The Impact of Public Financing on Electoral Competition: Evidence from Arizona and Maine

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ABSTRACT

Does complete public financing of campaigns enhance electoral competition? Arizona and Maine implemented similar clean elections programs for state-level races in 2000, providing an opportunity to examine the consequences of public financing. Employing two measures of competitiveness, I find that clean elections programs in both states significantly increased competition in districts where challengers accepted public funding. These findings suggest that public monies do not simply attract low-quality challengers and that access to campaign funds is an important determinant of competitiveness. As a result, while public financing programs are not panaceas for uncompetitive elections, such programs can enhance competition in races where money is accepted.

FOR OVER THIRTY YEARS, ADVOCATES of government reform have pushed for public financing of elections in the United States in hopes of reducing the influence of money in American politics. Clean elections laws at the state and local level generally allow candidates to use taxpayer dollars to fund their campaigns in exchange for accepting spending limits and forgoing private contributions. Supporters of public financing present two broad benefits of such laws.

First, they argue that public financing reduces both the amount of money that individual candidates need to raise from outside interest groups and the overall level of campaign expenditures (Center for Governmental Studies 2003). In principle, officials elected under clean elections programs would not need to dole out favors to pay back their supporters and would instead pass legislation designed to aid the public interest, not special interests. Further, candidates free from fundraising duties presumably would have more time to devote to their responsibilities as elected officials.

A second purported benefit of public financing is that clean elections

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laws level the playing field of the campaign, resulting in more competitive elections (Center for Governmental Studies 2003). By reducing the disparity in the amount of money incumbents and challengers are able to raise, public financing laws aim to prevent incumbents from becoming entrenched in government bodies. As a result, clean elections laws might not only reduce the number of uncontested seats, but also increase the chances of challengers winning races in which incumbents have structural advantages.

Although the rhetoric of public financing advocates is loud and clear, the true effect of public financing laws is less transparent. Evidence exists that clean elections laws affect the fundraising behavior of candidates for public office and reduce the overall amount of dollars raised, part of the first goal mentioned above. Francia and Herrnson (2003) found that candidates who accept full public funding spend less time raising money than candidates who have to raise money via private contributions. Mayer and Wood (1995) found that partial public funding in Minnesota reduced the overall level of election spending.

Nonetheless, the impact of public financing on the competitiveness of elections, the second goal mentioned above, is not as straightforward. Although public financing might strengthen the ability of challengers to obtain resources, it does not necessarily increase their chance of winning. In fact, the hurdles to qualify for public financing are sufficiently low that many challengers attracted by clean elections programs could be low-quality candidates. Donnay and Ramsden (1995) found that a partial public financing system in Wisconsin did not encourage challengers to enter state legislative contests, nor did it boost the competitiveness of contested races. Mayer and Wood (1995) reached similar findings in their analysis of Minnesota's partial public financing scheme. Yet, both Wisconsin and Minnesota allow candidates to receive a mixture of public and private funding. Perhaps public financing plans that fully subsidize elections have a greater impact on competitiveness since they provide more support to challengers. On the other hand, full funding might actually attract lower-quality challengers, who are unable to raise money on their own.

Only two states have offered complete public financing of state legislative campaigns for multiple election cycles: Arizona and Maine. As explained further below, both states offer full funding to the campaigns of candidates who are able to raise small qualifying sums. In exchange, candidates who opt into the system agree not to raise private monies. Clean elections laws were approved via referenda by voters in Maine and Arizona in 1996 and 1998, respectively, and went into effect during the 2000 election cycle. In this article, I analyze the impact of public financing laws on competitiveness in state legislative elections in these two states. In doing so, I assess whether

complete public financing of elections actually does make elections more competitive, a major argument of the advocates of clean elections laws.

State legislative elections in Arizona (1992–2000) and Maine (1994–2002) provide opportunities to study the effects of public financing on competitiveness. In Arizona, the 1992–1998 elections took place before the clean elections law was implemented and the 2000 election took place after its implementation. In Maine, the 1994–1998 elections occurred before the presence of clean elections, and the 2000 and 2002 elections occurred afterwards. Most importantly, all elections took place after the post-1990 redistricting and before the post-2000 redistricting; new district lines went into effect in 2002 in Arizona and 2004 in Maine. Although there were political and demographic changes between the two elections, the primary institutional difference was the presence of clean elections laws. Therefore, these two states provide relatively clean tests of the influence of public policies on election outcomes, thereby avoiding the pitfalls of pooling races from different redistricting cycles. Further, the tests ascertain whether public financing laws were powerful enough to overcome other, unobservable changes that occurred. As discussed below, I only examine Senate elections in both states in order to obtain an accurate measure of challenger quality.

