

## **Policy Attention and the Adoption of Public Sector Innovation**

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# **Policy Attention and the Adoption of Public Sector Innovation**

## **Abstract:**

We explore the nuanced role of policy attention in the adoption of public sector innovation by differentiating it between the issue and dimension levels. Using the case of Chinese online service platforms (OSPs), we find that provinces are more likely to adopt OSPs if they pay more attention to e-government issues or define e-government more as economic-related issues. The findings enrich our understanding of the pivotal role of policy attention in eliciting digital innovations and contribute to the literature on innovation adoption and e-government. Managing policy attention is a more flexible alternative than organizational and environmental leverages to facilitate innovations.

**Keywords:** policy attention, innovation adoption, online service platforms, policy diffusion, digital governance

## **Introduction**

With increasing environmental pressures on governments, public sector innovation (PSI) has long been regarded as a promising instrument to address challenging governance problems (Walker 2014; De Vires et al. 2016). Across the world, PSI is observed regularly in both developed and developing countries. Numerous studies have identified the organizational and environmental antecedents of PSIs (Berry and Berry 2007; Walker 2014). Nevertheless, little is known about the role of policy attention in PSI adoption.

Policy attention deserves a more theoretical elaboration in relation to the field of innovation adoption. First, previous studies have demonstrated that governments' policy attention can largely shape policy outputs and organizational structures (Yackee 2006; May et al. 2008; Mortensen 2009; Mortensen 2010; Mortensen and Green-Pedersen 2015; Chen et al. 2019), and one important but underexplored area is the relationship between policy attention and the adoption of innovations.

From the policy agenda perspective, governments, regardless of political ideology and institutional forms, commonly operate with various issues, while holding limited attention resources (March and Olsen 1983). Building on the notion that governments often have to be selective in the various policy issues they attend to, the way in which governments organize attention around one certain issue reflects governments' agenda preference and priority for that issue. For this reason, it is possible that how governments organizing their policy attention will direct their subsequent policy outputs.

The issue of competing for attention resource and priority is especially critical to PSI adoption. As PSIs in the prioritized and preferred policy fields are likely to receive more

resources and institutional supports to address the problems of extra costs, risks and dislocations brought by adopting something new in organizations, which is critical to the decisions of PSI adoption. Otherwise, PSI adoption may face strong resistances from risk-averse stakeholders inside governments.

Moreover, policy attention in and of itself probably plays a more proactive role in affecting PSI adoption compared to organizational and environmental antecedents revealed by conventional knowledge. As noted by March and Olson (1983: 292), the structures, resources, powers and rules that may affect organizational behaviors are largely subject to attention constraints, and researchers “should shift the focus, that the core reality is the organization of attention”.

The classical organizational antecedent for PSI adoption, such as slack resource, mainly captures governments’ potential ability to adopt innovations. Resources are passive in nature and require to be deployed, and having ample resources doesn’t necessarily result in allocating these resources to the tasks of innovating (O’Toole and Meier 2010; Fan et al. 2020). Before resources are deployed to support a certain PSI adoption, governments must pay enough attention to related policy field and notice its urgency and salience. This will in turn help the relevant tasks of innovating be prioritized by governments in resource allocation. Therefore, policy attention seems to play a rather important role for PSI adoption.

This study explores how changes in governments’ policy attention regarding a certain issue influences their adoption of innovations related to that issue. According to issue definition theory, every policy issue involves various dimensions (Baumgartner and Jones 1991; Nowlin 2016), which means that while governments may pay attention to a certain issue (policy

attention at the issue level), they may further divide such attention among multiple dimensions within that issue (policy attention at the dimension level). The latter can reflect how governments define an issue. Given that the way that governments define a certain issue may facilitate or impede that policy issue's expansion and implementation (Jeon and Haider-Markel 2001; Soroka and Lim 2003), we theoretically contend that it is not only the amounts of policy attention paid to a certain issue but also the percentage of such attention given to different dimensions within that issue may affect the adoption of innovations related to that issue.

We use the adoption of provincial online service platforms (OSPs) in China as an empirical case to explore the relationship between policy attention and PSI adoption, and the reasons are twofold. First, e-government constitutes one popular type of PSIs in the digital era. Particularly, OSPs emerge in the worldwide one-stop-shop reforms. As a new approach to e-government, OSPs reflect some elements of both technological and administrative innovations. Moreover, e-government is often treated as tools to achieve multiple governance goals, governments usually attach different emphases and meanings to it, indicating nuanced differences in policy attention.

Second, in China's multilevel governing system, subnational governments have policy autonomy to adopt innovations. The large regional differences in terms of socio-economic conditions mean provincial governments have different issue preferences. During the adoption process, we can observe considerable variations in the patterns of policy attention at the issue and dimension levels across provinces, which provides a good opportunity to test the "policy attention - innovation adoption" link.

