

THE ROUTINE MAY BE STABLE BUT THE ADVANTAGE IS NOT: COMPETITIVE IMPLICATIONS OF KEY EMPLOYEE MOBILITY

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We extend our theoretical understanding of the effect of key employee mobility on organizational performance. We find that when an organization with an advantageous set of routines loses a key employee to a competitor, the advantaged organization's competitive position is reduced vis-à-vis the hiring competitor. What is more interesting is that we also show that the diffusion of an advantageous set of routines through the mobility of key employees may affect competitive advantage in at least two additional ways. Our findings result from an analysis of 412 competitive events between the San Francisco 49ers and all other teams in the National Football League during the 24-year period when the San Francisco 49ers perfected the routines of a strategic innovation that has become known as the West Coast Offense. First, we find that there is a loss of advantage for the organization when competitors increasingly compete against additional organizations that hired key employees from it. Second, we find that there is a loss of advantage for the organization when competitors expect future competition against additional organizations that hired key employees from it. Our results challenge the traditional argument that socially complex routines create sustainable competitive advantages because they are not easily imitated and do not rely on any single individual. Instead, we show that routines are stable to the loss of key employees, but the advantages derived from them are not. Copyright © 2009 John Wiley & Sons, Ltd.

INTRODUCTION

Researchers from a variety of perspectives have highlighted the role of higher-order routines in the sustainability of competitive advantage as an important issue in organizational theory and strategy (Barney, 1991; Eisenhardt and Martin, 2000; Kogut and Zander, 1992; Nelson and Winter, 1982; Rivkin, 2001; Teece, 1998). The general argument is that higher-order routines are difficult for rivals to imitate because they are socially complex and reside in the collective (Kogut and Zander,

1992; Levitt and March, 1988; Nelson and Winter, 1982). The fact that those higher-order routines are hard to transfer may help firms sustain an advantage (Barney, 1991). Therefore, extant work argues that individual employee mobility does not significantly affect overall organizational competitive advantage (Kogut and Zander, 1992; Levitt and March, 1988). Given the primacy placed on collective routines and capabilities by core arguments of sustainability of competitive advantages in resource-based approaches (Barney, 1991), it is hardly surprising that strategy researchers have devoted little attention to the study of the competitive consequences of the loss of key employees to competitors (Felin and Foss, 2005; Gardner, 2002, 2005; Oliver, 1997; Zajac and Kraatz, 1993).

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However, recent work demonstrates that the effects of employee mobility on knowledge transfer, innovation, and competitive advantage is increasingly becoming an important domain of research (Gardner, 2005; Harris and Helfat, 1997; Lacetera, Cockburn, and Henderson, 2004; Rao and Drazin, 2002; Song, Almeida, and Wu, 2003; Sturman, Walsh, and Cheramie, 2008; Wezel, Cattani, and Pennings, 2006). Much of this research to date focuses on the influence of interorganizational mobility on the recipient organization. In this vein, for example, Rao and Drazin (2002) explored the effects of interorganizational mobility on product innovation for recipient organizations, Song *et al.* (2003) examined the effect on patenting activity that results from the hiring of U.S. engineers, and Boecker (1997) investigated how the mobility of top managers across organizations in the semiconductor industry affects decisions to enter new product markets. Less is known, however, about how interorganizational mobility affects gains or losses in terms of the competitive advantage and performance outcomes (e.g., survival, profitability, effectiveness in head-to-head competition) of organizations that lose employees (Phillips, 2002). In this sense, research has shown that firm survival is negatively influenced by the loss of employee groups (Phillips, 2002; Wezel *et al.*, 2006) while the survival of progeny organizations is enhanced by large transfers of employees from a parent firm (Phillips, 2002; Wezel *et al.*, 2006). Research, however, has not investigated how the mobility of key employees (as opposed to groups of employees) affects the performance of the organizations that lose those key employees. We address this void by focusing specifically on the competitive performance effects for an organization with an advantageous set of routines as key employees leave the organization and join other competing organizations.

