Regulators and Redskins

**Bentley Coffey · Patrick A. McLaughlin ·
Robert D. Tollison**

Abstract We examine the correlation between federal government activity and performance of the capital's National Football League team, the Washington Redskins. We find a positive, non-spurious, and robust correlation between the Redskins' winning percentage and bureaucratic output, measured by pages published in the *Federal Register*. Because the Redskins' performance is prototypically exogenous, we give this result a causal interpretation and provide a plausible, causal mechanism: bureaucrats must make "logrolling" deals to expand their regulatory power, and a winning football team offers a shared source of optimism to lubricate such negotiations. We do not find the same correlation when examining congressional activity.

1 Introduction

When the local sports team is on a winning streak, it generates good vibrations that propagate from fans outward through their social connections, reverberating throughout myriad

B. Coffey · R.D. Tollison (✉)
Clemson University, Clemson, USA
e-mail: rdtollison@bellsouth.net

P.A. McLaughlin
George Washington University, Washington, USA

social interaction in that locality. Such a positive shock may affect the local economy, which should include the political economy of governmental activity if the winning team's hometown is also the seat of government. This line of reasoning naturally leads to a series of research questions about the effects of these positive shocks. How does a winning team in the capitol influence the exercise of power by governmental agencies? If bureaucrats are happier for exogenous reasons, what is the impact on taxes, spending, legislation, regulation, and so on?

In this paper, we examine the effect of the win/loss performance of the Washington Redskins on federal regulatory activity, as measured by the page count of the *Federal Register*.

Economic theory produces conflicting predictions of whether the exogenous shock of a Redskins win would increase or decrease federal regulatory activity. On the one hand, both the exercise of regulatory power and a winning local football team are compensating differentials in wage and hence would be expected to move in opposite directions (ceteris paribus). Although top-level bureaucrats may be paid less than they would earn in the private sector, that wage differential is made up with the joy of exercising regulatory power and consuming local amenities. Hence, a winning football team adds to the utility associated with local amenities, somewhat obviating the need for top governmental officials to unleash zealous regulators in order to keep them happy. On the other hand, the commonly shared positive shock of a winning team may serve to lubricate logrolling negotiations that lead to more prolific regulations.

Both of these hypotheses highlight an obvious but nonetheless important insight of the public choice literature: namely, politicians and bureaucrats are humans, just like those outside of government, who may have home team loyalties, may conduct business in the stands of stadiums, or may be willing to accept a less generous compensation package if they have the opportunity to live in a city with a winning football team. At first pass, looking for any relation between the Redskins' performance and federal employee activity may seem whimsical. However, that is precisely the point—the government is a collection of individuals and hence inherits their susceptibility to the whimsies of a winning (or losing) team on the field.

We find a statistically significant and robust positive correlation between the Redskins' on-field performance (measured in winning percentage) and federal regulatory output (measured in pages published in the *Federal Register*). The Redskins' performance is prototypically exogenous. Hence, we give this surprising positive correlation a causal interpretation: it is easier for bureaucrats to expand their regulatory power when the Redskins are winning. Our findings fall right in line with the behavioral finance findings of Edmans et al. (2007) who similarly document that a winning national soccer team has a positive effect on a country's stock market. Like investors, bureaucrats can be influenced by positive exogenous shocks in local amenities, such as winning sports teams. In turn, they can influence the amount of regulation imposed upon the economy. This is the chief contribution to the literature of our paper, the first to examine the effects of local amenities on bureaucratic behavior.

Section 2 reviews some of the related literature and provides some background. Section 3 lays out our simple theoretical setup and Sect. 4 explores our data. Section 5 fuses these two preceding sections into an econometric model. The results and summaries of tests of robustness are presented in Sect. 6. We offer concluding remarks Sect. 7.

2 Background and related literature

The literature of political economy and public choice contains various explanations of the size and growth of government.[1] Some of these studies focus on the behavior of government workers (bureaucrats), with an emphasis on their voting patterns. Simply put, government workers are more likely to find a larger government in their self-interest and to vote accordingly. Though the evidence is mixed, there is some support for the bureaucratic voting hypothesis. In this paper, we consider the possibility that local amenities may affect the process by which bureaucrats position themselves to increase their regulatory power.

We are not aware of any literature that directly tests the impact of amenities on bureaucratic behavior. There is discussion in related papers about the fact that areas and cities that comprise the seat of government are characterized by more restaurants, parks, and golf courses, all of which are seen as facilitating the process of rent seeking (Ekelund et al. 1994). There is also a theoretical literature on the control of political agents in which the compensation of these agents is the key variable of analysis (Barro 1973; Becker and Stigler 1974; McCormick and Tollison 1978; Besley 2006). The general finding of this work is that higher pay is a deterrent to corruption. The local amenities that we explore in this paper are a form of compensating variation in pay and may also affect bureaucratic behavior.