[The empirical results confirm our theoretical expectations, suggesting Chinese provinces](#)

are more likely to adopt OSPs if they pay more attention to e-government issues or define e-government more as economic- and business-related issues. The contributions of this study are threefold. First, this study advances scholarship on PSI adoption by outlining a policy agenda perspective that considers the influences of policy attention. Specifically, by incorporating issue definition theories, this study distinguishes between issue- and dimension-level policy attention, which further enrich our understanding of the role of policy attention in affecting PSI adoption. Second, by revealing the adoption process of OSPs, an increasingly popular e-government practice, this study contributes to e-government adoption literature. **Third**, we developed a novel indicator to measure policy attention at the dimension level by employing the latent Dirichlet allocation (LDA) topic model (Blei 2003), an unsupervised text-mining technique that can automatically identify hidden topics in unstructured and large documents, which can be extended to other studies.

This article is organized as follows. We begin by reviewing the literature of PSI adoption, and present the theories of policy attention and PSI adoption and develop hypotheses. Then, we brief the background of e-government in China, and report the data and methods. We present and discuss the empirical results, and conclude with implications.

## **Review of the Literature on PSI adoption**

Innovation adoption refers to the first-time adoption of something new, such as an idea, practice, object, or service, by an organization (Rogers 2003). Based on the features of these newly adopted elements, scholars have proposed several typologies of innovation in public sectors (Wu et al., 2013). Technological and administrative aspects are two basic aspects that relate to elements brought by innovations (Damanpour 1987; Walker 2014). Technological innovation

primarily refers to the introduction of new technologies (e.g., equipment, systems, and platforms) in public sector. Administrative innovation occurs when new elements lead to changes in administrative process (Damanpour 1987; Walker 2014).

Existing studies have identified a number of antecedents of PSI adoption at organizational and environmental levels. As for organizational factors, the size and structures of organizations (Walker 2008), resources (Fernandez and Wise 2010), leadership styles (Ricard et al. 2017; Hansen and Nørup 2017; Lewis et al. 2018), and administrative expertise (Bhatti et al. 2011) are found to affect PSI adoption. Open system theories posit that one cannot understand the structure or behavior of an organization without understanding the context in which the structure or behavior operates. The environmental and contextual factors that are likely to affect PSI adoption are environmental complexity (Walker 2006; Jun and Weare 2011), public pressure (Ma 2014), and population size (Walker 2008). Besides these, another stream of literature focuses on diffusion mechanisms (e.g., top-down, bottom-up and horizontal effects) by drawing upon the policy diffusion theory (Berry and Berry, 2007). Several studies further explored how the interactions of these mechanisms influence PSI adoption (Zhu and Zhang, 2019; Zhang and Zhu, 2019). As with the antecedents of e-government adoption, extant studies mainly employ policy diffusion theories and conduct empirical tests in different scenarios, including e-government and e-democracy (Lee et al. 2011), government websites (Jun and Weare 2011), government micro-blogging (Ma 2014), and open government (Grimmelikhuijsen and Feeney, 2017).

Despite the above-mentioned explorations, limited information is available concerning the relationship between policy attention and PSI adoption. It is theoretically relevant to



explore this topic for two reasons. First, while the agenda setting scholarship has revealed that policy outputs and organizational structures (e.g. policy spending, agency numbers) will respond to changes in policy attention (Yackee 2006; May et al. 2008; Mortensen 2009; Mortensen 2010; Mortensen et al. 2015; Chen et al. 2019), we still lack empirical evidence to support the role of policy attention in shaping governments' adopting choice of innovations. Since PSI adoption represents one important type of policy outputs in public sectors, the lack of focus on this important albeit understudied "policy attention – innovation adoption" link is surprising. More importantly, considering that innovations may bring about potential risks, costs and dislocations to existing administrative operations (Walker 2014; de Vries et al., 2016), governments are often cautious about accepting new practices, unless they attend to those issues and are aware of the urgency and saliency. Therefore, PSIs have to compete with the existing tasks for limited attentional resources in order to get priority in governments adopting choices. For this reason, we expect policy attention to be important as well as challenging in PSI adoption.

Second, incorporating policy attention is necessary to improve our understanding of antecedents of PSI adoption. Previous studies identified the role of a range of organizational and environmental factors, assuming that the availability of resources, capacities, and pressures will automatically lead to PSI adoption. However, following March and Olson (1983), while these antecedents are relevant to organizational behaviors, the degree of effects are subject to limited attentional resources. For example, organizational antecedents like resources, size and structures only reflect whether the organizations are ready to but not whether they will adopt innovations. The passivity of these antecedents implies that PSI adoption not only require

governments' potential ability to digest new elements, but also their preferences and willingness to prioritize innovation tasks when deploying these organizational resources. Building upon this, policy attention may play a more proactive role in affecting PSI adoption, which should not be ignored by existing literature.