In this paper we argue that there are three important mechanisms by which the loss of key employees can hurt an organization that has an advantageous set of higher-order routines (e.g., strategy formulation and implementation). First, the hiring organization gains knowledge about the advantageous set of routines so that it can both defend against them and imitate them. Second, the diffusion of that advantageous set of routines gives other organizations additional opportunities for exposure to those routines through competition. Firms can now learn about the advantageous

set of routines through competition with imitators of the originating organization and thus imitate or develop competitive responses to those routines. Because organizations observe each other's actions and define unique strategies vis-à-vis each other (White, 1981), the diffusion of an advantageous set of routines will channel the attentional focus of competitors to develop responses to that set of routines. Finally, the diffusion of the advantageous set of routines will cause competitors to expect more competition against the advantageous set of routines in the future. When organizations expect to have lower performance in the future, they search for ways to improve performance (Cyert and March, 1963; March, 1981), so the mobility of key employees will indirectly promote a problemistic search for tactics to neutralize the advantage provided by those routines (Cyert and March, 1963; Nelson and Winter, 1982).

In order to gain a detailed understanding of the competitive performance effects of the loss of key managers, we analyze head-to-head competition between organizations. Head-to-head competition is the focus of a broad area of research dealing with competitive outcomes (Baum, Calabrese, and Silverman, 2000; Chen, Su, and Tsai, 2007). This approach is more precise (Sirmon, Gove, and Hitt, 2008) because it avoids the aggregation of multiple head-to-head competitions with different competitors, which is important in order to have a clean test of the effects of movements of key employees between specific organizations.

The present paper addresses our research questions through an analysis of 412 competitive events between the San Francisco 49ers and all other teams in the National Football League (NFL) during the 24-year period when the San Francisco 49ers perfected the routines of a strategic innovation that has become known as the West Coast Offense. Professional sports have proven to be an effective setting for studying organizational phenomena (Wolfe *et al.*, 2005). Examples include studies of the relationship of managerial succession to team performance (Allen, Panian, and Lotz, 1979; Brown, 1982; Gamson and Scotch, 1964; Pfeffer and Davis-Blake, 1986), new product development (Takeuchi and Nonaka, 1986), the match between strategy and human resources (Wright, Smart, and McMahan, 1995), and the resource-based view of the firm (Poppo and Weigelt, 2000; Sirmon *et al.*, 2008; Moliterno and Wiersema, 2007). In particular, competition

against the San Francisco 49ers during that period (1979–2002) in the NFL is a particularly good setting for the purpose of our analysis because it provides a distinctive example of an advantageous set of routines, a complete record of competitive engagements, a disaggregated measure of performance, and a perfect tracking of exposure to the routines.

We make three major contributions in this paper. First, we build upon a growing line of research on the competitive implications of employee interorganizational mobility and develop theoretical arguments that extend this line of research. We conceive routines as at least partially residing in key individuals and build out of Barnard's (1968: 139) idea that 'the individual is always the basic strategic factor in organization.' To help us better understand the direct implications of employee mobility on competition, we focus on the effect of the mobility of individual key employees on head-to-head competition.

Our second major contribution is to develop theoretical arguments about additional factors that arise from employee interorganizational mobility and that dilute the competitive advantage of leading organizations. In this sense, we extend research that has considered the implications of employee mobility for the structure of competition (Sorensen, 1999a, 1999b). Specifically, we argue that diffusion of routines and capabilities through a competitive landscape that results from key employee interorganizational mobility will enhance competitive responses of competitors that are more exposed to those advantageous routines and capabilities in their competitive experience. Finally, we examine how expectations about the increased exposure to a particular set of routines may enhance the purposeful development of responses to those competitive threats and, therefore, the reduction of the relative competitive advantage between the advantaged organization and its competitors.

THEORY AND HYPOTHESES

Loss of advantage through key employee mobility

We start with the premise that an organization's stock of routines is enacted by its members (Barnard, 1968; Cyert and March, 1963; Coff 1997). While some of the knowledge needed for

these routines is tacit and difficult to transfer, a significant amount is embedded in key employees within the organization and therefore transferable through employee mobility. In accordance with a growing line of research that has shown that new capabilities can be brought into an organization by recruiting key individuals from organizations with superior routines (Gardner, 2005; Harris and Helfat, 1997; Lacetera *et al.*, 2004; Rao and Drazin, 2002; Song *et al.*, 2003; Sturman *et al.*, 2008; Wezel *et al.*, 2006), we argue that organizations may be able to reduce the relative competitive effectiveness difference with an advantaged competitor by recruiting key employees from that competitor.

