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Investigating Resilience and Performance of Emergent Financial Technology Startups Endorsed by Knowledge Management

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ABSTRACT

The paper seeks to examine the effect of knowledge management on resilience and performance of emergent financial technology startups (Fintechs) in Lahore, Pakistan through the development of dynamic capabilities when confronted with environmental dynamism. Based on the tentative deductions derived from Dynamic Capability View (DCV) of emergent financial sector ventures, this paper employs Partial Least Square for Structured Equation Modeling in order to investigate these hypotheses. Sample of current cross-sectional study involves empirical analysis performed on primary data assembled from knowledge workers employed in emergent financial technology startups. Knowledge management practices also have a positive impact on the developing dynamic capabilities of the organization. Implementation of effective knowledge management practices results in reconfiguring and advancing the companies' dynamic competences under the conditions of dynamism and unexpected changes occurring in the external business environment. Consequently, fin-techs succeed to accomplish their goals of spirit, adaptive capacity i.e. increased resilience and escalated performance.

JEL Classification: *G24, M11, M1*

Keywords: *Dynamic capabilities, environmental dynamism, long term performance, organizational resilience, knowledge workers.*

INTRODUCTION

For years to come, telecommunication and IT sectors will face enormous challenges due to transfigurations happening in digital marketplace. History provides strong evidence on these sectors struggling hard to adapt against transformations occurring in the external environment. Financial services sector is no exception in confronting the digitization and technological disruption resulting in innovative business models for its endured survival. Companies in order to persist against technology based unprecedented transformations need to be proactively prepared (Jacobi & Brenner, 2018). Chaotic disturbance and acceleration expansion, both are perceived as either consequences of globalization that acts as a catalyst for political and socio-economic disruption. Consequently, heterogeneous organizations must leverage the diversity and complexity through innovation and knowledge networks for upholding their resilience, robustness and viable entrepreneurship (Carayannis, 2008).

Considered as open systems, organizations adaptably while operating in an environment characterized by uncertainly, turbulence and risk unceasingly strive for coherence and stability with change with a view to achieve high level excellence, efficacy, sustainability and

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resilience. (Carayannis Grigoroudis & Stamati, 2017). With the advent of continuous disruptive innovation and austere economic crisis during the last decade, organizations steered their attention toward improving their robustness and resilience and attain sustainable organizational excellence (Carayannis et al., 2017). While keeping abreast of the external changes, organizations need to emphasize investment in technology and develop superior innovation and Information Systems capabilities for establishing agile tech-oriented platforms and accomplish performance goals with profound success (D'Aveni, 2007; Ravichandran, 2018).

FinTechs, short form of Financial Technological organizations have gained immense popularity during last 8 years due their efficient and effective provision of financial services to the customers. This popularity project expects to bring many folds productivity to the banking financial sector. This is because of low transaction cost, increased capital productivity and highly resilient operational level processes. The trend of Fintech based startups is taking uplift in mainstreams of entrepreneurship as positive predictions have been made regarding elevated organizational resilience of these financial technology organizations with greater complexity and diversity. Pakistan is still a raw and fresh market for FinTech businesses and national regulatory compliance standards are far away from existence in managing either the collaborative or competitive digitized financial transactions. From 2016 and onwards a declining investment trend has been observed in the blockchain technologies, contrarily growth of InsurTech companies could be observed with accelerated growth.

Various policy and execution concerns have ascended regarding the evolution of the FinTechs. Posed with a series of challenges of it is important to find and answer the adaptation of technology based and digitized financial services according to the present regulatory and governance frameworks. This shows that FinTech's resilience will be challenged by regulatory compliance requirements, potential threats to business continuity, and deficient data and record protection systems in face to environmental transformations and breakthroughs (Chuen & David, 2017). Since, the purpose of the FinTechs is to enhance the process competence of traditional financial sector for balanced monetary development and sound and secured financial sector, it is therefore, important to look for the key leadership role and knowledge management based ambidextrous innovation for resilience of these businesses (Fan, 2017). 'Knowledge' refers to the combination of surrounded experience, contextual background information, professional's experience and the value as an innovation outcome for the organization (Davenport & Prusak, 1998). Hall and Andriani (2003) also defined 'knowledge' as the organizational value system & culture, reputation, skills, perceptions, and a codified philosophy that stimulates individual's thoughts and behaviors.

