The adoption of e-banking in developing countries: A theoretical model for SMEs

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*Electronic banking offers numerous benefits to SMEs. SMEs can check account balances, transfer money, pay bills, collect receivables and ultimately reduce transaction costs and establish greater control over bank accounts. Despite the benefits of e-banking to SMEs, there has been little research done on the factors affecting its adoption. Thus, this paper aims to investigate the factors that affect SMEs' adoption of e-banking in Bangladesh. The study has come up with an integrated model including seven variables (*Organizational capabilities, Perceived benefits, Perceived credibility, Perceived regulatory support, ICT industries readiness, Lack of financial institutions readiness and Institutional Influence) *which influence the adoption of e-banking by SMEs in developing countries.*

Field of Research: *Bangladesh, Developing Countries, Electronic Banking, Electronic Commerce, Electronic Finance, Information Systems (IS), Information and Communication Technologies (ICTs), Small and Medium Scale Enterprises (SMEs).*

1. Introduction

Electronic banking (e-banking) reduces the transaction costs of banking for both SMEs and banks. SMEs need not visit banks for banking transactions, providing round the clock services (Karjaluoto et al., 2002; Cheng et al., 2006). SMEs can apply for loans and do other banking services online (Smith and Rupp, 2003). Despite these benefits, little research has been conducted on factors affecting e-banking adoption by SMEs in developing countries. E-banking has been discussed from a retail point of view (B2C) (Wan and Chow, 2005; Celik, 2008), however financial services to SMEs have so far received limited attention. (Gehling et al., 2007). Nonetheless, online financial services represent a critical issue for the survival of SMEs (Wright and Ralston, 2002).

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E-banking grows faster than other e-commerce sectors, as financial services are data intensive and require no physical delivery (Kim, 2004; Zekos, 2004).The Literature on SMEs in developed countries has mostly focused on e-commerce issues (Bunker and MacGregor, 2000; Kartiwi and MacGregor, 2007; Eriksson et al., 2008), as unlike in developing countries, financing seems not to be a critical issue (Guglani, 2001). Khalifa and Davison (2006) mentioned that existing literature on the adoption of information technologies can be grouped into two approaches. One focuses on the rationalistic goal oriented behaviour of firms and the other focuses on external forces of institutions. These theories, however, are not mutually exclusive as both firms' related and institutional forces together determine adoption. Hence, there is a clear demand for an e-banking adoption model for SMEs in developing countries that incorporate both the goal oriented behaviour of firms as well as institutional pressure on technology adoption.

E-banking services have been available in Bangladesh since 2001. As of 2007, 29 out of 48 banks have offered online financial services (Rahman, 2007). However, the adoption of online banking channels by Bangladeshi SMEs has been rather slow when compared with the large companies in Bangladesh or SMEs in other developed countries. Dewan and Nazmin (2008) have reported that SMEs in Bangladesh lag behind in the use of ICTs. In Bangladesh, research has been done on electronic commerce issues (Azam, 2007), computer usage (Azam, 2005), Internet usage (Awal, 2004), telephone (Khan, 2001) and electronic banking (Alam et al., 2007; Bakta et al., 2007). But, no research has been done on e-banking issues in SMEs, although SMEs in Bangladesh contribute 25 percent of GDP, 80 percent of employment creation (Rikta, 2007). Also more than 40 percent of SMEs are deprived from any kinds of external sources of finance (IFC Investment Climate Survey, 2003). Banks in Bangladesh have invested huge amounts of money in offering financial services online (see appendix 1). However, SMEs are slow in adopting e-banking services. In order for the Banks to effectively integrate SME segments with e-banking systems, it is important to identify the factors responsible for this.

The aim of this paper is to extend the existing adoption models and to propose an integrated and eclectic conceptual framework of factors which influence e-banking adoption behavior by SMEs in Bangladesh. To accomplish this, we start with a critical understanding of SMEs' e-banking adoption behaviour and factors that could drive or inhibit wider adoption and use of e-banking. We then examine the roles of institutions in the e-banking adoption process of SMEs and how effectively they can play a role in expediting the adoption of e-banking. Finally, we develop a theoretical model by integrating theories of rationalistic goal oriented behaviours of firms and institutional theories in order to better explain technology adoption in developing countries like Bangladesh.

2. Literature Review

2.1 Benefits of Electronic Banking to SMEs

Using e-banking, SMEs can apply online for lines of credit, credit cards, loans and mortgages, hence, less visit is required to banks for doing banking transactions (Purcell and Toland, 2003). Rikta (2007) mentioned that in Bangladesh, SMEs owners had to visit on an average of 15 times to their lender for a single loan. Han (2008) also found the favorable impact of the application of informational technology on SME finance. Wendel and Williams (2001) mentioned that online SME businesses are more profitable and produce higher revenues, than SMEs that use only traditional channel. Through Internet, SMEs can do research on banking products, interest rates, terms, and then choose lenders that best fulfil their expectations and needs. Customers prefers e-banking for conveniences, speed, round the clock services and access to the account from any parts of the world (Cheng et al., 2006). E-banking offers benefits to banks as well. Banks can benefit from lower transaction costs as e-banking requires less paper work, less staffs and physical branches (Cheng et al., 2006). E-banking leads higher level of customers' satisfaction and retention (Poatoglu and Ekin, 2001).E-banking reduces loan processing time as borrowers loan application can be viewed by loan processing and loan approval authority simultaneously (Smith & Rupp, 2003). Typically, loan applications received at branch level and send to head office for approval. This documents transfer to and from branch to head office consume much time and delay loan sanction period.