Most of the research on the implications of key employee mobility focuses on the benefits gained by the hiring organization. For example, Song *et al.* (2003) show that foreign firms that hired U.S. engineers produced patents that were closely related to the knowledge of the U.S. firms from which the engineers were hired. Other studies demonstrated that young or poorly connected firms enhanced their product innovation (Rao and Drazin, 2002) and improved their survival chances (Phillips, 2002) by recruiting key employees from their advantaged counterparts.

Research on the performance implications of key employee mobility on the organizations that lose those employees has been limited to studies of large groups of employees. In this sense, Wezel *et al.* (2006) found that the survival of accounting firms in the Dutch accounting industry is negatively affected by group departures of key employees and by departures that go to local competitors or to form new accounting firms. Similarly, Phillips (2002) found that the survival of parent organizations is compromised by large employee transfers out of the organization. In both of these cases, the focus is on how the loss of groups of employees disrupts routines in the organization. However, even if routines are not disrupted, there is another way that an organization can be hurt by the loss of individual key employees.

An organization may attain superior performance by developing an advantageous set of routines. The performance advantage is contingent on competing firms being unable to respond adequately to the advantageous set of routines. The lack of response is at least partially created by a lack of knowledge regarding the routines. However, an organization that hires a key employee

from another organization with an advantageous set of routines will increase its ability to imitate those routines or to design an improved head-to-head competitive response. Accordingly, the hiring organization will improve its ability to compete against the organization with superior routines. This, in turn, should reduce the relative competitive effectiveness of the donor organization relative to the hiring or recipient organization. Therefore, we hypothesize that:

Hypothesis 1: The performance of an organization with an advantageous set of routines will be lower when competing against organizations that have hired a key employee who is experienced with that advantageous set of routines.

Loss of advantage through rival's increased exposure to routines

The interorganizational learning literature to date emphasizes learning through alliances rather than learning through competition (Ingram, 2002). Yet there is a rich theoretical tradition that highlights the importance of competitive interaction for search activities, innovation, and learning. In a competitive landscape in which organizations observe each other's actions and define strategies vis-à-vis each other (White, 1981), one organization's superior performance triggers search for responses or improvements by its rivals (Barnett and Hansen, 1996; Ingram and Simons, 1999; March, 1981; Nelson and Winter, 1982). A focal organization's competitive disadvantage against a single competitor with an advantageous set of routines may not produce a significant overall performance shortfall that is enough to trigger problemistic search for ways to improve performance against that competitor. But the diffusion of the advantageous set of routines through key employees' interorganizational mobility will expose the focal organization to more frequent encounters with aspects of the advantageous set of routines. Such exposure will result in more frequent performance shortfalls, leading to a more significant overall performance shortfall that will channel the focal organization's attention toward the development of specific tactics for competing against the advantageous set of routines (White, 1981). The implication here is that the more exposed rivals are to a set of routines that puts them at a disadvantage, the more likely they are to develop responses

to deal with those particular routines. We argue that the diffusion of an advantageous set of routines through a competitive landscape will enhance the competitive responses of competitors who are increasingly exposed to competing against them. Therefore we hypothesize that,

Hypothesis 2: The competitive performance of an organization with an advantageous set of routines is negatively related to its rival's experience competing against organizations that hired a key employee experienced with that advantageous set of routines.

Loss of advantage through rival's expectation of increased exposure to the routines

When an organization expects future contests against a rival organization, the actions of that rival are of higher importance (Porter, 1980). The expectation of future competition against organizations with an advantageous set of routines promotes search and learning effort (Cyert and March, 1963) and focuses attention on learning that set of routines and subsequently exploiting any weaknesses or developing any counterstrategies (Greve, 1998) to better compete against the advantageous set of routines. Greater expectation of exposure to an advantageous set of routines will increase the firm's focus on developing ways to respond. The competitive advantage of the organization with an advantageous set of routines will be reduced as rival organizations develop competitive responses. Therefore, we hypothesize that,

Hypothesis 3: The competitive performance of an organization with an advantageous set of routines is negatively related to its rival's number of expected head-to-head competitions against organizations that hired a key employee experienced with that advantageous set of routines.

