

## **The Role of Branch Managers in Tacit Knowledge Management in the Banking: Evidence from Turkey**

**Yavuz Yilmaz**

Ziraat Bank, Kocaeli, Turkey

### **Abstract**

In order to examine the role of bank branch managers in tacit knowledge management, a questionnaire was applied to employees of a public bank. For this, a model showing the mediating role of implicit information sharing in the effect of the leadership behaviors of the managers on the job performance of the branch employees was created. 146 responses obtained were analyzed. After analyzing the reliability and validity of the scales, the correlation analysis and the relationships between the scales were examined. As a result of the regression analysis, it was revealed that tacit knowledge management has a full mediation effect on the effect of the leader behaviors of the branch managers on the job performance of the branch employees. As a result, it is necessary for branch managers to encourage employees to share their confidential information and to provide a communication environment that will provide this.

**Keywords:** banking, tacit knowledge, leader behavior, job performance, Turkey

## 1. Introduction

We have been living in a society where knowledge is the source of the highest quality power, in a world, where markets, products, technologies, competitors, and regulations change rapidly (Nonaka et al., 2000). As the importance of financial services continues to grow throughout the world, pressures are building for a more effective and efficient marketing of the services offered to customers at the branch level (Deng et al., 1993). Banks, insurance companies and all other players in the competitive financial service sector have recognized that knowledge is power (Jayasundara, 2008). Knowledge which is the insights, understandings, and practical know-how that we all possess is the fundamental resource that allows us to function intelligently (Dalkir, 2005). Knowledge has become the key economic resource and the resource of competitive advantage (Harlow, 2008). Tacit knowledge, as the only available resource developed in the intellect, in the competences, and in the experiences built up by the human resources, would seem an appropriate means for constructing competitive advantages given the difficulties inherent to its imitation, its rarity, and hence its value (Pereira et al., 2016). Changing markets and business foci and increased understandings came together to make it possible for us to consider how knowledge might be managed effectively and systematically in support of enterprise objectives (Wiig, 1997). The globalization of financial markets forced bankers to be knowledge-based and be more efficient in managing knowledge in their banking operations (Ali and Ahmad, 2006). Organizations that effectively manage the knowledge and expertise embedded in individual minds can create more value and achieve superior competitive advantage (Chen and Huang, 2009). Knowledge management plays an important role in banking by supporting customer relation management, human capabilities and risk management (Easa, 2012).

It is the manager's responsibility to ensure that branch staff are knowledgeable about the range of services provided by the bank (Moutinho et al., 1997). Because of increasing use of electronic delivery systems, the customer's contacts with bank staff have been fewer. Employees are often unaware of the knowledge they possess or are incapable of expressing something that for them is natural and obvious, irrespective of their qualifications - given these difficulties, organizations are increasingly intensifying their search for ways to learn how to share tacit knowledge among their employees and teams and prevent the loss of this knowledge through employee turnover; because these individuals are fundamental source of tacit knowledge and they are the key to the success of any knowledge management initiatives (Muthuveloo et al., 2017). Retail banking is one of the many industries being transformed by modern information technology and the efficiencies it creates (Despres & Chauvel, 2000).

Al-Dmour et al. (2021) examined the impact of knowledge management functions on digital financial innovation through the moderating role of managers' demographic characteristics in commercial banks operating in Lebanon. The findings of the study provide support for the moderating effect of only two demographic characteristics of bank managers; experience and position on the relationship between knowledge management and digital financial innovation in commercial banks in Lebanon.

Imran et al. (2016) developed an organizational learning model through transformational leadership with indirect effect of knowledge management process capability and interactive

role of knowledge-intensive culture. The results are clearly depicting that transformational leadership has significant positive impact on organizational learning and knowledge management process capability.

Donate and Pablo (2015) examined the impact of a specific type of leadership, knowledge-based leadership, in a firm's innovation performance and found that knowledge management practices mediate the effect of knowledge-oriented leadership on innovation performance.

