Democratic institutions are ostensibly designed to serve the majority. Yet in some democracies, politicians routinely cater to the interests of minority groups. Why are leaders more responsive to narrow interests in some democracies than in others? Political institutions and economic geography provide the answer. To date, institutions and geography have been studied largely independent of one another. By integrating insights from these two literatures, I offer a resolution to the ongoing debate over which electoral institutions provide the greatest incentives for leaders to cater to narrow interests.

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1 This is a draft book manuscript. Included are condensed versions of the manuscript’s introduction chapter and first empirical chapter. This manuscript draws on work I published previously in the *British Journal of Political Science*. 
Democracy is envisioned as government for the majority. Yet in some democracies, elected leaders routinely cater to minority interests. In the United States, for example, politicians regularly provide economic assistance to industries that employ only a small fraction of the population. The US steel industry, for example, has a long history of receiving subsidies, tariffs and other targeted economic policies from the government. While these programs help citizens employed in the industry by making possible higher wages and more secure employment, they do so at a cost to the majority of citizens, namely taxpayers and consumers.

Why do democratically elected governments in some countries cater to narrow interests more often than others? One reason may be variation in elections across the world. Not all democratic elections are identical. In some, politicians can win office with less than a majority of votes. In others, politicians can gain access to the ballot only by currying favour with the party elite. Variation in the rules governing democratic elections may help to explain why some elected leaders are more willing to cater to narrow interests than others.

While previous studies have highlighted the potential importance of electoral rules, they have reached contradictory conclusions. Some suggest that proportional electoral rules make leaders most responsive to narrow interests. Others argue that plurality rules make leaders relatively more responsive to minority interests. Conflicting conclusions about a topic so central to democracy are surprising and raise fundamental questions about how democratic government works in practice. Do the institutions in contemporary democracies create incentives for governments to act in ways that reflect democratic ideals? This is the central puzzle motivating this research project.

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2 In majoritarian democracies, governments are expected to work on the behalf of a majority of citizens. In consensus democracies, governments are expected to work on the behalf of a super-majority of citizens (Lijphart 2012).
I argue that governments’ policy decisions reflect not only the constitutional rules governing elections but also the geography of citizens’ with shared economic interests. The location of citizens with shared interests is important because different electoral institutions provide dissimilar incentives for politicians to respond to geographically concentrated or geographically diffuse interests. Knowing where citizens with shared interests are located is necessary to understand how electoral institutions shape policy outcomes.

To date, institutions and geography have been studied independently. In this research, I bring together insights from these two disparate literatures. By doing so, I am able to suggest a potential resolution to the ongoing debate over which democratic institutions provide the greatest incentives for leaders to cater to narrow interests.

Motivation

Free and fair elections are one of the defining features of democracy. The rules that govern elections are therefore fundamental to the functioning of democratic government. These rules are often referred to as electoral institutions. Scholars have devoted pages of research to understanding the effects of electoral institutions on everything from the number of parties in government, to the representation of minorities, and voter turnout. Increased attention has recently turned to policy outcomes. Despite the growing attention to policy outcomes, no consensus has emerged as to which electoral systems most incentivize leaders to provide narrowly-beneficial policies.

Electoral institutions link voters to policy makers. It is therefore reasonable to assume that different electoral rules will produce different policy outcomes. Indeed, the idea that economic policy is systematically related to countries’ electoral institutions has a long intellectual history. Early studies by Ronald Rogowski (1987) and Peter Katzenstein (1985) suggested a natural affinity exists between trade openness and proportional electoral rules. More recently, Grossman and Helpman (2005) developed a theoretical model that envisages a
protectionist bias in trade policy in majoritarian systems. In this seminal model, two-parties compete in legislative elections and each party has equal chances of winning a given seat in a given district. There are three electoral districts; each district contains one third of the population and elects one legislator. Legislators represent districts with interests tied to district-specific industries. Upon forming the government, the delegation from the majority party seeks to maximize the welfare of its constituents. If the party in power represents all three districts, then the legislature will work to maximize the welfare of the entire country by setting tariffs at zero. In contrast, if the governing party represents only two of the three districts, they will set a positive tariff rate. A non-zero tariff emerges here because trade policy is chosen by the majority delegation and legislators in the minority have limited means to influence policy decisions. Legislators in the majority use tariffs to redistribute income to industries in their own districts, rather than maximize national welfare by setting an optimal tariff of zero. The governing party in majoritarian systems is unlikely to represent all three districts. In contrast, the government in proportional systems is more likely to represent all three districts and thus the legislature will work to maximize the welfare of the entire country by setting tariffs at zero. Majoritarian systems, in contrast, lead politicians to supply narrowly-beneficial economic policies, such as industry-specific tariffs.

A similar prediction emerges from a canonical model developed by Persson and Tabellini (2003) that demonstrates majoritarian elections are associated with more narrowly-beneficial policies and less public goods than proportional elections. Persson and Tabellini find empirical support for this prediction (1999). Several additional studies also report supportive evidence. In a sample of 147 countries from 1981 to 2004, Evans (2009) finds that majoritarian systems have higher tariffs than countries with proportional electoral systems, all else equal. Tariffs typically provide fairly narrow benefits that accrue only to select domestic
producers, and often at the expense of consumers. Ardelean and Evans (2013) demonstrate that tariffs are higher, on average, in majoritarian systems than in proportional systems using product-level tariff rates for a cross-section of developed and developing countries between 1988 and 2007. Rickard (2012a) reports that the share of total government expenditures allocated to subsidies is higher in countries with majoritarian electoral rules than in countries with proportional electoral rules, holding all else equal. On average, governments in majoritarian systems spend 2.5 percentage points more on subsidies than governments in PR systems (Rickard 2012a). Furthermore, democracies with majoritarian electoral rules are named as defendants in GATT/WTO disputes over illegal narrow trade barriers more often than democracies with proportional electoral rules (Rickard 2010, Davis 2012). This evidence suggests that the electoral incentives to provide narrowly-beneficial policies are so compelling in majoritarian systems that legislators are willing to supply such policies even when doing so violates their international treaty obligations (Rickard 2010, Davis 2012, Naoi 2009).

Although convincing empirical evidence suggests that majoritarian systems supply relatively more narrowly-beneficial economic policies, some scholars argue instead that proportional electoral rules generate greater incentives to cater to narrow interests. A model developed by Rogowski and Kayser (2002), highlights the importance of seat-vote elasticities. Majoritarian systems have greater seat-vote elasticities than PR systems, and as a result, a loss of votes translates into a greater loss of seats for parties competing in majoritarian systems. In proportional systems, politicians are able to cater to narrow interests without having to be overly concerned with any election losses they might incur for doing so. In contrast, politicians in plurality systems cannot stray far from the preferences of the

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3 Of course, tariffs can be designed to be more or less narrowly-beneficial. In theory, a tariff could be designed to protect a specific product produced by only a single firm. Such a tariff would provide very narrow benefits. At the other extreme, a government could impose a flat tariff that taxes all imported goods at the same rate, as in Chile.
median voter because a small change in vote share can produce a large change in seat share. Rogowski and Kayser therefore posited that politicians in proportional rule systems will be relatively more responsive to narrow interests, such as industry-specific demands for protection.

