

TACIT KNOWLEDGE AS A SOURCE OF COMPETITIVE ADVANTAGE IN CRICKET

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Abstract *This theoretical paper expounds the basic tenet of knowledge-based view (KBV) of the firm that tacit knowledge lies at the basis of sustained competitive advantage accrued to a company. This is because tacit knowledge embodies the intangible, valuable, rare, inimitable and non-substitutable human core capabilities and competencies. Taking lead from Berman et al. (2002) study of National Basketball Association (NBA), this paper proposes to use the notion of collective mind or stock of tacit knowledge of a Cricket team and suggests a positive relationship between shared team experience (a proxy for tacit knowledge) and team performance. The paper also suggests that over a period of time the relationship may turn negative because of the knowledge ossification or routinization of tacit knowledge schemas acquired by the players. Future research implications for other formats of Cricket apart from ODI matches and other sports are also discussed.*

Keywords: *Tacit Knowledge, Collective Mind, Sustained Competitive Advantage, Knowledge Ossification, Knowledge Management and Sports*

1. INTRODUCTION

The notion of 'collective mind' (CM) (Weick and Roberts, 1993; Lam, 2000) is well researched in the context of decision making by top management teams (TMT) in organisations. CM is thought to be a product of not only quality of interactions taking place between individuals with highly developed interpersonal skills but also time spent by the members together as a team. CM causes the groups or teams to behave in similar ways through a process not much different from the medical notion of 'contagion' (Forsyth, 2009) whereby contagious diseases spread by proximity and exposure to a patient or group of patients apparently invisibly. Carl Jung used the term to capture the idea of 'Corporate Brain' of an organisation whereby corporate members think and behave in similar ways (Truch, 2004). CM is especially relevant to the development of tacit knowledge because this form of knowledge represents a vast body of personal knowledge (Polanyi, 1958) present in the subconscious of individuals. Tacit knowledge is difficult to articulate explicitly and hence is acquired through direct observation or socialization which demands spending long periods of time together (Brockmann and Anthony, 1998; Flood *et al.*, 1997; Hitt *et al.*, 2001).

Knowledge management literature links the RBV logic of strategic management (Penrose, 1959; Barney, 1991; Juga,

1999; Wernerfelt, 1984; Grant, 1991; Day, 1994; Teece *et al.*, 1997; Selznick, 1957; Prahalad and Hamel, 1990; Amit and Schoemaker, 1993) with knowledge-based-view (KBV) for crafting business strategies (Massingham, 2004). This is because KBV views tacit knowledge as valuable, rare, inimitable and non-substitutable resource. The link between RBV and KBV develops because like resources, tacit knowledge is also underpinned by the notions of resource heterogeneity and immobility, value, rareness, imperfect imitability and substitutability. Tacit knowledge like resources, therefore, forms the core of the sustained competitive advantage accrued to any company or organisation. According to RBV theorists these resources (very much like tacit knowledge) cannot be purchased from open market but need to be developed inside the firm (Lado *et al.*, 2006; Sveiby, 2001) and require extensive time, capital and social complexity handling skills for their development. What could be a better example of such resources than the human resource of a company (Bartlett and Ghoshal, 2002) which are rare in terms of their acquired skills and tacit knowledge which in turn is difficult to imitate and hence highly valuable? Since knowledge is defined as capacity to act (Polanyi, 1958; Wittgenstein, 1995), therefore people are the starting point in strategy formulation because of all the organisational assets and resources only *people* have the capacity to act rationally.

According to RBV theorists it is the tacit knowledge of individuals which serves to generate the sustained competitive advantage for a company. This is because this knowledge is not only valuable, rare, inimitable and non-substitutable but because of these very attributes it creates causal ambiguity and isolating mechanisms due to which others cannot copy or imitate the source of sustained competitive advantage or else the competitive advantage would not be sustained but readily accessible to others (Lippman and Rumelt, 1982; Kogut and Zander, 1993; Teece and Pisano, 1998).

This paper is based on the work of Berman *et al.*, (2002) who linked tacit knowledge with the sustained competitive advantage in case of a sports team, Basketball. They argue that individual tacit knowledge forms the overall collective mind or stock of collective knowledge of a group or team. They also argue that this collective tacit knowledge takes time to develop through learning and that this relation is subject to diminishing returns. What they mean by diminishing returns is that at first learning leads to development of tacit knowledge at a much quicker rate which with the span of time however starts slowing down till a time comes that it starts to decay and decrease. They term this decaying effect as knowledge ossification. They therefore postulate an inverted U relation between accumulated tacit knowledge through experience over a period of time and the performance of a group or team.

