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CONTEXTUAL FACTORS RELATED TO SCHOOOL PRINCIPAL'S TURNOVER IN THE CITY OF RIO DE JANEIRO

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ABSTRACT: This study investigates school principal's turnover in the city of Rio de Janeiro from 2006 to 2012, a period that includes the years before and after the implementation of school accountability policies by the Municipal Education Department. The goal of the study was to investigate the contextual factors related to school principal's turnover rates at public primary schools, due to a growth of pressures over school principal's position, because of changes in the requirements to become a principal and the implementation of school accountability policies. The results suggest that the principal's experience, the percentage of pupils with age/grade gap in schools, and student performance are associated with the likelihood of principals' re-elections, especially at mandates that began in the period after the implementation of school accountability policies.

Keywords: Principal´s turnover; School accountability; Educational evaluation; School principal´s selection.

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FATORES ASSOCIADOS À ROTATIVIDADE DE DIRETORES NO MUNICÍPIO DO RIO DE JANEIRO[1]

RESUMO: Este estudo investiga a rotatividade de diretores no município do Rio de Janeiro, no período de 2006 a 2012, período que compreende o momento antes e depois da implementação de políticas de responsabilização escolar pela Secretaria Municipal de Educação. O objetivo do estudo foi investigar os fatores associados às taxas de rotatividade de diretores em escolas de ensino fundamental da rede municipal, frente ao aumento das pressões sobre o cargo de diretor, decorrentes da mudança nas regras de provimento de cargo e da adoção de políticas de responsabilização escolar. Os resultados sugerem que a experiência do diretor, a porcentagem de alunos com distorção idade-série nas escolas e o desempenho dos estudantes estão associados à probabilidade dos diretores permanecerem no cargo, em especial nos mandatos que se iniciaram no período após a adoção de políticas de responsabilização escolar.

Palavras-chave: Rotatividade de diretores; Políticas de responsabilização escolar; Avaliação da educação; Seleção de diretores.

1. INTRODUCTION

This article investigates the patterns and factors associated with principal turnover in the city of Rio de Janeiro's school system between 2005 and 2012. It investigates changes in the principal turnover pattern, as well as its conditioning factors, after a possible increase in the pressure on school principals due to the implementation of assessment systems and various measures composing the school accountability policy. Moreover, it studies changes in the way principal job offers are provided in the city of Rio de Janeiro's school system.

Several studies conducted in international contexts show that principal turnover is associated with work conditions such as salary, working journey, institutional responsibilities, stress, lack of autonomy, bureaucracy, and student demographics (DeANGELIS; WHITE, 2008; HERTLING, 2001; LADD; ZELLI, 2001; NI; SUN; RORRER, 2013; POPE, 2007; PARTLOW, 2007; SHEPPARD, 2010). In addition, they argue that school accountability policies unintentionally have been causing an increase in principal turnover. This phenomenon is more prevalent in contexts in which the design of accountability policies is unable to accurately measure the school or principal's effectiveness, and where the established goalsare not regarded as fair or feasible by school actors. Thus, principals are held accountable for factors that are beyond their control (LADD, 2001).

On the one hand, investigation of factors associated

with principal turnover become relevant due to evidence collected by studies that have found great variation in principals' effectiveness/productivity, especially in schools with students of low socioeconomic status Thus, schools can benefit from turnover if principal assessment and/or school accountability policies can push out the less effective principals and attract the most effective ones (RONFELDT; LOEB; WYCKOFF, 2012). On the other hand, principal turnover may be regarded as an unintentional/undesired consequence because changes in culture, school practices, and school management take time to occur (FULLAN, 2001; PARTLOW, 2007). This may not depend on the urgency of achieving goals established for principals and/or schools by school accountability policies. In addition, turnover may be undesirable considering substantial evidence of the relationship between school effectiveness and school principal experience (FULLAN, 2001).

In the Brazilian context, several states and municipalities have implemented their school assessment systems and formulated school accountability policies with different designs (KOSLINSKI *et al.*, 2015; Brooke; CUNHA, 2011). In 2009, the municipality of Rio de Janeiro adopted a student performance assessment system and school accountability procedures. This policy involves consequences to schools and employees based on the establishment of performance targetsfor the schools, bonus pay, and co-responsibility devices for schools, the department of education, and its intermediate instances.

Even with the introduction of accountability policies in Brazil, there has been no discussion yet on how to evaluate the effectiveness of a school, principals, and teachers. Thus, the academic discussion on methodologies employed to meet the accountability goalsis still incipient (KOSLINSKI; CUNHA; ANDRADE, 2014). Also, few studies attempt to estimate the impact of such policies on the daily life of schools and school practices (SOUSA; KOSLINSKI, 2017); there is also a lack of studies on such policies' impact on the turnover of principals.

Based on this context, this article aims to investigate the factors associated with principal turnover in the city of Rio de Janeiro from 2005 to 2012. This period comprises a cycle before and another one after the implementation of school accountability devices in the municipality and changes in how school principal jobs are offered. The leading questions that guide this study are: What is the principal turnover pattern between 2005 and 2012? What characteristics are associated with the probability of a principal not being re-elected or

resigningprior to the end of his/her term? Have the characteristics associated with principal turnover changed after the implementation of school accountability policies in 2009?

This study is based on the hypothesis that there have been changes in the patterns and factors associated with the permanence of school principals in schools, especially school performance in external evaluations. To answer the research questions, logistic regression models were used to estimate the probabilities of principals not being re-elected or leaving the position before the end of appointment. This was based on variables related to characteristics of schools, school principal's experience, and school performance. The results indicate that the variables related to performance affect the chances of the principals' remaining in the position only in the second period analyzed. This seems to occur after school accountability devices are implemented and after changes were made in the way school principal positions are provided.

2. SCHOOL PRINCIPAL TURNOVER

School principal turnover may be characterized by a systematic change in job position and/or how often this phenomenon occurs in a given period of time (PARTLOW, 2007). Several studies suggest that school principals play a key role in the transformation of daily school life, even though the impact of their interventions is not necessarily direct. Principals' actions work as triggers of teachers' actions and behaviors, which may affect student performance (ELACQUA et al., 2015). Still, there are few studies investigating the factors associated with school principal turnover. The school effectiveness literature presents evidence of the relationship between experience, stability in the job position, and school results (DHUEY and SMITH, 2009; BRANCH, HANUSHEK, and RIVKIN, 2012; DeANGELIS and WHITE, 2011).