A theoretical model developed by Bueno de Mesquita and Smith (2005) also implies that narrow policies will be more frequent in PR systems, as compared to majoritarian systems. Their model examines the political consequences of a winning coalition’s size. A winning coalition is a subset of the selectorate with sufficient size to allow the subset to endow leadership with political power to negate the influence of the remainder of the selectorate and the disenfranchised members of the society (Bueno de Mesquita et al. 2003, 51). The winning coalition is larger in majoritarian systems than in PR systems, according to Bueno de Mesquita and Smith (2005). As the size of the winning coalition grows the cost of private goods, such as subsidies, increase. According to their logic, narrow policies should be less frequent in majoritarian systems than in proportional systems.

Some empirical evidence exists to suggest that proportional electoral rules incentivize the supply of narrow policies. Non-tariff barriers are higher, on average, in proportional rule democracies than in majoritarian systems (Mansfield and Busch 1995). Proportional rule systems are also associated with higher consumer prices (Rogowski and Kayser 2002, Chang, Kayser and Rogowski 2008, Chang Kayser, Linzer and Rogowski 2010). Higher consumer prices, arguably, reflect governmental policies that privilege producer groups at the expense of consumers. Legislatively imposed barriers to trade, for example, raise the prices of consumer goods. The presence of greater trade barriers in proportional rule countries may therefore explain why consumer prices are higher in PR systems than in majoritarian systems.

4 However, Persson and Tabellini (2003) make the opposite claim.
In sum, it remains unclear which electoral formula generates more narrowly-beneficial economic policies. The mixed results are puzzling given the centrality of elections to the functioning of representative democracy. Understanding why scholars have reached this stalemate is necessary to progress beyond it and advance understanding of electoral institutions’ impact on policy outcomes.

**Argument in brief**

Electoral institutions aggregate citizens’ preferences. To fully understand how institutions influence economic policy, it is therefore necessary to consider citizens’ economic interests. My argument is that the geographic location of citizens with shared economic interests in combination with electoral institutions shapes policy outcomes. The logic of this argument builds on the idea that different electoral institutions provide dissimilar incentives for politicians to respond to geographically concentrated or geographically diffuse interests. Knowing where citizens with shared economic interests are located geographically is necessary to fully appreciate how electoral institutions shape policy outcomes.

Citizens’ economic interests hinge on how individuals they earn income. Most people earn a majority of their income through labor, even in developed countries. Citizens that work together therefore share a common economic interest. Citizens employed in a given industry share a common interest in the economic performance of that industry. In the short to medium term, employees’ incomes are tied to the economic fortunes of their industry. Well performing industries hire and retain more employees and offer more generous wages and compensation than poorly performing industries. Citizens therefore have a shared interest in the economic performance of their industry of employment. Although this interest is shared by people employed in the industry, it is a relatively “narrow” interest because any given

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5 Citizens who own factors of production employed in the industry, such as capital or labor, also benefit.
industry typically employs only a small fraction of the total electorate. For example, the steel industry employs approximately 0.3% of the total population in the United States.

Narrow interests, defined as economic interests shared by only a small fraction of the electorate, can be more or less geographically concentrated. Although industries today have fewer constraints on where they locate, strong patterns of concentration and specialisation persist at national and regional level in developed economies (OECD 2008). Geographic concentration remains a striking feature of some industries in certain countries (OECD 2008). Yet, others exhibit varying levels of geographic concentration (OECD 2008).

To date, narrow interests have been conflated with concentrated interest. But in theory, narrow interests can exhibit varying levels of geographic concentration. Employment in an industry may be entirely concentrated in a single electoral district. Alternatively, an industry may employ people across numerous electoral districts and geographic regions. For example, the forestry industry employs people in every region of Germany. In 85 German counties, the forest sector accounts for more than 5 per cent of total employment (Kies, Mrosek and Schulte 2009, 44).

Legislators seek re-election and a legislators’ optimal re-election strategy depends on both the country’s electoral institutions and the geographic configuration of citizens with shared economic interests. In countries with plurality electoral formulas and single member districts, cultivating a personal vote is the optimal re-election strategy (Fenno 1978; Weingast, Shepsle and Johnson 1981; Cox and Rosenbluth 1993; Carey and Shugart 1995). The best way to develop a personal vote is by providing private or local public goods to relevant constituents (Cox and McCubbins 2001). One way to develop a personal vote is via economic policy.

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6 Most existing studies assume that narrow economic interests are concentrated in this way. Grossman and Helpman explicitly assumed that each electoral district contains one unique industry. Similarly, McGillivray assumed that concentrations of industries occur entirely within distinct, geographically defined electoral districts.
When voters in a district share a common economic interest, politicians can increase their re-election chances by appealing to that interest by, for example, providing particularistic economic policies, such as industry-specific subsidies. The benefits of such programs will be concentrated in a politician’s electoral district, while the costs will be spread widely across taxpayers and consumers. Politicians elected via plurality rules will be especially responsive to geographically-concentrated groups because elections in these systems are won district-by-district. Subsidies are therefore an efficient way for politicians to maximize their chances of re-election in plurality systems when voters with an economic interest in subsidies are geographically concentrated.

In contrast, subsidies and other particularistic economic policies are inefficient electoral tools in plurality systems when voters with an interest in subsidies are geographically diffuse. Politicians whose electoral successes depend on support only from their geographically defined constituents have few incentives to cater to geographically-dispersed interests. Doing so neither sufficiently rewards their efforts nor maximizes incumbents’ chances for re-election because the electoral rewards for catering to diffuse interests are spread across districts. For example, in an industry where employment spans an entire country, the benefits of industry-specific subsidies accrue to voters in all electoral districts. In this case, promoting subsidies would be an inefficient way for a politician to “buy” the votes she needs to win in a geographically-defined constituency. In plurality systems, allocating government expenditures to these types of programs is inefficient from an electoral perspective.

In 2002, for example, the United States government imposed a 30 per cent tariff on steel imports in an attempt to win key Congressional seats in the steel-producing states of
Leaders were able to target benefits to voters in these states using particularistic trade protection precisely because the steel industry was geographically concentrated. If the industry had been geographically diffuse, steel tariffs would have been an inefficient electoral tool (i.e. it would have bought votes in state where they were not needed). In sum, the usefulness of particularistic economic policy for politicians competing in plurality systems depends on the geographic distribution of citizens with shared economic interests.

In contrast, the geographic location of citizens with a shared economic interest is less important in party-centred, proportional rule systems. In proportional systems, legislative seats are awarded in accordance with parties’ share of the national vote. Legislators competing in proportional, party-centred systems therefore have incentives to cater to voters’ economic interests regardless of where they are located geographically. Because every vote contributes to the allocation of legislative seats among parties, politicians and parties competing in proportional systems have incentives to cater to geographically diffuse, narrow interests. Winning the support of voters in an industry that employs only two per-cent of the population could, for example, translate into several additional legislative seats. In Sweden, a 2 percent vote gain could translate into as many as seven additional legislative seats. Furthermore, winning an additional two per cent of the national vote share may mean the difference between being in or out of parliament because many proportional systems have minimum threshold requirements. These rules require that a party must receive a minimum

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8 By doing so, the US risked provoking retaliation from their trading partners and violating their obligations as a member of the World Trade Organization.
percentage of votes to obtain any seats in the parliament. In Sweden, for example, there is a
nationwide threshold of four percent.\(^9\)

The incentives for leaders to work to maximize their party’s share of the national vote may help to explain why geographically-diffuse sectors receive generous government subsidies in PR systems. The geographically diffuse forestry sector receives ten percent of all subsidies in Sweden even though it employs less than 1 percent of the total Swedish population.\(^10\) Subsidies to the diffuse forest sector are eight to ten times greater in Austria, an archetypal proportional system, than in the United Kingdom, a single-member, plurality system.\(^11\) Unlike leaders in plurality systems, leaders in PR systems have incentives to cater to geographically diffuse, narrow interests.

