$

It is easy to recognise that the level of isolation for State B would be exactly the same, despite the population density around the capital city being double. Instead, if we compute population potential for State A would be:

$$PopPotential_A = \sum_i \frac{pop_i}{d_{Ai}} = \frac{1M}{50} + \frac{1M}{300} = K$$

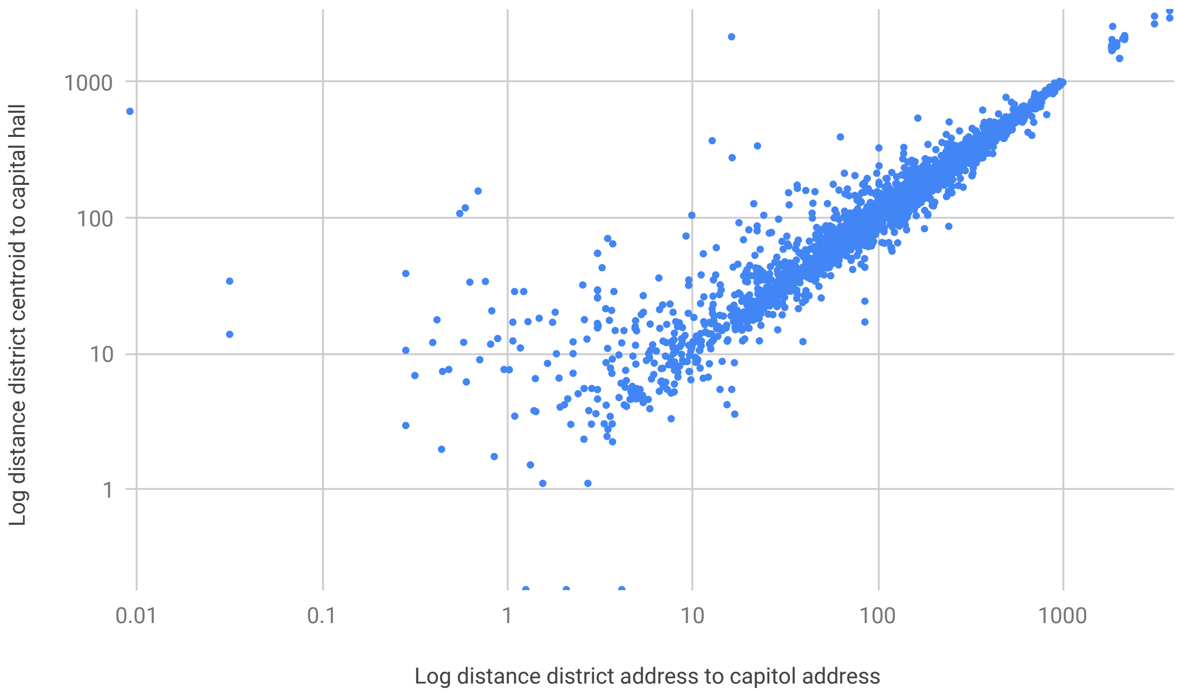
where $K := \frac{1M}{50} + \frac{1M}{300}$. Using the same formula for State B:

$$PopPotential_B = \sum_i \frac{pop_i}{d_{Bi}} = \frac{2M}{50} + \frac{2M}{300} = 2K$$

Population potential in State B is exactly double, reflecting the higher number of people living closer to the capital. The same applies for measures of population density in a 50 and 100 km radius around the capital, they would be exactly double for State B.