While linking tacit knowledge with Basketball, Berman *et al.* base their argument on the observation that this knowledge is largely hidden and very difficult to express explicitly. It can be acquired through what Nonaka and Takeuchi (1994) call a 'socialization' process where tacit-tacit knowledge transfer occurs by direct observations much like a master-apprentice relationship. Human skills are also tacit in the sense that they are invisible, developed over a period of time through practice and knowledge gained through direct observations and repeated experiences (Nelson and Winter, 1982). Playing Basketball at National Basketball Association (NBA) level demands high degree of a set of skills which are unconsciously engrained in a player's mind as a pattern or gestalt. Applying this to sports Berman *et al.* argue:

“(Tacit knowledge) involves pattern recognition, it is acquired through cumulative experience, it operates unconsciously in the background, it is difficult if not impossible to articulate, and it forms the basis of valuable human skills - from hitting a baseball to playing chess.....”

In the same lines this paper argues that playing Cricket at international level demands a variety of highly specialized skills which are learnt over a period of time and that their acquisition is quite like tacit knowledge development both at individual and team levels through the development of collective mind. The skills of individual players will sharply increase when they play with seasoned and experienced

players. Through learning curve effect this gain will be speedy in the beginning but slow down or even decay as the shared experience of playing together increases. This knowledge ossification would occur because the acquired skills or tacit knowledge or mental schemas will tend to be routinized in a player's mind over a period of time with the result that new knowledge acquisition will either be flattened or start decreasing.

2. THEORY DEVELOPMENT AND THE RESULTANT PROPOSITIONS

Interdependence within organisations is considered an important and crucial contingency in determining organisational and departmental structural implications (Daft, 2009). It is also thought to be directly linked with coordination requirements at departmental and organisational levels (Andrew *et al.*, 1976). This implies that a mechanistic organisation employing routine technology and standardized procedures would be low in interdependence and coordination requirement as opposed to an organic service sector organisation employing non-standardized processes and procedures.

Organisation theory literature identifies three types of interdependencies: sequential, pooled and reciprocal. The degrees of interdependence and coordination requirements move from low to medium to high respectively across the three typologies of interdependence (Pasmore *et al.*, 1982).

The interdependence framework identified above is also studied in the context of sports teams. Three levels of interdependence are illustrated through three sports: Baseball, Football and Basketball. It is postulated that because of low interdependence among players due to their physical dispersion in the field, Baseball exemplifies sequential interdependence. In a Football field the players are much less dispersed and require more coordination and interdependence whereas in a Basketball court the players' dispersion is minimal and their coordination requirements are highest of all the three sports. Football is said to exhibit pooled while Basketball demands reciprocal interdependence for proper execution of the game (Keidel, 1984; Keidel, 1987; Katz, 2001).

Since this paper focuses on Cricket it would be appropriate to determine which type of interdependence is required in its case. Cricket on the surface is more like Baseball because it involves batters, bowlers (like ball pitchers in Baseball) and apparently dispersed fielders. The batters have to anticipate the speed, trajectory, swing, and spin on the ball. Although no neurobiological studies have been conducted in case of Cricket but such studies in Baseball show that both pitchers (bowlers in case of Cricket) and batters require tremendous skills not only to hurl the ball at 80 mph and above but to

anticipate it and hit it from a batters point of view (Berman *et al.*, 2002). Cricketers would also need to have extensive skills (tacit knowledge) to form and recognize patterns and to develop unconscious level skills through collective experience. These skills are difficult to articulate but they need to be translated during practice sessions and on the field through socialization process so that a team collective mind develops which lead the team to victories or competitive advantage. As long as a team keeps winning matches it would be said to have gained sustained competitive advantage.

