Impacts of government website information on social sciences and humanities in China: A citation analysis

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ABSTRACT

The purpose of this research is to investigate the current state and trend of government website information cited by social science and humanities (SS&H) journal articles in China. The Chinese Social Science Citation Index (CSSCI) was used as the benchmark and the Social Science Citation Index (SSCI) journals as the reference samples. It analyzed 204,019 web citations (N = 5,063,237) found in 925,506 articles that were published in CSSCI journals during the 1998–2009 period. The findings unveil that web citations accounted for only 4.03% of the total number of citations (N = 5,063,237), and that citations of Chinese government websites constituted 6.6% of the total number of web citations (N = 204,019). The study disclosed detailed information regarding citations derived from ministries and commissions directly under the State Council websites (N = 69), government online media (N = 7), government website citation subjects (N = 21), and various types of government website information (N = 5). Although government website information has limited influence on SS&H, their impact is currently growing rapidly. In comparison with international research community, influence of government web information on Chinese social science is higher, while its influence on humanities is lower. Essentially, Chinese scholars put emphasis on citing information from authoritative central government websites or highly visible state-owned media information as supporting evidences in their articles. In general, the citation of information from Chinese government website tends to hot social issues of society. Finally, it is necessary to promote the visibility of local government websites, to develop policies and guidelines to encourage the disclosure and the diversity of data, so that there will be more citation balances between social and technological topics.

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1. Introduction

The recent development of World Wide Web (WWW) has greatly enriched e-government resources. Online tools and data are important facilitators to scholarly communication and academic research (Zhao & Logan, 2002). The richness of internet resources is far beyond human imagination and many scholars use the internet for searching information. With the implementation of the Ordinance on Openness of Government Information of the People's Republic of China on May 1, 2008, the Chinese law requires government information openness through government websites and open access channels. It has been reported that 54,974 government websites have been established, of which 43,968 are under the .gov.cn domain (Chinese Government Website Statistic Report, 2010).

Finding evidence is one of the most significant steps in scientific research. There have been some studies showing that SS&H publications are more likely to cite government publication either in print or online (Barnes, 2006; Casserly & Bird, 2003; Caswell, 1997; Hogenboom, 2002; Nilsen, 1998; Weech, 1978). Nevertheless, it seems to have no particular attention to what has been happening in China. This article

endeavors to fill the literature gap by investigating how Chinese SS&H researchers cite information from government websites as supporting evidences in their research, and to evaluate the impact of government website information used on SS&H publications. This study was undertaken based on the hypothesis that the quantity of information from government websites cited by researchers could likely demonstrate the impact of such information.

2. Research background

2.1. Literature review

The advent of the internet has significantly changed the scholarly communication patterns of researchers. Either in social sciences, humanities or natural sciences, researchers has been citing information from the web as supporting evidences in their scholarly publications in an ever-increasing pace. An analysis of 175 articles published in 12 journals representing different academic areas (including LIS, gender studies, ecology, religion and society, computer, education and law) from 1999 to 2000 disclosed that 97 literatures contained web citations, accounting for 62.58% of the total articles studied (Herring, 2002).Oermann, Nordstrom, Ineson, and Wilmes (2008) selected 573 web citations in nursing articles from the Journal Citation

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Reports and unveiled that 30% of these articles contained at least one web citation, whereas 13.2% of the citations were linked to research reports, government websites and university websites. A study on 133 conference proceedings published from 1995 to 2003 exhibited an increasing number of authors who used URL citations to support their academic research (Sellitto, 2005). From an analysis of 13,859 research papers published in 30 journals in six disciplines from 2001 to 2007, Zhang (2011) discovered that the web resource citations used by researchers increased yearly.

Government information affects the life of every citizen. Since the 1970s, there has been growing interests in using government publications in academic research, because they contain valuable information for teaching, research and the provision of consulting services (Butcher, 1991). Based on citation analysis of seven articles, Weech (1978) identified that 17.5% social science journals cited government publications. Among all the social science journals investigated, economic journals accounted for 36% (ranked highest) of total government publication citations, whereas sociology journals only accounted for 10% (ranked lowest). Caswell (1997) reviewed the use of government publications from 1990 to 1996 and pointed out that analyzing the references to government electronic publications would be a new research direction and research should be undertaken without being limited to articles in English. In Brill (1990) on citations of government publications in the area of international relations, a total of 3784 citations were sampled from three years. The study found that the number of citations of government publications was 710, 19% out of the total citations investigated. An investigation on social science research in Canada during the period of the cost-recovery and restraint initiatives based on Statistics Canada, pointed out that articles published in geography and economics journals made the greatest use of Statistics Canada's statistics, and those journals in political science made the least use of them. However, there was no change over time in these disciplinary variations (Nilsen, 1998). A total of 2809 citations from American Indian issues were analyzed, of which 1350 citations (48.1%) were of government publications, specifically, 1193 (88.4%) were from the U.S. Federal Government and 33 (2.4%) were from international governmental organizations (Metoyer-Duran & Hernon, 1995).

The internet stimulates the utilization of government website information as references in research reports and publications. In 1982, when the internet was in its infancy, the use of government document was limited, and only found in doctoral dissertations written by doctoral candidates of the University of Oklahoma (McClure & Harman, 1982). While in 2006, with the rapid development of the internet, by examining the citations to the U.S. Federal Government publications used in the doctoral dissertations in Mississippi State University from 2000 to 2004, there was a growing tendency in citing online government publications, especially in the Colleges of Education, Agricultural Sciences, Engineering, Business and Industry, Forest Resources and Medicine (Barnes, 2006). Hogenboom (2002) investigated the influences of government information on demographic journals. The results showed that researchers are more likely to cite government publications in electronic format than they are with non-government publications. Mooko and Aina (1998) surveyed 101 social scientists at the University of Botswana, and revealed that most of the respondents (97.3%) used government documents. Moreover, most users attached a high importance to the use of government publications for research (89%) and teaching (86%). Furthermore, frequent users constituted 65.4% of all users, whereas infrequent users were only 12%, and moderate users accounted for one-fifth of the total number of users. Additionally, the most cited five types of government publications were statistical reports (51.4%), national development plans (37%), and annual reports (28.6%), reports of ministries and committees (28.6%) and census reports (20%). Of the 205 publications, only 19 did not contain citations of government documents. These findings clearly indicated that social scientists at the University of Botswana frequently used government publications in their research. Casserly and Bird (2003) sampled 3582 citations in 1425 LIS papers

published from 1999 to 2000, and identified that 9% of the citations were under the domain name .gov, much less than those under domain name .org (21.8%) or .edu (18.8%).