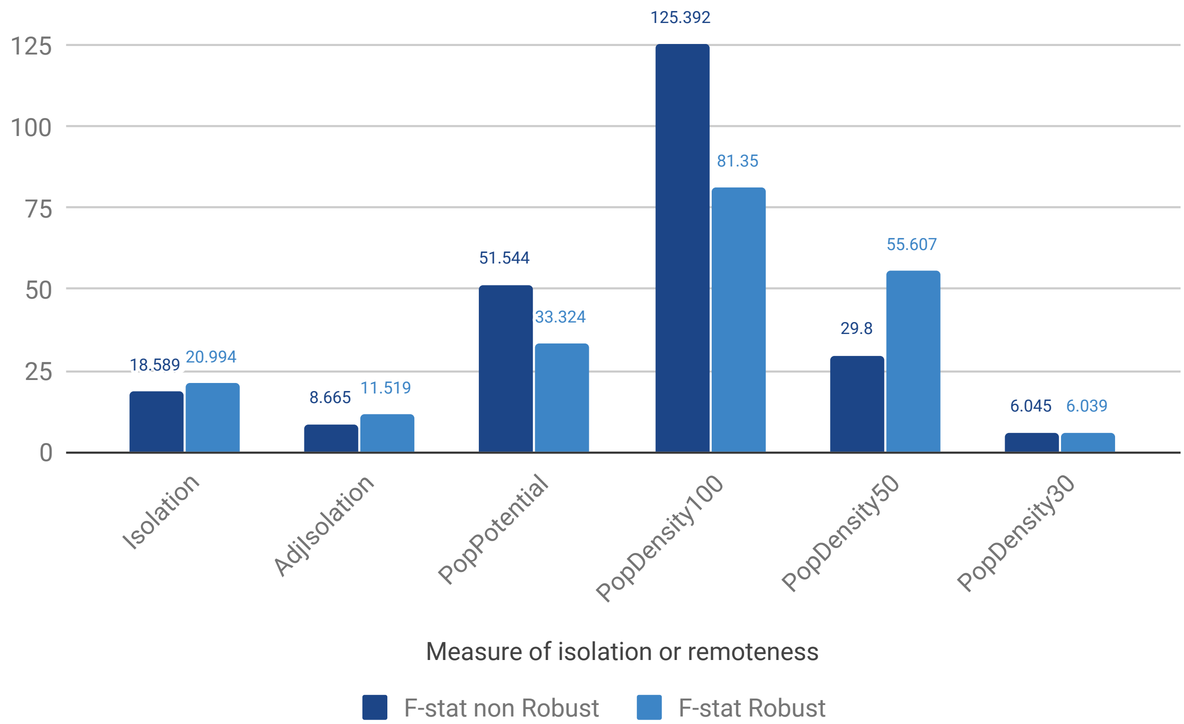
Appendix C Additional Figures

Figure C1: Address distance vs district distance



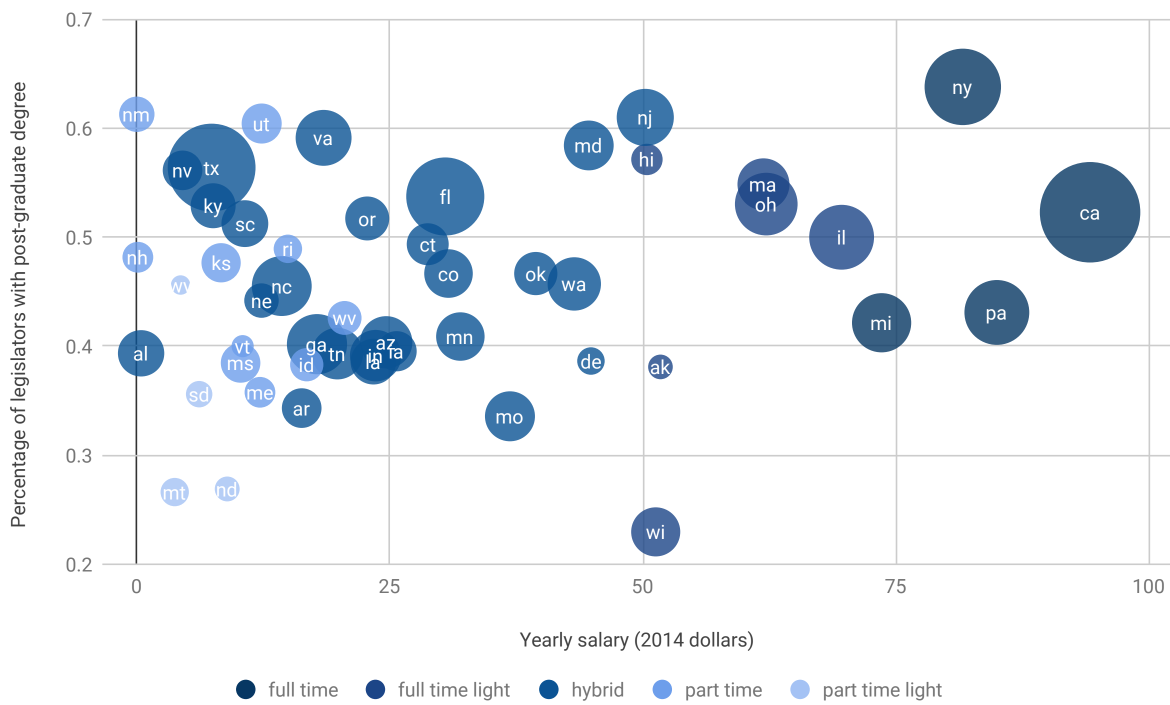
On the horizontal axis: distance between district address and capitol address as recorded in Vote Smart (2019). On the vertical axis: distance between the centroid of the district of election and the coordinates of the capitol building in the state capital.