Birasnav et al. (2013) empirically investigated the role of transformational leadership and knowledge management process on predicting product and process innovation. Results of the study showed that transformational leadership has direct influence over product and process innovation, and employees' day-to-day involvement in the knowledge management process such as acquiring, transferring, and applying knowledge have positive associations with product and process innovation.

Jain and Jeppesen (2013) investigated the impact of the cognitive styles of leaders on knowledge management practices in a public sector organisation in India. The results of regression analysis showed a negative impact of the radical and innovative collaborator styles, while the adaptor style had a positive impact on knowledge management practices.

Singh (2008) investigated the relationship as well as the impact of leadership styles on knowledge management practices in a software firm in India. The research findings indicate directive as well as supportive styles of leadership to be significantly and negatively associated with the art of knowledge management practices. It also depicts that consulting and delegating styles of leadership are positively and significantly related with managing knowledge. Finally, only the delegating mode of leadership behaviours was found to be significantly in predicting creation as well as management of knowledge for competitive advantage.

Crawford (2005) empirically explored the relationship between transformational leadership, organizational position, and knowledge management. The findings of the study demonstrated that knowledge management behaviours were significantly predicted by transformational leadership.

Bryant (2003) investigated the role of transformational and transactional leadership in creating, sharing and exploiting organizational knowledge. He offered the propositions in individual, group, and organization levels. He implicated managers can make their organizations more effective and create a competitive advantage by intentionally managing knowledge.

The goal of this paper is to fill a gap in the literature and identify what the role of managers in tacit knowledge management. The model development is draw upon the SECI (Socialization, Externalization, Combination, and Internalization) model from organizational knowledge creation theory. Since tacit knowledge management is examined in this study, socialization and externalization are discussed.