There are several barriers which prevent researchers from using of government information. Specifically, there are barriers in searching and using of government information, namely, the correlation between government information and the specific research, the importance of government information to the research, the familiarity with the organization of government publications in library, and the unavailability of the publications to the scholars (Meho & Haas, 2001). In this regard, they asserted that instability, content fluidity, fast change, mobility and inaccessibility of the web-based resources could affect the acceptance of scholars in using government information as a legitimate source in formal scholarly communications (Lawrence et al., 2001; Spinellis, 2003). Government document librarians also acknowledged that the use of government document collections was out of proportion to its value and importance. One possible explanation is that while government document depository libraries have focused on public access and issues on collection preservation, they have failed to recognize the importance of the discipline-based framework and the impact so much freely available information would have on the use of government information (Cheney, 2006). In order to identify the main barriers, Meho and Haas (2001) surveyed a group of social scientists, and revealed that 50% of the participants indicated that the lack of a comprehensive online catalog was one of the main obstacles, 37.5% showed that it was difficult to determine which publications their libraries had or did not have, while 37.5% of the scientists pointed out that the classification scheme of government information was confusing. Moreover, the ownership of the government website information prevented the extensive use of such information. Some of the government information remains the property of the agencies producing it. Private information providers, such as publishers and the information industry, cannot reproduce the information or add value to it, without specific contractual arrangements with the government. When a government agency chooses to increase the prices for its information products, potential users must either pay the higher prices, or attempt to obtain similar information from alternative sources (Nilsen, 1998).

Researchers in different disciplines such as law (Rumsey, 2002), library and information science (Casserly & Bird, 2003), pedagogy (Markwell & Brooks, 2002) and history (Russell & Kane, 2008) further identified that traceability existed in web citations. An, Jiang, and Zhang (2004) analyzed 300 randomly drawn web citations from six LIS journals. The results indicated that the general traceability was not only low, but also uneven. According to analysis of the web resource citations contained in articles that published in *Journal of Software* and *Journal of Library Science in China* from 1999 to 2003, Wu (2009) suggested the backtracking ratio decreased 9–10% every year and that the traceability of the web citations was related to the type of the source website, the type of the web resource and the language. A study in the persistence of URL containing contents of science or science education exhibited that 46.5% of the websites sampled either changed their released contents, or became inaccessible in a period of 14 months, while the web resources under domain name .gov had the highest availability (Markwell & Brooks, 2002).

2.2. The openness policy of Chinese government information on the web

Chinese government officially launched the National Economy Informationization Project at the end of 1993. More than 40 government ministries, departments and commissions jointly endorsed and initiated a "Government Online Project", and they named the year 1999 as the "e-government year". By 2000, 80% of government agencies and departments at all administrative levels had launched their official websites and provided information service for the public. In 2003, the National Informationization Steering Group decided that e-government

should be the main focus of the national informationization infrastructure in future.

The Ordinance on Openness of Government Information was enacted on May 1, 2008. The Ordinance demands that all state agencies adopt a "complete openness principle, apart from exceptional cases". Two approaches to information openness have been adopted, namely "release governmental information on initiative" and "release information according to the request of public". Article 15 in the Ordinance clearly stipulates that the release of government information on initiative should be via government websites and other official and convenient channels well-known to the public (State Council of the P.R.C., 2008). However, only the state or local governmental agencies have the responsibility to disclose information to the public. In addition, the government information referenced in this Ordinance is either created or obtained in the exercise of official functions, information that is recorded and preserved in whatever form. The public administrative regulations, policies, statistical information and other governmental information are the main governmental information open to the public. Scientific data, such as mapping, hydrological, meteorological data, is not included in the disclosed information. Users should apply to designated state agencies to obtain such information. Therefore, the application process significantly hinders the access of these types of government information.

The government websites have already become the main channel for government information and service. They have formed a system consisting of central government portal websites, websites of departments in the state council, and websites of local governments and their departments. Hainan government was the first provincial government to launch a portal website in 1996. Since then, a total of 52,155 gov.cn domains, accounting for 1.2% of the total number of cn domain names, have been created by January 2011 (CNNIC, 2012). However, facing a great demand from citizens, the amount of information released on government websites is quite uneven. For example, in 2009, the website of State Administration of Taxation was visited by 21.5 million people for 1.86 billion times (State Administration of Taxation, 2010). The 2011 Annual Report of Information Openness published by the Ministry of Land and Resources states that limited land and resources information that generated before the implementation of the Ordinance is released online; the information, which is released by request, represents a small amount. In total, only 185 items of requested information were opened to the public (Ministry of Land & Resources of the P.R.C., 2012). The 2011 Annual Report published by the Ministry of Justice shows that 7290 pieces of information were released online on initiative. Nevertheless, the report raises several issues, namely, "the information openness mechanisms and systems is not well built, the process of information lags behind the needs, and information distribution platform is under-developed" (Ministry of Justice, 2012). According to the Ministry of Science and Technology, although released 9726 pieces of various information in 2011, the functionality of portal website still needs to be further developed (Ministry of Science & Technology, 2012).

In August 2011, the General Office of the CPC Central Committee and the State Council issued the document of "Suggestions on Further Deepening the Openness of Administrative Affairs and Improving Governmental Service". It emphasizes that "the governmental information content should be enriched and upgraded in time. All non-confidential information should be open to the public through the government portals" (CPC Central Committee & State Council, 2011). In September 2011, the General Office of State Council forwarded a notice requesting all of the administrative affairs and services be published completely and accurately through the e-government service platforms, i.e. governmental services, in order to be widely accessible to the public (State Council General Office, 2011). On July 20, 2012, the State Council issued the document "Suggestions on Promoting the Informationization Development and Firmly Ensuring Information Security". It requires all governmental departments and agencies to promote the service of e-government, pushing forward the construction of information system in supervising medicines,

food, property, energy, finance, consumer price, and other key areas. The information sharing and business cooperation in key areas should also be continuously enhanced, as well as the exploration and utilization of basic information resources in geospatial data, natural resources, census, corporate entity, taxation, etc. which all serve the ultimate purpose of information sharing (State Council General Office, 2012).

2.3. Current research of Chinese government information on the web

Currently, research literatures published in China are mainly focusing on strategic planning of government information resources, government information openness, and information utilization services. Regarding the effects of the public's access to government information, Dong (2003) did a survey, and identified that 9.2% of participants highly valued the information obtained from government websites. Yang and Yuan (2009) analyzed the articles indexed in CSSCI journals from 1998 to 2007 and found that Chinese social science researchers adopted .gov, .edu, and .com websites as the main sources to access government information. Also, their analysis showed that information released on the government websites of the U.S., U.K., Japan and Australia strongly influenced the social science research in China. Moreover, by categorizing social sciences into 21 specific disciplines, and using statistical analysis of articles indexed in SSCI between 2004 and 2006, Su and Zou (2008) discovered that research studies in library and information sciences (LIS), pedagogy and political sciences were the top three disciplines that most frequently cited government online information; whereas Marxism studies, archeology and history were ranked the lowest. Qu, Yao, W, and Gu (2008) analyzed 14 academic journals in LIS, however they only found 10.81% of the articles citing information from .gov websites, much fewer than .com (33.40%), .org (22.59%), and .edu (17.49%). Based on the analysis of web citations of articles indexed in CSSCI between 2006 and 2007, Yang, Qiu, and Xiong (2010) revealed that SS&H researchers preferred using web resources from .com sites (36.59%), much higher than .org, and .gov, which accounted for 20.4% and 13.11% respectively. In addition, they also identified that researchers in LIS and journalism/communication are the highest in using the web citations (15.44% and 10.01% respectively), while researchers in Chinese Literature and History are the lowest (0.38% and 0.51% respectively). Nonetheless, it is necessary to note that Yang et al. (2010) neither distinguished government online information from general online information, nor clearly specified Chinese sources from sources in other languages. Finally, Chen et al. (2007) evaluated the validity and currency of scientific information on the web, and found that .gov web information was the strongest both in validity and timeliness. Two years later, Chen et al. (2009a, b) further investigated 14 academic journals that were indexed in the Science Citation Index (SCI), and found that web information had very limited impact on SCI natural science publications.