Figure C2: Relevance of centroid based instruments



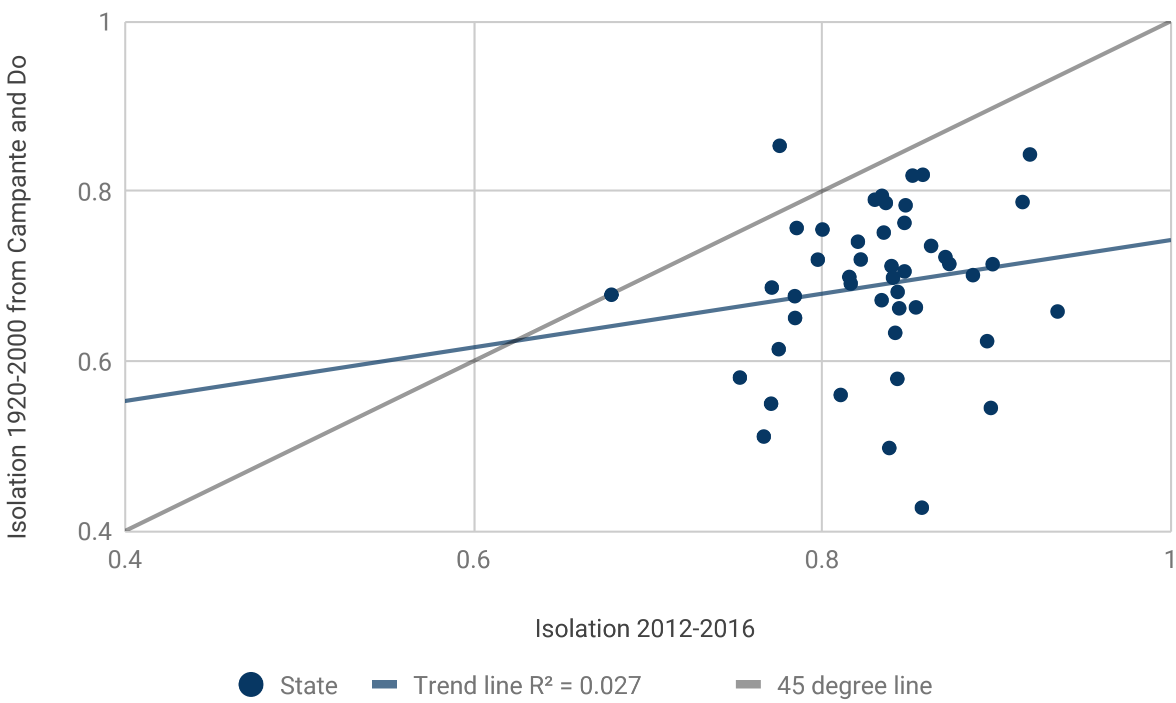
Left bar is Cragg and Donald (1993) Wald F statistics from 2SLS regression of average state legislators' educational attainment measured using ISCED classification (UNESCO Institute for Statistics, 2011) on capital city remoteness, state average educational attainment from Census Bureau ACS 2012-2016 average, logarithm of state land area and logarithm of maximum distance between the capital and any point in the state. Regressions for isolation and adjusted isolation also include log state population on the right-hand side. Capital city remoteness is instrumented using the equivalent measure of remoteness for the centroid of the state. The right bar is the robust Kleibergen and Paap (2006) Wald F statistics for the same specification. It also coincides with Olea and Pflueger (2013) efficient F statistics. The 10% Stock and Yogo (2005) critical test value is 16.38, the 15% critical value is 8.96. The critical values for the Olea and Pflueger (2013) efficient F statistics are 23.109 for 10% of worst case bias and 15.062 for 20%.

