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Bringing home the bacon: an empirical analysis of the extent and effects of pork-barreling in Australian politics

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Abstract Which electorates receive targeted funding, and does targeted funding swing votes? To answer these questions, I analyze four discretionary programs funded by the Australian federal government during the 2001–2004 election cycle. Controlling for relevant demographic characteristics of the electorate, those electorates held by the governing coalition received a larger share of discretionary funding, and a larger number of program grants. Among government seats, funding does not appear to have been directed towards those that were more marginal. More discretionary funding—particularly on road-building—was associated with a larger swing towards the government in the 2004 election.

Keywords Elections · Local expenditure · Voting · Targeted funding · Pork barreling

JEL Classification D72 · R58

1 Introduction

Pork barrel politics—the practice of targeting expenditure to particular districts based on political considerations—has been in existence for at least two centuries.[1] In the United States, where the term is often used, over 15,000 projects per year are "earmarked" for particular districts (Flake 2006). Variously sponsored by representatives of both major parties, such projects are frequently added onto budget appropriations to accommodate constituents, campaign donors, or potential supporters.

[1] Gordon (1993) argues that the construction of the Egyptian pyramids was a form of pork-barreling, designed to keep peasants from rebelling. A more settled example is the US *Bonus Bill* (1817), a highway project introduced by then Congressman John Calhoun, but ultimately vetoed by President Madison. The Oxford English Dictionary dates the first use of the term "pork barrel" to an article written in the *Westminster Gazette* in 1909.

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While pork-barreling has been extensively studied in the United States, less research has been conducted on the phenomenon among parliamentary democracies, in which political parties typically exert more control over their legislators. When decision-making over local expenditure is more highly centralized, resources may be allocated differently than in a decentralized system.

Here, I focus on four multi-million dollar Australian programs that were allocated on a discretionary basis across federal electorates. As a parliamentary democracy with compulsory voting, Australia provides a useful testing-ground for theories about the partisan allocation of discretionary funding—both between government and opposition, and within the governing Liberal-National Coalition. It also provides an opportunity to explore the effect of additional spending on voting patterns in the subsequent election.

To preview my findings, I observe a strong partisan component to the expenditure decisions, with more generous funding and more program grants allocated to electorates held by the party in power. This result is robust to controlling for demographic characteristics of the electorate that might have affected the allocation of funding. Estimating the effect of this expenditure on voting, I find that targeted funding—particularly roads funding—had a positive and statistically significant impact on the vote received by the Liberal-National Coalition in the 2004 election.

The remainder of this paper is organized as follows. Section 2 briefly reviews the relevant literature. Section 3 outlines the data and institutional context. Section 4 estimates the extent to which funding decisions appear to have been skewed by political considerations. Section 5 estimates the effect of the funding on the results in the following election, and the final section concludes.

2 Research on pork-barreling

The ability of governments to apportion local-level expenditure for partisan purposes has long been of interest to political scientists and economists (for a recent review of the literature, see Evans 2004). One set of studies has focused on the relationship between electoral systems and pork-barrel politics. For example, Lancaster (1986) points out that one should expect more pork-barreling in countries with single-member electorates (e.g., Australia, Britain, Canada) than in countries with multi-member electorates (e.g., Italy, Israel, the Netherlands). This occurs because voters in multi-member systems are unsure which politician to reward for a particular piece of pork, which leads to more free-riding among representatives, and therefore a lower level of pork-barreling. (In the formulation of Mayhew 2004, "credit claiming" is most straightforward when a single member of parliament has responsibility for each district.) Another factor that may explain cross-national differences in the level of pork-barreling is the potential for clientelism and corruption to be mutually reinforcing in countries with weak democratic institutions (Manzetti and Wilson 2007).

Another key question in this literature is whether politicians allocate resources primarily towards swing seats or safe seats. While Cox and McCubbins (1986) posited a model in which politicians are risk-averse, and therefore channel resources more generously towards their core supporters, Dixit and Londregan (1996) argued that in certain circumstances, politicians may prefer to spend money on swing voters.

Several studies have sought to determine whether a greater share of spending is directed towards core supporters or swing voters. Programs that seem to be more targeted towards core supporters include Canadian regional development grants (Milligan and Smart 2005), Italian provincial infrastructure spending (Golden and Picci 2008), and New Deal funding

in the United States during the 1930s (Lindstädt 2005). By contrast, those that appear to be more targeted towards swing voters include Canadian job training grants (Crampton 2004), French road spending (Cadot et al. 2006), allocations to Indian states (Arulampalam et al. 2008), and Swedish environmental spending (Dahlberg and Johansson 2002).[2]

In the Australian context, two studies of a $60 million sports grants program in the early 1990s concluded that the spending was directed in a partisan fashion, primarily towards swing voters (Gaunt 1999; Denemark 2000). Similarly, an analysis of federal programs for the unemployed (Andrews et al. 2005) found that the program was skewed towards government-held marginal electorates.

Within single-member electorate systems, the power of individual members relative to political parties has been regarded as important. Theory predicts that in systems with weaker political parties and stronger individual members, pork-barreling will tend to be directed towards core supporters. By contrast, when parties are stronger and individual members weaker, discretionary funding is more likely to be targeted towards electorates with smaller vote margins.[3] As Denemark (2000, 898) has noted:

> Unlike the sharp dichotomy between the interests of the individual and the party that fuels constituency activities in America, parliamentary parties in government confront a collective electoral imperative to assure the victory of their most vulnerable party colleagues in marginal seats. In short, the parliamentary gap between individual and collective interests is 'virtually nonexistent' (Cain et al. 1984: 111).[4]

With some exceptions (e.g., Milligan and Smart 2005), the empirical literature across countries has tended to support this theoretical prediction.

How much does pork-barreling matter at the ballot box? While some studies have observed little or no relationship between local expenditure and vote share (Feldman and Jondrow 1984; Stein and Bickers 1994), others have found that more spending raises the vote share of the incumbent (Alvarez and Saving 1997b; Levitt and Snyder 1997). Levitt and Snyder (1997) suggested that if spending levels are higher when the incumbent is weak, the coefficient on expenditure might be biased downwards, and instrument for local spending using spending in the same state but outside the district. I discuss this possible bias in Sect. 5.

3 Data and institutional context

3.1 Background

Australia is a bicameral parliamentary system. For elections to the House of Representatives, which will be the focus of this study, the preferential system of voting (also termed instant-runoff) is used. Voters number candidates on the ballot in order of preference. Once all votes have been counted, the candidate with the lowest number of votes is eliminated and that candidate's votes distributed to the remaining candidates according to the preference

[2] Other studies have looked at the manner in which committee memberships affect the distribution of pork-barreling in the United States (e.g., Alvarez and Saving 1997a; Stein and Bickers 1995).

[3] An additional factor in Australia is the existence of compulsory voting, which substantially reduces the risk that the governing party's core supporters will refuse to vote.