With the implementation of the Ordinance on Openness of Government Information, information released on government websites is becoming increasingly abundant. It is also becoming very common that social science researchers gather government information from official online resources. Therefore, it is necessary to understand the citation behavior of Chinese social science research when using information from government websites, which includes citation frequency, citation preferences of information sources and media, topics and the type of resources, etc. Such knowledge will definitely help policymakers and researchers develop and improve government information policies, and promote the effectiveness and efficiency of scholarly communication in the research community.

3. Methodology

3.1. Study sample

This study used the CSSCI database as the web citation source. The CSSCI is a citation index database developed by Chinese Social Sciences

Table 1
Web citations and government website citations from 1998 to 2009.

Year	Articles	Citations	Web citations (%)	Government website citations		Non-government website citations				
				.gov (%)	.gov.cn (%)	.edu (%)	.com (%)	.org (%)	.net (%)	Others (%)
1998	60,416	207,290	206 (0.10)	9 (4.37)	0 (0)	14 (6.8)	23 (11.17)	15 (7.28)	1 (0.49)	144 (69.90)
1999	65,712	190,506	871 (0.46)	102 (11.71)	14 (1.61)	125 (14.35)	102 (11.71)	103 (11.83)	31 (3.56)	408 (46.84)
2000	57,382	173,938	1590 (0.91)	152 (9.56)	18 (1.13)	248 (15.60)	174 (10.94)	308 (19.37)	78 (4.91)	630 (39.62)
2001	61,492	198,682	2705 (1.39)	276 (10.02)	75 (2.72)	327 (11.87)	747 (27.11)	501 (18.19)	122 (4.43)	732 (26.57)
2002	64,855	250,237	5195 (2.08)	517 (9.95)	162 (3.12)	620 (11.93)	1397 (26.89)	996 (19.17)	265 (5.10)	1400 (26.95)
2003	69,069	315,338	8782 (2.78)	834 (9.50)	357 (4.07)	946 (10.77)	2463 (28.50)	1598 (18.20)	541 (6.16)	2400 (27.33)
2004	78,522	399,097	15,410 (3.86)	1514 (9.82)	762 (4.94)	1742 (11.30)	4639 (30.10)	2816 (18.27)	943 (6.12)	3756 (24.37)
2005	82,434	479,852	22,868 (4.77)	2131 (9.32)	1161 (5.08)	2648 (11.58)	6949 (30.39)	4212 (18.42)	1238 (5.41)	5690 (24.88)
2006	90,269	576,550	29,712 (5.15)	3267 (11.00)	1855 (6.24)	3057 (10.29)	9371 (31.54)	5441 (18.31)	1446 (4.87)	7130 (24.00)
2007	93,647	634,288	34,418 (5.43)	4054 (11.78)	2348 (6.82)	3437 (9.99)	11,001 (31.96)	6269 (18.21)	1597 (4.64)	8308 (24.14)
2008	99,551	821,170	39,632 (4.83)	5229 (13.19)	3040 (7.67)	3824 (9.65)	12,837 (32.39)	6872 (17.34)	1650 (4.16)	9220 (23.26)
2009	102,157	816,289	42,580 (5.22)	5805 (13.63)	3627 (8.52)	3898 (9.15)	14,221 (33.40)	7465 (17.53)	1639 (3.85)	9552 (22.43)
Total	925,506	5,063,237	204,019 (4.03)	23,890 (11.71)	13,419 (6.58)	20,886 (10.24)	64,006 (31.33)	36,458 (17.94)	9519 (4.68)	49,399 (24.2)

Research Evaluation Center at Nanjing University, and has been widely accepted by the Chinese social science community in retrieving academic publications. It adopts bibliometric laws and qualitative and quantitative methods to select premium journals from over 2700 Chinese SS&H academic journals. Its reference database covers parenthetical citations, footnotes and endnotes that guarantee the integrity of the reference data. The CSSCI divides 528 selected academic journals into 25 categories, including law, management, economics, history, and political science, etc. Journals that are not classified into one specific discipline, such as multi-disciplinary university journals, are excluded in this study. This research has collected 5,063,237 citations from 925,506 articles in 411 journals published between 1998 and 2009. They have been divided into 23 categories.

The process of sample collection is as follows. Firstly, 204,019 web citations were downloaded from the CSSCI citation database (1998–2009) using the software that we developed specifically for this research. Secondly, 23,890 government references were manually selected, which accounted for 11.7% of all web citations. Finally, 13,419 entries for Chinese online government information were filtered by the .gov.cn domain name.

In order to compare the scenario in China with international journals, this study used Thomson Reuters Social Science Citation Index (SSCI) as data reference samples. Web citations are collected from 32 SSCI indexed (2001–2010) journals included in 11 disciplines. The findings show that there were 674,170 citations generated in 18,964 journal articles, of which 26,785 were web citations representing 3.97% of total number of citations. There were 4347 government website citations in 5415 articles, which accounted for 28.55% of all articles in this study.