Most of the studies on factors associated with school principal turnover focus on the North American context, which features extensive experience in adopting school principal accountability policies. For instance, Sheppard (2010) conducted a study on factors linked to permanence and turnover in a sample of public high school principals in the State of Texas. In the first stage of the analysis, the principals were separated into two groups. Group 1 wereonly those principals who remained in the position from one to four years before they moved on to another public school in the state.

Group 2 included principals who remained on the job from five to 15 years before transferring to another school. Both the number of individuals in each group and their demographic characteristics were equivalent. To verify which factors were associated with the school principal stay/turnover, the authors employed a logistic regression model in which the dependent variable was dichotomous and represented each of the two groups. The independent variables reflected the principals' contextual characteristics (sex, age, race, salary, and school background), school characteristic, as well as variables created from the principals' answers on the factors associated with stay/turnover.[2] The results indicated that the salary was the main indicator of school principal turnover in high schools. Thus, the chances of more experienced principals, with five years or more experience leading a school, leaving the positiondue to salary were twice as highas less experienced principals.

In a similar study, DeAngelis and White (2011) examined factors associated with school principal turnover in the State of Illinois from 2001 to 2008. The principals were classified into the following categories: 0 - principals who remained in the position in the subsequent year; 1 - principals who remained in the position, but were transferred to another school within the same district; 2 - principals who remained in the position, but switched to a school in another district; 3 - principals who changed function; and 4 - principals who left the Illinois public school system. To verify the effect of contextual characteristics associated with schools and principals on the dependent variable described above, the authors employed a multinomial logistic regression model. The results of these analyses indicated that women have significantly lower chances of transferring to other schools within and outside the district as compared to men. Furthermore, for each additional year in age, the chances that a principal will transfer to another school within the same district increased about 19%. The results also indicated that high school principals are less likely to change schools within the district as compared to elementary school principals. Student characteristics presented little impact on the change of principals. On the other hand, student performance affected the stay/turnover process. More specifically, school principals who achieved the targets in the *Adequate Yearly Progress* (AYP) exhibited lower chances of transferring to schools within the district or leaving the public school system as compared to school principals who did not achieve their targets. In addition, school principals with the highest percentages

of "unskilled" teachers,[3] as defined by the "No Child Left Behind Act" (NCLB), had higher chances of transferring to other schools outside the district and leaving the public school system as compared to school principals with low percentages of "unskilled"teachers.

In a study using similar statistical modeling, Ni, Sun, and Rorrer (2013) compared school principal turnover in *charter schools* and public schools in the State of Utah. The authors hypothesized that charter schools principals would suffer greater pressure for student performance, and for this reason, they would be more likely to leave the position. By comparing the results of the two types of schools, the authors found that charter schools[4] principals are more likely to leave the position. On the other hand, the results from more experienced charter school principals are in the opposite direction, with a lower probability of leaving school, transferring to another school, or quitting the educational system. The authors concluded that the intensive demand for accountability, effectiveness, efficiency, choice, and equity made the position of school principal very complex for both types of schools. Nevertheless, greater job instability in charter schools may be linked to the greater autonomy that these schools have in hiring and dismissing employees (NI, SUN, and RORRER, 2013).

Previous studies show that factors associated with demand and work conditions play an important role in the turnover phenomenon. Principals may be held accountable for school characteristics for which they have little or no control. Furthermore, several states within the United Stateshave formulated indicators seeking to measure the effect of principals on student performance. For example, Liu, Charley, and Fuller (2013) examined to what extent states within the United Stateshave adopted school principal assessment measurements, the mechanisms employed to create quality indicators, and whether the assessment results were used in decision-making. Their research suggests that the states have used different criteria to evaluate school principal efficacy, from percentage gain in student performance after the new principal took the position to value addedmeasurements. However, despite the more sophisticated statistical methods, such indicators are still inaccurate, and they can culminate in mistakes concerning hiring, dismissals, rewards, and punishment for principals and schools (LIU, CHERLEY, and FULLER, 2013). In addition, it is possible that in these educational systems, low-performing schools are the ones presenting the higher rates of principal turnover. Changing principals may be beneficial to schools with low educational indicators, nonetheless, there is no guarantee that the newly-hired principal will be

more effective thanhis or her predecessor, especially in low-performing schoolswith economic and geographical disadvantages and which experience greater difficulty in attracting more effective principals.

The research on the pressures on the school principal, factors associated with the turnover phenomenon, and challenges to evaluatingprincipal's quality/effectiveness have been progressing in the international context. However, in Brazil, evidence on the size of the phenomenon, its relationship with how job positions are provided, factors related to educational policies/school accountability pressures, and school characteristics is still scarce.

3. PRINCIPALS UNDER PRESSURE? SCHOOL ACCOUNTABILITY POLICIES AND WAYS OF PROVIDING POSITIONS IN THE CITY OF RIO DE JANEIRO

In recent years, changes in the city of Rio de Janeiro's educational policy guidelines may have led to an increase in pressure on school principals. This feature seems to be similar to states and municipalities that have adopted their own assessment systems, quality indicators, and especially, high-stakes school accountability devices.

In Brazil, there is no determination as to the provision of the school principal position. It is up to the Departments of Education to establish their own selection criteria to the position. According to school principal questionnaire data from the 2015 Prova Brasil exam, the ways of occupying that position for all public schools in the country present the following percentages: public tendering (7%), election (22%), nomination (46%), selection process (3%), selection process and election (11%), selection process and nomination (6%), and other (5%).

In the municipality of Rio de Janeiro, the school principal's position is filled based on a selection process and election, but the criteria have undergone changes over the years. This position seems to have become a key element of the educational system from an increase in qualification requirements, responsibilities, and clear performance targets associated with financial incentives.[5] Previously, in a notice to fill vacant positions in 2008, the candidates interested in becoming school principals were selected based on amanagement plan, formulated in line with the municipality's educational policy in effect, a self-assessment of their work in their sphere of activity, and an assessment made by the school board and students council based on the work carried out by the candidates. The last step consisted of public consultation to choose a principal.[6]

In 2009, the municipality of Rio de Janeiro adopted its own student performance assessment system (Prova Rio) and accountability devices for school agents. Such devices include the Annual Performance Award (APA), which is a program that rewards all school employees who achieve performance goals with a wage bonus. In the following year, the school accountability system, with the establishment of targets, was extended to the Municipal Department of Education (MDE) and the Regional Education Departments (REDs).