Bureaucrats and politicians regularly are the targets of gift-giving by lobbyists, firms, and other groups and individuals. One popular form of gifts is tickets to sporting events. In fact, one newspaper article alleges that "[m]ost of the lobbyist spending on [Georgia governor Sonny] Perdue last year involved football" including Atlanta Falcons tickets and a flight to Jacksonville for the Georgia-Florida football game.[2] Thus, it seems plausible that the existence of local professional sports teams allows bureaucrats and politicians to receive a different compensation package than would be possible without the teams. If those sports teams' presence alters the possible compensation package for local residents, local wage rates and housing rents would reflect those compensating differentials. Carlino and Coulson (2004) used hedonic wage and rent equations to test this idea and found that housing rents were about 8% higher in cities with NFL teams and wages were about 2% lower in areas with teams, although the latter finding was not statistically significant at normal levels. The authors speculate that local sports clubs may produce public goods that improve the quality of life of residents, thereby justifying the public expenditure that often is dedicated to the stadiums of local sports clubs. In contrast, Coates and Gearhart (2008) examined a different sport—auto racing—using data from 140 different SMSAs over a 13-year period and found no evidence that either a NASCAR track or NASCAR event affects housing rents positively or negatively.

Conversely, even if local sports teams provide no positive amenities to local residents, there still may exist a relation between local sports teams' performances and local residents' productivity. For example, Coates and Humphreys (2002) find that residents of cities whose teams won Super Bowls experience a small but statistically significant increase in real per capita personal income in the same year and suggest that this could stem from an increase in labor productivity following the championship. On a very simple level, one might suppose that winning teams lead to happier and therefore more productive residents. Alternatively, the existence of local teams and their events provides opportunities for local residents to

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[1]See Mueller (2003), especially Chap. 21, and the references cited there.

[2]Salzer, James and Cameron McWhirter. "Loophole allows governor to receive gifts." *Atlanta Journal Constitution*. February 8, 2009. Available online at: http://www.ajc.com/services/content/metro/stories/2009/02/08/legperdue_0208.html?cxntlid=inform_artr (accessed February 10, 2009).

engage in "business-related" activities (e.g., attending football games) without which some business relationships would not exist.

If this sort of relation exists between local residents and local sports teams, the Washington, D.C. area offers a useful testing ground to discern it. As of January 2007, there were over 284,000 federal employees living in the Washington, D.C. area (Bureau of Labor Statistics 2009). One measure of the output of these federal employees is the number of pages published each quarter in the *Federal Register*. The *Federal Register* prints, on a daily basis, all regulatory activity from notices of proposed rulemakings to final regulations to deregulation, executive orders, proclamations, and administrative directives (Davies and de Rugy 2008). We exploit this measure of federal employee output to test for the relation between the Washington Redskins' performance and federal employee output, as detailed below.

3 Theory

We want to determine if the performance of the Washington Redskins has any impact on federal government activity. There are two competing hypotheses which would lead to such a relationship:

H_1: Wage Hedonics
H_2: Transactions Costs

Under H_1 the basic theory focuses on the role of the federal government's compensation package in attracting and retaining skilled laborers. Although wages are a significant part of this compensation package, they do not adjust as freely as private sector wages due to the complicated bureaucratic process by which wages are set. The resulting variation in the differential of federal relative to private sector compensation is equilibrated with the exercise of power or political/policy influence over the real world. Under standard hedonic wage theory, individuals lured into the beltway would require less compensation when Washington offers more desirable local amenities. A winning football team is a positive local amenity. Moreover, the Redskins' performance is clearly orthogonal to any other variable of plausible theoretical interest. Hence, holding wages and other relevant factors constant, we would expect that federal governmental employees exert less power when Washington fields a better football team.

Under H_2 the objective of each federal employee is to maximize his/her power. Due to our complex system of checks and balances, individuals can gain power only with the cooperation of others involved in the rulemaking.[3] This is easier to accomplish when the transaction costs of bureaucratic interactions are lower. When the Redskins are winning, the costs of bureaucratic interaction are lower for reasons grounded in human behavior. Football fans feel more optimistic when their team is winning, and they can more easily interact and

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[3]At least two common situations could fit this scenario. First, for executive branch agencies, economically significant rules and rules deemed significant for other reasons must be reviewed by the Office of Information and Regulatory Affairs prior to publication in the Federal Register (see McLaughlin 2010 and Ellig and McLaughlin 2010 for further discussion of this review process). Second, several agencies engage in negotiated rulemaking processes, in which specifics of rules are typically worked out over a series of meetings with stakeholders (see, for example, Cothen et al. 2005 for a discussion of the negotiated rulemaking process at one executive agency). In each of these scenarios, it is not hard to imagine that cooperation speeds the regulation publication rate.

get their business done. Happier workers mean that the costs of decision making have fallen, making agreements easier to reach.

