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From aperture satellite to "Internet finance": Institutionalization of ICTs in China's financial sector since 1991

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ABSTRACT

China's financial industries started the process of marketization only two decades ago, but by 2017 its financial technology or fin-tech sector had taken half of the global market. The exponential diffusion of information and communication technologies (ICTs) in Chinese financial contexts have generated new organizational structures and socio-political relations that have the capacity to change China's position in the world economy. Drawing upon the sociological concept of institutionalization, this paper examines how the Chinese state has integrated ICT diffusion in its formal policies and its informal rules in China's financial development since 1991. Further, it addresses the political and socio-economic consequences of these developments. Based on the analyses of government documents and sources, trade journals, and statistic data from business databases, this paper divides the Chinese institutionalization of financial technologies into three stages and identifies the primary actors and paradigms for ICT diffusions in each stage. ICT diffusion has been constitutive but also disruptive to the existing financial policies, instrumental to the commercialization of state-owned banks, and has gradually transformed into a set of formal and informal rules accepted by a network of professionals, corporations, and government agencies. The institutionalization of ICT diffusion has engendered the continuous adjustment of financial policies and propelled innovations in China's financial economy.

1. Introduction

The financial industries in China embarked on informatization[1] and networking strategies in the early 1990s (Zhang, 2004). In April 1991, the debut of the Satellite Communication System (SCS) by the People's Bank of China (the central bank) significantly accelerated inter-bank transactions. Cash transaction would formerly take seven to ten days through a telegraph system, but now it only takes two days through the SCS. To meet the efficiency standards set up by the central bank, regional and local banks started to adopt the informatizing strategies promoted by the state, and information and communication technologies (ICTs) became a vital element to rebuild the financial infrastructure nationwide. In less than a decade, most Chinese banks had established a national network based on computerization and the Internet-mediated exchanges of financial information. The Internet and the related digital technologies became the cornerstone of the Chinese financial regime.

In July 2015a, The *People's Daily* officially recognized the new business category "Internet finance." Aside from the mainstream

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[1] Informatization here has two-fold meanings. It is a set of particular policies called *xinxihua* (信息化) which has been promoted by the Chinese government in the financial sector since the early 1990s. The informatization strategies aim at higher efficiency and networked financial works computerization and the Internet technologies (Wen, 2009). In the meantime, informatization is also emblematic of the increasing scholarly attention in the 1990s to the role of information and communication technologies in transforming the techniques and styles of public administration (e.g., Bellamy & Taylor, 1998; Hudson, 1999) and forming the new socio-economic relations in the post-industrialization age (Castells, 2010).

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financial industries (e.g., banks, insurance companies), licensed Internet companies are eligible to provide financial products or services, including investment brokerage, online payment, person-to-person online loans, crowd-funding, and insurance to the market ("Guanyuhulianwang," 2015), which formerly were solely controlled by state-owned financial corporations. Extensive media reports on " Internet finance" soon brought this emerging business category into popular discourse and triggered an investing trend followed by more than 300 million lay investors (Wang, 2017). A 2017 article in *The Economist* flagged China as the world's fin-tech leader which has taken more than half of the global market ("The age of the appacus …," February). The largest Chinese fin-tech company, Ant Financial, a subsidiary of Alibaba, has been valued at about $75 billion in year 2016 (Bajipai, 2017) and identified as the world's most valuable fin-tech firm ("China's digital payment giant ...," August 2016).

In the last two decades, Chinese financial industries including the mainstream financial companies, Internet firms, and the private companies providing financial products and services have adopted ICTs through increasingly diversified forms. Yet, the ICT adoptions by these actors have always been intertwined with the institutional reforms initiated and lead by the Chinese government. This paper asks, how have the shifting modes of ICT diffusions related to the state's policymaking and regulative adjustment in the financial sector? Specifically, who are the actors involved in and contributing to the formation of policy discourses? How have policy changes influenced the diffusion of financial technologies, and what are the technological implications that, in turn, disrupt the existing social-political orderings in the development of fin-techs? The theoretical starting point of this paper is that ICT does not only refer to a general term for electronic or digital communication technologies. Rather, it is a network of industries, professions, and widely cultivated assumptions about the value of information, computers, and telecommunications in modern society (Avgerou, 2002).