2.2 Factors Affecting E-banking Adoption by SMEs: Organizational Perspectives

Literature on organizational adoption of ICTs can be categorized under two groups. The first one focuses on rationalistic goal oriented behaviour of firms, such as Technology Adoption Model (Davis, 1985). Other approaches focus on institutional pressure on firms such as Institutional theory. Rationalistic goal oriented behaviour are mostly grown from the Theory of Planned Behaviour (TPB) (Ajzen, 1991), derived from the Theory of Reasoned Action (TRA) (Fishbein and Ajzen, 1975) and Technology Acceptance Model (TAM) (Davis, 1989). TRA can be described as one of the most influential theory to explain human behaviour's attitude towards adoption of innovation (Venkatesh *et al*., 2003). TBP best suited with the situations where people do not have complete control over their behaviour. Taylor and Todd (1995) proposed a model, which is popularly known as Decomposed Theory of Planned Behavior (DTPB), based on Innovation Diffusion Theory and TPB. In DTPB, attitudinal beliefs are broken into three parts: perceived usefulness, perceived ease of use and compatibility. A good number of studies have investigated the adoption of various IS using either TAM or extended version of TAM (Venkatesh and Davis, 2000; Wang *et al*., 2003; Yiu *et al*., 2007). Most important extension of TAM was made by Venkatessh and Davis (2000) by adding subjective norm construct and this modified model is known as TAM2. TAM model is based on two main constructs: perceived usefulness and perceived ease of use. This

model explains how individual customers or organizations take decisions regarding adoption of technology.

*On the other hand, the perspective of Innovation Diffusion Theory (Rogers, 1983; Tornatzky and Klein, 1982) has been embraced by a group of researchers in which behavioural intention or behaviour and determinants of innovation diffusion are relative advantages, compatibility, complexity, observability, and Trialability (Rogers, 1983).*Rogers Innovation Theory has been extended by Moore and Benbaset (1991) by adding two more construct: image and voluntariness of use. It is widely believed that the explanatory power of any model increases if researchers extend the existing models rather than looking at only one goal oriented model (Cheng *et al*., 2006). Hernandez and Mazzon (2007) studied Internet banking adoption in Brazil by combining constructs from various models like innovation characteristics, subjective norm, perceived behavioural control, and individual characteristics and found that integrated model offers superior ability to explain adoption. Wang *et al*. (2003) studied adoption of Internet banking in Taiwan using TAM model and introduced new construct 'perceived credibility' that reflects the user's security and privacy concerns in the acceptance of Internet banking. They found the significant influence of perceived ease of use, perceived usefulness and perceived credibility on the intention to use Internet banking. Celik (2008) extended TAM for studying factors that determine customers' acceptance of Internet banking.

Tornatzky and Fleischer (1990) in their Technology-Organization-Environment (T-O-E) framework describe that three factors are important for any technology or innovation adoption diffusion process: technology context, organizational context and environmental context. Technology context includes both internal and external technologies applicable for firm. Organizational context includes resources (capital and human), organizational scope and size. Environment context includes both the direct and indirect roles of competitors, industry associations, and the governments.

All the adoption model described above (like TAM, TPB, TRA) are developed for studying technology adoption in developed countries, however, technology adoption in developed countries might be different from those of developing countries as the challenges are different in various contexts (Molla and Licker, 2005). In most developing countries e-commerce adoption has been inhibited by the quality, availability and cost of accessing infrastructure (Humphrey *et al*., 2003). Furthermore, as SMEs in developing countries have lack of skilled human resources, businesses and technological resources and hence, those are vital in adopting electronic business (Hempel and Kwong, 2001). Therefore, there is a demand for an adoption model for developing countries.

2.3 Factors Affecting E-banking Adoption by SMEs: External Institutional Perspective

In technology diffusion, the role of institutional involvement has been described and acknowledged in various literatures (Tornatzky and Fleischer, 1990; King et al., 1994; Andersen et al., 2003). King et al (1994) mentioned that six types of institutional intervention can stimulate IT adoption by firms. These are knowledge building, knowledge deployment, subsidy, mobilization, standard setting and innovation directives. Institutions can influence in several ways in IT adoption, like through enacting rules and regulations or through creating demand for innovative product and processes (Montealegre, 1999). Damsgaard and Lyytinen (2001) mentioned that institutional involvement is imperative in the technology adoption and such institution contains governmental agencies, national and global standardization organizations, local government, and non profit organization like industry association. Andersen et al (2003) also acknowledged the role of information infrastructure (telecommunication, wireless and Internet infrastructure, technology acceptance) and roles of government and private sectors in technology adoption. Shi et al. (2008) studied adoption of Internet banking from consumers perspectives and found that normative and coercive pressure significantly influence the attitude and intention to adopt of Internet banking. Wang and Cheung (2004) found that coercive pressure have influence on travel agencies' adoption of e-business. Online banking allows both SMEs and financial institutions to lower transaction cost and save time to SMEs and creates more business and ensure better customer relationship management to financial institutions (Han, 2008). Therefore, pressure may come from banks to SMEs to adopt online financial services.

Government in both developed and developing countries together with donor agencies are playing crucial role to foster the adoption of e-commerce (OECD, 1999), as government intervention is critical in sustainable technological development in SMEs (Rothwell, 1994). SouthAsian Development Facility (SEDF), a concern of World Bank, is also working for technology and e-commerce adoption in SMEs in some Asian countries. Role of institutions have been studied by many researchers like role of government (Scupola, 2003), role of consultant (Dessant and Rush, 1993), role of professional association (Damsgaard and Lyytinen, 2001). Kapurubandara and Lawson (2008) emphasized the need for training programs, workshops and seminars in local languages for awareness and skill development for SMEs. Infrastructural issues are also concern for SMEs in developing countries. Issues faces in developing countries in e-commerce adoption are different from developed countries (Corbitt et al., 2001; Huff and Yoong, 2000). Lack of telecommunications infrastructures, lack of skilled staff, low Internet penetration, low bank account, lack of timely and delivery of physical goods hinder the growth of e-commerce/e-banking diffusion in developing countries. Therefore, developed countries technology adoption model cannot fully explain the technology adoption behaviours of developing countries. Exhibit 1 shows some factors identified by researchers that have bearing impact on SMEs' e-banking adoption.