Although several other works have addressed the Arizona and Maine clean elections laws, few academic studies have been published analyzing the effect of the programs on competition in legislative races. Francia and Herrnson (2003) studied the effect of public financing on the amount of time candidates spent fundraising, but they did not analyze the impact on competitiveness. Daniel (2001) found that more candidates ran in Arizona's legislative races following the implementation of the public financing system. The Government Accountability Office (2003) issued a report to Congress concluding that the Arizona and Maine public financing laws had minimal impacts on competitiveness. Finally, Mayer, Werner, and Williams (2006) reported mixed evidence showing increases in competitiveness in the lower chambers. But there are two main problems with the methodologies of existing studies. First, the extant literature does not utilize multivariate regression techniques to isolate the impact of clean elections, controlling for other important determinants of competition such as incumbency and challenger quality. Second, existing studies examine all districts after the implementation of public financing, instead of only those in which challengers actually participated in the program.

Comparing Arizona and Maine also allows an assessment of how sensitive campaign finance regulations are to differing pre-existing institutional structures. The procedures of the public financing systems are similar in both states and a similar percentage of candidates opted into the programs (31 percent

in Maine and 25 percent in Arizona) (Sanchez 2001). Nonetheless, the legislative and electoral institutions in the two states significantly differ. Arizona's legislature is more professional than Maine's, and compared to Maine's legislators, Arizonan legislators earn $14,000 more per year and have access to over three-and-a-half times as many staff (National Conference of State Legislatures 2003). District size also varies substantially across the sample of electoral bodies. Arizona's Senate districts contain roughly 170,000 people, whereas Maine's Senate districts contain approximately 36,000 people. I cannot estimate the independent effects of particular institutional differences on the effectiveness of clean elections laws with only two data points, but the inclusion of the two states does test if the impact of full public financing systems is robust to institutional differences.

This article is organized as follows: In the first section, I describe in detail the public financing and electoral systems of Arizona and Maine, as well as a discussion of the relevant literature on electoral competition. The second section provides an overview of the data and methods used to assess the impact of the public financing systems in the two states. The results of the analyses are in the third section, and the final section discusses implications and presents potential extensions.

OVERVIEW

Background of Laws

In 1996, Maine passed the Maine Clean Elections Act by ballot initiative, and it became the first state to approve full public funding for state legislative elections. Arizona followed in 1998 with the Citizens' Clean Election Act ballot initiative. The Acts, which closely resemble each other, both went into effect in the 2000 election. This section provides background information on the programs and outlines the procedures involved in obtaining public funds.

The process of public financing consists of three phases: qualification, primary election disbursement, and general election disbursement (see Table 1). First, candidates who wish to receive public funds must demonstrate a minimal threshold of electoral support by collecting a specified number of $5 contributions from registered voters in their districts. Candidates must not raise more than a certain amount during this qualifying period, and they must also agree not to accept private monies once they receive public funds. The second phase consists of an initial disbursement of money to primary candidates. Should a candidate face an opponent who raises more private money than the initial public allotment, the participating candidate

Table 1. Overview of Public Financing Systems in Arizona and Maine

	Arizona		Maine	
	House	Senate	House	Senate
Qualification Phase				
Number of $5 contributions required	200	200	50	150
Max seed money permitted	$2,500	$2,500	$500	$1,500
Primary Election Phase				
Primary disbursement (initial)	$10,000	$10,000	$1,141	$4,334
Primary matching funds (max)	$20,000	$20,000	$2,282	$8,668
General Election Phase				
General election disbursement (initial)	$15,000	$15,000	$3,252	$12,910
General election matching funds (max)	$30,000	$30,000	$6,504	$25,820
Maximum total disbursement	$75,000	$75,000	$13,179	$51,732

Sources: Government Accountability Office (2003) and the Institute on Money in State Politics (2006a, 2006b).

is eligible for supplemental matching funds, equal to a maximum of twice what he or she initially received. The third and final phase of the program involves the distribution of money to general election candidates. As in the primaries, the general election candidates are eligible for matching funds equal to a maximum of twice the initial disbursement depending on the status of their opponents.

