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Measuring E-government performance of provincial government website in China with slacks-based efficiency measurement

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ABSTRACT

As the rapid development of the information science and technology especially the network technique, e-government has a very promising application foreground. E-government acts as a quite new form of government affairs and also an effective exploration of government innovation. The development and popularizing of the network puts forward a new request and challenge to the government. This paper devotes to evaluate e-government performances of 31 provincial government websites in China using the method of DEA. Research results show that most of these provincial government websites operate at an inefficient level and in a bad manner. Moreover, the e-government efficiency differences lie in both different individual provinces and different districts. It is confirmed that the less developed western provinces achieve a higher efficiency mean than the eastern and middle ones.

1. Introduction

With the fantastic spur both in industry and in economy, great changes have taken place in China since its opening and reforming to the outside world over the past three decades. Especially, the rapid-developed information technology promotes the revolutionary reform of productivity and brings a deep transform in the environment of running a modern business and in contemporary management model, and management tool. This situation leads to a usual challenge to governmental sectors. For example, with the rapid increase in the number of Internet users, how to manage Internet smut, false information in chat rooms, and disclosure information on unexpected events timely become multi-hot issues. Along with the electronic commerce explosive progress, Chinese governmental institutions are getting to put more emphasis on the application of electronic government (e-government) using computers and communication techniques.

The appearance of Internet changes people's lifestyle and it has been a very important part of people's everyday life, which offers the convenience to implement on-line marketing of the traditional enterprises and new service industries, so does on-line electronic government affairs. By the end of December 2013, there have been a total of 618 million Internet users in China and the Internet penetration rate reaches 45.8% more than in 2012 with an increase of 3.7% (Anon., 2014). It is not hard to infer that the number of people who uses Internet should be further on the rise in the following years along with the growth of the so-called Internet generation. This also provides a mass-based condition for on-line e-government affairs management. Thus, the Internet is becoming closer and closer to a wide variety of economic activities, such as shopping, logistics, payment and financial applications, and the related government activities, such as online approve management, online business figures statistics and so on. This newly paperless office requires civil service to enhance work efficiency and speed up the transformation of government functions which challenges the government administration.

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The advance of e-government will boost the government's ability to manage many kinds of social affairs and obtain both good economic efficiency and social efficiency remarkably. It reduces management cost greatly and enhances the working efficiency of the government. However, whether e-government will play its expected role effectively in government administration and reflect the current social management requirements set onto government performance by modern public administration and really improve the working efficiency in governments, depend on the construction of an advanced government performance evaluation system with the characteristics of e-government and the scientific evaluation method. Otherwise, e-government will not live up to peoples' expectations with its costly construction, first-rate equipment but low efficiency and poor performance. So far, the status quo of China's e-government is far from satisfaction due to incomplete regulations for information and many problems in the process of information collection, processing and maintenance.

Evaluating the e-government performance of websites has been a constant concern of searchers in different fields. Many prior e-government researchers tend to adopt qualitative methods in general and make contribution to theoretical reinforcement but neglect practical applications (Heeks and Bailur, 2007). Serving as a non-parametric programming approach, data envelopment analysis (DEA) developed by Charnes et al. (1978) is frequently used for evaluating the relative efficiency of a set of homogeneous entities called decision making units (DMUs) with multiple inputs and outputs. It has been a popular quantitative research method since the advent in 1978 owing to its excellent properties. For example, it owns unit-invariance property and does not require presupposing any production functional form at first. This study will further explore this issue and focuses on how to evaluate and account for the government performances of 31 official provincial/municipal websites quantitatively in China and promote their efficiency improvements using the non-radial slacks-based efficiency measurement (J-SBM model) in DEA.

2. Literature review

2.1. E-government

Since the initial proposal of the concept for e-government, e-government began to receive high attention and rapid development when the Internet and web-based technologies began commercialization in the 1990s. A host of research topics especially related to e-government arise at the turn of this new century. The evaluating ways and the selection of evaluation criteria for websites are different and still require more theoretical justification. Most of the previous approaches have focused either on basic management content or a specific set of web site outcomes (Miranda et al., 2009b). They either use subjective factors, such as easy-access, text clearness, presentation quality, etc., as performance indices (see Buenadicha et al., 2001; Cullen and Houghton, 2000; Evans and King, 1999) or using the investigation of questionnaire survey by manually to determine the specific website assessment indices (see Miranda et al., 2009b), such as the accessibility, speed, navigability and content of the website.