METHODS

Sample

The sample for this study consists of all the dyadic competitive engagements between the San Francisco 49ers and all other teams in the NFL from 1979 to 2002. In the NFL, which comprises the American Football Conference (AFC)

and the National Football Conference (NFC), no team dominated the league the way the NFC San Francisco 49ers did under the guidance of Bill Walsh. His direction and innovation in offensive football strategy allowed the 49ers to win Super Bowl championships in 1981, 1984, 1988, and 1989. During Walsh's tenure with the 49ers, he perfected the offensive strategic innovation that he had originated in Cincinnati during his 1968–1975 stint as assistant coach of the Bengals, which eventually became known as the West Coast Offense, and redirected the way football was played. In 1991, when Bill Polian—then general manager of the AFC champion Buffalo Bills—first studied the West Coast Offense, he saw what ‘persuaded him that Bill Walsh’s passing game would change football’ (Lewis, 2007: 117). The West Coast Offense was a strategy innovation that was a vastly different approach to the game and resulted in a set of advantageous routines being implemented in head-to-head competitive engagements. The West Coast Offense, an advantage-creating strategic innovation implemented as an advantageous set of routines, provides a prime opportunity to investigate the competitive implications of key employee mobility.

For this study, we developed and combined two separate databases. The first database used team publications and Web sites to generate yearly information on all head coaches and assistant coaches in the NFL. The second database contained scores and statistical information for all games played in the NFL since the merger of the American Football League and the NFL in 1970. From this database, we extracted all games played by the San Francisco 49ers starting in 1979 (the first year that Bill Walsh was the head coach) and ending in 2002 (the last year that a Bill Walsh assistant was the head coach). Our sample includes all 412 games between the San Francisco 49ers and all other NFL teams across the 24 seasons (years) that we examine.

Measures

Dependent variable

‘Point margin’ is the number of points scored in a game by the 49ers minus the points scored by their opponents. A positive value indicates a San Francisco victory; a negative value indicates a loss. In the context of this study, the margin of victory is the best measure of the relative strength

of a team’s competitive and strategic abilities in a head-to-head competition. We also created three alternative performance variables to assess competitive outcomes. First, we created the measure ‘Win,’ which is a Boolean variable equal to one when the 49ers win the game. We included this measure because it is perhaps closer to the overall objective of NFL teams and can provide additional rigor to our results, but it is also more distant (i.e., has less information) from the relative competitive strengths of the two teams. Finally, because the focus of our hypotheses is the West Coast Offense, we created two additional variables that are more nuanced in specifying each team’s offensive outcomes. ‘Offensive points for’ is the number of points scored by the 49er offense—excluding points scored by the defense or special teams. Similarly, ‘offensive points against’ is the number of points scored by the opponent’s offense. These last two measures allow us to disaggregate the diffusion and defensive aspects of strategy resulting from key employee mobility between organizations.

Independent variables

‘Key hire’ is a dummy variable indicating that the head coach of the opposing team has experience with the advantageous set of routines that make up the West Coast Offense. Bill Walsh is universally recognized as the originator of the West Coast Offense (Lewis, 2007), so key hire is equal to one if the head coach is either a first- or second-generation assistant to Bill Walsh. In other words, key hire indicates that the head coach either worked directly for Bill Walsh or was an assistant to a coach who previously worked under Walsh.¹ A total of 56 (13.6 percent) of the 49er games were against these coaches.

‘Past competition’ is the number of times that the opposing team’s head coach has competed

¹ Hiring a head coach with previous experience with a certain offensive scheme does not guarantee that the team imitates that offensive scheme. However, in the case of the West Coast offense, this has become the conventional wisdom (see Lewis, 2007). In order to verify this, we analyzed offensive statistics for all NFL games played between 1983 and 2002. As expected, the 49ers were significantly different from the rest of the league having a higher completion percentage, fewer interceptions per passing attempt, more passing touchdowns per game, more points per game, and a reliable factor combining all four of these measures. Furthermore, teams coached by West Coast assistants were also significantly different from the rest of the league in these same offensive categories.

against a first- or second-generation Walsh assistant. 'Future competition' is the number of games in the current season scheduled against first- or second-generation Walsh assistants.