With the introduction of accountability devices in the municipality as of 2009, the criteria for selecting principals have become stricter, requiring candidates with greater technical capacity for interpretation and analysis of educational data. This demand for professionals with a specific profile can be found in the requirements established in the 2011 notice to principals.[7] It was based on the need for the certification of Management of Public Education offered by MDE, a term of commitment to goals of improving Ideb/IDE-Rio and reduction of school failure rates and dropout rates Moreover, the candidate's management plan was to be evaluated by a panel composed of members of the central and intermediate governmental instances.[8] The last stage remained the same as the 2008 notice, with public consultation to appoint the new school principal. In 2013, the city of Rio de Janeiro established a program named Strategic Leaders,[9] in which job posts deemed of high impact to public governance were defined, such as school principals. Individual performance targetswere set for the occupants of these positions.

The school accountability policies implemented in the municipality beginning in 2009 and the changes in job notices for school principals may have resulted in greater pressure on school principals to achieve the performance goals set by the policy. The increase in pressure on the position may have produced a two-way effect. The first one, more dramatic, is leaving the position during tenure, while the second one, a little less dramatic, is inhibiting or discouraging principals to apply again.

4. METHODOLOGY

To answer the proposed study questions, a database was assembled[10] to enable the tracking of school principals[11] and school characteristics each year, from 2005 to 2012.[12] This time gap comprises a period before and after implementation of the school accountability policy, as well as changes in how schools managementare provided and three principal election cycles.[13] Thus, logistic regression models were adjusted to estimate the probability of the following situations: (i) 0 - the principal remains in the position and is re-elected (reference category), and (ii) 1 - the principal changed job functions during tenure[14] or he/she was not re-elected to a new management cycle.

The analyses were divided into two management cycles. The first included the period from 2006 to 2008/2009. Because a principal's tenure can last up to three years, it was only possible to verify a re-election/non re-election situation in the subsequent year (2009). The second cycle included the period from 2009 to 2011/2012.

Table 1 shows the variables used in models, type, description, and data source. Consequently, this tablemay be divided into two blocks: one of them has variables associated with student profiles, whereas the other one has principal profiles, large-scale assessment performance, and accountability policy. This study is based on the assumption that both groups of variables may be related to principals' stay/turnover. For example, principal turnover may be affected by the student inputof the school becausethe targets established by the school accountability policy of the city of Rio de Janeiro do not comprise controls related to student demographic characteristics. For instance, such school accountability design may encourage the exodus of teachers and principals to schools with "more desirable" features, where they would have a greater probability of receiving a wage bonus for reaching performance goals (LADD, 2001). A study by Carrasqueira *et al.*, (2015) found that along with school accountability measures, the Department of Education of the city of Rio de Janeiro adopted various specific programs to improve quality indicators for schools with lower performance in standardized external assessment. These measures are likely to contribute to an increase in pressure on principals and teachers of the schools targeted by such programs.

TABLE 1. Descriptio n of Variables Used in the Models.

| Name	Type	Description	
Dependent Variable			
Principal's Situation	Dichotomic	The principal who remains during appointment and is re-elected for a following one = 0. Principal who left the position before the end of appointment or remains during the appointment, but he/she does not apply or is not re-elected to a new one = 1.	MDE Data
Explanatory Variables			
Age/Grade Gap	Continuous	Indicates the percentage of students per school with some age or grade gap.	Inep Indicator
Poverty Index	Continuous	Indicates the percentage of students eligible to receive Bolsa Família per school.	MDE Data
Parents Education	Continuous	Percentage of students with parents with high school education level and/or complete or incomplete higher education level.	MDE Data
Principal Experience	Continuous	Number of years that the principal acts in the city of Rio de Janeiro's school network, based on an individual's date of taking office.	MDE Data
School Math Performance (2005)	Continuous	School proficiency in mathematics in the 2005 Prova Brasil.	Prova Brasil
School Math Performance (2009)	Continuous	School proficiency in mathematics in the 2005 Prova Brasil.	Prova Brasil
2009-2010 Wage Bonus	Dichotomic	Indicates if the school received the wage bonus relating to achieving goals in 2009 and/or 2010 (1 = Yes, 0 = No).	Prova Rio
Low Performance	Dichotomic	Dummies who indicate if the schools were among the ten worst indicators per CRE[15] in one of the years or educational segment, or if the school has the worst indicators in two years or in both educational segments.	Prova Brasil

Source: This study production.

TABLE 2. Description of Variables Used in the Models.

Name	Mean	Standard Deviation
Parent's Education (2006)	29.31	13.95
Parent's Education (2009)	31.90	14.01
Age/Grade Gap (2007)[16]	23.93	12.14
Age/Grade Gap (2009)	21.87	11.10
Poverty Index (2006)	25.19	10.69
Poverty Index (2009)	29.01	12.12
Principal's Experience (2006)	16.74	6.76
Principal's Experience (2009)	19.53	6.79
Low Performance (2005)	0.34	-
Low Performance (2005/2009)	0.35	-
School Math Performance 5th grade (2005)[17]	188.89	13.03
School Math Performance 9th grade (2005)	247.13	15.05
School Math Performance 5th grade (2009)	215.65	16.68
School Math Performance 9th grade (2009)	243.22	14.97
2009/2010 Wage Bonus	0.72	-

Source: This study production.

Figure 1 shows the percentages of principals who were re-elected, not re-elected, or leave the position before the end of tenure for the periods of 2006-2008/2009 and 2009-2011/2012.