This study attempts to bridge the research gap by exploring how does governments' policy attention regarding a certain issue affect their adoption of innovations related to that issue and specifically modeling PSI adoption as a function of changes in the patterns of policy attention. In particular, we choose one certain type of innovation (OSPs) in the field of e-government as an empirical case. E-government represents a relevant field for our explorations for two reasons. First, e-government has become one innovation type which is popular around the world in the digital era. For the specific OSP reform which introduces newly centralized online interfaces and restructure of tedious administrative process, it reflects both elements of technological and administrative innovation. Second, as an emerging governance tool, e-government is linked to multiple economic, democratic and civic goals. Different governments usually attach varying levels of emphasis to e-government and its various dimensions, which offers an opportunity to explore the possible impacts of policy attention at the issue and dimension levels.

### **Theory and Hypotheses**

This section develops the theoretical link between policy attention and PSI adoption. First, we differentiate between policy attention at the issue and dimension levels. Then, we will specify the "policy attention – innovation adoption" link in e-government, and separately discuss how the amounts of e-government attention (issue level) and the percentage of e-government attention to the favorable dimension (dimension level) will play an important role in affecting

provincial governments' OSPs adoption.

### ***Policy attention at the issue and dimension levels***

The concept of attention captures the extent to which a set of policy issues occupy the consciousness and agendas in organizations (Simon 1947, p.102). Different governments may pay different amounts of attention to a certain issue (e.g., e-government), because of the differences in levels of environmental pressures and policy problems they face, as well as the distinct organizational identities they have (Gilad 2015; Alexandrova et al. 2016). Moreover, considering that any certain issue often contains multiple dimensions (Baumgartner and Jones 1991; Nowlin 2016), the amounts of attention paid to a certain policy issue could further be divided by various dimensions within this issue. Thus, it is not only important to focus on a certain issue as a whole and explore how much policy attention that governments pay to it, but also meaningful to go inside the issue and tackle how governments further divide such attention across multiple dimensions within that issue.

Take e-government issue as an example. The amounts of policy attention that e-government issue as a whole receives (e-government attention) reflect the relative priority of e-government in government agenda. For instance, if government B pays more attention to e-government issues in comparison with A, e-government issues have a higher priority in B's policy agenda.

However, e-government is also multidimensional. Thus, attention paid to e-government issues could be further divided by these various dimensions. And it is possible that while governments may direct most of their e-government attention at certain dimensions, they may

also direct their attention away from other dimensions at any point in time (Baumgartner and Jones 1991; Jones and Baumgartner 2005). Accordingly, for e-government issues, the relative salience of certain dimensions may vary across governments and time periods.

Such attention allocation within a specific policy issue reflects the manner in which that issue is perceived and defined by governments, and determines the real nature of that issue (Rochefort and Cobb, 1993; Nowlin 2016). For example, considering that e-government is usually linked to boost economy by reducing business burden, building digital infrastructures and attracting investments in various countries, economic dimension represents one fundamental dimension of e-government. If governments direct most proportion of their e-government attention to the economic dimension, it means that they tend to define e-government in terms of economic issues. For example, even if government A and B pay similar levels of attention to e-government issues, they may exhibit different patterns of attention allocation across various dimensions. If government A allocates 70% of its e-government attention to economic dimension, and the value for government B is only 30%. This suggests that while A and B have a similar level of preference for e-government, they define e-government in differentiated ways.

### ***The policy attention – innovation adoption nexus in e-government***

Amounts of e-government attention

Governments often operate with multiple issues with competing interests. However, due to the limitation of information processing capacity, they are unable to advance all these interests simultaneously, therefore, have to decide which ones to focus on and which to screen out (Lavie

1995). As a result, there will always exist several issues that attract more policy attention than others do. This distributed nature of policy attention demonstrates that the amount of attention paid to a certain issue reflects the degree of its relative priority, importance and urgency among an increasingly crowded agenda (Mitchell et al. 1997).

As an important cognitive process, attention focus is a starting point in predicting organizational behaviors. Particularly, issues receiving more attention in policy agenda are probably the more preferred one. Accordingly, governments commonly have motivations to give special cares to the issues they prefer and stimulate follow-up actions towards those issues. For example, they may be willing to prioritize and legitimize the preferred issues when allocating resources and initiating practices. Or they may incline to be tolerant of the risks brought by the preferred issues. In comparison, for the peripheral issues which gain little attention, governments tend to ignore them during the process of resources allocation and initiating practices. Governments' risk tolerance for those issue is also probably very low. Building upon this, scholarship in policy agendas posits that the focus of policy attention is of great importance in explaining policy outputs when governments' capacity problems are evident. The selective policy attention focus on a certain issue gives priority and grants legitimacy to the follow-up policy actions on the issue.

Considering that PSI adoption is not an easy decision and usually requires organizations to give special treatments to new elements (e.g. providing resources, tolerating risks, forming support attitudes) (de Vries et al. 2016), it is reasonable to expect that: Governments that pay more attention to a certain issue are more likely to adopt innovations related to that issue.

We believe that it is especially the case in the field of e-government. On the one hand,

adopting e-government innovations (e.g. OSPs) is commonly associated with building digital infrastructures and changing established work routines, which requires amounts of resources.