Cricket however demands much more interdependence than Baseball across all the three disciplines of batting, bowling and fielding. This is because unlike Baseball, in Cricket two batsmen are at the crease and a high degree of coordination is required between them in terms of running between the wickets, keeping up the required run rate and as any casual watcher of the game on TV can note, they talk with each other in between deliveries and overs, showing their need for communication on regular basis. Similarly the fielders might seem dispersed physically like Baseball but the wicketkeeper, slip and other close fielders are not physically dispersed at all and usually stand within feet of each other. They also communicate among each other and with the bowler frequently. There is great coordination required between the bowler (especially if he is master spinner with variety of deliveries or a reverse swing fast bowler) and wicketkeeper or else the later will not only concede too many extra runs in the form of byes but would also fail to hold on to the catches and miss stumping opportunities. It follows from this discussion that Cricket demands high degree of interdependence and coordination among players which would be much higher than that of Baseball (sequential interdependence). This would be especially relevant in the case of One-Day International (ODI) matches demanding ball to ball improvisation, frequent changes in batting order and playing strategy because of the ever changing required run rate. For example the Pakistani captain Imran Khan frequently promoted his lower order batsmen Abdul Qadir and Waseem Akram as 'pinch hitters' during the Nehru Cup Tournament in India in 1989 and many other matches. This shows that a good international Cricket team's dressing room works on minute-to-minute basis on strategy building which would naturally demand high degree of coordination and interdependence among the entire team.

Like all sports a Cricket team's sustained competitive advantage would be manifested through more wins than loses. If a team continues to win it would have competitive advantage over other teams. The above discussion shows that Cricket teams need accumulation of skills (tacit knowledge) to have competitive advantage to win. Since tacit knowledge is acquired through 'socialization' which entails playing together for extended periods of time through shared team experience which is subject to decay because of knowledge

ossification effects hence our first proposition is:

Proposition 1a: There would be a positive relationship between shared team experience and team performance.

Proposition 1b: The positive relation between team's shared experience and performance would be subject to diminishing returns and therefore the positive performance effect of shared experience will decline as the later grows over a period of time. After a period of time the relation between performance and shared team experience will become negative.

In line with the theoretical development of Berman *et al.* in case of NBA, this paper also calls to employ two moderator variables: team leadership and tenure heterogeneity. Using the same argument of knowledge ossification and routinization of tacit knowledge or mental schemas, it is postulated that same team leader or captain's presence will decrease team's performance:

Proposition 2: Captaining experience will moderate the relation between performance and shared team experience in such a way that positive effects of captaining on performance with the same team will decline as shared team experience grows.

Organisation theory literature suggests that group diversity tends to increase group performance (Hoffman and Maier, 1961). In terms of a Cricket team this would mean that a mix of senior and experienced players and fresh players will enhance a team's performance. On the other hand some studies also argue that increase in group diversity undermines group moral and cohesiveness through increase in group conflicts (Robbins *et al.*, 2009; Staples and Zhao, 2006; Brief, 2008). Other studies suggest that although at a broader and overall level group diversity is positively related with group performance yet these "effects are realized more when diversity-related criteria are incorporated in the evaluation of team and management performance" (Outz, 2010; Holvino *et al.*, 2004). These criteria usually include inclusion of underrepresented groups. In case of Cricket rationality suggests that inclusion of new players will not only shake a team's cohesiveness and moral but the team will also take more time to develop tacit skills. This leads to our 3rd proposition:

Proposition 3: Tenure heterogeneity of the team will be negatively associated with a Cricket team's performance.

3. RESEARCH STRATEGY

This is a theoretical paper calling for an empirical study embedded in the objectivistic research epistemology using empiricist research methods like secondary data analysis through regression models to arrive at results, analysis and discussion.

4. PROPOSED METHODS

International Cricket has three formats: test matches, ODIs and T20 matches. This study only calls to cover ODI matches played by Pakistan against all other international teams from the period 1972 to 1992. ODI matches are preferred over test matches because the nature of this form of game requires more interdependence and coordination which demand more development of stock of collective skills or tacit knowledge from the players. T20 matches are obviously not included because they appeared on international scene only after 2005.

Berman *et al.* (2002) argue that the testing of a construct as intangible as tacit knowledge requires at least three attributes: a good proxy for the intangible construct, adequate measurement of the dependent variable and the structure of data, and its completeness so that it allows isolation of the effects of the intangible construct.

This proposed study meets all these three conditions. The intangible construct or team tacit knowledge or development of collective mind is captured through shared team experience. The below discussion will show how worthwhile and effective this proxy is for the purpose of this proposed study. The dependent variable is proposed to be adequately measured through number of wins while the proposed data set is built on the basis of a 20 years period (1972 – 1992) of ODI match records.