Figure 1. Percentage of re-election, non-re-election, and leave the positionduring tenure (2006-2008/2009 and 2009-2011/2012).[18]

	Reelected	Not Reelected	Left Position
2006/2009	84,8	13,4	1,8
2009/2012	82,2	13,0	4,8
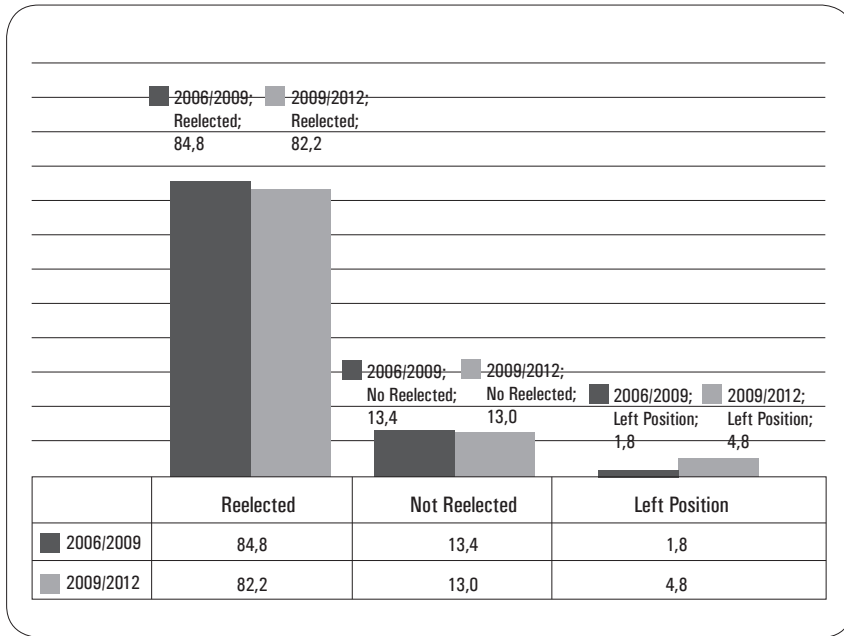
Source: This study production.

Figure 1 indicates small variations in the three categories regarding the two periods. Still, the percentage of re-elected principals presented a small drop from the first management cycle to the second one. Regarding the non-elected principal category, the percentages between the two periods are stable. As to the group of principals who changed the position during tenure, there is a slight increase in the number of individuals who left the position before the end of tenure in the period of 2009 to 2012 as compared to the previous cycle.[19] A possible explanation for the small variations in the percentages may be the short time series examined (i.e., it is not known what the pattern of the three categories before 2005 was like). Therefore, it is not known whether the results shown in the figure above were due to random fluctuations. On the other hand, it is possible that policy incorporation and longevity have a greater impact on the size of the turnover phenomenon in subsequent years. This may indicate a more accurate understanding of the rules and educational policy mechanisms by principals. Furthermore, the pressure to receive a performance bonus and other measures adopted by the municipality

that increase principals' responsibility and accountability may also influence turnover rates after the period analyzed. Finally, another possible explanation is that the trends observed may suggest that the principals are not under as much pressure as expected.

5. RESULTS AND DISCUSSION

The analyses were divided into two stages, representing the principals' tenure periods. The first stage comprised the period of 2006-2008/2009, which is the cycle from 2006 to 2008, with the possibility of a new cycle beginning in 2009 if the principal were re-elected. In the second stage, the period formulated was from 2009 to 2011/2012. For each stage analyzed, four different models were estimated In the first model of each cycle, variables corresponding to demographic characteristics of schools were inserted, such as maximum education of parents, percentage of students with some age/grade gap, percentage of students in a situation of socioeconomic vulnerability, and principal's experience. The second model adds the previous variables and a low-performing school indicator. The third model was set with the variables of school characteristic and the average school performance in the first segment of elementary school in mathematics. The fourth model is similar to the previous one, replacing the variable of mathematics performance in the first segment with mathematics performance in the second segment of elementary school.[20]

5.1 FIRST CYCLE (2006-2008/2009)

In this cycle, the variables inserted in the models are associated with the start of each principal's tenure. For example, after the 2005 principals' election, the tenure started the following year. The 2006 and 2007 contextual variables were added together with the 2005 performance, which was only released in 2006.

This study's hypothesis is based on the premise that the variables related to student characteristicsat the beginning of tenure[21] contribute to the decision-making by the principals regarding their permanence in the position. Also, most of these variables would not present great variation in the two-year period. The following tables present the results of models adjusted for the first cycle.

TABLE 3. Logistic regressions estimating the probabilities of a principal's change the position or not being re-elected (2006-2008/2009)[22]

	Dependent Variable:			
	0- Reelected / 1- Left the Position or Not Reelected			
	(1)	(2)	(3)	(4)
Parent`s Education	1.003 (0.010)	1.009 (0.012)	1.005 (0.014)	1.014 (0.020)
Age/Grade Gap	1.008 (0.011)	1.023 (0.012)	1.012 (0.015)	1.006 (0.023)
Poverty Index	1.007 (0.013)	1.013 (0.014)	1.019 (0.016)	1.013 (0.022)
School Math Performance 5th Grade (2005)			1.011 (0.013)	
School Math Performance 9th Grade (2005)				0.988 (0.014)
Principal`s Experience	1.036* (0.018)	1.031 (0.019)	1.042* (0.022)	1.013 (0.028)
Low Performance		0.756 (0.314)		
Constant	0.058*** (0.759)	0.032*** (0.847)	0.003* (2.563)	1.243 (3.667)
Observations	603	549	456	206
Log Likelihood	−255.147	−223.829	−174.615	−99.281
Akaike Inf. Crit.	520.293	459.658	361.231	210.562
Note:				*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$

The results of the first model[23] indicate that all of the variables, despite their not being statistically significant, are associated with an increased likelihood of principals'leaving the position before the end of tenure or of not being re-elected for a new cycle. The later models present coefficients and statistical significance like the first model. Therefore, the variables that try to capture parents' education, students'age/grade gap the percentage of low-SES students, the schools with lower quality indicators, and their corresponding performances in math do not seem to be associated with probabilities of principals' remaining in the position in the period from 2006 to 2009. However, Principal experience variable, the only one that was

statistically significant, suggests that principals who had a greater number of years in the school systemwere more likely to change the position or to not be re-elected.

Based on the results presented, the predicted probabilities for the variable of principal's experience were calculated. This was adjustedby controlling the meanof all other variables included in the models. The idea was to demonstrate how the probabilities of principals' not being re-elected or changing the position before the end of tenure behaved as the years of experience of the principal in the city of Rio de Janeiro's school system progressed.[24]

FIGURE 2. Probabilities predicted for the variable of principal's experience in the first cycle (2006-2008/2009)
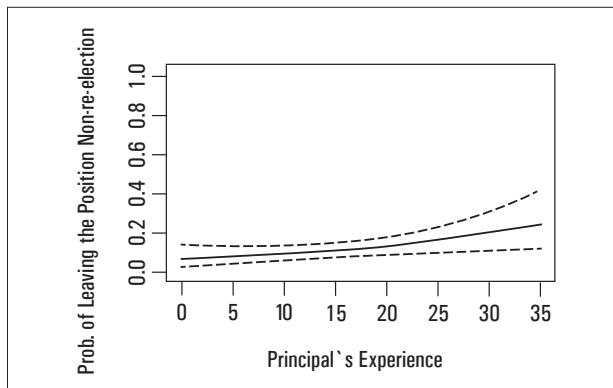
Source: This study production is based on Model 3 of Table 1.