On the other hand, it is a risky attempt to adopt e-government innovations, which often come with the costs and dislocations to organizational operations in short run and face risk-averse stakeholders' resistance (Jun and Weare 2011; Ma 2014). If e-government is the preferred issue in governments' policy agenda, it is more likely to be prioritized in resource allocation. The costs and risks brought by e-government innovations are also more likely to be tolerated. Without being attended by governments, e-governments innovations are difficult to get priority and legitimacy in governments' adoption choices. Thus, if the provincial governments pay more attention to e-government issues, suggesting their policy preferences for e-government, they probably have a higher likelihood to accept OSP. Therefore, we formulate the following hypothesis:

- ***H1: Greater prominence of e-government issues in provincial governments' attention allocation will increase the likelihood of OSPs adoption.***

Proportion of e-government attention to the favorable dimension

To construct the image of an issue is to select and highlight several attributes of the issue (Entma 1993). Building upon this idea, attention allocation within a certain issue relates to theoretical concept of issue definition. Given that any issue is multidimensional, a certain issue can be understood and defined along its various dimensions (Rocheftort and Cobb, 1993; Nowlin 2016). That is, "an issue definition for policy issue ... is an aggregation of the various issue dimensions weighted by the salience of each dimension." (Nowlin 2016 pp.313). For

example, the policy debate about the used nuclear fuel (UNF) issue in US congressional hearings from 1975 to 2012 usually contain seven dimensions (Nowlin 2016). The proportion of UNF issues attention that each of these seven dimensions receives varies across time, which suggests the dynamics in congress's issue definition of UNF.

While any issue contains multiple dimensions, some dimensions are favorable, and some others are detrimental to the proponent of a certain issue (Baumgartner and Jones 1991). Following this, relevant studies posit that how an issue is defined and interpreted determines the alternative policy behaviors and outputs (Jeon and Haider-Markel 2001). Particularly, when governments focus more on the favorable dimensions in defining a certain issue, they have more incentives to prioritize that issue in resource allocation and policy choices. Ranges of empirical explorations substantiate these claims (Soroka and Lim, 2003; Boushey 2016; Jennings et al. 2020). For example, economic dimension represents one typical favorable dimension for many policy issues which involve more or less economic character (Liu et al. 2020). Previous studies in public policy identify that policy issues “usually benefit from the rises in the salience of the economic dimension via a link to economic aspects” (Alexandrova 2016). Liu and colleagues (2020) examine the relationship between individuals' problem definition and their policy choice regarding energy and power plant. They find that, when individuals define the energy and power plant issues more as images which could bring economic benefits (e.g. creating jobs), they will prefer the use of energy sources. The discussion above lead to our expectation: Governments that pay more attention to the favorable dimension of a certain issue are more likely to adopt innovations related to that issue.

We expect the same logic in the field of e-government. As e-government is increasingly

used to achieve transformative outcomes in multiple areas. For instance, some may value its potentials to boost economy, while others mainly see e-government as a facilitator of democracy and participation. If provincial governments define e-government issues more as favorable issues that resonate with existing governments' core functions and incentive schemes, as reflected by the greater prominence of favorable dimensions in the e-government attention, they probably prefer to give special care (e.g. giving more resource, holding higher levels of risk tolerance) to innovations regarding e-government, thus increasing the likelihood of OSPs adoption.

- ***H2: Greater prominence of favorable dimensions in the attention allocated to e-government issues will increase the likelihood of OSPs adoption.***

## **The Background of E-government in China**

### ***The economic dimension of e-government in China***

E-government in China involve many dimensions such as economic development, democracy, anticorruption, government effectiveness, and public services (Ma and Wu 2020; Chen and Aklikokou 2021), but we specifically focus on the economic dimension in this study. It is not only because achieving economic benefits is treated as favorable in many policy fields as mentioned above, and e-government is not an exception, but also due to the fact that fulfilling economic visions constitutes the core objective of e-government in China (Ma 2005; Meng and Fan 2021).

Generally, e-government can be linked to multiple goals, such as boosting economy and enhancing democracy. The comparative e-government literature reveals that leveraging digital



technologies to boost economy via improving government-business interactions and attracting business investment is one fundamental objective of e-government in various types of countries internationally (Chen and Hsieh 2009; Stier 2015; Maerz 2016; Lin 2018). However, transition countries particularly implement e-government with the expectations of promoting economic growth. This is interestingly different from the situations in Western democracies which value the fulfillment of e-democracy in the same time (Maerz 2016; Lin 2018). As demonstrated by Åström et al (2012), the conceptual basis of e-government initiatives in transition countries “could therefore be economic instead of democratic and still carry tangible benefits for the regimes”. Thus, the potentials of achieving economic benefits and therefore enhancing the regime legitimacy make the economic dimension of e-government especially attractive to transition countries.

As a typical case of transition countries, China started implementing e-government since 1990s. China specifically placed e-government as a component of broad-based administrative reforms with the major goal of stimulating economic growth (Ma 2005; Lin 2018). Due to the nature of a developmental state, Chinese governments mostly treat e-government initiatives as vehicles to support economic growth (e.g., attracting foreign investments and enhancing the steering mechanism of economy) (Ma 2005; Kluver 2005).