Moreover, the diffusion of e-government is widely studied. For instance, technological factors, organizational factors and environmental factors found by studies are the major influencing factors with respect to diffusion of e-government (Specific details see Zhang et al., 2014). Gil-Garcia and Pardo (2005) presented an analysis of a selected set of resources that government practitioners use to guide their e-government efforts. Their analysis examined the extent to which IT-related research is reflected in the practical guides. E-government has been proposed as a way to increase citizen trust in government and improve citizen evaluations of government generally. Tolbert and Mossberger (2006) used two-stage models to analyze recent Pew survey data and explored the relationship between e-government use, attitudes about e-government, and trust in government.

As an open, complex system with dissipation structure, e-government imposes a great impact on the traditional management pattern of government operations. Whether the service goal and style of e-government is objective, just and scientific or not, it will directly affect the operation quality of the government management. As Ma et al. (2005) pointed out, China's leaders also expect to foster administrative reforms by transforming government functions, streamlining procedures, and enhancing administrative transparency through e-government. Ma et al. (2005) further indicated that these reforms are designed to support China's economic development agenda through brief case studies of actual e-government experiments at both the national and city levels. Miranda et al. (2009a) stated that due to more increasing importance, the Internet makes the usability of municipal web sites a critical factor in government–citizen communication. They proposed and tested a model for evaluating the potential of municipal websites.

The above literatures mainly discussed the theoretical framework of the issues related to e-government affairs mostly from the qualitative point. These researches are subject to subjective influences. However, one major advantage of DEA method is to avoid the subjective factors in model implementation. It does not need to assign weight for input and output indices. Next, we will introduce the slacks-based metric in DEA that we are going to employ.

2.2. Slacks-based efficiency measurement in DEA

In recent years, DEA has been widely extended and applied in many fields in different countries (Cooper et al., 2000). The technique of DEA depicts a best-practice production efficient frontier formed by observed DMUs and provides a benchmark or reference point on this frontier for each DMU to compute its efficiency score. The efficiency value obtained by the classic CCR model indicates how efficient a DMU has performed when comparing with other DMUs so as to determine its efficient level within the group of all DMUs. The CCR model works as a radial model and may find the weakly efficient reference point for the current evaluated DMU which still have positive amount of input excesses or output shortfalls, for it is not the strong Pareto-efficient reference point (Chen, 2013). So the evaluated DMU will be misestimated with respect to its strong Pareto-efficient reference point on the efficient frontier.

One typical way to address this problem is the non-radial model with slacks-based measure (SBM) by Tone (2001). This

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Table 1
Performance index.

Index	Reflection from index	Index direction	Index attribute
GDP index	Economic factor	−	Input
Internet penetration index	Human factor	−	Input
Operational maintenance index	Equipment maintenance factor	−	Input
Information disclosure index	Information publicity factor	+	Output
Interaction index	Communication factor	+	Output
Education service index	Public service factor	+	Output
Employment service index		+	Output

model used a fractional objection function that depends on input and output slacks instead of a simple radial efficiency variable. The SBM model only has one style, for there is no distinction between input-orientation and output-orientation under SBM. The efficiency score computed by the SBM model is also between 0 and 1. The DMU under consideration is called SBM-efficient if and only if its efficiency score is 1. Otherwise, it is called SBM-inefficient. While distinguishing SBM-efficient DMUs further, Tone (2002) designed a super-efficiency model (S-SBM model) to examine its super-efficiency score in order to make SBM-efficient DMUs and could also be ranked and compared based on the first super-efficiency model creatively developed by Andersen and Petersen (1993). Liu and Chen (2009) developed a Hypo-SBM model to distinguish the worst-performance DMUs from the bad ones. Du et al. (2010) extended the SBM super-efficiency model to the additive slacks-based DEA model. Fang et al. (2013) established a two-stage process, which was an alternative disposal treatment for the SBM method proposed by Tone (2001, 2002). They demonstrated that their two-stage approach generated the same results as Tone's models. Lin et al. (2011) integrated DEA and analytic hierarchy process (AHP) to evaluate the economic development achieved by local governments in China. The proposed integrated DEA/AHP model can evaluate and rank different alternatives. Hsieh et al. (2013) measured the effectiveness of Taiwan's established, city- and county-level

Table 2
Information on 31 provinces/municipalities (DMUs).

