

**School Leadership Stability, Principal Moves and Departures:  
Evidence from Missouri**

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## **Abstract**

*Purpose:* The objective of this study is to investigate and characterize principals' backgrounds, individual and school level factors associated with leadership stability, and principal career paths and exit behaviors in Missouri.

*Methods:* In this study we construct two data sets of practicing school principals in the state of Missouri: 1) a data set consisting of approximately 2,700 school principals across grade levels for each year from 1999 to 2006; and 2) a data set consisting of three cohorts of principals who were new to a given school in 1999, 2000 and 2001. With the first data set, we construct "stability" ratios identifying the amount of time a principal spent in any given school as a percent of the total time that principal was in the data set. With the second data set, we create indicators of the time period at which a cohort member 1) left the principalship altogether (in Missouri), 2) made a first move to another school, or 3) made a second move to another school. Using the first data set, we estimate truncated regression models to identify the relationship between principal characteristics, school context and principal stability. Using the second data set, we estimate Cox Proportional Hazard models to determine the relationship between principal characteristics, school context and exit or move behavior.

*Findings:* We find that a principal's relative salary, compared to peers in the same labor market, exerts a consistent influence on stability – the higher the salary the more likely a principal is stable and less likely he or she is to move to another school. Principals were able to leverage school to school moves for an average change in relative salary of about +5%. We also find that school racial composition – specifically percent of students who are black – may lead to instability and greater likelihood of a second move. We also find middle school principals to be less stable.

## **1.0 Introduction**

The objective of this study is to investigate and characterize principals' backgrounds and career paths, and identify individual and school level factors associated with leadership stability, and principal move and exit behaviors in Missouri. This study provides preliminary evidence from 8 years of administrative and personnel certification data from the Missouri Department of Elementary and Secondary Education.

We begin with a review of existing literature on a) the importance of principal leadership, b) growing evidence on principal career paths, c) job choice theory, career stability and two-sided matching of employees and employers. We follow this extensive review with our empirical analysis of Missouri principals, including descriptive characteristics of principals over the 8 year period and a series of statistical models intended to identify factors associated with job position stability of principals and the likelihood of exit and move behavior.

### *1.1 The Importance of Principal Leadership*

School level leadership plays a role in the school culture, the teachers' perception of their work environment, the quality of the teaching staff, and student outcomes. With the significance of these roles, research on principals, who they are and where they come from has gained increased attention in recent years. While greater attention has been paid to teacher labor markets and teaching quality than to principal labor markets and principal quality, the two are highly interconnected in part because most principals rise from the ranks of teachers but also because principals may influence teacher sorting across schools, teacher hiring and retention. Because there are many fewer principals than

teachers involved in public education systems and because principals may exert influence over teacher labor markets, principals are a potentially critical leverage point for influencing school improvement through state education policies.

A growing body of empirical evidence validates that principals may substantively influence schools, teachers, and student achievement (Hallinger & Heck, 1998; Heck & Hallinger, 1999; Leithwood, Louis, Anderson & Wahlstrom, 2004; Leithwood & Jantzi, 2005; Waters, 2003). Specifically, research has found that principals indirectly influence student achievement through several key “avenues of influence:” people, purposes and goals of the school, structure of the school and social networks, and organizational culture (Hallinger & Heck, 1998, p.171). Additionally, principals play a leading role in designing and supporting school social contexts that support professional learning (Printy, 2008), which has been associated with increasing teacher retention (Ingersoll, 1999).

With respect to the influence that principals have on the people working in their schools, studies indicate that effective schools leaders hire and retain high quality teachers not only by influencing retention but also by influencing hiring (Baker and Cooper, 2005; Brewer, 1993). Brewer (1993) measured the percentage of teachers hired by a particular principal with either high or low standards, finding that student outcomes were better in schools where larger shares of teachers were hired by principals with high standards. Similarly, Baker and Cooper (2005) used national data from the Schools and Staffing Survey to explore the link between principals’ background education and that of the teachers they hired. Using the selectivity of one’s undergraduate institution as a proxy both for ability and for principal and teacher quality, they found that principals who

attended more selective colleges were more likely to attract and hire teachers with similar backgrounds-- even in high poverty schools. Taken together, the findings of Baker and Cooper (2005) and Brewer (1993) suggest that not only is a principals' educational background and ability important in their selection of teachers but that the quality of a leader, as indicated by his or her undergraduate institution, may be a key indicator of the quality of the team of teachers that she or he hires and develops.

Applying the same logic, a leader's graduate education may play a role in signaling the quality of an educational leaders and his or her ability to build and retain a high quality teaching team. Although the literature focused on quality preparation is in its infancy, the growing number of studies are building a case that 1) certain program attributes are associated with quality preparation (Darling-Hammond, et.al., 2007; Young, 2008; Young & Grogan, 2008; Young, Fuller, Brewer, Carpenter, & Mansfield, 2007), 2) different types of graduate institutions have more or less institutional capacity to prepare leaders effectively (Baker, Orr & Young, 2007), and 3) different types of graduate institutions yield different rates of principal career advancement, suggesting differences in principal effectiveness (Fuller, Young & Orr, 2007; Orr & Pounder, in press). Although limited research exists on the relationship between preparation and effective leadership practices (Leithwood, Jantzi, Coffin, & Wilson, 1996), a principal's preparation institution could potentially serve as an indicator of principal quality.

### *1.2 Principal Career Paths*

Literature on principal career paths remains sparse, with much of the research involving individual case studies, other small scale qualitative studies and some limited

sample size survey studies. Of the studies conducted, a few common areas have been or are currently being addressed: pathways to the principalship, principal characteristics, and factors associated with deciding to leave teaching to pursue administration.

Principals leading K-12 public schools today most often ascend to their current position after being employed as a classroom teacher. This gateway to administration through teaching, according to Rand (2004), has become a somewhat standard prerequisite for building level leadership that is universally understood in the profession. This pathway to administration is often decided upon and set earlier in a teacher's educational career; Fuller, Young, and Orr (2007) use Texas administrative datasets and find that teachers decide within the first five to seven years of their teaching careers to strive for positions in administrators, begin accumulating experience, and pursue the proper post-bachelor training and education. The authors also find that more secondary teachers become certified in administration than elementary teachers and that individuals scoring in the top 10% on the state certification exams are more likely to become principals.

The decision to pursue administration occurring early in a teacher's career may be attributed to salary compensation. Entry level administrative positions often have salaries that are rather similar to those of veteran/experienced teachers in same/similar districts; however, the difference in the salaries between novice teachers and entry level administration positions is significant (Papa, 2004). Often the entry level administration position carries with it additional days from that of a teaching contract and is generally met with an increased length in workday and responsibilities. The attractiveness of administrative positions late in teacher's career often times is lessened due to the lack of

additional financial incentive. Papa, Lankford, and Wyckoff (2002) find that in New York salaries for principals do not fare well in the 1990s in both relative and absolute terms although the overall influence of the lack of increased average salary is not completely known.

Principals have similar paths into leadership positions. According to Fahrni (2001), the common path into the principalship starts from the teaching ranks and often includes additional roles and responsibilities found outside typical teaching contracts. In New York, nearly 85% of all administrators start their careers in education as teachers; of the 15% that did not begin as teachers, the likelihood that they found principal positions in an urban setting are greater than landing a position in suburban or rural communities (Papa, Lankford, Wyckoff, 2002). More specifically, using Texas data, Fuller, Young, and Orr (2007) find that teachers with physical education certification are 50% more likely to pursue the principalship compared to any other teaching content area.

Even with similar paths to the principalship, there remains a gender gap in administration. According to the Rand (2004) report, which used large datasets from New York, North Carolina, and Illinois, females represent 70% of all teachers across the three states, yet only represent 50% of the administrative ranks. This finding aligns well, due to higher percentages of male teachers in secondary schools compared to elementary schools, with Fuller, Young, and Orr's (2007) findings that more secondary teachers obtain certified to become principals than elementary teachers. Further, Syvertson (2002) finds in North Dakota that female principals do not specifically plan their careers and training with the goal of being an administrator; rather, it is an option that presents itself as opposed to pursuing the option from the early stages of a career.