After the Xi Jinping administration took office in 2012, while the relative importance of other policy issues (e.g. social issues, environment protection) increased, economic issues still represented the fundamental core function of Chinese governments. Given the global recession after 2008 financial crisis and more recent China-US trade disputes, traditional economic engines (e.g., exports, foreign investments) lost power, “keep economic growth

stable” frequently appeared and got first priority on government agendas. What was changed was that governments shifted emphasis from extensive, speed-first economic growth to sustainable growth characterized by high quality.

Against these backgrounds, the new central administration particularly recognized the role of e-government in building business environments and reactivating domestic market actors, such as reducing administrative burdens on business registration (Meng and Fan 2020). Furthermore, under the promotion tournament in China, local officials’ career opportunities have largely been dependent on economic performance (Li and Zhou 2005). Provincial leaders who exhibit higher economic performance have a higher probability to be promoted by the central government. Local governments have strong political incentives to boost economic growth, which is supported by a recent provincial-level study (Sun et al., 2019). Therefore, compared to other dimensions, economic dimension represents the major favorable dimension of e-government in China, which is consistent with the core functions and incentive schemes of Chinese governments.<sup>1</sup>

### *The adoption of provincial OSPs in China*

The governing system of China is organized into five administrative levels. While the central government is responsible for national policymaking, the 31 provincial governments constitute the first level of local governments in mainland China and direct the other three tiers of local entities (prefecture-level cities, counties, and towns) in their jurisdictions to implement policies.

The reason to focus on provincial level policy adoption is that Chinese provinces with respect

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<sup>1</sup> Besides economic and democratic issues, social issues have been also increasingly mentioned in Chinese government agenda. However, the major objective of e-government is to enhance economic growth, which is confirmed by the LDA results (see Figure A1 in the Online Appendix).

to geographical size and policy autonomy are comparable to the US states, and most classic policy adoption and diffusion theories are derived from the state-level empirical evidence (Ma 2017; Zhang & Zhu, 2019).

Although China is a one-party unitary state, its multilevel system is characterized by political centralization and fiscal decentralization (Zhu and Zhao 2021). Even though the central government can supervise and evaluate local behaviors via performance-based personnel management systems, local governments still hold considerable discretion in resources allocation among a range of issues, including PSI adoption (Zhu and Zhao 2021). The central government usually initiates policies without setting clear goals and unified instruments (Zhu and Zhang 2019; Zhu and Zhao 2021), and provincial governments have flexibility and autonomy to choose diversified practices on their own, such as setting specific goals and designing policy instruments. Due to the differences in local interests, not only the amount of attention paid to a certain policy issue (issue-level), but also the patterns of attention allocation within this issue (dimension-level) may vary across provinces. Thus, exploring provincial level policy adoption represents an initial step to test the attention-based framework in explaining PSI adoption.

The creation of OSP in China is a direct response to the problems of poor coordination and public service caused by NPM reforms, which follows the one-stop-shop reforms in western democracies (Bhatti et al. 2011). With the marketization process in post-1978 period, NPM reforms emerged as the dominant administrative paradigm in China, resulting in the widespread e-government fragmentation and undermining cross-spanning coordination (Christensen and Fan 2018; Scott and Gong 2021). The original NPM-oriented practices

degenerated into obstructions to socio-economic development and brought huge administrative burdens to civic and business activities.

In order to address these problems, the OSP reform in each province adheres to the principle of “whole of government” and requires to build an integrated online platform for service delivery at the provincial level (Christensen and Fan 2018). Through this one entrance point, enterprises and citizens of each province can use this single one interface to easily access various services (e.g., administrative licensing, tax payment, and residence permits application) offered by different departments and local-level entities in their jurisdictions. Without OSPs, each department have its own platforms and administrative procedures, and enterprises and citizens have to contact them individually. As a new approach to e-government, OSP reform requires not only the introduction of the newly centralized online interface, but also the integration of distributed and fragmented functions across agencies, and the streamlining and unifying of tedious administrative procedures.

The OSP was first implemented in Tianjin in 2006, and as of 2018, all the 31 provincial governments have adopted OSPs (see Figure A2). While the central government issued several policy signals to stimulate local governments to build OSPs, these nationwide advocacies did not offer a one-size-fits-all plan. Instead, they granted provinces with the autonomy to formulate OSP reforms based on their own peculiar characteristics. In relation to this, provincial governments had the opportunities and incentives to choose among alternatives and place the attention focus on different dimensions in accordance to their local interests. Hence, the OSP reform in China presents an appropriate context for our study with respect to the possible variations in patterns of attention allocation among provinces.

## Methods and Data

We tested the above hypotheses by examining the adoption of provincial OSPs in China from 2006 to 2018, which covers the whole adoption process of 31 provinces. We employed EHA with a logit model, and the unit of analysis is province-year.

We collected data from multiple sources. As for the information on the event of OSPs adoption, we recorded the year when OSPs were launched by searching government websites and official medias. For provinces that lacked clear and accurate notifications, we checked with the local officials responsible for e-government issues.