Two central features of the acts indicate that the acts represent faithful public policy embodiments of the spirit of publicly-funded elections: their relative ease of accessibility and their generous level of campaign funding.[1] The requirements to qualify for public funds are relatively modest. For example, to qualify in Arizona, candidates must raise 200 $5 contributions in districts of roughly 170,000 people, and candidates for Maine's House of Representatives must only raise 50 $5 contributions. Moreover, the level of public funding is comparable to the typical amount raised via private contributions prior to the introduction of clean elections programs. Only very rarely will a participant candidate be severely financially disadvantaged against an opponent who opts out of the system. Across the set of candidates from 1996 and 2000, only 10 out of 309 general election candidates from Arizona (3 percent) and 15 out of 728 general election candidates from Maine (2 percent) spent more than the maximum public disbursement (Institute of Money in State Politics 2006a, 2006b).

Literature

The extant literature on congressional elections, which has implications for the study of state legislative races, has identified two major determinants of

electoral competition: incumbency and challenger quality. First, incumbents have been found to enjoy systematic advantages that make their contests markedly less competitive than open-seat races (e.g., Alford and Hibbing 1981; Gelman and King 1990; King and Gelman 1991). Potential sources of the incumbency advantage include the ability of officeholders to perform constituency service (Cain, Ferejohn, and Fiorina 1987) and deliver distributive benefits to their districts (Levitt and Snyder 1997). Another set of studies has found that incumbents are effectively challenged only when they are facing quality challengers, generally defined as those that have previously held elective office (e.g., Jacobson and Kernell 1983; Green and Krasno 1988). Presumably, these candidates have electoral skills and personal characteristics that make them effective campaigners and attractive to voters. Further, high-quality candidates strategically enter races under favorable national and local conditions, such as when the economy is doing poorly or when incumbents are tainted by scandal (Jacobson and Kernell 1983; Krasno and Green 1988; Gordon, Huber, and Landa 2007). Under these conditions, strategic incumbents also choose to retire.

What are the implications of these two central variables for an assessment of public financing? The literature has presented two competing perspectives. According to Jacobson (1978, 1990), only campaign spending by the challenger impacts electoral competition. Jacobson (1978) argues: "The unmistakable conclusion to be drawn from this is that, in general, any increase in spending by both candidates will help the challenger. Public subsidies—or any other policy which gets more money into the hands of challengers—should therefore make House elections more competitive" (489). In other words, public financing will enhance competition because it will offset the incumbency advantage by helping challengers mount effective campaigns. However, Levitt (1994), who finds that candidate quality is the primary determinant of victory in legislative races, presents an opposing argument: "changing campaign spending patterns is a very blunt tool for affecting election outcomes . . . public financing of campaigns is clearly not justified" (794–795). In other words, low-quality challengers with large campaign accounts are no more likely to be competitive than low-quality challengers with small campaign accounts. Therefore, public financing is not a panacea.

Analyzing public financing programs in Arizona and Maine provides data to help choose between these competing perspectives. If races in which challengers accept funding experience an increase in competition, Jacobson's logic appears correct. The lack of competition in state legislative races is primarily a function of challengers lacking adequate access to funds to mount

effective campaigns. But if public financing has no effect, Levitt appears correct that money finds quality candidates in the open market. Public subsidies are ineffectual if they are channeled to poor candidates.

DATA AND METHODS

Dependent Variable

The first concern is how to measure the dependent variable of electoral competitiveness. Previous studies (Hogan 2004; Government Accountability Office 2003; Gross, Goidel, and Shields 2003; Mayer and Wood 1995) have analyzed two main measures of competitiveness: (1) whether an election is contested by a major party and (2) the margin of victory. Because these measures have important limitations, I also examine another operationalization that is not used as often in political science in order to assess the robustness of the findings: the inverse of the Herfindahl-Hirschman Index (HHI).

First, simply because an election is contested does not necessarily mean that the race is competitive. Competition is a function of both the number of candidates and the distribution of vote shares. Little difference exists between an incumbent who wins 100 percent of the vote in an uncontested race and an incumbent who wins 98 percent of the vote in a contested race against an ineffective challenger. Further, substantive difference exists between a race in which a challenger receives 2 percent of the vote and one in which a challenger receives 49 percent of the vote. Concerns regarding the validity of this measure are amplified by the introduction of public financing, which according to the Acts' advocates, will inject fresh (and inexperienced) faces into elections. Very possibly many of the elections that might be coded as contested would in fact be uncompetitive.