Exhibit 1 Factors of E-Banking Adoption by SMEs

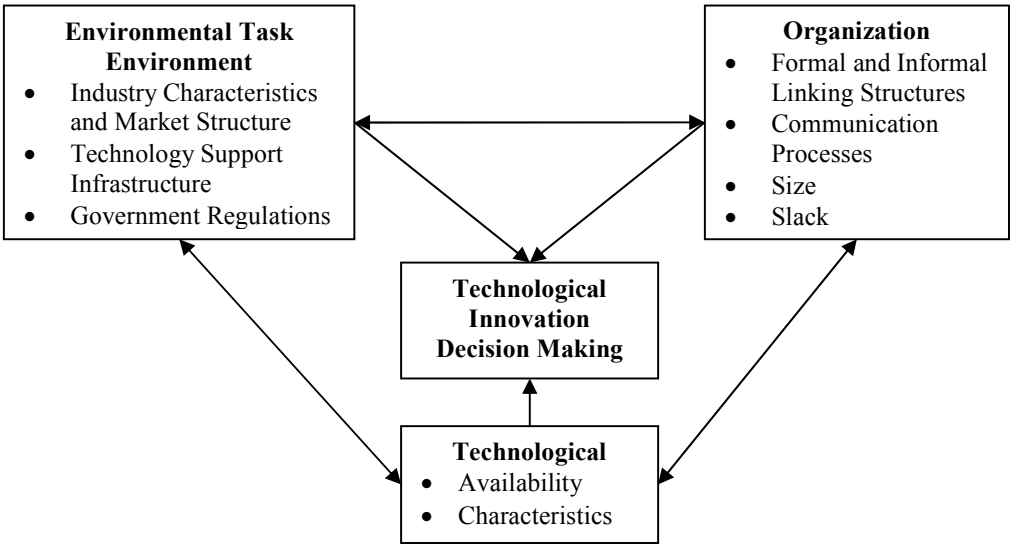
Sources	Influencing Factors	IS Adoption	Samples Size	Industries
Celik (2008)	Perceived Usefulness, Perceived Ease of Use, Perceived Risk, Perceived Behavioural Control	Internet Banking adoption	161 Bank consumers in Turkey	Bank consumers
Han and Greene (2007)	Characteristics of the Entrepreneurs, Trust, Number of Lenders, Distance between lenders and applicants	Online Loan Application	3,561 SMEs in USA	All-for-profit, non-financial, non-firm, non-subsidiary business (SMEs)
Kapurubandara and Lawson (2008)	Staffs' IT Skills, Security Concern, Legal & Regulatory Issues, ICT infrastructures, Awareness and Education, Government Supports	E-commerce adoption	139 SMEs in Sri Lanka	Not mentioned (SMEs in General)
Sukkar and Hasan (2005)	Culture, Trust, Online Service Quality, Perceived Usefulness, Perceived Ease of Use	E-Banking adoption	75 Jordanians living in Australia	Banks
Rotchanakitumnuai and Speece (2003)	Trust, Legal Support, Organizational Barriers	E-Banking Adoption	7 Online Banking Customers and 8 Non internet banking customers	Corporate Customers
Tan and Teo (2000)	Relative Advantages, Compatibility With Values, Internet Experiences, Banking Needs, Trialability, Risk, Self-efficacy, Government Support	Internet Banking Adoption	454 Internet Users in Singapore	Consumers
Wan *et al*. (2003)	Perceived Ease of Use, Perceived Usefulness, Perceived Credibility (Security and Privacy Concern)	Internet Banking	123 Internet Bank Users in Taiwan	Consumers

3. Background Theory

Literature on technologies adoption and diffusion suggest us to be open to more than one approaches of technology adoption to identify relevant factors of any technology adoption (Khalifa & Davison, 2006). Abrahamson (1991) also advocates for using multiple perspective in innovation research. He argues that under the condition of uncertainty, 'fad' or 'fashion' model, based on institutional theory of innovation, better suits with innovation research than 'rationalistic goal oriented' model. The underlying notion of rationalistic goal oriented or efficient theory is individual make choice regarding adoption of an innovation based on goals and technical consideration. Inclusion of more than one theoretical perspective enriches the depth and breadth of innovation research (Poole and Van de Ven, 1989; Wolfe, 1994). In this paper we present four dominants technology adoption model. Out of four, Technology Adoption Model (TAM) (Davis, 1985) and TOE framework (Tornatzky & Fleischer, 1990) are known as rationalistic goal oriented model. Institutional Intervention Theory of King et al., (1994) and Institutional Theory of DiMaggio and Powell (1983) are two dominant institutional theories in technology adoption.

3.1 The Technology-Organization-Environment (TOE) Framework

To study adoption of general technology innovations, technology-organization-environment (TOE) framework was developed by Tornatzky & Fleischer (1990). TOE framework shown below identified three aspects, technological context, organizational context, and environmental context, which influences technology adoption by firms' (Tornatzky & Fleischer, 1990).