With regard to data on policy attention, we compiled a unique dataset by drawing articles on the topic of e-government from each province's official newspapers. Extant approaches measuring policy attention are usually based on data sources such as congressional hearings (Jones and Baumgartner 2005), party manifestos (Soroka and Lim 2003) and executive speeches (Boydston et al. 2014). As for the measurement of attention paid to a certain policy issue, relevant studies use the number of congressional hearings on that issue (Jones and Baumgartner 2005; Lowery et al. 2010). In terms of issue definition of a certain policy issue, scholars often use content analysis of the congressional hearings (Nowlin 2016).

Chinese scholars have limited access to complete records of government meetings, written directives or leaders' speeches, and several studies adopt official newspapers to measure governments' policy signals or attention (Guan and Liu 2019; Zhu and Zhang 2019).<sup>2</sup> The

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<sup>2</sup> For example, five-year plans and government work reports are two alternatives used to measure policy attention. However, they are not applicable to our research context. First, both are documents covering a very broad range of policy issues. Therefore, any certain policy issue can only occupy very small space in the main texts, which cannot offer enough textual data to conduct content analysis and reveal the patterns of issue definition of a specific policy issue. This is especially the case for e-government, as it usually takes up a few sentences in these documents. Furthermore, the five-year plan is updated every five years, which is not applicable to our annual analysis. Recently, some scholars also use central leaders' written directives to measure policy attention (Chen et al. 2019). However, due to information sensitivity and secrecy, scholars usually have very limited access to them in recent periods.

official newspaper goes beyond the tool of ideological campaigns and functions as “a vehicle of command” (Wu 1994). It contains important policy information on major governments’ activities, events and reports. Most of policy information comes from government agencies who are responsible for that policy issue. Before publishing, the editors also need to get approval from governments, suggesting official newspaper articles could be proxies to represent the policy intentions of governments (Wu 1994).

We specifically collected articles on e-government in provincial official newspapers by searching keywords on the database of WiseSearch, and obtained 53,841 qualified articles in total. Compared with data sources like congressional hearings, we admit that official newspapers may have limitations in reflecting policy attention, but they are the one we have completely access to, and also have been often used by existing studies to investigate the policy priority of Chinese government (Guan and Liu 2019).

We controlled for a range of variables that may affect the adoption of OSPs (see the Online Appendix).

### ***Dependent variable***

*OSP’s adoption.* Based on the timing of OSPs adoption in each province, we constructed the dependent variable. We coded it as 1 in the years of adoption, and 0 otherwise.

### ***Independent variables***

*Amounts of e-government attention.* We used the number of articles on e-government in each province’s official newspaper the previous year to capture the extent to which the

provincial government draws attention to e-government issues, which has been adopted by existing studies (Zhu and Zhang 2019).

*Proportion of e-government attention to the economic dimension.* Each newspaper article on e-government issues may simultaneously contain various topics. Following the approach of Nowlin (2016), we used the LDA topic model to extract the latent topics hidden in the articles and compute the probability of each topic. For each province, we aggregated the probability of each topic in the economic dimension by year. We uncovered 16 topics hidden in 53,841 e-government articles of provincial official newspapers. The number of topics is determined by computing the “topic coherence score” (see the Online Appendix). These 16 topics represent the 16 dimensions within the e-government issues of Chinese provincial governments (see Table A2). In addition, we obtained the probability for each of these topics in a single article. As noted, we interpreted and labelled these topics by inspecting 10 most frequently occurring words. For example, with respect to the topic of *Rule of Law*, the term “rule of law” had the highest probability of being related to this topic. Then, based on the authors’ qualitative judgements, we identified the topics in the economic dimension (see the Online Appendix).

## **Results**

### *Descriptive statistics*

The descriptive statistics for key variables are reported in Table A1. We incorporate 303 observations of 31 provincial governments over a period from 2006 to 2018. As for the amounts of e-government attention, provincial official newspapers on average published around 71

articles on e-government annually during our study period, with a SD of 65.875. The official newspaper in Anhui, which is an inland province located in central China, published only one article closely related to e-government issues in 2006. In contrast, the official newspaper in Guangdong, which is a pioneer province located in southeastern coastal region, published the largest number of e-government articles, with the value of 384 in 2011.

As for the economic preference of provincial e-government attention, provincial official newspapers annually allocate 46.344% of their e-government attention to the economic dimension as measured by the economic-related topic probabilities in e-government articles. The eastern coastal province Jiangsu in 2005 allocated the smallest percentage of e-government attention to the economic dimension, with the value of 15.228%. In contrast, the western Xinjiang autonomous region exhibited the strongest economic orientation when discussing e-government issues on its official newspapers in 2016, which is 65.604%.

### ***EHA with a logit model***

We summarized the empirical results in Table 1. Model 1 provides the baseline model which only includes classical control variables. Model 2-3 further include our two independent variables which report the estimations of the direct effects of policy attention at the issue and dimension levels on OSPs adoption. All three models present the coefficients and percentage changes in odds ratios to better interpret the direction and magnitude of the estimated effects. For robustness check, please see Online Appendix.