Gender balance has shifted over time. Gates, Guarino, Santibanez, Brown, Ghosh-Dastidar, and Chung (2004) find that in North Carolina from 1990-2000, the percent of female administrators increased from 26% of the total field of administrators to 47%, and Strauss (2003) echoes this increase as evident in the increased percentage of female administrators in Pennsylvania from 1984-1999. But, while there appears to be a recent increase in the number of females in administration, males continue to secure and seek principal positions at a greater rate than females. It appears, however, that this pool of male teachers pursuing leadership positions represents a relatively small share of the number of certified male teachers. Fuller, Young, and Orr (2007) find that in Texas, only 10% of male teachers earn an administration certification. Subsequently, the authors find that males tend to stay in principal positions with a greater frequency after five years of first landing a job as compared to females.

Research on principal exit behavior is also thin but growing. By 2004 turnover rates of school leaders in North Carolina and Illinois were between 14-18% annually according to a policy brief by Rand (2004). In New York State public schools, Papa, Lankford, and Wyckoff (2002) find that approximately two-thirds of new principals leave within the first six years from the school in which they started their careers. Through the analysis of the New York administrative data, these researchers find that many principals transfer within the same district and/or moved to schools similar to those they left. Using New York data as well, Papa (2004) finds that as student enrollment increases, the likelihood of principal turnover grows; on the other hand, there is a greater likelihood of principal retention if a school leader is in a suburban setting with low enrollment, higher salary, and low numbers of limited English proficient (LEP) students.



Fuller, Young, and Orr (2007) find that in Texas 50% of building leaders leave the principalship within five years and 75% leave within ten years. The findings are strikingly similar to the New York State findings despite dramatic difference in context. In Texas, gender seems to play a role, as female building leaders leave their principal positions at a higher rate than males. Age also seems to play a role in exit behavior in Texas, as principals under the age of 46 are more likely to stay in their building positions, whereas by using New York data, Papa (2004) finds that there are more individuals certified to be administrators under the age of 45 than are currently practicing as school leaders. Furthermore, Mitgang (2003) notes that there is no statistical evidence of a national shortage of certified candidates for principal positions, and Winter (2001) identifies, through a qualitative study of one of the largest school districts in the country, that only 10% of the certified administrators in the pool of 194 teachers with administrative certificates are actively searching or plan on pursuing principal positions.

Principal labor market research has revealed disparities in qualifications across school settings within labor markets. Papa, Lankford, and Wyckoff (2002) illustrate that urban schools are much more likely to have less experienced principals and principals who received their undergraduate degree from lower ranked colleges. Urban principals are more likely to move to new jobs in their current district and less likely to move to new districts than their suburban colleagues. Fuller, Young, and Orr (2007) confirm that principals serving low SES schools in Texas are more likely to be promoted to district level positions, which results in a greater chance that there is less experience at both the building level and the district level in urban schools. Additionally, urban school leaders are difficult to recruit to schools with low SES, high poverty, and low per pupil spending

(Mitang, 2003) and are more likely to leave the principalship compared to their suburban counterparts (Papa Lankford, and Wyckoff, 2002).

Schools that struggle to show adequate student achievement share some building leadership characteristics. Fuller, Baker, Young (2007) and Papa, Lankford, and Wyckoff (2002) find that schools with lower student outcomes have less experienced principals. Principals who fail certification exams are more likely to lead a teaching staff with greater numbers of uncertified or out-of-field faculty. Principals who graduate from highly selective universities tend to search for employment in smaller towns near metropolitan areas, hire teachers with similar educational backgrounds, and are found to be less likely to work in schools with high poverty and schools with high percentages of minority students. Moreover, principals who have graduated from highly selective universities tend to have a greater likelihood of retaining quality teachers than what is found for principals who attended and graduated from non-selective universities (Clotfelter, Ladd, Vigdor, and Wheeler, 2006).

Principals' undergraduate credentials are largely granted by less and non-selective regional colleges (Baker and Cooper, 2005), but their graduate backgrounds may be stratified differently. Baker, Orr and Young (2007) show dramatic 10 year increases in masters' degree production (principal certification) among regional comprehensive colleges and relatively unchanged production among research universities and highly ranked universities; however, Fuller, Young and Orr (2007) show that in Texas principals receiving their leadership credentials at highly ranked institutions and research universities are more likely to achieve principalships in a shorter period of time after

becoming credentialed, providing some evidence that principal labor markets may discriminate on the basis of academic qualifications.

There is little thus far known about the relative localness of administrator labor markets. It is believed that because fewer positions are available in any one location, those wishing to be school leaders may seek positions more geographically dispersed than teachers; hence, geographical location may not appear to be a drawback or factor associated with a candidate's willingness to apply for a position and employability (Pounder & Merrill, 2001).

Moreover, little is known about the differences amongst districts in relation to specific processes and procedures involved in attracting, recruiting, hiring, and retaining the very best principals. Still greater is the lack of quality, accessible, and nationwide data to predict and plan for future principal needs while describing characteristics and determinants associated with principal's backgrounds, preparation, stability, moves, and exit behaviors.

### *1.3 Job Choice, Stability and Two-Sided Matching*

Few studies explore specific theories of job choice and matching for school principals. Pounder and Merrill (2001) apply *job choice theory* to the career decisions of potential aspiring high school principals, adopting frameworks from personnel management literature. Pounder and Merrill decompose principals' job choices into preferences of potential principals for various job and organizational attributes of available high school principalships. They further decompose these factors into objective factors - characterized by seeking maximization of economic status - and subjective

factors - characterized by psychological advantage-seeking. That is, Pounder and Merrill adopt the assumption that potential principals choose among a set of available principalships based on a mix of subjective and objective preferences. Pounder and Merrill (2001) focus on the likelihood that middle school principals and high school assistant principals - a likely pool of candidates - will pursue high school principalships. But, Pounder and Merrill evaluate only one side of these choices - the choice of a potential principal to pursue a principalship based on subjective and objective criteria regarding available jobs. Within this approach, Pounder and Merrill find salary to be a significant driver of job choice for potential high school principals, somewhat in contrast to literature on teachers (Hanushek, Kain, Rivkin, 2001).

While the choice of an individual to pursue or not pursue the principalship may be one-sided, the process of matching potential principals with specific leadership positions in schools is two-sided. Two-sided matching theories and empirical frameworks, developed by game theorists (Roth & Sotomayor, 1992), have been applied to better understand teacher labor markets (Boyd, Lankford, Loeb & Wyckoff, 2006). Boyd, Lankford, Loeb and Wyckoff specifically employ game theoretic models to untangle common counterintuitive findings of more conventional *hedonic* methods for evaluating teacher job selection. Hedonic models (similar to *job choice theory*) assume choices to be relatively one sided, from the teacher's or employee's perspective and based on pecuniary (salary) and non-pecuniary (working conditions) factors associated with job options. Hedonic models assume that the ultimate sorting of employees across jobs and settings, at specific salary levels will reveal the salaries necessary to recruit and retain teachers with specific characteristics into specific jobs in schools and districts having

certain characteristics (Duncombe and Goldhaber, 2004). But, *hedonic* methods often find relative insensitivity of teachers to salary differences and also imply that employers (schools) are relatively indifferent to the academic qualifications of teachers (Duncombe and Goldhaber, 2004). Boyd, Lankford, Loeb and Wyckoff's (2006) findings for teachers, adopting a two-sided matching conceptual framework and empirical procedure suggest that salaries may play a stronger role and that preferences of employers are relevant. In short, they find: "that schools prefer high ability teachers and teachers prefer higher wages and schools that are closer to home with fewer poor students."(p. 47)

One constraint associated with teacher-school matching which may be less applicable to principal matching is that teachers are generally unable to negotiate substantial variations to their starting salary due to district-wide negotiated agreements, but principals may have greater leverage to do so. This factor complicates hedonic analysis for teachers but may be less problematic for principals.

Perhaps most interestingly, the game theoretic framework of two-sided matching addresses the concept of a stable match - a match where the preferences of both parties are initially and remain aligned, and where achieving such matches are arrived at by fully revealed preferences by both firms and workers. That is, in our specific case, the principal must be honest regarding the type of school he/she is looking for along with type of job and salary, concurrently the school district must similarly reveal preferences regarding the type of principal they are looking for, job demands and salary.