Of course, the two hypotheses are not mutually exclusive. Both may be present in the data, and we may only be able to discern which hypothesis dominates. However, we note that the timing of their equilibrating mechanisms may be different. H_1 may be associated with the longer time horizon of changing employment, while H_2 may be associated with shorter-term bureaucratic interactions.

4 Data

For our measure of the federal government's exercise of power, we use the page count of the *Federal Register*, which is available in library records on a monthly basis since 1945 and on a daily basis since 1994 (when the *Federal Register* became available in electronic form). As previously mentioned, the *Federal Register* contains records of the daily regulatory activities of the federal government, as well as executive orders, administrative directives, and procla-mations. Our treatment variable is the performance of the Washington Redskins, which is available for each game since 1932.[4] Because our treatment variable is clearly exogenous and arguably independent of any other candidate explanatory variables, econometric theory requires neither instrumentation nor controls for confounding variables. Nevertheless, we also gathered data on numerous potentially confounding political variables: the party controlling the Executive branch, the percentage of congressional seats occupied by Democrats, and quarterly cabinet turnover rates.[5] We include these variables in numerous regressions as robustness tests.

Table 1 presents summary statistics for our quarterly variables. We have observed the Redskin's to-date winning percentage (To-Date Redskins WinPerc), real GDP (RGDP), the page count for the *Federal Register* for 253 quarters (Quarterly Pages in FR), whether the President is a Democrat (President Democrat), the turnover rate of the Cabinet (Cabinet Turnover Rate), and the percentage of members of Congress that are Democrats (Democrat % of Congress). The Redskin's record ranged from winless to perfect (in that quarter), with a mean around 0.500. The quarterly pages of the *Federal Register* run from a low of 1,454 pages to a high of 28,679 pages with a mean of 11,121 pages.

Table 1 Quarterly summary statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Quarterly pages in FR	253	11120.87	6881.896	1454	28679
To-date Redskins WinPerc	253	0.496	0.239	0	1
RGDP	253	6321.962	3537.242	1768	13415.3
Democrat President	253	0.433	0.496	0	1
Cabinet turnover rate	244	0.078	0.174	0	1
Democrat % of Congress	253	0.559	0.063	0.450	0.679

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[4]A copy of our data is available on request.

[5]These data were gathered from a variety of government websites, including those of each chamber of Congress and each cabinet agency.

Table 2 Annual summary statistics

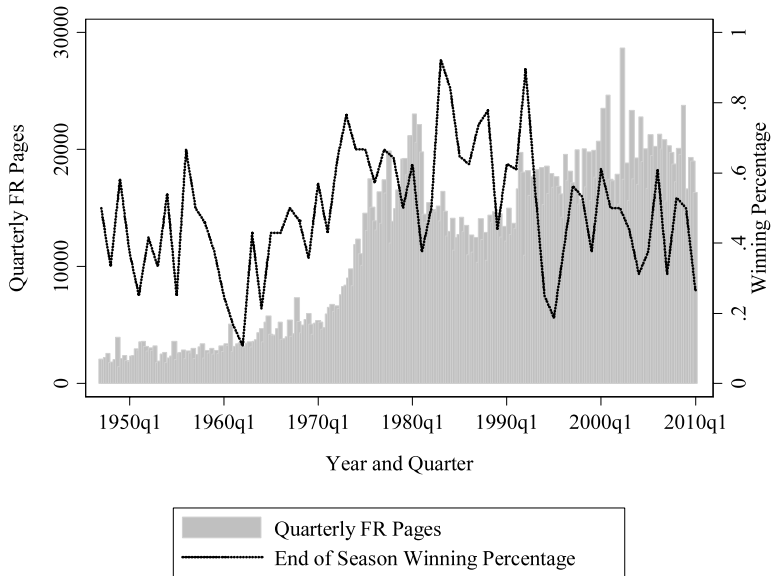| Variable	Obs	Mean	Std. Dev.	Min	Max
Annual pages in FR	65	43500.020	27110.240	7952.000	87012.000
Redskins WinPerc last season	65	0.501	0.176	0.107	0.923
Redskins in playoffs last season	65	0.262	0.443	0.000	1.000
RGDP	65	6156.014	3558.246	1776.100	13228.900

Fig. 1 Pages of Federal Register each quarter and the Redskins end of season winning percentage

Table 2 presents summary statistics for the Redskins winning percentage and RGDP, aggregated up to the annual level with an indicator for having earned a playoff berth. The Redskins' winning percentage ranged from 0.l to 0.9, with a mean around 500. Over the course of these 65 seasons, the Redskins earned a playoff berth about 25% of the time.