In sum, geography provides a bridge between two prominent, rival arguments regarding the effect of electoral institutions on economic policy. Both types of electoral systems incentivize the provision of narrowly-beneficial policies under certain conditions. Leaders in plurality systems have greater incentives to supply narrow policies when citizens that benefit from such policies are geographically concentrated. When citizens with shared interests are geographically diffuse, leaders in PR systems will provide relatively more policies to meet their needs, as compared to plurality systems.

**Contributions**

This study is not the first to suggest the importance of geography for politics or policy. However, previous studies failed to consider the potential interactive effects of

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\(^9\) If a party reaches 12\% in one election district, however, it will be represented even if it does not reach the 4\% level nationally. Nobody has been elected based on the 12\% rule up through the 2010 election.


geographic concentration and political institutions (Barkan, Densham and Rushton 2006). Furthermore, many existing studies simply assume that narrow economic interests are geographically concentrated. For example, Grossman and Helpman explicitly assumed that each electoral district contains one unique industry. Similarly, McGillivray assumed that concentrations of industries occur entirely within distinct, geographically defined electoral districts. The assumption that narrow interests are geographically concentrated is crucial to their conclusion that plurality systems lead politicians to be more responsive to narrow interests. Once assumptions about the geographic concentration of narrow interests are relaxed it is possible to draw different conclusions. I argue and find evidence that leaders in PR systems have incentives to respond to narrow interests and they respond to such demands more frequently than leaders in plurality systems when narrow interests are geographically diffuse.

Previous empirical studies of geographic concentration are limited exclusively to plurality systems. McGillivray examined the effects of geographic concentration in two countries that both have plurality electoral rules: the United States and Canada. In these countries, McGillivray found that concentrated industries tend to win more trade protection than diffuse industries. Similarly, Hansen established that geographically concentrated industries are more likely to secure favourable rulings for anti-dumping claims in the United

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12 Barkan et al. (2006) argue instead that differences in electoral systems do not matter at very high levels of geographic concentration, defined by population density. Furthermore, Barkan et al. (2006) posit that geographic concentration likely has little importance in developed countries while in developing countries "voters define their political identities in terms of their place of residence" (2006, 938).


States. Milner showed that concentrated industries in the United States made fewer trade concessions in negotiations over the North American Free Trade Agreement (NAFTA). These studies demonstrate that geographic concentration is a political asset for industries in plurality systems. However, it remained unclear whether geographic concentration played a similar role in PR systems. Cognisant of this limitation, McGillivray recommended that future research investigate the effects of geographic concentration in proportional electoral systems. This research responds to this call by examining the effects of geographic concentration across various electoral systems. By doing so, it clarifies the role of geographic concentration in various institutional settings.

This study makes several additional contributions. First, the argument developed and tested here provides a potential solution to the ongoing debate over which set of electoral institutions lead politicians to be most acquiescent to narrow interests. Geography provides a bridge between two prominent, rival arguments and specifies the conditions under which one is more appropriate than the other. To date, institutions and geography have been studied largely independent of one another. By integrating insights from these two literatures, I offer a resolution to the ongoing debate over which electoral institutions provide the greatest incentives for leaders to cater to narrow interests.

Second, the argument sheds new light on the enduring puzzle of institutional change. Institutions may come to produce outcomes that are no longer acceptable following a change in the geographic distribution of economic interests. Cussack et al. (2007) allude to this

18 Busch and Reinhardt (2003) argued that geographic concentration may be an asset regardless of a country’s electoral rules drawing on survey evidence from the Netherlands.
possibility when they suggest that the increased geographic diffusion of citizens following the industrial revolution generated pressures for PR. This argument follows from their assumption that PR systems produce outcomes that are better for diffuse interests. The current study provides novel evidence in support of this assumption, which is a critical component of Cussack et al.’s argument. As demonstrated here, PR systems provide more generous benefits to diffuse economic interests than plurality systems. In short, the current study provides original empirical evidence in support of a key link in Cusack et al.’s causal story. This is an important contribution in and of itself given the controversy surrounding Cusack et al.’s claim (APSR Forum May 2010).

Finally, this research also has policy implications for constitutional design and reform. When reformers deliberate over how to change their country’s constitution, they frequently focus on how to achieve a desired policy outcome. For example, the vast majority of Italians who approved recent electoral reforms did so because they believed that it would stifle corruption. However, as my research makes clear, institutions alone cannot guarantee a particular policy outcome. Instead, policy outcomes depend critically on both institutions and interests. Institutions must then be chosen with care and perhaps for reasons other than any particular desired policy outcome.

**Empirical evidence: Subsidies**

Governments’ spending patterns can illuminate leaders’ propensity to cater to narrow interests. In this chapter, I focus on a particular item in governments’ budgets: subsidies to manufacturing industries. Manufacturing subsidies benefit voters who own production factors, such as labour or capital, employed in manufacturing industries. Subsidies can

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20 This type of spending, often referred to as “pork barrel” spending, frequently reflects discretionary spending decisions. See Persson and Tabellini, *The Economic Effects of Constitutions*, p. 14.

increase returns, such as wages, to levels above those in a purely competitive market.\textsuperscript{22} Subsidies can also help to protect the industry from competition with lower-cost foreign imports and maintain wages and employment above competitive market levels.\textsuperscript{23} Subsidies to the British textile industry, for example, were funded by the government for precisely these reasons.\textsuperscript{24} Following a rapid increase in import-competition, the geographically-concentrated textile industry was heavily subsidized by a conscious assistance programme created by the government to maintain employment and wage levels in the industry.\textsuperscript{25} In the United States, subsidies to the geographically-concentrated sugar industry maintain a domestic sugar price usually two to three times higher than the world’s market price.\textsuperscript{26} As a result, sugar cane farmers in the United States receive, on average, an extra $369 million a year above the internationally determined value for the commodity.\textsuperscript{27} However, the benefits to sugar farmers come at a cost to a broader group of citizens. American taxpayers and consumers pay over $2.3 billion a year more for sugar due to government subsidies and other trade barriers.\textsuperscript{28}

Because subsidies benefit a minority group at the expense of the majority of citizens, government spending on subsidies provides valuable information about how leaders weigh narrow demands against broader societal interests. This is particularly true when subsidy

\textsuperscript{23} Other similar programs may include tax incentives, relief from industry-specific regulations, and industry-specific trade barriers. See, for example, David A. Singer, ‘Capital Rules: The Domestic Politics of International Regulatory Harmonization’, \textit{International Organization}, 58 (2004), 531–65.
\textsuperscript{24} Francois Duchene and Geoffrey Shepherd, ‘Sources of Industrial Policy’, in Francois Duchene and Geoffrey Shepherd, eds, \textit{Managing Industrial Change in Western Europe} (London: Frances Pinter, 1987), pp.7-20; McGillivray, \textit{Privileging Industry}.
\textsuperscript{25} Duchene and Shepherd, ‘Sources of Industrial Policy’.
\textsuperscript{26} Mortensen and Pissarides, ‘Taxes, Subsidies and Equilibrium Labour Market Outcomes’.
\textsuperscript{28} Beghin, El Osta, Cherlow and Mohanty, ‘The Cost of the US Sugar Program Revisited’.
spending is reported as a percentage of total government expenditures (excluding interest payments).\textsuperscript{29} This ratio indicates the relative importance of subsidies among governments’ myriad spending priorities and represents an important innovation in measuring governments’ propensity to cater to narrow economic interests.