[4] The word "virtually" is important here. Even in the strict party discipline of the British system, Cain et al. (1984) note that candidates have an incentive to build their personal vote.

orderings on each ballot paper. This process continues until one candidate has more than 50% of the vote.[5] The term of office is a maximum of three years, and the government has discretion in setting the election date.

Since World War II, the three major political parties in Australia have been the Australian Labor Party (a left-wing party closely aligned with the trade union movement), the National Party (a right-wing rural party) and the Liberal Party (a right-wing party with a more urban base). In the post-war era, the Liberal and National Parties have operated in permanent coalition with one another, with the exception of two brief breaks in 1973–1974 and 1987. During the period covered by this study (2001–2004), the Liberal-National Coalition, led by Prime Minister John Howard, held office. This government came to power in 1996 and held office until 2007, winning elections in 1996, 1998, 2001, and 2004. In the 2001 federal election, the Labor Party received 38% of the first preference vote, the Liberal Party 37%, and the National Party 6%. In the 2004 federal election, the three parties' first preference vote shares were 38%, 41%, and 6% respectively. Voting is compulsory in Australia, and in the 2001 and 2004 elections the fine for failing to vote was A$20, approximately equal to the median hourly wage.

In selecting the programs used in this study, my focus is on Australian federal government programs that meet the following criteria:

(a) they are regional in nature, and allocated in a manner that allowed for some discretion by politicians;
(b) grants were largely announced or delivered between the 10 November 2001 and 16 October 2004 federal elections; and
(c) statistics on the size of the funding are available by electorate.

Four programs meet these three criteria: Roads to Recovery, Stronger Families & Communities, Sustainable Regions, and Regional Partnerships. In Sects. 3.2 to 3.5, I discuss each of the programs, focusing on the aims of the programs, the dates when the funding was delivered, the funding criteria, the source of the funding data, and any publicly available cost-benefit analyses. Section 3.6 outlines the electoral and demographic variables.

3.2 Roads to Recovery

The Roads to Recovery program was announced in November 2000, and commenced in January 2001. It provides funding to local councils to undertake "the construction, upgrade or maintenance of roads". Overall, 46% of funding was devoted to reconstruction, rehabilitation or widening of existing roads, 26% to sealing or resealing, 7% to bridges and tunnels, and 6% to the construction of a new road. The remainder of the funding was devoted to smaller programs, including signage, street lighting and bicycle paths (Department of Transport and Regional Services and the Australian Local Government Association [DOTARS/ALGA] 2003).

To prevent federal funding merely being substituted for state funding, a condition of receipt is that local councils are required to maintain their roads expenditure at the same level as in the 1998–99 to 2000–01 financial years. Another condition requires that each of the projects be signposted at both ends with a "Roads to Recovery" sign, acknowledging the financial assistance of the federal government (with each pair of signs costing $550, the total cost of this advertising across more than 8000 projects nationwide exceeds $4 million). The

[5] The Australian Senate is elected through the single-transferable vote system. At an ordinary election, there are six vacant Senate positions from each of the six states, and two from each of the two territories.

allocation mechanism is somewhat opaque, but according to the program's annual report (DOTARS 2004), funding is allocated across states and territories according to "historical precedents, length of local roads and population". The report does not make clear precisely how funding is allocated across local areas.

In this analysis, I focus on $1.1 billion of funding allocated between January 2001 and June 2005 ($1.2 billion was allocated, but not all projects could be matched to a federal electorate). For the most part, this funding was announced and delivered during the 2001–04 election cycle. Figures were tabulated according to local councils (DOTARS 2004), and were then matched to federal electorates by Davis (2005).[6]

In 2003, the federal government commissioned a cost-benefit analysis of the programs (DOTARS/ALGA 2003). This covered 80 projects, slightly less than 1% of the total number of Roads to Recovery projects funded to that point. Based on data provided by councils (most of which failed to supply the requested data), the analysis concluded that the average benefit-cost ratio of Roads to Recovery projects was 1.8. However, the distribution was highly skewed. While some projects had benefit-cost ratios as high as 16, most were much lower. 55% of projects had a benefit-cost ratio below one, so for the median Roads to Recovery program, the costs outweighed the benefits. Only 20% of programs had a benefit-cost ratio exceeding two. By contrast, the National Black Spot program, which also operated over this period, refused to consider applications for any programs whose benefit-cost ratio was lower than two (DOTARS 2001a: Part 2.1).[7]

3.3 Stronger Families & Communities

The Stronger Families & Communities Strategy commenced in April 2000. The strategy comprised four initiatives: (i) Communities for Children; (ii) Invest to Grow-Established and Developing Programs; (iii) Local Answers; and (iv) Choice and Flexibility in Child Care. Here, I focus on Volunteer Small Equipment Grants delivered under the "Local Answers" program in the financial year 2004–05. Although the 2004 federal election was held early in the financial year, these grants typically were announced or delivered prior to the election.

The aim of the Local Answers program was to support projects that: "build effective parenting and relationship skills; build opportunities and skills for economic self reliance in families and communities; strengthen support to families and communities by delivering better services and addressing unmet needs through the building of partnerships between local services; assist young parents in particular to further their education or access to training and other services where they are seeking to make the transition to employment; assist members of the community to get involved in community life through local volunteering or mentoring of young people or training to build community leadership and initiative."

[6] In a 10 March 2008 email to me, Davis stated that "The Roads to Recovery figures were reported on a Local Government Area basis because the money goes straight to local councils. I converted those figures firstly to statistical local areas and then from SLAs (Statistical Local Areas) to federal electorates, allocating the LGA (Local Government Area) spending amounts according to population distributions." Davis did not tabulate figures for the Australian Capital Territory (ACT) and the Northern Territory (NT), each of which were allocated $20 million. In the absence of further detailed breakdowns, I assume that the seats of Canberra (ACT), Fraser (ACT), Lingiari (NT) and Solomon (NT) each received $10 million.

[7] Using the same methodology as Davis (see previous footnote), I summed the estimates in the DOTARS/ALGA cost-benefit report to a federal electorate level, and tested whether there was any relationship between the benefit/cost ratio and the political party that held the seat at the 2001 election. I found no statistically significant relationship, but in any case, it should be borne in mind that these projects were probably not a random sample of all Roads to Recovery projects.

(Department of Family and Community Services [FaCS] 2005a). So far as I am aware, no cost-benefit analysis of the Local Answers program was conducted.[8]

Volunteer Small Equipment Grants were grants to "encourage and support volunteers by enabling local community organizations to purchase small equipment items to make the work of their volunteers easier, safer and more enjoyable" (FaCS 2005a). The funding data, tabulated by electorate, were provided by FaCS in response to a question on notice by Senator Chris Evans.[9] It covered 1206 grants, ranging in value from $59 to $4545.[10] For example, grants included $2200 to the Apex Club of Bairnsdale, $1833 to the Munglinup Pony Club, $2932 to the Ryde Regional Radio Cooperative, and $1204 to the Blackburn Community Church of Christ. Nationally, the grants amounted to $2.5 million, only a small fraction of the total expenditure on the Stronger Families & Communities strategy. These grant-level figures are then collapsed to electorate level.