Second, the margin of victory can also be misleading if more than two candidates are running. One of the goals of clean elections programs is to provide voters with more choices and to encourage third party candidates to run for elective office (Center for Governmental Studies 2003). Assume a district exists in which two candidates (one incumbent Democrat and one Republican challenger) run in 1998, and three candidates (the previous two plus a Green Party challenger) run in 2000. Suppose that the 1998 vote share was split 60 percent to 40 percent between the Democrat and Republican—a victory margin of 20 percent—and that the 2000 vote share was split 50 percent to 30 percent to 20 percent between the Democrat, Republican, and Green—again, a margin of 20 percent. According to the margin of victory measure, the 2000 election was just as competitive as the 1998 election, despite the entry of a new and effective

candidate. The 2000 election described above is fundamentally different from the 1998 election, and it might help to use a measure that captures the unique nature of competition in the district.

Another commonly-used measure of competition—the inverse of the Herfindahl-Hirschman Index (HHI)—accounts for two dimensions of competition: the number of candidates in the race and the distribution of vote shares. The index is a commonly used measure of market concentration, with perhaps its most famous application being the Department of Justice's adjudication of antitrust cases and merger approvals.[2] The HHI is calculated by squaring the market share of each firm competing in a market, and then summing the resulting numbers. In the context of electoral politics, vote share is used as opposed to market share:

$$\text{HHI} = \sum_{i=1}^{n} (s_i)^2 \tag{1}$$

where s_i represents the vote share of the ith candidate (out of n candidates in the race). The HHI statistic can range from close to 0 (perfect competition) to 1 (zero competition). In an uncontested race, one candidate would capture 100 percent of the vote, meaning that the HHI statistic of the race would be 1^2, or 1. Conversely, if an infinite number of candidates evenly split the vote, then they would each have nearly 0 percent vote share, producing an HHI statistic of 0.

Adelman (1969) showed that if one takes the inverse of the HHI (HHI^{-1}), the resulting number equals the effective number of firms in a market. The HHI^{-1} indicates how many equally sized firms it would take to produce a given HHI value (Adelman 1969, 100). Therefore, HHI^{-1} for a monopolistic market is $1/(1^2)$, or 1; HHI^{-1} for a market that is nearly perfectly competitive is 1/(a very small number), a number that approaches infinity. By using this measure, I can assess whether public financing increased the effective number of candidates in a race. Coefficients from OLS regression analyses can tell us the change in the effective number of candidates associated with a one-unit change in the independent variables.

One limitation of HHI^{-1} is that its theoretical range is a function of the number of candidates. For example, when there are two candidates running, HHI^{-1} can range from 1 to 2, whereas it can range from 1 to 3 when an additional candidate enters the race. This feature can create perverse results when comparing races with different numbers of candidates. For instance, a race in which two candidates evenly split the vote produces an HHI^{-1} value of 2. However, a three-candidate race in which the split is 50-45-5 percent results in 2.198 effective candidates. Nonetheless, there are several features of the former

race that make it more competitive from a theoretical perspective than the latter.

Because each measure of competition has its limitations, I conduct all analyses using two dependent variables: the margin of victory and HHI^{-1}. If similar results are obtained across measurement approaches, then it suggests that the findings are robust and not simply an artifact of the operationalization used.[3]

Methodological Approach

The goal in this analysis is to assess whether public financing policies promote, inhibit, or have no impact on the dependent variable of electoral competition, as measured by HHI^{-1} and margin of victory. Accordingly, the central independent variable is a dummy—equivalent to a year fixed effect—that represents the presence of a clean elections program. The regressions below allow one to estimate the mean shift associated with the clean elections dummy variable (Fox 1997, 135–40). This could have been easily done via a paired-sample t-test comparing mean competitiveness before and after the introduction of public financing, but the great benefit of regression is controlling for possibly confounding variables.

Accordingly, I estimate the following regression model:

$$Y_i = \beta_0 + \beta_1 C_i + \beta_2 I_i + \beta_3 Q_{2i} + \beta_4 Q_{0i} + \varepsilon_i \quad (2)$$

where i indexes districts, Y_i represents the dependent variable of competition (measured either by HHI^{-1} or margin of victory), C_i is a dummy variable representing the presence of a clean elections statute, I_i is a dummy variable representing the presence of an incumbent in the race, Q_{2i} is a dummy variable representing the presence of two quality candidates in the race, Q_{0i} is a dummy variable representing the presence of zero quality candidates in the race, and ε_i is stochastic error. The incumbency dummy takes into account any legislators that retired due to term limits, which affected different incumbents at different times. Because my attention is only on state Senate races, a quality candidate is defined as one who previously served in the state legislature (either in the upper or lower chamber).[4] The baseline category includes races in which there was a single quality candidate (either the incumbent or a previous officeholder in an open-seat race), those which are the least competitive.

