

## *Who Helps the Teams to Win the Games? – The Case of the NBA*

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The Asian Conference on the Social Sciences 2019  
Official Conference Proceedings

### **Abstract**

Increasing the winning percentage is a common goal for each head coach in National Basketball Association (NBA). Understanding the strategic deploy of the team and providing appropriate incentive to motivate each player are crucial to achieve this goal. In this study, we argue that teams with head coaches with experience in team management have better performance than those without. Managerial experiences may enhance ones' ability to see the whole picture of tactic planning as well as to understand each player and maintain better interpersonal relationship. In addition, we investigate whether or not salary disparities are related to winning percentage of the teams. Greater disparity may be the result of heroism but discourages team morale. Our argument is unique in the aspect that existing literatures emphasize the impact of characteristics of head coach on team performance; such as ages, tenures, and experiences as ball players, but not the experience as team manager. Employing data from Basketball Reference from Sportrac for season 2012/2013 to 2016/2017, panel ordinary least square methods with fixed and random effects are performed for analyses. Our findings suggest that managerial experience of head coaches is significantly positive related to team performance. Secondly, salary disparities are not related to team performance. This finding is consistent with that of Berri and Jewell (2004) but somewhat different from that of Frick, Prinz and Winkelmann (2003).

Keywords: coach, experience, team performance

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## Introduction

The sport industry is a thriving business. In Figure 1, it reported that a comparison of growth rate of US GDP, NBA revenue and box office revenue. It suggests that the NBA which is a fast-growing organization has better growth rate in comparison with US GDP and box office revenue. As the result of our survey, we notice that sport industry has great market potential value. However, the basic of sport industry is the quality of the matches. To have the best quality of the games, the NBA needs talent players and great coaches to support the content.

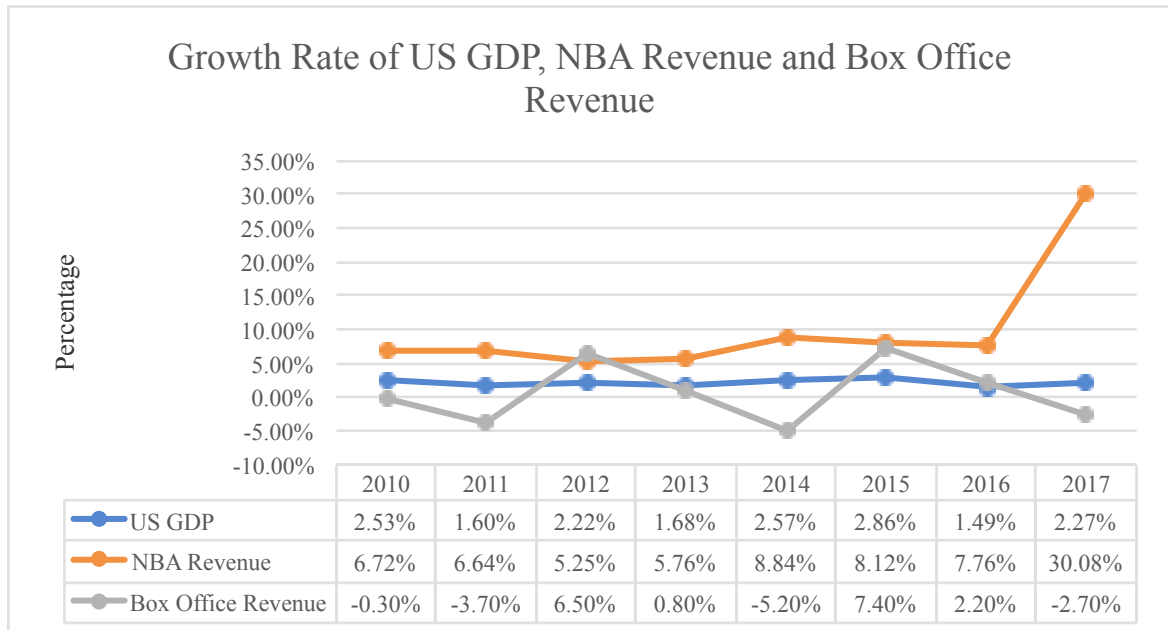


Figure 1 Growth Rate of US GDP, NBA Revenue and Box Office Revenue

Source: <http://www.worldbank.org/>, <https://www.statista.com/> and <https://www.boxofficemojo.com> edited by author

The NBA is a dream stage where plenty of basketball players desire to stay. It has two conference: East and West. Both of two conferences have 15 teams each. There are a lot of basketball players who have the best gift on basketball in the world.