3.2. Data process and analysis

Based on URL analysis of the web citations, we firstly collected all web citations in the CSSCI. This effort lasted from June to September 2010. Moreover, according to the Journal Citation Report (JCR) released in 2010, 32 journals with higher impact factor in 11 disciplines were selected as data samples from SSCI. Due to the limited coverage, we also use other professional databases to find citations. For instance, for information and library science discipline, we selected three different journals, *Journal of the American Society for Information Science and Technology* from the Willy database, *Information Processing & Management*, and *Government Information Quarterly* from the Elsevier database. We collected those citations from different databases. Later, we used MS Office Excel 2007 and Visual Basic for Application (VBA) to process the data. In order to determine the quantitative relation between SSCI and CSSCI web citations, we performed a bivariate analysis by using SPSS 12.0. The Pearson correlation coefficient ($\rho = 0.628$) of SSCI and CSSCI web citations and the two-tailed test probability ($p < 0.05$) confirmed the correlations between the two variables. Spearman Rank Correlation
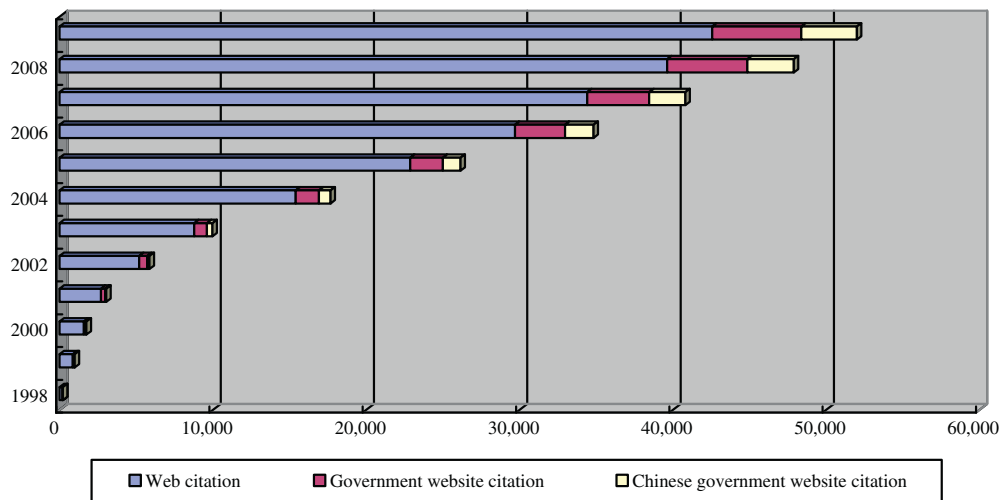
Fig. 1. Web citations and government website citation trends from 1998 to 2009.

Table 2
Distribution of web citations and government website citations by discipline from 1998 to 2009.

Discipline	1998		1999		2000		2001		2002		2003		2004		2005		2006		2007		2008		2009		Total	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A (%)	B (%)
Law	0	0	36	7	53	3	94	15	207	15	522	55	833	82	1137	123	1772	161	1831	222	2349	323	2063	327	10,897 (5.34)	1333 (5.58)
Management	14	1	20	7	98	12	183	30	295	30	570	57	896	116	1151	143	1476	212	1719	302	2117	424	2662	512	11,201 (5.49)	1846 (7.73)
Environmental science	0	0	0	0	14	0	8	0	20	5	70	12	141	22	139	19	159	33	162	39	282	55	262	71	1257 (0.62)	256 (1.07)
Pedagogy	4	1	21	6	77	4	220	21	560	74	948	70	1629	139	2217	181	2737	246	3669	367	4467	591	4958	536	21,507 (10.54)	2236 (9.36)
Economics	7	1	61	1	139	16	278	42	548	66	1119	118	1387	145	2368	420	2947	455	2985	505	3791	647	4550	864	20,180 (9.89)	3280 (13.73)
Archeology	0	0	0	0	0	0	0	0	0	0	4	0	3	0	12	0	8	0	8	0	37	0	26	1	98 (0.04)	1 (0.01)
History	0	0	2	0	10	1	17	3	50	3	87	15	147	19	180	12	332	41	424	41	382	51	468	70	2099 (1.02)	256 (1.07)
Marxism studies	0	0	6	0	0	0	9	0	25	1	88	6	211	23	350	30	418	45	447	58	532	69	681	71	2767 (1.36)	303 (1.27)
Ethnology	0	0	3	0	0	0	4	0	18	1	69	16	69	19	150	14	254	30	312	27	611	95	664	85	2154 (1.06)	287 (1.20)
Humanities and economic geography	1	0	14	4	12	0	54	5	90	9	134	30	128	23	354	60	513	95	514	92	632	165	669	128	3115 (1.53)	611 (2.56)
Sociology	0	0	4	0	1	0	27	5	54	24	38	4	141	27	214	37	290	61	278	63	271	61	406	102	1724 (0.85)	384 (1.61)
Physical education	1	0	1	0	11	0	25	1	22	3	78	18	110	10	277	21	491	49	575	73	694	96	758	79	3043 (1.49)	350 (1.47)
Statistics	0	0	3	0	0	0	1	0	1	0	18	9	32	4	97	11	92	9	156	22	301	26	262	52	963 (0.47)	133 (0.56)
Foreign literature	1	0	3	0	1	0	7	0	16	0	27	0	84	0	58	1	80	1	127	2	96	0	91	0	591 (0.29)	4 (0.02)
Psychology	0	0	0	0	4	0	4	0	8	0	47	2	55	0	112	3	77	2	65	5	107	2	52	2	531 (0.26)	16 (0.07)
Journalism &communication	6	0	43	0	65	0	79	2	213	5	272	14	607	21	813	38	1062	49	1181	62	1671	97	1873	101	7885 (3.86)	389 (1.63)
Art	2	0	1	0	1	0	15	0	42	0	29	2	89	2	139	8	291	25	348	10	534	24	452	12	1943 (0.95)	83 (0.35)
Linguistics	11	0	11	0	8	0	10	0	22	0	30	1	123	0	147	9	247	9	289	5	405	23	382	30	1685 (0.83)	77 (0.32)
Philosophy	5	0	6	0	3	0	35	1	59	1	65	3	96	5	174	4	142	7	213	12	231	12	263	20	1292 (0.63)	65 (0.27)
Political science	2	1	46	6	10	0	185	16	352	60	743	87	1688	227	2340	276	2887	439	3440	564	5211	794	4611	798	21,515 (10.55)	3278 (13.72)
Chinese literature	1	0	0	0	9	0	0	0	6	0	16	0	85	1	75	1	115	1	142	1	168	1	166	1	783 (0.38)	6 (0.03)
Religious studies	0	0	3	0	0	0	0	0	3	0	4	0	6	0	17	0	24	1	11	0	24	0	16	0	10 8 (0.05)	1 (0.01)
Library & information science	112	11	439	33	703	66	1025	101	1811	140	2373	174	3554	284	5502	349	6132	548	6992	516	8246	828	9093	903	45,982 (22.53)	3953 (16.55)