A particularly important substantive question is whether public financing increased competition in races where incumbents were running, since one of the goals of the statutes is to reduce entrenchment. Accordingly, another

set of models also include an interaction term between the clean elections and incumbent dummies:

$$Y_i = \beta_0 + \beta_1 C_i + \beta_2 I_i + \beta_3 (I_i \times C_i) + \beta_4 Q_{2i} + \beta_5 Q_{0i} + \varepsilon_i. \quad (3)$$

In equation (3), the effect of public financing in open-seat races is captured by the β_1 term, while the effect in races where incumbents are running is captured by $\beta_1 + \beta_3$.

The clean elections dummy only captures the overall effect of the presence of the law, not whether any candidates in the district actually took advantage of public financing. Therefore, equations (2) and (3) might attenuate the true effect of the policies if decreases in competition in the districts where challengers took advantage of the program are swamped by null effects in the districts where no public monies were spent. Accordingly, revised versions of equations (2) and (3) were re-estimated, replacing C_i with a dummy variable representing whether a non-incumbent accepted public financing in the district (P_i).

$$Y_i = \beta_0 + \beta_1 P_i + \beta_2 I_i + \beta_3 Q_{2i} + \beta_4 Q_{0i} + \varepsilon_i \quad (4)$$

$$Y_i = \beta_0 + \beta_1 P_i + \beta_2 I_i + \beta_3 (I_i \times P_i) + \beta_4 Q_{2i} + \beta_5 Q_{0i} + \varepsilon_i. \quad (5)$$

In all regression models, heteroskedasticity and autocorrelation were detected with Breusch-Pagan (Breusch and Pagan 1979) and Woolridge (Woolridge 2002) tests, respectively. In the Arizona data, there was significant evidence of heteroskedasticity (but not autocorrelation), and accordingly I estimated White heteroskedastic-consistent standard errors (White 1980) to correct for non-spherical disturbances. In the Maine data, there existed significant evidence of both heteroskedasticity and autocorrelation, and accordingly I estimated panel-corrected standard errors (Beck and Katz 1995). Table 2 presents descriptive statistics.[5]

Table 2. Descriptive Statistics

	Arizona Senate				Maine Senate			
	Mean	S.D.	Min	Max	Mean	S.D.	Min	Max
Dependent Variables								
HHI^{-1}	1.52	0.42	1.00	2.26	1.87	0.29	1.00	2.86
Margin of victory	0.56	0.35	0.01	1.00	0.25	0.24	0.00	1.00
Independent Variables								
Clean elections law	0.20	0.40	0.00	1.00	0.40	0.49	0.00	1.00
Incumbent running	0.71	0.45	0.00	1.00	0.71	0.45	0.00	1.00
Challenger participated	0.07	0.25	0.00	1.00	0.26	0.44	0.00	1.00
Two quality candidates	0.06	0.24	0.00	1.00	0.09	0.29	0.00	1.00
No quality candidates	0.15	0.35	0.00	1.00	0.11	0.31	0.00	1.00

Note: N=150 for Arizona and N=175 for Maine

Equations (2) through (5) were estimated for both dependent variables including district fixed effects. However, the joint test that the fixed effects are simultaneously equal to zero was rejected in every model specification (i.e., there is not a significant level of heterogeneity across districts). Nevertheless, the main statistical and substantive findings presented below are basically the same, including district fixed effects. But the inefficiency of this less parsimonious model produces larger standard errors; therefore, the focus is on the models excluding fixed effects.

Separate regressions were run for each state. Pooling across states is appealing because it increases the number of observations and the power of the tests. However, I want to allow for the possibility that clean elections programs can have different impacts across states, a possibility that cannot be fully handled by the inclusion of dummy variables and mean shifts.

RESULTS

Arizona

Before investigating the effect of the public financing statute in Arizona, I first examine the control variables to assess the plausibility of the regression results. As expected, races in which an incumbent is running are significantly less competitive than open-seat contests. As shown across all specifications in Table 3, the presence of an incumbent decreases the number of effective candidates by about .30 and expands the margin of victory by over 20 percentage points. Additionally, consistent with the literature on candidate quality, races are much more competitive when both candidates have previously held public office. As shown in Table 3, the coefficients on *two quality candidates* are all highly statistically significant and offset the size of the incumbency advantage. Hence, compared to districts where only one challenger has served in the legislature, competition is much greater when an experienced candidate is challenging an incumbent, or when two people who have previously served in the legislature are vying to fill an open seat. Interestingly, open-seat races in which both candidates are political novices (as represented by the *no quality candidates* variable) are as uncompetitive as those in which only one quality candidate is running.