Knowledge has been classified into 'Explicit' (coded and transferable) and 'Tacit' (deeply engrained within organizational system) knowledge depending upon using the rationalized approach to cipher and transfer the information (Nonaka & Takeuchi, 1996). If kept in passive form, the utilization of knowledge becomes impractical. Nevertheless, employing creative approaches for knowledge application, restocking and sharing effectively results in exceptional performance of the organization. Consequently, knowledge management can be defined as the process of triggering inactive knowledge and utilize for the welfare of the organization in order to gain and sustain ling term competitive edge (Van Buren, 1999; Duffy, 2000).

Recent survey analysis on future prospects for the sustainability and business continuity of the Financial Technology startups in Pakistan have revealed eye-opening results. It has been estimated that massive uncertainty in regulatory systems of FinTech's exists as it sets entry barriers for the huge capital requirements to small Financial Technology companies. The present ecosystem of FinTechs in Pakistan comprises of financial institutions, government funding, regulatory bodies, technology enabled financial service startups, and supporting environment and infrastructure. Despite of high support from incumbents, Pakistan's business ecosystem particularly in this sector is susceptible to possible business discontinuity and minimal resilience due to huge gaps in information sharing among all hierarchical levels, lack of capable and collaborative business venturing platforms, and mere local investment generated with nonexistent international funding and support for FinTech's incubation and sustainability. Lack of awareness and appropriate know how on FinTech can tend to fluctuate the stability of FinTech's ecosystem. This ambiguity and threat of business failure will keep on horrifying the interested entrepreneurs in future until and unless, a mature, resilient, safe, and policy compliant business execution framework is legitimately introduced in the country. Besides, an appropriate growth model should be designed for Pakistani FinTech's sustainability and robust survival through education, guidance and collaborative support.

Research Question

Q: How can organizations (technology enabled financial service providers) become resilient and high performers through dynamic capability development by capitalizing upon knowledge management practices?

LITERATURE REVIEW

Path and time dependent process based dynamic capabilities in designing digitized platforms of the organizations help them become more agile and resilient. Therefore, in order to withstand competitive advantage and uphold endured continuity of the business, it important to exploit technological advancement opportunities (Armstrong & Sambamurthy, 1999; Ravichandran & Liu, 2007). Modern organizations while competing among the giants of the business, must develop dynamic capabilities by investing in synergizing and exploiting advancing technologies with current business process so as to encounter the ever-changing demands of the customers (Wang, Liang, Zhong, Xue & Xiao, 2012).

Dynamic capabilities of organizations in terms of having agile competency to seize technological transformations promote organizational resilience at extended levels. Therefore, resilient organizations must possess innovation based dynamic capabilities for leveraging IT resources (Danneels, 2002). Financial organizations operate in an open systems characterized by continuous threats posed by the external environmental transformations such as financial and budget loss, financial risk management, business continuity pressures, disruptions of IS processes, and distorted risk communication (Antunes, Palma-Oliveira & Linkov, 2017). Organizational Resilience is evolving as one of the chief tools for the redressal of all these potential extortions. Practical execution of 'Resilience' in modern financial services organizations aids in guiding on managing the risks and hazards inherent to their critical technological infrastructures (Antunes et al, 2017).

Improving FinTechs' resilience is burning issue at hand around the globe. It is hence, important to assess the resilience of the systems and processes of Financial Technology

companies by determining the potential risks inherent to the financial service providers, market arena and operational infrastructure of these Fintechs. Eventually a sound resilience framework can be designed through renewed risk identification, calculation and management within compliance of the governing law for meeting utmost standards of information systems privacy, reliability and scalability (Antunes et al., 2017; Carney, 2017). At present, these resilience of FinTech organizations are confronted with threats of Cybercrime, a byproduct of business transformations and technological advancement prospects in cyberspace.

The cybercrime is considered as an eminent risk in technological businesses operating at global level. Tech savvy companies are leveraging substantial investment on control mechanisms and defensive measure to counter act on the potential threats in order to achieve resilience against these risks posed by network crimes. Yet, technology enabled financial service providers despite of taking preventive countermeasures are not sheltered against the continuously rising hazardous cyberattacks (Ambore, Richardson, Dogan, Apeh & Osselton, 2017). This research undertaking is therefore important to determine the factors that can proliferate the organizational resilience of the digitized financial services startups against threats of cybersecurity and cyberattacks (Henderson, 2017). Another, serious peril questioning the resilience of FinTech startups is the lack of administrative controls (permitting the "Byzantine Faults") and undue delegation of conducting financial transactions (recorded the Blockchain in distinctive order) through autonomous cryptographic practices. Thus protocols' resilience is adversely impacted. Still there is a need to establish trustworthy and secured protocols of transacting cryptocurrencies in order to make FinTechs highly resilient and dependable businesses (Cachin, 2017).