With these talent basketball players, there is a fact that they need the top sport management to achieve some important goals, for instance, the title of NBA championship. Winning a title is every player's goal, but there is just an O'Brien trophy for the championship team. To be the winner, each of these teams make a suitable plan for themselves. Some teams are very dominant for a long time, so they might only need the very one last puzzle piece for the championship to enter the final game of the NBA. Some are the bottom of the league. For them, they have no idea about the puzzles for the championship, only they need the players who have super power to change them into a playoff-level team from a team which is bottom of the standing. To achieve their goal, they might have a decision which is to tank. Lose each of games in the regular season. Once they are the bottom of standing in the league, they can have higher draft selection to choose a player who has more talent in the NBA draft. The last one type is that the teams are middle of the standing. They might neither enter the playoff, nor have better draft selection. For this situation, they

have to make a choice with either doing some trades for making in playoff, or tanking for better draft selection to get a more talent rookie player and rebuild the team for benefiting the team both competitively and financially (Walter and Williams, 2012).

There are not only three situations of the teams but also others. It might be that there are 30 teams in different condition. However, a team would evaluate its situation and then find out the suitable strategy for it. It's an important operation issue which the management group should deal with. There are many characters in the group. Such as owners, president of basketball operation and general manager. As Wong and Deuber definition of a general manager's (GM) duties, it follows:

A GM will generally be involved in nearly all operations of the club, including business operational items such as finances, marketing, stadium issues and media and public relations. Then, of course, the GM is responsible for basketball operations such as coach selection, scouting, contract negotiations and perhaps most importantly, player personnel decisions. Whether the GM has decision-making authority or merely advisory input into each of these categories varies from team to team. Obviously, the teams' success in all of its operations is quite difficult if the team does not first succeed on the court. (Wong and Deuber 2011)

However, a general manager might have no power of decision making in a team. In some teams, the President of Basketball Operation has the power of decision making. Due to this reason, we call the one who has power of decision making as GM.

As a coach, he/she has different responsibility and goal from the management group. The International Council for Coaching Excellence (ICCE) and the Association of Summer Olympic International Federations (ASOIF) stated that coaching functions focus on raising athlete performance and personal development. As a result, we notice that they have totally different goal from each other. The management team concentrate on how to make the whole company better; however, a coach aims on elevating performance of the team's athletes. This paper wants to discuss that a fact which the head coach is/was the executive of the team. If the head coach is a GM, it benefits the team or not. For instance, Gregg Popovich, the head coach of the San Antonio Spurs, is the president of the basketball operation. He makes a lot of great decision for the Spurs which won 5 times championship in 20 years. Due to this example, more and more teams made the similar decision to inspire the team's ability of competition.

This paper is organized as follows. Chapter II describes that the past literatures. Chapter III describes the data and the method we used. Chapter IV tests our hypothesis and discusses the results. Chapter V will present our conclusions.

## **Literature Review**

This section divided into three parts to discuss. The first part disserts the characteristics and responsibilities of the roles of managers and coaches, and how they help the team. Second, there are some studies that investigated the impact of the payroll and salary inequality on the team performance. In the final part, we studied the dismissal of the head coach in the mid-season which several scholars have contributed

some evidence.