DMU	Province (municipality)	District	Input			Output			
			GDP index[b]	Internet penetration index[c]	Operational maintenance index[a]	Information disclosure index[a]	Interaction index[a]	Education services index[a]	Employment service index[a]
1	Beijing	East	0.031	0.722	0.67	0.85	0.86	0.93	0.89
2	Shanghai	East	0.035	0.684	0.67	0.84	0.81	0.88	0.87
3	Hainan	East	0.005	0.437	0.65	0.82	0.85	0.89	0.79
4	Guangdong	East	0.100	0.631	0.59	0.84	0.75	0.75	0.81
5	Fujian	East	0.034	0.613	0.62	0.84	0.84	0.79	0.76
6	Zhejiang	East	0.060	0.590	0.49	0.80	0.82	0.70	0.54
7	Jiangsu	East	0.094	0.500	0.61	0.75	0.77	0.53	0.62
8	Tianjin	East	0.022	0.585	0.60	0.78	0.31	0.75	0.43
9	Shandong	East	0.087	0.401	0.54	0.72	0.47	0.70	0.77
10	Liaoning	East	0.043	0.502	0.49	0.75	0.38	0.70	0.71
11	Hunan	Central	0.038	0.333	0.47	0.84	0.83	0.93	0.88
12	Anhui	Central	0.030	0.313	0.56	0.77	0.83	0.78	0.54
13	Hubei	Central	0.039	0.401	0.50	0.70	0.63	0.67	0.70
14	Heilongjiang	Central	0.024	0.347	0.54	0.81	0.59	0.70	0.40
15	Shanxi	Central	0.021	0.442	0.54	0.68	0.69	0.51	0.18
16	Jiangxi	Central	0.023	0.285	0.56	0.68	0.32	0.53	0.23
17	Jilin	Central	0.021	0.386	0.58	0.73	0.40	0.35	0.26
18	Henan	Central	0.051	0.304	0.54	0.51	0.39	0.39	0.36
19	Hebei	Central	0.046	0.415	0.52	0.66	0.12	0.13	0.18
20	Sichuan	West	0.041	0.318	0.66	0.85	0.86	0.84	0.60
21	Shaanxi	West	0.025	0.415	0.35	0.82	0.79	0.80	0.73
22	Yunnan	West	0.018	0.285	0.46	0.74	0.48	0.75	0.79
23	Guangxi	West	0.023	0.342	0.52	0.66	0.56	0.52	0.29
24	Chongqing	West	0.020	0.409	0.50	0.66	0.65	0.37	0.51
25	Qinghai	West	0.003	0.419	0.48	0.70	0.62	0.50	0.41
26	Guizhou	West	0.012	0.286	0.53	0.61	0.60	0.20	0.19
27	Gansu	West	0.010	0.310	0.41	0.57	0.33	0.29	0.31
28	Inner Mongolia	West	0.028	0.389	0.52	0.62	0.36	0.25	0.15
29	Xinjiang	West	0.013	0.436	0.44	0.56	0.27	0.33	0.42
30	Tibet	West	0.001	0.333	0.43	0.57	0.12	0.10	0.12
31	Ningxia	West	0.004	0.403	0.40	0.33	0.24	0.14	0.17

[a] The 11th China government website performance evaluation (the year 2012).
[b] The China Statistical Yearbook (the year 2012).
[c] The 32nd statistics report for China Internet network status of development, China National Network Information Center (CNNIC) (the year 2012).

governments' websites and revealed that the well-developed web services provided by Taiwan's government are apparent in two geographically dispersed cities (north and south). Chen (2013) indicated that there exists a discontinuous gap between the SBM score and S-SBM score for a DMU who has the weak reference point under S-SBM model. In his study, an ambidextrous joint computation model (J-SBM) for slacks-based measure was provided. Theoretically speaking, the J-SBM model can well dispense with the situation that the evaluated DMU gets its efficiency score against by the weak efficient reference point on the efficient frontier, instead of the strong Pareto-efficient reference point.