***[Table 1]***



Model 1 shows that only neighboring pressures and organizational capacities exert positive impacts on OSPs adoption, which is consistent with existing studies. Model 2 further includes e-government attention. The results suggest that paying more attention to e-government issues one year has a significantly positive impact on OSPs adoption the following year.

Model 3 is full specification incorporating policy attention at the issue and dimension levels, and it again confirms the robust positive impact of e-government attention on OSPs adoption. On average an additional article on e-government issues in the provincial official newspaper is probably related to about a 1.3% increase in the odds of adopting OSPs.

Regarding the effect of policy attention at the dimension level, we found evidence substantiates H2. Allocating more proportion of e-government attention to the economic dimension, which means that e-government attention is more economic-oriented, will also facilitate OSPs adoption. Specifically, a 1% increase in proportion of e-government attention allocated to economic dimension increases the probability of OSPs adoption by 11.6%.

With respect to the control variables, the positive effects of neighboring pressures and organizational capacity in Model 3 are no more significant compared to that in Model 1. The top-down policy signals are positively related to OSPs adoption as expected, but the estimated coefficients are not significant. In addition, the findings suggest economic competition pressures probably have no significant impact on OSPs adoption. Interestingly, the socio-economic factors are found to be insignificant. In comparison with the classic antecedents, it seems that both the amounts of e-government attention and the proportion of e-government

attention to the economic dimension matter significantly for OSPs adoption.

The economic dimension of e-government issues is composed of 9 specific topics (see Table A2), and we further look into the differentiated roles played by each topic on OSPs adoption (see Figure A3). We found that, it is the proportion of e-government attention paid to the topics of *economic and trade cooperation*, *market regulation* and *administrative licensing* that stimulates OSPs adoption. That is, if provincial governments define e-government issues more as issues which is related to one of these domains, they are more likely to adopt OSPs. Among these 3 topics, the proportion of e-government attention paid to the topic of *economic and trade cooperation* generates the strongest effect.

## **Discussion**

This study explores an important but underexplored topic in existing PSI adoption literature: how, if any, governments' policy attention affects their PSI adoption. The basic claim is that governments will organize policy outputs such as PSI adoption to fit the issues gaining more policy attention. We theoretically posit that paying more policy attention to a certain issue or allocate more such attention to the favorable dimension of that issue are positively associated with the adoption of innovations related to that issue. Using the case of provincial OSPs adoption in China, we find that provinces are more likely to adopt OSPs if they pay more policy attention to e-government issues or define e-government more as economic- and business-related issues in the previous year, even if they need to bear the organizational and financial risks and costs of adaptation to new digital systems.

Our results suggest the importance of examining policy attention for PSI adoption and

supplement existing understandings of PSI adoption. Policy attention may not only shape policy choices and organizational restructuring as previous studies suggest (Yackee 2006; May et al. 2008; Mortensen 2009; Mortensen 2010; Mortensen and Green-Pedersen 2015; Chen et al. 2019), but also influence the acceptance of innovations in relevant policy fields. The extant PSI adoption literature has identified the values of organizational and environmental factors (e.g., fiscal resources and neighboring pressures). However, policy attention seems to be a stronger predictor than these classical factors according to our results. If innovations are not attended by governments without being elevated to higher levels of salience, the “potential energy”, represented by the availability of resource the governments have or the intensity of external pressure they may face, is difficult to be translated to support innovation adoption (O’Toole and Meier 2010; Fan et al. 2020).

Moreover, by differentiating policy attention at the issue and dimension levels, this study takes an important step in producing a more nuanced explanation of the role of policy attention in PSI adoption. Considering that the allocating pattern of policy attention within a specific issue reflects how governments define that issue (Baumgartner and Jones 1991; Jones and Baumgartner 2005; Nowlin 2016), the findings indicate that what matters for PSI adoption is not only how much policy attention governments pay to a certain issue, but also the extent to which they can see the good aspects of PSIs and define it as a favorable issue. By revealing the role of issue definition in PSI adoption, this study aligns with the previous literature which finds that certain types of issue definition (e.g. addressing economic benefits when defining them as energy, immigration, or/and biotechnology issues) can stimulate policy outputs (Jeon and Haider-Markel 2001; Soroka and Lim, 2003; Boushey 2016; Liu et al 2016; Liu et al. 2020).

This study also represents a meaningful addition to the literature on e-government adoption, a research topic receiving an increasingly scholarly attention with the rapid advances in digital technologies. The relevant empirical work mainly focuses on the governments' adoption of e-government initiatives such as government portals and e-participation (Lee et al. 2011), social media (Ma 2014), e-procurement (Chen et al. 2021) and open government data (Grimmelikhuisen and Feeney 2017), while the adoption mechanisms of OSPs received little attention. As a new approach to e-government in the movements of one-stop-shop reforms, OSPs will continue spreading internationally and are expected to unleash the full potentials of digital technologies in public services delivery. Recent examinations of OSPs primarily use qualitative case methods (Castelnuovo and Sorrentino 2018; Fan et al. 2020), and to the best of our knowledge, this study is one of the first to explore governments' adoption of OSPs by using large-N quantitative research design, thus extending our understanding of the complexity and dynamism of e-government adoption.