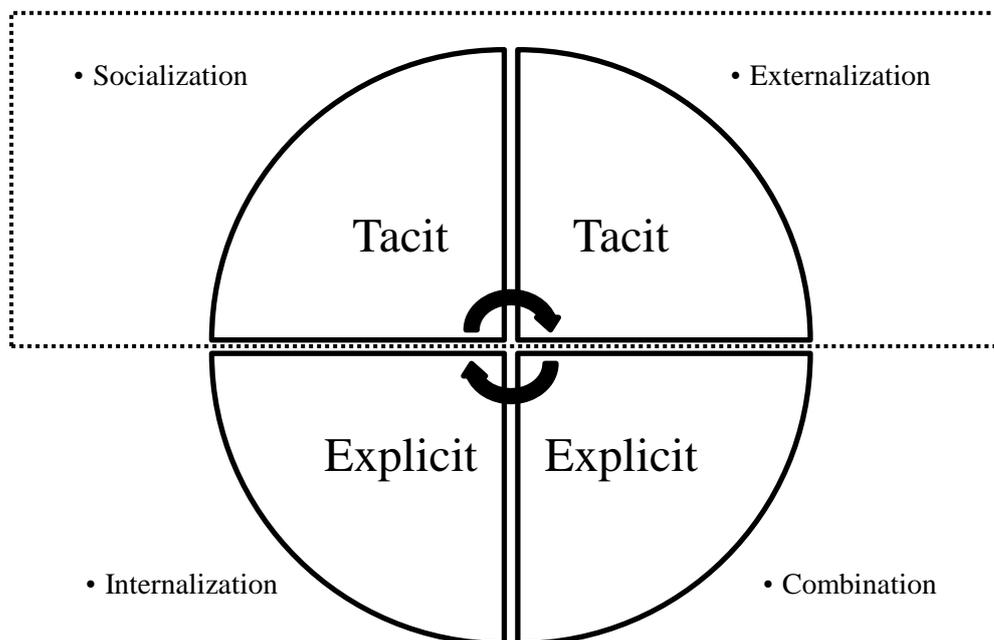
## 2. Hypotheses

Individuals develop new ideas and new knowledge by converting their experiences into personal insights (Bryant, 2003). The knowledge covers the range from the bank's intellectual capital, to the wealth of data on any customer's transaction (Jayasundara, 2008). Knowledge is information, understanding and skills gain through education or experience. There are two types of knowledge: explicit, which can be written down and shared; and tacit which is learnt through experience and is communicated person to person (Nonaka, 1998). Polanyi is credited with being the first to conceptualize tacit knowledge as knowledge that cannot fully explicated even by an expert and can be transferred from one person to another only through a long process of apprenticeship (Ambrosini & Bowman, 2001). Tacit knowledge is defined into four categories; know-how, know-what, know-who, and know-why. Know-what refers to knowledge about facts especially things that we can actually call information. Know-why refers to scientific knowledge of the principles and laws of nature. Know-how is the capability of doing something. Finally, know-who is knowledge about who knows what and can do what (Mohajan, 2016). Tacit knowledge represents know-how that is acquired via the informal take-up of learned behaviour and procedures, and corresponds to the work-related practical knowledge (Howells, 1996; Ambrosini & Bowman, 2001; Howells, 2002; Harlow, 2008). Tacit knowledge spans information that is difficult to express, formalise, or share because it derives from know-how unconsciously acquired by individuals when they are involved in a particular situation (Pereira et al., 2016). Because tacit knowledge is created, accumulated and developed from the minds, experiences and perspectives of workers, it is not easy to acquire, transfer and share such knowledge across contexts through formalised mechanisms such as presentations and documents (Kim & Gong, 2009). Tacit knowledge is action-oriented knowledge, acquired without direct help from others, which allows individuals to achieve goals (Insch et al., 2008).

Every organization needs a person or persons to watch over and manage the creation, storage and dispersion of knowledge. Leadership matters a great deal. Good leaders can accelerate the SECI process and make it more productive (Nonaka et al., 2008). The SECI model is a framework for creating knowledge in the effort to help managers comprehend the best methods for creating and managing knowledge within an organization (Lascko, 2021). Organizational knowledge creation is the process of making available and amplifying knowledge created by individuals, as well as crystallizing and connecting it with an organization's knowledge system. New knowledge is created through the four phases of the SECI process (Nonaka, 1998; Nonaka et al., 2000; Dalkir, 2005; Erden et al., 2008). *Socialization* represents the sharing and conversion of tacit knowledge through the shared experiences of individuals. Sharing or the transfer and diffusion of knowledge includes processes to improve the willingness and ability of knowledgeable organizational members to share what they know to help others expand their own learning and knowing (Orzano et al., 2007). *Externalization* represents the articulation of tacit into explicit knowledge. Employees, if they don't identify with the organization, won't help convert tacit knowledge to explicit knowledge (Nonaka et al., 2008). *Combination* represents the process of combining different strands of explicit knowledge to create more complex or systematic sets of knowledge. It is the process of systematizing concepts into a knowledge system, which happens when people

synthesize different sources of explicit knowledge into, for example, a report, or through meetings and telephone conversations and exchange of documents (Gourlay, 2004). *Internalization* represents the process of embodying explicit into tacit knowledge (Von Krogh et al., 2012).

Figure 1. The SECI Process



Deposit banks branches have two main functions: customer relationship management and operation. Customer relationship management includes marketing and managing all kinds of loan, deposit and investment products to customers. Operation, on the other hand, includes the execution of any operational process. The main responsibility of the branch manager is to ensure the efficient and profitable operation of the branch. In addition, the managerial responsibilities of the branch manager are to carry out the product and service delivery in the branch in a way that ensures customer satisfaction and operational excellence, and to coordinate the operations carried out. A credit decision is taken at front office of the bank branch, with support of top management, on the basis of predetermined criteria known as official criteria for credit assessment. Credit personnel evaluate credit proposals by applying process of inquiry prior to decision of credit. They have limited time to allocate for analysis of credit proposals but have to analyse it very comprehensively. In order to deliver a fair judgment, they make an assessment about credibility, productivity and capability of a borrower (Niazi et al., 2020). The credit is provided facilities in the back office of the bank branch, after monitoring/controlling the conformity of the loan made in the branch with the notification conditions.

The job performance of the bank assistant is measured by the number and duration of transactions and the number of product sales in the retail banking. Implementing a specific marketing knowledge on how to market a product is difficult because customer waiting time is limited. This is entirely dependent on the tacit knowledge of the bank assistant. It is the manager's responsibility to ensure that branch staff is professional, well-trained and knowledgeable about the range of services provided by the bank (Moutinho et al., 1997).