3.4 Sustainable Regions

The Sustainable Regions program was announced on 29 August 2001, and was aimed at assisting regions facing major economic, social or environmental change. Initially, eight regions were selected, and each was allocated a maximum amount, to be spent between 2001 and 2006. The regions selected and the maximum amounts allocated were: the Atherton Tablelands, Queensland ($18 million); Wide Bay Burnett, Queensland ($8 million); Campbelltown-Camden, New South Wales ($12 million); Far North East New South Wales ($12 million); Cradle Coast, Tasmania ($12 million); Gippsland, Victoria ($12 million); Kimberley, Western Australia ($12 million); and Playford/Salisbury, South Australia ($12 million). In 2004, two additional regions were selected, to receive funding over the period 2004–2008. These were Northern Rivers and North Coast, New South Wales ($12 million); and Western Queensland and Western New South Wales ($21 million). These regions in turn allocate funding to specific local programs, focusing on particular regional priorities. Common priority areas include creating jobs, attracting new industries, attracting more young people to the area, and boosting tourism.

According to the government department responsible, a variety of considerations were taken in account in selecting the regions:

> Regions (including urban fringe areas as well as those outside capital cities) were identified against criteria that included remoteness as well as important socio-economic and demographic indicators, such as levels of unemployment, family income and structural change indices, amongst others. Importantly, each of the eight regions selected initially demonstrated a strong degree of initiative, self-reliance and commitment to community action. (quoted in Senate Finance and Public Administration Committee [SFPAC] 2005: para 9.7)

[8] The 2000–04 evaluation of the Stronger Families & Communities strategy was primarily qualitative in nature. A summary of the evaluation stated: "The key evaluation questions for Local Answers are: to what extent were aims and outcomes achieved? what were the success factors? what were the unintended project outcomes and how well were they addressed?" (FaCS 2005b).

[9] Senate Community Affairs Legislation Committee, *Answers to Estimates Questions on Notice, Family and Community Services Portfolio, 2004–05 Supplementary Budget Estimates—December 2004,* Stronger Families & Communities Strategy Question 31(k), Attachment A (provided in February 2005).

[10] Although FaCS (2005a, 2005b) stated that the grants were to be for amounts "up to $3000", one-quarter of the grants in the electoral breakdown were for amounts larger than $3000.

Ultimately, however, final decisions on the program were the responsibility of the minister. As the guidelines stated:

> The *Sustainable Regions Programme* is a discretionary grants programme. The funding of projects is at the discretion of the Minister for Transport and Regional Services. Therefore, meeting the assessment criteria and addressing one or more regional priorities does not guarantee funding. (quoted in SFPAC 2005: para 9.12).

A Senate Report on the program concluded that "The Committee has been unable to discover the process by which sustainable regions were selected by the minister" (SFPAC 2005: para 9.7). So far as I am aware, no cost-benefit analysis of the Sustainable Regions program has been conducted.

In this paper, I analyze electorate-level tabulations provided by the Department of Transport and Regional Services to the Senate Finance and Public Administration Committee. These tabulations cover individual programs funded under the Sustainable Regions program. For example, projects include $550,000 given to the North Coast Plywood Products Pty Ltd (New South Wales) to build new age plywood preservative treatment facilities; $950,000 given to Burra Foods Pty Ltd (Victoria) to build a cheese plant; $15,000 to the River of Gold Slate Mine Pty Ltd (Queensland) to develop a marketing plan, and $1.1 million to the City of Salisbury (South Australia) for the Wyatt Road Redevelopment Project. Projects were approved between April 2002 and December 2004. The data cover 192 projects, totaling $136 million. Of this, $64 million (181 projects) was spent on projects within a single federal electorate, while the remainder went to projects that were split across multiple federal electorates. In this analysis, I use only the $64 million that can be allocated to a single federal electorate, though the results shown below are similar if the split funding is used instead.

3.5 Regional Partnerships

The Regional Partnerships program, which commenced on 1 July 2003, was aimed at giving effect to the principles set out in the Coalition government's statement *Stronger Regions, A Stronger Australia* (DOTARS 2001b). The statement set out broad goals for regional assistance, emphasizing the desirability of different tiers of government working together, increasing the economic diversity of regional areas, and communities themselves identifying the programs they wished to fund.

The Regional Partnerships program replaced eight precursor programs (the Regional Solutions, Regional Assistance, Rural Transaction Centres, and Dairy Regional Assistance programs, plus four regional structural adjustment programs). Between 1 July 2003 and 31 December 2004, $124 million of expenditure was approved under the program (SFPAC 2005: para 2.39). The programs are administered by regional bodies known as Area Consultative Committees (ACCs were first established in 1995; there are 56 in Australia).

Similarly to the Sustainable Regions program, the guidelines for the Regional Partnerships program explicitly stated that:

> Regional Partnerships is a discretionary programme. The funding of projects, through Regional Partnerships, is at the discretion of the Federal Minister for Transport and Regional Services or the Federal Minister for Regional Services, Territories and Local Government, therefore meeting the assessment criteria does not guarantee funding. (quoted in SFPAC 2005: para 2.32)

Among the programs funded were $250,000 to develop a complex in Georgetown, Tasmania to house the Bass and Flinders replica ship; $550,000 for the Slim Dusty Foundation Ltd in Kempsey (NSW); $1.5 million for dredging work at the mouth of Tumbi Creek

(NSW); and $12.7 million for transitional support to the sugar industry. A Senate Committee raised questions about the high proportion of applications that were approved immediately prior to the 2004 federal election. So far as I am aware, no cost-benefit analysis of the Regional Partnerships program has been conducted.

In this paper, I analyze electorate-level tabulations provided by the Department of Transport and Regional Services to the Senate Finance and Public Administration Committee. These tabulations cover 511 projects, amounting to $111 million of the total $124 million allocated between July 2003 and December 2004.

3.6 Electoral and demographic variables

In both the 2001 and 2004 elections, there were 150 seats in the House of Representatives. However, as a result of redistributions that occurred in Queensland, South Australia and Victoria, two seats were abolished (Bonython, SA and Burke, Vic), and two new seats were created (Bonner, Qld and Gorton, Vic). Further complicating matters, data on the Roads to Recovery program are tabulated according to 2004 electorates, while data on the Stronger Families & Communities, Sustainable Regions and Regional Partnerships programs are tabulated according to 2001 electorates.

When analyzing Roads to Recovery expenditure (Sect. 4), I use the share of the vote received by the Coalition in 2001.[11] For this purpose, it is necessary to impute vote share to those seats that did not exist at the 2001 election. This is done using predictions from election analyst Antony Green, estimated prior to the 2004 election based on booth-level data from the 2001 election.[12] Since the booth-level data suggest that Labor would have won both seats in 2001, both are classified as Labor seats. The actual composition of the 150-seat parliament following the 2001 election was 69 Liberal, 13 National, 63 Labor, 3 Independent, 1 Green, and 1 Country Liberal. For the purpose of this analysis, the Country Liberal Party seat is coded as a National Party seat.