Estimating how politicians’ weigh narrow demands against broader societal interests is notoriously difficult. Despite the theoretical and normative importance of this concept, no standard empirical measure of it exists in the literature. Existing measures vary significantly and often capture only indirectly the relative importance of narrow interests. For example, Rogowski and Kayser used national price levels to estimate the responsiveness of politicians to narrow interests.\textsuperscript{30} Similarly, McGillivray used industry stock prices to measure industries’ political influence.\textsuperscript{31} These indirect measures capture many factors that have nothing to do with governments’ responsiveness to narrow interests, such as transportation costs, market size and consumer demand.\textsuperscript{32}

Existing spending measures are similarly problematic. Milesi-Ferreti, Rostagno and Perotti estimated government spending on narrowly targeted transfers using the sum of social security payments and other transfers to families, plus subsidies to firms.\textsuperscript{33} Persson and Tabellini operationalized broadly targeted transfers as spending on education, transportation

\textsuperscript{29} These spending data come from the International Monetary Fund’s \textit{Government Financial Statistics}. These data include all fiscal outlays targeted to the manufacturing sector. For example, all subsidies, grants, and subsidized loans provided to the manufacturing sector to support manufacturing enterprises and/or development, expansion or improvement of manufacturing are included. Although conventional government accounts are generally not suitable for comparisons among countries and over time because they reflect the organizational structures of governments, these data, uniquely complied by the IMF, allow meaningful cross-national comparisons over time. For additional information, see International Monetary Fund, \textit{Government Finance Statistics Manual} (Washington, D.C.: IMF, 2001).

\textsuperscript{30} Rogowski and Kayser, ‘Majoritarian Electoral Systems and Consumer Power’.

\textsuperscript{31} McGillivray, \textit{Privileging Industry}.


\textsuperscript{33} Milesi-Ferreti, Rostagno and Perotti, ‘Electoral Systems and Public Spending’.
and order and safety. Both measures conflate geographically-targeted spending with more broadly targeted spending and illustrate the difficulty of measuring governments’ willingness to privilege select groups of voters.

The current study proposes a novel empirical measure of governments’ responsiveness to narrow economic interests: the percentage of total government expenditures devoted to subsidies for the manufacturing sector. This variable provides a direct measure of how politicians’ weigh narrow demands against broader societal interests. Additionally, this variable captures an increasingly important component of governments’ budgets. As international agreements restrict the use of tariffs, governments employ subsidies more and more often to protect domestic producers from direct competition with international trade. On average, governments in developed countries allocate nearly 10 percent of total government expenditures (excluding interest payments) to subsidies, grants, and subsidized loans and subsidies may account for an even greater share of governmental expenditures in developing countries. Despite the growing political and economic importance of subsidies, few studies explicitly examine government spending on subsidy programs. The current

study aims to further understanding of the cross-national variation in government spending on industrial subsidies amongst democratic countries.

Variation exists in the provision of government-funded industrial subsidies across countries and over time. Cross-national variation in governments’ propensity to spend on subsidies was especially evident in the wake of the 2008 economic crisis. In some countries, leaders raced to provide subsidies to troubled industries. In October 2008, Nicolas Sarkozy, the French president, unveiled a “strategic national investment fund” to buy stakes in certain French industries to protect them against foreign “predators”.38 In Italy, Silvio Berlusconi called subsidies a “categorical imperative” in times of economic distress and rejoiced over their new post-crisis vogue.39 The Australian government increased budgetary assistance to industries by 26 per cent from 2006 to 2010. Britain poured money into select parts of the economy that were deemed to “make a difference”. However, the rush to subsidize select industries at taxpayers’ expense was not uniformly welcomed by democratic leaders. Germany’s economics minister, Michael Glos, warned that privileging certain industries went against “all successful principles of our economic policy.” 40 The varied responses to the Great Recession point to the importance of understanding when and under what conditions governments provide subsidies.

The cross-national variation in subsidy spending corresponds in the anticipated fashion with electoral institutions and the geography of economic interests. In the United States, for example, where elections are determine by a first-past-the-post electoral rule, concentrated industries habitually win generous subsidies. For example, US sugar cane farmers receive an extra $369 million dollars a year from government-funded subsidies and

38 *The Economist* Nov 1, 2008: 62.
40 *The Economist* Nov 1, 2008: 62.
nearly 60 per cent of this goes to just 17 growers.\textsuperscript{41} American taxpayers and consumers pay $2.3 billion a year more for sugar that is two or three times as expensive as on the world market.\textsuperscript{42} The sugar industry is far from unique in being protected from imports by leaders in the United States. Footwear, automobiles and steel are among the many other goods that have benefited from narrowly targeted trade protection in the US.

Yet, geographically concentrated producers are not equally privileged in other countries. In Germany, for example, the government routinely refused to provide subsidies to individual firms with a single geographic location (Schatz and Wolter, 1987; Thöne and Dobroschke 2010).\textsuperscript{43} In contrast, diffuse industries can and do win subsidies in Germany, where the government is elected via a mixed-member proportional systems. Thirty per cent of German subsidies go to the geographically diffuse forestry sector (Thöne and Dobroschke 2008). The total volume of these subsidies amounted to €10.8 billion in 2006 (Thöne and Dobroschke 2008). The geographic diffusion of the German forestry sector helps to explain why it wins generous subsidies.\textsuperscript{44} Employment in the forest sector is similar to the overall distribution of the German population.\textsuperscript{45} There are people employed in the forest sector in every region of Germany.\textsuperscript{46} In 85 counties (19 percent) the forest sector accounts for more than 5 percent of total employment and in 30 countries for more than 7.5 percent (Kies, Mrosek and Schulte 2009, 44).

\textsuperscript{43} During the late 1960s and early 1970s, the Germany government focused instead on building a comprehensive framework of policies that would benefit large numbers of citizens, called the Soziale Marktwirtschaft (Sharp and Shepherd, 1987).
\textsuperscript{44} The forest sector employed nearly 900,000 employees in 2004 (Kies, Mrosek and Schulte 2009, 39).
\textsuperscript{45} Kies, Mrosek and Schulte 2009
\textsuperscript{46} Kies, Mrosek and Schulte 2009
Similarly, the diffuse forestry sector in Sweden, where the government is elected via PR, won ten per cent of all subsidies during the period from 1977-1979. In fact, the Swedish government spent nearly twice as much on subsidies to the geographically diffuse forest sector as on subsidies to the highly concentrated textile industry during this period (Carlsson 1983, Table II, page 11). This fact suggests that concentration may be something of a political liability in PR countries. If so, this would be in sharp contrast with the conclusion drawn from Dutch survey evidence by Busch and Reinhardt (2005). Busch and Reinhardt report that people employed in concentrated industries are more likely to say they voted in the last election in the Netherlands, which has a single, nation-wide electoral district. Busch and Reinhardt conclude that concentration should therefore be a political advantage for industries, regardless of a country’s electoral system.

