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# **Empirical Analysis of Reward for Creativity, Innovation and Length of Service of Federal Employees**

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## **Abstract**

This paper investigates the statistical relationship between federal employee performance and the reward for creativity and innovation. The study applies a cross-tabulation technique and the Pearson correlation coefficient for ordinal/nominal variables using data from 2018 Federal Employee Viewpoint Survey. A Chi Square non-parametric analysis was applied to corroborate the results of the Pearson correlation coefficient. In the second analysis, the study applies the Spearman rho correlation for ordinal variables to examine the relationship between the level of satisfaction of federal employees with the policies and practices of senior leaders and the overall quality of work done by the work units. In all cases, the hypothesis test indicates a statistically significant relationship and the rejection of the null hypothesis in favor of the alternative. The implication of these findings is that federal employee performance and length of service is enhanced by adequate reward for innovation and creativity.

**Key Words:** Federal Employee Performance, Crosstabulation, Chi-Square, Pearson, Spearman Rho Correlation

## Introduction

There is no doubt that federal civil service employees are often fraught with the burden of work and the extra effort to keep pace with developments in technology, whereas their physical and emotional abilities may not be in cognizance. This situation may be due to the fact the federal civil service policies are derived from legislation and administrative regulations that are hierarchical in nature and demanding of qualitative inputs for effective work outputs. According to Richardson & Norgate (2015), good reward systems encourage innovation and creativity, irrespective of the organizational structure. Oftentimes, it is taken for granted that employees must oblige to lay down procedures, but the incentives are neglected (Xue, Li, Wang & Zhang 2020; Mehmood, Hamstra & Schreur 2020). Due to the high caliber of personnel that are engaged in the federal civil service, there is always a concern for good incentives to equate their counterparts in the private sector with negotiated salaries and allowances. However, the order of incentives grows with length of service, as senior managers are bound to be more remunerated than their junior counterparts. As a result, the reward for creativity and innovation cannot be easily ascertained to be exclusive of the total reward package. This study therefore argues for a distinction of rewards to encourage creativity and innovation in the federal civil service.

Performance could be predicted from the level of incentives and IQ scores to mention but a few. There are scholarly papers with proven empirical analysis to show that performance is encouraged by a good reward system (Olson 2005, Richardson & Norgate 2015). When senior leaders implement policies in the federal civil service, the results of such procedural steps are improvements in work output by the various units and the level of satisfaction derived from policies by subordinates. Because measures of performance have always been consistent with Supervisor's rating. In most cases Senior Leaders determine the progression of subordinates. Nonetheless, they have been very inconsistent in determining the criteria for job performance (Nisbeth *et al.* 2012). Sometimes their perception may be limited by sentiments. In a bid to resolve or ascertain the extent of inconsistencies in this regard, there is a need to apply some statistical techniques to figure out the relationship between variables of concern using data from a Federal employee survey conducted in 2018. Results from the statistical analysis show significant statistical relationships between rewarding creativity and innovation and the length of service of federal employees excluding military service. In the second analysis, a significant statistical relationship was observed between the level of satisfaction with the policies and practices of senior leaders and the overall quality of work done by the employee's work unit.

This study fills an existing gap in knowledge in the area of understanding whether government policies for reward in creativity and innovation follows any known statistical pattern. Also, to understand the level of satisfaction of employees with the implementation of government policies and practices in order to improve performance. The literature review shows studies that examine relationship between IQ and job performance in the federal civil service, and organizational control systems using pay-for- performance, but none dealt with the reward of creativity and innovation by employees, hence the need for this study.

This study intends to answer two research questions; Is there a significant relationship between the rewarding of creativity and innovation by employees and the employees' length of service in the federal civil service? Second, is there a significant relationship between the level of satisfaction with the policies and practices of senior leaders and the overall quality of

work done by the employee's work unit? The tests of the hypotheses to answer these research questions is set in the methods section and subsequent results presented in the discussion. The study is presented in six sections, the next section is a review of literature and the relevant theories of performance and reward in public organization. The third section is the method of analysis, the fourth section is a presentation of the results of statistical tests of hypotheses, while the fifth section discusses the results, the sixth concludes the study.

## **Literature Review/Theory**

The literature on employee reward and performance in the federal public service is scant, but some scholars have done some work in some relevant areas that will help to elicit the salient points of argument in this study. There seems to be a general disinterestedness on public sector performance by management scholars (Frey, Homberg & Osterloh 2013). Many of the theories on organizational and personnel performance rely more on Behavioral Economics framework as opposed to the sociological and psychological elements. In the wake of New Public Management, output related performance measures and rewards become commonplace in public sector organizations in many countries (Lah & Perry, 2008; Perry, Engbers, & Jun 2009). These characteristics are assumed to raise public servants' motivation and enhance service quality. Indeed, praise for output related pay-for-performance as a symbol of modern quality management is common in New Public Management (Moynihan & Pandey, 2010). However, in this study we have gone beyond the use of traditional management models to estimate job performance in public service to fundamental models of statistical estimation of relationships between variables.