Figure 1 displays the quarterly number of pages of the *Federal Register*. The page publication rate in the *Federal Register* grew steadily until the early 1970s when it began a precipitous climb that ended in the late 1970s. The rate of the *Federal Register* then declined until the late 1980s when a moderate growth path was rejoined. On this same figure, we have plotted the performance of the Washington Redskins. Despite a fair amount of volatility in performance, the Redskins had their best seasons between the late 1970s and the early 1990s.

Because the study period is dominated by growth in the size of the *Federal Register*, we should be concerned in the stationarity of this time series. When plotted in Fig. 2 alongside RGDP, the non-stationarity of both the pages of the *Federal Register* and RGDP becomes more apparent. Note that the ratio of the Pages of the Federal Register to RGDP, as displayed in Fig. 3, appears to be stationary. Indeed we provide stationarity tests for these variables in the results section where we rule out the suspicion that our results are merely the results of running a spurious regression.
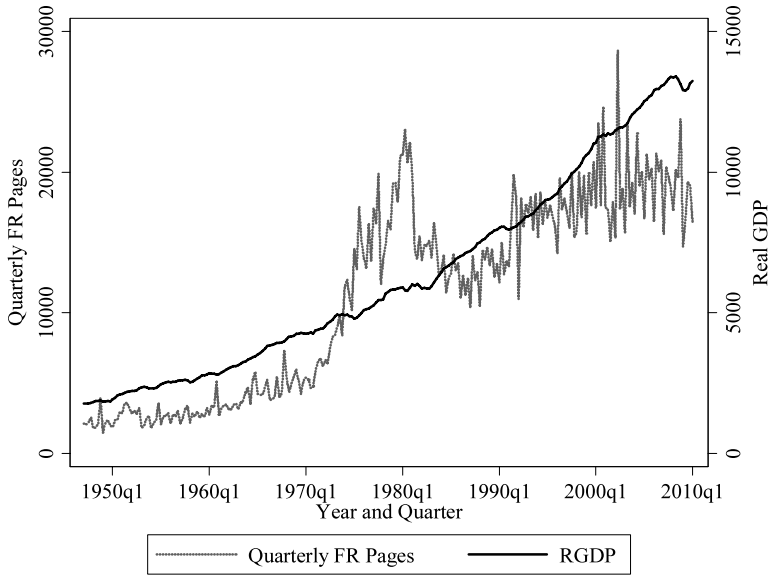
Fig. 2 Quarterly RGDP and quarterly Federal Register pages
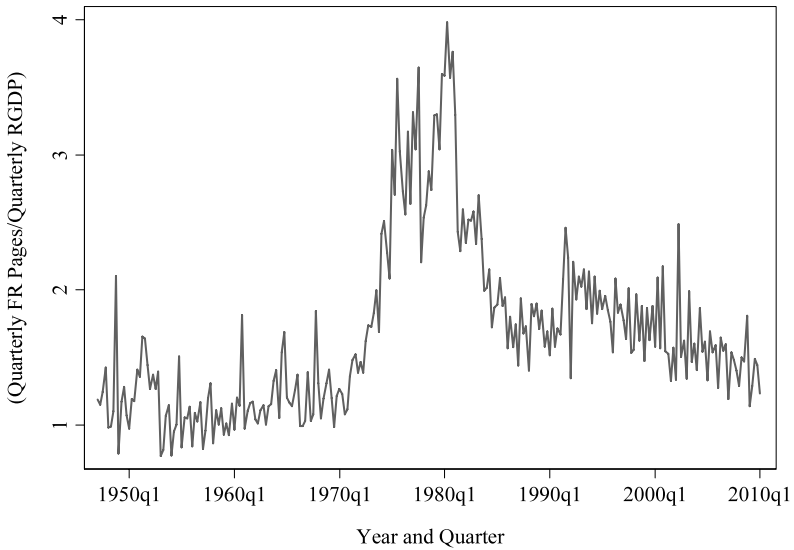

Fig. 3 Ratio of quarterly Federal Register pages to RGDP (FR pages/RGDP)

5 Econometric model

The basic econometric model is a simple linear regression:

$$R_t = \beta_0 + \beta_1 Q(W_t) + \beta_2 GDP_t + u_t, \tag{1}$$

where u is a well-behaved disturbance term, R is the page count of the *Federal Register*, W is the entire history of the Washington Redskins' win-loss record, $Q()$ is a function that maps that history into a current measure of the team's quality, and *GDP* is a control variable which captures the general trend of R increasing over time with the size of the economy. Our theoretical hypothesis generates unambiguous predictions about the parameter values:

H_0: $\beta_1 < 0$
H_1: $\beta_1 > 0$

The simplest and most intuitive model for $Q(W)$ is the winning percentage at that point in the current season. This model of beliefs over team quality can be constructed from a straightforward Bayesian model (see the Appendix for a full development). We also examine another reasonable candidate: whether the team earned a playoff berth.