Yet, evidence from Sweden seems to suggest that concentration may, in fact, be a political liability in PR countries. The Swedish government refused to provide financial assistance to Saab – a firm with highly concentrated employment. Saab, an automobile manufacturer, employed 4,100 people in Sweden, 3,700 of who worked at its hub in the south-western town of Trollhättan. In Trollhättan, it was virtually impossible to find anyone in the city who was not somehow connected to Saab. Saab was the largest employer – employing even more people than the municipal government. Despite this, the Swedish Prime Minister, Fredrik Reinfeldt, ruled out a government bail-out for Saab saying he would not put "taxpayer money intended for healthcare or education into owning car companies". The Swedish Enterprise and Energy Minister Maud Olofsson told Swedish public radio that "voters picked me because they wanted nursery schools, police and nurses, and not to buy loss-making car factories". This anecdotal evidence suggests that leaders in proportional, party-centred systems, like Sweden, are relatively less responsive to concentrated economic interests. Why this might be the case is unclear. One possibility is that leaders in PR systems
see broadly beneficial spending programs, such as education, as a relatively easier way to maximize their share of the national vote. Whatever the reason, it appears to be the case that geographically diffuse interests win particularistic economic policy in party-centred PR systems.

These illustrative examples are confirmed in a large-N quantitative analysis. I hypothesize that government spending on subsidies will be higher in PR systems than plurality systems when voters with economic interests in subsidies are geography diffuse. When voters with economic interests in subsidies are concentrated, spending on subsidies will be higher in plurality systems, as compared to proportional systems.

To estimate the geographic concentration of voters with a shared interest in manufacturing subsidies, I measure the concentration of manufacturing employment. Employment data from Cambridge Econometrics disaggregated into Nomenclature of Territorial Units for Statistics (NUTS-2 and NUTS-3) regions make possible the construction of entropy indices that calculate within-country sector employment concentrations. This measure captures the degree of a sector’s employment concentration relative to the geographic distribution of aggregate employment. Weighted sector employment per square kilometre represents the degree of aggregate employment for that particular square kilometre, and in effect, conditions physical space according to the distribution of aggregate employment. The “no-concentration” benchmark implies that the employed within a particular square kilometre allocate their working time among sectors in exact proportions which correspond to those sectors’ uses of employed labour among all locations. The


concentration score ranges from zero to one with higher values indicating more geographic concentration.

This measure captures a politically important aspect of geographic concentration. In a hypothetical country where the manufacturing sector has a zero concentration score, employment in the sector is geographically spread exactly proportional to total employment. As a result, the level and intensity of demand for government subsidies from the manufacturing sector will be no greater (or less) than from any other sector(s) in a given geographic location. In this situation, politicians cannot use manufacturing subsidies to target voters in select electoral districts and thus subsidies are likely to be less useful as electoral tools in plurality systems than in PR systems.

The construction of the geographic concentration variable is data intensive. Consequently, it is possible to calculate this variable for only 14 European countries from 1976 to 1996. Although this limited sample raises potential questions about the external validity of the results, it does allow for direct comparisons with previous studies of electoral institutions that also use similar samples. In this sample, Concentration ranges from a minimum of 0 (Ireland 1988, 1992) to a maximum of 0.13 (Greece 1976).

The definition of electoral rules used in this study classifies countries as PR if proportional electoral rules control most of the seats in the lower house. Specifically, the variable PR equals 1 if proportional electoral rules are used to select most of the seats in the

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49 It is not, however, a measure of political concentration. At present, measures of political concentration are only possible in the data rich United States.

50 Unfortunately, due to data limitations mapping the geographic dispersion of manufacturing employment into electoral districts is not possible for even the limited sample of countries under investigation here.


52 The 14 sample countries include: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Netherlands, Norway, Spain, Sweden, Switzerland, and the United Kingdom.
lower house, and zero if most of the seats are filled via plurality. Data used to construct this variable come from the World Bank’s Database of Political Institutions.\footnote{Thorsten Beck, George Clarke, Alberto Groff, Philip Keefer, and Patrick Walsh, ‘New Tools in Comparative Political Economy: The Database of Political Institutions’, \textit{World Bank Economic Review}, 15 (2001), 165-76.}

Although Germany has a mixed-member electoral system, it is coded as being proportional. Mixed-member electoral systems, like Germany’s, typically combine nominal-tier elections with list-tier elections.\footnote{Matthew Shugart and Martin Wattenberg, ‘Mixed-Member Electoral Systems: A Definition and Topology’, in Matthew Shugart and Martin Wattenberg, eds, \textit{Mixed-Member Electoral Systems: The Best of Both Worlds?} (Oxford: Oxford University Press, 2001), pp. 9-24; Frank C. Thames and Martin S. Edwards, ‘Differentiating Mixed-Member Electoral Systems’, \textit{Comparative Political Studies}, 39 (2006), 905-27.} In the former, citizens vote for individual candidates who accrue votes independently of party affiliation. In the latter, the distribution of legislative seats is according to votes for multiple candidates nominated on party lists.

Germany’s system is characterized as a mixed member proportional system (MMP) by Shugart and Wattenberg because the total number of legislative seats received by a party is proportional to its list-tier results.\footnote{Shugart and Wattenberg, ‘Mixed-Member Electoral Systems’} Since linking the tiers obtain outcomes that are proportional, MMP systems, like Germany’s, often resemble pure PR systems. In fact, several previous studies of the effects of mixed-member systems have demonstrated the similarity between MMP and PR systems.\footnote{Robert G. Moser, ‘The Effects of Electoral Systems on Women's Representation in Post-communist States’, \textit{Electoral Studies}, 20 (2001), 353-69; Karen Cox and Len Schoppa, ‘Interaction Effects and Mixed Member Systems: Theory and Evidence from Germany, Japan and Italy’, \textit{Comparative Political Studies}, 35 (2002), 1027-53; Frederico Ferrara and Erik Herron, ‘Going it Alone? Strategic Entry Under Mixed Electoral Rules’, \textit{American Journal of Political Science}, 49 (2005), 16-31; Thames and Edwards, ‘Differentiating Mixed-Member Electoral Systems’.} Germany is therefore included together with pure PR systems in the current study (i.e. PR equals 1).

Several additional measures of electoral institutions are used to test the robustness of the results to various specifications of countries’ institutions. First, Gallagher’s least squares index, which measures disproportionality between the distributions of votes and seats, is
This variable (Disproportionality) ranges, in theory, from 0 to 100. Lower values indicate less disproportionality. An electoral system where the legislature perfectly matches the distribution of votes would receive a score of zero. A legislature scoring 100 would consist only of individuals for whom not a single member of the electorate voted. Usefully, Gallagher’s disproportionality index provides greater cross-national variation than the dichotomous measure of electoral systems (PR).

Second, the variable Ballot, measures parties’ control over access to the ballot. Access to the ballot determines, in part, the extent to which an electoral system is candidate or party centred. Politicians competing in candidate-centred systems tend to have geographically defined constituencies and thus an incentive to cater to geographically concentrated interests. In contrast, politicians competing in party-centred systems tend not to have geographically defined constituencies. Instead, candidates’ electoral fortunes are determined by their party’s national electoral success and thus politicians in party-centred systems have fewer incentives to cater to geographically-defined interests.