In the context of public service performance management and the composite factors that explain the behavior of individuals in the workplace, the Behavioral Economics framework tends to elicit the statistical behavior of the various components. In this study, we apply descriptive statistics and correlation analysis to find the relationship between ordinal variables on job performance and employee relations in the federal public service. Frey, Homberg & Osterloh (2013) introduced the Management Control Theory in order to clarify which kinds of control exists and under which conditions output, process or input control is applicable. This paper follows the fact that Behavioral Economics keeps the theoretical comprehensiveness of the principal-agent theory, while considering the rich psychological reality of public service organizations. At this time, we consider the fact that Behavioral Economics is increasingly based on empirical foundations.

Sperkle & Verbeeten (2009) finds that performance measures can fulfill an exploratory role if the data is used to trigger learning and experimentation. In this regard, further exploratory use of performance measures and incentives would be preferred in an environment which cannot rely on clear-cut targets, which is the case for a large number of public service organizations. Another important aspect of managerial effectiveness in public service is procedural fairness, which could be seen to improve the overall quality of work in the public service organization. People seem to accept unfavorable decisions when a fair and transparent procedure produces them (Tyler & Blader 2000). This informs the reason why senior leaders in organizations influence the work done by employees when they implement fair policies and practices. Greenberg (1996) opines that the key elements of procedural fairness are dignity, participation, respect and neutrality. In the main, Moynihan (2008) finds that the reward system or incentives for exceptional performance is also an element of pay-for-performance that promotes productivity in public organizations. Frey, Homberg & Osterloh (2013) concludes that procedural fairness is relevant when output or process control is not feasible, though it is

a universal concept and low-cost measure to improve performance. Awards are also relevant in public sector organization to signal recognition for innovation and quality service (Hartley & Downe, 2007).

As a result of the developments from literature, this study adopts the Management Control theory, which allows senior leaders to influence policy and practices for effective administration in order to improve work done. On the other hand, the pay-for-performance theory seems very feasible for this study since it promotes the idea of rewarding excellent performance and follows procedural fairness, which is a key element of resource management in public organizations.

## **Methods**

The data for this study was obtained from the 2018 Federal Employee Viewpoint Survey for a population of 505,738 federal employees excluding military service.

To test the hypothesis for Research Question 1, we apply the crosstab analysis on rewarding of creativity and innovation by employees to employees' length of service in the federal government. Secondly, to deduce the statistical significance of the variables we apply Pearson Correlation Coefficient Test used to ascertain the linear relationship between variables (Cronk 2018). The Pearson Correlation Coefficient works well for determining statistical relationship between ordinal and nominal variables since length of service is ordinal and perception of reward for creativity and innovation is nominal (Meier *et al.* 2015). The Chi-Square test statistic is applied to determine the statistical relationship between the variables on a contingency table.

In the second analysis for Research Question 2, we apply the Spearman rho correlation coefficient to determine if there is a statistically significant relationship between the level of satisfaction with the policies and practices of senior leaders and the overall quality of work done by the employee's work unit.

## **Result of Analysis**

**Research Question 1: Is there a significant relationship between the rewarding of creativity and innovation by employees and the employees' length of service in the federal civil service?**

**Table 1:** Crosstabulation of rewarding creativity and innovation and the length of service of federal employees (excluding military service)

Total

		How long have you been with the Federal Government (excluding military service)?							
		Ten years or fewer		Between 10 and 20 years		More than 20 years		N	%
		N	%	N	%	N	%		
Creativity and innovation are rewarded.	Strongly Disagree	22516	10.5%	19455	12.4%	12652	9.4%	54623	10.8%
	Disagree	37196	17.4%	29180	18.6%	21431	15.9%	87807	17.4%
	Neither Agree nor Disagree	58037	27.1%	43237	27.5%	37554	27.8%	138828	27.5%
	Agree	67209	31.4%	47270	30.1%	45013	33.4%	159492	31.5%
	Strongly Agree	28813	13.5%	17966	11.4%	18209	13.5%	64988	12.9%
Total		213771	100.0%	157108	100.0%	134859	100.0%	505738	100.0%

**Table 2:** Correlations of rewarding creativity and innovation and the length of service of federal employees (excluding military service)

		How long have you been with the Federal Government (excluding military service)?	Creativity and innovation are rewarded.
How long have you been with the Federal Government (excluding military service)?	Pearson Correlation	1	.013**
	Sig. (2-tailed)		.000
	N	524927	505738
Creativity and innovation are rewarded.	Pearson Correlation	.013**	1
	Sig. (2-tailed)	.000	
	N	505738	567767

\*\* . Correlation is significant at the 0.01 level (2-tailed).