6 Results

The quarterly results in Table 3 show that *Federal Register* pages are positively correlated to the to-date winning percentage of the Washington Redskins, and this effect is statistically significant at the 1% level. RGDP is also significantly positive (largely picking up the fact that real GDP has grown over the time period of interest and so has the size of the *Federal Register*). For an increase in the winning percentage in 2007 from 0.50 to 1.0 (i.e., from being a 0.500 team to having a perfect season), our model predicts a 9% increase in

Table 3 Quarterly results for pages of the Federal Register

Variables	(1) Quarterly pages in FR	(2) Quarterly pages in FR	(3) Quarterly pages in FR	(4) Quarterly pages in FR
To-date Redskins WinPerc	3,997.971 $(4.47)^{***}$	4,143.400 $(5.00)^{***}$		
RGDP	1.651 $(27.35)^{***}$	1.935 $(30.51)^{***}$	1.647 $(27.07)^{***}$	1.933 $(30.13)^{***}$
Lagged Redskins WinPerc			3,896.313 $(4.32)^{***}$	3,912.610 $(4.70)^{***}$
Democrat President		1,012.728 $(2.46)^{**}$		976.044 $(2.35)^{**}$
Cabinet turnover rate		862.617 (0.78)		1,006.513 (0.90)
Democrat % of Congress		21,950.413 $(6.53)^{***}$		21,733.759 $(6.40)^{***}$
Constant	−1,300.878 $(2.18)^{**}$	−15,738.007 $(7.62)^{***}$	−1,224.738 $(2.04)^{**}$	−15,480.300 $(7.44)^{***}$
Observations	253	244	252	243
R-squared	0.76	0.81	0.76	0.81

Absolute value of t statistics in parentheses
*significant at 10%; **sign. at 5%; ***sign. at 1%

Table 4 Annual results for pages of the Federal Register

Variables	(1) Annual FR pages	(2) Annual FR pages	(3) Annual FR pages	(4) Annual FR pages	(5) Annual FR pages	(6) Annual FR pages
Redskins WinPerc last season	37,717.03 (2.01)**		14,855.40 (0.59)	25,143.54 (2.98)***		22,449.98 (1.96)*
Redskins in Playoffs last season		17,464.28 (2.36)**	13,473.09 (1.34)		7,699.04 (2.20)**	1,614.77 (0.35)
RGDP				6.65 (15.94)***	6.59 (15.14)***	6.63 (15.55)***
Constant	24,584.98 (2.46)**	38,932.44 (10.30)***	32,526.32 (2.81)***	−10,057.35 (2.03)**	908.60 (0.30)	−8,977.59 (1.53)
Observations	65	65	65	65	65	65
R-squared	0.06	0.08	0.09	0.82	0.80	0.82

Absolute value of t statistics in parentheses

*significant at 10%; **significant at 5%; ***significant at 1%

the quarterly pages of the Federal Register.[6] Although this may appear to be a large effect, it is not unlike analogous effects found in behavioral finance; Edmans et al. (2007) find a substantial negative impact on national stock markets of a loss in international competition (World Cup) by a country's soccer team.[7] Additionally, Table 3 shows that the inclusion of our political variables, which include the party controlling the Executive branch, the percentage of congressional seats occupied by Democrats, and quarterly cabinet turnover rate, leaves our coefficient estimates on the Redskins winning percentage virtually unaffected.

We explore several robustness checks. As can be seen in Fig. 1, one might be concerned that these results are coming from the quarters between 1970 and 1980, where there is a dramatic rise in the quarterly page count in the *Federal Register* that coincides several good seasons for the Redskins. However, when those observations are excluded from the regressions, our results still hold. Aggregating the data up to the annual level produces similar findings, as displayed in Table 4, albeit with a smaller sample size and the corresponding expected effect on the precision of the finding.[8] The significant positive correlation is present

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[6]The model predicts the change in the page count of the Federal Register in response to a 1 unit change in winning percentage. Given our measurement units, a 1 unit change in the winning percentage is the change from a winless season to a perfect season. Half of that is the change from a 0.5 season to a perfect season. We then translate this into a semi-elasticity, which is appropriate since winning percentage is already measured as a percentage, by dividing by the average quarterly page count during that period (around 20,000 pages).