## **Sport General Managers and Coaches**

### **General Managers**

Generally, there are some common feature of the top management team. Zaleznik (1992) mentioned that the managers seek order, control, and rapid resolution of problems. Mintzberg (1973) interviewed with CEOs and had a conclusion that there are 10 principal roles, which can be clustered into three categories: interpersonal, informational, and decision related. As the above mentioned, the management team needs to be a precious decision maker and maximize the performance. In various professional team sports, each team has a management team to achieve the team's goals. In baseball, Wong and Deubert (2010) had a conclusion that a General Manager team is powerful decision maker who usually has the influence to form a professional baseball team to compete at the major league level. In the field of the NFL, a GM is mostly in charge of the overall management and direction of the club, involving, possibly most essentially, the success of the team on the field (Deubert, Wong and Hatman 2013). For the basketball, a GM is required to have the ability of leading an organization and the potentiality to help his/her team to a championship. It generates the limitless work hours, responsibilities, obstacles and shortage of job security worthwhile (Wong and Deubert 2011). As mentioned above, the sports management team is required that they had to know how to make decisions and build up a team which has excellent competency.

### **Coaches**

In the previous literature, Cruickshank& Collins (2015) mentioned that it mostly includes the coach organizing practice sessions and training schedules, supporting the development and refinement of physical, technical, and tactical skills for competition, and leading the performers or team throughout a season and beyond. Donofrio (2011) suggested that success of all coaches can be attributed to two things: one is the technical skill and knowledge about the game that a coach has. Leadership and motivation are critical to translating this knowledge into on the field success. Cote, Young, North, & Duffy, (2007) stated that excellent coaches know how to deploy their own competencies such as that they are consistent with the needs of their athletes and the context in which they work.

### **Payroll and Salary Disparity**

Some studies have contribution about the influence of the salary dispersion on the team performance. Depken (2000) used the intrateam Herfindahl–Hirschman index to measure the salary dispersion and discover that the wage inequality has negative effect on the team performance in MLB. Depken and Lureman (2017) and Kahane, Longley, and Simmons (2013) found the evidence that greater wage disparity on NHL teams decreases team performance, but differ from Frick, Prinz and Winkelmann (2003). Berri and Jewell (2004) had a result that wage disparity is not found to be a statistically significant determinant of team wins in the NBA; however, Frick et al. (2003) found that a higher level of wage disparity is able to have a positive relationship with team performance. Mondello and Maxcy (2009) discovered that it had negative influence of the wage disparity on team performance. In some literatures, the higher payroll has positive influence on team performance. Hall, Szymanski and Zimbalist (2002) found that player expenditure has statistically significant evidence to

create improved performance in English soccer. Stimel (2011) suggests that a team can temporarily win more games by spending more on payroll, but not permanently.

### **2.3 Dismissal of the Coach**

There is some evidence for the dismissals of the head coach. White, Persad and Gee (2007) found that in the period of 1989 to 2003 changes of head coach in mid-season in the NHL have had a positive influence on performance for the remainder of the season and for the subsequent season. Lago-Peñas (2011) concluded the analysis result that the team performance is positively influenced by the shock effect of a turnover over time. Results reveal no effect of coach turnover in the long term in football. Martinez and Caudill (2013) discovered that midseason coaching change leads to improved team performance in about sixty-one percent of the cases examined. As mentioned above, it has positive effect in the NHL and NBA. In football, it has good effect in the short run but no influence in the long term.

## **Data and Research Method**

### **Research Method**

In this paper, we intended to discuss several issues. First, we are interested in how a head coach with experience of management team influences team performance. Wong and Deubert (2011) elucidated several qualifications and characteristics: playing experience, coaching experience, education, age, race, gender and family ties. Also, they organized four paths to become the NBA GMs.

Table 1 The probability to be a GM

The Path	Probability
Former College Player but not NBA Player	26/84
Former NBA Player	38/84
Non-former Player	17/84
Former Coach	49/84

Source: National Basketball Association General Managers: An Analysis of the Responsibilities, Qualifications and Characteristics. Vill. Sports & Ent. LJ, 18, 213 edited by author