**Table 3: Chi-Square Tests of Significance**

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	1551.100 <sup>a</sup>	8	.000
Likelihood Ratio	1555.009	8	.000
Linear-by-Linear Association	89.872	1	.000
N of Valid Cases	505738		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 14565.65.

#### Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	.055	.000
	Cramer's V	.039	.000
	Contingency Coefficient	.055	.000
N of Valid Cases		505738	

From Table 1 we observe that 46.9% of federal government employees who have worked for more than 20 years either Agree or Strongly Agree that creativity and innovation are rewarded in the federal public service. Overall, about 44.4% of federal employees Agree or Strongly Agree with the reward of creativity and innovation in the public service. Although, a total of 28.2% either disagree or strongly disagree with the reward system for creativity and innovation in the federal public service, about 27.5% of federal employees are still undecided on whether the reward system is adequate or not. To this end, the number of employees who believe that the reward for creativity and innovation in the federal public service is greater than those who disagree with the reward system. As a result, we apply the Pearson correlation to test if there

is a linear association between the variables of interest. As stated in Table 2, the Pearson correlation coefficient indicates a significant relationship at the .01 level of significance for a 2-tailed test. We therefore reject the null hypothesis of no significant relationship between rewarding of creativity and innovation by employees and employees' length of service in the federal government. This finding is corroborated by the Chi Square Test statistic for nominal variables presented in Table 3. The result of the Chi Square Test indicates the relationship between the variables is statistically significant @ 1%.

**Research Question 2: Is there a significant relationship between the level of satisfaction with the policies and practices of senior leaders and the overall quality of work done by the employee's work unit?**

**Table 4:** Spearman rho correlations for level of satisfaction with the policies and practices of senior leaders and the overall quality of work done by the employees work unit.

		How satisfied are you with the policies and practices of your senior leaders?	How would you rate the overall quality of work done by your work unit?
Spearman's rho	How satisfied are you with the policies and practices of your senior leaders?	Correlation Coefficient Sig. (2-tailed) N	1.000 .382** 576502
	How would you rate the overall quality of work done by your work unit?	Correlation Coefficient Sig. (2-tailed) N	.382** .000 575349
			575349 594870

\*\* . Correlation is significant at the 0.01 level (2-tailed).

From Table 4, we observe that the Spearman rho correlation test for the relationship between the level of satisfaction with the policies and practices of senior leaders and overall quality of work done by the employees work unit is significant at 1%. Therefore, we reject the null hypothesis that there is no statistically significant relationship between the level of satisfaction with the policies and practices of senior leaders and the overall quality of work done by the employee's work unit.

**Discussion**

The findings in the test of hypothesis for research question 1 presented in Tables 1, 2 and 3 support the conclusion in Frey, Homberg & Osterloh (2013) and Hartley & Downe (2007) about procedural fairness and reward as a means to improve performance in public service organizations. To this end, we conclude that there is a significant relationship between the rewarding of creativity and innovation by employees and employee length of service. There is no doubt that with the adoption of pay-for-performance that is revealed in the literature, public servants are bound to be more incentivized the longer they stay in service. It is obvious that this policy will encourage employees to put more time in service and at the same time earn more for improved and sustainable life at retirement.

Second, the result in Table 4 corroborates Sperkle & Verbeteen (2009) and Tyler & Blader (2000) on the role of management and senior leaders in improving performance through setting organizational standards and improving the quality of work done. Therefore, the



significant statistical relationship that exists between the level of satisfaction with the policies and practices of senior leaders and the overall quality of work done by the employees' work unit is supported by evidence.

## **Conclusion**

This paper concludes that rewarding of creativity and innovation in the federal civil service follows a linear association with length of service. The implication of this finding is that the longer an employee remains in the public service the more incentives the employee will receive for creativity and innovation. However, the percentage of those who neither agree nor disagree with the question reduces the reliability of test results as a measure of association between variables.

In the second Research Question using the Spearman rho correlation coefficient we find a significant relationship between the level of satisfaction with the policies and practices of senior leaders and the overall quality of work done by the employees work unit. In this study we have seen that procedural fairness promotes employee effectiveness in public service. There is no doubt that when senior leaders employ policies and practices that are fair and inclusive the output and performance of employees will improve.

The study concludes that the performance of federal employees could be improved by an adequate reward system for creativity and innovation and the role of senior leaders in the implementation of policies and practices improves the overall quality of work done by the work units and ultimately the performance of employees in public organizations.

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