3. Methodology

3.1. Evaluation index

The current paper first chooses seven indices which can reflect different factors among all provinces (municipalities), as shown in Table 1, they are GDP index, Internet penetration index, operational maintenance index of website, information disclosure index, education service index and employment service index respectively. For perspective, GDP index can reflect different development level of economy and society and serves as an economic input while Internet penetration index acts as a human input which provides a mass base of Internet participation. As for education services index and employment services index, they are two aspects of government online public services.

3.2. Data set

Here, 31 provincial governments consist of 23 provinces, 4 municipalities, and 4 autonomous regions in China serve as 31 homogeneous DMUs. Their specific information is listed in Table 2. These 31 provincial governments located at three different districts, ten ones in the east, nine ones in the middle and the rest of twelve ones in the west. The input and output numerical values for all DMUs are also presented in Table 2.

In this study, we not only aim to evaluate and improve the efficiency of e-government business for each local government, but also attempt to compare the efficiency score from different districts.

3.3. DEA evaluation method

In this paper, we adopt the J-SBM model with slacks-based measure proposed by Chen (2013). First and foremost, we introduce the J-SBM model.

Suppose there are n DMUs, $\{DMU_k(k = 1, 2, \cdots, n)\}$. Let $x_k = (x_{1k}, \cdots, x_{mk})$ and $y_k = (y_{1k}, \cdots, y_{sk})$ denote the input and output vectors of the kth DMU. The ith input of the kth DMU is denoted as x_{ik} and the rth output of the kth DMU is denoted as y_{rk}, respectively. λ_j is the intensity coefficient for the kth DMU which means its contribution to forming the efficient frontier. Assume that all input and output data are positive.

The J-SBM model is constructed as following:

$$
\begin{aligned}
&\min \quad \phi_k = \frac{\mathrm{JSBM}_k^x}{\mathrm{JSBM}_k^y} - M(b_1 + (1-b_1)b_2)\\
&s.t.\ \mathrm{JSBM}_k^x = 1 - \frac{1}{m}\left[b_1\left(\sum_{i=1}^{m}\frac{s_i^-}{x_{ik}}\right) - (1-b_1)b_2\left(\sum_{i=1}^{m}\frac{s_i^-}{x_{ik}}\right) + (1-b_1)(1-b_2)\left(\sum_{i=1}^{m}\frac{\tilde{s}_i^-}{x_{ik}}\right)\right]\\
&\mathrm{JSBM}_k^y = 1 + \frac{1}{s}\left[b_1\left(\sum_{r=1}^{s}\frac{s_r^+}{y_{rk}}\right) - (1-b_1)b_2\left(\sum_{r=1}^{s}\frac{s_r^+}{y_{rk}}\right) + (1-b_1)(1-b_2)\left(\sum_{r=1}^{s}\frac{\tilde{s}_r^+}{y_{rk}}\right)\right]\\
&(\mathrm{I}) \begin{cases} b_1\left(\sum_{j=1, j\neq k}^{n}\lambda_j x_{ij}\right) = b_1(x_{ik} - s_i^-), & i = 1, \cdots, m\\ b_1\left(\sum_{j=1, j\neq k}^{n}\lambda_j y_{rj}\right) = b_1\left(y_{rk} + s_r^+\right), & r = 1, \cdots, s \end{cases}\\
&(\mathrm{II}) \begin{cases} (1-b_1)b_2\left(\sum_{j=1, j\neq k}^{n}\lambda_j x_{ij}\right) = (1-b_1)b_2(x_{ik} + s_i^-), & i = 1, \cdots, m\\ (1-b_1)b_2\left(\sum_{j=1, j\neq k}^{n}\lambda_j y_{rj}\right) = (1-b_1)b_2\left(y_{rk} - s_r^+\right), & r = 1, \cdots, s \end{cases}\\
&(\mathrm{III}) \begin{cases} (1-b_1)(1-b_2)\left(\sum_{j=1, j\neq k}^{n}\lambda_j x_{ij}\right) = (1-b_1)(1-b_2)(x_{ik} - \tilde{s}_i^-), & i = 1, \cdots, m\\ (1-b_1)(1-b_2)\left(\sum_{j=1, j\neq k}^{n}\lambda_j y_{rj}\right) = (1-b_1)(1-b_2)\left(y_{rk} + \tilde{s}_r^+\right), & r = 1, \cdots, s \end{cases}\\
&\lambda_j \geq 0, \quad j = 1, \cdots, n\\
&s_i^- \geq 0, \quad \tilde{s}_i^- \text{ free for } i = 1, \cdots, m\\
&s_r^+ \geq 0, \quad \tilde{s}_r^+ \text{ free for } r = 1, \cdots, s\\
&b_1, \quad b_2 \in \{0, \ 1\}\\
&M \text{ is a large enough positive number.}
\end{aligned}
\tag{1}
$$