When estimating the effect that targeted funding had on election outcomes (Sect. 5), I calculate the "swing" towards or away from the Coalition in each electorate. For this purpose, it is desirable to measure the swing not by comparing the actual 2001 and 2004 results, but instead by using the booth-level results from 2001 to calculate what the election result would have been if the 2001 election had been held on the 2004 boundaries, and then comparing this to the actual 2004 election result.[13] The variable *Swing* is therefore the percentage point difference between the Coalition's share of the two-party vote in the 2001 election (on 2004 boundaries) and the Coalition's share of the two-party vote in the 2004 election.[14] On average, the Coalition received a 2 percentage point swing in its favor. At an electorate level, the

[11] Throughout this paper, references to the Coalition include the Liberal Party, the National Party, and the Northern Territory Country Liberal Party.

[12] Available at www.abc.net.au/elections/federal/2004/. For the seats of Calare, Cunningham, Kennedy and New England, Antony Green's two-party preferred estimates are not based on the two major parties. For these seats, I therefore use the actual 2001 two-party preferred vote instead.

[13] For the two seats that were eliminated in 2003, the 2004 vote was calculated as the average of the main seats into which the former 2001 seat was absorbed. Thus the hypothetical 2004 vote for Bonython was calculated as 46.2%, being the average of the two-party preferred vote in Makin, Port Adelaide and Wakefield, while the hypothetical 2004 vote for Burke was calculated as 44.2%, being the average of the two-party preferred vote for Gorton, Lalor and McEwen.

[14] In calculating the swing in this manner, I assume that the redistribution was exogenous with respect to funding allocations. This is likely to be a reasonable assumption, since the final decision on the new redistribution is made by the independent Australian Electoral Commission (AEC), giving regard primarily to population trends and natural boundaries between communities. Although the parties had an opportunity to

swing towards the Coalition varied from −12 percentage points (i.e., a 12 percentage point swing towards the Labor Party) to +22 percentage points.

Demographic variables are included to take into account possible characteristics of the seat that might have directly influenced the allocation of funding.[15] The variables selected are the population density (square kilometers per person), and the median family income (in thousands of dollars). Demographic characteristics are from Kopras (2003), based on the 2001 Census and 2001 electoral boundaries.[16]

Table 1 presents summary statistics. The variables *Liberal Party Seat* and *National Party Seat* denote respectively whether the seat was won by one of the two governing parties in 2001.

4 An empirical analysis of the distribution of funding

4.1 Quantum of funding

To see the relationship between political considerations and funding decisions, Fig. 1 charts the percentage of the two-party preferred vote received by the Coalition at the 2001 election against the amount of funding received under each of the programs. All four programs were more generous to Coalition-held seats (those to the right of the dashed line) than to those held by the non-government parties (those to the left of the dashed line). Among Coalition-held seats, it does not appear that more funding was devoted to marginal seats than safe seats.

To formally test whether the allocation of funding was affected by partisan factors, I regress the amount of funding assigned to each seat on indicator variables denoting whether the seat was held by the National Party or the Liberal Party in 2001. Table 2, Panel A shows the results from this exercise. The largest partisan effects are observed for Roads to Recovery and Stronger Families & Communities. In the case of Roads to Recovery, an average of $14.9 million more funding was allocated to each National Party seat, while $2.9 million more funding was allocated to each Liberal Party seat (both significant at the 5% level or

make submissions to the AEC, such submissions are much more likely to have focused on the underlying demographics than on targeted funding decisions.

[15] There is a certain degree of judgment involved in the selection of the appropriate control variables. In testing for a partisan skew in the allocation process, it is important to control for variables that directly affect funding decisions ("confounders"). However, one should not include variables that affect funding decisions only through their impact on the Coalition's vote share ("partisan proxies"), since this will lead to an underestimate of the true partisan effect. For example, the regional grant regressions control for population density, since this is a potential *confounder*, in the sense that it may conceivably have had a direct impact on the allocation decision. By contrast, it would be a mistake to control for the share of the population who grew up in Coalition-voting households, since this variable is more likely to be a *partisan proxy*—affecting the allocation of discretionary funding only via its impact on the political complexion of the electorate. A more difficult case is the proportion of people in an electorate who were born overseas. None of the four funding programs took any explicit account of the share of overseas-born persons living in an electorate (nor am I aware of any suggestions that this was implicitly considered). However, overseas-born voters are known to be much less likely to vote for the Coalition than native-born voters (see e.g., Leigh 2005a). Consequently, I regard the overseas-born share as more likely to be a partisan proxy than a confounder, and do not control for it in the regressions reported in Tables 2 and 3. If the overseas-born share is included, the partisan variables remain statistically significant, but the coefficients are smaller in magnitude.

[16] For the two electorates that were created in the 2003 redistribution, the density and income variables take the mean of the main electorates covering that area in the 2001 election. Thus Bonner is the average for Bowman and Griffith, while Gorton is the average for Burke, Calwell and Maribyrnong.

Table 1 Summary statistics

Variable	Obs	Mean	SD	Min	Max
Roads to Recovery ($m)	150	7.845	9.712	1.691	59.642
Stronger Families ($m)	150	0.016	0.016	0.000	0.097
Stronger Families (# of projects)	150	7.973	7.595	0.000	49.000
Sustainable Regions ($m)	150	0.428	1.811	0.000	12.928
Sustainable Regions (# of projects)	150	1.207	5.141	0.000	44.000
Regional Partnerships ($m)	150	0.736	1.641	0.000	12.145
Regional Partnerships (# of projects)	150	3.353	5.012	0.000	33.000
National Party seat (2001)	152	0.092	0.290	0.000	1.000
Liberal Party seat (2001)	152	0.454	0.500	0.000	1.000
Coalition share of 2PP vote (2001)	152	50.763	10.862	24.920	73.930
Swing (2004 minus 2001)	152	2.206	5.986	−11.950	21.510
Population density (km^2 per person)	152	0.353	1.484	0.000	10.000
Median weekly family income ($000s)	152	0.970	0.242	0.618	1.792

Note: Between the 2001 and 2004 elections, two seats were abolished and two new seats were created. Since Roads to Recovery funding is tabulated on 2004 electoral boundaries, and the other three programs are tabulated on the 2001 electoral boundaries, the summary statistics cover 152 seats. All regression results, however, cover either 150 seats (if focusing on a single program), or 148 seats (if focusing on multiple programs)