Figure 2 shows the predicted probabilities for the variable of principal's experience in the school system of the city of Rio de Janeiro in the first cycle of management analyzed.[25] Even though this variable shows statistical significance, its effect is not so broad because the odds thata principal will leavethe positionbefore the end of tenure or not bere-elected do not vary much. For example, the predicted probability of a principal with 5 years' experience of not remaining in the position is 8%, while the predicted probability of a principal with 15 years' experience leaving the position is 12%. A hypothesis for the increase in the probability of leaving the position because of increased experience is the possibility of retirement. Because most principals in the city of Rio de Janeiro have worked as teachers or as staff, it is possible that these individuals do not remain in the principal position for too long before achieving the minimum retirement age.

5.2 SECOND CYCLE (2009-2011/2012)

The following contextual variables were inserted in the analyses for the second cycle of management: the ones associated with school characteristics, principal's experience, school performance in the Prova Brasil exam, as well as a variable indicating if the school received the Annual Award of Performance in 2009 and/or 2010. Below are the results of the models for the second management cycle.

TABLE 4. Logistic regressions estimating the probabilities of a principal's change the position or not being re-elected (2009-2011/2012)[26]

| | Dependent Variable: | | | |
| | 0- Reelected / 1- Left the Position or Not Reelected | | | |
	(1)	(2)	(3)	(4)
Parent`s Education	1.004 (0.009)	1.006 (0.010)	0.996 (0.011)	1.039* (0.020)
Age/Grade Gap	1.037*** (0.010)	1.033** (0.011)	1.032* (0.013)	1.054* (0.023)
Poverty Index	1.004 (0.009)	0.997 (0.010)	0.992 (0.011)	1.016 (0.016)
Principal`s Experience	1.042** (0.015)	1.050** (0.017)	1.058** (0.019)	1.066* (0.025)
Wage Bonus		0.713 (0.230)	0.744 (0.265)	0.897 (0.333)
Low Performance		1.284* (0.254)		
School Math Performance 5th Grade (2009)			0.993 (0.009)	
School Math Performance 9th Grade (2009)				0.971* (0.014)
Constant	0.030*** (0.657)	0.035*** (0.745)	0.194 (2.037)	3.147 (3.504)
Observations	733	651	540	273
Log Likelihood	−331.194	−290.535	−229.400	−135.445
Akaike Inf. Crit.	672.387	595.070	472.799	284.889
Note:		$p < 0.1$; **$p < 0.05$; ***$p < 0.01$		

In all models adjusted for the second tenure, the variable of age/grade gap which measures the percentage of students with some

academic gap, was significant, with the resultsin the same direction. These results indicate greater likelihood of leaving the position for school principals with a greater percentage of students with age/grade gap Moreover, the age/grade gap variables associated with the school flow used to calculate quality indicators (Ideb and IDE-RIO).[27] Like the first cycle management analyzed in this article, the variable indicating the percentage of disadvantaged students remains without a direct association with the re-election or change of principals in the school system. These results suggest that only some contextual variables are associated with the turnover of principals.

The experience variable reveals that principals who had a greater number of years in the school system were more likely to leave school management before the end of their tenure or to not be re-elected. This variable remains significant in all models adjusted for the second cycle. These results may indicate a renewal in the school principals' profile regarding the accountability policy implemented in the city of Rio de Janeiro.

Model 2 suggests that low-performing school principals have a greater likelihood of leaving the position before the end of tenure or of not being re-elected as compared to the principals who did not direct low-performing schools. The hypothesis is that these school managers were under pressure from higher authorities for an increase in student performance. Similarly, the increased performance in mathematics in the ninth year of the 2009 Prova Brasil exam decreased the chances of principals' quitting school management before the end of their tenure or of not being re-elected. On the other hand, the variable indicating the schools awarded a bonus in 2009 and/or 2010 decreased the probability of principals'leaving the position. Nonetheless, this variable was not statistically significant in any of the models.

It is possible that the principals are feeling more pressured, and they may consider themselves to be less able to increase student performance and achieve the establishedtargets (LADD, 2001). In addition, the use of indirect mechanisms to assess principal performance may result in a feeling of injustice, impotence, or increased pressure on the principals regarding issues that they cannot control.

The predicted probabilities for leaving the position were calculated considering the followingvariables: principal's experience, age/grade gap, and school performance in mathematics in the ninth year.

FIGURE 3. Predicted probabilities for the variable principal's experience in the second cycle (2009-2011/2012)
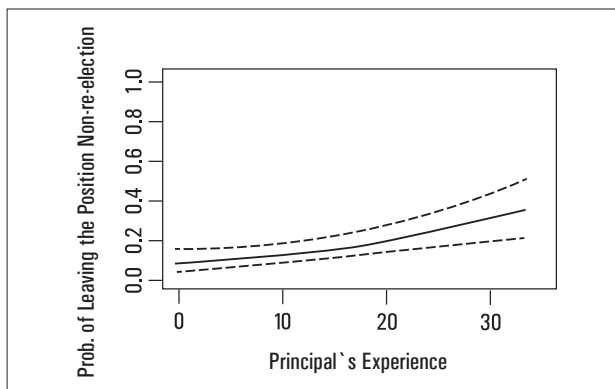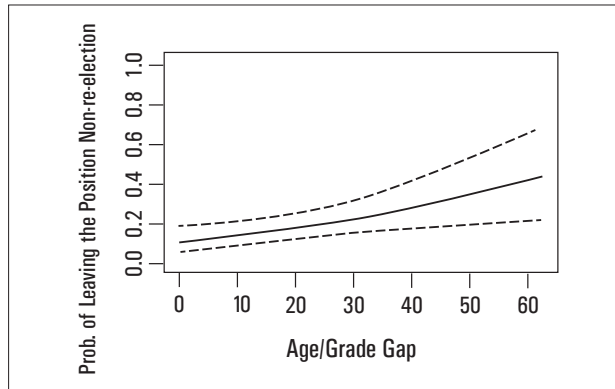

Source: This study production is based on Model 3 of Table 2.

Figure 3 shows the predicted probabilities for the variable of principal's experience in the second management cycle. As described in the section that presented the results for this period, the variable experience was significant in all models.

