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# UNDERSTANDING THE ADOPTION OF PAY-FOR-PERFORMANCE IN STATE GOVERNMENTS: A DIFFUSION THEORY APPROACH

Sangyub RYU
John C. RONQUILLO
Seejeen PARK

**Sangyub RYU**
Assistant professor, Department of Public Administration,
Yonsei University, Seoul, South Korea
E-mail: sangyub@yonsei.ac.kr

**John C. RONQUILLO**
Assistant professor, School of Public Affairs,
University of Colorado Denver, Denver, U.S.A.
E-mail: john.ronquillo@ucdenver.edu

**Seejeen PARK** (corresponding author)
Assistant professor, Department of Public Administration,
KwangWoon University, Seoul, South Korea
E-mail: sjpnpm@gmail.com

**Abstract**

As various private sector practices have been introduced into the public sector, some were adopted without careful assessment of potential policy and management implications. One such example is the adoption of pay-for-performance (PFP). While previous research has corroborated that this performance incentive mechanism was implemented without thorough assessment, the diffusion process of PFP has not been empirically tested or evaluated.

This study applies a regional diffusion model among American (U.S.) states to examine the diffusion process. Findings show that state governments tend to adopt PFP plans when they become aware of their neighboring states adopting them, but the marginal probability of adoption decreases as the numbers of neighbors adopting such plans increases.

**Keywords:** PFP, merit pay, policy diffusion, state governments.

## 1. Introduction

Pay-for-performance (PFP), is often considered a failed public personnel management practice despite its diffusion throughout many nations in recent decades (Kellough and Nigro, 2002; Perry, Engbers and Jun, 2009; Weibel, Rost and Ostrloh, 2009). Until the present, most contemporary research on PFP focused on explaining the success or failure of the program rather than investigating the processes of PFP diffusion. Few studies, such as the research conducted by Park and Berry (2014) explore the origin of PFP and explain the diffusion process of PFP from the private sector to the public sector.

Park and Berry (2014) defined PFP as 'a successful diffusion of a failed policy' and argued that the federal government adopted PFP based on the myth that it worked well in the private sector, with the assumption that performance enhancements leading to organizational effectiveness and efficiency could also be achieved in the public sector. Much of this research has laid the groundwork for attempts at understanding the rationale behind providing performance-based-pay to employees. However, extant research has not yet empirically demonstrated the diffusion process of PFP at the state-level during the early stages of PFP adoption.

The current study is concerned with filling this research gap and investigates the state-level diffusion process of PFP using policy diffusion theory. Previous studies employing theories of diffusion have examined other topics including energy policy (Freeman, 1985), licensing laws (Lutz, 1986), state lotteries (Berry and Berry, 1990), affirmative action policies (Kellough, Selden and Legge, 1997), and education reforms (Mintrom and Vergari, 1998). This variation of topics connotes the importance of the need to not only understand the diffusion process, but in turn, each of the policy or management programs proposed or implemented in certain geopolitical jurisdictions. Due to various contextual factors associated with PFP (i.e. political control of state legislatures or fiscal health, etc.), further study is necessary to better understand the effects of both the process and the policy. Based on a regional diffusion model, this study tests whether state governments whose neighboring states adopted PFP are more likely to adopt PFP. Furthermore, this study also tests the assumption that the marginal probability of adopting PFP for a state decreases as the number of neighboring states adopting PFP increases.

The study consists of the following: first, it provides a review of the adoption of PFP; second, it summarizes diffusion theory and presents the hypotheses, and third, using data collected from United States Government Accountability Office (GAO, 1990) reports, the hypotheses are tested. Finally, findings and implications are offered.

## 2. The adoption of PFP

The basic logic of PFP is that if employees are provided with extrinsic incentives (e.g. financial incentives) depending on their performance, it will motivate the employees to work harder, ultimately improving individual and organization performance (Perry, Engbers and Jun, 2009; Park and Berry, 2014). Thus, PFP leads indi-

viduals to come to an agreement that good performers are to receive higher pay than average or lower-than-average performers (Kellough, Selden and Legge, 1997). Based on this logic, the initial adoption of PFP in the US federal government occurred in 1978 with the enactment of the Civil Service Reform Act (CSRA) and a substantial portion of past research investigated PFP at the federal government level organizations (Perry, Engbers and Jun, 2009).

However, only several studies documented the adoption process of PFP in the federal government. The core argument of these studies is that the adoption of PFP was a private to public policy diffusion that occurred without sufficient assessment of whether it worked well in the private sector (Ingraham, 1993). Park and Berry (2014) reviewed the PFP related studies that were conducted before 1978 to demonstrate that PFP in the private sector already showed problems such as subjectivity in measuring performance, perceived inequity in performance appraisal, contradictory relationship between intrinsic and extrinsic motivators, and weak link between pay and performance before CSRA. Thus, the authors concluded that the adoption of PFP was based on wrong presumptions and political reasons and suggested possible reasons for the diffusion as '(1) reform in the Carter administration based on the myth that 'private practices work', (2) reaction to the public's dissatisfaction with the bureaucracy, and (3) President Carter's belief that having the majority of federal employees receiving 'satisfactory' performance was not normal and should be corrected' (Park and Berry, 2014, p. 775). The result of the adoption of PFP in the Federal government can be found in a review by Perry, Engbers and Jun, (2009) in which the authors assessed studies from 1977 to 2008 observing that PFP was not successful in attaining its goal of motivating employees and increasing performance.