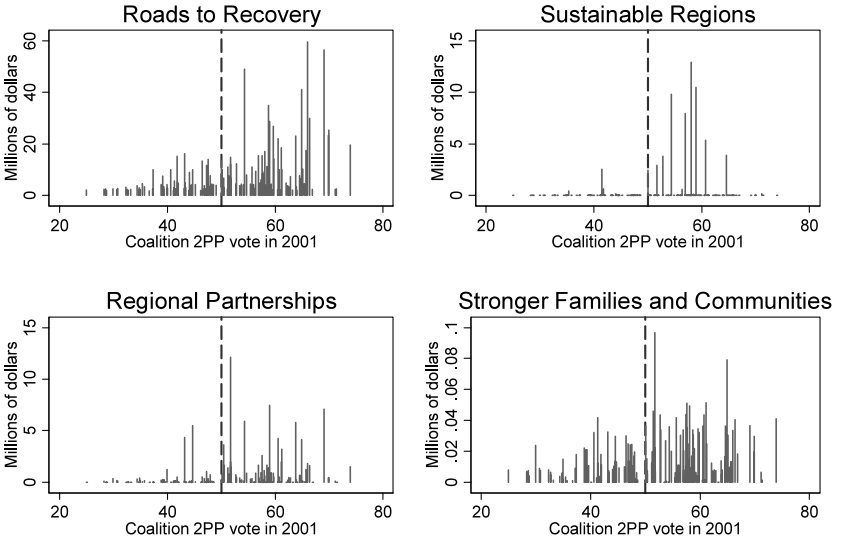

Fig. 1 Seat margin and amount of targeted funding received

better). Stronger Families & Communities allocations were also more generous to National Party Seats (an additional $0.02 million) and to Liberal Party seats (an additional $0.007 million), a result that is significant at the 1% level. More funding was received by National Party seats under the Sustainable Regions program (an additional $1.7 million) and the Re-

Table 2 Partisanship and funding allocation. Dependent variable: Total funding per electorate ($m)

	(1) R2R	(2) SF&C	(3) SR	(4) RP
Panel A: Without demographic controls				
National Party	14.904***	0.021***	1.684*	1.501*
	[4.084]	[0.005]	[0.958]	[0.833]
Liberal Party	2.902**	0.007***	−0.001	0.192
	[1.346]	[0.002]	[0.249]	[0.234]
Observations	150	150	150	150
R-squared	0.18	0.15	0.07	0.07
Panel B: With demographic controls				
National Party	6.767***	0.015***	1.345	0.71
	[2.152]	[0.005]	[1.197]	[1.051]
Liberal Party	2.699***	0.008***	−0.035	0.142
	[0.928]	[0.002]	[0.211]	[0.141]
Income		−0.072**		
		[0.030]		
Income^2		0.022*		
		[0.012]		
Population Density	17.704***		0.711	1.692**
	[3.320]		[1.200]	[0.813]
Population Density^2	−1.558***		−0.041	−0.123
	[0.359]		[0.125]	[0.080]
Observations	150	150	150	150
R-squared	0.70	0.26	0.15	0.37

Note: R2R = Roads to Recovery, SF& C = Stronger Families & Communities, SR = Sustainable Regions, RP = Regional Partnerships. Robust standard errors in brackets
***, ** and * denote statistical significance at the 1%, 5% and 10% levels respectively.
Population density is square kilometers per person. Income is median weekly family income ($000s)

gional Partnerships program (an additional $1.5 million). These two results are statistically significant only at the 10% level.

In Panel B, I control for the demographic characteristics of the electorates that might be associated with the allocation of funding. Specifically, I include a quadratic in population density for the Roads to Recovery, Sustainable Regions and Regional Partnerships programs, and a quadratic in income for the Stronger Families & Communities grants. With these controls, the allocations to the National Party and the Liberal Party remain statistically significant for the Roads to Recovery program, although the magnitude of the coefficients falls to +$6.8 million for National Party electorates, and +$2.7 million for Liberal Party electorates. The population density controls confirm that the program was indeed more generous towards less densely populated electorates.

For the Stronger Families & Communities program, including income controls has little impact on the magnitude or statistical significance of the partisan coefficients. The income controls indicate that slightly more funding was provided to poorer seats.

Controlling for population density, allocations to the Sustainable Regions and Regional Partnerships do not have a statistically significant partisan bias. The population density coefficient is statistically significant for the Regional Partnerships program. For the Sustainable Regions program, the population density coefficients are not statistically significant.

One point to note about all of the results above is that in all specifications in Panels A and B, the National Party coefficients are larger in magnitude than the Liberal Party coeffi-

cients. Since the National Party are the junior party in the federal Coalition, this is somewhat surprising, and suggests that the party's influence in obtaining targeted funding was disproportionate to its representation in the government.

4.2 Number of grants

I now turn to looking at the relationship between partisanship and the number of grants delivered. The intuition for this approach is that, with quasi-rational voters, a politician may gain more political capital from being able to announce a larger number of grants. Alternatively, more grants may allow a politician to target a larger number of interest groups within the electorate. Either scenario suggests the possibility that a politician may gain more political advantage from announcing ten separate grants of $50,000 than a single $500,000 grant. Since I do not have data on the number of Roads to Recovery programs per electorate, I focus in this section only on the other three programs.

Panel A of Table 3 shows the number of grants per electorate, including a control for demographic characteristics. Compared with non-government seats, National Party electorates tend to have an additional 5.2 Stronger Families & Communities grants, and an additional 3.4 Regional Partnerships grants. Liberal Party electorates have an additional 4.3 Stronger Families & Communities grants, and an additional 1.7 Regional Partnerships grants. There are no significant differences in the number of Sustainable Regions grants allocated to either National Party or Liberal Party electorates.

In Panel B of Table 3, I add a control for the total amount of funding (in effect now testing whether the funding in government electorates is delivered in smaller parcels than in non-

Table 3 Partisanship and number of grants. Dependent variable: number of grants per electorate

	(1) SF&C	(2) SR	(3) RP
Panel A			
National Party	5.195***	4.852	3.355**
	[1.907]	[3.946]	[1.311]
Liberal Party	4.338***	−0.214	1.740***
	[1.221]	[0.487]	[0.583]
Demographic Controls	Yes	Yes	Yes
Observations	150	150	150
R-squared	0.25	0.16	0.46
Panel B			
National Party	−1.631**	1.254	2.465*
	[0.760]	[0.853]	[1.482]
Liberal Party	0.713**	−0.119	1.562***
	[0.315]	[0.215]	[0.512]
Total funding ($m)	467.050***	2.675***	1.255**
	[18.401]	[0.307]	[0.608]
Demographic Controls	Yes	Yes	Yes
Observations	150	150	150
R-squared	0.93	0.91	0.56

Note: SF&C = Stronger Families & Communities, SR = Sustainable Regions, RP = Regional Partnerships. Robust standard errors in brackets
***, ** and * denote statistical significance at the 1%, 5% and 10% levels respectively.
Demographic controls are a quadratic in median family income for SF&C, and a quadratic in population density for SR and RP