4.1. Proposed Sample

The proposed sample of this study consists of 7 teams competing against Pakistan in all ODIs played from 1972 to 1992. The proposed data set presents entire population of ODI matches played by Pakistan during this period. The data for the study are proposed to be collected from the most reliable and valid website of Cricket records, cricinfo.com.

4.2. Proposed Dependent Variable

The proposed dependent variable of this study is the number of yearly wins of Pakistan Cricket team in ODI matches played from 1972 to 1992. Number of wins in cricket like any other sport is probably the best measure of its performance and sustained competitive advantage (Berman *et al.*, 2002). In order to avoid making the relationship between number of yearly wins and independent variables of this study too simplistic, two moderating variables, captains experience and tenure heterogeneity are also proposed to be employed. These variables are explained in some detail under the relevant section.

4.3. Proposed Independent Variables

Like the Berman *et al.* study, this study also proposes to employ three independent variables: shared team experience, shared team experience squared, and standard deviation of shared team experience.

Shared team experience reflects the shared tacit knowledge of Cricket team and is therefore regarded as a good proxy for accumulated tacit knowledge of the team. It is a central tenet of this study because the basic thesis of this research asserts that tacit knowledge is accumulated as hidden and difficult to articulate mental schemas in an individual's mind. Since this knowledge is difficult to articulate and externalize therefore it is transferred through face-to-face socialization process. In case of Cricket this socialization would occur during the practice sessions, team discussions and actual matches which players play together as a unit. Following procedure is proposed to be employed to calculate the shared team experience of Pakistan Cricket team between 1972 and 1992.

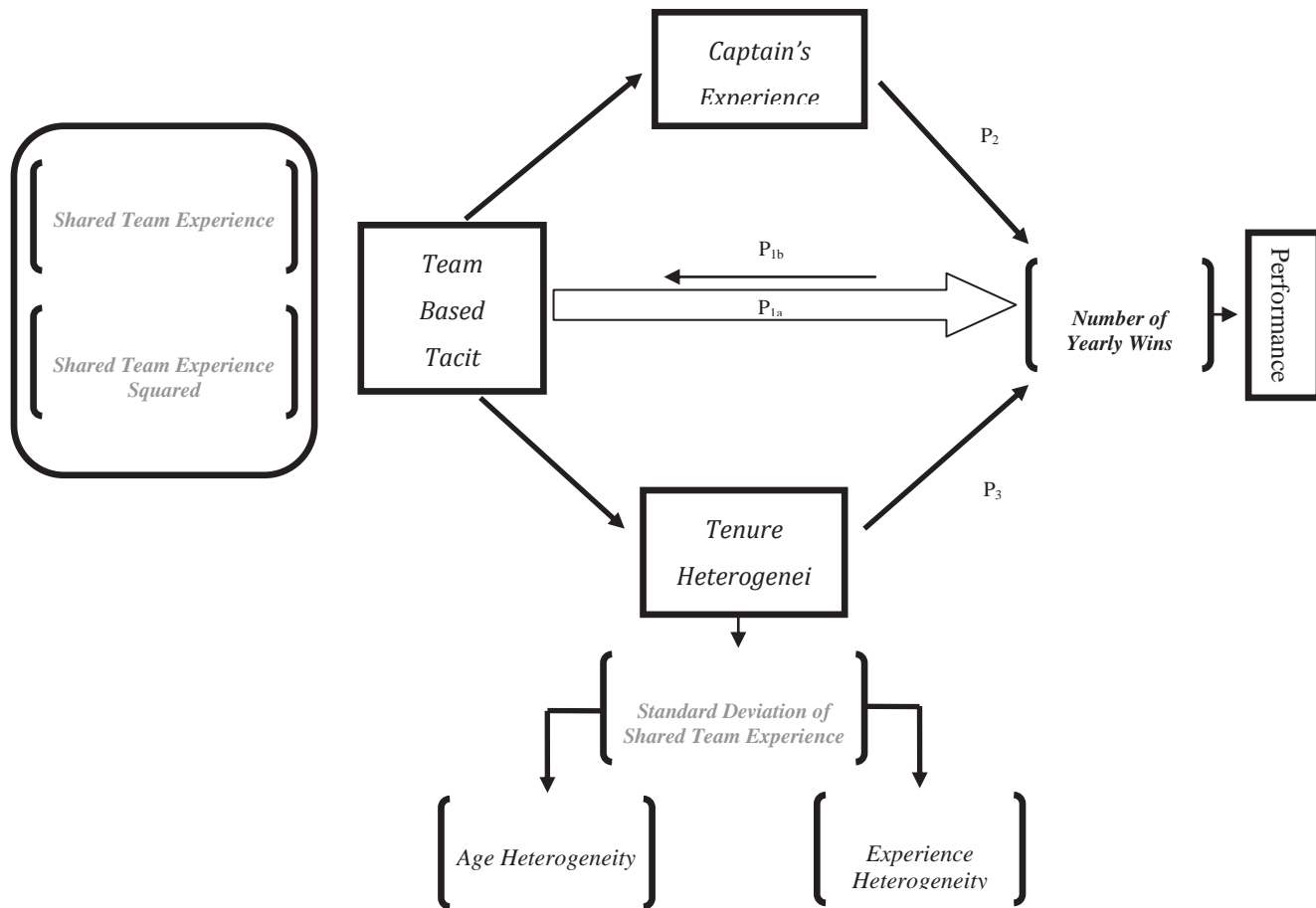
20 years is a long period of time. Many players retired from the game whereas new players joined the squad during this period. The players are therefore divided in three broad pools based on the time periods during which they played together as a team. Pool A for example comprises of the players who played together from 1972 to late 70s. Pool B and C consist of those players who represented Pakistan in ODI games from early 80s till 1992. Appendix B enlists all the three pools showing their basis, players' names and number of matches played as a pool. It is worth noting that only those players who played at least 50 ODIs are included in the pools.