These organizations for their boosted resilience embrace the need for innovation processes, actions and research development areas through ambidextrous knowledge management initiative to explore and exploit forthcoming opportunities (Teece 2007). Financial service companies faced heavy pressures during 1990s to bring product and service improvements. With the advent of efficient and effective digital platforms, organization have been impelled to digitize their enterprise-wide processes. Owing to this highly dynamic environment evolved over the increase in number of recognized technology service providers and financial service based venture capitals offering conventional financial and monetary services to their customers, these financial startups need to develop dynamic response capabilities (Das, Verburg, Verbraeck & Bonebakker, 2018).

Financial service organizations deficient of implanting emerging and evolving technologies under environmental dynamism, therefore fail exploring and exploiting innovative disrupting business plans (Christensen, 1997; Teece, 2007; Tushman & O'Reilly, 1996). Deprived of dynamic capabilities to create innovative business models, conventional companies flop to sense, seize and reconfigure the value of organizational innovation, eventually lose their ability to demonstrate resilient traits (Teece 2010). For keeping pace with the external chaotic confrontations, resilient organizations continuously analyses their business models, innovate them by capitalizing upon critical knowledge assets and dynamic capabilities for preserving their sustained survival, uninterrupted continuity and competitive advantage (Teece, 2010).
The concept of resilience recently has gained highlighted importance within the context of environmental dynamism and business transformations. Modern researches have defined "Resilience" as a capability to bounce back and redeem equilibrium before experiencing any

adversary, uncertainty, hazard or risk (Southwick, Martini, Charney & Southwick, 2017). Not considered an eventual state of existence, resilience entails the process of absorption, adaptation and progression with an unsafe landscape. An organization owning resilience characteristics efficaciously thrives in uncertain and continuously changing environment (Southwick et al., 2017). Moreover, researchers (Hamel & Välikangas, 2004; Reinmoeller & Van Baardwijk, 2005) regarded organizational novelty as the core enabler of the robustness and resilience of the organizations.

Here, surfaces the notion of resilience oriented knowledge creation, acquisition, sharing and application (exploration and exploitation), that acts as the prerequisite for adaptive resilience (Siegel & Schraagen, 2017). Knowledge discovering and executing teams deploy their keen end refection (Ellis, Carette, Anseel & Lievens, 2014). Moreover, for increasing organizational resilience, these teams must create socio-material imbrication and entanglement in order to bind both implicit and explicit knowledge (Rasmussen, 1997). This aids in sharing guided knowledge among teams in face of environmental disruptions (Siegel & Schraagen, 2017). What future will bring seems to be highly unpredictable in modern world of improbability and instability. Organizations must as a component of unlearning and methodically undergo the cyclic process of learning through acquiring and implementing updated knowledge for increasing the organizational resilience while thriving successfully in face of disorder and uncertainty (Jørgensen & Pedersen, 2010).

The evolving Dynamic Capability View (DCV) has its roots for organizational resilience, and for bringing transformation and change in the organization in face of external environmental turbulence (Ricard, Klijn, Lewis & Ysa, 2017). Tangaraja, Mohd Rasdi, Ismail and Abu Samah (2015) emphasized the vitality of knowledge sharing among all knowledge management practices in ensuring the ultimate survival and sustainability of a company. To boost the performance of a company under environmental dynamism, it must consider organizational learning and knowledge management as integral donors. Hence, the mechanism and process managing knowledge and learning must be taken into serious account so that successful performance goals of the organization can be steered with right direction (Kianto, Hussinki & Vanhala, 2018). Acquisition of critical knowledge and developing learning capabilities smoothen the change cycles in adaptive organizations (Carayannis et al., 2017). Updated learning and knowledge are undeniably vital to firm's performance through constant learning new knowledge and unlearning the obsolete one for adapting against changing environment (Tsang & Zahra, 2008). Series of past and current literature studies have inferred that the resistant behaviors of the employees in terms of upholding the already entrenched and outdated knowledge can be harmful for the organizational performance (Starbuck & Milliken, 1988; Starbuck & Starbuck, 2017).

Tech savvy companies and those ensuring inclusion of digital platforms related knowledge management practices generating and extracting knowledge for managing big data that may lead to company's advantage (McAfee, Brynjolfsson & Davenport, 2012), while monitoring variety, veracity, volume, and velocity of data (knowledge) (Barul, Bhandarkar, Nambiar, Poess & Rabl, 2013). Managing these knowledge resources in an effective and efficient manner provides better quality decision making, ultimately increases efficiency in advancing and streamlining of knowledge and improved performance of the FinTechs (Nickerson & Zenger, 2004).