Fully revealed preferences are unlikely in principal labor markets in part because many aspects of the job or individual applying for the job are difficult to observe and there may exist perceived advantages by either part to withhold information. We

hypothesize that in any given labor market, as principals gain experience in that labor market they become more astutely aware - whether fully revealed or not - of comparative aspects of principalships in other schools and types of schools in the same labor market and are also better able to evaluate the salary they would accept for taking a position other than their current one. However, changing conditions over time, such as changing school demographics and or outcomes, or changes in relative salary may stimulate move or exit behavior as other matches on the labor market become more appealing than a principals current match, and as firms alter job requirements and salaries in order to attract new or different principals. As such, it may require greater mismatch to destabilize more experienced principals, all else equal.

#### *1.4 Goals of the Study*

The three major goals of this study are to:

1. Characterize the distribution of principals across Missouri schools;
2. Characterize principal leadership stability and exit behavior in Missouri schools;
3. Evaluate school and individual factors associated with leadership stability and exit behavior.

We acknowledge that we emphasize *stability* herein having little evidence that stability in-and-of-itself is desirable. Arguably, if a principal is a good principal, with high standards (as noted by Brewer, 1993) and exercises positive influence over teaching quality in a school, one would want that principal to stick around for a while, whereas, if that principal is a particularly weak one, adversely affecting work environment and teaching quality, one would want to replace that principal with all deliberate speed. In

either case, it becomes relevant to understand which factors are associated with principal stability – in order to take advantage of controllable factors that increase stability for the high quality principal and identify factors that might encourage the departure of the low quality principal. Even in high teacher turnover rate schools, a principal must stay in place for at least five years to replace a substantial share of teaching staff. With teachers, as with principals, it's not the magnitude of turnover but rather the nature of that turnover.

### *1.5 What this study adds to the current literature*

This study adds to the current literature on principal career paths in a variety of ways. First, the analysis is applied to a new context – Missouri, using an 8 year panel of all school level administrators in the state, with detailed data on those administrators linked to data on the schooling contexts in which they work. In addition, we have compiled a variety of indicators describing the preparation institutions for Missouri school principals, including Barrons' ratings of the competitiveness of undergraduate institutions attended, and 1994 Carnegie Classifications for graduate institutions attended.

We also take a unique approach in our empirical estimation of principal stability and exit behavior by focusing on conditions relative to a principal's current labor market context. Recent work on teacher moves indicates that teacher salary may play a stronger role than identified in previous studies, if teacher salary is measured (a) with respect to teacher salaries in nearest competing neighboring districts and (b) with respect to private sector non-teacher wages for individuals with comparable education levels in the same geographic labor market (Ondrich, Pas & Yinger, 2008). Other recent research has shown

that school district salaries in Missouri specifically are highly sensitive to local competitive labor markets (Slagle, Yan & Baker, 2008). In this study, we measure all working condition and salary variables in relation (as a ratio) to the average characteristics of other schools and principals in the same labor market.

Finally, following the work of Podgursky, Monroe and Watson (2004) on teacher labor markets, specifically in Missouri, we estimate Cox Proportional Hazard models to determine which schooling context factors, personal attributes, training characteristics and controllable policy variables are most associated with the principals exiting the data set or moving to another school.

In the present study, we do not undertake a game theoretic empirical model of two-sided matching for principals, like that of Boyd, Lankford, Loeb and Wyckoff (2006) for teachers because we feel that such analysis is premature given the dearth of more straightforward descriptions and analyses of principal labor markets. We acknowledge, however, that theories of two-sided matching likely best explain the relative stability, exit and move behavior of principals observed herein.

## **2.0 Data & Methods**

Data for this study include individual level data on principals and data on the characteristics of Missouri schools from 1999 to 2006. Data are from the Missouri Department of Elementary and Secondary Education, and include information on the preparation background and job characteristics of Missouri educators, including teachers, principals and other certified staff. School data on student demographics, school location



and structure were also available through the Missouri Department of Elementary and Secondary Education.

We supplement the Missouri DESE principal and school level data with data from the Integrated Post-Secondary Education Data System (IPEDS) of the National Center for Education Statistics. IPEDS provides a rich set of variables describing higher education institutions, including Carnegie classifications of institutional type, average ACT and SAT scores of enrolled students and a variety of additional institutional characteristics. We construct an IPEDS matched identifier variable for each undergraduate and graduate institution attended by Missouri school principals and merge IPEDS institutional characteristics to each institution attended by each principal.

Of particular interest to us in the present study, is whether graduate institution type – using the 1994 Carnegie Classification system – plays any role in the career stability or exit behavior of principals. One might argue that the additional effort of attending a major research university may lead a principal to stay in his/her leadership role longer. Conversely, individuals who attended major research universities may also be more likely to use the principalship as a stepping stone to greater opportunities, including higher salaries. Little evidence exists one way or the other, but Baker, Young and Orr (2007) raised serious questions about the redistribution of degree production by institutional type over time.

The 1994 Carnegie system is preferred for analysis purposes by most scholars of postsecondary institutional diversity because it is an indication of institutional purpose and resource capacity. The classification system's hierarchical method for categorizing

the “comprehensiveness” and research emphasis of postsecondary institutions reflects differences in institutional program diversity and resources.<sup>1</sup>

Baker, Young and Orr (2007) note a dramatic increase in the production of graduate degrees in educational administration by non-research universities, also using the 1994 Carnegie classification scheme. It is relatively well understood that the vast majority of teachers in public schools have attended regional comprehensive colleges for their undergraduate training, and assumed if not understood that the majority of school principals rise through the ranks of teaching.

We also construct a data set in which we match competitiveness ratings from the *Barron’s Profiles of American Colleges*, where the lowest rating is *non-competitive*, and the highest two categories are *highly* and *most competitive*.<sup>2</sup> While many authors

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<sup>1</sup> Although comprehensiveness and research capacity is not a pure measure of quality, it is an indication of what an organization is potentially capable of achieving, particularly with regard to doctoral preparation. These include the following eight categories (Glassick, Huber, & Maeroff, 1997): Research I institutions offer a full range of baccalaureate programs, award 50 or more doctoral degrees each year, and receive \$40 million or more in federal support annually. In 1994, there were 88 Research I institutions, which included major state flagship universities and large private universities. Research II Universities are like Research I institutions but receive between \$15.5 million and \$40 million in federal support annually. In 1994, there were about 40 Research II Universities, which included flagship universities in smaller states (Vermont, Wyoming, Idaho), other non-flagship state universities (Kansas State, South Florida), and some midsized to large private universities. Doctoral I institutions offer a full range of baccalaureate programs and award at least 40 doctoral degrees annually in five or more disciplines (Glassick, Huber & Maeroff, 1997). In 1994, there were about 50 Doctoral I institutions, including some regional public universities (Univ. of Missouri at Kansas City, Georgia State University), as well as medium sized to large private colleges (Drexel, Fordham, Marquette). Doctoral II institutions award at least 10 doctoral degrees in three or more disciplines or 20 or more doctoral degrees in one or more disciplines. A typical example is Wright State University. In 1994, there were about 50 Doctoral II institutions, which represented an eclectic mix of regional public colleges and universities and private colleges with a handful of specialized graduate programs (Law, Medicine). Comprehensive I institutions offer a full range of baccalaureate programs and award 40 or more master’s degrees annually in three or more disciplines. In 1994, there were over 400 Comprehensive I colleges which included large numbers of regional public universities, many of which had been founded as state teachers’ colleges, or normal schools such as Montclair State in New Jersey or Emporia State in Kansas. Comprehensive II institutions award 20 or more master’s degrees annually in one or more disciplines. In 1994, there were under 100 Comprehensive II institutions, which included small regional public colleges (such as Castleton State in Vermont), and small to midsized private colleges. Liberal Arts Colleges I tend to be highly selective, predominantly private institutions serving primarily undergraduate populations. They award more than half of their baccalaureate degrees in arts and science fields. In 1994, there were approximately 160 Liberal Arts I Colleges. Examples include Williams College (MA) and Swarthmore College (PA). Liberal Arts Colleges II tend to be less selective, predominantly private institutions also serving primarily undergraduate populations. They award more than half of their baccalaureate degrees in arts and science fields. In 1994, there were approximately 400 Liberal Arts II Colleges, including small private and some small regional public colleges.