Organization-Technology-Environment (TOE) Framework (Tornatzky and Fleischer, 1990)

As a generic theory of technology diffusion, the TOE framework can be used for studying any kind of information systems (IS) innovation research (Zhu,K. *et al*., 2003) including e-banking Liao *et al.*1999).The TOE framework has been used extensively in various IS adoption empirical works. Exhibit 2 summarizes few studies based on TOE framework.

Exhibit 2 Major IS adoption studies on T-O-E Framework

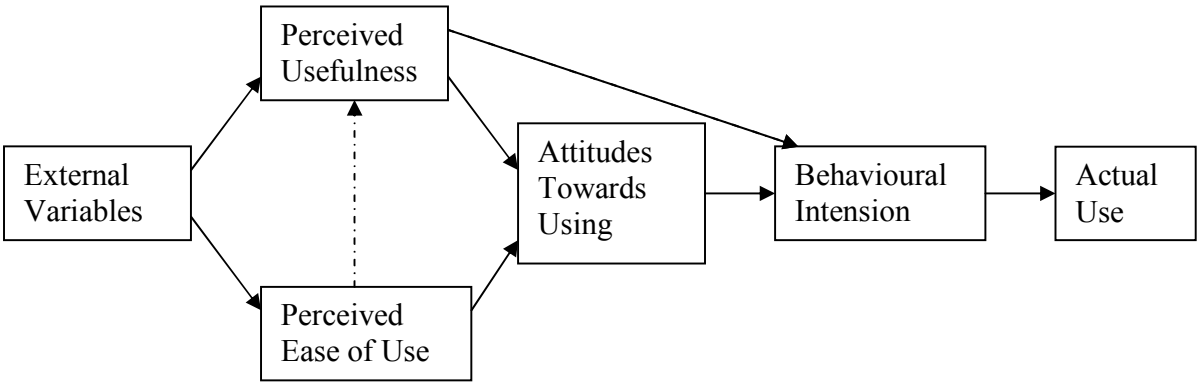
Authors	Types of IS Studied	Construct Used in the Model	TOE Framework		
			Technology	Organization	Environment
Zhu & Kraemer (2005)	E-Business Adoption	Technology competence	Yes		
		Size		Yes	
		International Scope		Yes	
		Financial Commitment			Yes
		Competitive Pressure			Yes
		Regulatory Support			
Xu *et al*. (2004)	Internet Adoption	Technological Competence	Yes		
		Firm Size		Yes	
		Global Scope		Yes	
		Enterprise Integration		Yes	
		Competition Intensity			Yes
		Regulatory Environment			Yes
Lin (2008)	IS Adoption	Explicitness of Technology	Yes		
		Accumulation of Technology	Yes		
		Organizational Encouragement		Yes	
		Quality of Human Resources		Yes	
		Environmental Uncertainty			Yes
		Governmental Support			Yes
Lina & Lin (2008)	E-business diffusion	IS Infrastructure	Yes		
		IS Expertise	Yes		
		Organizational Compatibility		Yes	
		Expected Benefits of e-business		Yes	
		Competitive Pressure			Yes
		Trading partner readiness			Yes

3.2 The Technology Acceptance Model (TAM)

Technology Adoption Model (Davis, 1985, 1989) has been the foundation of many technology adoption and diffusion research and it is rooted in the Theory of Reasoned Action (TRA). As per TAM, the two important independent variables of actual use of technology are:

- *Perceived ease of use*, defined as 'the degree to which a person believes that using a particular system would be free of effort'
- *Perceived usefulness*, defined as 'the degree to which a person believes that using a particular system would enhance his or her performance'

The presentation of TAM (Davis, 1985) is shown below:



TAM was developed to explain and predict particular IT usages. However, this particular model has been using by many researchers in studying adoption and diffusion of various IS technologies. Exhibit 3 shown the empirical support of Technology Adoption Model (TAM):

Exhibit 3 Empirical Support of Technology Adoption Model

Sources	Types of Technology	Sample Size
Wang *et al*. (2003)	Internet Banking	123 Internet Banking Users in Taiwan
Kleijnen *et al*.(2004)	Wireless Finance	105 Mobile Phone Users in USA
Cheng *et al* (2006)	Internet Banking	203 Internet Banking users in Hong Kong
Celik (2008)	Internet Banking	161 Internet Banking Consumers in Turkey

3.3 Institutional Intervention Theory

In the adoption and diffusion of an innovation, influence and regulatory actions are important (King *et al*., 1994). King *et al*. (1994) provide a list of institutions in their seminal paper and claim that potential institutional action may take two dimensions and draw a model in line with that. Institutions can exert pressure through influence and regulatory power and 'Supply push' and 'Demand pull' forces lay down the context for those actions to take place (King *et al*.1994). Both 'Supply push and 'Demand pull' are required for innovation adoption (See Exhibit 4 for details). Supply push innovation comes from the supplier of innovation and demand pull generates from the users to enjoy the innovation. This theory has been used in many technology adoption studies like e-commerce adoption (Scupola, 2003); EDI adoption (Dansgaard and Lyytinnen, 2001).