In order to proactively determine the potential threats and uncertainties in the external environment, organizations adopt technology oriented mechanism of ensuring learning and knowledge creation, sharing, application and retention for improving decision making (Galbraith, 1977; Alavi & Leidner, 2001; Sambamurthy & Subramani, 2005; Zammuto, Griffith, Majchrzak, Dougherty & Faraj, 2007; Kane & Alavi, 2007; Provost & Fawcett, 2013). The ambidextrous capability of organizations in discovering and using the strategies for improvement in producing new and improving current products and services respectively is prerequisite for achieving goals of improved performance and increased sustainability of the company (He & Wong, 2004).

Hypotheses

H_1: Knowledge management (KM) practices incur a positive impact on resilience of emergent financial technology companies.

H_2: KM practices experience a positive influence on performance of emergent financial technology companies.

H_3: Dynamic capabilities play an intervening role in connection between KM practices and resilience of emergent financial technology companies.

H_4: Dynamic capabilities play an intervening role in connection between KM practices and performance of emergent financial technology companies.

H_5: Environmental dynamism moderates the link between KM practices and dynamic capabilities.

METHODOLOGY

Based on the tentative deductions derived from Dynamic Capability View (DCV) of emergent financial sector ventures, this paper employs Partial Least Square for Structured Equation Modeling in order to investigate these hypotheses. The cross-sectional study design contains empirical analysis performed through primary data collection. Data has been gathered from knowledge workers employed in emergent financial technology startups using simple random sampling.

Sampling Technique And Data Collection

According to He and Wong (2004) firms having extensive technology based setup and functioning enjoy the value of knowledge exploring and exploiting activities. Technology based financial organizations take in account a strategies focused on managing knowledge resources including both tacit (routine based) and explicit (codified) knowledge (Yahya & Goh, 2002). Likewise, influential role of dynamic capabilities should not be undervalued at all as these are fundamental extension to steer energy of employees in pursuit of managing knowledge distinctively in face of environmental dynamism (Chowdhury & Quaddus, 2017). The population consists of Financial Technology companies operating in Lahore, Pakistan. These companies have been designated based on parameters of they being emergent in FinTech industry. There are total of 8 emergent FinTech companies taken as population. The practices of FinTechs include operating in domains of business continuity & recovery, information security, cloud computing that uses network based faraway servers to collect,

process and manage financial data than using a personal computer and IT governance and strategy to align IT approaches with corporate strategy using KM practices for the sustained performance and resilient growth of these firms (Pakistan Software Export Board, 2018).

Measuring Instruments

The 20 item scale on Organizational Resilience has been adopted form the Mafabi, Munene and Ntayi (2012). The 19 item scale on Knowledge Management has been chosen from earlier study conducted by Mafabi et al. (2012). The 7 item instrument for Environmental Dynamism has been adapted partially from Garg, Walters and Priem (2003). The 4 items based measuring instrument for Dynamic Capabilities has been adapted from Wu, Wu, Lee and Lee (2017) that primarily conforms to measurement method of Teece, Picano and Shuen (1997). Similarly, the 6 item scale of Performance has been adopted from Wu et al (2017). Respondents will be asked to designate the level of agreement across 5 point Likert Scale with 1 = Strongly Disagree to 5 = Strongly Agree.

Path Analysis

Cross-Validation Redundancy & Cross Validation Communality

The indexes of cross-validation redundancy and cross-validation communality prove the authentication of the model fit and projected strength as shown in Table 2.

Correlation Analysis, Descriptives, Convergent and Discriminant Validity

The correlation analysis, descrtiptive statistics and convergent and discriminant validity values of the model have been shown in Table 1, depicting positive correlations among latent variables.

Path Analysis

As exhibited in the Table 3 below, the result of first assumption (H1) disclose that KM practices have optimistic impact on the resilience of financial technology companies. The analysis result authorizes the presence of positive and significant relationship between KM practices and FinTechs' resilience ($\beta = 0.389$, p-value < 0.01). These consequences positively declare the supporting role of KM for effective outcomes for resilience emergent FinTech companies. Moreover, path (β) coefficient and p - value of effect of KM on FinTech firms' performance have been analyzed. Results based on statistical examination legalize the presence of a considerably positive relationship of KM practices (H2) ($\beta = 0.442$, p-value $<$ 0.01), with performance in organizations operating within context of technology enabled financial services. It can be interpreted that KM practices bear immense importance in increasing the performance of FinTech companies, to outperform the anomalies occurring in the external environment can effortlessly accomplish significant goals of improved performance.