<sup>2</sup> Factors included in determining the category for each college included: median entrance exam scores for the 2001-2002 freshman class (SAT or ACT); percentages of 2001–2002 freshman scoring in the top 15% of the SAT or ACT; percentage of 2001–2002 freshman who ranked in the upper fifth and upper two-fifths of their high school graduating

promote the virtues of recruiting and retaining teachers with strong academic backgrounds, one element of which is college selectivity, Baker and Dickerson (2006) point out that the ability to recruit teachers from selective colleges is highly contingent on the geographic proximity of selective colleges. More relevant to the present study, Baker and Cooper (2005) find a significant connection between undergraduate institutions attended by principals and by the teachers who enter their schools after their arrival. This finding would be of little consequence if research had not repeatedly and consistently found this rather blunt characterization of teachers to be highly related to student outcomes. While some debate persists on the value of undergraduate college competitiveness measures, most recent rigorous findings include this, from Boyd, et al. (2008): “Furthermore, almost half of the teachers in the most effective quintile graduated from a college ranked competitive or higher by Barron’s, compared to only ten percent of the teachers in the least effective quintile.”(p. 23)

### *2.1 Data Structures & Dependent Measures*

A major limiting factor in dealing with longitudinal panels of data on individuals, teachers or administrators, is that data necessarily have endpoints and those endpoints do not coincide with the beginnings or endings of the careers of any or all individuals in the data set. Rather, the data panel is of a window in time on the careers of individuals in a state – Missouri in this case. For some, we are capturing a window near the end of their career, and for others near the beginning. For still others, we may be capturing their entire

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classes; minimum class rank and grade point average required for admission (if any); and percentage of applicants to the 2001–2002 freshman class who were accepted. We assume relative stability over time to the highest categories of selectivity.

career as principal. Nonetheless, we must find some empirical strategy to account for these data limitations.

We apply two strategies herein, and have attempted many alternatives with the present data. In our first strategy, we construct as our dependent measure, a measure we refer to as the *stability ratio*. A principal's stability ratio is a measure of the number of years that principal spent in a given school as a percent of the time that principal was in the data set. A variety of alternative measures of "length of stay" or "length of time in any specific school" were tested, along with appropriate statistical modeling variations to accommodate the different scales of those measures. Each variation of dependent measure produces largely the same results. We settle on the *stability ratio* in part due to greater ease in interpretation when compared to measures which required estimation of poisson regressions (counts data on years where a principal was matched to a specific school) with truncated distributions.

Notably, the number of years a principal could have been in the data set will depend on the year of the data. In years of data near the beginning or end of the panel, larger shares of principals are likely to be in the data set for fewer years, because they are either on their way in or on their way out. We account for these concerns in our modeling by including year fixed effects. That is, principals in the data set in a given year are compared against principals in the data set in that same year. In alternative models, we tested two other dependent measures which were effectively inverses of one another. The first was a principal *average length of stay* in a given school measure and the second was a measure of the *number of schools per principal*. Model findings were comparable regardless of which of the three – our current or the two previous – measures was used.

We assume stability to be a function of a good match between principal and school, at least in terms of mutual revealed preferences. This match is partly achieved as an equilibrium between the competing preferences of local school districts to retain “good” principals as long as possible, and the likelihood that at least some “good” principals seek to gain many experiences and make multiple moves as they aspire to district level leadership positions.

Our second strategy herein involves construction of a data set including cohorts of principals with an identified start point for those cohorts and indicators of various types of end points – 1) exiting the data set, 2) first move to another school and 3) second move to another school. As a start point, we identify a set of principals in 1999, 2000, 2001 who were new to a given school in that year. We identify their start year as time “0,” and so on, with maximum times of 8, 7, and 6 for each cohort. This data set is constructed for purposes of estimating a *Cox Proportional Hazard* model to determine which principal characteristics and contextual characteristics are most associated with the likelihood that a principal will exit the system or move to a new school.

From a statistical standpoint, our Cox models are more appropriate than our stability ratio models because the Cox models follow specific cohorts of principals over time until they exit the system and while they make moves from school to school. The downside of the Cox model is that isolating specific cohorts of principals who have a starting point at a specific school within the time frame of the data set results in dramatic reductions of the available sample. The Cox model cohorts consist of only one to two hundred cases per year before attrition, which occurs quickly. The small sample size precludes labor market specific analysis in St. Louis and Kansas City. By contrast, the

larger sample used for calculating stability ratios and estimating related models includes over 2000 cases per year and sufficient cases for more fine grained analysis within the two major labor markets.

## *2.2 Predictors of Stability, Move and Exit Behavior*

Drawing on a variety of analyses of teacher labor market behavior, but most specifically on Ondrich, Pas and Yinger (2008), we identify the following groups of factors most likely to predict mobility and exit behavior among principals: 1) relative compensation, 2) personal characteristics, 3) job characteristics and 4) work environment characteristics. Perhaps the most important contribution of Ondrich, Pas and Yinger (2008) is their attention to the measurement of salary in determining whether salary influences the likelihood of teacher moves. While previous studies have used measures of salary alone (usually natural log), Ondrich, Pas and Yinger use two measures of relative salary: 1) the salary of a teacher in district X compared to the salary of teachers in other districts in the same county, and 2) the salary of teachers in the county to the salary of non-teachers at same age and degree level in the same county. We focus on the first of these approaches for measuring principals' salaries. It is most likely that a principal will chose to change schools or districts not if his or her salary is "X" but if his or her salary is higher or lower than the salary of other comparably qualified principals in the same labor market. We choose the broader labor market over the narrower county measure in part due to Missouri specific geographic constraints (counties in our sample may have few or only 1 school district among which to choose, whereas labor markets capture a wider array of employment options within the same metropolitan area).

We construct our relative salary measure by estimating a regression model of all principals' salaries for each labor market. Then, we calculate the ratio of each principal's actual salary to his or her predicted salary, given their a) labor market, b) experience and c) degree level. This approach has the advantage of allowing us to use this salary competitiveness ratio measure in the same regression models with measures of principals' experience (career stage) and degree level, while avoiding concerns over collinearity.

In terms of job characteristics, we isolate in our data sets only those individuals who are principals, not assistant principals or otherwise. We delineate primarily on the basis of grade level of school using a dummy variable for middle and secondary school principals. We also include a measure of the relative size of the school – the enrollment of the principals' school compared to the average enrollment of other schools at same grade level on the same labor market.

In terms of student population characteristics, we include measures of the racial composition of schools (% black students and % Hispanic students) which a) vary more strongly than differences in poverty concentration across schools in the Kansas City and St. Louis metropolitan area, and b) have been linked more strongly with teacher job choice and mobility than poverty (see Hanushek and Rivkin, 2004).

In terms of personal characteristics, we include the principals' own race which may bias matching with respect to student population racial composition, the principals' experience, which in part signals career stage and likelihood of exit, and we include indicators of the principals' academic preparation such as degree level but also the type of institution from which degrees were obtained. Our interest in institutional type stems

from the findings of Baker, Orr and Young (2007) which found substantial shifting in the distribution of graduate degrees in educational administration by institutional type over time.

### 2.3 Models

For our first set of models, we use our stability ratios for the dependent variable, and address this variable in three ways. First, we run models in which the stability ratio itself is the dependent variable, as a function of principal characteristics including educational background and relative salary, student population characteristics relative to other schools in the same metropolitan area, and school grade level.

$$\text{Stability Ratio} = f(\text{Salary}_p, \text{Exper}_p, \text{Educ}_p, \text{Personal}_p, \text{Students}_s, \text{School}_s)$$

Because many principals in the data set have stability ratios of 1.0, a truncated regression was estimated.

Alternatively and primarily for illustrative purposes, we identify the most and least stable principals, where the most stable are identified as those with stability ratios over .9 – those spending 90% or more (in effect, those spending all of their time) in a given school – and those with stability ratios under .333, or those spending less than 1/3 of their time in a given school. For these dichotomous indicators, we estimate logistic regression models using the same set of independent variables. The logistic regressions are used to illustrate the differences in probabilities that a principal is highly stable, or unstable, associated with principal and school characteristics. Logistic regression models provide us with odds ratios as coefficients, allowing straightforward interpretations of factors associated with the most and least stable principals.