Note: "A" indicates the total number of web citations by discipline; "B" indicates the total number of government website citations by discipline.
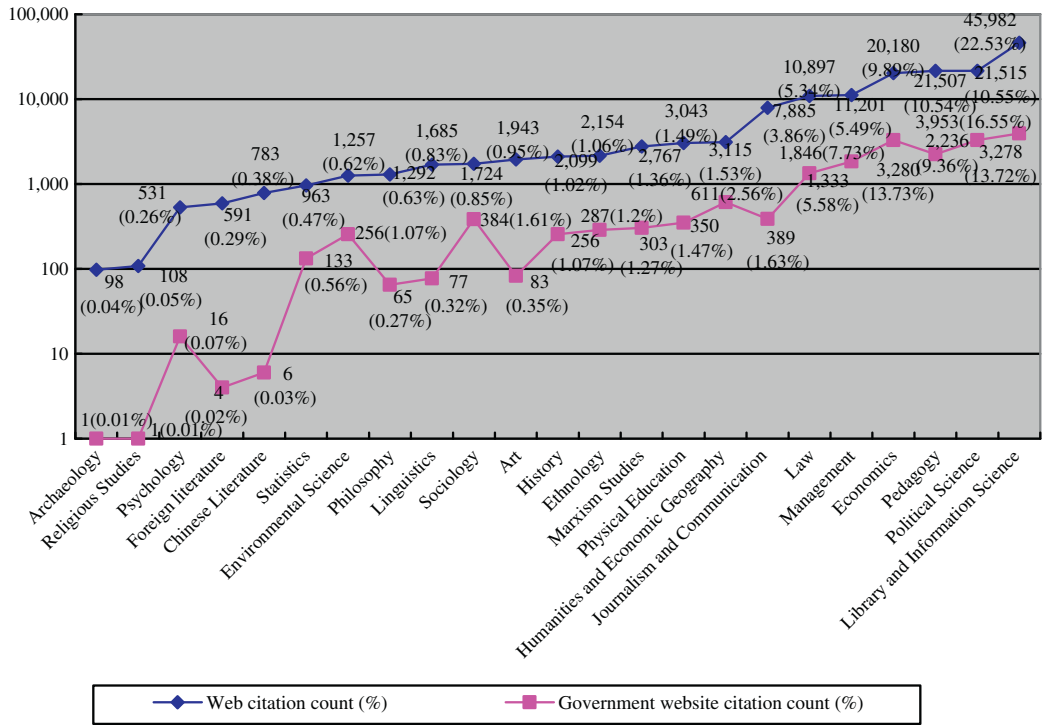
Fig. 2. Scholars' web citation and government website citation trends by discipline from 1998 to 2009.

($\rho = 0.80$) and two-tailed test probability ($p < 0.01$) also support the correlations.

3.3. Research steps

Step 1: Identified the current status of web citations based on CSSCI database from 1998 to 2009 (CSSCI citation database, 2010).

Step 2: Used 411 journals in 23 categories from the CSSCI as the benchmark (CSSCI, 2010). Conducted quantitative statistical analysis of web citations and governmental web citations yearly from 1998 to

2009. Summarized the characteristics and trends of web citations and government web citations in 23 disciplines.

Step 3: Examined the quantity of government web citations from different state agencies based on analysis of the web citations and government web citations, and analyzed the preferences of scholars in citing online government information resources.

Step 4: Investigated citation amount and features based upon the government information category. The government information category was issued on September 10, 2007, by the General Administration of Quality Supervision, Inspection and Quarantine of the P.R.C. and Standardization Administration of the P.R.C., which classified government
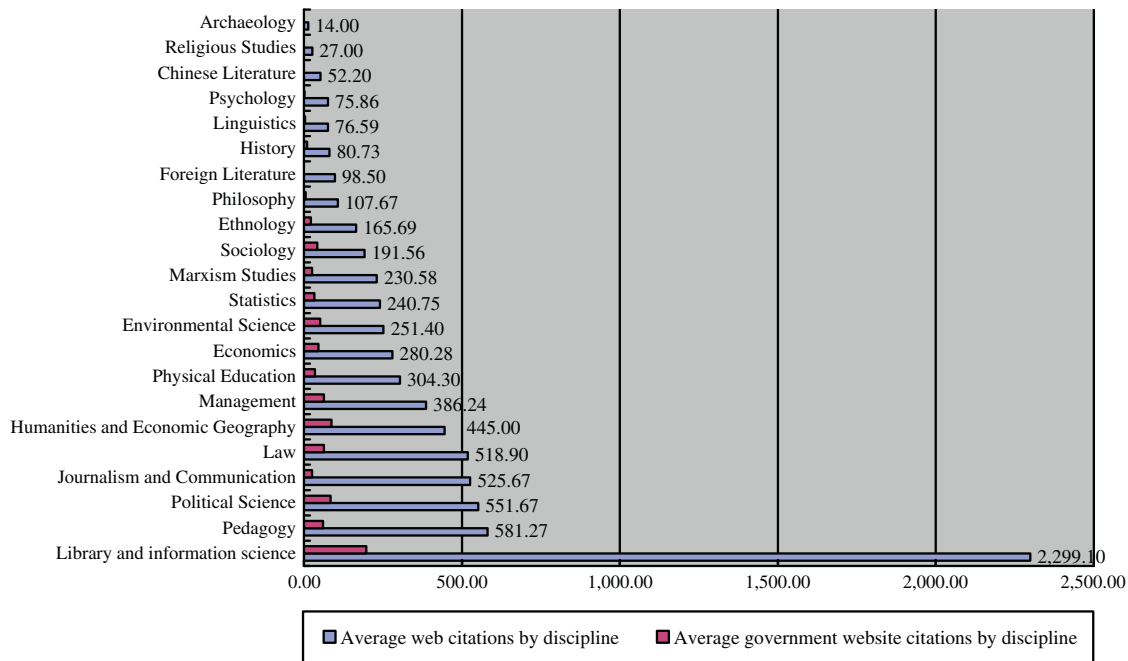

Fig. 3. Distribution of web citation count by discipline from 1998 to 2009.

Table 3
Distribution of web citations and website citations by state agency from 1998 to 2009.