Control variables

'Average point margin' is the average point differential of the competing team in regular season games played in the previous 12 months excluding games played against the 49ers. This controls for the relative strength of each opponent. 'Season' controls for a time trend. It is equal to zero in the first year of the sample (1979). 'Home game' indicates that the game was played in San Francisco. A total of 210 (51.0 percent) of the 49er games were home games. 'Games against 49ers' is the number of times that the opposing coach previously played against the 49ers since 1979. This is a control for direct competitive exposure.

'Same division' indicates that the opponent is in the same conference and division as the San Francisco 49ers. Teams do not know exactly which opponents they will face until the NFL releases the schedule about five months before the start of each season. The lone exceptions are teams that compete in the same division. Same division opponents are predictable on a yearly basis, as each team must play each of the other teams in their division twice every season—once at their home location and once at the home location of the opposition. The 49ers competed in the NFC West Division for the duration of this study. We control for teams that are in the same division because these teams could be expected to be more aware of the 49ers routines since they play them twice every year and can expect to play them twice a year in future seasons. A total of 158 (38.3 percent) of the 49er games were against teams in their same division. 'Playoff game' is a dummy variable indicating that the game was a post-season game. We control for this because these games have increased importance for both teams.

ANALYSIS AND RESULTS

The descriptive statistics and correlations are presented in Table 1. Over the course of 24 seasons, the 49ers had an average victory margin of 6.4 points and won 66 percent of their games. The 49er offense scored 23.6 points per game

while opponents' offenses averaged 17.6 points per game. Not surprisingly, all four alternative dependent variables are highly correlated with each other. The three independent variables measuring the different diffusion mechanisms are significantly correlated with season, illustrating the spread of the West Coast Offense over time.

We estimated the model with panel methodology utilizing generalized least squares with random effects for coaches. Random effects were the method of choice for dealing with the nonindependence and the inherent longitudinal characteristics of our cross-sectional panel data for two reasons. First, one of the key variables of interest (i.e., key hire) does not vary across coaches and therefore cannot be estimated with fixed-effects methods. Second, fixed effects are not the method of choice in longitudinal data where one of the effects does not vary much over time (Wooldridge, 2002), as in the case of the coaches effects in our data in which there is an average of only four observations per coach. The coefficient estimates for this model are presented in Table 2. The first model includes only the controls. The coefficient for average point margin is negative and significant, indicating that every additional point in point margin that the opponent had on average during the previous 12 months' games (excluding those against the 49ers) predicts that the 49er point margin will be about one-half point smaller; also games played in San Francisco (i.e., home games) give the 49ers a four-point advantage.

In the second model, we add the key hire, past competition and future competition variables. The effect of key hire on point margin is negative and significant, indicating that teams that hire a coach experienced with the West Coast Offense are more competitive against the 49ers. This supports Hypothesis 1. In fact, the 49ers' victory margin against these teams is more than five points lower. The effect of past competition on point margin is also negative and significant. On average, for every three games that a coach plays against a coach experienced with the West Coast Offense, his team is able to reduce the point margin against the 49ers by one point. This result supports Hypothesis 2. Finally, the effect of future competition on point margin is negative and significant, supporting Hypothesis 3. The more a team expects to play against coaches experienced with the West Coast Offense, the better that team will play against the 49ers.

Table 1. Descriptive statistics and correlations

	Mean (std. dev.)	1	2	3	4	5	6	7	8	9	10	11	12	13
1 Point margin	6.43 (15.36)	1.												
2 Win	0.66 (0.48)	0.76***	1.											
3 Offensive points for	23.62 (9.89)	0.71***	0.56***	1.										
4 Offensive points against	17.58 (9.66)	-0.69***	-0.51***	-0.08	1.									
5 Key hire	0.14 (0.34)	-0.16***	-0.07	-0.12*	0.14**	1.								
6 Past competition	7.34 (10.88)	-0.15**	-0.07	-0.03	0.18***	0.42***	1.							
7 Future competition	2.23 (2.73)	-0.14**	-0.09	-0.03	0.17***	0.41***	0.69***	1.						
8 Avg. victory margin	0.50 (5.87)	-0.19***	-0.19***	-0.11*	0.16**	0.09	0.01	0.02	1.					
9 Season	11.67 (6.83)	-0.01	0.03	0.06	0.07	0.39***	0.69***	0.80***	0.01	1.				
10 Home game	0.51 (0.50)	0.14**	0.11*	0.07	-0.13**	0.01	0.02	-0.02	0.02	0.00	1.			
11 Games vs. 49ers	3.47 (4.21)	0.09	0.12*	0.07	-0.06	-0.15**	0.22***	0.01	-0.03	0.21***	0.03	1.		
12 Same division	0.38 (0.49)	0.02	0.00	0.04	0.00	-0.20***	0.00	-0.04	-0.16***	0.07	-0.01	0.45***	1.	
13 Playoff game	0.09 (0.28)	-0.01	-0.01	0.03	0.03	0.13**	0.04	0.00	0.33***	0.00	0.06	-0.02	-0.21***	1.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 2. Regression results