Exhibit 4 Dimensions of Institutional Intervention (King, *et al*.1994)

	SUPPLY PUSH	DEMAND PULL
INFLUNCE	KNOWLEDGE BUILDING Funding of Research Projects KNOWLEDGE DEPLPYMENT Provision of education services SUBSIDY Funding development prototypes Encouragement of capital markets to support R&D Provision of tax benefits for investment in R&D INNOVATION DIRECTIVE Direct institutional operation of production facilities for innovation	KNOWLEDGE DEPLOYMENT Training programs for individuals and organizations to provide base of skilled talent for use SUBSIDY Procurement of innovative products and services Direct and indirect provision of complementarities required for use Direct or indirect suppression of substitute products or services MOBILIZATION Programs for awareness and promotion
REGULATION	KNOWLEDGE DEPLPYMENT Require education and training of all citizens SUBSIDY Reducing in general liabilities for organizations engaging in innovative activity Modification of legal, administrative, or competitive barriers to innovation and trade STANDARDS Establishment of standards under which innovative activity might be encouraged INNOVATION DIRECTIVE Establishment of requirements for investment in R&D by organizations	SUBSIDY Procurement support for products and process that facilities adoption and use STANDARDS Require particular products or processes to be used in any work for institution Require conformance with other standards that essentially mandate use of particular products or processes INNOVAIVE DIRETIVE Require that specific innovative products or processes be used at all times

3.4 Institutional Theory

Institutional theory asserts that in societies where organizations work are guided by both rational rules and activities as originations are treated as system (Waber, 1946). DiMaggio and Powell (1983) and Scott (2001) claim that three types of institutional pressures-coercive, normative and mimetic, determine the technology adoption by individuals and firms.

- *Coercive pressure* are exerted by organizations or other bodies on social actors to adopt the prescribed attitudes, behaviours, and practice as the later have resource dependency to the former (DiMaggio and Powell, 1983). At organization level, coercive pressure may come from resource dominant organizations and regulatory bodies (Teo *et al*., 2003). Shi *et al*. (2008) mentioned that coercive pressure significantly influence the attitude and intention to adopt Internet banking.
- Normative pressure occurs when an organization voluntarily, but unconsciously imitate the attitude, behaviours and practices of other organizations. Although this imitation is not pushed by large actors, however, social actors those who have not adopted innovation may feel discomfort when peers whose they admirer have adopted the same (DiMaggio and Powell, 1983). Shi et al. (2008) have found the significant influence of normative pressure on Internet banking adoption.
- *Mimetic pressures* are directly associated with the both voluntary and conscious imitation or copying of the practices and behaviours of competitors or successful and high status actors (DiMaggio and Powell, 1983).

4. Theoretical Model for e-banking Adoption by SMEs

Since the TOE framework, TAM, Institutional Theory and Institutional Intervention Theory has strong theoretical bases, proven empirical supports, and applicability to wide range of IS innovation, therefore we have adopted all these theories as underpinning theory for the research. However, all the theories described above are mostly applied and used for technology adoption studies in developed countries. The social, cultural, economic condition of both developed countries and developing countries are different (Molla and Licker, 2005), therefore, developed countries technology adoption model cannot be applicable for developing countries without modifications.

Yet, as a significant differentiation from prior research: Firstly, we divide all the factors affecting e-banking into two groups: internet and external, for better appreciation of these factors in determining technological adoption. Secondly, we acknowledge the role of different institutions in the adoption and diffusion process as their roles are important (Lynch, 1989; Abrahamson, 1991; Swan & Newell, 1995; Khalifa and Davision, 2006). Finally, we integrate two different approaches of research and develop an integrated framework that can better explain the e-banking adoption by SMEs in developing countries.

4.1Internal Organizational Factors:

Based on existing literatures this research identified that among many, three internal factors have more influence on e-banking adoption by SMEs.

- Organizational Capabilities: Organizational capabilities may take several forms including human capital, IT literacy, and slack resources. Yap et al., (1992) mention that SMEs are regarded as 'poor' in human, financial and material resources and that hinders them to adopt ICTs. Hence, SMEs with more IT experience and IT in use are more likely to adopt IS innovation. Technological readiness of SMEs is important for e-commerce adoption (Zhu et al., 2006) and it includes not only physical assets, but also human resources as human resources are complementary to physical asset (Mata et al.1995). Iacovou et al., (1995) measured organizational readiness through financial resources and technological resources. Zhu and Kraemer (2005) mentioned that, organizational readiness includes infrastructure, relevant systems, and technical skills. Although, the definition of organizational readiness differs in literature but all agreed that organizational readiness have strong influence on SMEs' technologies adoption (Zhu et al., 2003, 2004). Due to importance of human, IT and capital in determining technology adoption and use in any organization, we have included organizational capabilities as one of the factors in e-banking adoption by SMEs.
- Perceived Benefits: Numerous literature states that perceived benefit is a key reason for technology adoption. Benefits e-commerce to SMEs includes lower administrative cost (Quayle, 2002), increased internal efficiency (MacGregor et al. 1998; Hawkins and Prencipe, 2000), improved relationship with business partners (Poon and Swatman, 1997), improve competitiveness (Fraser et al., 2000); improve quality of information (Kaplan and Sawhney, 2000). Mehrtens. et al (2001) ranked perceived benefits as main factors for small firms' Internet adoption. E-banking provides benefits to SMEs like 24/7 access to bank account, fund transfer and bill payment. E-banking also widens scope of financing from both local and global players (UNCTAD, 2001). Therefore, we can conclude that perceived benefits is one of the main factors for e-banking adoption by small firms.
- Perceived Risk, Online Security, Trust and Perceived Credibility: 'Perceived risk is the consumer's subjective expectation of suffering a loss in pursuit of a desired outcome' (Wang et al., 2003). Perceived risk is multi-dimensional in nature and captures performance, physical, financial, psychological, social loss and time (Greatorex and Mitchell, 1994) and therefore, difficult to capture objectively (Pavlou, 2001). Akinci et al. (2004) found that lack of confidence, security, reliability and privacy issues are main concerns of online banking customers. The components of online security are trust, confidence, reliability, risk on online transactions and reputation of online financial service providers. Security issues arise due to disruption of the operating system, or interrupted supply of the internet (Min and Galle, 1999). In case of web based transactions trust on service providers as well as on the system are important (Lee and Turban, 2001). Wang et al., (2003) found the perceived credibility is most determining factors in Internet banking adoption. Perceived credibility is impersonal in nature, and

captures reputation, information and economic reasoning (Ba and Pavlou, 2002). It reflects consumers' perception regarding the online transaction's security and trust issues (Wang et al., 2003). Therefore, this research adopts perceived credibility as a construct in the adoption of e-banking.