Furthermore, the significance of hypotheses (H3) and (H4) has also been confirmed i.e. dynamic capabilities mediate the relationship between KM practices and resilience and performance respectively of financial technology firms ($\beta = 0.64$, p-value < 0.01, $\beta = 0.62$, p-value < 0.01). The estimates show significance of direct positive effect of KM practices on FinTech firms' resilience and performance through the intervening relationship demonstrated

by dynamic capabilities. However for hypothesis (H5), the relationship between KM practices and dynamic capabilities is not significantly moderated by environmental dynamism. An insignificant relationship between KM practices and dynamic capabilities moderated by environmental dynamism has been consequently established ($\beta = 0.019$, p-value > 0.01

Table 1:
Descriptives, Convergent Validity and Discriminant Validity

Constructs/ Variables	Mean	S.D.	Series of Loadings	AVE	CR	KM	OR	OP	DC	ED
Knowledge Management Practices	4.31	1.03	0.80-0.90	0.83	0.89	0.84				
Organizational Resilience	3.80	1.46	0.72-0.89	0.76	0.78	0.27	0.66			
Organizational Performance	4.17	1.35	0.80-0.88	0.84	0.87	0.19	0.23	0.65		
Dynamic Capabilities	3.92	1.78	0.79-0.91	0.79	0.80	0.26	0.12	0.43	0.77	
Environmental Dynamism	3.99	1.98	0.70-0.81	0.72	0.75	0.41	0.32	0.31	0.54	0.34

All of these item loadings possess p-values significance values < 0.05. Average Variance Explained that is the square root of the variance present among all the variables has been shown as bold highlighted in diagonal.

Table 2:
Structured Model Analysis

	Cross-Validation Redundancy	Cross-Validation Communality
Knowledge Management Practices	0.33	0.49
Organizational Resilience	0.29	0.30
Organizational Performance	0.43	0.38
Dynamic Capabilities	0.56	0.41
Environmental Dynamism	0.31	0.53

Table 3:
Path Estimation of the Structured Model

Path	t-values (Standardized β Coefficients)			
	Total Effect	Direct Effect	Indirect Effect	Interaction Term (Effect)
KM Practices ⟶ Organizational Resilience	0.39(5.65*)	0.47(7.10*)		
KM Practices ⟶ Organizational Performance	0.44(6.32**)	0.52(6.98**)		
KM Practices ⟶ Organizational Resilience			0.64(4.21**)	
KM Practices ⟶ Organizational Performance			0.62(5.61*)	
Know-Mngt_x_Env-Dyn ⟶ Dyanmic Capabilities				0.02(0.13)

* p - value < 0.05
** p - value <

CONCLUSION AND DISCUSSION

This research undertaking pinpoints an issue in the spotlight that is at the moment concerning for all the global participants of digital platform enabled businesses for providing financial services. This study holds immense importance for recognition of the practical implications for FinTechs' in achieving their goal of resilience. Knowledge management ambidextrous approach is very essential for FinTech startups, as it can help renew the innovation capacity of organizational processes and systems. Knowledge management practices can be extremely valuable for technology enabled financial institutions new to financial sector; this is because of their assistance in up to date information dissemination, retention, and application, enhancing the business intelligence and easing the process of managing complex online networks on information systems (Antunes et al., 2017). This agrees with view of dynamic capabilities of organizations in terms of having agile competency to seize technological transformations promote organizational resilience at extended levels. This requires resilient organizations to be dynamic for leveraging IT resources (Danneels, 2002).

Business model innovation in FinTech can be guaranteed by capitalizing upon digitized platforms for gaining current knowledge and intelligence on the continuously evolving tools for secured financial transaction and provision of related services in a resilient and an agile manner. Factors that can proliferate the organizational resilience of the digitized financial services startups against threats of cybersecurity and cyberattacks (Henderson, 2017). This study is an eye opener for new businesses with intensified focus on replacing tradition banking and financial market with novel autonomous and highly efficient technology based financial service providers. A sustained determination toward enhancing knowledge competencies for advanced technology adoption and innovation will be beneficial and yield value to the tech oriented financial service providers (Das et al., 2018). This research study drives an enthusiasm and spirits of new business entrants in FinTech industry to ensure their information technology empowered adaptations for value adding innovation and hence increased absorptive capacity against external threats and vulnerabilities. Since, many financial organizations operating with high-scale digitization in pursuit of prevention against possible discontinuities and disruptions attempt to nurture their electronic or technology enabled business initiatives independently from all other systems and processes. This shows sync with the understanding organizations undergo the cyclic process of learning through acquiring and implementing updated knowledge for increasing the organizational resilience while thriving successfully in face of disorder and uncertainty (Jørgensen & Pedersen, 2010).

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