Based on the examination of ICT-related policies in China's financial industries since 1991, this paper first analyzes the proliferation of "electronic finance" in the 1990s and identifies how the central bank has used communication technologies, particularly communication satellite and IC cards to promote the protocols and technical standards among regional banks. This section is followed by a review of "financial informatization" in the early 2000s. The expansion of financial networks from regional to national, from within banking industries to across the national treasury system has fully utilized ICTs–a form of widely recognized must-haves for high productivity. ICTs in this stage have been constitutive to management rules implemented by individual banks as well as the entire financial industries. In the past five years, when the integration of ICTs emerged as a dynamic engine to enlarge the financial market, the state legitimized it as a way to jump-start the alternative financial sector, referred to as "Internet finance." Ultimately, ICTs became normalized and catalyzed policy adjustments and structural reform in the Chinese financial industry.

This paper contributes to telecoms policy studies by providing new perspectives on the institutional approach. Institutional analyses of ICT development have mostly focused on the political, social, and organizational surroundings of technologies (e.g., Dholakia & Kshetri, 2004), thus only taking formal policies and informal rules as "institutions." This paper identifies such institutional factors external to ICT diffusion, but also considers ICT diffusion itself as an institution which has been administrative, constitutive, and also disruptive to policymaking. Finally, the historical review provided here helps to clarify the policy legacies in the development of the fin-tech sector in China that has drawn increasing attention from practitioners and scholars in ICT studies and finance studies.

1.1. An institutional approach to ICT policies in China's financial sector

The institutional approach is useful to define the conceptual boundaries of the two interacting variables in this project: ICT diffusion and fin-tech policy-making. The outset of institutional theory is very broad, and the definition of institutions varies across and within disciplines including political science, economics, and sociology (see detailed reviews in Djelic, 2010). Taking "institutions" as organizations embedded in a larger socio-economic structure, Avgerou (2002) considers ICTs as a network of actors at multiple levels (government agencies, industries, and individual users) and their value systems. The early adoptions of ICTs were mostly based on their technical merits (Zuker, 1983) and were under the influence of powerful individuals, such as business executives or political leaders (Granovetter & McGuire, 1998), which then led to the standardization and stabilization of ICT uses within or among organizations. Further, ICT diffusion is a non-stationary process driven by multiple types of organizational forces, including company culture, management orders, and super-organizational interventions (Avgerou, 2002).

For neo-institutionalists, policies, laws, and regulative rules only represent institutions in a narrow sense—that is, by the ways they influence the society; institutional rules can be broken down into three categories: the regulative, cultural-cognitive, and normative institutions (Scott, 2008). Regulative institutions are formally established in the forms of regulations and laws made by powerful actors such as the state, to constrain and regularize behaviors. The cultural-cognitive elements identify the shared conceptions and meanings through which social reality is conceiv. Lastly, the normative rules refer to the value systems and norms which can be used to assess or valorize behaviors or existing structures.

From the institutional perspective, the relations between formal policies and ICT diffusion essentially include the interactions between a network of actors (both organizational and individual) adopting and disseminating emerging technologies, and the authoritative actors dominating the overall network. In the financial context in China, the "dominating actor" refers to the Chinese state and its policy-making agencies (e.g., the central bank), whereas the remaining actors include banks, securities, insurance companies, and, more recently, IT companies that have been licensed to develop fin-tech businesses (Xie, Zou, & Liu, 2016). International IT corporations and consulting firms have also been part of the network since the early 1990s when they were assigned as vendors to build up the IT infrastructure (Zhang, 2004). Furthermore, this network includes the individual investors and borrowers participating in a wide variety of finance practices (Wang, 2017).

Thus, a complex of networked actors drives the processes of policy-making and its influence on political and socio-economic relations. Institutionalization of ICTs in China's financial sector is a process in which the state, corporative, and individual actors