	(1) Controls	(2) Full model	(3) Win	(4) Offensive points for	(5) Offensive points against
Key hire					
Past competition		-5.343* (2.608)	-0.178 (0.372)	-4.348* (1.991)	1.592 (1.555)
Future competition		-0.333** (0.105)	-0.031* (0.015)	-0.113 (0.074)	0.184** (0.064)
Avg. point margin		-1.391** (0.488)	-0.186* (0.074)	-0.638† (0.341)	0.723* (0.306)
Avg. points allowed	-0.510*** (0.137)	-0.512*** (0.131)	-0.089*** (0.021)		
Avg. points scored				0.296* (0.144)	
Season					0.462*** (0.117)
Home game	-0.054 (1.459)	0.879*** (0.199)	0.103*** (0.030)	0.476** (0.145)	-0.377** (0.121)
Games vs. 49ers	4.140** (1.403)	4.201** (1.403)	0.480* (0.222)	1.361 (0.935)	-2.540** (0.905)
Same division	0.389† (0.218)	0.320 (0.223)	0.089* (0.038)	0.115 (0.162)	-0.181 (0.132)
Playoff game	-1.812 (1.880)	-3.270† (1.810)	-0.620* (0.272)	-0.741 (1.353)	1.614 (1.079)
Constant	1.995 (2.812)	2.596 (2.713)	0.346 (0.424)	2.974 (1.793)	-0.177 (1.696)
<i>N</i>	4,247* (1.826)	0.422 (1.865)	-0.113 (0.270)	14.012*** (3.177)	10.501*** (2.620)
<i>N</i>	412	412	412	412	412
<i>R</i> ²	.066	.146		0.057	0.121
Chi ²	26.051	66.104	40.401	27.304	55.396

Standard errors in parentheses

† $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

We repeated the analysis with three additional dependent variables (win, offensive points for, and offensive points against) to check the robustness of our results and to gain greater insight into how diffused superior routines affect competitive outcomes. The results of these analyses are presented in Table 2. The models for these dependent variables are the same as for point margin except that the model for win is a random-effects logit model because win is a Boolean variable. All findings are generally consistent with our hypothesized results, but they provide a more nuanced reading of our findings. Model 3 presents our results for performance measured as wins, a somewhat more coarse but important measure of performance in head-to-head competition. Our analysis for wins shows that the effect of past competition on wins is negative and significant. This result provides additional support for Hypothesis 2. Also, the effect of future competition on wins is negative and significant, providing additional support for Hypothesis 3. The more a team expects to play against coaches experienced with the West Coast Offense, the higher the probability it will win in its next game against the 49ers. The effect of key hire on wins is not significant but in the predicted direction. Our test for wins, a more coarse measure of performance in head-to-head competition, generally supports our predictions about the effects of the diffusion of key employees on the overall competitive outcomes of an organization with superior routines. Finally, Models 4 and 5 present two more nuanced measures of performance in head-to-head competition (i.e., offensive points for and offensive points against) that support our general findings and allow us to further clarify the meaning of our results.

In both models, the coefficients go in the direction that we would expect—the three diffusion mechanisms decrease the ability of the 49er offense to score points and increase the ability of opponents to score points. The significance of the coefficients suggest that key assistants are better able to stop the 49er offense, but are not able to score significantly more points. Also, experience against West Coast Offenses helps teams to improve their offense but does not significantly decrease their ability to stop the 49ers offense. These findings support our hypotheses but seem to show a distinction between the mechanisms in Hypothesis 1 and the mechanisms behind Hypotheses 2 and 3. The advantage loss of the 49ers against an opponent that hired a key employee from the 49ers

(i.e., the support for Hypothesis 1) comes in the form of the opponent getting better at defending against the superior routine. The opposite, however, is true for the more systemic advantage loss of the 49ers to all competitors that get more exposure or expect more exposure to their superior scoring routines because of the diffusion of their practice in the competitive landscape through employee mobility (i.e., the support for Hypotheses 2 and 3). In these cases, the support comes in the form of actual improvement in their ability to score, and therefore from their increased ability to implement the superior routines.