In order to account for differences in the length of stay of principals as relates to the year of the data set, and to account for the fact that each principal occurs many times in sequence in the data set, we include dummy variable, fixed effects for year and for the number of years a principal is in the data set (prin-years), and we estimate the models with robust standard errors clustered by principal “id”, negating the effect of replicated principals on the standard errors and thus statistical significance of our estimates. We run our models for the statewide population of principals (excluding rural principals) and subsequently we run separate models for the two major metropolitan labor markets in the state – St. Louis and Kansas City. Rural principals are excluded for two reasons: 1) because of the extent to which distance to alternative principal positions, and likelihood of household moves associated with job changes might affect the analysis, and b) more practically, because of smaller numbers of rural principals per labor market, and even smaller numbers of less stable principals per labor market.

Finally, drawing on the recent work of Podgursky, Monroe and Watson (2004) on Missouri teachers and Goldhaber, Gross and Player (2007), we apply a Cox proportional hazard model to three alternative outcomes. Here, our dependent measures of interest are whether and when a principal a) exited the data set, b) made his/her first move to another school or c) made his/her second move to another school. We could similarly estimate a logistic regression model for a cohort or group of cohorts of principals whereby we would include an outcome indicator variable that the principal has left the building (exited altogether or moved), at any time in the data set. Setting aside when he/she left, we could estimate a logistic regression on the likelihood that he/she left as a function of a set of independent variables.

The Cox Proportional Hazard model is a variant on this approach, which includes the time dimension of when the move or exit occurs – after period 1, 2, 3 and so on. The approach allows for comparing our individual principals at the same time periods over several time periods. The proportional hazard model estimates the relative likelihood that an event (move or exit) occurs at any given time, with respect to a set of covariates. For example, in our specific case, we might evaluate the relative likelihood that a male principal versus a female principal makes a move or exits at time period 3. Our hazard ratio for male versus female (as a baseline) might turn out to be 1.2, indicating that the male principal is 20% more likely than the female principal to move (or exit) at time 3, or any other given time period. The Cox model also allows for time variant covariates. For example, we use a time variant measure of principal’s salary relative to the labor market average for principals. As a principal’s salary falls behind that of his or her peers the likelihood that the principal moves or exits may increase.

We estimate our Cox Proportional Hazard models on three cohorts of principals using the same set of independent variables as used in our stability ratio models. The analysis is primarily confirmatory and is arguably a more precise and rigorous empirical strategy for addressing the research questions at hand. However, this strategy also results in a dramatic reduction in our sample size because we must isolate cohorts of principals by a common start point metric (new to a building in 1999, 2000 or 2001).

### **3.0 Findings**

Table 1 summarizes the numbers of principals in our data set from year to year, by school level and by the relative stability of those principals. There are approximately

2,500 to 2,700 total principals per year, with 848 remaining in the data set for all 8 years (about 31.5%). This finding alone is telling. The average stability ratio among all principals was approximately 70%, or principals spent about 70% of their time in a single school. For those in the data set all 8 years, principals spent about 65% of their time in a single school. That is, many who stayed in the data set all 8 years, served as principals in two schools during that time period. Stability is somewhat lower in middle schools and somewhat higher in high schools. It is conceivable that some principals view the middle school principalship as stepping stone to a secondary school principalship.

**Table 1**  
Principals in Data Set by Year, Grade Level and Stability Ratio (>.90)

Year	All Grades	Stable in All Grades	% Stable	Stable in Middle School			Stable in High School		
				Middle School	Middle School	% Stable	High School	High School	% Stable
<i>All Principals</i>									
1999	2,527	1,928	76.3%	511	350	68.5%	667	529	79.3%
2000	2,589	1,888	72.9%	517	331	64.0%	677	512	75.6%
2001	2,634	1,842	69.9%	533	330	61.9%	691	500	72.4%
2002	2,681	1,843	68.7%	565	345	61.1%	700	484	69.1%
2003	2,730	1,861	68.2%	583	355	60.9%	710	491	69.2%
2004	2,679	1,823	68.0%	577	358	62.0%	713	484	67.9%
2005	2,669	1,859	69.7%	579	374	64.6%	704	479	68.0%
2006	2,706	1,916	70.8%	581	379	65.2%	722	508	70.4%
<i>Principals in Data for 8 years</i>									
1999	848	553	65.2%	184	99	53.8%	236	161	68.2%
2000	848	553	65.2%	181	99	54.7%	243	165	67.9%
2001	848	553	65.2%	178	101	56.7%	246	161	65.4%
2002	848	553	65.2%	181	100	55.2%	245	161	65.7%
2003	848	553	65.2%	185	102	55.1%	240	162	67.5%
2004	848	553	65.2%	184	104	56.5%	243	164	67.5%
2005	848	553	65.2%	190	104	54.7%	244	165	67.6%
2006	848	553	65.2%	186	104	55.9%	246	164	66.7%

Numerous studies have highlighted the role of student racial composition with respect to teacher sorting and some studies have evaluated principal sorting (Hanushek and Rivken, 2007) with respect to racial composition (Clotfelter, Ladd & Vigdor, 2006). As noted previously, among our interests is the role of relative salary in influencing

stability, exit and move behavior of principals. Table 2 presents the salaries of principals relative to salaries of other principals in the same labor market, and the student black population concentration relative to the average black concentration for other schools in the same labor market. Principals are separated by stability, with stable principals being those who stayed in one school for the full time frame (over 90%).

Table 2 shows that the average relative salary for stable principals during the early years of the data set was higher than the average labor market salary. Interestingly, this salary differential appears to taper off and reverse during the period to the point where other principals have higher relative salary in the last three years. The percent black population of students is generally lower in the schools of stable principals throughout the period.

**Table 2**  
Relative Salaries and School Racial Composition by Stability Ratio (>.90)

year	Relative Salary[1]		Relative % Black	
	Other	Stable	Other	Stable
1999	0.980	1.021	1.063	0.981
2000	0.994	1.017	1.082	0.971
2001	1.002	1.014	1.134	0.943
2002	1.006	1.014	1.084	0.963
2003	1.013	1.010	1.088	0.961
2004	1.018	1.008	1.073	0.965
2005	1.034	1.005	1.039	0.981
2006	1.041	1.001	1.042	0.981

[1] ratio of principals' actual salary to predicted salary for labor market, degree and experience level

Of the principals in our data set, the most common educational background included attending a competitive (3<sup>rd</sup> from bottom on a 6 level on a scale from non-competitive to most competitive) undergraduate college and receiving one's masters degree from a regional comprehensive college (Carn94 = 21). While there has been minimal shift in undergraduate backgrounds over time, the rapid growth of masters'

degree options at smaller private institutions such as Lindenwood University and William Woods University is rapidly reshaping the educational backgrounds of the principal workforce in Missouri since 2000. In 1999, 24 principals in our data set held William Woods' masters' degrees. By 2006, that number exceeded 200 (nearly 8% of practicing principals in 2006). Lindenwood masters' degrees also climbed from about 36 to nearly 200 during that time period (about 7% of practicing principals in 2006).

Table 3 displays the findings from our statewide models of stability ratios and of highly stable and unstable principals. Table 3 shows that relative salary exerts a consistent effect regardless of specification. In our truncated regression model of stability ratio, principals' stability ratios are higher where relative salary – compared to peers on the same labor market is higher. Further, a principal with a higher relative salary is more likely to be a highly stable principal and much less likely to be an unstable one. Doubling the principal's salary relative to other on the same labor market increases the likelihood that a principal is stable by 2.27 times. That said, causality is difficult to discern in this case. It may just be that principals who stay in place longer earn higher salaries. But, we suspect that many principals gain higher salaries on their moves.

The other consistent effect across specifications is the effect of principal experience. More experienced principals are more likely to stay in one place. They are likely to have higher stability ratios, like to be in the highest stability category and less likely to be unstable. This finding cuts both ways in terms of policy implications, because this finding may also indicate that ineffective but experienced principals are more likely to stick around.