PFP diffusion research is scarcer at the state-level. The origin of PFP at the state-level dates back to 1968 when Florida first adopted the system (GAO, 1990). However, state-level PFP research was almost non-existent until scholars and practitioners began to question the effectiveness of the system in the late 1980s to early 1990s (Kellough and Selden, 1997). Since then, studies on state PFP – like the federal government – found numerous problems of the system. One of the most inclusive state-level PFP studies conducted by the GAO (1990) offers insights about the results of PFP implementation at the early stage from analyzing interviews of 75 state employees. The GAO concluded that insufficient funding led to ineffectiveness, as the performance appraisal system could not actually be differentiated based on performance. Furthermore, employee morale and the motivation to achieve high performance decreased. A subsequent survey was conducted in 1991 by Ingraham (1993) where she reconfirmed the results of the earlier study by the GAO. The majority of the respondents were dissatisfied with the performance appraisal process, the absence of consistent and adequate funding, and the generalized unwillingness to differentiate employees by individual performance (Ingraham, 1993).

Kellough and Selden (1997) analyzed the early stages of PFP adoption by conducting a survey of 189 state agency personnel managers. The findings revealed that most

managers perceived PFP outcomes negatively. More specifically, more than half of the respondents stated that PFP had problems such as a 'lack of employee confidence in supervisory objectivity and precision' (62.7%), failure to discriminate among different levels of performance (56.9%), employee's distrust in the system (54.2%), inadequate compensation for achieved performance (57.6%), and extensive documentation and paperwork (64.4%). Nevertheless, the authors concluded that PFP has been and will continue to be popular in state governments as the majority of respondents state that PFP motivates employees to produce high-quality work (76%) and that their organization has sunk costs from investment in setting up PFP (73%).

More recently, Kellough and Nigro (2002) reported similar findings after surveying Georgia state employees' perception on PFP as about 70% of them did not agree that PFP was a good system to motivate employees. More important, employees' cynicism regarding PFP led to their dissatisfaction with the nature of their work and the work environment (Kellough and Nigro, 2002); PFP, according to the authors' findings, not only fails to motivate employees but also causes their dissatisfaction.

Consequently, there is ample evidence that PFP mechanisms in states were facing barriers and setbacks in their implementation process. Since the initial adoption of PFP in Florida, however, the spread of PFP has been a 'trend' among states (GAO, 1990). Nevertheless, no research has attempted to unveil how the number of states adopting PFP increased. Thus, there is a gap in the literature in discussing the diffusion process of PFP among state governments. The current study attempts to fill this gap by applying the diffusion theory of Berry and Berry (1990, 2007) to the PFP context and empirically illustrate the diffusion process.

### 3. Policy diffusion of PFP: hypotheses

According to Gray (1973, p. 1175), 'the process by which an innovation spreads is called diffusion; it consists of the communication of a new idea in a social system over time'. Similarly, Rogers (1983, p. 5) argues that diffusion is 'the process by which an innovation is communicated through certain channels over time among the members of a social system'. Some scholars in the business, sector such as Abrahamson (1991, p. 588), view diffusion of management innovation as 'fad' or 'fashion', indicating that these fads or fashions cause organizations to adopt inefficient administrative technologies if they are considered cutting-edge innovations.

Scholars of public administration focus on policy innovation as a result of policy diffusion (Berry and Berry, 2007). Berry and Berry (2007) contend that states adopt each other's policy for three main reasons. First, they point out that states learn of innovations from other states where, they perceive, such innovations have been implemented successfully. Second, they argue that, to compete with other states, states take economic advantages over other states or move away from disadvantages by emulating other states' policies. Finally, Berry and Berry (2007) point to Walker's (1969) argument that states, even in an autonomous federal system, tend to follow nationally or regionally accepted standards regardless of whether those standards are beneficial or advantageous.

Similarly, DiMaggio and Powell (1983) stress the diffusion of innovation as a product of imitation among members of a social structure. According to them, the general public renders legitimacy to states based on the states' practices and innovation, and the legitimacy of the states encourages other states to imitate the practices and innovation. In other words, a certain successful policy from one state may diffuse to other states if the general public supports the policy.

Additionally, the regional diffusion model contends that policies are diffused across state borders and that positive regional effects are generally based on states' similarity and competition (Mooney, 2001). Scholars of the regional diffusion model argue that a state is more likely to adopt a new policy if its neighbors have already adopted it (e.g., Berry and Berry, 1990 and 2007; Mintrom, 1997; Balla, 2001). Neighboring states are more likely than non-neighboring ones to share similarities in terms of values, culture, or policy preferences (Freeman, 1985; Lutz, 1986; Mooney, 2001; Tversky and Kahneman, 1973). When confronting problems, state policy makers and citizens observe other states with similar problems in order to search for solutions, and because of familiarity, ease of communication, cross-mixing of media and population, and common values, the states are likely to look at their neighbors first (Cyert and March, 1963; Hagerstrand, 1965; Katz, Levin and Hamilton, 1963; Myers, 2000; Mintrom and Vergari, 1998; Mooney, 2001; Walker, 1969).

Another explanation for positive regional diffusion is that states compete with their neighboring states by adopting good policies or by avoiding bad policies (Dye, 1990; Mooney, 2001; Tiebout, 1956). Berry and Berry's (1990) state lottery diffusion study provide support for this assertion; states adopted a lottery in order to prevent their citizens from crossing the border and buying lottery tickets from neighboring states. Similarly, states set standards of welfare equivalent to their neighbors' standards in order to avoid an influx of the poor population from their neighboring states (Peterson and Rom, 1989 *apud* Mooney, 2001). Based on the literature, we hypothesize that: state governments are more likely to adopt PFP if their neighboring states have adopted PFP (hypothesis 1).