This figure shows that more experienced principals have a greater likelihood of leaving the office before the end of tenure or of not being re-elected for a new management cycle. For example, the predicted probability of a principal with 5 years' experience quitting office or of not being re-elected is 8%, whereas the predicted probability is 18% for a principal with 20 years' experience. The variable indicating a principal's experience presented a stronger effect in the second management cycle as compared to the first one. These results can be interpreted as a renewal in the job position because of the retirement of principals who have more time on the job, such as the hypotheses proposed for the first management cycle analyzed, or because of disincentives for re-election of a certain principal profile considering the new demands and pressures of the job. Interviews with principals who left the position during the appointment or were not re-elected in the first two cycles will enable us to precisely identify the circumstances associated with leaving the appointment.

FIGURE 4. Predicted probabilities for the variable of age/grade gapin
the second cycle (2009-2011/2012)

The predicted probabilities in Figure 4 reveal that the percentage of students with an age-grade distortion is linked to a principal's permanence in the school. These results indicate that as the percentage of students with academic skill delay increases, the likelihood of the principal's resigning before the end of tenure or not being re-elected also increases. The predicted probability of a principal resigning or not being re-elected in a school where 10% of students have an academic skill delay is approximately 11%. On the other hand, it is about 20% for a school principal where 25% of the students have an academic skill delay.

As mentioned in the discussion of the effects of the variables in Table 2, the percentage of students with some academic skill delay is associated with the probability of the principal's permanence in the school. It is also noteworthy that this variable was not significant in the first cycle of management (i.e., seemed not to interfere in the process of principal turnover), but the effects in the second cycle indicate that the percentage of students with some skill delay impacts the probability of the principal's remaining in office. As mentioned, academic skill delay is related to the flow, which is part of the calculation of quality indicators. Thus, the results may be associated with greater pressure on principals to raise their flow rates regarding the accountability policies of the city of Rio de Janeiro. Some studies suggest that the school flow in the Brazilian education systems are still high, despite the improvement in the last two decades, compared with the educational systems of other countries. This may suggest the

maintenance of a 'pedagogy of failure' (KLEIN, 2006; ALVES, 2007; RIBEIRO, 1991). Consequently, the school flow rates plays a key role in accountability policies that consider this variable to calculate quality index. The association between the percentage of age/grade gap students and principal turnover may be partially explained by the increase in the pressure on principals to increase school flow rates in view of the accountability policy demand. This could also be explained by the turnover of principals with high numbers of students with age/grade gap. Finally, the turnover of those school principals may increase the educational system inequity (LADD, 2001).

FIGURE 5. Predicted probabilities for leaving the position according to the age/grade gap variable in the second cycle (2009-2011/2012)
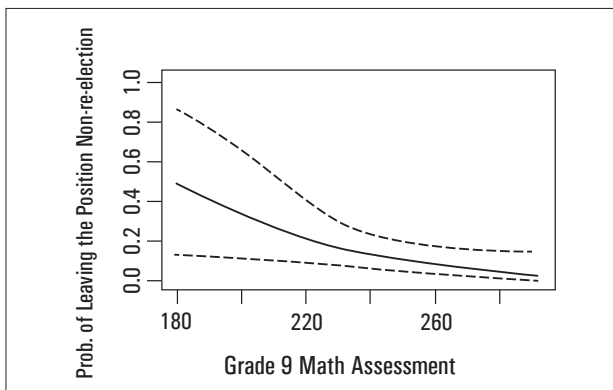
Source: This study production is based on Model 4 of Table 3.

Figure 5 used the variable of performance in mathematics of the ninth graders in the Prova Brasil 2009 to calculate the principals' probabilities of leaving school management. The results suggest that when school performance increases, the likelihood of a principal's quitting school management decreases. When Prova Brasil proficiency levels were employed to calculate the predicted probability, the following scenario was constructed: if performance is fixed as 174 points (below basic level), the predicted probability of a principal's leaving the position is 54%, while if the performance is 225 points (basic level), the probability drops to 21%. When performance is 275 points (adequate level),[28] the probability is 5%. The relationship between the performance variable in the second cycle (2009-2011/2012) with re-election or leaving the position before the end of tenure may be a consequence of the changes in the criteria adopted by the central instances (Regional Education Departments

and Municipal Education Department) to evaluate the performance and effectiveness of municipal schoolsystem

6. FINAL CONSIDERATIONS

This study investigated the patterns and changes in school principal turnover and the factors associated with turnover rates in the city of Rio de Janeiro's schoolsystemfrom 2005 to 2012. Although this is an exploratory analysis, this is a pioneering study in Brazil because little is known about the school principal turnover phenomenon, as well as how it is affected by the adoption of policies that increase pressure on principals. Research conducted in other contexts indicate that factors such as salary, sex, age, experience, and student performance may lead to principal turnover. Furthermore, most of these studies show that the school accountability policies were partially responsible for the increase in turnover, and not only due tothe expansion of tasks and pressure directed to school managers (SHEPPARD, 2010; DeANGELIS & WHITE, 2011).

The results of this study suggest that the school principal turnover rate did not increase after school accountability policies in the municipality of Rio de Janeiro were implemented. However, the factors associated with turnover changed in the second management period analyzed, particularly, school performance and the percentage of students presenting age-grade gap.

A limitation of this study is related to the short time series used in the analysis. Pressures on principals may have increased due to new demands established by the Strategic Leaders Program and changes in school principal public tendering notices. In addition, the data do not enable us to determine which principals are more or less effective or even the profile of principles who replaced those who left the position during tenure or were not re-elected. Consequently, it is not known whether the pressures of school accountability policies brought a positive contribution (i.e., ensuring more effective principals able to promote student learning), or whether they led to changes that do not necessarily bring greater effectiveness to the position. Instead, the changes may only bring greater instability to school management. This suggests the importance of analyzing the subsequent management cycles because the policy is consolidated and is becoming a part of the daily school life. This article identified the factors associated with school principal turnover in the city of Rio de Janeiro's school system. However, this analysis is

unable to make a causal inference regarding the impact of school accountability policies on principal's turnover. In future analyses, more appropriate models and a greatertime period should be employed to observe the impact of change of principals in school performance, especially low-performing schools.

REFERENCES

ALVES, F. Qualidade da educação fundamental: integrando desempenho e fluxo escolar. **Ensaio (Fundação Cesgranrio),** v. 15, p. 525-542, out/dez, 2007.