State Council department	1998 (%)	1999 (%)	2000 (%)	2001 (%)	2002 (%)	2003 (%)	2004 (%)	2005 (%)	2006 (%)	2007 (%)	2008 (%)	2009 (%)	Total (%)
G1 National Bureau of Statistics	0 (0)	0 (0)	1 (0.08)	5 (0.42)	12 (1.01)	32 (2.70)	73 (6.16)	96 (8.10)	139 (11.73)	214 (18.06)	312 (26.33)	301 (25.40)	1185 (8.83)
G2 Ministry of Commerce	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	6 (0.54)	39 (3.49)	123 (11)	152 (13.60)	181 (16.19)	294 (26.30)	323 (28.89)	1118 (8.33)
G3 Ministry of Education	0 (0)	2 (0.20)	1 (0.10)	4 (0.40)	7 (0.70)	34 (3.40)	33 (3.30)	82 (8.21)	128 (12.81)	214 (21.42)	241 (24.12)	227 (22.72)	999 (7.44)
G4 Ministry of Foreign Affairs	0 (0)	0 (0)	0 (0)	0 (0)	4 (0.78)	13 (2.52)	46 (8.93)	57 (11.07)	81 (15.73)	103 (20.00)	102 (19.81)	109 (21.65)	515 (3.84)
G5 State Intellectual Property Office	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	8 (2.47)	20 (6.17)	21 (6.48)	75 (23.15)	43 (13.27)	69 (21.30)	88 (27.16)	324 (2.41)
G6 Chinese Academy of Social Sciences	0 (0)	0 (0)	1 (0.33)	3 (0.99)	6 (1.99)	14 (4.64)	34 (11.26)	50 (16.56)	68 (22.52)	54 (17.88)	45 (14.90)	27 (8.92)	302 (2.25)
G7 Ministry of Agriculture	0 (0)	0 (0)	0 (0)	1 (0.39)	1 (0.39)	2 (0.79)	12 (4.72)	20 (7.87)	35 (13.78)	56 (22.05)	49 (19.29)	78 (30.71)	254 (1.89)
G8 Ministry of Science and Technology	0 (0)	0 (0)	0 (0)	1 (0.46)	3 (1.37)	3 (1.37)	18 (8.22)	14 (6.39)	30 (13.70)	42 (19.18)	69 (31.51)	76 (34.70)	219 (1.63)
G9 The People's Bank of China	0 (0)	0 (0)	1 (0.47)	2 (0.95)	11 (5.21)	8 (3.79)	22 (10.43)	18 (8.53)	31 (14.69)	37 (17.54)	31 (14.69)	50 (23.70)	211 (1.57)
G10 Ministry of Civil Affairs	0 (0)	0 (0)	0 (0)	1 (0.52)	1 (0.52)	1 (0.52)	14 (7.33)	22 (11.52)	28 (14.66)	29 (15.18)	39 (20.42)	56 (29.32)	191 (1.42)
G11 Ministry of Health	0 (0)	0 (0)	0 (0)	0 (0)	1 (0.58)	14 (8.14)	8 (4.65)	17 (9.88)	30 (17.44)	34 (19.77)	34 (19.77)	34 (19.77)	172 (1.28)
G12 General Administration of Sport	0 (0)	0 (0)	0 (0)	1 (0.76)	0 (0)	6 (4.55)	4 (3.03)	10 (7.58)	14 (10.61)	25 (18.94)	38 (28.97)	34 (25.76)	132 (0.98)
G13 Development Research Center of the State Council	0 (0)	2 (1.79)	0 (0)	0 (0)	0 (0)	0 (0)	5 (4.46)	4 (3.57)	13 (11.61)	27 (24.11)	33 (29.46)	28 (25)	112 (0.83)
G14 Ministry of Finance	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	3 (2.86)	4 (3.81)	14 (13.33)	13 (12.38)	19 (18.10)	52 (49.52)	105 (0.78)
G15 China Banking Regulatory Commission	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2 (2.08)	9 (9.38)	10 (10.42)	13 (13.54)	28 (29.17)	16 (16.67)	18 (18.75)	96 (0.72)
G16 General Administration of Press and Publication	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	3 (3.61)	7 (8.43)	16 (19.28)	17 (20.48)	40 (48.19)	83 (0.62)
G17 National Development and Reform Commission	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	6 (7.31)	20 (24.39)	28 (34.15)	28 (34.15)	82 (0.61)
G18 Chinese Academy of Sciences	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (1.39)	11 (15.28)	7 (9.72)	20 (27.78)	11 (15.28)	22 (30.56)	72 (0.54)
G19 China Securities Regulatory Commission	0 (0)	0 (0)	0 (0)	1 (1.41)	5 (7.04)	13 (18.31)	5 (7.04)	9 (12.68)	4 (5.63)	5 (7.04)	13 (18.31)	16 (22.54)	71 (0.53)
G20 National Natural Science Foundation	0 (0)	0 (0)	0 (0)	0 (0)	1 (1.43)	2 (2.86)	3 (4.29)	12 (17.14)	3 (4.29)	15 (21.43)	12 (17.14)	22 (31.43)	70 (0.52)
G21 National Population and Family Planning Commission	0 (0)	0 (0)	0 (0)	0 (0)	1 (1.43)	0 (0)	3 (4.29)	5 (7.14)	12 (17.14)	19 (27.14)	16 (22.86)	14 (20.00)	70 (0.52)
G22 National Tourism Administration	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	5 (7.46)	11 (16.42)	5 (7.46)	8 (11.94)	8 (11.94)	16 (23.88)	14 (20.90)	67 (0.50)
G23 National Audit Office	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2 (3.33)	4 (6.67)	10 (16.67)	3 (5)	7 (11.67)	8 (13.33)	26 (43.33)	60 (0.45)
G24 Ministry of Justice	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (1.67)	8 (13.33)	8 (13.33)	10 (16.67)	17 (28.33)	8 (13.33)	8 (13.33)	60 (0.45)
G25 State Administration of Taxation	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (1.72)	7 (12.07)	9 (15.52)	17 (29.31)	16 (27.59)	8 (13.79)	58 (0.43)
G26 Ministry of Land and Resources	0 (0)	0 (0)	0 (0)	1 (1.82)	0 (0)	1 (1.82)	3 (5.45)	8 (14.55)	5 (9.09)	9 (16.36)	15 (27.27)	13 (23.64)	55 (0.41)
G27 State Administration of Foreign Exchange	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2 (4.65)	6 (13.95)	6 (13.95)	6 (13.95)	10 (23.26)	13 (30.23)	43 (0.32)
G28 General Administration of Customs	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (2.63)	5 (13.16)	7 (18.42)	5 (13.16)	7 (18.42)	13 (34.21)	38 (0.28)
G29 Insurance Regulatory Commission	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	3 (9.68)	5 (16.13)	10 (32.26)	4 (12.90)	9 (29.03)	31 (0.23)
G30 State Administration for Industry & Commerce	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2 (6.67)	1 (3.33)	2 (6.67)	7 (23.33)	6 (20)	3 (10)	9 (30)	30 (0.22)
G31 Ministry of Transport	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2 (8.33)	3 (12.50)	9 (37.50)	6 (25)	4 (16.67)	24 (0.18)
G32 Ministry of Water Resources	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (4.55)	0 (0)	5 (22.73)	5 (22.73)	6 (27.27)	2 (9.09)	3 (13.64)	22 (0.16)
G33 State Forestry Administration	0 (0)	0 (0)	0 (0)	0 (0)	2 (9.52)	0 (0)	2 (9.52)	3 (14.29)	5 (23.81)	2 (9.52)	1 (4.76)	6 (28.57)	21 (0.16)