The policy diffusion literature suggests that an increase in the number of neighboring states previously adopting a certain policy and the probability of a state adopting the policy may not be linear (Rogers, 1995; Gray, 1973; Mooney, 2001). Gray (1973) tested policy diffusion of 12 innovative state laws in three policy areas: education, welfare, and civil rights. He analyzed the cumulative proportion of policy adopters of each policy, and found that in half of the cases, diffusion of innovation followed an S-shape in its cumulative form. Berry (1994, p. 443) also suggests that, based on the national interaction model, 'the probability that a state that has not yet adopted a policy will adopt it in a particular year is proportional to the number of interactions its officials have with officials of already-adopting states'. Thus, Berry (1994) concludes that the proportion of states adopting a policy cumulates over time and shows the form of a S-shaped curve. The S-shaped curve of cumulative proportion of adopters implies that, as time passes, the number of states that adopt the policy increases and number of states that can adopt policy decreases. For that reason, the graph be-

tween the proportion of previous policy adopters and the probability of adopting the policy will become an inverted U-shaped relationship. Several scholars such as Rogers (1995) contends that the frequency of adopting an innovation follows an inverted U-shaped curve, which is normal because information about new innovations diffuses quickly at the initial stage, but the learning of information or the degree of innovativeness eventually decreases (Rogers, 1995).

Based on the discussion above, we expect that the curve-linear relationship between the proportion of previous policy adopters and the probability of adopting the policy will be present in the case of the adoption of PFP. Thus we hypothesize as follows: the marginal probability of adopting PFP for a state decreases as its neighboring states keep adopting PFP (hypothesis 2).

## 4. Methodology

### *4.1. Model and data*

This study investigates diffusion effects of PFP in state governments. To do so, we employ two econometric models with two sub-models. The first model tests the absolute number of neighboring states that previously adopted PFP and the probability of adoption, and the second model tests the proportion of neighboring states that previously adopted PFP and the probability of adoption. In each model, the first sub-model tests the linear impact and the second model tests a quadratic impact with a squared term included. The following are econometric models for our analyses.

**Model 1** – diffusion effects model with the absolute number of neighbors that previously adopted PFP, with its two sub-models:

1.1. Linearity:

Pr(adoption) = f(# of previously adopting neighboring states, democratic governor, #. state employees, % of employees with union membership, CPI-adjusted state employee salary(logged), CPI-adjusted state expenditure(logged), CPI-adjusted per capita gross state product(logged), CPI-adjusted per capita income(logged), population, time trend), and

1.2. Curvilinearity:

Pr(adoption) = f(# of previously adopting neighboring states, # of previously adopting neighboring states-squared, democratic governor, #. state employees, % of employees with union membership, cpi-adjusted state employee salary(logged), CPI-adjusted state expenditure(logged), CPI-adjusted per capita gross state product(logged), CPI-adjusted per capita income(logged), population, time trend).

**Model 2** – diffusion effects model with the proportion of neighbors that previously adopted PFP with its two sub-models:

2.1. Linearity:

Pr(adoption) = f(% of previously adopting neighboring states, democratic governor, #. state employees, % of employees with union membership, CPI-adjusted state

employee salary(logged), CPI-adjusted state expenditure(logged), CPI-adjusted per capita gross state product(logged), CPI-adjusted per capita income(logged), population, time trend), and

2.2. Curvilinearity:

Pr(adoption) = f(% of previously adopting neighboring states, % of previously adopting neighboring states-squared, democratic governor, # of state employees, % of employees with union membership, CPI-adjusted state employee salary(logged), CPI-adjusted state expenditure(logged), CPI-adjusted per capita gross state product(logged), CPI-adjusted per capita income(logged), population, time trend).

Adoption refers to whether a state adopts PFP. Variables # of previously adopting neighboring states, # of previously adopting neighboring states-squared, % of previously adopting neighboring states, and % of previously adopting neighboring states-squared denote the number of one's neighbor states that previously adopted PFP, its squared term, the proportion of one's neighbor states that previously adopted PFP, and its squared term, respectively. We squared the variable # of previously adopting neighboring states and % of previously adopting neighboring states to test non-linearity of each variable. Their statistical significance will confirm the non-linear relationship that is tested in our second hypothesis. The variable democratic governor is a dichotomous variable coded as 1 if the governor is a democrat; otherwise it is coded as 0. Variables # of state employees, % of employees with union membership, and CPI-adjusted state employee salary(logged), as state employees' variables, are the number of state employees, the percentage of state employees with union membership, and their salary in a logarithmic form. A variable CPI-adjusted state expenditure(logged) is the logged amount of a state government's expenditures, whereas CPI-adjusted per capita gross state product(logged), CPI-adjusted per capita income(logged), and population are logged gross state product per capita, logged per capita income, and the number of population in millions, respectively. Finally, time trend is the time trend from 1968 to 1989. A dollar value changes over time and to precisely measure the impact of any financial variables over time, it is necessary to adjust the value of a dollar. As a result, all financial variables are discounted based on the consumer price index of 1989 (Wooldridge, 2009). Also, variables measuring monetary values (e.g., expenditure, gross state product, salary, or income) are large integer values, and they tend to be skewed. To correct the skewedness, Wooldridge (2009) suggests transforming such variables into a natural log format. Thus, we transformed CPI-adjusted state employee salary, CPI-adjusted state expenditure, CPI-adjusted per capita gross state product, CPI-adjusted per capita income in a natural log format.