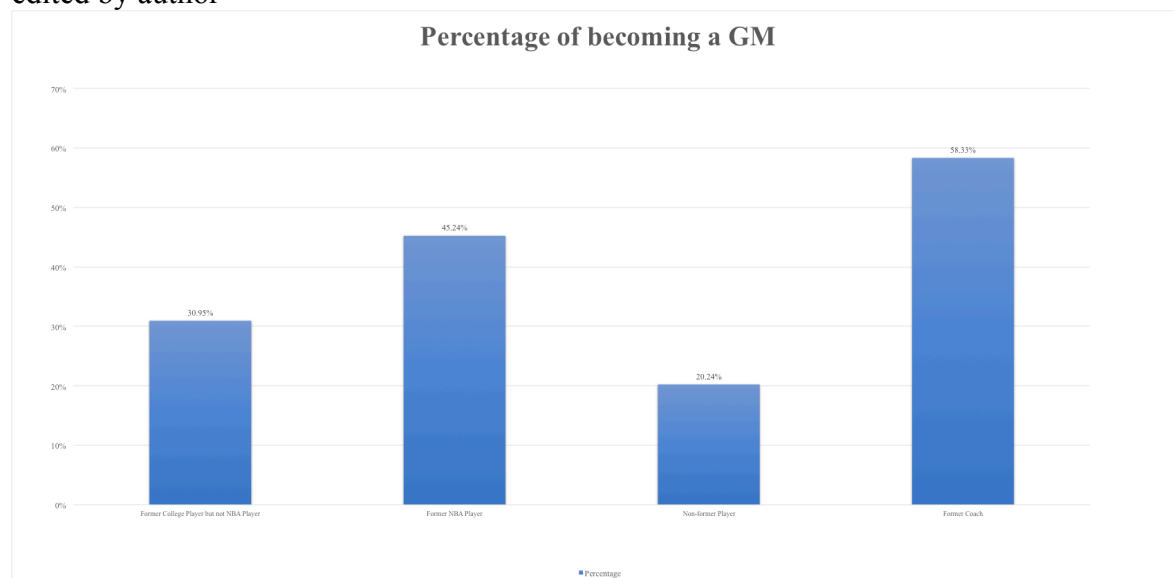


Figure 2 The Percentage of Becoming a GM

Source: National Basketball Association General Managers: An Analysis of the Responsibilities, Qualifications and Characteristics. Vill. Sports & Ent. LJ, 18, 213 edited by author

As their result, a GM who has coaching experience has more chance to be an executive for the NBA team. Whereas a coach might have experience of being the highest power person who possess the decision-making of the player personnel. We are interested in the influence that head coach with experience of GM on team performance in the NBA. It could build up a hypothesis that a head coach with management experience might have positive influence on team performance. Additionally, this paper investigates impact of head coach undergoing professional player career on team performance.

Second, we discuss with dismissal of head coach in the mid-season. Most of the theory asserted that changing the head coach will make team performance better. In recent decade, it happens 32 times of dismissal of the head coach in the mid-season. In 32 times, there are some team getting improved on team performance. As the result, to examine the effect of dismissal of head coach, it could form a hypothesis that dismissing head coach contribute positive impact on team performance.

Finally, payroll and salary dispersion are the most common issue to debate. Depken (2000) build up a production function with total team salary as an instrument

and created the intrateam Herfindahl–Hirschman index (HHI) for measuring salary dispersion. Frick et al. (2003) found that the greater wage disparity has positive contribution on team performance. However, Berri and Jewell (2004) had a different conclusion with Frick et al. (2003). Berri and Jewell (2004) found that there is no statistically significant evidence of the impact of wage disparity on team performance. In Berri and Jewell (2004) `s statement, they inferred that a player would have less time sharply to play if this player were not satisfied with the level of salary disparity. Eventually, payment streams in the future could slow to a trickle.

The result of Frick et al. (2003) can be explained by the fact that there are fewer active number of the roster in comparison of other sports. Additionally, a single “star player” may play primely important role for the team’s performance. Two studies have different results and conclusions. Frick et al. (2003) views from the nature of the basketball. According to the latest CBA (collective bargaining agreement) for the NBA, the maximum salary of a player can be from 25% to 35% of a team`s total salary in the year which the player negotiates his contract with basketball team. To keep or recruit the talent players who have dominant performance, the teams need to offer them maximum deal for attract those talent players. As the result, it could form the hypothesis that a higher salary disparity influences positively on team performance.