BROOKE, N. O Futuro das Políticas de Responsabilização Educacional no Brasil. **Cadernos de Pesquisa**, v.36, n. 128, p. 377-401, maio/ago. 2006.

BROOKE, N.; CUNHA, M. A. A. A avaliações externa como instrumento de gestão educacional nos estados. **Estudos & Pesquisas Educacionais**, Fundação Victor Civita, v. 2, p. 3-64, 2011.

CARRASQUEIRA, K. ; ANDRADE, F. M. ; KOSLINSKI, M. C. ; CUNHA, C. P. ; REGIS, A. . Políticas de Responsabilização Escolar: um estudo exploratório sobre as estratégias de instâncias intermediárias na rede municipal do Rio de Janeiro. **Jornal de Políticas Educacionais,** v. 9, p. 75, 2015.

CUSHING, K.; KERRINS, J.; JOHNSTONE, T. **Disappearing principals. Leadership**, 32(5), 28. Retrieved January 11, 2008 from Master FILE Premier database.

DeANGELIS, K. J.; WHITE, B. R. **Principal turnover in Illinois public schools, 2001-2008 (IERC 2011-1).** Edwardsville, IL: Illinois Education Research Council, 2011.

DIAMOND, J. B.; SPILLANE, J. P. High stakes accountability in Urban Elementary Schools: Challenging or Reproducing Inequality? **Teachers College Records**, v. 106, n. 6, p. 1145-1176, 2004.

ELACQUA, G.; OLIVEIRA, J. B. A.; MARTINEZ, M.; CHRISTOPHE, M. Educação **baseada em evidências**: como saber o que funciona em educação. Brasília: Instituto Alfa e Beto, 2015.

FIGLIO, D.; ROUSE, C. "Do Accountability and Voucher Threats Improve Low-Performing Schools?" **Journal of Public Economics,** 90(1-2): 239-255, 2006.

FULLAN, M. (2001). Leading in a culture of change. San Francisco: Jossey- Bass.

HEILIG, J. V.; DARLING-HAMMOND, L. Accountability Texas-Style: The Progress and Learning of Urban Minority Students in a High-Stakes Testing Context. **Educational Evaluation and Policy Analysis**, v. 30, n. 2, 2008.

HERTLING, E. Retaining principals. **Eric Digest**, 147. (ERIC Document Reproduction Service No. ED454567). Retrieved December 18, 2001.

KERRINS, J.; CUSHING, K., e JOHNSTONE, T. Anticipated vacancies, hiring practices, and

new principal competencies in school district in the state of California, 1997-2003. **Educational Leadership and Administration**: Teaching and Program Development, 13, 73-87, 2001.

KLEIN, R. Como está a educação no Brasil? O que fazer? **Ensaio (Fundação Cesgranrio)**, v.14, p. 139-172, abr/jun, 2006.

KOSLINSKI, M. C.; CARRASQUEIRA, K.; ANDRADE, F. M. & CUNHA, C. P. Políticas de responsabilização educacional: modelos possíveis e uma análise preliminar da política do município do Rio de Janeiro. In: CAVALIERI, A. M. & SOARES, A. J. **Políticas educacionais no Estado do Rio de Janeiro** (2015).

KOSLINSKI, M.; CARRASQUEIRA, K.; ANDRADE, F. M.; PORTELA, C.; REGIS, A. Políticas de responsabilização escolar de alta consequência e práticas escolares: um estudo exploratório da rede municipal do Rio de Janeiro. In: MELO, B. P.; DIOGO, A. M.; FERREIRA, M.; LOPES, J. T.; GOMES, E. E. **Entre a Crise e a Euforia**: Práticas e Políticas no Brasil e em Portugal.

LADD, H. F. School-Based Educational Accountability Systems: the promise and the pitfalls. **National Tax Journal**, v. 54, n. 2, 2001.

LADD, H. F.; ZELLI, A. School-Based Accountability in North Carolina: The Responses of School Principals. **Educational Administration Quarterly**, v. 38, n. 4, p. 494-529, oct. 2002.

LIU, J.; CHARLEY, E.; FULLER, E. **Evaluating principals**: ananalyis of current State strategies. Trabalho apresentado no Congresso do UCEA, Indianápolis, 2013.

MURALIDHARAN, K.; SUNDARARAMAN, V. Teacher performance pay: experimental evidence from India. **National Bureau of Economic Research**. Cambridge, Massachusetts, p. 37, [11], 2009. 84.

NAKAMURA, D.; SAMUELS, C. A. In schools, changes at the top: Area faces shortages of new principals. **The Washington Post**, 2000.

NI, Y.; SUN, M.; RORRER, A. **Principal Turnover**: Upheaval and Uncertainty in Charter Schools? University Council for Educational Administration (UCEA) 2013.

PAPA, F. "Why do Principals Change Schools? A Multivariate Analysis of Principal Retention." **Leadership and Policy in Schools 6**, n. 3, p. 267-290, 2007.

PARTLOW, M. Contextual factors related to elementary principal turnover. Planning and Changing, 38(1/2), 60-76. Retrieved December 13, 2007 from **Education Research Complete database**, 2007.

RIBEIRO, S. C. **A pedagogia da repetência. Estudos Avançados**, São Paulo, v. 5, n. 12, maio/ago. 1991.

RONFELDT, M., LOEB, S.; WYCKOFF, J. How Teachers Turnover Harms Student Achievement. **CALDER Working Paper** n. 70, January, 2012.

ROUSE, C.; HANNAWAY, J.; GOLDHABER, D.; FIGLIO, D. Feeling the Florida heat? How low-performing schools respond to voucher and accountability pressure. **NBER Working Paper**. n. 13681, 2007.

SOUSA, S. Z.; KOSLINSKI, M. C. Avaliação em larga escala, índices e premiação: iniciativas de estados brasileiros e seus efeitos. In: SETTON, M. G. J. (org.). **Mérito, desigualdades e diferenças: cenários da (in)justiça escolar Brasil e Portugal**. São Paulo: Annablume Editora, 2017.

SHEPPARD, R. R. **Determining Factors that Influence High School Principal Turnover Over a Five Year Period. 2010**. Tese (Doutorado) – University of North Texas, Texas. 2010.

TOWNSEND, T; ACKER-HOCEVAR, M. A.; BALLENGER, J.; PLACE, A. W. School Leadership Challenges Under No Child Left Behind: Lessons from UCEA's Project, "**Voices from the Field: Phase 3**". University Council for Educational Administration (UCEA) 2013.