We collected each variable in the econometric models above from various sources. First, we used GAO's report from 1990 on PFP to identify states with PFP. Based on the US congressmen's request for PFP information, and GAO-identified states with PFP, we described how these states structured and operated PFP, and introduced how state officials and employees viewed PFP as of 1989 (GAO, 1990). From the

GAO's report, we find which states had PFP and when they introduced it. Since 1989, other states have also adopted PFP, and therefore, data used in this study for analysis may be considered outdated. However, the GAO report is the only official report that has investigated the early stages of adoption. Thus, due to limited archival data, this study analyzes the adoption of PFP in state governments from 1968 to 1989. Nonetheless, the current available data are valuable and reliable enough to test whether the PFP policy diffused from states to states. First, the current data used in this study include observations for 21 years across 48 states. This time and observations are long and big enough to test a general trend of diffusion of the PFP policy. Considering the length of years and the number of state governments, it is expected that updated data since 1990 may result in similar outcomes to the outcomes of this study. Furthermore, this study is the first of its kind to empirically explain why state governments adopted PFP using the diffusion theory.

Although the literature on PFP is well developed, no researchers explained the adoption of PFP in the public sector with the exception of Ingraham (1993). Even Ingraham (1993) suggested that PFP might be diffused from the private sector to the public sector, but she did not empirically test her proposition. This study, however, using empirical and official data, tested the possible diffusion of PFP from states to states; thus, although the data are old, the current pooled cross-sectional time series data may be helpful and reliable enough to generalize diffusion effects of PFP.

To identify each state's neighboring states, this study relies on work by Berry and Berry (1990). Based on their identification and GAO's (1990) report, this study finds the number of neighboring states, and the numbers and proportions of neighboring states that previously adopted PFP.

This study uses data from the website of 'State Politics and Policy Quarterly'[1] to control for governors' partisanship, gross state product, per capita personal income, and state governments' expenditures. We collected data on the number of state employees and average state employee salary from the US Census Bureau[2]. Lastly, we collected data on state employees' union membership from Hirsch and Macpherson (2003)[3].

### *4.2. Method*

This study performs an event history analysis using pooled cross-sectional time-series data. As shown in Table 1, the first state to adopt PFP was Florida in 1968, followed by Utah and Wisconsin in 1969.

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1 Data are available at http://academic.udayton.edu/sppq-TPR/tpr_data_sets.html (accessed on June 16, 2013).

2 Data are available at http://www2.census.gov/pub/outgoing/govs/special60/ (accessed on June 16, 2013).

3 More details are available at http://www.unionstats.com/ (accessed on June 16, 2013).

**Table 1:** Order of states with PFP and their neighbors

| Extent of diffusion | State | Year of adoption | Number of previously adopting adjacent states | Number of adjacent states | Proportion of previously adopting adjacent states |
|---|---|---|---|---|---|
| 1 | Florida | 1968 | 0 | 2 | 0.00 |
| 2 | Utah | 1969 | 0 | 6 | 0.00 |
| 2 | Wisconsin | 1969 | 0 | 4 | 0.00 |
| 4 | South Carolina | 1970 | 0 | 2 | 0.00 |
| 5 | Arizona | 1973 | 1 | 5 | 0.20 |
| 6 | Iowa | 1977 | 1 | 6 | 0.17 |
| 7 | Illinois | 1978 | 2 | 6 | 0.33 |
| 8 | Connecticut | 1979 | 0 | 3 | 0.00 |
| 8 | Idaho | 1979 | 1 | 6 | 0.17 |
| 10 | Michigan | 1980 | 2 | 4 | 0.50 |
| 11 | New York | 1981 | 1 | 5 | 0.20 |
| 11 | Oregon | 1981 | 1 | 4 | 0.25 |
| 13 | Indiana | 1983 | 2 | 4 | 0.50 |
| 14 | California | 1984 | 2 | 3 | 0.67 |
| 15 | Mississippi | 1985 | 0 | 4 | 0.00 |
| 15 | Minnesota | 1985 | 3 | 5 | 0.14 |
| 17 | Arkansas | 1986 | 1 | 7 | 0.14 |
| 17 | Kentucky | 1986 | 2 | 8 | 0.25 |
| 17 | South Dakota | 1986 | 2 | 6 | 0.33 |
| 20 | Alabama | 1987 | 2 | 4 | 0.50 |
| 20 | Massachusetts | 1987 | 2 | 6 | 0.33 |
| 20 | Nebraska | 1987 | 2 | 6 | 0.33 |
| 23 | Maryland | 1989 | 0 | 5 | 0.00 |

Because 1968 is the earliest year and the data are available only until 1989, this study confines the analysis from 1968 to 1989. Once a state adopts PFP, it is no longer a target of interest. However, if states do not adopt PFP until 1989, they remain targets of interest. Therefore, a number of observations vary across states. We use the following formula to calculate some observations for those states with PFP: 1989 - (year of adoption) + 1. Their dependent variable, 'adoption', is coded as 0 until the year of adoption. Once states adopt PFP, the dependent variable is coded as 1 and is not coded in the following years. If states do not adopt PFP during the period, 22 observations with the dependent variable coded as all 0 are analyzed. To analyze this type of dependent variable, we use a pooled cross-sectional time-series probit model with robust standard errors.