4.2 External Environmental Factors:

Literature confirms that external factors together with internal determine the level of IS innovation adoption. Relevant external factors that we include in conceptual model are discussed below:

- ICT Industries Readiness: ICT infrastructure includes telecommunication network, Internet connectivity, availability of computer, other hardware and software. Technological environment, both electronic and telecommunication, where a particular firm operates have influence on ICT adoption (Dholakia and Kshetri, 2004). Shortage of information technology infrastructures act as barriers for sustaining growth of online commerce (Chircu and Kauffman, 2000). Hence, we conclude that e-banking adoption by SMEs depends on ICTs industries readiness.
- Perceived Regulatory Support: Rotchanakitumnuai and Speece (2003) found that legal support for online banking for safeguarding customers is most important. Customers hesitate to use the e-banking services if there are inadequate laws on it (Larpsiri et al., 2002). Thomas et al., (1998) mentioned that who will bear the liability if financial loss occurs is another concern as sometimes it is hard to recognize the location of online service providers. Banks often transfer the risk to users of their services by signing agreement and that may hinders customers to use this services (Attaran, 2000). In developing countries regulatory environment is more critical than developed countries in adoption of innovation (Zhu et al., 2004, 2006). Due to the importance of regulatory support in e-banking adoption, we include this construct in the conceptual model.
- Financial Institutions Readiness: E-banking offers benefit for banks as well their customers. E-banking is described as 'wallet sharing' for both financial institutions and SMEs (Sato and Hawkins, 2001). If any banks have online channel for providing banking services, and as building these online channel requires huge amount of investment, therefore, bank certainly would ask their customers to use online channel. Zhu et al. (2003) mentioned that lack of trading partner readiness is significant adoption inhibitor. Trading partner readiness encourages small firms to adopt ICT and electronic commerce (McCole & Ramsey, 2005) and same expected to apply in e-banking adoption by SMEs.
- Pressure from Institutions: Institution is a social structure that has attended a high degree of reliance (Scott, 2001). King et al., (1994) provides a list of institutions including government, governmental institutes, development agencies, educational institutes, business association. Pressure may emerge due to competition and as well as from regulation. Institutions can exert pressure to SMEs to adopt e-banking through many ways including enacting laws, providing training, subsidy, and knowledge deployment. Institutional pressure can be

coercive, normative and mimetic (DiMaggio and Powell, 1983). Financial institutions can also influence SMEs regarding use of their online channel for banking as it is benefited for both of them. Hence, this research includes pressure from institutions as a construct in the adoption framework.

4.3 Institutional Role in Technology Diffusion:

Among the institutions government and financial services providers' role are vital for diffusion of e-banking as both institutions are working closely with SMEs (Chong and Parvan, 2007). Government through setting up infrastructure and enacting rules and regulations can create environment for SMEs for technological uptake. Donor institutions also help governments in developing countries in setting up infrastructures as well as through funding to SMEs and IT projects. IT service providers are also important and provide support to SMEs and financial institutions. The roles of Resource centres (includes training institutes, consultants, business association) are limited in creating awareness and providing consultancy services as well as training. They mostly depend on external sources of funding either from donor or from government. Association of IT service providers and association of banks are also part of resources centres.

Although, all institutions have certain roles to play, however, among all groups, government role are most important (Scupola, 2003) and it was acknowledged in various literatures (Iacovue et al., 1995; Kuan and Chau, 2001).Pressure from financial institutions are also important for SMEs to adopt e-banking adoption as online channel decreases transaction cost and banks can reach to larger segments of customers (Claessens et al., 2002; Zekos, 2004). That is why both government and financial institutions are grouped as influencing institutions. SMEs lack technical expertise (Mirchandani & Motwani, 2001) hence they rely on vendors and external expertise for website development, technological upgradation, security of their online systems (Gehling et al., 2007). Industry association, educational institute, training centres also have impact on technology adoption and hence they are also included as influencing institutions.

Exhibit 5 Summary of the Institutional Support to SMEs in Bangladesh

Institutions	Finance	Market Access	Business Environment	Training	IT Capability
Govt. & Agencies					
MoSICT Ministry of Science and Information Communications Technology					***
BSCIC Bangladesh Small and Cottage Industries Corporation		***	**	***	
BoI Board of Investment			**	*	
EPB Export Promotion Bureau		***		**	
SME Foundation	***	**	**	**	**
NASCIB National Association of Small and Cottage Industries of Bangladesh		**		***	
Bangladesh Bank	***				
BSTI Bangladesh Standard and Testing Institute		*	*	**	
Donor Agencies					
Donors World Bank, Asia Development Bank etc.	***	*	*	***	*
Financial Institutions					
BASIC Bank of Small Industries and Commerce Bangladesh Limited	***				
MIDAS Micro Industries Development Assistance and Services	**	***	*	***	
Various NGOs	***			**	
Commercial Banks, other Financial Institutions.	***				
IT Support Institutions					
BCC Bangladesh Computer Council				**	***
GTC German Technical Corporation				**	***
Resource Centres					
FBCCI Federation of Bangladesh Chamber of Commerce and Industry		***	**	*	
BEI Bangladesh Enterprise Institute				***	
JOBS (supported by USAID)		*	*	***	*
Katalyst (funded by DFID, SDC, Sida and CIDA)		**	***	**	
SEDF SouthAsia Development Facility	*	**	**	***	**
LEIC Local Enterprise Investment Centre	**		**	***	
(Key: *** highly focused, ** moderately focused * less focused)					
Source: Riyadh & Bunker (2008)					