[7]The loss (estimated to be 7%) is not explained by any other factor or event. The effect is hypothesized to work through the impact of a sports loss on investor sentiment. This result is closely tied to the one we find for government workers and football wins in that a link is found between sports outcomes and the real economy.

[8]When we disaggregated down to the weekly level, real GDP was no longer available (it is released quarterly), and almost nothing was significant (except whether the Redskins made the playoffs in the previous season). For the disaggregated regressions, we explained virtually none of the variation in the data. This suggests that there is no discernable relationship in the very short-run, implying that it takes a long time to get things done in government, which should not be surprising. We would be amazed if a Redskin win on Sunday would immediately generate a slew of new regulations by the end of the week. Rather, the lowering of bureaucratic transaction costs due to a commonly shared series of exogenous positive shocks works over a longer time horizon (for example, quarters).

Table 5 Augmented Dickey-Fuller tests for unit root process

	Test statistic	1% Critical value	5% Critical value	10% Critical value
VARIABLE: (**FR pages/RGDP**) Number of obs = 252				
Interpolated Dickey-Fuller				
$Z(t)$ −4.540	−3.460	−2.880	−2.570
MacKinnon approximate p-value for $Z(t) = 0.0002$				
VARIABLE: (**RGDP**) Number of obs = 252				
Interpolated Dickey-Fuller				
$Z(t)$ 4.293	−3.460	−2.880	−2.570
MacKinnon approximate p-value for $Z(t) = 1.0000$				
VARIABLE: (**FR pages**) Number of obs = 252				
Interpolated Dickey-Fuller				
$Z(t)$ −3.156	−3.460	−2.880	−2.570
MacKinnon approximate p-value for $Z(t) = 0.0227$				

H0: Variable contains a unit root

HA: Variable generated by stationary process

whether we use the previous season's winning percentage or playoff berths as our measure of believed quality.[9]

These results may appear to be yet another example of spurious regression to a time series econometrician unfamiliar with public choice theory. Indeed, Table 5 reveals that both RGDP and the *Federal Register* page count fail the (augmented) Dickey-Fuller test for stationarity. However, we fail to reject the null hypothesis of stationarity for the ratio of the *Federal Register* page count to GDP. Hence, we can regress this measure on the performance of the Washington Redskins. The result, as shown in Table 6, is that we once again see a significant positive correlation between the performance of the Redskins and the scale of federal regulatory activity relative to GDP. Therefore, we conclude that the general relationship that we have uncovered is not simply the result of spurious regression.

We tried a similar experiment with congressional behavior. This included running the same models as in Table 3 using bills introduced in the U.S. House and Senate, bills introduced in the House and Senate per days in session, and days in session for the House and Senate as dependent variables. There are no Redskin effects in these results (results not reported here but available upon request). This is consistent with political agents remaining loyal to home state teams and with Redskin fans in the House and Senate being too small in numbers to affect legislative output. Indeed, the Baltimore Ravens are close by, and the District of Columbia has no meaningful representation in Congress.

As a final series of robustness checks, we gathered data on three other Washington area professional sports teams: the Nationals (baseball), Wizards (basketball) and Capitals (hockey), to test whether other local teams' winning percentages affect regulatory output.[10] We tested for correlations between these teams' winning percentages and the page-to-GDP ratio in numerous ways. This battery of tests (not reported here, available upon request) can be summarized in four key points. First, we found that the Redskins winning percentage is still very strongly, positively correlated to regulatory output, even when including other

[9]Lagged winning percentage also performs well in the quarterly results, as can be seen in Table 3.

[10]Data on Capitals', Wizards', and Nationals' winning percentages gathered from Wikipedia.

Table 6 Quarterly FR pages/RGDP regressed on winning percentage

Variables	(1) (FR pages/ RGDP	(2) (FR pages/ RGDP	(3) (FR pages/ RGDP	(4) (FR pages/ RGDP	(5) (FR pages/ RGDP
To-date Redskins WinPerc	0.834	0.894			0.630
	(5.17)***	(5.51)***			(3.57)***
Lagged Redskins WinPerc			0.836	0.883	0.606
			(5.17)***	(5.45)***	(3.44)***
Democrat President		0.083		0.084	0.131
		(1.03)		(1.04)	(1.64)
Cabinet turnover rate		0.151		0.185	0.175
		(0.69)		(0.85)	(0.82)
Democrat % of Congress		2.905		2.854	2.817
		(4.77)***		(4.67)***	(4.72)***
Constant	1.270	−0.424	1.270	−0.390	−0.564
	(14.32)***	(1.23)	(14.27)***	(1.13)	(1.66)*
Observations	253	244	252	243	243
R-squared	0.10	0.19	0.10	0.19	0.23

Absolute value of t statistics in parentheses

*significant at 10%; **significant at 5%; ***significant at 1%

sports' teams winning percentages in the regression. Second, the Wizards' winning percentage is positively and robustly correlated to regulatory output as well. Third, while the Nationals' lifespan appears too short (we gathered data only from their present incarnation, which started in 2002) to obtain statistical significance in any estimates, the coefficient estimate on the Nationals' winning percentage is generally positive and borderline significant ($p = 0.15$) in some regressions. Fourth, the Capitals' winning percentage is very strongly, negatively correlated to regulatory output, a result for which we have no explanation.