Table 4 Swing seats or base? Sample is electorates won by the Coalition in 2001

	(1) R2R	(2) SF&C	(3) SR	(4) RP
Panel A: Dependent variable is total funding per electorate ($m)				
Coalition Vote share	0.570**	0.000	−0.040*	−0.004
	[0.263]	[0.000]	[0.021]	[0.041]
Observations	83	83	83	83
R-squared	0.08	0	0.01	0
Panel B: Dependent variable is number of grants per electorate				
Coalition Vote share		0.050	−0.095	0.150
		[0.172]	[0.062]	[0.117]
Observations		83	83	83
R-squared		0	0.01	0.02

Note: R2R = Roads to Recovery, SF&C = Stronger Families & Communities, SR = Sustainable Regions, RP = Regional Partnerships. Robust standard errors in brackets
***, ** and * denote statistical significance at the 1%, 5% and 10% levels respectively

government electorates).[17] For the most part, the results are qualitatively similar to those in Panel A. Controlling for total funding, Liberal Party electorates receive a larger number of Stronger Families & Communities grants and Regional Partnerships grants. Controlling for total funding, National Party electorates receive a larger number of Regional Partnerships grants, but a smaller number of Stronger Families & Communities grants.

4.3 Swing seats or base?

An important question in the existing literature is whether targeted funding tends to be delivered more towards swing seats or safe seats. To test this, I restrict the analysis to Coalition seats, and regress the amount of funding on the Coalition's share of the vote in the 2001 election.[18] The results are presented in Table 4. I find some evidence that Roads to Recovery funding was targeted towards safer seats (significant at the 5% level), and some evidence that Sustainable Regions funding was targeted towards more marginal seats (significant at the 10% level). However, the magnitude of both coefficients is quite small. When the dependent variable is the number of grants instead of the total funding allocation, I find no significant relationship between grants and the Coalition's share of the vote in Coalition-held seats.

Note that while the results in Table 4 do not show any strong patterns according to whether seats were safe or marginal, it would not be correct to say that funding was spread evenly across Coalition seats. As the results in Tables 2 and 3 demonstrate, seats held by the National Party, the junior partner in the Coalition, received significantly more funding than those held by the Liberal Party.[19]

[17] This specification is presented since it is easily comparable with the results in Panel A of Table 3. Results are similar if the dependent variable is the average grant size.

[18] Non-government seats are excluded from this analysis on the basis that it is not clear whether targeted funding in non-government electorates would have led voters to reward the sitting member or the governing party. Assuming that voters always reward the governing party for targeted funding, the appropriate way to conduct the analysis would be to include all seats, and then regress the funding allocation for each program (or the number of grants) on |Coalition Vote share-50%|. Such an exercise produces results that are qualitatively similar to those shown in Table 4.

[19] This result is consistent with the results of Tham and Grove (2004) for political donations. They found that between 1999–2000 and 2001–02, the National Party received considerably more private donations per

5 An empirical analysis of the effect of funding on elections

How do voters respond at the ballot box to targeted funding? To test this, I analyze the relationship between additional funding provided through the programs analyzed above and the vote received by the Coalition in the 2004 election. However, as has been noted by others, it is possible that the relationship between funding and voting is biased by omitted variables. The direction of this bias is in principle unclear. For example, the quality of the Coalition candidate and targeted funding could be negatively correlated (e.g., if funding is centrally allocated, the government might devote more resources to electorates where their candidate is of low quality). Alternatively, Coalition candidate quality might be positively correlated with funding (e.g., if the main determinant of funding is the perseverance of the local Coalition member of parliament).

To address this problem, I focus not on the share of the vote received by the Coalition candidate in the 2004 election, but on the swing towards the Coalition. Since the Coalition candidate in most electorates was the same in 2001 and 2004, the swing is more likely to reflect factors that have changed between the two elections. Unobserved factors (such as the quality of the Coalition candidate) are assumed to have affected the Coalition's vote share equally in both elections. Note that it is not necessary to first-difference the funding variable, since the four programs analyzed in this paper dispensed little or no money prior to the 2001 election.

Table 5 presents the results from regressing the swing towards the Coalition on the amount of targeted funding. The coefficient on the Roads to Recovery program is 0.25, indicating that a $1 million increase in funding raised the Coalition's share of the vote by 0.25 percentage points. Since the standard deviation on Roads to Recovery funding is 9.7, a one standard deviation increase in Roads to Recovery funding boosted the Coalition's vote share by 2.4 percentage points. The coefficient on the Stronger Families & Communities program is substantially larger, at 117.7. However, the standard deviation of Stronger Families & Communities funding is much smaller. A one standard deviation increase in Stronger Families & Communities funding ($0.016 million) boosted the Coalition's vote share by 1.9 percentage points.[20] The coefficients on the Sustainable Regions and Regional Partnerships programs are not statistically significant.

One possibility is that the swing to the Coalition between 2001 and 2004 was driven by factors that were also correlated with both funding allocations. To test this, Panel B includes controls for population density (for Roads to Recovery, Sustainable Regions, and Regional Partnerships), and for income (for Stronger Families & Communities). This has the effect of increasing the size of the Roads to Recovery coefficient substantially, and reducing the Stronger Families & Communities coefficient very slightly. Both remain statistically significant at the 1% level.

Next, I include a control for the share of the vote received by the Coalition in 2001. As the results in Table 4 showed, more Roads to Recovery funding was provided to safe Coalition seats than marginal Coalition seats. It is also possible that the Coalition's swing

vote ($28.64) than the Liberal Party ($18.62), Labor Party ($22.14), the Australian Democrats ($6.12) or the Greens ($8.51).

[20] As one reader of an earlier draft pointed out, this coefficient suggests that $1 million allocated through the Stronger Families & Communities program would guarantee the Coalition 100% of the vote. However, such a calculation extrapolates far outside the available data, since no electorate received more than $100,000 of Stronger Families & Communities funding. Were funding through this program to be substantially increased, the marginal electoral effect of additional Stronger Families & Communities funding may well decline.

Table 5 Electoral swing and funding allocation. Dependent variable: swing to coalition (percentage points)