## 5. Results

Table 2 shows the results of the EHA models with an absolute number of neighboring states that previously adopted PFP (Model 1) and its squared term (Model 2). According to the results of Model 1, the raw coefficient 'number of previously adopting neighboring states' is 0.125 and its marginal effect is 0.007. However, it is found statistically insignificant; thus, a linear diffusion effect is not confirmed. However,

Model 2 in the same table shows that, the raw coefficient of 'number of previously adopting neighboring states' and its squared term is 0.508 and -0.119 respectively with statistical significance at p-value of 0.05; thus, non-linear diffusion effects are clearly found. This finding confirms that the probability of adopting an innovative policy does not increase linearly as the number of neighboring states that have adopted the policy increases; rather, a state tends to adopt an innovation as its neighboring states have adopted the policy earlier than the state, but at a certain point in the number of neighboring states adopting the innovation, the state is demotivated to adopt the innovation.

Figure 1 shows an inverted U-shaped relationship between the number of neighboring states that previously adopted PFP and the probability of a state adopting PFP, based on Model 2 of Table 2. The graph shows that the positive relationship turns negative when the number of neighboring states that previously adopted PFP is 2.13; that is, a state shows a tendency to adopt a new policy as its first one or two neighboring states introduce the policy. The finding implies that when after only a few neighbors introduce a new policy, the remaining states compete with their neighbors to not be behind the trend of adopting an innovation. However, as more of their neighbors adopt the innovation, the remaining states may lose their incentive to adopt the new policy, because at this stage, they can observe their neighbors' trials and errors in the policy and contemplate whether they will also adopt the policy. Findings support this study's hypotheses.

**Table 2:** Policy diffusion by number of neighbors

| Variables | (Model 1) | | (Model 2) | |
|---|---|---|---|---|
| | Raw Coefficient | Marginal Effect | Raw Coefficient | Marginal Effect |
| Number of Previously Adopting Neighboring States | 0.125 | 0.007 | 0.508** | 0.032 |
| | (0.084) | | (0.212) | |
| Number of Previously Adopting Neighboring States (squared) | | | -0.119** | -0.007 |
| | | | (0.053) | |
| Democratic Governor | -0.274 | -0.012 | -0.241 | -0.011 |
| | (0.196) | | (0.196) | |
| Number of State Employees (in ten thousand) | 0.052* | 0.003 | 0.051* | 0.003 |
| | (0.003) | | (0.003) | |
| Percentage of Employees with Union Membership | -0.014 | -0.001 | -0.013 | -0.001 |
| | (0.015) | | (0.015) | |
| CPI-adjusted State Employee Salary (logged) | -0.117** | -0.007 | -0.124** | -0.007 |
| | (0.056) | | (0.055) | |
| CPI-adjusted State Expenditure (logged) | 0.463* | 0.027 | 0.462* | 0.026 |
| | (0.246) | | (0.244) | |
| CPI-adjusted Per Capita Gross State Product (logged) | -2.123** | -0.125 | -2.210** | -0.127 |
| | (1.004) | | (1.025) | |
| CPI-adjusted Per Capita Income (logged) | 1.734 | 0.102 | 1.943* | 0.111 |
| | (1.112) | | (1.171) | |

| Variables | (Model 1) | | (Model 2) | |
|---|---|---|---|---|
| | Raw Coefficient | Marginal Effect | Raw Coefficient | Marginal Effect |
| Population in Millions | -0.116 | -0.007 | -0.117 | -0.007 |
| | (0.071) | | (0.073) | |
| Time Trend | 0.033 | 0.002 | 0.027 | 0.002 |
| | (0.029) | | (0.029) | |
| Constant | -32.241** | | -34.530** | |
| | (14.940) | | (15.466) | |
| Observations | 852 | | 852 | |
| Pseudo R-squared | 0.085 | | 0.099 | |

**Note**: robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

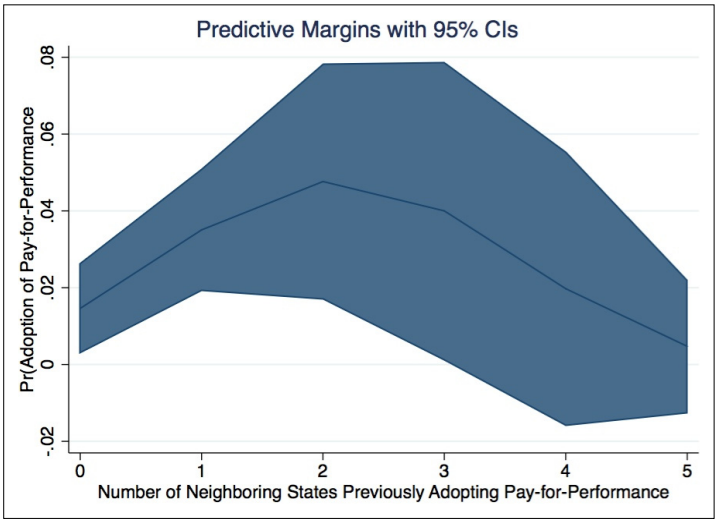


**Figure 1**: Impact of number of neighbors

Table 3 presents an EHA model with a proportion of neighboring states that previously adopted PFP. Diffusion models with absolute numbers of neighboring states that previously adopted an innovation are limited in such a way that each state has a different number of neighbors. Thus, to precisely capture diffusion effects, we need to take into account proportions of neighboring states that previously adopted an innovation. Model 3 in Table 3 tests the linearity between the proportion of previously adopting neighboring states and the probability of adopting PFP. The result shows that the raw coefficient of 'the proportion of previously adopting neighboring states' is 0.123 but its t-statistics is 0.333, which is not statistically significant at the p-value of 0.10. Thus, the analysis fails to find a linear impact. However, as the Model 4 in Table 3 presents, raw coefficients for 'proportion of previously adopting neighboring states' and its squared term are 2.069 and -2.707 respectively with statistical significance at the p-value of 0.05. This result clearly finds an inverted U-shaped relation-

ship between the proportion of neighboring states that previously adopted PFP and the adoption of PFP.