All of the above results hold when including dummy variables for three of the four quarters of the year, to account for possible seasonal variation in regulatory output.

7 Concluding remarks

Our results show that at least one local amenity—a winning professional football team—is associated with more regulatory output from the federal government. This finding is consistent with the hypothesis that the transaction costs of creating regulations decrease when the Redskins are winning. One possible interpretation of this finding is that happier government workers are more prolific regulators, which leads to the question of whether this point applies on a larger scale. For example, all else the same, is the supply of regulation related to weather conditions or seasonal influences? Are other local amenities (e.g., golf courses, beaches, skiing venues, restaurants, or holidays) complements to or substitutes for the output of regulation? There is also a possible quantity-quality tradeoff in regulatory output. McLaughlin (2010) and McLaughlin and Ellig (2010) note that the surges in regulatory output that occur during lame-duck administrations—the midnight regulations phenomenon—could result in a decrease in the quality of regulations and regulatory analysis if less time is spent creating and reviewing each individual rule. Could a Redskins-induced increase in regulatory output have any effect on regulation quality?

Alternatively, the existence of a winning football team may simply provide an environment conducive to logrolling. This environment could actually be the stadium or at sports-centric activities such as viewing parties, where deals could be struck or relationships formed that allow for deals to be discussed at other times. Similarly, a winning football team could simply lead to office environments in which more conversations occur around water coolers and coffee pots, enabling relationships to form and lubricating the logrolling process. If a necessary ingredient for greater regulatory activity, or worker productivity in general, is simply having a reason to talk around the water cooler, then similar results might be observed around the time of the NCAA men's basketball tournament, when many offices informally allow office-wide betting on the outcome of the tournament. Of course, any increase in productivity from relationship-forming conversations centered on the NCAA men's basketball tournament may be more than offset by decreases in productivity resulting from workers actively watching the games during workdays rather than working—a phenomenon unlikely to occur for NFL games because most of them occur well outside of normal office hours.

If this positive relation between the Redskins' performance and regulatory activity is indeed because of a "lubricated logrolling effect," then this could help explain why public funds are sometimes used to help subsidize local professional sports teams, especially in the construction of new stadiums. Regardless of whether the investment of public funds in a stadium makes economic sense for residents and taxpayers, politicians and bureaucrats may support it because it is their best interest to expand government power through rulemaking. Of course, the reason public funds are allocated to stadiums in some cases may be even more direct: government officials may receive free tickets to games from lobbyists or special interest groups, thereby receiving a greater compensation package for their "public service."

Appendix: A Bayesian model of beliefs over a football team's quality

We create a model of the beliefs of an average Redskins fan (as opposed a super fan or someone who owns lots of paraphernalia, religiously watches all games, actively trades in a fantasy football league, regularly rattles off statistics, and would never allow a move across the country to change her allegiance). The Redskins will beat week t's opponent if their ability (a_r) and luck (ε_r) are greater than that of opponent i:

$$\ln a_r + \varepsilon_r \geq \ln a_t + \varepsilon_t \tag{2}$$

If luck is a Type I extreme value, then the probability that the Redskins win given the teams' abilities is the familiar logit form:

$$\Pr(w_t | a_r, a_t) = \frac{a_r}{a_r + a_t} \tag{3}$$

The ability of the Redskins is unknown to the Redskins fan. We can construct Bayesian beliefs over the ability of the Redskins for a given season. Assuming that casual fans (as opposed to super fans) update their beliefs about their team's ability, but not of their opponents (who are all drawn from the same distribution), we can simplify their beliefs about their team's ability into a constant probability of winning on any given Sunday:

$$q = \int_{\underline{q}}^{\overline{q}} \left[\frac{a_r}{a_r + a_t} \right] pdf_t(a_t) dq, \tag{4}$$

where q measures both the probability of winning any game (that is, the unconditional probability of winning, as opposed to the probability of winning conditional upon the opponent) and the quality of the team. With this simplification, the data-generating process for wins is a simple Bernoulli process with probability, q. Let beliefs over the team's quality be given by the extremely flexible Beta distribution:

$$pdf(q) = \left[\frac{\Gamma(\omega_t + \lambda_t)}{\Gamma(\omega_t)\Gamma(\lambda_t)} \right] q^{\omega_t - 1}(1 - q)^{\lambda_t - 1}, \tag{5}$$

where ω captures the team's winningness and λ the team's losingness. Due to the constancy of the Beta beliefs with the Bernoulli data-generating process, Bayes' rule for updating beliefs simplifies to:

$$\omega_{t+1} = \omega_t + w_t \quad \lambda_{t+1} = \lambda_t + [1 - w_t] \tag{6}$$