Tacit knowledge is converted, through the externalization mode, into new explicit knowledge in the form of concepts, images, and written documents (Farnese et al., 2019). Knowledge sharing refers to the willingness to share one's own knowledge with colleagues, when needed or asked (Bryant, 2003). Knowledge sharing between participants can generate networks of personal communication that reinforce a sense of identification with the community (Dalkir, 2005). Employees are often unwilling or unable to share their knowledge and expertise with others because of self-interests and lack of trust (Chen & Huang, 2009). Employees may be more likely to share knowledge when they are praised by managers, have knowledge sharing as part of their performance evaluations and are provided financial and non-financial rewards for sharing (Bryant, 2003). Memon et al. (2020) concludes with suggestions for fostering a culture of leadership where information is easily transferred, enabling employees at every level to contribute to operational success. Managers should act as knowledge brokers, contributing to the diffusion of knowledge across and between communities (Easa, 2012). It is the role of managers to encourage and support the exchange of tacit knowledge (Irick, 2007).

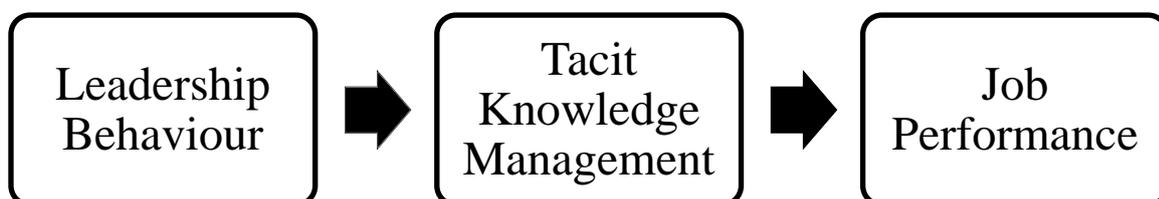
H1: Leadership Behaviour has a positive significant influence on Externalization.

H2: Externalization has a positive significant influence on Job Performance.

H3: Leadership Behaviour has a positive significant influence on Job Performance.

Based in the research model shown in Figure 2, the dependent variables are job performance and tacit knowledge management and the independent variable is leadership behaviour.

*Figure 2. Research Model*



### 3. Research Methodology

The present study employs a questionnaire survey approach to collect data for testing the validity of the model and research hypotheses. Variables in the questionnaire include leadership behaviour, tacit knowledge management, and job performance. All independent and dependent variables require seven-point Likert-style responses ranging from “strongly disagree” to “strongly agree”.

### 4. Sample and Data Collection

The population of this study consists of the employees that work in the retail branches in Kocaeli, Sakarya, and Istanbul regions of a public bank in Turkey. The questionnaire was distributed to the employees after getting the acceptance from the administration of the bank. In total 773 email were sent to the targeted population. Only 97 employees have filled the questionnaire and replied their answers by e-mail. 2 replied email with uncompleted answers was eliminated from the study. The final sample of this study is consists of 128 employees at all administrative levels of banking sector. Table 1 shows the demographic description of sample.

*Table 1. Demographic of Sample*

<b>Characteristic</b>	<b>Frequency</b>	<b>Percentage (%)</b>
<i>Gender</i>		
Female	70	50,0
Male	73	47,9
Missing	3	2,1
<i>Age</i>		
40 and more	35	24,0
30-40	99	67,8
30 and less	11	7,5
Missing	1	0,7
<i>Education</i>		
High School	2	1,4
Associate Degree	10	6,8
Bachelor	106	72,6
Postgraduate	27	18,5
Missing	1	0,7
<i>Position</i>		
Bank Assistant	29	19,9
Operation Assistant	21	14,4
Operation Officer	18	12,3
Customer Relations Asistant	35	24,0
Customer Relations Officer	42	28,8
Missing	1	0,7
<i>Length of service with the current employer</i>		
10 and more years	76	52,1
5-10 years	59	40,4
5 and less years	10	6,8
Missing	1	0,7