In the above model (1), b_1 and b_2 are two binary variables that are used to control which one of three kinds of constraint conditions (I), (II) and (III) is chosen. For the SBM-inefficient DMUs, $b_1 = b_2 = 1$, constraint condition (I) is active, now model (1) works as the SBM model. For SBM-efficient DMUs, model (1) first acts as the S-SBM model under active constraint condition (II) when $b_1 = 0$, $b_2 = 1$. In the meantime, if the super-efficiency reference point is not Pareto-efficient for evaluated DMU, model (1) will activate constraint condition (III) when $b_1 = 0$, $b_2 = 0$, the corresponding super-efficiency score will be corrected for the evaluated DMU. As can be seen from the above procedures in operating model (1), essentially speaking, the constraint condition (III) is set intentionally to correct the misestimated efficiency score due to the less Pareto-efficient reference point caused by the S-SBM model (Tone, 2002). The J-SBM efficiency score $\overline{\phi}_k^*$ is defined to be the optimal objective value omitting the part of M. i.e.,

$$\overline{\phi}_k^* = \phi_k^* + M\left(b_1^* + (1-b_1^*)b_2^*\right). \tag{2}$$

The J-SBM model has several merits. It first can compute SBM scores for inefficient DMUs and super-efficiency for efficient DMUs simultaneously and guarantee the reference points by this model for all DMUs are Pareto-efficient. Meanwhile, the J-SBM score for each DMU is continuous in the input and output spaces. In view of these advantages, the J-SBM model can be used to investigate more information on DMUs under evaluation and reveal more recognization of DMUs' final efficiency scores.

Table 3
J-SBM efficiency scores and ranking for 31 DMUs.

DMU	Province (municipality)	District	SBM score	S-SBM score	J-SBM score	Ranking
1	Beijing	East	0.6309	1	0.6309	11
2	Shanghai	East	0.6034	1	0.6034	13
3	Hainan	East	1	1.2527	1.1925	1
4	Guangdong	East	0.5006	1	0.5006	20
5	Fujian	East	0.6217	1	0.6217	12
6	Zhejiang	East	0.5456	1	0.5456	15
7	Jiangsu	East	0.4569	1	0.4569	23
8	Tianjin	East	0.4088	1	0.4088	26
9	Shandong	East	0.5274	1	0.5274	17
10	Liaoning	East	0.5296	1	0.5296	16
11	Hunan	Central	1	1.1073	1.1073	4
12	Anhui	Central	1	1.0200	1.0200	8
13	Hubei	Central	0.6761	1	0.6761	9
14	Heilongjiang	Central	0.6622	1	0.6622	10
15	Shanxi	Central	0.3781	1	0.3781	27
16	Jiangxi	Central	0.4584	1	0.4584	22
17	Jilin	Central	0.3776	1	0.3776	28
18	Henan	Central	0.4201	1	0.4201	24
19	Hebei	Central	0.1639	1	0.1639	31
20	Sichuan	West	1	1.0222	1.0222	7
21	Shaanxi	West	1	1.1440	1.1440	3
22	Yunnan	West	1	1.0923	1.0923	5
23	Guangxi	West	0.5119	1	0.5119	19
24	Chongqing	West	0.5472	1	0.5472	14
25	Qinghai	West	1	1.0884	1.0884	6
26	Guizhou	West	0.4663	1	0.4663	21
27	Gansu	West	0.5246	1	0.5246	18
28	Inner Mongolia	West	0.2720	1	0.2720	30
29	Xinjiang	West	0.4183	1	0.4183	25
30	Tibet	West	1	1.1732	1.1732	2
31	Ningxia	West	0.3100	1	0.3100	29
	Total mean				0.6403	

4. Empirical study

In this section, we apply the J-SBM model to the empirical study with the data set of 31 official province/municipality websites to evaluate e-government performance for year 2012 in China.