Note that we will need a ω_0 and λ_0, but we can estimate those (nonlinear) parameters by searching for the values that minimize Mean Square Error. It is reasonable to think of fans as foolishly optimistic (that is, $\lambda_0 = 0$, with the cautiousness of that optimism given by ω_0) at the start of each season.

Our estimation will be a straightforward regression:

$$R_t = \beta_0 + \beta_1 E_q(q|\omega_t, \lambda_t) + \beta_2 E_q(q^2|\omega_t, \lambda_t) + u_t, \tag{7}$$

where the expectations over the moments of q serve as the measure of Redskin-fueled optimism. Note that we do not really need other RHS variables because the performance of the Redskins should be truly exogenous.

With Beta distributed beliefs, the moments of q are given by:

$$E_q(q|\omega_t, \lambda_t) = \frac{\omega_t}{\omega_t + \lambda_t}$$

$$E_q(q^2|\omega_t, \lambda_t) = \left[\frac{\omega_t}{\omega_t + \lambda_t} \right]^2 + \frac{\omega_t \lambda_t}{(\omega_t + \lambda_t)^2(\omega_t + \lambda_t + 1)} \tag{8}$$

$$\vdots$$

Note that just including the first moment is the intuitive approach of including the winning percentage on the RHS. The second moment would bring in the variance of the beliefs (should quality not be as certain for a 3-1 record as a 9-3 record).

References

Barro, R. J. (1973). The control of politicians: an economic model. *Public Choice*, *14*, 19–42.

Becker, G., & Stigler, G. (1974). Law enforcement, malfeasance, and compensation of enforcers. *The Journal of Legal Studies*, *1*, 1–19.

Besley, T. (2006). *Principled agents: the political economy of good government*. Oxford: Oxford University Press.

Bureau of Labor Statistics, U.S. Department of Labor (2009). *Career guide to industries, 2008-09 edition*, Federal Government, Excluding the Postal Service. Available online at http://www.bls.gov/oco/cg/cgs041.htm. Accessed 10 February, 2009.

Carlino, G., & Coulson, N. E. (2004). Compensating differentials and the social benefits of the NFL. *Journal of Urban Economics*, *56*(1), 25–50.

Coates, D., & Gearhart, D. (2008). NASCAR as a public good. *International Journal of Sports Finance*, *3*, 41–57.

Coates, D., & Humphreys, B. (2002). The economic impact of postseason play in professional sports. *Journal of Sports Economics*, *3*, 291–299.

Cothen, G., Schulte, C. F., & Horn, J. D. (2005). Consensus rulemaking at the federal railroad administration: all aboard for railway safety measures. *TR News*, *236*, 8–14.

Davies, A., & de Rugy, V. (2008). *Midnight regulations: an update*. Mercatus Working Paper 08-06. Mercatus Center at George Mason University. Available online at: http://www.mercatus.org/uploadedFiles/Mercatus/Publications/WP0806_RSP_Midnight%20Regulations.pdf. Accessed February 10, 2009.

Edmans, A., Garcia, D., & Norli, O. (2007). Sports sentiment and stock returns. *The Journal of Finance*, *62*(4), 1967–1998.

Ekelund, R., Laband, D., & Mixon, F. (1994). Rent seeking and hidden resource distortion: some empirical evidence. *Public Choice*, *78*, 171–185.

Ellig, J., & McLaughlin, P. A. (2010). *The quality and use of regulatory analysis in 2008*. Working Paper. Available online at: http://ssrn.com/abstract=1639747. Accessed 2 December, 2010.

McCormick, R., & Tollison, R. (1978). Legislatures as unions. *Journal of Political Economy*, *86*, 65–78.

McLaughlin, P. A. (2010). The consequences of midnight regulations and other surges in regulatory activity. *Public Choice*. doi:10.1007/s11127-010-9635-4.

McLaughlin, P. A., & Ellig, J. (2010). *Does haste make waste in regulatory analysis*? Working Paper. Available online at: http://ssrn.com/abstract=1646743. Accessed 2 December, 2010.

Mueller, D. C. (2003). *Public choice III*. Cambridge: Cambridge University Press.