	(1) R2R	(2) SF&C	(3) SR	(4) RP
Panel A: Funding only				
Funding ($m)	0.248***	117.686***	0.169	0.495
	[0.040]	[31.640]	[0.136]	[0.350]
Observations	150	150	150	150
R-squared	0.18	0.10	0.00	0.02
Panel B: Controlling for relevant demographics				
Funding ($m)	0.370***	113.009***	−0.051	0.09
	[0.071]	[36.682]	[0.268]	[0.284]
Income		−26.282**		
		[11.274]		
Income^2		12.291***		
		[4.664]		
Population Density	−2.884**		4.245***	4.020***
	[1.452]		[1.443]	[1.473]
Population Density^2	0.215		−0.418***	−0.401**
	[0.146]		[0.153]	[0.156]
Observations	150	150	150	150
R-squared	0.21	0.13	0.07	0.07
Panel C: Controlling for past vote share				
Funding ($m)	0.058**	42.575**	−0.092	−0.261
	[0.025]	[17.252]	[0.219]	[0.223]
Coalition vote (2001)	0.820***	0.798***	0.832***	0.849***
	[0.059]	[0.070]	[0.068]	[0.061]
Observations	150	150	150	150
R-squared	0.71	0.67	0.66	0.66
Panel D: Controlling for demographics and past vote share				
Funding ($m)	0.132**	22.143	−0.114	−0.419
	[0.055]	[20.555]	[0.232]	[0.273]
Income		3.401		
		[7.663]		
Income^2		−2.99		
		[3.150]		
Population Density	−1.909		0.634	1.229
	[1.698]		[1.093]	[1.091]
Population Density^2	0.158		−0.066	−0.11
	[0.160]		[0.113]	[0.109]
Coalition vote (2001)	0.809***	0.844***	0.821***	0.836***
	[0.059]	[0.081]	[0.068]	[0.062]
Observations	150	150	150	150
R-squared	0.71	0.69	0.66	0.67

Note: R2R = Roads to Recovery, SF&C = Stronger Families & Communities, SR = Sustainable Regions, RP = Regional Partnerships. Robust standard errors in brackets
***, ** and * denote statistical significance at the 1%, 5% and 10% levels respectively. Population density is square kilometers per person. Income is median weekly family income ($000s). Coalition vote in 2001 is the election result in 2001, based on the 2004 boundaries (see Sect. 3.6 for details)

Table 6 Electoral swing and funding allocation. Dependent variable: swing to coalition (percentage points)

	(1)	(2)	(3)	(4)
R2R	0.250***	0.343***	0.087***	0.090**
	[0.044]	[0.073]	[0.026]	[0.045]
SF&C	51.937*	45.447	33.85	18.576
	[30.930]	[34.409]	[21.940]	[23.447]
RP	−0.453*	−0.309	−0.580**	−0.650**
	[0.243]	[0.228]	[0.278]	[0.324]
SR	−0.16	−0.106	−0.097	−0.084
	[0.195]	[0.183]	[0.165]	[0.139]
Income		−19.869		3.504
		[12.054]		[5.961]
Income^2		10.070**		−3.202
		[4.929]		[2.481]
Population Density		−2.310*		−0.944
		[1.310]		[1.202]
Population Density^2		0.177		0.096
		[0.125]		[0.110]
Coalition vote (2001)			0.825***	0.890***
			[0.055]	[0.061]
Observations	148	148	148	148
R-squared	0.2	0.25	0.73	0.75

Note: R2R = Roads to Recovery, SF& C = Stronger Families & Communities, SR = Sustainable Regions, RP = Regional Partnerships. Robust standard errors in brackets
***, ** and * denote statistical significance at the 1%, 5% and 10% levels respectively.
Population density is square kilometers per person. Income is median weekly family income ($000s). Coalition vote in 2001 is the election result in 2001, based on the 2004 boundaries (see Sect. 3.6 for details)

from the 2001 to 2004 election was positively correlated with its vote share in 2001 (for example, government parliamentarians might have been more successful than opposition representatives at exploiting the resources of incumbency). If this were the case, then the relationship between funding and the swing might be spurious.

Such an approach could be over-cautious—for example, if one of the channels through which Coalition incumbents were particularly successful was through obtaining targeted funding. In Panel C, I include a control for the Coalition's vote share in 2001. This has the effect of reducing the coefficients on Roads to Recovery and Stronger Families & Communities to about one-third to one-quarter of their magnitude in Panel A. Both are still significant at the 5% level. In Panel D, I include controls for both demographics and vote share. In this specification, Roads to Recovery expenditure is positively correlated with the swing towards the Coalition. The other three programs are no longer statistically significant.

Since allocations of funding under these four programs might be positively correlated with one another, Table 6 presents results with all four programs included together. In the first column, I find that without any other controls, the coefficient on the Roads to Recovery program is positive (and significant at the 1% level), while Stronger Families & Communities is positive (and significant at the 10% level). Regional Partnerships funding is, surprisingly, negative (and significant at the 10% level). Since the coefficient on the Regional Partnerships program was insignificant in Table 5, it would be unwise to make much of this result.

Controlling for demographics and the Coalition's share of the vote in 2001, it is notable that the magnitude of the Roads to Recovery coefficient is very similar to that in Table 5. By contrast, the coefficient on the Stronger Families & Communities program is statistically insignificant in columns (2), (3) and (4). The coefficient on the Regional Partnerships pro-

gram is statistically insignificant with only demographic controls (column 2), but negative and significant in columns (3) and (4).

Do electorates that receive a larger number of grants have a larger swing towards the Coalition? In Table 7, I show the relationship between the swing towards the Coalition and the number of grants, focusing on the three programs for which data are available. In Panel A (with no other controls), I find that an extra Stronger Families & Communities grant raised vote share by 0.25 percentage points, while an additional Regional Partnerships grant raised vote share by 0.4 percentage points (both significant at the 1% level). These two results are still statistically significant when controlling for either electorate demographics (Panel B) or the Coalition's vote share in 2001 (Panel C). However, when controls for both electorate demographics and Coalition vote share in 2001 are included (Panel D), only the number of Regional Partnerships grants remains statistically significant (at the 10% level).

Note, however, that including a control for 2001 vote share may be "overcontrolling". Assuming this to be the case, the results in Table 7 suggest that the number of grants does matter at the ballot box. So far as I am aware, this paper is the first to document an effect of the number of grants delivered on the vote. This suggests that future analyses of pork-barreling should take into account not only the quantum of funding, but also the number of grants that are delivered to each constituency.

6 Conclusion

This paper analyzes the distribution of regional assistance programs across Australian federal electorates. Such an approach has its limitations—while these programs amounted to over a billion dollars of expenditure, this sum was only a small fraction of total federal government spending. Moreover, regional assistance programs are only one possible way that governments can direct resources towards particular electorates. Decisions over the location of universities, hospitals, military bases, and government offices can all be implemented in a partisan manner.

Yet regional assistance programs do account for a large (and in some cases, growing) share of government budgets. Spending on regional assistance amounts to over US$16 billion in the United States, more than €30 billion in the European Union, and over $4 billion in Australia. In allocating these resources, there is therefore considerable potential for political considerations to take precedence over social and economic factors.[21]

The distribution of funding under the four programs analyzed in this paper appears to have been strongly skewed towards electorates that were held by the Coalition government in 2001. Compared with non-government seats, and controlling for relevant demographic characteristics, seats held by the National Party received on average $6.8 million more under the Roads to Recovery program and $15,000 more under the Stronger Families & Communities program. Liberal Party seats received $2.7 million more under the Roads to Recovery program, and $8000 more under the Stronger Families & Communities program. As well as receiving more money, the number of grants also was higher in Coalition seats. National Party electorates received an additional 5.2 Stronger Families & Communities grants, and an additional 3.4 Regional Partnerships grants. Liberal Party electorates received an additional

[21] United States and European Union figures are taken from Milligan and Smart (2005). Australia figure is the sum of expenditure on agriculture, forestry, fisheries, transport and communication. While this may include some expenditure that is not regionally directed, it also does not include expenditure in other portfolio areas (e.g., recreation and culture, tourism promotion, community assistance) that is regionally directed.