The regression analyses suggest that the Arizona clean elections law had no significant effect on increasing mean electoral competition in the chamber overall (see specifications (1) and (5) in Table 3). The post-2000 elections tended to closely resemble the elections conducted prior to the implementation of public financing. The presence of public financing increases the effective number of candidates (HHI^{-1}) by .08, or introduces less than one-

thirteenth of an effective candidate into the race, representing about 6 percent of the range of the dependent variable (and about two-fifths of its standard deviation). Similarly, the presence of that statute, in and of itself, does not significantly reduce the margins of victories.

The broad effects of the statutes are equally weak both in open-seat contests and those in which an incumbent is running. As shown in specification (2) in Table 3, the effect of the clean elections law does not significantly affect HHI^{-1} in districts with ($\beta_1 + \beta_3 = .08$, $p = .46$) and without ($\beta_1 = .09$, $p = .50$) incumbents. Similar results are found when predicting margin of victory ($\beta_1 + \beta_3 = -.07$, $p = .41$; $\beta_1 = -.11$, $p = .32$).

However, the previously-stated results did not take into account whether a challenger actually participated in the public financing program. As shown in specifications (3) and (7), the clean elections law significantly enhanced competition (both statistically and substantively) in these districts. For instance, compared to pre-2000 races, districts in which a non-incumbent accepted public monies exhibited an increase in .43 effective candidates ($p<.001$), an effect that is greater than the standard deviation of the dependent variable and encompasses over one-third of its range. A similarly large effect is found with respect to the margin of victory.

Further, the effect of public financing is larger in races where an incumbent is running. Whereas the clean elections law boosts the number of effective

Table 3. Results of OLS Regression Analyses Predicting Electoral Competition (Arizona Senate)

	Dependent Variable: HHI^{-1}				Dependent Variable: Vote Margin			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Clean elections law	.08	.09	____	____	-.08	-.11	____	____
	(.08)	(.13)			(.07)	(.11)		
Incumbent	–.30****	–.30***	–.29***	–.32***	.22***	.21***	.21***	.23***
	(.08)	(.10)	(.08)	(.09)	(.06)	(.07)	(.06)	(.07)
Clean elections law × Incumbent	____	–.01	____	____	____	.04	____	____
		(.17)				(.14)		
Challenger participated	____	____	.43****	.23***	____	____	–.41****	–.28***
			(.06)	(.08)			(.05)	(.08)
Challenger participated × Incumbent	____	____	____	.29***	____	____	____	–.19*
				(.10)				(.10)
Two quality candidates	.38****	.38****	.38****	.35****	–.39****	–.40****	–.39****	–.38****
	(.07)	(.07)	(.07)	(.08)	(.06)	(.06)	(.07)	(.07)
No quality candidates	–.03	–.03	–.02	–.03	–.01	–.01	–.02	–.01
	(.11)	(.11)	(.11)	(.11)	(.08)	(.08)	(.08)	(.08)
Intercept	1.70****	1.70****	1.68****	1.71****	.45****	.46****	.47****	.45****
	(.08)	(.09)	(.08)	(.08)	(.06)	(.06)	(.06)	(.06)
R^2	.17	.17	.23	.24	.19	.19	.26	.27

*p<.1; **p<.05; ***p<0.1; ****p<.001 (two–tailed tests)
Note: White heteroskedastic-consistent standard errors in parentheses.
N=150.

candidates by .23 (p =.005) in open-seat races, the effect in districts occupied by an incumbent is .52 (p<.001). Similar findings are obtained when using margin of victory as the dependent variable. Hence, public financing is strongest in the districts where its effect is most needed: those where incumbents might be entrenched.

Nevertheless, while public financing is not a panacea for the overall level of competition in the state, it can effectively enhance competition when challengers select into the system. In the absence of these monies, challengers would not have the ability to mount effective campaigns against incumbents. The implications of these findings for public policy are discussed in the following section.

Maine

The analyses of the Maine Senate produce nearly parallel findings to the Arizona Senate. Although public financing did not enhance competition across all districts, it did make those races where challengers accepted monies more competitive. This was again the case for both open-seat contests and for those where an incumbent was running for re-election. Due to the similarities in the findings across the two states, I mainly discuss important differences where they exist.