Third, Mean District Magnitude refers to the number of seats filled according to the vote tally from a given district. Plurality systems generally have an average district magnitude of one. In the sample of 14 countries, mean district magnitude ranges from one to 150. The variable Mean District Magnitude is logged to minimize the potential impact of outliers.

To investigate whether the effect of electoral systems on subsidies is conditional on the geographic distribution of voters with a shared interest in subsidies, the estimated models

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57 This measure is calculated for each country-election-year. For non-election years, the least squares index from the most recent previous election is used. If two elections occur in the same year, the average of the least squares index (LSq) for that country-year is used.

58 These data are from Joel W. Johnson and Jessica S. Wallack, ‘Electoral Systems and the Personal Vote’, Available at [http://polisci2.ucsd.edu/jwjohnson/espv.htm](http://polisci2.ucsd.edu/jwjohnson/espv.htm). (Accessed April 14, 2011.)

59 Johnson and Wallack, ‘Electoral Systems and the Personal Vote’
include an interaction term equal to the product of electoral systems and Concentration, along with both constitutive terms. More precisely, a partial-adjustment regression is estimated by ordinary least squares (OLS) with the following form and robust standard errors:

\[
\text{Subsidies}_{it} = \beta_0 + \beta_1 \text{PR}_{it-1} + \beta_2 \text{Concentration}_{it-1} + \beta_3 \text{PR}_{it-1} \times \text{Concentration}_{it-1} + \beta X_{it-1} + \lambda_t + \varepsilon_{it}
\]

where \( \lambda_t \) is a year fixed effect, and \( \varepsilon_{it} \) is an error term. The coefficient on \( \beta_3 \) is expected to be negatively signed; as the geographic concentration of manufacturing employment increases, politicians in plurality systems will become relatively more responsive to demands for subsidies.

\( X_{it-1} \) refers to a vector of control variables, which are lagged by one year to minimize concerns about endogeneity and account for the fact that government budgets generally go through the legislative process and are voted on prior to the year in which spending occurs.\(^{60}\) All estimated models include three key control variables: The first is a measure of trade openness. Since manufacturing subsidies assist domestic producers’ in competing with lower cost foreign imports, countries more open to trade may spend more on subsidies. This is problematic if trade openness systematically relates to electoral institutions. Rogowski argued that countries dependent on international trade are more likely to have proportional electoral rules.\(^{61}\) To minimize the potential for spurious correlation, a variable measuring trade openness as the sum of imports plus exports divided by GDP is included as a control.

The necessary second control variable is country size, measured by the natural log of a country’s land area in square kilometres. Large countries will tend to have bigger manufacturing industries, which may increase government spending on manufacturing subsidies. Country size may also relate systematically to electoral systems; larger countries

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\(^{60}\) Bawn and Rosenbluth, ‘Short Versus Long Coalitions’.

are more likely to have plurality electoral rules. Controlling for country size minimizes the possibility of finding a spurious correlation between electoral rules and manufacturing subsidies.

The third control variable included in all estimated models is \textit{GDP per capita}. Electoral support from lower-income voters may be relatively cheaper to “buy” using subsidies. Manufacturing subsidies may, therefore, be higher in countries whose voters have lower incomes as a result of strategic vote-maximizing spending by national governments.

Despite the potential relationship among the three control variables, standard tests show acceptable levels of multicollinearity. Introduction of additional control variables one-at-a-time further minimizes multicollinearity. These additional control variables are:

\textit{Federalism}, a dichotomous variable coded 1 for federal systems and 0 otherwise. This is a potentially important control since the spending data refer only to central government expenditures. Data on general government spending, including that from local and regional governments, is often missing and when available it tends to be less reliable than central government spending data. Furthermore, the precise definition of local and regional governments’ outlays are often incomparable among countries and time periods.

Central government expenditures on subsidies may be lower in federal systems than non-federal systems if some of the burden of subsidizing industries falls to regional and local governments. This would be particularly problematic if federal systems co-vary with electoral

\begin{flushleft}
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\textsuperscript{64} The variance inflation factor (VIF) is less than 4 for all variables included in the estimated models, as recommended by Evelyne Huber, Charles Ragin and John D. Stephens, ‘Social Democracy, Christian Democracy, Constitutional Structure and the Welfare State’, \textit{American Journal of Sociology}, 99 (1993), 711-49.
\textsuperscript{65} Persson and Tabellini, \textit{The Economics Effects of Constitutions}.
\textsuperscript{66} Persson and Tabellini, \textit{The Economics Effects of Constitutions}.
\end{flushleft}
systems. In other words, if plurality electoral systems occur more often in federal systems, identifying a spurious negative correlation between plurality electoral rules and subsidy spending may be possible. To minimize this possibility, *Federalism* is introduced as a control variable.

*Sector Employment* equals the number of people employed in the manufacturing sector as a percentage of the total labour force. This is a potentially important control variable because the number of people employed in manufacturing may influence both the amount spent on manufacturing subsidies and the geographic distribution of manufacturing employees.

*Left* is a dichotomous variable coded one if the largest governmental party is left of centre and zero otherwise. In general, governments’ industrial policies tend to have only a minimal ideological component. Indeed, Verdier found that left-leaning governments spend more on subsidies favouring labour while right-leaning governments spend more on subsidies that favour capital. Given this, the effect of a government’s ideology on total subsidies to the manufacturing sector is unclear. However, controlling for ideology is important because left governments tend to be associated with proportional electoral systems. Failure to control for the ideological tendency of a government could result in mistakenly assigning explanatory power to electoral rules rather than ideology.

*Concentration (squared)* tests for the possibility that maximum political influence occurs at some intermediate level of geographic concentration. The literature on interest group politics in plurality systems hypothesizes a positive coefficient for the un-squared

concentration term and a negative coefficient for the squared term. In other words, concentration may increase a group’s political influence only up to some point. Beyond that point, any additional increase in geographic concentration may reduce the group’s political influence.

Table 1 reports the coefficient estimates for the OLS regression of manufacturing subsidies on PR, Concentration, the key interaction term and the control variables. The coefficient estimates provide evidence that the geographic distribution of voters with a common narrow interest matters for accurately specifying the effects of electoral rules. Subsidies for the manufacturing sector constitute a larger share of government expenditures in plurality systems than in PR systems when manufacturing employment is geographically concentrated. However, when employment is diffuse, governments in PR systems assign relatively more of their budgets to subsidies than governments in plurality systems, holding all else equal.

The key interaction term, which equals the product of PR and Concentration, is included in Columns 2 through 8. Therefore, the estimated coefficient for PR in Columns 2 through 8 reports the marginal effect of PR for the unique case when Concentration equals zero. When Concentration equals zero, the effect of proportional electoral rules on


71 Thomas Brambor, William Roberts Clark and Matt Golder, ‘Understanding Interaction Models: Improving Empirical Analyses’, Political Analysis, 14 (2006), 63–82, p. 74; Robert J. Franzese and Cindy D. Kam, Modelling and Interpreting Interactive Hypotheses in Regression Analyses. (Ann Arbor: University of Michigan Press, 2007). The unconditional (or average) effect of proportional electoral rules (PR) on manufacturing subsidies is positive and statistically significant, as reported by the coefficient for PR in Column 1 of Table 2. This finding is consistent with those reported by Rogowski and Kayser, ‘Majoritarian Electoral Systems and Consumer Power’ and Chang, Kayser and Rogowski, ‘Electoral Systems and Real Prices’. These studies found that more proportional systems are associated
manufacturing subsidies is positive and statistically significant. In other words, governments elected via PR spend more of their budgets on subsidies than governments in plurality systems when the geographic diffusion of manufacturing employees is exactly proportional to total employment.