Shared team experience is proposed to be calculated on the following basis. The number of matches is first translated into number of minutes. It is assumed that playing one match together would demand at least three full days (or 24 hours assuming an 8 hours day) of practice sessions and team meetings. Three additional days are also translated in number of minutes. One match therefore represents four days or 32 hours. Proposed calculation details for three pools are shown in Appendix C.

Shared team experience squared is proposed to be arrived by squaring the average shared team experience values as shown in Appendix C. This variable is envisaged to reflect the "curvilinear form of relationship between shared team experience and performance" (Berman *et al.*, 2002). This proposed study anticipates curvilinear relation between shared team experience and performance because of routinization of tacit knowledge acquisition or knowledge ossification.

Standard deviation of shared team experience variable is proposed to be calculated for all players included in the

Figure 1: Proposed Model



study who played in the team each year. This measure is adopted to calculate team heterogeneity.

4.4. Proposed Moderating Variables

There is no doubt that winning a match of any game requires many additional factors (Berman *et al.*, 2002). This study therefore proposes to include two other variables in the proposed model.

Captain's tenure means how many matches were played under a captain in a certain period of time and what were the results of these matches. In other words this variable captures years of captaining experience with the team. This variable proposes to tests the proposition that high shared team experience under the leadership of one captain may lead to decline in performance due to knowledge ossification effects. Players who captained Pakistan between 1972 to 1992 for at least 20 matches are proposed to be included and the details are shown in Appendix D.

Average age of the players for each pool is the average of that pool's players' age for each year included in the study.

Age is a crucial factor in a team's performance because increases in age may lead to decline in overall performance due to deterioration in physical fitness and mental fatigue. Proposing to include this variable in the model rules out the possibility that increase in shared team experience or knowledge ossification is simply due to increase in players' age (Berman *et al.*, 2002).

The above discussion is summarized below in Figure 1 as the proposed model of this paper.

It is to be noted in Figure 1 that the reverse arrow of P1b captures the proposed inverted U relationship between shared team experience and performance over a longer period of time due to knowledge ossification effects.

5. DISCUSSION AND FUTURE RESEARCH IMPLICATIONS

The proposed model and propositions of the study can be converted into testable hypotheses. OLS Regressions models can be used to test the hypotheses which can empirically confirm the RBV/KBV logic underpinning much of

discussion in strategic management and recent knowledge management literature. Berman *et al.* study has already done so but repeating the study with a different sport having completely different format, playing conditions, rules, data set and sample structure would yield new and rich insights about sustained competitive advantage accruing from tacit knowledge or intangible, rare, inimitable, valuable and non-substitutable human capabilities and competencies in case of sports teams. If the results of empirical study support the inverted U theory for Cricket as suggested in this paper then Berman *et al.* study and its results would not only be considerably substantiated but application of similarly designed studies in the context of management teams and groups would also be encouraged. This paper's suggestions and subsequent empirical testing would also give credence to the notions of Collective Mind or development of stock of collective tacit knowledge in team and group situations.