We also find that minority principals are more likely to be unstable, as are male principals. We find little effect of student population. Finally we find that middle school principals are indeed less likely to be stable and more likely to be highly unstable.

Table 4 focuses on the St. Louis metropolitan area which includes the single large school district of St. Louis City, and many small school districts ranging widely in wealth and racial composition. Again, salary and experience play a consistent role regardless of specification of the dependent variable, with the magnitude of the salary effect being greater in St. Louis than in the statewide model. Minority principals are also less likely to be stable and more likely to be unstable. In fact, Minority principals in the St. Louis area are only about 50% as likely to be highly stable, and twice as likely to be highly unstable. Further, principals in schools with greater black student concentration are less likely to be highly stable. Consistent with the statewide model, middle school principals in the St. Louis metro area are less stable.

Table 5 presents the models for the Kansas City area, which generally includes geographically larger school districts than in the St. Louis area, fewer of them, and less heterogeneity across districts. Two of Kansas City's suburbs are also relatively poor, racially diverse districts (Center and Hickman Mills) and the most affluent suburbs of Kansas City are far less affluent than those in the St. Louis metro area. In short, Kansas City presents fewer competing units and less heterogeneity. Nonetheless, relative salary continues to exert a consistent influence as does experience level. Further, as in St. Louis, principals in schools with higher black student concentration are less likely to be highly stable. Again, middle school principals are less likely to be highly stable and more likely

to be highly unstable. In the Kansas City area, high school principals are also less likely to be highly stable.

**Table 3**  
**Statewide Truncated Regression and Logistic Regression Models of Principal Stability**

<i>MISSOURI</i>	<b>Truncated Reg. of Stability Ratio</b>			<b>Logit for Most Stable (SR&gt;.9)</b>			<b>Logit for Least Stable (SR&lt;.333)</b>		
	Coef.	Std. Err.	P>z	Odds Ratio	Std. Err.	P>z	Odds Ratio	Std. Err.	P>z
<i>Relative Salary</i>	0.127	0.032*		2.269	0.622*		0.113	0.034*	
<i>Total Experience (ln)</i>	0.046	0.009*		2.760	0.208*		0.406	0.029*	
<i>Degree Level</i>									
BA Only	-0.014	0.020		1.160	0.196		1.253	0.253	
Specialist	0.018	0.013		0.908	0.089		1.151	0.130	
Doctorate	-0.010	0.017		1.072	0.157		1.320	0.201**	
<i>Degree Source</i>									
BA Highly or Most Selective	0.002	0.025		1.091	0.220		1.254	0.275	
MA from RU1	-0.012	0.020		1.161	0.202		0.757	0.160	
<i>Personal</i>									
Minority	-0.009	0.017		0.768	0.109**		1.438	0.213*	
Male	-0.007	0.010		0.925	0.086		1.240	0.122*	
<i>School Students</i>									
Rel. Enrollment	-0.005	0.011		1.125	0.085		0.928	0.087	
Rel. % Black	0.000	0.005		0.932	0.036**		1.033	0.044	
Rel. % Hispanic	-0.004	0.004		1.029	0.029		0.991	0.030	
<i>School Grade Level</i>									
Middle School	-0.013	0.013		0.665	0.068*		1.477	0.172*	
High School	0.017	0.017		0.825	0.105		1.190	0.180	

Excludes rural principals outside of core based statistical areas. Estimated with fixed effect for core based statistical area and year and for the number of years a principal occurs in the data set. Estimated with robust standard errors accounting for multiple occurrence of principals in the data set (clustered in principal ID). \*p<.05, \*\*p<.10



**Table 4**  
**St. Louis Metropolitan Area Truncated Regression and Logistic Regression Models of Principal Stability**  
**Table 1**

<i>ST. LOUIS</i>	<b>Truncated Reg. of Stability Ratio</b>			<b>Logit for Most Stable (SR&gt;.9)</b>			<b>Logit for Least Stable (SR&lt;.333)</b>		
	Coef.	Std. Err.	P>z	Odds Ratio	Std. Err.	P>z	Odds Ratio	Std. Err.	P>z
<i>Relative Salary</i>	0.152	0.044*		2.392	0.764*		0.152	0.054*	
<i>Total Experience (ln)</i>	0.056	0.011*		2.913	0.273*		0.346	0.031*	
<i>Degree Level</i>									
BA Only	-0.020	0.025		1.529	0.279*		0.926	0.199	
Specialist	0.012	0.014		0.880	0.085		1.170	0.128	
Doctorate	-0.042	0.025		0.967	0.173		1.431	0.305**	
<i>Degree Source</i>									
BA Highly or Most Selective	-0.014	0.029		1.074	0.241		1.197	0.297	
MA from RU1	-0.026	0.019		1.074	0.188		0.706	0.148**	
<i>Personal</i>									
Minority	-0.010	0.021		0.523	0.089*		2.047	0.346*	
Male	-0.001	0.012		0.939	0.096		1.062	0.111	
<i>School Students</i>									
Rel. Enrollment	-0.007	0.012		1.110	0.087		1.019	0.093	
Rel. % Black	0.000	0.003		0.943	0.022*		1.000	0.033	
Rel. % Hispanic	-0.003	0.003		0.989	0.022		1.000	0.024	
<i>School Grade Level</i>									
Middle School	-0.024	0.016		0.697	0.079*		1.296	0.163*	
High School	-0.021	0.019		0.877	0.110		1.132	0.169	

Excludes rural principals outside of core based statistical areas. Estimated with fixed effect for year and for the number of years a principal occurs in the data set. Estimated with robust standard errors accounting for multiple occurrence of principals in the data set (clustered in principal ID).

\*p<.05, \*\*p<.10

**Table 5**  
**Kansas City Metropolitan Area Truncated Regression and Logistic Regression Models of Principal Stability**

<i>KANSAS CITY</i>	<b>Truncated Reg. of Stability Ratio</b>			<b>Logit for Most Stable (SR&gt;.9)</b>			<b>Logit for Least Stable (SR&lt;.333)</b>		
	Coef.	Std. Err.	P>z	Odds Ratio	Std. Err.	P>z	Odds Ratio	Std. Err.	P>z
<i>Relative Salary</i>	0.107	0.036*		2.019	0.583*		0.159	0.053*	
<i>Total Experience (ln)</i>	0.040	0.009*		2.805	0.222*		0.395	0.028*	
<i>Degree Level</i>									
BA Only	-0.032	0.022		1.434	0.263*		1.082	0.245	
Specialist	0.023	0.015		0.891	0.091		1.192	0.149	
Doctorate	-0.009	0.019		0.905	0.145		1.499	0.247*	
<i>Degree Source</i>									
BA Highly or Most Selective	-0.012	0.024		1.257	0.239		1.150	0.229	
MA from RU1	0.005	0.019		1.116	0.198		0.696	0.145**	
<i>Personal</i>									
Minority	-0.027	0.017		1.003	0.163		1.065	0.201	
Male	-0.019	0.011**		0.776	0.076*		1.494	0.161*	
<i>School Students</i>									
Rel. Enrollment	0.001	0.012		1.157	0.090**		0.966	0.092	
Rel. % Black	0.000	0.003		0.948	0.022*		0.995	0.036	
Rel. % Hispanic	-0.003	0.003		1.020	0.026		0.987	0.029	
<i>School Grade Level</i>									
Middle School	-0.003	0.014		0.668	0.071*		1.295	0.161*	
High School	0.010	0.017		0.775	0.097*		1.105	0.163	

Excludes rural principals outside of core based statistical areas. Estimated with fixed effect for year and for the number of years a principal occurs in the data set. Estimated with robust standard errors accounting for multiple occurrence of principals in the data set (clustered in principal ID).

\*p<.05, \*\*p<.10

Figure 1 displays the Kaplan-Meier survival estimates for the three cohorts of principals, for each type of event identified – exit, first move, second move. Panel A shows the exit behavior for principals in each cohort, indicating that by period 6 nearly 50% of each cohort had exited the principalship in Missouri. Panel B shows that by period 6, nearly 75% of each cohort had made at least one building change. Far fewer had made two moves (Panel C).