The marginal effect of PR is positive and significant whenever Concentration is less than 0.033. When Concentration is less than 0.033, as it is for 67 percent of the sample, governments in proportional rule systems assign relatively more of their budgets to manufacturing-sector subsidies than governments in plurality systems, holding all else equal. Arguably, this is because manufacturing subsidies provide greater electoral benefits to politicians in PR systems than politicians in plurality systems when voters employed in the sector are geographically diffuse. If the geographic diffusion of manufacturing employees is exactly proportional to total employment (i.e. Concentration equals zero), politicians cannot use manufacturing subsidies to target voters in select electoral districts. In proportional systems where voters’ geographic locations are unimportant for the electoral success of parties, this is not a problem. However, in plurality systems, elections are won district-by-district and therefore parties and politicians seek to target benefits to voters in geographically-defined electoral districts. Given this, subsidies are relatively less valuable with higher consumer prices. Subsidies are one obvious means by which government policy may increase consumer prices.

72 A large and unresolved debate exists over precisely which electoral districts are most likely to be targeted by parties competing in plurality systems. Gary W. Cox and Mathew D. McCubbins ‘Electoral Politics as a Redistributive Game’, *The Journal of Politics*, 48 (1986), 370-89 argue, For example, some argue that parties use transfers to reward loyal voters. In contrast, Dixit and Lodregan in ‘The Determinants of Success of Special Interests in Redistributive Politics’ argue that parties target transfers to swing voters. It is not necessary (or possible) to mediate between these theories in this paper. Both theories agree that parties and politicians in plurality systems want to target benefits to geographically-defined constituents. Thus, the key point holds: plurality electoral rules incentivize parties and politicians to target benefit to geographically-defined constituents. Sector-specific subsidies can be used to target benefits to geographically-defined constituents only when sectors are geographically concentrated. When sectors are geographically diffuse, sector subsidies are inefficient electoral tools for parties and politicians competing in plurality systems.
to politicians competing for office in plurality systems when the beneficiaries of subsidies are geographically diffuse. Therefore, manufacturing subsidies account for a smaller share of government expenditures in plurality systems than in proportional systems when manufacturing employment is diffuse.

As expected, the positive marginal effect of PR on subsidies declines and eventually becomes negative as Concentration increases. The marginal effect of PR on subsidy budget shares is calculated across the observed range of Concentration using the relevant elements from Column 2 in Table 1. Figure 1 graphically reports these results. The solid line in Figure 1 represents the marginal effect of PR on subsidy budget shares and the broken lines represent the 95% confidence intervals for two-tailed tests. Whenever both the upper and lower bounds of the confidence interval appear above (or below) the zero line, the marginal effect of PR is statistically significant at the .05 level.

Subsidies constitute a larger share of government expenditures in plurality systems than in proportional systems when voters with an economic interest in subsidies are geographically concentrated. When Concentration is greater than .054, proportional electoral rules have a negative marginal effect on the share of government appropriations devoted to subsidies. The reductive effect of plurality electoral rules on subsidy spending shares holds for nearly 15 percent of the sample.

At intermediate levels of concentration, no statistically significant difference exists between PR systems and plurality systems. The marginal effect of proportional electoral rules is not statistically different from zero when Concentration falls between .033 and .054. When

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73 The coefficient matrix and the variance-covariance matrix from Column 2 are used to calculate the marginal effects of PR. For a complete description of these matrixes and the precise formulas used to calculate the marginal effects and standard errors, see Brambor, Clark and Golder, ‘Understanding Interaction Models’ and Aiken and West, *Multiple Regression: Testing and Interpreting Interactions* (London: Sage Publications, 1991). The computer code used to calculate the marginal effects and standard errors are available at https://files.nyu.edu/mrg217/public/interaction.html

74 Brambor, Clark and Golder, ‘Understanding Interaction Models’, p. 76.
manufacturing employment is neither concentrated nor diffuse, governments elected via
different electoral systems allocate similar percentages of their budgets to manufacturing-
sector subsidies, all else equal. In other words, there are some conditions under which
electoral rules do not matter for governments’ subsidy spending. Failing to account for the
geographic distribution of voters that share a narrow interest may lead to incomplete, and
potentially inaccurate, conclusions about the effects of electoral rules on politicians’
responsiveness to narrow interests.

A few words about the control variables are in order. Countries more open to foreign
trade spend relatively more on manufacturing subsidies, all else equal. This suggests that
governments fund subsidies at least in part to shield domestic manufacturers from the effects
of international trade. Typically, the assumption in much of the literature on globalization and
spending is that governments respond to trade openness by increasing spending on social
welfare programs.75 However, the results reported here suggest that governments use multiple
fiscal policies to offset the costs of trade, including subsidies. Understanding when and under
what circumstances governments choose a particular fiscal policy in response to globalization
is an important question for future research.76

Country size, measured by the natural log of a country’s land area in square
kilometres, is consistently positive and significant. Apparently, larger countries spend
relatively more on subsidies for their manufacturing sectors as a share of total government
expenditures (minus interest payments), all else equal.

GDP per capita has a negative effect on subsidies. A possible explanation is that
richer voters have greater abilities to self-insure against price volatility and income risk.

Studies in Comparative International Development, 35 (2001), 3-29; Nita Rudra,
Alternatively, lower-income voters may be less costly to attract with subsidies\textsuperscript{77} and consequently governments in countries with lower levels of GDP per capita spend more on subsidies.

A number of sensitivity analyses evaluate the robustness of the current study’s key findings.\textsuperscript{78} First, several different measures of electoral institutions are used to test the robustness of the results to alternative specifications of countries’ institutions. Gallagher’s disproportionality index is substituted for the dichotomous variable, \textit{PR}. Results found using Gallagher’s disproportionality index show that more proportional electoral systems favour geographically diffuse interests, while less proportional systems favour more concentrated interests. These results are reported in Table 2. Using the relevant elements of the variance-covariance matrix from Column 2 in Table 2, the marginal effect of \textit{Disproportionality} is calculated across the entire range of \textit{Concentration}. When \textit{Concentration} is less than .009, the marginal effect of \textit{Disproportionality} is negative and statistically significant.\textsuperscript{79} An increase in the disproportionality of electoral outcomes decreases subsidy spending shares when manufacturing employment is geographically diffuse. As employment becomes more and more concentrated, the negative marginal effect of \textit{Disproportionality} declines in magnitude and eventually becomes positive and statistically significant. When \textit{Concentration} is greater than .055, an increase in the disproportionality of electoral outcomes increases subsidy spending shares. This is consistent with the finding that \textit{PR} has a negative marginal effect on subsidy spending shares when manufacturing employment is geographically concentrated.

\textsuperscript{77} Dixit and Londregan, ‘The Determinants of Success of Special Interests in Redistributive Politics’; Lindbeck and Weibull ‘Balanced Budget Redistribution and the Outcome of Political Competition’.

\textsuperscript{78} For example, excluding the UK from the sample does not change the key results. Similarly, the key results are robust to alternative model specifications including OLS models with Driscoll-Kraay standard errors and the Newey and West estimator with lag length one.