Support services play a pivotal role for the growth of SMEs in any country. Therefore, their scope of activities and pertinent problems are highly interlinked with the growth of such industry. There exist many studies which have evaluated the effect of support services in many developed countries and got positive impact. For example, Gibb and Scott (1985), Turok and Richardson (1989), Wilson (1992), Read (1994), in the UK; Centaur Associates, Inc. (1983), Chrisman and Katrishen(1994) in the USA. However, assistance seems not to be very effective in case of Asian developing countries (Sarder, J.H, 2000). Riyadh and Deborah (2008) mentioned that in Bangladesh, the support services can be categorized under five umbrellas (Government and agencies, donor agencies, financial institutions, IT support institutions and Resource centres*)* and their activities can be assessed under five parameters (*Finance, market access, business environment, training and IT capability*). (See Exhibit 5).

Financial support is the major assistance provided against its pressing need expressed by small entrepreneurs. In Bangladesh, two government agencies (SME foundation and Bangladesh bank), most of the donor organizations and financial institutions are highly focused in financing. However, resource centres are quite inactive to serve this purpose except SEDF and LEIC which have respectively low and moderate focus on this parameter.

In case of *market access*, four govt institutions (BSCIC, EPB, SME foundation and NASCIB) play a vibrant role along with financial institution MIDAS and three resource centres(FBCCI, Katalyst and SEDF). For creating a better *business environment*, some govt. agencies (BSCIC, BOI & SME foundation) and resource centres (FBCCI, SEDF, Katalyst and LEIC) play a crucial role.

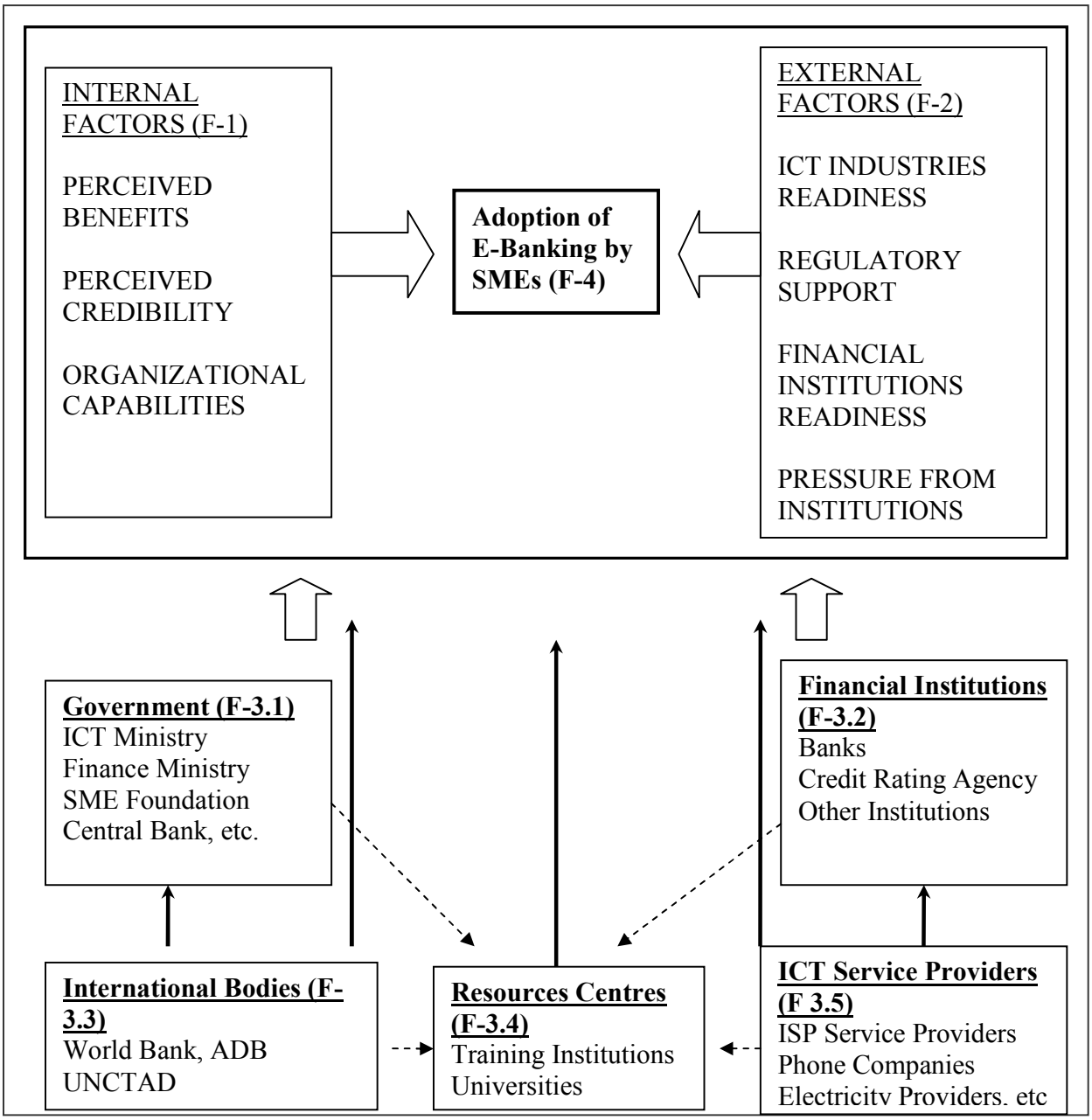
Training, related to management, technology, entrepreneurship and so on, is one of the important support measures, at different levels of enterprise development from pre start to high growth firms. In Bangladesh, among the govt. organizations, BSCIC & NASCIB have stronger focus and EPB & SME foundation have moderate focus in this aspect. In addition, most financial institutions, IT support institutes and resource centres have noticeable contribution in this sector.