## 5. Measures

Leadership Behaviour, Tacit Knowledge Management, and Job Performance scales developed by Chang (1999), Sabri (2012), and Andrade et al. (2020) have been used for the data collection. The leadership behaviour scale consists of 5 items, the tacit knowledge management scale consists of 9 items, and the job performance scale consists of 10 items. Two items were removed from the tacit knowledge management scale because they reduced its reliability. The reliability and validity of all three scales has been estimated with the help of Cronbach's alpha and factor analysis. Factor loadings of sample and values of reliability are presented in Table 2. All research variables have Cronbach's alpha scores above 0.70, which indicates a high reliability of the questionnaire.

*Table 2. Factor Loadings of Sample*

	1	2	3
<b>Leadership Behaviour Scale</b> (Cronbach's Alpha: 0,929)			
The following questions concern your perceptions about your manager.			
L1. When faced with a problem, s/he consults with his/her subordinates	,861		
L2. Before making decision s/he gives serious consideration to what his/her subordinates have to say	,906		
L3. S/he asks subordinates for their suggestions concerning how to carry out assignments	,877		
L4. Before taking action s/he consults with his/her subordinates	,892		
L5. S/he asks subordinates for suggestions on what assignments should be made	,811		
<b>Tacit Knowledge Management Scale</b> (Cronbach's Alpha: 0,865)			
T1. I document my knowledge and experience for colleagues to learn		,678	
T2. I document knowledge and experience for colleagues outside organization		,797	
T3. I record ideas to share with colleagues		,862	
T4. I record ideas to share with colleagues outside organization		,833	
T5. I document my best practices and share with colleagues		,794	
<b>Job Performance Scale</b> (Cronbach's Alpha: 0,938)			
J1. I perform hard tasks properly			,811
J2. I try to update my technical knowledge to do my job			,793
J3. I do my job according to what the organization expects from me			,758
J4. I plan the execution of my job by defining actions, deadlines and priorities			,861
J5. I plan actions according to my tasks and organizational routines			,708
J6. I take initiatives to improve my results at work			,762

J7. I seek new solutions for problems that may come up in my job	,861
J8. I work hard to do the tasks designated to me	,769
J9. I execute my tasks foreseeing their results	,827
J10. I seize opportunities that can improve my results at work	,811

## 6. Results

Table 3 shows that the Inter scale correlation coefficient determined for the variables. According to the Inter scale correlation here is a significant relation between leadership behaviour, externalization, and job performance at  $p < .01$ . There is a significant between leadership behaviour and job performance at  $p < .05$ .

*Table 3. Results of Correlation Analysis*

	Mean	Std. Deviation	1	2	3
<b>1. Externalization</b>	2,90	1,07	1		
<b>2. Job Performance</b>	4,27	0,62	0,22**	1	
<b>3. Leadership Behaviour</b>	3,34	1,07	0,26**	0,20*	1

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

Testing for the mediation role of tacit knowledge management on the relation between leadership behaviour and job performance, three regression equations should be estimated (Baron & Kenny, 1986). According to this method, an independent variable should have an effect on dependent and mediator variable. When a mediator variable is involved in regression analysis with the independent variable, the regression coefficient of the independent variable on dependent variable decreases whereas the meaningful effect of mediator variable on dependent variable continues. The relationship between leadership behaviour and job performance through hierarchical regression analysis is analysed with the aim of determining the mediation role of tacit knowledge management in this scope. Therefore, three different regression models are conducted to see direct and indirect effects at the same time.

The below table shows the leadership behaviours of the branch managers is predicting the tacit knowledge of the employees. It also shows that the leadership behaviour has a significant impact on the job performance. The predictor variable leadership behaviour has a significant

positive effect on the outcome variable job performance with a significance level  $p < .01$  in the model 1.