Figure 2 shows the graph of this nonlinearity; the turning point is about 0.38. This finding implies that states tend to adopt PFP as the proportion of their neighbors that previously adopted PFP approaches up to 38%, but after this point, the probability declines. The findings from Table 2 and Table 3 conclude that PFP diffuses to neighboring states, but states are demotivated to adopt the program as more and more neighboring states have adopted the program before them.

**Table 3:** Policy diffusion (proportion of neighbors)

| Variables | (Model 3) | | (Model 4) | |
|---|---|---|---|---|
| | Raw Coefficient | Marginal Effect | Raw Coefficient | Marginal Effect |
| Proportion of Previously Adopting Neighboring States | 0.123 | 0.007 | 2.069** | 0.118 |
| | (0.369) | | (0.950) | |
| Proportion of Previously Adopting Neighboring States (squared) | | | -2.707** | -0.155 |
| | | | (1.154) | |
| Democratic Governor | -0.277 | -0.013 | -0.250 | -0.011 |
| | (0.192) | | (0.194) | |
| Number of State Employees (in ten thousand) | 0.052* | 0.003 | 0.052* | 0.003 |
| | (0.003) | | (0.003) | |
| Percentage of Employees with Union Membership | -0.012 | -0.001 | -0.009 | -0.001 |
| | (0.015) | | (0.016) | |
| CPI-adjusted State Employee Salary (logged) | -0.120** | -0.007 | -0.130** | -0.007 |
| | (0.058) | | (0.056) | |
| CPI-adjusted State Expenditure (logged) | 0.476* | 0.028 | 0.459* | 0.026 |
| | (0.245) | | (0.245) | |
| CPI-adjusted Per Capita Gross State Product (logged) | -1.789* | -0.105 | -1.881* | -0.109 |
| | (0.975) | | (0.981) | |
| CPI-adjusted Per Capita Income (logged) | 1.429 | 0.084 | 1.625 | 0.094 |
| | (1.055) | | (1.122) | |
| Population (in millions) | -0.118* | -0.007 | -0.120* | -0.007 |
| | (0.069) | | (0.072) | |
| Time Trend | 0.043 | 0.002 | 0.039 | 0.002 |
| | (0.031) | | (0.031) | |
| Constant | -28.142** | | -30.151** | |
| | (14.301) | | (14.843) | |
| Observations | 852 | | 852 | |
| Pseudo R-squared | 0.079 | | 0.095 | |

**Note**: robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

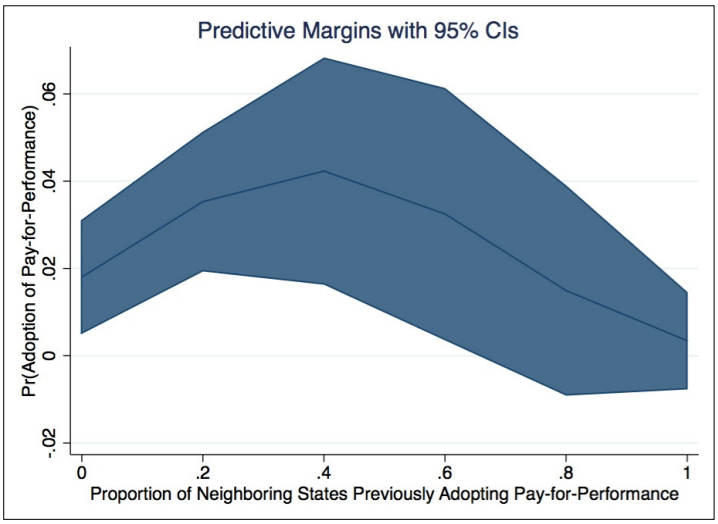


**Figure 2:** Impact of proportion of neighbors

Figure 3 shows flows of PFP among states analyzed through UCINet 6.0 (Borgatti, Everett and Freeman, 2002) assuming that PFP diffuses. Dots indicate state governments and lines indicate flows of diffusion[4]; arrows indicate from where to where PFP diffuses. The graph shows three independent, unconnected cliques. One clique consisting of Connecticut, Massachusetts, and New York exists in the eastern US. Another clique consisting of Oregon, California, Arizona, Utah, and Idaho is in the western US. The last clique encompasses states from the northern Midwest (Minnesota) to the South (Florida). In the East clique, Connecticut is an early adopter and diffuses PFP to other states. In the West, Utah is the early adopter and diffuses PFP to other states in the West. The last clique is more complicated. Clearly, Wisconsin is an early adopter and diffuses PFP to its neighbors. However, Mississippi and Florida are also early adopters among their neighbors and influence them as well. It cannot be generalized through a PFP case, but policy diffusion may explain adoption of an innovation in some regions although not in all of the states.

Table 4 indicates out-degrees and in-degrees of diffusion. Out-degree denotes the number of states to which the focal state diffuses PFP, whereas in-degree denotes how many neighboring states adopted PFP from the focal state. Weighted out-degrees and weighted in-degrees are calculated by dividing raw out-degrees and in-degrees by a state's number of neighbors. Results show that Wisconsin, Iowa, and Connecticut are

4 UCINet is used simply to visualize which states were early adopters compared to other neighbors of theirs, and data were created by the authors for this purpose based on the GAO's 1990 report (see Table 1). Our argument that the lines indicate the flows of diffusion is based on our hypotheses that PFP is diffused from one state to another, which are supported by the empirical analyses. Thus, unfortunately, we are unable to draw any implications other than the time order of the PFP adoption, which is meant by the ties on Figure 3.