4.1. Results

The computed SBM, S-SBM and J-SBM efficiency scores are all listed in Table 3. It should be noted that S-SBM model is specially used for distinguishing SBM efficiency units (SBM score is equal to one), and for those SBM inefficiency units, they will get S-SBM efficiency score as unity.

From Table 3, we can see that for the DMU whose SBM score is less than one, its J-SBM efficiency score is equal to its SBM score. While for the DMU who is SBM efficient, its J-SBM score is larger than one. At this time, the J-SBM score may be equal to its S-SBM score and maybe not. For example, Tibet municipality (DMU 31) is SBM efficient and obtains its J-SBM score of 1.1732 that is equal to its S-SBM score. While as a SBM efficient DMU, Hainan province (DMU 3) obtains its J-SBM score as 1.1925, which is not equal to its S-SBM score of 1.1925. This is because Tibet municipality gets the same reference point under S-SBM model and J-SBM model while Hainan province obtains a weak reference point under S-SBM model and achieves an efficient reference point via J-SBM model.

The last column gives the ranking according to efficiency scores obtained by the J-SBM model. The total mean of 31 provincial e-government efficiencies is 0.6403, which was presented in the last row in Table 3.

4.2. Inter-provincial differences

There exist evident differences among the e-government efficiency scores of 31 provincial websites. 19 provinces' efficiencies are less than the total mean efficiency more than half, which reflect the fact that most of local governments ignore the construction of e-government systems and are still not used to utilize e-government platform to address government affairs. Under the e-governance, the governmental attitude, role and power operation need a significant transformation. Greater openness and information release in government affairs should be promoted and the application of e-government should be increased.

Hainan province gets the highest efficiency score of 1.1925 and comes first owing to its lower inputs and higher outputs. Its GDP index is at a lower rate than most other provinces, while four outputs are fairly high. But for Hebei province who gets the lowest score of 0.1639, its three inputs are not small. Nevertheless, its three outputs are all rather minimal. The interaction index, education services index and employment service index ranks behind compared to other DMUs. So in order to enhance its efficiency, it should improve the interaction ability and

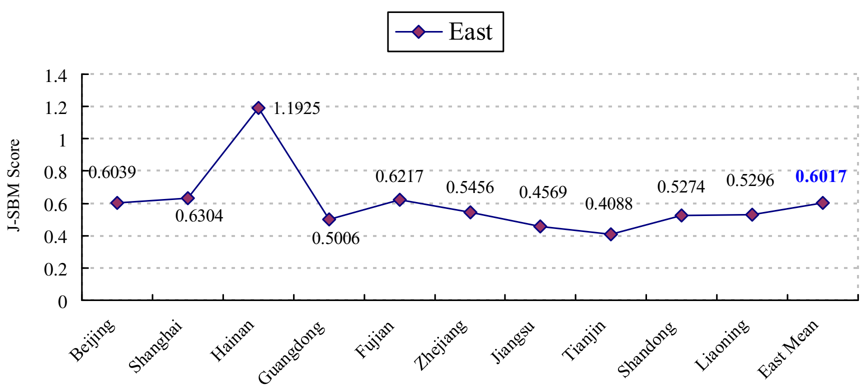

Fig. 1. E-government efficiency in east district.