The first cohort began with 179 principals new to their school in 1999, the second with 239 in 2000 and the third with 266 in 2001. By the final period, there were 81, 111, 152 remaining in the data set in each cohort, respectively. Of the 179 who were new to their school in 1999, 24 had completed their masters' degrees in 1998 and 36 others since 1995, with others scattered across years. Of the 239 in the 2000 cohort, 26 had completed their masters' degree in 1999 and 62 others since 1995. Similarly, of the 2001 cohort, 26 had completed their masters' degrees in the previous year, with the largest shares of remaining masters degrees granted over the eight previous years. The 2001 cohort was larger, and had obtained their graduate degrees over a longer span.

The University of Missouri at St. Louis, University of Missouri at Columbia and University of Missouri at Kansas City were the largest producers of masters' degrees in the survival model cohorts. University of Missouri at Columbia, Southeast Missouri State and Truman State were the largest granters of bachelors' degrees to our cohorts. Interestingly, by selecting cohorts beginning in 1999, who received their masters' degrees in the mid-1990s, we have excluded large shares of current principals who received masters' degrees from William Woods University and Lindenwood University, two of the

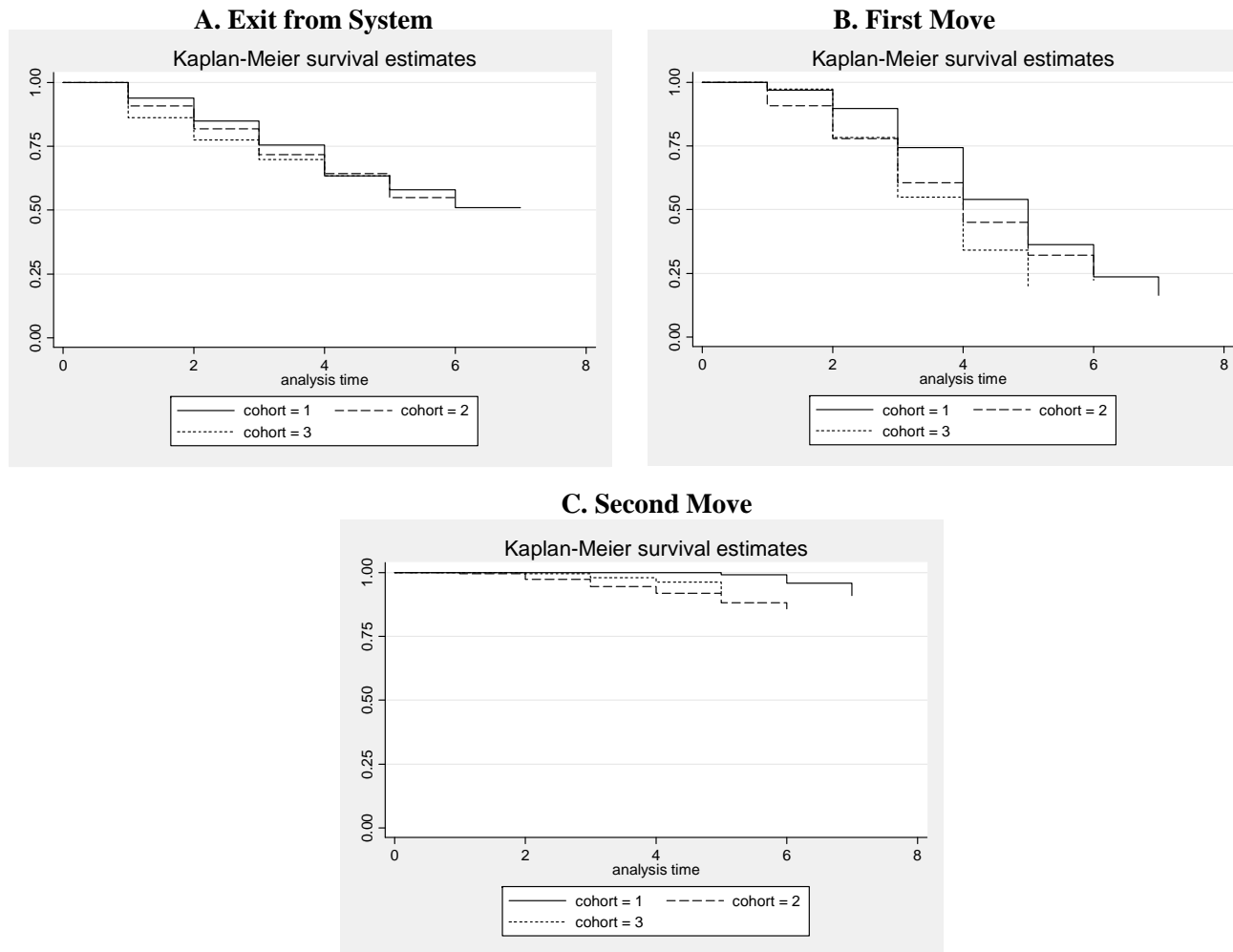
largest current producers of masters' degrees for principals in the St. Louis area, and increasingly statewide.

Table 6 displays the results of the Cox Proportional Hazard models. Effects of salary are less pronounced than in our stability ratio models, but the sample size is dramatically reduced. We find that salary has significant effects on likelihood of a first move, where higher salaries relative to peers in the same labor market are associated with reduced likelihood of a move. It makes sense that a principal whose salary is higher than peers around him or her would be less likely to move to a position that might lower his or her salary.

We also find a marginally significant effect ( $p < .10$ ) of experience on likelihood of exiting the system, and a significant effect on making a first move. More experienced principals are more likely to exit the system but are less likely to move. Indeed it is logical that more experienced principals are more likely to be approaching retirement, or simply to have had enough, and also that more experienced principals who are not yet ready to retire or exit the system are more likely to stay put.

In our Cox models we find that principals of larger schools are less likely to exit, or make a second move, but find no effect on first move. Finally, regarding racial composition of schools, we find black concentration to be associated positively with likelihood that a principal makes a second move. This is consistent with our earlier finding that increased student black population shares were strongly associated with the least stable principals.

**Figure 1**  
Kaplan-Meier Survival Estimates for Exits and Moves of Missouri Principals (non-rural)



**Table 6**  
Cox Proportional Hazard Model of Exit and Move Behavior of Missouri Principals

	Exit System			First Move			Second Move		
	Haz. Ratio	Std. Err.	P>z	Haz. Ratio	Std. Err.	P>z	Haz. Ratio	Std. Err.	P>z
<i>Relative Salary</i>	1.441	0.701		0.510	0.164*		0.182	0.229	
<i>Education and Experience</i>									
Total Experience (ln)	1.294	0.178**		0.724	0.063*		1.032	0.394	
BA Only	0.815	0.829		0.000.	.		0.000.		
Specialist	1.198	0.187		1.061	0.111		1.077	0.405	
Doctorate	1.514	0.326**		0.939	0.146		0.379	0.283	
BA from Highly/Most Competitive	1.664	0.387*		0.925	0.185		0.000.		
MA from RU1	1.018	0.247		1.015	0.170		0.387	0.396	
Minority	1.100	0.293		0.606	0.127*		0.272	0.284	
Male	1.148	0.164		1.109	0.105		0.841	0.287	
<i>Student Population</i>									
Enrollment (rel to CBSA)	0.664	0.097*		1.008	0.094		0.525	0.186**	
% Black (rel to CBSA)	1.026	0.038		1.039	0.031		1.297	0.065*	
% Hispanic (rel to CBSA)	1.010	0.034		1.042	0.025**		0.936	0.122	
<i>Grade Level</i>									
Middle	0.697	0.134**		1.094	0.122		0.863	0.411	
High	1.088	0.193		1.000	0.128		2.529	1.030*	

\*p<.05, \*\*p<.10

Given the role of salary throughout our models, we felt it relevant to explore further the distribution of salaries across principals by their attributes and the schools in which they work. Digging underneath the salary effect revealed in our statistical models above, we find that the relative competitiveness of a principal's salary from the year before a move to the year after a move improves from about 91% of labor market average to about 96% of labor market average. That is, principals are leveraging moves for an average 5% gain in relative salary. In a labor market with an average salary of \$62,000 in a given year, this translates to increasing salary from \$56,420 to \$59,520, on average.