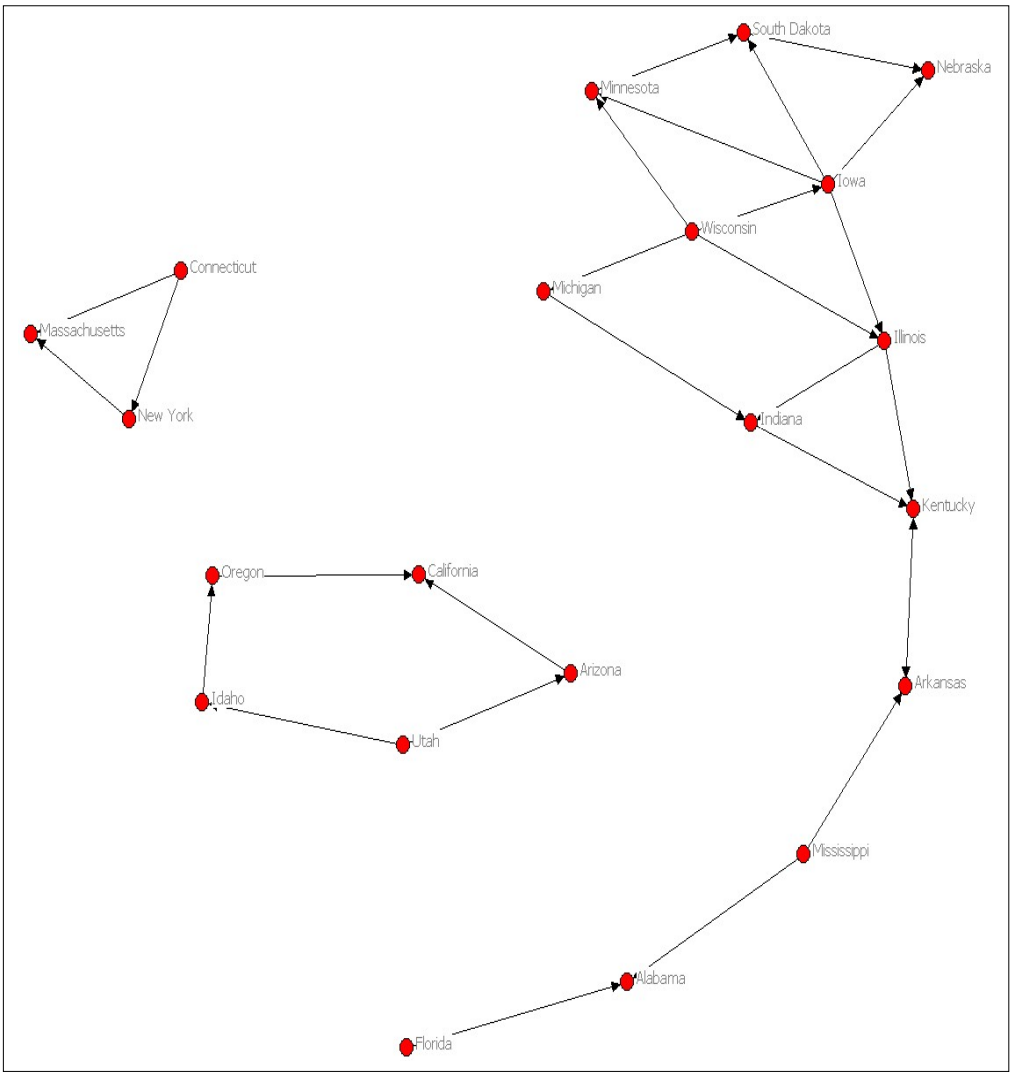


**Figure 3:** Directions of PFP diffusion

the three states that influence their neighbors most. California, Alabama, and Indiana are the three states that are the most influenced by their neighbors; one might call them the states most cautious to adopt PFP; they wait until their neighbors adopt and test PFP before adopting it themselves.

As for control variables, findings from Table 2 and Table 3 show that states whose employees' average salary and gross state product are high are less likely to adopt PFP, whereas states whose number of state employees is high are more likely to adopt PFP. This finding may indicate that wealthier states are less likely to adopt PFP. Population is statistically significant only when we control for the proportion of states; states with higher populations are less likely to adopt PFP. The results show that political factors (governor's partisanship and employees' union membership) and some

economic factors (per capita income and expenditure of state government) do not statistically influence the probability of a state's adoption of PFP. Unlike Mooney's (2001) expectation, PFP is less time sensitive; the time trend is not statistically significant.