WHALEY, J.; COX, C. **Developing the effective teacher, hiring, evaluation, and retention practices for the school administrator**. Gaithersburg, Maryland: Aspen Publications, 2002.

NOTES

[1] This study was funded by FAPERJ (Young Scientist of the State Notice).

[2] The answers of the questionnaires dealing with factors associated with stay/turnover were categorized with Likert scale responses (1 - without influence, 2 - little influence, 3 - moderate influence, 4 - influential, and 5 - very influential). The same scale of intensity, but with only four categories (1 - not at all, 2 - very little, 3 - to a certain extent, and 4 - in great measure), was used to assess the influence of factors motivating the principals to change schools.

[3] According to NCLB, to become a highly qualified teacher, two things are required: 1 - a license in the area to be taught, and 2 - a state certification to teach in classrooms, obtained through an assessment of knowledge and skills. According to this policy, an unqualified teacher is someone who does not have item 2.

[4] Charter schools are characterized by shared funding between the public and private sectors, as well as greater autonomy of management, teaching methodology, resource allocation, and teacher hiring.

[5] The school principal job position is rewarded; consequently, there is no exclusive public tendering for this post in the municipality.

[6] Ordinance E/AIE 33 of September 16, 2008.

[7] Despite the constant changes in the notice for school principal job posts, there is no limitation for the reelection of principals in the city of Rio de Janeiro.

[8] Diário Oficial of the City of Rio de Janeiro, 09/09/2011.

[9] Decree No 36673 of January 1, 2013.

[10] The information contained in the database was obtained from four sources: (I) Magister - administrative data from employees of the Rio de Janeiro's school system, such as date of taking the job post in the Rio de Janeiro's school system, sex, school where he/she is allocated, change of position, and characteristics of the schools and students; (II) Prova Brasil - school performance on the 2005 and 2009 Prova Brasil exam; (III) - School Census - characteristics of schools and students in 2006 and 2009; and (IV) Educational Index/

Inep - proportion of students with age/grade gap per school.

[11] In this study, only the main school principals were considered, and thus assistant principals were not investigated.

[12] The period of analysis considered in this study was based on the availability of data to which we had access.

[13] The public consultations for choosing principals always occur in the year before the beginning of tenure. For example, first cycle: consultation in 2005 for tenure starting in 2006, 2nd cycle: consultation in 2008 for tenure starting in 2009, and 3rd cycle: consultation in 2011 for tenure starting in 2012.Thus, all principals, regardless of their having been re-elected or not, begin their tenure on the same date.

[14] The term 'the principle has changed the position during tenure' refers to principals who interrupted their respective tenures. Such interruption may result from several reasons/circumstances, which may be personal or determined by higher instances. Some of them may be returning to the classroom, moving into a pedagogical coordination or administrative position at schools, taking over an assistant principal position at the same school or another one, being nominated for a job post in another instance (MED or RED), or being removed from office, among many other possibilities. In this study, the job position that the principals took over subsequently was not analyzed. Only those who were absent from the principal job post were coded as changed position.

[15] The Regional Education Departments (RED) are intermediate instances related to the Municipal Education Department (MED), working together with a group of schools and assisting in educational policy implementation. In the city of Rio de Janeiro's accountability policy, the REDs also have goals depending on school performance. For this reason, it is likely that they pressure low-performing schools.

[16] The indicator proportion of students with age-grade distortion of 2007 was employed because it is the first year of the historic line provided by Inep.

[17] The non-standardized SAEB scale proficiencies were employed.

[18] The analyses were based on data from 603 principals from 603 schools in the period between 2006 and 2009 and 733 principals from 733 schools in the period between 2009 and 2012.

[19] There was an increase in the number of principals who left the position during the appointment, in the period between the first and the second cycle. However, the number of cases in this category remained low, from 11 cases in the first period to 35 in the second one. With a longer time series, it will be possible to verify if this category continued to increase. Thus, the variable was analyzed with three outcomes: 1 – re-elected; 2 – not re-elected, and 3 – left the position during the appointment.

[20] The third and fourth models are different only regarding the performance variable. Because the city of Rio de Janeiro's school system has a few schools with the fifth and ninth elementary school grades, the analyses were adjusted separately. The third model was employed for principals whose schools offer the first segment, while the fourth model was employed for principals whose schools offer the second segment of elementary school. This option prevents a significant sample loss and prevents results from corresponding to a specific school profile.

[21] These variables include parents' education, age/grade gap, and low socioeconomic status (poverty index).

[22] The exponential was calculated for all the coefficients shown in Table 3, and thus they are expressed as odds.

[23] The number of observations in the third model and particularly in the fourth one are lower, compared to the number of schools that participated in the first edition of Prova Brasil in 2005. Models 1 and 2 comprise all of the elementary schools that have information on variables inserted in the model. Model 3 excludes all of the schools that offer the final grades of elementary schools, but do not offer the first grades in the same school segment. Furthermore, Model 4 excludes all of the schools that offer the initial grades but do not offer the final grades of elementary school. Consequently, school principals who did not participate in the 2005 Prova Brasil are not considered in Models 3 and 4. This lack of data, an issue that may not be solved, does not allow us to understand the effect of the performance variable on the probability that the principals leave the position.

[24] The predicted probabilities for the variable of principal's experience were calculated based on Model 3, found in Table 1 of results for the first period of management.

[25] The graphs of predicted probabilities presented in this study were made based on the variable indicating re-election/non re-election for each cycle (2006-2009 and 2009-2012), as well as contextual variables presenting statistical significance in Tables 1 and 2. The continuous line in the graph corresponds to the predicted probability of the principal's quitting the post before the end of tenure or not being re-elected, considering the variation of Principal's experience. The dotted lines in the graphs represent the confidence intervals in relation to the predicted probability.

[26] The exponential was calculated for all the coefficients shown in Table 2, and thus they are expressed as probabilities.

[27] Ideb and IDE-RIO are indicators used to calculate the Annual Award of Performance goals. In addition, IDE-RIO, like Ideb, is calculated based on the standardized grade obtained in mathematics and Portuguese and school flow.

[28] To facilitate interpretation, various education departments divide the SAEB performance scale into four levels: below basic (below 150 points), basic (150 to 200 points), adequate (201 to 250 points), and advanced (above 250 points).