Instead of using team payroll as a variable, we prefer to develop total salary dividing by luxury tax apron which is a level to punish a team which pay too much. In the NBA, there is a salary cap ceiling for each team to avoid that a team use much money to attract a lot of all-star players who are very dominant. In addition, after the resigning the CBA in 2016, the team payroll restriction ceiling level increased dramatically as shown in figure 3. A team pays more than the level of luxury tax apron which means that the team is willing to pay more for the players. If a team was willing to pay more for players salary, it could inspire them to compete. We could deposit the hypothesis that the greater ratio of total salary dividing by luxury tax apron has positive impact on team performance.

In this research, we use the winning percentage as the dependent variable for measurement of team performance. While we discuss the variable of the coach, it is difficult to use a variable to describe coach. In order to measure the coach as variables, we use some proxy variables for it. This study uses management experience (MGT) as a dummy variable which is attributed the value of 1 if the head coach has experience of a GM. It makes a dummy variable which is assigned the value of 1 if the head coach experiences professional player career (ExPro), moreover, the interaction term of management and professional player experience (MGT × ExPro). And we also set the coach tenure in professional team (EXP) and dismissal head coach in mid-season (CHANGE) as proxy variables. This study estimates intra-team salary disparity using Herfindahl–Hirschman index (Depken, 2000)

$$HHI_{it} = \sum_{i=1}^N \left( \frac{\text{Individual Player's Salary}}{\text{Total Salary}} \right)^2$$

To measure the payroll of the amount, we use the ratio of total salary dividing by

luxury tax apron ( $\frac{TOTAL}{LTA}$ ) as a variable.



Figure 3 Luxury Tax Apron from 2012-2013 to 2016-2017  
Source: www.spotrac.com edited by author

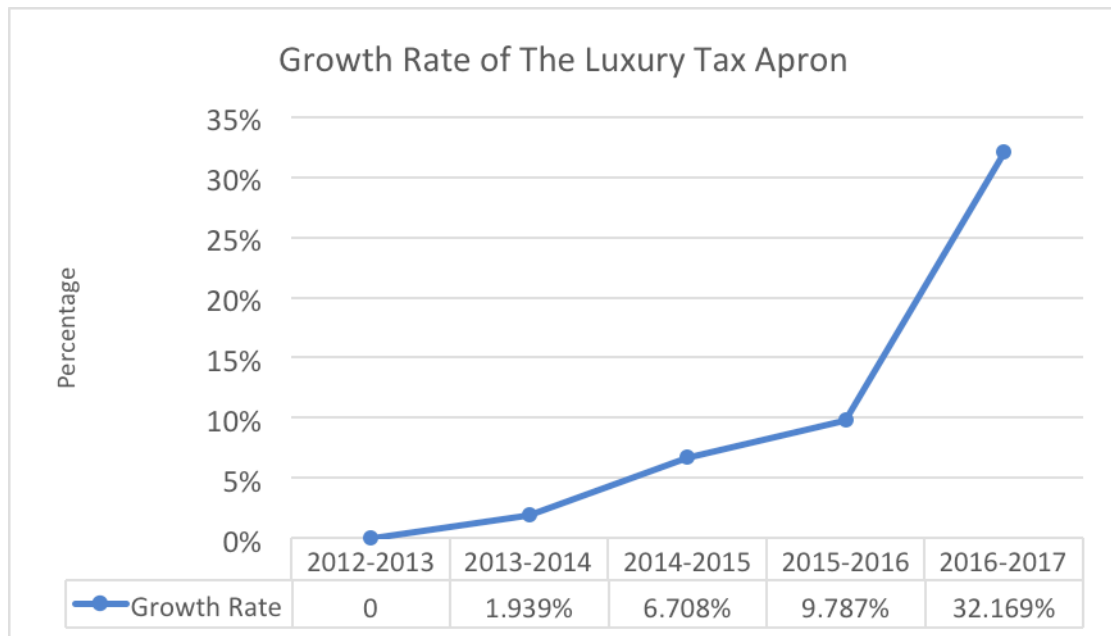


Figure 4 Growth Rate of The Luxury Tax Apron  
Source: www.spotrac.com edited by author



Table 2 List of hypotheses

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Hypothesis

H1: The head coach with management experience contributes positive impact on team performance.

H2: The dismissal of head coach contributes positive impact on team performance.

H3: The greater salary dispersion contributes positive impact on team performance.