Table 4. Results of Regression Models

		Std.		t	Sig.	
		B	Error			
Model 1	(Constant)	3,888	0,166	23,471	0,000	
	Leadership Behaviour	0,115	0,047	0,200	2,444	0,016
	<b>H3: Leadership Behaviour → Job Performance</b>					Supported
Model 2	(Constant)	2,031	0,284	7,158	0,000	
	Leadership Behaviour	0,260	0,081	0,259	3,221	0,002
	<b>H1: Leadership Behaviour → Externalization</b>					Supported
Model 3	(Constant)	3,676	0,190	19,304	0,000	
	Leadership Behaviour	0,088	0,048	0,153	1,829	0,069
	Externalization	0,104	0,048	0,181	2,166	0,032
	<b>H3: Leadership Behaviour → Job Performance</b>					Unsupported
	<b>H2: Externalization → Job Performance</b>					Supported

The B value indicates the contribution of the leadership behaviour in the job performance in the branch managers. If the leadership behaviour changes by one unit, there will be 0.115 units change in the job performance. It also shows the direction of the relationship. The coefficient is positive, which indicates direct impact of the leadership behaviour on the job performance in the bank managers. In the regression in model 2, it was revealed that leadership behavior had a positive effect on externalization and the hypothesis was supported. In model 3, all variables were included in the regression analysis. In this model, it has been revealed that leadership behavior has no effect on job performance. This revealed that externalization plays a mediating role in the effect of leadership behavior on job performance.

## 7. Conclusion

This research initiated to determine the mediation effect of tacit knowledge management via its SECI based externalization in relationship between leadership behaviour and job performance. This study, which examines the role of managers of retail branches of commercial banks in sharing tacit knowledge of branch employees, showed that tacit knowledge fully mediates the effect of leadership behaviours of branch managers on the job performance of employees. It is the manager's responsibility to ensure that branch staff is professional, well-trained and knowledgeable about the range of services provided by the bank. Branch managers could play a role in building trust among staff so that they can share

tacit knowledge. Managers should take initiative in setting up knowledge sharing channels. Branch managers must motivate employees to share their tacit knowledge. Managers should facilitate relationships and focus on building trust among employees to enhance knowledge transfer.

### References

- Alavi, M., and Leidner, D. E. (2001). Review: Knowledge management and knowledge management systems: conceptual foundations and research issues, *MIS quarterly*, pp. 107-136.
- Al-Dmour, A., Al-Dmour, R., and Rababeh, N. (2021), "The impact of knowledge management practice on digital financial innovation: the role of bank managers", *VINE Journal of Information and Knowledge Management Systems*, vol. 51(3), pp. 492-514.
- Ambrosini, V. and Bowman, C. (2001). Tacit Knowledge: Some Suggestions for Operationalization, *Journal of Management Studies*, vol. 38(6), pp. 811-828.
- Baron, R. M., and Kenny, D. A. (1986). The Moderator–Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic, and Statistical Considerations, *Journal of Personality and Social Psychology*, vol. 51(6), pp. 1173-1182.
- Birasnav, M., Albufalasa Y., and Bader, Y. (2013). The role of transformational leadership and knowledge management processes on predicting product and process innovation: An empirical study developed in Kingdom of Bahrain, *Tékhné*, vol. 11(2), pp. 64-75.
- Chang, D. S. M. (1999). *A study of the effect of House's leadership style on job satisfaction and performance in Taiwan's pharmaceutical industry*, The School of Business and Entrepreneurship, Nova Southeastern University, unpublished doctoral thesis.
- Chen, C. - J. and Huang, J. - W. (2009). Strategic human resource practices and innovation performance — the mediating role of knowledge management capacity, *Journal of Business Research*, vol. 62, pp. 104–114.
- Crawford, C. B. (2005). Effects of transformational leadership and organizational position on knowledge management, *Journal of Knowledge Management*, vol. 9(6), pp.6-16.
- Despres, C. and Chauvel, D. (2000). *Knowledge Horizons: The present and the Promise of Knowledge Management*, 1st ed. France: Butterworth-Heinemann.
- Donate, M. J. and de Pablo, J. D. S. (2015). The role of knowledge-oriented leadership in knowledge management practices and innovation, *Journal of Business Research*, vol. 68(2), pp. 360-370.
- Easa, N. F. H. (2012). *Knowledge management and the SECI model: a study of innovation in The Egyptian Banking Sector*, Stirling Management School, University of Stirling, unpublished doctoral thesis.