To test for alternative explanations, we considered the possibility that hiring an assistant coach with West Coast Offense experience is less effective later in time and for direct learning through games against the 49ers. We run additional models with interaction terms between a variable called ‘first year,’ which is the year that a coach begins as a head coach, and ‘key hire,’ but found no significant results ($p = 0.35$). We also ran additional models for the interaction between key hires and the number of games played against the 49ers, which was also not significant ($p = 0.10$). Therefore, we have ruled out direct learning and age of the routine as possible alternative explanations for our findings.

In general, in line with our theorizing, our results indicate that key employee mobility has important competitive implications for organizations that possess superior routines. As we see in our results, hiring a coach experienced with the West Coast Offense helped hiring teams improve their performance against the 49ers’ routines in terms of both margin and points scored by the 49ers against them, indicating that hiring a key employee from an organization with superior routines makes hiring organizations better at responding to those routines in head-to-head competition. But, more importantly, the diffusion of those coaches through the competitive landscape increased competitive exposure (actual and expected) to the superior routines, allowing competitors with increased exposure to become better at implementing superior routines themselves.

DISCUSSION

The foregoing results challenge the conventional argument that individual employee mobility does

not significantly affect organizational competitive advantage (Barney, 1991; Kogut and Zander, 1992; Levitt and March, 1988). Collectively, our results suggest significant performance consequences associated with key employee mobility. To our knowledge, this is the first study that has examined the effect of key employee mobility on competitive performance outcomes. Our test for Hypothesis 1 suggests that an organization that enjoys a position of competitive advantage due to its development of an advantageous set of routines will experience lower performance outcomes against rival organizations to which it has lost a key employee.

This study has also presented additional rationales for examining the sustainability of potential competitive advantages. While traditional views rely on survival of the routine (Levitt and March, 1988), imitation, and substitution (Barney, 1991), our findings suggest that the diffusion of an advantageous set of routines through the mobility of key employees may affect competitive advantage in at least two additional ways. First, as tested in Hypothesis 2, an organization with an advantageous set of routines has a smaller advantage against firms that have been exposed through competition to organizations that hired key employees familiar with the advantageous set of routines. This implies that the diffusion of aspects of the routines that are transferred with key employees provides other organizations with additional opportunities to learn how to compete against that advantageous set of routines. Second, as tested in Hypothesis 3, the expectations about future competition against the routines also results in a reduction of the advantage that results from having developed those advantageous routines. Here, future expectations of competition provide attentional focus to develop responses against the advantageous set of routines.

It is important to note that transferring key employees does not seem to have any implication for the stability and survival of an organization's advantageous set of routines. Despite losing several assistant coaches to other teams, the 49ers continued to show consistent performance over the period of our study, as shown by the positive and significant coefficient of the control for season in the full model. Therefore, our results are consistent with Levitt and March's (1988: 320) view that, 'Routines are independent of the individual

actors who execute them and are capable of surviving considerable turnover in individual actors.' As the innovator of the West Coast Offense, the 49ers enjoyed a strong advantage over competitors. But while the routines of the 49ers were able to survive turnover, their advantage over competitors seemed to depend on the limited opportunities to gain access to the routine through hiring an assistant coach or playing games against the 49ers or other teams that employed the West Coast offense.

We believe these findings are generally applicable to the strategies of business firms for several reasons. First, by testing our theory in the context of the NFL, we can present a clean test of how actual or expected exposure to an advantageous set of routines results in changes in relative competitive performance at the engagement level of analysis. During the period of our study, the San Francisco 49ers achieved more wins, play-off appearances, and Super Bowl titles than any team in the league. The West Coast Offense as a strategic innovation provides a clear and distinctive example of a competitive advantage created by an advantageous set of routines. These routines are 'actions that firms engage in to accomplish some business purpose or objective' (Ray, Barney, and Muhanna, 2004: 24), in our case, winning a sports game. In athletic organizations dyadic successes (i.e., winning sports games) leads to larger fan bases, more marketing revenues, and increased ticket prices; these are strong predictors of team business performance.