Table 7 Electoral swing and number of grants. Dependent variable: swing to coalition (percentage points)

	(1) SF&C	(2) SR	(3) RP
Panel A: Number of grants only			
Number of Grants	0.254***	0.066	0.399***
	[0.071]	[0.048]	[0.100]
Observations	150	150	150
R-squared	0.11	0	0.12
Panel B: Controlling for demographics			
Number of Grants	0.250***	−0.017	0.414***
	[0.080]	[0.093]	[0.091]
Income	−26.883**		
	[10.943]		
Income^2	12.644***		
	[4.552]		
Population Density		4.249***	1.617
		[1.436]	[1.617]
Population Density^2		−0.419***	−0.218
		[0.151]	[0.161]
Observations	150	150	150
R-squared	0.15	0.07	0.15
Panel C: Controlling for past vote share			
Number of Grants	0.099**	−0.032	0.089**
	[0.038]	[0.085]	[0.044]
Coalition vote (2001)	0.794***	0.833***	0.802***
	[0.070]	[0.068]	[0.067]
Observations	150	150	150
R-squared	0.67	0.66	0.66
Panel D: Controlling for demographics and past vote share			
Number of Grants	0.058	−0.042	0.130*
	[0.044]	[0.089]	[0.070]
Income	3.449		
	[7.506]		
Income^2	−2.942		
	[3.102]		
Population Density		0.656	−0.188
		[1.079]	[1.528]
Population Density^2		−0.07	−0.006
		[0.111]	[0.145]
Coalition vote (2001)	0.838***	0.821***	0.796***
	[0.082]	[0.068]	[0.066]
Observations	150	150	150
R-squared	0.69	0.66	0.67

Note: R2R = Roads to Recovery, SF&C = Stronger Families & Communities, SR = Sustainable Regions, RP=Regional Partnerships. Robust standard errors in brackets
***, ** and * denote statistical significance at the 1%, 5% and 10% levels respectively.
Population density is square kilometers per person. Income is median weekly family income ($000s). Coalition vote in 2001 is the election result in 2001, based on the 2004 boundaries (see Sect. 3.6 for details)

4.3 Stronger Families & Communities grants, and an additional 1.7 Regional Partnerships grants.[22]

I find little evidence that the grants were more generous to more marginal electorates (indeed, if anything, more of the Roads to Recovery program seems to have gone to safe seats). To the extent that funding was allocated disproportionately to Coalition seats, it appears to have been targeted towards seats held by the smaller party in the Coalition, the National Party, and not towards swing seats. This is surprising in light of the fact that earlier studies of pork-barreling in Australia have found the funding to be more generously targeted towards marginal electorates (Gaunt 1999 and Denemark 2000 for sports grants in the early 1990s; Andrews et al. 2005 for unemployment programs in the late 1990s).

Although this study is not the first to observe targeted assistance in a parliamentary system which is directed towards safe seats (Milligan and Smart 2005 saw a similar pattern for Canadian regional development grants), such a finding differs from the usual predictions of a model in which pork-barreling in parliamentary systems tends to focus on swing seats. One possible explanation is that during Australia's 2001–2004 election cycle, the government was always confident of winning reelection. Leigh and Wolfers (2006) show that the betting market—an accurate prediction of election outcomes—had the government as favorites from when it opened in July 2003 until polling day in October 2004. Similarly, macroeconomic models of election forecasting (based on variables such as unemployment and inflation), suggested that the Coalition would win comfortably. Another possibility is that the government was more concerned about assuaging internal tensions among the Coalition parties by providing largesse to National Party electorates than about increasing its parliamentary majority.[23]

Analyzing the effect of the programs on the swing towards the Coalition in the 2004 election, I find robust evidence that additional funding increased the swing towards the Coalition government, and suggestive evidence that a larger number of grants delivered to an electorate also helped the government. In terms of the amount of funding delivered, the most robust results are for the Roads to Recovery program. For every additional $1 million in Roads to Recovery funding, the Coalition increased its vote share by between 0.06 and 0.37 percentage points, depending on the controls included in the regression. Since the average number of votes cast per electorate in 2004 was 82,367, this suggests that each additional vote obtained through the Roads to Recovery program cost between $20,234 and $3281.[24] This

[22] In general, the roads-funding and community grants programs (Roads to Recovery and Stronger Families & Communities) seem to be allocated in a more partisan manner and to have a stronger effect on the vote than the two industry assistance programs (Sustainable Regions and Regional Partnerships). One possible explanation arises from the fact that the former pair of programs had more grants per electorate (as Table 1 shows, there were an average of eight grants per electorate for both Roads to Recovery and Stronger Families & Communities, but one for Sustainable Regions and three for Regional Partnerships). This might have limited the potential for a strong partisan bias in the allocation process, since the smaller numbers would have made partisanship more readily apparent to outside observers. Another possibility is that industry assistance is less salient or less visible to voters than community development and road-building expenditure. If true, this might help to explain why industry assistance did less to swing the vote than the other two programs.

[23] One source of this tension is the fact that the National Party's vote share has been steadily declining over recent decades, partly as a result of the diminishing share of the Australian population working in farm employment (Brett 2007). For more discussion of these tensions, see Warhurst (2007) and Economist Intelligence Unit (2007). The extensive literature on coalition government is surveyed in Diermeier (2006).

[24] In an opinion piece, I reported this figure as $28,000 (Leigh 2005b). That regression differed from those reported here in two respects: it excluded Roads to Recovery funding to the territories; and it was based on swing data comparing the actual 2001 result with the 2004 result. Here, I include funding allocations to the four territory seats, and calculate the swing by comparing the 2001 result (translated onto 2004 electoral boundaries) with the 2004 result.

figure is similar to Levitt and Snyder (1997), whose estimates of the relationship between federal funding and voting suggest that each additional US vote costs around US$14,000 (approximately $22,000 in 2004 Australian dollars).

Economists and political scientists in parliamentary democracies have traditionally been less concerned about the issue of pork-barreling than their United States counterparts. These results suggest that outside the United States, more attention should be given to considering the role that partisanship plays in funding decisions, and the role of targeted funding in shaping election outcomes. Pork-barreling is inequitable, potentially inefficient, and may have other social costs, such as reducing the level of turnover among politicians below the social optimum.[25]

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[25] In the 2004 Australian election, the incumbent reelection rate was 92% (130/141 incumbents seeking re-election were successful: Jackman 2005), which was lower than in the 2004 US congressional elections, where the incumbent reelection rate was 99% (399/401). In the 2001 Australian federal election, the reelection rate was 96% (130/135), while in the 1998 election, it was 85% (109/129).

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