Methodologically, as a response to the fast-growing development of big data analytics and computational social science, we demonstrated the value of the LDA topic model as a powerful method for understanding and measuring policy attention at the dimension level, which could be of use in future studies.

The findings generate practical implications to promote PSI adoption. The organizational and environmental factors revealed by previous studies are usually stable and hard to change in short period. In comparison, changes in policy attention are more flexible. This seems appealing to some extent. Even if someone may argue that it is also not easy for a certain issue to get additional policy attention, as governments often have to cope with numerous tasks

simultaneously. However, the significant role of policy attention at the dimension level still implies that governments may address this cognitive capacity problem by managing issue definition without allocating additional attention to that issue. For instance, as for OSPs, governments can allocate most of their e-government attention to the favorable dimensions in order to elicit OSPs adoption. In transition countries, considering that economic dimension is widely regarded as a favorable dimension of e-government (Ma 2015; Åström et al. 2012; Maerz 2016; Lin 2018), decision-makers can frame e-government as an economic and apolitical issue. However, the democratic dimension probably performs a more favorable role in western democracies (Feeney and Welch 2012; Lin 2018). This indicates that e-government innovation can benefit from addressing the potentials of e-democracy in issue definition.

The limitations of this study raise interesting questions for future studies. First, governments can express policy intentions via various mechanisms (May et al. 2008), such as meetings agendas, policy speech, official newspapers and budgetary spending. While official newspapers are the most complete data we can access, further studies can collect policy attention data from various sources to replicate the study. Second, since boosting economy usually represent the major goals of e-government in transition countries, this study focuses on the role of policy attention paid to the economic dimension of e-government. However, countries in western democracies may exhibit different preferences in e-government, such as facilitating e-democracy and e-inclusion. We hope future research can follow a comparative perspective and extend the existing studies in other contexts by exploring whether addressing the democratic potentials of e-government in issue definition will also facilitate e-government innovations.

## Conclusion

This study explores the “policy attention – innovation adoption” link in the context of provincial OSPs in China. The results show that both the issue- and dimension-level policy attention play pivotal roles in OSPs adoption. As for policy attention at the issue level, paying more attention to e-government issues is positively affect OSPs adoption. Regarding policy attention at the dimension level, defining e-government more as an economic or apolitical is also positively related to OSPs adoption. Policy attention deserves more scholarly attention in PSI adoption. In comparison with organizational and environmental factors, managing policy attention can be a more flexible alternative for practitioners to promote innovations in governments.

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**Table 1. The EHA of the Adoption of OSPs**

Model	Model 1		Model 2		Model 3	
	Coefficient (SE)	% Change Odds Ratio	Coefficient (SE)	% Change Odds Ratio	Coefficient (SE)	% Change Odds Ratio
<b>Attention at the Issue Level</b>						
E-government Attention			0.012*** (0.004)	+1.2	0.013*** (0.004)	+1.3
<b>Attention at the Dimension Level</b>						
Proportion of E-government Attention to the Economic Dimension					0.110** (0.047)	+11.6
<b>Control Variables</b>						
Top-down Signals	0.009 (0.007)	+0.9	0.007 (0.007)	+0.7	0.007 (0.006)	+0.7
Neighboring Pressures	1.498* (0.839)	+347.2	1.648* (0.886)	+419.6	1.385 (0.956)	+299.4
Economic Competition Pressures	-0.108 (0.235)	-10.2	-0.031 (0.269)	-3.1	0.021 (0.293)	+2.1
Organizational Capacity	1.238** (0.497)	+244.8	0.882 (0.603)	+141.5	0.884 (0.688)	+142.1
Fiscal Health	0.685 (4.116)	+98.5	-0.703 (4.264)	-50.5	-2.201 (4.155)	-88.9
Populations	0.237 (0.656)	+26.7	-0.248 (0.662)	-22.0	-0.425 (0.691)	-34.6
Economic Levels	0.420 (0.976)	+52.1	-0.061 (1.164)	-5.9	-0.116 (1.172)	-10.9
Economic Growth	-0.166 (0.151)	-15.3	-0.234 (0.154)	-20.9	-0.215 (0.152)	-19.3
Tertiary Industry	-0.004 (0.057)	-0.4	-0.009 (0.060)	-0.9	-0.013 (0.059)	-1.3
Constant	-7.970*** (15.261)		0.800 (17.462)		-2.444 (17.683)	
<i>N</i>	303		303		303	
Log likelihood	61.622		-56.825		-53.374	
Pseudo R <sup>2</sup>	0.384		0.432		0.466	
AIC	143.244		135.650		130.748	
BIC	180.381		176.501		175.313	

*Notes: The dependent variable is OSPs adoption. \* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$  (two-tailed). We report robust standard errors clustered by provinces in parentheses.*