In Table 7, we regress principal salaries as a function of our various principal attributes, school characteristics and year. While it is common to estimate such a model to the natural logarithm of salaries, we use salaries themselves here a) such that dollar effects can be addressed directly and b) because there was no statistical advantage, in terms of explanatory power or distribution of the error term, to log transforming the salary variable.

It would appear that minority principals in the St. Louis area are paid less than their non-minority counterparts. However, it is also the case that principals of schools with higher black concentration are paid more than principals in schools with lower black concentration. As one might expect, minority principals are far more likely to hold leadership positions in higher black concentration schools, so these salary differentials are to an extent, offsetting for many.

As one might expect, principals of larger schools and of high schools – which tend to be larger – also receive higher salaries, and this effect is cumulative. While high school principals clearly receive a salary premium over elementary school principals,

middle school principals do not, possibly aiding in explaining the relative instability of middle school principals.

While there is no apparent salary premium associated with undergraduate background of principals, there appears to be some salary premium associated with having one's masters' degree from a research university, at least in the St. Louis area, which then drives a statewide effect. This may be a function of lower salaries being awarded to the increasing numbers of graduates of upstart degree producers which have had less impact on the Kansas City area. Additional salary models revealed that recipients of masters' degrees from William Woods specifically were paid on average \$12,000 per year less across years and approximately \$8,800 less in 2006 than recipients of masters' degrees from Research I institutions, holding other factors (those in Table 7) constant. Notably, the gap appears to be closing.



**Table 7**  
Principal Salary Model Statewide and for Kansas City and St. Louis

<i>DV= Principal Salary</i>	<u>Statewide</u>			<u>St. Louis CBSA</u>			<u>Kansas City CBSA</u>		
	<i>Coef.</i>	<i>Std. Err.</i>	<i>P&gt;t</i>	<i>Coef.</i>	<i>Std. Err.</i>	<i>P&gt;t</i>	<i>Coef.</i>	<i>Std. Err.</i>	<i>P&gt;t</i>
<i>Personal</i>									
Minority	-585.91	449.97		-2,082.10	839.69*		669.89	747.88	
Male	1,329.35	275.97*		828.33	568.34		1,730.74	539.22*	
<i>Education &amp; Experience</i>									
MA from RU1	1,751.70	513.84*		1,267.24	1,155.13		2,881.04	999.13*	
BA from Highly/Most Competitive	-480.53	583.06		481.17	1,025.92		-1,621.19	2,323.21	
Doctorate	7,252.02	505.66*		7,043.30	806.28*		7,648.08	976.09*	
Specialist	1,777.13	277.42*		-2,857.29	1,019.42*		3,241.00	529.75*	
BA Only	-3,852.75	512.80*		-6,863.57	1,430.61*		-3,937.65	855.69*	
Total Experience (ln)	5,718.74	236.64*		5,684.00	414.28*		5,514.59	506.12*	
<i>Student Population</i>									
% Black (rel to CBSA)	538.18	68.84*		593.60	320.83**		832.39	258.19*	
% Hispanic (rel to CBSA)	357.95	90.95*		1,018.07	267.83*		70.86	114.30	
Enrollment (rel to CBSA)	7,286.25	269.42*		8,733.30	600.14*		6,988.36	648.36*	
<i>Grade Level</i>									
Middle	702.83	665.86		2,844.61	1,686.14**		1,540.16	1,127.48	
High	3,146.18	532.27*		5,758.10	2,297.52*		5,016.62	1,250.92*	
<i>Year</i>									
year=2000	2,293.60	119.68*		2,974.00	250.01*		1,199.46	288.07*	
year=2001	4,821.22	151.57*		5,940.31	319.62*		3,540.06	335.32*	
year=2002	6,905.38	172.82*		8,469.63	352.25*		4,881.97	392.19*	
year=2003	9,088.55	189.93*		11,392.69	381.71*		7,317.08	429.21*	
year=2004	10,530.91	206.07*		13,329.38	429.08*		9,471.04	448.19*	
year=2005	12,128.54	219.70*		14,908.44	465.53*		11,418.56	444.42*	
year=2006	14,732.77	219.61*		17,987.76	467.77*		14,437.05	435.39*	
<i>Constant</i>	20,465.15	811.74*		40,228.92	3,106.92*		35,513.49	2,040.62*	
<i>R-squared</i>	0.672			0.477			0.528		

Excludes rural principals outside of core based statistical areas. Statewide model estimated with fixed effect for core based statistical area. Estimated with robust standard errors accounting for multiple occurrence of principals in the data set (clustered in principal ID).

\*p<.05, \*\*p<.10

#### **4.0 Conclusions and Policy Implications**

Analyses herein show that, on average, over an 8 year period, elementary school principals spend about 65% of their time in a single school, while high school principals spend slightly more and middle school principals slightly less. On average, from a given start point, approximately half of principals are no-longer principals in the state after about 5 years, and nearly 75% have made at least one move to another school. Overall, there appears to be relative instability in the principalship, though it remains difficult to evaluate this instability in the absence of relevant comparison groups. Our Missouri principals appear at least comparable to the Texas principals addressed by Fuller, Orr and Young (in press).

Schooling exogenous conditions like student population characteristics appear to exert some effect on the instability of principals, with student black population concentration increasing likelihood of second moves and being highly associated with the least stable principals – those that spent less than 1/3 of their time in any one school.

The most consistent, potential policy lever for influencing principal retention appears to be principal's relative salary. Our findings regarding the importance of salaries to principals is not entirely novel. For example, Pounder and Merrill (2001) found salaries to be the most significant objective factors driving principal job choice, balanced with work considerations including time and job demands and subjective factors including "desire to achieve and improve education"(p. 27).

In the present study, principals with higher salaries than their peers in the same labor market appear more likely to stay longer and less likely to be unstable. Movers tended to have lower than labor market average salaries and, on average, were able to

leverage moves to improve their relative position on the labor market by about 5%. In a labor market with an average salary of \$62,000 in a given year, this translates to increasing salary from \$56,420 to \$59,520, on average by moving from one principal position to another.

As noted previously, increasing principal stability is desirable where it is perceived that the principal is a good one, for example, positively influencing the quality of teacher workforce in a school. However, there are likely some principals that should be destabilized. Teacher labor market literature indicates that universal retention is not always the best objective, especially where weak teachers are involved. The same is likely true for principals. Findings herein do not indicate whether higher relative salaries could be effectively used to keep good principals in place while using salary reductions or freezes for ineffective principals to encourage exits and moves. In cases where principals are hired and employed under teacher contracts, fewer options may be available. But, where principal contracts are negotiated separately, alternative incentive structures may be a viable option. However, the use of such incentives, tied to effectiveness of principals presumes that policy makers and/or district leaders can make appropriate judgments regarding principal effectiveness. This is much easier said than done.

Differentiated pay for principals might also serve to aid in the redistribution of principal quality across schools within districts. In the St. Louis metropolitan area, schools of principals who attended the least competitive two categories of undergraduate colleges have student populations that are 59% to 62% black, whereas schools of principals who attended the two upper middle categories (very and highly competitive)

are 28.5% and 18.7% black. Within Kansas City Missouri School District, schools of the 20 principals who attended the least competitive two categories of undergraduate colleges have student populations that are 76% to 79% black, compared to only 52% black for schools of the 15 principals who attended very competitive colleges (only 2 principals attended highly or most competitive colleges).

Pundits pressing for decentralized control of large urban public schooling systems – power to the principals, so-to-speak – fail to acknowledge these persistent disparities and ignore entirely the possibility that such disparities might severely undermine equity – or advance inequity – in a highly decentralized system.<sup>3</sup> In fact, decentralizing control to a disparately distributed team of principals across schools might do more harm for a district’s highest need children than retaining centralized governance and controlling the teacher staffing decisions of weak principals. Given the negative effect of student racial composition on principal stability and the potential positive offsetting effect of relative salaries, findings herein suggest that it may be reasonable to use salary policy and targeted principal hiring to equalize the leadership playing field within large urban districts before taking the leap toward decentralized governance. More investigation into this specific application of targeted principal salaries is warranted.

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<sup>3</sup> For a particularly glaring example of this oversight, see Ouchi, 2006.

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