G34 State Administration of Work Safety	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	3 (15)	4 (20)	2 (10)	7 (35)	4 (20)	20 (0.15)
G35 State Administration of Coal Mine Safety	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	3 (15)	4 (20)	2 (10)	7 (35)	4 (20)	20 (0.15)
G36 Ministry of Industry and Information Technology	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	3 (15)	17 (85)	20 (0.15)
G37 State Oceanic Administration	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (5.26)	0 (0)	1 (5.26)	10 (52.63)	1 (5.26)	1 (5.26)	5 (26.32)	19 (0.14)
G38 State Administration of Radio Film and Television	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	3 (16.67)	1 (5.56)	4 (22.22)	7 (38.89)	3 (16.67)	18 (0.13)
G39 State Ethnic Affairs Commission	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	4 (23.53)	6 (35.29)	7 (41.18)	17 (0.13)
G40 Ministry of Public Security	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (6.25)	0 (0)	1 (6.25)	2 (12.50)	2 (12.50)	2 (12.50)	8 (50)	16 (0.12)
G41 Ministry of Human Resources and Social Security	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2 (12.50)	14 (87.50)	16 (0.12)
G42 National Council for Social Security Fund	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2 (12.50)	4 (25)	1 (6.25)	3 (18.75)	6 (37.50)	16 (0.12)
G43 Chinese Academy of Governance	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2 (14.29)	2 (14.29)	0 (0)	2 (14.29)	6 (42.86)	2 (14.29)	14 (0.10)
G44 China Academy of Engineering	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (7.69)	1 (7.69)	3 (23.08)	3 (23.08)	4 (30.77)	1 (7.69)	13 (0.10)
G45 General Administration of Quality Supervision Inspection and Quarantine	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (9.09)	5 (45.45)	5 (45.45)	11 (0.08)
G46 National Energy Administration	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (10)	4 (40)	2 (20)	3 (30)	10 (0.07)
G47 Civil Aviation Administration	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (10)	0 (0)	4 (40)	1 (10)	3 (30)	1 (10)	10 (0.07)
G48 Ministry of Culture	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	3 (33.33)	4 (44.44)	2 (22.22)	9 (0.07)
G49 Ministry of Environmental Protection	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (12.50)	7 (87.50)	8 (0.06)
G50 State Administration of Cultural Heritage	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (12.50)	4 (50)	3 (37.50)	8 (0.06)
G51 Ministry of Supervision	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2 (28.57)	1 (14.29)	1 (14.29)	3 (42.86)	7 (0.05)
G52 Ministry of Housing and Urban–rural Development	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (16.67)	5 (83.33)	6 (0.04)
G53 State Electricity Regulatory Commission	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (16.67)	1 (16.67)	2 (33.33)	2 (33.33)	6 (0.04)
G54 China Meteorological Administration	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	3 (60)	1 (20)	1 (20)	5 (0.04)
G55 State Bureau of Surveying and Mapping	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (20)	0 (0)	0 (0)	1 (20)	0 (0)	2 (40)	1 (20)	5 (0.04)
G56 State Tobacco Monopoly Bureau	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	3 (75)	0 (0)	0 (0)	0 (0)	1 (25.)	4 (0.03)
G57 State Food and Drug Administration	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (25)	0 (0)	0 (0)	1 (25.00)	2 (50)	4 (0.03)
G58 State Administration of Traditional Chinese Medicine	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (33.33)	0 (0)	0 (0)	1 (33.33)	1 (33.33)	0 (0)	3 (0.02)
G59 State Administration of Grain	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (33.33)	0 (0)	2 (66.67)	3 (0.02)
G60 China Earthquake Administration	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2 (100)	2 (0.01)
G61 Ministry of Railways	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (50.00)	1 (50)	2 (0.01)
G62 State Post Bureau	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (100)	1 (0.01)
G63 State Administration of Foreign Experts Affairs	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (100)	0 (0)	0 (0)	1 (0.01)
G64 State Bureau for Letters and Calls	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (100)	0 (0)	0 (0)	1 (0.01)
G65 State Administration of Civil Service	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (100)	1 (0.01)
G66 State Administration of Science Technology and Industry for Defense	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (100)	1 (0.01)
G67 Government Offices Administration of the State Council	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (100)	1 (0.01)
G68 State Administration for Religious Affairs	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (100)	0 (0)	1 (0.01)
G69 Counselors' Office of the State Council	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (0.01)

information into 21 categories (Standardization Administration of the P.R.C., 2010).

Step 5: Classified the contents of government information into 5 categories, including news and report, regulation and policy, administrative information, public service information, and statistical report.

4. Results

4.1. Government website citation trends

As shown in Table 1, among the 5,063,237 references indexed by CSSCI from 1998 to 2009, web citations (204,019) only account for 4.03% of total citations. There are 206 web citations found in 1998 CSSCI journal articles and the web citation count increased to 42,580 in 2009. Fig. 1 presents the amount of government website citations from 23,890 journal articles in 1998 to 2009, which represents 11.71% of the total web citations. Chinese government website citations (13,419 entries) account for 6.6% of the total web citations. In terms of citing different domain names, the percentage of citation count for government websites is lower than that of commercial websites (.com, 31.33%) and of organization websites (.org, 17.94%).

4.2. Disciplinary difference in citing government websites

We examined the disciplinary difference of 411 source journals in 23 categories, including law, management, environmental science, pedagogy, economics, archeology, etc. The statistical results regarding the citation behavior are listed by year in Table 2.

Fig. 2 presents a steadily growing trend in government website citations from 1998 to 2009. The following three disciplines have above mean of government website citation ratio (11.71%), library and information science (3953, 16.55%), economics (3280, 13.73%), and political science (3278, 13.72%). For most disciplines, government website citation ratio is lower than mean, including pedagogy (2236, 9.36%), management (1846, 7.73%), law (1333, 5.58%), humanities and economic geography (611, 2.56%), journalism and communication (389, 1.63%), sociology (384, 1.61%), physical education (350, 1.47%), Marxism studies (303, 1.27%), ethnology (287, 1.20%), history (256, 1.07%), environmental science (256, 1.07%), statistics (133, 0.56%), art (83, 0.35%), linguistics (77, 0.32%), philosophy (65, 0.27%), psychology (16, 0.07%), Chinese literature (6, 0.03%), foreign literature (4, 0.02%), religious studies (1, 0.01%), and archeology (1, 0.01%) (as shown in Fig. 2).

The quantity of journals listed in CSSCI is not distributed evenly among disciplines. There are 72 journals in Economics and 37 journals in Pedagogy, but only four journals in Statistics and four journals in Religious Studies. In order to conduct an accurate analysis on web citation trends by discipline, it is essential to calculate the average count for web citations and government website citations for each journal. Fig. 3 shows that the average web citation counts per journal are 2299.1, while the average count of government website citations is 197.65 for LIS. Although LIS ranks the highest among all disciplines in citing government websites, its average citation ratio for such websites only accounted for 8.6% of all web citations. Nevertheless, the highest government website citation ratios are found in sociology (22.28%), environmental science (20.37%), humanities and economic geography (19.62%), management (16.48%), economics (16.26%), and political science (15.24%), which demonstrates the significant influence of government information on these disciplines. However, government information's impact on archeology (1%), religious studies (0.93%), Chinese literature (0.77%), and foreign literature (0.68%) is relatively small.

4.3. Ministries and commissions website citations

The most cited government websites are those of ministries and commissions directly under the State Council. We used 69 departments listed on central government website as the research samples. The

Ministry of National Defense and the Ministry of State Security are excluded from this study.