First, across all specifications, incumbency is negatively related to competition whereas the presence of two quality candidates increases competitiveness, suggesting that the regression results are sensible (see Table 4). However, note that the effects of these two variables are substantively weaker in Maine than in the Arizona regressions. The coefficients on *incumbent* in the Maine analyses are about 63–78 percent the size of comparable coefficients in Arizona. Similarly, the coefficients on *two quality candidates* in Maine are about 28–43 percent the size of those in Arizona. This discrepancy could be due to the difference in legislative professionalism. Holbrook and Tidmarch (1991), Gelman and King (1990), King (1991), Cox and Morgenstern (1993, 1995), and Carey, Niemi, and Powell (2000) all find that incumbency advantage is greater in states with more professional legislatures. The mitigating force of challenger quality might be weaker for this reason as well.

As in Arizona, the effects of public financing are statistically and substantively weak when examining the totality of districts (see specifications (1) and (5) of Table 3). The impact is no stronger in races with incumbents (see specifications (2) and (6) of Table 4). However, when isolating attention to races in which non-incumbents participated in the program, again public financing is observed to increase significantly the number of effective candidates by .14, representing about one-half of the standard deviation of

Table 4. Results of OLS Regression Analyses Predicting Electoral Competition (Maine Senate)

	Dependent Variable: HHI^{-1}				Dependent Variable: Vote Margin			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Clean elections law	.02	.06	____	____	–.02	–.03	____	____
	(.05)	(.08)			(.05)	(.06)		
Incumbent	–.21****	–.19***	–.20****	–.20****	.17****	.16****	.16****	.18****
	(.04)	(.05)	(.04)	(.04)	(.03)	(.04)	(.03)	(.04)
Clean elections law × Incumbent	____	–.06	____	____	____	.02	____	____
		(.06)				(.05)		
Challenger participated	____	____	.14***	.15**	____	____	–.11**	–.06
			(.05)	(.07)			(.04)	(.05)
Challenger participated × Incumbent	____	____	____	–.01	____	____	____	–.07
				(.06)				(.05)
Two quality candidates	.14**	.14**	.15***	.15***	–.11**	–.11**	–.12***	–.13***
	(.06)	(.06)	(.05)	(.05)	(.04)	(.05)	(.04)	(.04)
No quality candidates	–.11	–.11	–.12	–.12	.07	.07	.08	.08
	(.10)	(.09)	(.09)	(.09)	(.08)	(.08)	(.08)	(.08)
Intercept	2.02****	2.00****	1.98****	1.98****	.14***	.14****	.17****	.15****
	(.05)	(.06)	(.05)	(.05)	(.04)	(.05)	(.04)	(.04)
R^2	.40	.40	.50	.50	.10	.10	.14	.14

*p<.1; **p<.05; ***p<0.1; ****p<.001 (two–tailed tests)
Note: Panel-corrected standard errors in parentheses.
N=175.

the dependent variable (p=.006, see specification (3)). Similarly, the margin of victory in these districts decreased by 11 percentage points, a similarly substantively large effect (p=.01, see specification (7)).

Nonetheless, note that the sizes of the effects in Maine are about one-third as large as those in Arizona. Both a Hausman test (Hausman 1978) and a Chow-type test (Chow 1960; Cohen 1983) confirm that the coefficient on *challenger participated* is significantly greater in specifications (3) and (7) of Table 3 compared to the analogous models in Table 4 (p<.001 in all cases). Two factors could explain this discrepancy. First, because Arizona has a more professional legislature than Maine, seats might be seen as more valuable, and the races could be influenced to a greater extent by campaign expenditures. Second, Arizona Senate districts are much larger than those in Maine, and the amount of money needed to mount a credible campaign is much larger. Hence, Arizonan politicians might rely more on high-cost campaign activities such as media buys, whereas retail politicking may be a more important activity in Maine.

Finally, whereas in Arizona the effects of public financing were much stronger in districts held by incumbents, there is no significant difference between these two district types in Maine. In the regression predicting HHI^{-1} (see specification (4) of Table 4), public financing increases the number of effective candidates by .15 in open-seat races (p=.04), and by .14 in races

where an incumbent is running for reelection (p=.008). In the regressions predicting margin of victory, the effect of public financing does not quite achieve statistical significance in open-seat races (p=.25), but does in incumbent-held districts (p=.005). Nevertheless, the difference between district types is not statistically significant. Again, the higher level of incumbency advantage in Arizona could explain this difference. Incumbents might rely on financial advantages in Arizona to win races against under-funded challengers. The infusion of money into challenger campaign accounts mitigates this large difference. Because money could play a smaller role in building an incumbency advantage in Maine, public financing laws might not have a disproportionately large effect in these contests.