Second, this longitudinal sample allows us to analyze each of the 49ers games while controlling for the competitive strength of each opponent during a 24-year period. Winning games is as essential to the success of sports organizations as beating competitors to a technology, having better logistics, or having a more successful pricing strategy is to winning in many other industries. Success in dyadic contests contributes to the overall performance of organizations (Chen *et al.*, 2007). For example, in the industries where a large part of the business is gained through competitive bidding (e.g., consulting firms, professional services in general, or airlines), the relative outcomes of dyadic engagements will collectively result in overall organizational performance (Ray *et al.*, 2004). By assessing the outcomes of face-to-face competitions that are rarely available in other settings, we get a close look at the effect of differential exposure to diffused superior routines by

competitors on the competitive advantage of the originator of those superior routines.

A third reason for choosing our NFL context was that sports teams have objective and easily interpretable performance measures (Pfeffer and Davis-Blake, 1986; Sirmon *et al.*, 2008; Wolfe *et al.*, 2005). These performance measures are disaggregated to the competitive event level and therefore result in a more consistent measure of the effectiveness of the competitive routines (Ray *et al.*, 2004) that we address in this study. This allows us to have a non-aggregated measure of the relative effectiveness of an organization that is widely recognized as having an advantageous set of routines compared to its competitors at different points in time.

Finally, our context was also selected because sports organizations offer the distinct advantage of completeness and objectivity of the data describing their operation (Beerman, Down, and Hill, 2002; Sirmon *et al.*, 2008). This last feature of NFL data allows us to access objective and complete data for our nonperformance variables, including a full record of the employment history of all coaching teams during the extensive period of our study. We were able to perfectly track the career paths of assistant coaches who helped implement the West Coast Offense and subsequently became head coaches for other teams. We were also able to track every team that played against these coaches.

However, this study's context also has some limitations. As in many other strategy studies that rely on industry-specific data, it is clear that the idiosyncratic properties of all such setting-specific studies potentially limit their generalizability. We think our testing is especially relevant to those industries in which head-to-head competition takes the form of competitive bidding, much like that found in many other industries such as accounting, consulting, advertising, TV broadcasting, and airline (Peteraf, 1993) where exposure to pricing and other competitive routines is more direct.

While this study sheds light on the performance implications of key employee mobility, it also leaves a couple of interesting puzzles for the future. First, future research could explore the specific mechanisms by which competitors develop responses to an advantageous set of routines or capabilities in the face of past or expected competition against them. While we explored the

performance implications, we acknowledge that a limitation of our study that could benefit from future research would be that of unlocking the internal mechanism by which past or expected exposure to an advantageous set of routines or capabilities may lead to organizational changes that result in the improved responses we find in our study. A second puzzle is posed by the need to study ways to identify advantageous higher-order routines in more complex organizations and the location of key employees that may embody them. A feature of our sample that was important to the contributions of this study was the widely acknowledged and clearly defined strategic advantage that the 49ers created by the development and implementation of the West Coast Offense and our ability to track the movement of assistant coaches and the teams against which they competed. Further studies that provide a set of antecedents to identify those individuals in other more complex organizations can further enhance the contribution of our study.

CONCLUSION

The current study is the first to examine the effects of key employee mobility on comparative performance between competitors. These results challenge the simple argument that socially complex routines create sustainable competitive advantages because they are not easily imitated and do not rely on any single individual. In this sense, this study extends recent research that explores the effects of employee mobility on knowledge transfer and innovation (Gardner, 2005; Lacetera *et al.*, 2004; Rao and Drazin, 2002; Song *et al.*, 2003; Sturman *et al.*, 2008; Wezel *et al.*, 2006). Our study shows that hiring key employees from a competitor that possesses an advantageous set of routines will enhance the competitive position of the hiring organization vis-à-vis the advantaged competitor. It also shows that the resulting diffusion processes reduce the benefit of the advantageous set of routines because rivals have more experience against the routines and direct more attention to preparing for future competition against the routines. Therefore, understanding the diffusion of key employees throughout the competitive arena is fundamental to our understanding of the full impact of key employee turnover.

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