H4: The greater total salary dividing by luxury tax apron contributes positive impact on team performance.

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Referring to the model of Depken (2000) and Frick et al. (2003), this paper sets up the equation as follows:

$$WINPCT = \beta_0 + \beta_1 MGT_{it} + \beta_2 ExPro_{it} + \beta_3 ExPro \times MGT_{it} + \beta_4 EXP_{it} + \beta_5 EXP^2_{it} + \beta_6 HHI_{it} + \beta_7 \left( \frac{SAL}{LTA} \right)_{it} + \beta_8 CHANGE_{it} + \epsilon_{it}$$

Table 3 List of the variables

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Variables	Meaning	Measurement
MGT	The head coach is/was management team (including GM, President and VP of Basketball Operation)	Dummy variable The head coach is/was management team (including GM, President and VP of Basketball Operation) = 1, else 0
ExPro	The head coach was professional player	Dummy variable The head coach was professional player = 1, else 0
ExPro × MGT	The interaction term between the ExPro and MGT	
EXP	The experience of head coach	
EXP <sup>2</sup>	The square of experience	
HHI	Measure salary dispersion	$\sum_{i=1}^N \frac{Player's\ Salary_i^2}{Total\ Salary^2}$
$\frac{SAL}{LTA}$	Measure the willingness of paying team payroll	$\frac{Total\ Salary}{Luxury\ Tax\ Apron}$
CHANGE	Change head coach in mid-season	Dummy variable Change head coach in mid-season = 1, else 0

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## **Data Description**

The NBA is composed of 30 teams which have competition in a regular season and play-off season schedule. The regular season is played in 82 games and the best 8 teams of each conference (East and West Conference) participate playoff. To simplify the empirical analysis process, we only study the data from regular seasons. The data are acquired from the website, Sportrac and Basketball Reference. The Sportrac is a website which involves information of sports team, and player contracts on the internet. This website was founded by Michael Ginnitti & Scott Allen in 2007. It provides a team payroll, player valuation, and more research tools for a variety of groups. The Basketball Reference which is used by some researchers (e.g. Omidiran, 2011) is an online sport-related data resource. Furthermore, it provides the information of baseball, hockey, football, soccer etc. The data of salary are obtained from Sportrac which is available for the period of 2011-2012 ~ 2021-2022. Additionally, to prevent from the impact of the change on the collative bargaining agreement (CBA), this study avoids 2011-2012 and 2017-2018 due to a fact that both of two seasons had ratified the CBA. We used 2012-2013 ~ 2016-2017 as our panel dataset. In this period, there are some teams which perform a strategy that hire a head coach who has the experience of management team. For instance, the San Antonio Spurs appointed Gregg Popovich, the head coach of the Spurs, as the President of Basketball Operation. Additionally, the Golden State Warriors hired Steve Kerr who possessed the experience of the GM of the Arizona Suns as head coach. Moreover, it happened several times to change head coaches in mid-season in this period.

Variable	Description	Mean	Std	Mini	Max
WIN_PCT	Team winning percentage	0.5	0.1548	0.122	0.89
MGT	The head coach is/was management team (including GM, President and VP of Basketball Operation)	0.1733	0.3798	0	1
ExPro	The head coach was professional player	0.5333	0.5006	0	1
ExPro × MGT	The interaction term between the ExPro and MGT	0.0867	0.2823	0	1
EXP	The experience of head coach	16.34	9.1063	1	38
EXP <sup>2</sup>	The square of experience	349.36 67	309.08 23	1	1444
HHI	Measure salary dispersion	0.1391	0.0296	0.0905	0.2517
SAL/LTA	Measure the willingness of paying team payroll	0.8181	0.1625	0.3499	1.3567
CHANGE	Change head coach in mid-season	0.08	0.2722	0	1

As the result of Depken (2000) and Frick et al. (2003), the result of the Hausman test which examines that this equation favors random or fixed effect suggests that it preferred the random-effect model. For the completeness of estimation, we decided to examine the equation in both of two models.