DISCUSSION

The mere presence of a public financing program is not a panacea for uncompetitive legislative elections across an entire state. In both Arizona and Maine, I observed the greatest effects in the races in which challengers accepted public monies. There are two potential, underlying mechanisms for this result. First, because the programs are nascent, it could be that they were not publicized extensively or appeared risky to potential contestants. If this is true, then the effectiveness of public financing might increase over time as participation rates increase. An alternative mechanism is that candidates who have a greater chance of winning select into public financing. High-quality challengers might be more likely to identify public financing as a source of campaign funds and undergo the effort to fulfill the participation requirements. If this is the case, then clean elections laws are still effective tools of enhancing competition, but their impact is not all-powerful and depends on the characteristics of individual contestants. Disentangling these two mechanisms (which are not mutually exclusive) is beyond the scope of this analysis.

In either case, the results are much more supportive of Jacobson's (1978) view of public financing than Levitt's (1994). If money were inconsequential in mounting effective challenges, then I would not have observed the strongest effects of the programs in those districts where challengers accepted funds. As a result, the empirical evidence on public financing suggests that these programs do not simply fill the coffers of unserious and low-quality candidates, but rather they help serious contestants mount effective challenges.

The pre/post design used in this analysis is obviously limited by the fact that one cannot observe all changes that occurred between t and t+1. One principal concern is that strategic candidates might wait for district lines to

change in their favor. However, given that the district is the unit of analysis, the same feature that allows direct comparability over time also acts as an impediment since lines change after redistricting. Nevertheless, this potential limitation only prevents one from observing the full effect of clean elections since a substantial number of high-quality participants might not be running in the post-treatment timeframe being studied. Thus, the impact of public financing reported here can be viewed as a floor effect.

In closing, I note that the ultimate goal of public financing is to reduce the role of money in U.S. state politics—a goal that includes, but is not limited to, increased electoral competition. This study does not touch on important issues related to the substantive content of elections or legislative behavior. With the role of special interest groups presumably mitigated, do candidates propose policy platforms closer to the median voter in their district? Do legislators elected by publicly-funded campaigns behave differently than those elected by privately-funded campaigns? At least one theoretical study (Baron 1994) predicts that public financing will result in candidate policy positions closer to the district median voter. Future work on state-level campaign finance should closely evaluate the programs based on the full range of their intended effects.

Public financing initiatives are beginning to spread throughout the American states. In the wake of the scandal involving ex-Governor John Rowland, Connecticut implemented a full public financing system for state legislative races in 2006. Beginning in 2005, New Jersey initiated pilot programs, experimenting with the use of public financing in select legislative districts. The experiences of Arizona and Maine suggest that these programs will inject needed funds into the campaigns of challengers, assisting them in mounting effective races. However, states with new programs will also provide data to assess whether these public policy instruments are exportable across different institutional and electoral contexts.

ENDNOTES

1. By generous, this is not a reference to particular dollar amounts, but that public monies generally equalize spending levels between candidates.

2. In political science, the HHI and its inverse have been used to calculate the effective number of political parties in a polity (Taagepera and Shugart 1989) and to construct party fragmentation variables (Persson 2004). Wand and Mebane (1999) also used HHI^{-1} to measure the effective number of candidates in primaries. The Department of Justice's merger guidelines, which mention the HHI, can be found at www.ftc.gov/bc/docs/horizmer.htm.

3. I do not examine whether the race is contested as a dependent variable for two reasons. First, as explained above, an extreme amount of information is lost by dichotomizing the data in this fashion. Second, when estimating logistic regressions, there are several instances where the inclusion of important control variables produces perfect predictions and the models are not identified.

4. I do not examine House races because it is unclear what the definition of a quality candidate would be. Clearly, not all city council and school board positions are created equal in terms of fostering political experience. Focusing on Senate contests allows an unambiguous measure of candidate quality with respect to legislative races: prior service in the legislature. Coding candidates who previously held insignificant offices as quality candidates may attenuate the coefficient estimate. Moreover, biographical data on challengers in state legislative contests is not consistently and reliably recorded.

5. Data for Arizona vote share, incumbency, candidate quality, and other election-related variables were obtained from the office of the Secretary of State for the state of Arizona (2006). Data for Maine vote share, incumbency, candidate quality, and other election-related variables were obtained from the Department of the Secretary of State for the state of Maine (2006). Data on program participation were obtained from the Citizens Clean Elections Commission (Arizona 2007) and the Maine Commission on Governmental Ethics and Election Practices (Maine 2007). The dataset is available from the author upon request.

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