It is important to note that since 1992 many changes like induction of neutral umpires, more standardization in terms of rules of the game through the governing body International Cricket Council (ICC) and use of technology through TV referrals and Decision Review System (DRS) have developed. The game has also commercialized considerably and has become a big source of revenue generation for the teams. Because of these changes revenue generated by teams can also be used as a good proxy for sustained competitive advantage gained through accumulation of stock of tacit knowledge. This proxy would further align Berman *et al.*, study and this paper with the business context of RBV and KBV of strategic and knowledge management discourses.

Future empirical studies on the lines proposed in this study can also include other formats of the game like Test matches and T20 matches to test if the relation between performance and accumulated tacit knowledge holds in other versions of the game or are there any significant variations associated with different formats. This paper proposes only to study Pakistan Cricket team's shared team experience or accumulated tacit knowledge as a source of its sustained competitive advantage. Other Test playing nations are not included in this study. Similar studies repeated for other Test playing teams would also yield interesting insights regarding the theory developed in this paper.

As already mentioned the game has commercialized manifolds since 1992. With the advent of T20 form of the game, major leagues tournaments like Champions League, Indian Premier League, Sri Lankan Premier League, and Bangladesh Premier League have emerged as high revenue generating tournaments. If similar studies are conducted using the statistics of Premier League games interesting patterns would emerge because these teams undergo yearly changes in terms of players who are auctioned before the start of league tournaments. It would be of interest to note how high team heterogeneity in terms of demography and nationality

of players affects the relation between performance and tacit knowledge. Similarly the role of coaches has emerged as an important factor since 1992 and adding coaching tenure as a moderating variable would also yield new insights regarding the main propositions suggested in this paper.

Future studies can also incorporate other moderating variables impacting the outcome of the game which are not proposed in this paper's model. These variables may include playing at home or abroad, difference in nature of wickets¹ across geography, difference in weather conditions and winning of toss.

Future research studies can also be extended to other team sports like Football and Hockey to test the basic theory and logic underpinning the Berman *et al.* study that tacit knowledge underpins the sustained competitive advantage of a sports team.

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¹ The nature of wickets/ pitches differs considerably geographically. Sub-continental wickets are dry, low and slow whereas Australian and South African tracks are hard and bouncy. Similarly English weather conditions favour seam and swing bowling whereas Sub-continental conditions are more conducive for spin and reverse swing bowling.

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APPENDIX A

Teams proposed to be included in the study

Team Pakistan's performance in ODI matches against the following teams is proposed to be measured

from 1972 to 1992:

Australia

England

India

New Zealand

Sri Lanka

West Indies

Zimbabwe

APPENDIX B

Pool A

Players: Asif Iqbal, Intikhab Alam, Majid Khan, and Mushtaq Muhammad

Playing tenure together: Early 1970s

Number of matches played together: 3

Pool B

Players: Imran Khan, Sarfraz Nawaz, Javed Miandad, Mohsin Khan, Mudassar Nazar, Wasim Bari, Wasim Raja, and Zaheer Abbas

Playing tenure together: Early 1980s

Number of matches played together: 5

Pool C

Players: Imran Khan, Javed Miandad, Rameez raja, Saleem Malik, Tauseef Ahmed, and Wasim Akram

Playing tenure together: Mid-1980s to 1992

Number of matches played together: 34

APPENDIX C

Example of Calculation of Shared Team Experience

Shared team experience for Pool C (Pool A and B as well) would be calculated on the basis of following formula:

Number of matches played together x 32 hours x 60 =
Number of Minutes

$34 \times 32 \times 60 = 55280$ minutes of shared team experience

APPENDIX D

Captains

Pool A: Intikhab Alam, 3 matches

Pool B: Javed Miandad, 1 match and Imran Khan, 4 matches

Pool C: Javed Miandad, 2 matches and Imran Khan, 32 matches