Figure C3: Percentage with postgraduate degree by legislature



On the horizontal axis: average 2010-2014 legislators' yearly salary in 2014 US dollars from Bowen and Greene (2014a). On the vertical axis: the percentage of legislators' with a postgraduate degree (Master's or above). The size of the bubble represents the US Census Bureau 2017 population estimates of the state from U.S. Census Bureau, Population Division (2017). States are ranked using 5 categories in terms of legislators' time on the job from NCSL (2015b).

Figure C4: Isolation evolution over time



Scatter plot of unadjusted isolation measured as 6 using the maximum distance in contiguous US states for normalisation and population data from ACS estimates 2012-2016 vs the unadjusted isolation measure from Campante and Do (2014) based on 1920-2000 US Census population data.

Appendix D Additional Tables

Table D1: Education and capital city remoteness, other variables

	Dependent variable:				
	Top 20 (1)	Top 50 (2)	Uni rank (3)	Graduate (4)	Associate (5)
Panel A					
Density 100km	0.0360	0.428	-2963.5	1.029***	0.450
	(0.38)	(0.47)	(2352.0)	(0.37)	(0.27)
Panel B					
Pop potential	-0.472	-0.587	-6014.2*	1.431**	0.839*
	(0.49)	(0.72)	(3094.0)	(0.60)	(0.43)
All controls	✓	✓	✓	✓	✓
Observations	47	47	47	47	47

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors in parentheses. OLS regressions where the dependent variable is the share of legislators with a postgraduate degree from a top 20 university according to the Times Higher Education (2019a), THE, ranking (1), the share of legislators with a postgraduate degree from a top 50 university according to the THE ranking (2), the average legislators' graduate of postgraduate academic institution rank from the THE ranking (3), the share of legislators with a Bachelor's degree or higher (4), the share of legislators with an Associate's degree or higher (5). In Panel A density indicates the population density around the state capital in a 100 km radius (measured in 10,000 people per km^2). In Panel B population potential is computed as in Equation 5 (measured in 10,000 people per km). All regressions include as controls the average level of education in the state, the log of the maximum distance between the capital and a point in the state, the log of the state land area, the real salary, Squire (2017) index of legislature's professionalism, newspaper political coverage from Campante and Do (2014), voter turnout from in the last 3 presidential elections from CSG (2018). Montana is excluded as there is no political newspaper coverage data.

Table D2: Education, experience and capital city remoteness, robustness

	Dependent variable:			
	Edu attainm v2	Edu attainm v3	Quality v2	Experience v2
	(1)	(2)	(3)	(4)
Panel A				
Density 100km	5.932***	5.289***	171.7*	3.586***
	(1.17)	(1.20)	(94.3)	(0.85)
Panel B				
Pop potential	4.851*	3.813	322.2**	3.581***
	(2.48)	(2.32)	(142.3)	(1.19)
All controls	✓	✓	✓	✓
Observations	47	47	47	47