**Table 4:** State's out-degree and in-degree of policy diffusion

| Out-degree | | | | In-degree | | | |
|---|---|---|---|---|---|---|---|
| State | Out-degree | State | Weighted out-degree* | State | In-degree | State | Weighted in-degree** |
| Wisconsin | 4 | Wisconsin | 1.00 | Kentucky | 3 | California | 0.67 |
| Iowa | 4 | Iowa | 0.67 | Illinois | 2 | Alabama | 0.50 |
| Illinois | 2 | Connecticut | 0.67 | Indiana | 2 | Indiana | 0.50 |
| Utah | 2 | Mississippi | 0.50 | Arkansas | 2 | Minnesota | 0.40 |
| Mississippi | 2 | Florida | 0.50 | Minnesota | 2 | Kentucky | 0.38 |
| Connecticut | 2 | Illinois | 0.33 | South Dakota | 2 | Illinois | 0.33 |
| Florida | 1 | Utah | 0.33 | California | 2 | Massachusetts | 0.33 |
| Arizona | 1 | Michigan | 0.25 | Alabama | 2 | Nebraska | 0.33 |
| Idaho | 1 | Oregon | 0.25 | Massachusetts | 2 | South Dakota | 0.33 |
| Michigan | 1 | Indiana | 0.25 | Nebraska | 2 | Arkansas | 0.29 |
| New York | 1 | Arizona | 0.20 | Iowa | 1 | Michigan | 0.25 |
| Oregon | 1 | New York | 0.20 | Arizona | 1 | Oregon | 0.25 |
| Indiana | 1 | Minnesota | 0.20 | Idaho | 1 | Arizona | 0.20 |
| Arkansas | 1 | Idaho | 0.17 | Michigan | 1 | New York | 0.20 |
| Minnesota | 1 | South Dakota | 0.17 | New York | 1 | Idaho | 0.17 |
| South Dakota | 1 | Arkansas | 0.14 | Oregon | 1 | Iowa | 0.17 |
| Kentucky | 1 | Kentucky | 0.13 | Wisconsin | 0 | Connecticut | 0.00 |
| California | 0 | California | 0.00 | Utah | 0 | Florida | 0.00 |
| South Carolina | 0 | South Carolina | 0.00 | Mississippi | 0 | Maryland | 0.00 |
| Alabama | 0 | Alabama | 0.00 | Connecticut | 0 | Mississippi | 0.00 |
| Massachusetts | 0 | Massachusetts | 0.00 | Florida | 0 | South Carolina | 0.00 |
| Nebraska | 0 | Nebraska | 0.00 | South Carolina | 0 | Utah | 0.00 |
| Maryland | 0 | Maryland | 0.00 | Maryland | 0 | Wisconsin | 0.00 |

* Raw out-degree divided by number of neighbors

** Raw in-degree divided by number of neighbors

## 6. Conclusion and discussion

Adopting Berry and Berry's (1990) approach, this study tests for possible diffusion effects on the adoption of state governments' PFP; empirical analyses from 1968 to 1989 show that as neighboring states adopt PFP, a state is more likely to do the same, but the marginal increase of probability naturally decreases as the number of neighboring states adopting PFP increases. The same effect arises during the analysis of the proportion of neighboring states that have adopted PFP. Moreover, we find geographical cliques of diffusion, which may suggest that some barriers block diffusion across regions; however, without making assumptions or inducing speculation, this possibility is best left for future research.

PFP has been widely adopted throughout the US. Unlike the expectation that PFP will demonstrate a marked improvement within organizations, the literature contin-

ues to report failures of PFP in the public sector, and thus it would appear that performance is not augmented as expected. However, the findings of the current study suggest that, 21 years after Florida's adoption of PFP, 23 states have adopted and implemented some form of PFP. Few researchers have clearly explained this odd practice of adoption-sans-evaluation, though Ingraham (1993) has suggested a possible policy diffusion effect, presuming that if it is useful for one jurisdiction or state, it must be a good idea in general, and thus, other states adopt the policy. Since the time Ingraham's conclusion was put forward, no empirical studies have been conducted to apply diffusion models to the adoption of PFP in state governments.

Under the notion of new public management (NPM), private sector practices such as strategic planning, total quality management, and organization performance management techniques are still being adopted to the public sector (Park and Berry, 2014). As these numerous policy innovations may be disseminated through policy diffusion, governments may investigate and project the diffusion process using the method of the current study before making policy adoption choices. By doing so, the interested governments can verify whether the policy diffusion is based on region-to-region diffusion or not. If decision-makers find that the policy diffusion occurred between neighboring regions, it may be preferable to re-assess the quality of the policy itself rather than merely adopting it.

The results of the current study can also contribute to PFP research in other countries. According to OECD (Organization for Economic Co-operation and Development, 2005), compared to 1980s and 1990s when civil servants were paid based on seniority, most of the member states are using the PFP system to manage public employees. Moreover, as of 2017, PFP is popular in European Union Member States in the Eastern Europe region including Bulgaria, the Czech Republic, Estonia, Hungary, Lithuania, Latvia, Poland, Slovakia, Slovenia, etc. (Staronova, 2017). Nevertheless, few research examined the PFP diffusion process at the regional level in each country. By utilizing the approach of the current study, future research may identify the PFP adoption process in the country of their interest.

Although this study clearly confirms diffusion effects, it is not without limitations. First, diffusion theory cannot explain what causes the first adopters to adopt a certain innovation. Practical implications for public managers may carry a certain amount of risk before policy actors take action in implementing programs such as PFP. This study finds that Florida, Wisconsin, Utah, South Carolina, Connecticut, Mississippi, and Maryland are the first adopters when it comes to PFP measures at the state-level but diffusion models are limited in their ability to explain why these states adopted PFP. Diffusion theory, of course, suggests that non-diffusion factors influence the adoption of an innovation (Rogers, 1995). Another limitation of this study is that it does not control for the variation of PFP across states. One factor to consider, for example, is that the number of employees covered by PFP varies across state governments. However, our study is unable to capture this coverage aspect. Moreover, due to data scarcity and limitations, more recent adoptions of PFP cannot be analyzed. However, a current pooled cross-sectional time-series probit model

may capture diffusion effects. And lastly, while it is assumed that policy diffusion can occur across a variety of geopolitical jurisdictions, our study is confined to the US, and further research on international policy diffusion would not only be useful, but would likely require some additional or contextualized variables in assessing the diffusion process.

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