\textsuperscript{79} This holds for approximately 10 percent of the sample.
Table 2 also reports the estimated coefficients on *Ballot* and *Mean District Magnitude*. The estimated coefficients on *Ballot* demonstrate that geographically concentrated sectors win more subsidies in candidate-centred systems than in party-centred systems. Geographically diffuse sectors win more subsidies in party-centred systems than in candidate-centred systems. Arguably, this is because politicians’ relevant constituencies tend not to be geographically defined in party-centred systems. In these systems, candidates maximize their chance of being in office by working to maximize the party’s share of the national vote. In contrast, politicians’ best electoral strategy in candidate-centred systems is to appeal directly to the interests of their geographically-defined constituents by, for example, providing subsidies to geographically concentrated industries.

The estimated coefficients on *Mean District Magnitude* show that governments elected from multi-member districts allocate less government money to subsidies than governments elected from single-member districts when manufacturing employment is geographically concentrated. More precisely, when *Concentration* is greater than .27, *Mean District Magnitude* has a negative and significant marginal effect on subsidy budget shares, all else equal. The magnitude of the reductive effect of *Mean District Magnitude* increases as *Concentration* increases.

In sum, different measures of electoral institutions report strikingly consistent results. Taken together, these results demonstrate that the geographic distribution of voters with an interest in subsidies is a necessary consideration needed to accurately specify the effects of electoral rules on subsidy spending.

The OLS models estimated thus far do not account for the fact that the choice of electoral institutions is not likely to be random. Although countries choose their own electoral systems, it seems improbable that the choice of electoral rules would be endogenous

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to manufacturing subsidies in the short to medium term. Similarly, it seems unlikely that electoral rules would be endogenous to changes in the geographic concentration of manufacturing employment in recent decades. There is no difference between the average levels of geographic concentration in PR systems and plurality systems.\footnote{This may be because no direct relationship exists between geographic concentration and electoral systems. Instead, as Thomas R. Cusack, Torben Iversen and David Soskice, ‘Economic Interests and the Origins of Electoral Systems’, \textit{American Political Science Review}, 101 (2007), 373-91 argue the effects of geographic concentration on electoral rules may be conditional on the type of asset investment.} The sample mean value of Concentration is equal to .035 in PR countries and .031 in plurality countries. The difference (-.004) is not statistically significant, as demonstrated by a two-sample t-test with equal variances.

The fact that the geographic concentration of manufacturing employment is no higher in plurality systems than in PR systems, on average, helps to minimizes concerns about the potential endogeneity of electoral institutions. A two-stage least squares model is estimated to further allay concerns about endogeneity. Following Persson and Tabellini, Evans and others, indicators of the historical periods during which the current electoral rules were adopted are used as instruments in the first stage of the model.\footnote{Persson and Tabellini, \textit{The Economics Effects of Constitutions}; Evans ‘A Protectionist Bias in Majoritarian Politics’.} The distribution of current electoral rules vary with the age of the rules.\footnote{Persson and Tabellini, \textit{The Economics Effects of Constitutions}.} Experience of other democracies and prevalent political and judicial doctrines shift systematically over time and may explain why the distribution of current electoral rules vary with the age of the rules. To exploit this temporal pattern, three dummy variables are constructed that correspond to the periods 1921-1950, 1951-1980 and post-1981, which take a value of 1 if the current electoral rule originated in the respective period, and 0 otherwise.\footnote{Persson and Tabellini, \textit{The Economics Effects of Constitutions}, demonstrate that these periods best describe the pattern of electoral system adaptation.} Although countries’ electoral systems are associated with the year
in which countries’ constitutions were adopted, the date at which a country adopts its constitution is unlikely to directly affect industrial policy or manufacturing subsidies.

The results from the second-stage of the 2SLS model are reported in Table 3. As before, the marginal effect of PR on subsidies is positive and statistically significant at low levels of geographic concentration. As Concentration increases, the positive marginal effect of PR declines and eventually becomes negative. At high level of Concentration, the marginal effect of PR is negative, substantively large and statistically significant. In short, the key results are robust to an alternative model specification that relaxes the assumption that electoral systems are exogenous.\(^{85}\)

Before concluding, considering possible alternative explanations for the reported results is a worthy pursuit. Production factors employed in geographically concentrated sectors may confront higher adjustment costs than factors in geographically diffuse sectors. This raises the possibility that asset specificity rather than Concentration, per se, explains the reported results. To test for this possibility, a measure of labour mobility is introduced as a control variable. This measure estimates the adjustment costs facing workers in the manufacturing sector by calculating the rate of labour movement between industries in the sector.\(^{86}\) The rate of movement varies according to the costs to workers of voluntarily entering and exiting different industries. Higher rates of movement indicate lower adjustment costs. Including Labour Mobility in the estimated model does not change the key results and suggests that geographic concentration is, in fact, the source for explanation rather than adjustment costs.

\(^{85}\) If anything, correcting for potential endogeneity appears to reduce the standard errors on the estimated marginal effect of PR.

Another plausible alternative explanation is the number of parties in government. The current study’s argument maintains that electoral systems affect politicians’ incentives to cater to certain constituencies and that these incentives influence spending on subsidies. Alternatively, electoral systems may influence subsidy spending via the number of parties in government. Single-party governments are most common in plurality systems, while PR systems are more likely to foster multi-party governments. Bawn and Rosenbluth argued that multi-party governments will spend more than single-party governments because multi-party governments negotiate less efficient logrolls. This raises the possibility that multi-party governments will spend more on subsidies than single-party governments. If this is the case, the reported results may not be the consequence of the suggested electoral dynamics but rather the accountability and bargaining dynamics induced by multi- versus single-party governments.

To test for this possibility, the number of parties in government is introduced as an additional control variable. Including the number of parties in government as a control variable in the estimated model does not change the key results. The fact that the key results are robust, even with the inclusion of this variable, demonstrates that electoral systems affect spending on subsidies via their influence on politicians’ incentives to cater to certain interests rather than the composition of governments.

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87 Bawn and Rosenbluth, ‘Short Versus Long Coalitions’.
### Table 1: Effect of PR on Subsidy Budget Shares

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<td>1.547***</td>
<td>1.548***</td>
<td>1.962***</td>
<td>1.421***</td>
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<td></td>
<td>(0.118)</td>
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<td>L.PR*L.Concentration</td>
<td>-40.72***</td>
<td>-40.72***</td>
<td>-47.90***</td>
<td>-34.91***</td>
<td>-55.89***</td>
<td>-26.05*</td>
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<td>-15.61***</td>
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<td>24.63*</td>
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<td>(12.96)</td>
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<td>0.017***</td>
<td>0.017***</td>
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<td>L.GDP per capita (log)</td>
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<td>-1.875***</td>
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<td>0.272***</td>
<td>0.272***</td>
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<td>(0.057)</td>
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<td>L.Mobility</td>
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Robust standard errors appear in parentheses. All models include year fixed effects. Year coefficients are not reported due to space constraints. *** p<0.01, ** p<0.05, * p<0.1
Table 2: Effects of Alternative Measures of Electoral Rules on Subsidy Budget Shares

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Robust standard errors appear in parentheses. All models include year fixed effects. Year coefficients are not reported due to space constraints. *** p<0.01, ** p<0.05, * p<0.1
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Figure 1: Marginal Effect of $PR$ on Subsidy Budget Shares