Finally, for *IT capacity development*, MoSICT and SME foundations are playing better roles among Govt. organizations to create competitive business environment. In addition, IT support institutes (BCC & GTC) and one resource centre (SEDF) is moving the wheels of this domain for gaining competitive advantages.

5. **Model Development:**

A framework is defined as a map, set of maps whose structure and layout is guided by theory (Morecroft, 1988). It is also viewed as a guide in helping to structure problems (Satty and Alexander, 1981). A conceptual framework, therefore, can be described as an orderly presentation of a rational thinking in verbal, graphical or mathematical form. Here, in our case, the framework conceptualizes and articulates all the relevant variables which influence the adoption of e-banking by SMEs in Bangladesh (See Exhibit 6). For convenience of analysis, all these elements are put in different boxes, from F-1 to F-4.

Exhibit 6 Theoretical Model for E-banking Adoption by SMEs



The central task of assessing factors is shown at the centre (F-4), that is, 'adoption of e-banking by SMEs'. The uniqueness of this framework lies in its integration of all the related variables which influence adoption of e-banking as a whole in Bangladesh. On the one hand, internal factors (F-1) in terms of perceived benefits (lower administrative cost, increased internal efficiency, improved relationship with business partners improved competitiveness and improved quality of information), perceived credibility (level of risk, security, trust and privacy) and organizational capabilities (people, structure and technology) provide competitive advantages to the SMEs. And on the other hand, the external factors (F-2) in terms of ICT industry readiness, regulatory

support, readiness of financial institutions and pressure from other support institutions play a crucial role for ICT adoption. Above all, the ultimate adoption rate of this service depends on institutions (F-3) which influence external factors directly and internal factors indirectly.

A logical explanation of relationship between inputs and output is possible considering internal factors (F-1), external factors (F-2) and institutions (F-3) as inputs and adoption (F-4) as output. Mathematically, the input-output function can be expressed as:

$$y = f(X_{1n} + X_{2n} + M_j)$$

Where, y = adoption;

X_1 = internal factors……1st items

X_2 = external factor……. 2nd items and

M = institutions and other influencing factors…….jth items.

In practice, output can be a function of many factors- 'M' including X_1 and X_2. Outputs may have several dimensions and can be measured both at micro and macro levels. At micro level, we can measure the impact of internal factors (F-1) on E-banking adoption (F-4) and at macro level, the overall contribution of external factors and support services can be assessed in terms of profitability, growth rate of adopted SMEs.

5. Conclusion

This study develops a conceptual framework of e-banking adoption by SMEs in Bangladesh by integrating all the pertinent parameters under three umbrellas, these are, internal factors, external factors and support institutions. Based on background theories, extensive literature review the study develops an integrated model that captures both individual goal oriented behaviours of firms and institutional forces of technology diffusion. Internal factors include perceived benefits, perceived credibility and organizational capabilities. External factors include ICT industries readiness, regulatory support, financial industries readiness, and institutional pressure. We have also identified that five types of institutions- government, donor agencies, financial institutions, IT support institutions and resource centres are playing role in technology diffusion in SMEs in Bangladesh. It is expected that the combined model would better explain the e-banking adoption behaviour of SMEs in Bangladesh.

The leading technology adoption model that we have taken as background theory like Technology Adoption Model (TAM: Davis, 1985, 1989), TOE framework (Tornatzky & Fleischer, 1990), Institutional Theory (DiMaggio & Powell, 1983), Institutional Intervention Theory (King et al., 1994) are all developed for technology adoption for developed countries. Furthermore, all theories have some limitations. As per Technology Adoption Model (TAM) the technology adoption of firm or individual depends upon perceived usefulness and perceived ease of use. Beside these two factors, there might be other factors that explain the technology adoption. Therefore, TAM is known as partial model of technology adoption. On the other hand, TOE

framework is too generic. Both institutional theories are important in explaining technology adoption in developing countries as institutional roles are found to be dominant in developing countries. However, institutional theories ignore the impact of organizational factors in technology adoption. The model that we have presented here captures the impact of internal factors, external factors as well as the role of institutions. Therefore, the integrated model overcomes some of the limitations of TAM, TOE Framework and Institutional theories. SMEs are vital for any economy due to its contribution to GDP, GNP and employment creation. E-banking offers numerous benefits to SMEs hence, it is important to know the factors that inhibits or accelerates SMEs e-banking adoption process. An understanding of SMEs online behaviours and preferences help banks and other financial institutions to reach this customers' segment more efficiently. Furthermore, identification of the e-banking adoption barriers also helps banks to influence government to improve the current scenario of e-banking infrastructure. Although the research model is developed for identifying the factors in e-banking adoption by SMEs in Bangladesh, the model can be applied in e-banking/e-commerce adoption by SMEs in other developing countries.

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Appendix 1 Electronic Banking Services in Bangladesh (% of Banks)

EBS	1998	2000	2001	2002	2003	2004	2005
Tele Banking	14	20	24	28	33	37	40
Electronic Fund Transfer	15.4	15	18	20	25	28	30
Online Corporate Banking	---	8	12	18	22	26	29
Credit Card	---	10	23	30	38	45	50
Debit Card	---	3.8	18	25	38	46	55
Internet Banking	---	7.6	12	19	28	33	50

Note: --- means services were not available
Source: Islam & Ahmed (2005)