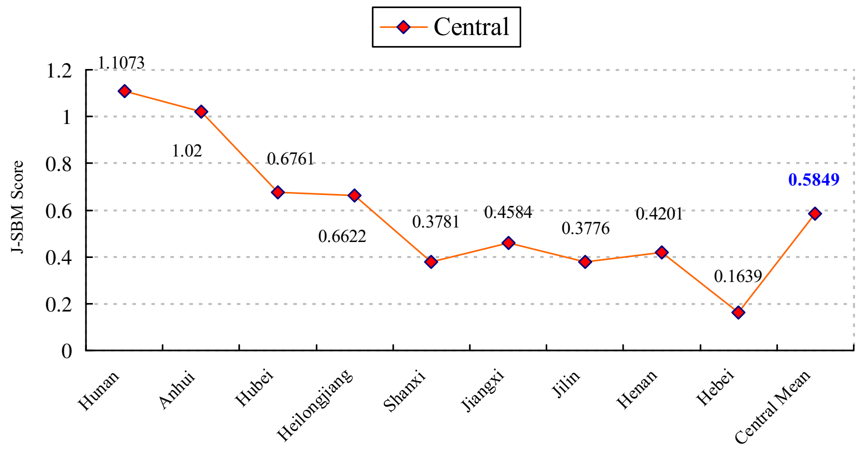

Fig. 2. E-government efficiency in central district.

strengthen the communication between information users as its core. Modern governmental administration should play not only as demanders of e-government information, but also suppliers of information. Other provinces can also identify the sources of low performance efficiency and the direction of efficiency improvement through similar analysis.

4.3. Regional differences

The e-government efficiency difference not only displays among different provinces, but also exhibits in different areas. Fig. 1 through 3 depicts 31 provinces' e-government efficiency scores according to the division of three districts.

From Fig. 1, efficiency values for 10 provincial e-governments have little difference, except that Hainan has a remarkable high score. The broken line is relatively smooth. However, the line in Fig. 2 fluctuates strongly, indicating that the efficiency score varies from one province to another of 9 provinces in the central district. The efficiency values for the west 12 provinces also have a certain fluctuation as shown in Fig. 3.

In each broken line graph, the last point represents the efficiency mean value in the corresponding district. It can be observed from these three that the efficiency mean values are 0.6017, 0.5849 and 0.7142. It's surprising that the highest efficiency mean lies in the relative lagging of economic development of the western district. This is different from our cognitive and deviate from our imagination. Through further observation, we find that although the western provinces do not invest heavily in inputs, they create major amount in outputs. This leads to their higher efficiency mean value than other provinces in other two areas.

5. Conclusions

It has been proved that government administration can be effectively promoted towards an efficient, honest, open and transparent one by the aid of e-government. Facing such an opportunity, how to make use of e-government and realize the change of government function and optimize business process, which is of great significance for China.

In the present paper, the DEA method is utilized to evaluate e-government performance of provincial government website in China. We choose seven evaluation indices and use the J-SBM model with slacks-based efficiency metric to assess efficiency for each provincial e-government websites and give the direction for efficiency improvement. Our study shows that local provincial governments in China do not pay enough attention to the e-government construction at present. The

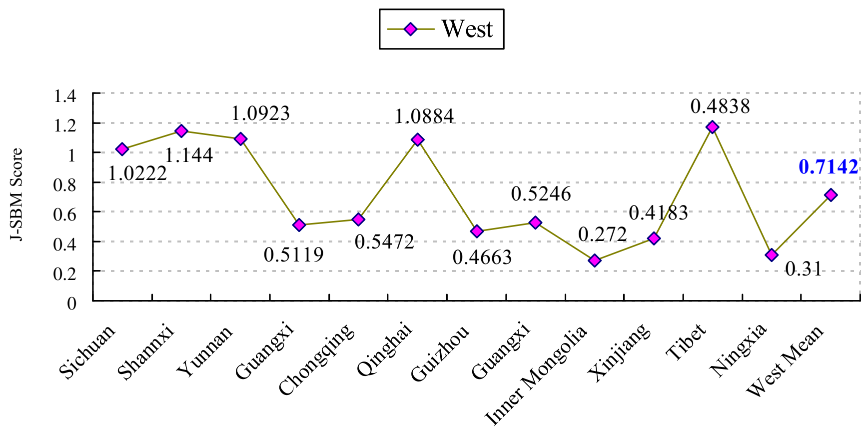

Fig. 3. E-government efficiency in west district.

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situation of inefficient e-government operating environment exists and the mission of government transformation has a long way as a whole. In addition, the e-government efficiency differences not only lie in different individual provinces, but also display in different districts. According to this study, the western provinces achieve a more excellent efficiency mean than the eastern and middle ones.

This work can be extended by inserting value judgment into the evaluation framework. Performance evaluation for e-governance information service needs to establish its value orientation, which will have important impact on construction of e-governance.

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