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors in parentheses. OLS regressions where the dependent variable is average state legislators' educational attainment measured on ISCED 1-8 scale assuming the lower level whenever the degree is not reported (1), average state legislators' educational attainment measured on ISCED 1-8 scale excluding legislators whose degree is not reported (2), the average legislators' highest academic degree institution score from the Times Higher Education (2019a) ranking (3), the number of different political appointments in local government, excluding state level (4). In Panel A density indicates the population density around the state capital in a 100 km radius (measured in 10,000 people per km^2). In Panel B population potential is computed as in Equation 5 (measured in 10,000 people per km). All regressions include as controls the average level of education in the state, the log of the maximum distance between the capital and a point in the state, the log of the state land area, the real salary, Squire (2017) index of legislature's professionalism, newspaper political coverage from Campante and Do (2014), voter turnout from in the last 3 presidential elections from CSG (2018). Montana is excluded as there is no political newspaper coverage data.

Table D3: Education and capital city remoteness, robustness

	Dependent variable:					
	Edu attainm			Postgrad		
	(1)	(2)	(3)	(4)	(5)	(6)
Density 100km	4.613***	5.339***	5.179***	2.648***	2.950***	2.554**
	(1.22)	(1.13)	(1.46)	(0.79)	(0.69)	(0.99)
All controls	✓	✓	✓	✓	✓	✓
Observations	47	47	46	47	47	46

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors in parentheses. OLS regressions where the dependent variable is average state legislators' educational attainment measured on ISCED 1-8 scale (1-3), the share of legislators with a postgraduate degree (4-6). Density indicates the population density around the state capita in a 100 km radius. All regressions include the following controls: the log of the maximum distance between the capital and a point in the state, the log of the state land area, the real salary, Squire (2017) index of legislature's professionalism, newspaper political coverage from Campante and Do (2014), voter turnout from in the last 3 presidential elections from CSG (2018). In columns 1 and 4 state education is measured as the share of the population over 25 in the state with a graduate degree, in columns 2-3 and 5-6 as the average level of education in the state of population over 25. In columns 2 and 5 I use a different measure of newspaper political coverage from Campante and Do (2014). In columns 3 and 6 I control for a large set of legislatures' characteristics: existence of term limits and lifetime term limits, time required to reside in district, state, country to run for office, requirement of state citizenship, average minimum age to run for office, average share of Democrats in the two houses. Montana is excluded as there is no political newspaper coverage data. In columns 3 and 6, when controlling for share of Democrats in the houses, Nebraska is also excluded because the state legislature is composed of a single non-partisan house.

Table D4: Density vs isolation

	Dependent variable:							
	Edu attainm				Postgrad			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Density 100km	5.229***		5.230***		3.201***		3.205***	
	(1.01)		(1.00)		(0.52)		(0.51)	
Density 50km		3.883***		3.905***		1.882**		1.908**
		(1.16)		(1.16)		(0.91)		(0.91)
Isolation	-0.126	0.438			0.363	0.594		
	(0.72)	(0.74)			(0.40)	(0.44)		
Isolation (adj.)			-0.120	0.435			0.353	0.584
			(0.69)	(0.71)			(0.39)	(0.42)
All controls	✓	✓	✓	✓	✓	✓	✓	✓
Observations	47	47	47	47	47	47	47	47

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors in parentheses. OLS regressions where the dependent variable is average state legislators' educational attainment measured on ISCED 1-8 scale (1-4), the share of legislators with a postgraduate degree (5-8). Density indicates the population density around the state capital respectively in a 50 and 100 km radius (measured in 10,000 people per km^2). Isolation is measured on a 0-1 scale following Equation 6. Adjusted isolation is measured on a 0-1 scale following Equation 7. All regressions include as controls the average level of education in the state, the log of the maximum distance between the capital and a point in the state, the log of the state land area, the real salary, Squire (2017) index of legislature's professionalism, newspaper political coverage from Campante and Do (2014), voter turnout from in the last 3 presidential elections from CSG (2018). Montana is excluded as there is no political newspaper coverage data.