## Empirical Results

Table 5 Panel estimation results (dependent variable: winning percent; preferred estimate: random effects)

Random Effect Model			
Form	Variable	coefficient	std. error
Linear	Intercept	0.1004	0.0714
	MGT	0.0776**	0.0373
	ExPro	-0.0478**	0.0238
	ExPro × MGT	0.0965*	0.0537
	EXP	-0.0013	0.0040
	EXP <sup>2</sup>	3.0775*10 <sup>-5</sup>	0.0001
	HHI	-0.1429	0.3562
	SAL/LTA	0.5405***	0.0622
	CHANGE	-0.0778**	0.0372
	N	150	
Hausman Test			
H = 7.1980 with p-value = prob (chi-square (8) > 7.1980) = 0.5154			

\*significant at the 10% level; \*\*significant at the 5% level; \*\*\*significant at the 1% level

Table 5 report the result of estimating equation in linear form for the random effects model. The Hausman test result which between the fixed and random effects model supports the random effect model is consistent with the consequence of Depken (2000) and Frick et al. (2003). Additionally, there is no qualitative difference between two results of models.

Generally, the empirical results support the hypothesis which the head coach with management experience has positive influence on team performance. This result implies that the managerial experience helps the head coaches to organize the whole team between the front office and the players. Dewey (1997) presented that the principle of continuity of experience means that every experience both takes up something from those which have gone before and modifies in some way the quality of those which come after. Building up a team which is strong enough to compete with other teams for the titles is the duty of a manager in sport industry. To achieve this goal, perhaps the most important part is to find out some players who is suitable for the team. Moreover, a GM also is responsible for hiring the head coach for the team. A head coach is the fundamental of a team's court strategy. He not only train and develop his/her players, but also create a system for the team. Each coach has different coaching philosophy on the court. Some coaches might believe in that tough defense makes a team win the titles or some may be faith in run and gun (a term for fast break). Due to a fact that every system needs the most suitable players to maximize the performance of the team on the court. Both of two roles have their

unique challenges in basketball operation. These two roles need to collaborate with each other. If a head coach has the managerial experience, he/she might have better understanding about the consideration of a GM. It might make easier to mutually exchange perception with each other.

There is no statistically significant evidence that salary disparity has negative influence on team performance in the NBA. This result is consistent with Berri and Jewell (2004) but contrary to Frick et al. (2003). However, the predicted coefficient on total payroll is positive and statistically significant same as we anticipated. It could assert that the greater spending on players will contribute positive influence on team performance.

In our origin speculation, the result should follow Frick et al. (2003) because the fact that the managers of the NBA would offer the maximum salary contract which includes from 25% to 35% of team payroll for attracting the top players. If a team has two dominant players, their salaries might hold larger percentage of team payroll. However, our result which is consistent with Berri and Jewell (2004) suggested that there is no statistically significant evidence that the salary disparity has influence on team performance. We could infer that some teams offered a talent player maximum contract but didn't build up the team around him or he didn't fit with the system of the head coach.

The total salary has positive effect on team performance. As we estimated, the teams pay more spending on players, it can have better team performance. This measurement tests that the teams are willing to pay luxury taxes or not. If a team is willing to pay luxury taxes, it means that this team spends larger money on the players and it agrees to pay the luxury taxes.

The previous literatures prove that the dismissal of head coach in mid-season contributes positive impact on team performance (White, Persad and Gee, 2007; Lago-Peñas, 2011; Martinez and Caudill, 2013). Our result suggests that firing the head coach in mid-season has negative relationship with team performance. The reason which the estimation result is exhibited is that these teams which demand to change the head coach usually have bad team performance in that season. However, basketball is a team sport which really needs systematic strategy. The head coach might need some time to figure out how to position the player in the team via games for a long time, especially the team which has plenty of rookies.

## **Conclusions**

This research's purpose is to examine the effect of the head coach with management experience on the performance of professional basketball teams. In previous studies, there are some researches which focus on the tenure, the professional player experience and the change of the coach in the mid-season. We could learn that there is no relative research on the coach's managerial experience. Through this study, it proves that the head coach with management experience has positive influence on team performance. In our result, the effect of salary dispersion might have no significant influence on team performance. Though the teams are willing to pay more money, even they need to pay luxury tax, to enhance the teams' roster. In the end, we find out that change of the head coach has negative impact on team performance.

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