- El-Chaarani, H. and El-Abiad, Z. (2020). Knowledge Management and Job Performance: The Case of Lebanese Banking Sector, *International Review of Management and Marketing*, vol. 10(1), pp. 91-98.
- Fahey, L. and Prusak, L. (1998). The eleven deadliest sins of knowledge management, *California Management Review*, vol. 40(3), pp. 265-276.
- Farnese, M. L., Barbieri, B., Chirumbolo, A., and Patriotta, G. (2019). Managing Knowledge in Organizations: A Nonaka's SECI Model Operationalization, *Frontiers in Psychology*, vol. 10, pp. 1-15.
- Howells, J. (1996). Tacit knowledge, innovation and technology transfer, *Technology Analysis & Strategic Management*, vol. 8(29), pp. 91-106.
- Insch, G. S., McIntyre, N., and Dawley, D. (2008). Tacit Knowledge: A Refinement and Empirical Test of the Academic Tacit Knowledge Scale, *The Journal of Psychology*, vol. 142(6), pp. 561-579.
- Irick, M. L. (2007). Managing tacit knowledge in organizations, *Journal of Knowledge Management Practice*, vol. 8(3).
- Imran, M. K., Ilyas, M., Aslam, U., and Rahman, U.-U. (2016). Organizational learning through transformational leadership, *The Learning Organization*, vol. 23(4), pp. 232-248.
- Jain, A. K., and Jeppesen, H. (2013). Knowledge management practices in a public sector organisation: the role of leaders' cognitive styles, *Journal of Knowledge Management*, vol. 17(3), pp. 347-362.
- Jayasundara, C. C. (2008). Knowledge Management in Banking Industries: uses and opportunities, *Journal of the University Librarians Association of Sri Lanka*, vol. 12, pp. 68-84.
- Memon, S. B., Qureshi, J., and Ali, I. (2020). The role of organizational culture in knowledge sharing and transfer in Pakistani banks: A qualitative study, *Global Business and Organizational Excellence*, vol. 39(3), pp. 45-54.
- Singh, S. K. (2008). Role of leadership in knowledge management: a study, *Journal of Knowledge Management*, vol. 12(4), pp. 3-15.
- Muthuveloo, R., Shanmugam, N., and Teoh, A. P. (2017). The impact of tacit knowledge management on organizational performance: Evidence from Malaysia., *Asia Pacific Management Review*, vol. 22(2017), pp. 192-201.
- Niazi, A. A. K., Lodhi, S. S. Basit, A. and Qazi, T. F. (2020). Tacit Knowledge Sharing Model for Banks: Remedial Measure of Likelihood of Default, *Bulletin of Business and Economics*, vol. 9(1), pp. 32-50.
- Nonaka, I., Toyama, R., and Konno, N. (2000). SECI, *Ba* and Leadership: a Unified Model of Dynamic Knowledge Creation, *Long Range Planning*, vol. 33, pp. 5-34.

- Nonaka, I., Toyama, R., and Hirata, T. (2008). *Managing Flow a Process Theory of the Knowledge-Based Firm*. Palgrave Macmillan, New York.
- Sabri, S. Md (2012). *The Knowledge Sharing Practices in Higher Learning Institution: Implementation of SECI Model*. October 2012, Conference: UiTM Sarawan Conference 2012, Akademi Percukaian Malaysia, LHDN, Kuching.
- Von Krogh, G. (1998). Care in knowledge creation, *California Management Review*, vol. 40(3), pp. 133-153.
- Von Krogh, G., Nonaka, I., and Rechsteiner, L. (2012). Leadership in Organizational Knowledge Creation: A Review and Framework, *Journal of Management Studies*, vol. 49(1), pp. 240-276.
- Wiig, K. M. (1997). Knowledge Management: Where Did It Come From and Where Will It Go?, *Journal of Expert Systems with Applications*, vol. 13(1), pp. 1-14.