Table 3 shows the statistical results by tracing government website addresses. Due to the lack of uniform citation format, some researchers simply use URL addresses, Chinese appellations, or IP addresses as reference to the citation sources. For example, researchers just use the term Ministry of Education when citing online information from the Ministry of Education website www.moe.edu.cn, www.moe.gov.cn. In the meantime, we discovered some departments having two different URL addresses, such as the Ministry of Foreign Affairs which can be accessed via http://www.mfa.gov.cn/chn/gxh/tyb/ or http://www.fmprc.gov.cn/chn/gxh/tyb/.

Fig. 4 shows 26 ministries which are directly under the State Council and have been cited over 50 times. The National Bureau of Statistics accounts for 1185 (8.83%) of total government website citations, and is ranked number one among all departments, followed by the Ministry of Commerce and the Ministry of Education. The least cited departments are the State Post Bureau, the State Administration of Foreign Experts Affairs, the State Bureau for Letters and Calls, the State Administration of Civil Service, the State Administration of Science Technology and Industry for Defense, the Government Offices Administration of the State Council, the State Administration for Religious Affairs, and the Counselors' Office of the State Council. The citation rate in these departments is exceptionally low, since there was only 1 citation made from these departments in 12 years.

4.4. Citations of government media websites

Combining the statistical results from the previous study and the nature of government information, citation distributions from 7 government media citation sources are listed in Table 4. They are Xinhua Net (Xinhua News Agency), the People's Daily Online (People's Daily), Guangming Web (Guangming Daily), CNNIC (China Internet Network Information Center, which is under the Ministry of Industry and Information Technology), CCTV (China Central Television, which is under the Propaganda Department of the CPC Central Committee and the State Administration of Radio Film and Television), Chinese Court Net (The Supreme People's Court), and southcn.com (southcn.com is under the Propaganda Department of the CPC Guangdong Committee). Fig. 5 presents an ascending trend of government media citations by year. There are no government media citations in 1998. From 1998 to 2009, most of the citations are made by Xinhua Net (6842), whereas Guangming Web accounts for the least amount of citations (337). Further, SS&H scholars often cite information from CNNIC, which is under the direction of the Ministry of Industry and Information Technology.

4.5. Citation subjects of government websites

The influence of online government information on Chinese SS&H research can also be discussed in terms of subject distribution. The Government Information Resource Catalog System (Part 4: GBT21063.4-2007) has been used to classify the subjects for citing government websites. This standard is adopted as the principle and method in classifying e-government information into 21 first level categories and 133 second level categories. We examined the first level categories in this study and sorted cited government website information into different subjects as shown in Fig. 6 (Table 5).

There are 11,854 citations classified into the first level categories. Citations in science and education (1600), culture, health and sports (1396), business and commerce (939), general information (894), economics and management (787), and finance (781) are highly ranked in this study, as shown in Fig. 6. The results indicate the richness of government website information in these subjects and the massive information demand from scholars in these subjects. The least cited subjects for government website information includes meteorology, hydrology,
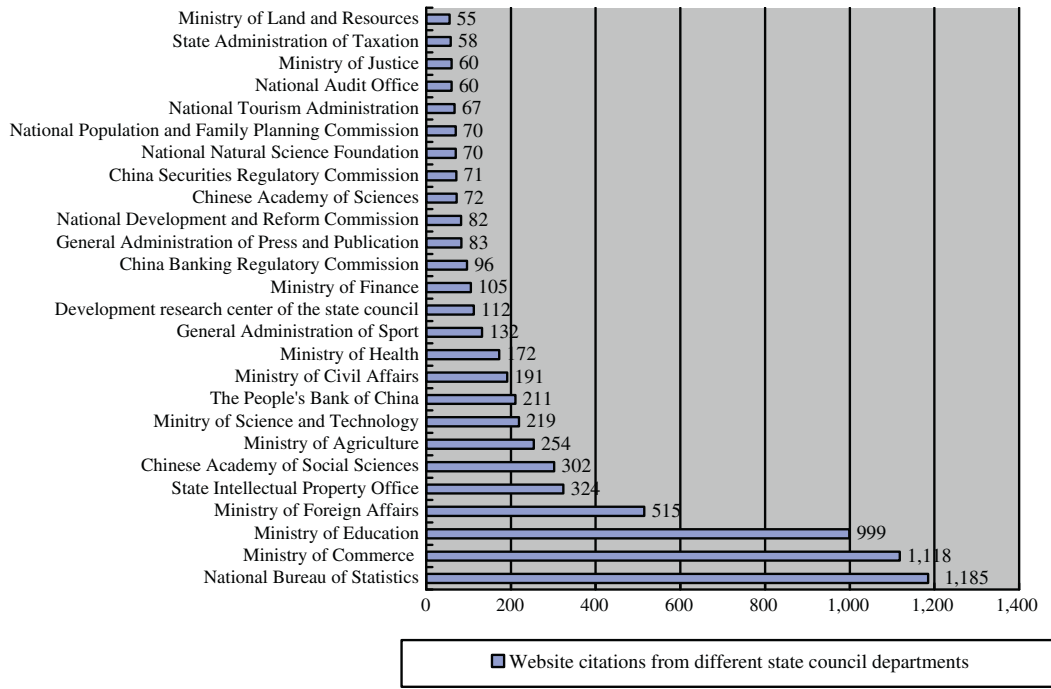
Fig. 4. Distribution of government website citations of state agencies from 1998 to 2009.

mapping, and earthquake (70), the CPC Party and the Communist Youth League (59), secretary and administration affairs (48) and military and defense (31). Based on the citation count over 12 years, we discovered limited impact of information from government websites in these subjects on SS&H.

4.6. Government website citation source types

The analysis of government website citations by source type is essential for determining which sources are highly valued by SS&H researcher. In this analysis, government information is classified into the following 5 source types:

1. News and report, released by government or media including government press briefing reports, public notices, news reports, correspondence, news criticism, editorials, and speeches.
2. Regulation and policy, including legal and regulatory ordinances, rules and regulations, instructions, guidelines, codes, standards, conventions, mandates, etc.
3. Administrative information, released by the government regarding operation and management processes, includes public hearing drafts, draft policies for comment, public announcements, and discussions. Additionally, it also includes functional documents, such as letters of intent on cooperation, plans, statements, invitations for bidding proposals, bidding proposals, contracts, letters, meeting minutes,

instruction requests, replies, notices, assessment reports, institutional reform documents, dismissal notices, and rewards and punishment announcements.
4. Public service information, which is a public announcement released by the government. It is used to raise public awareness and participation, including business processes, guidance, and information regarding education, employment, medical care, insurance, housing, transportation, and investment.
5. Information compilation, which is made by extracting, organizing, and processing the raw information into valued added information products. Information compilation not only includes statistical reports, analysis reports, monitoring reports, document collection, information briefs, anthologies, and policy briefs but also includes scientific data.

The distributions of Chinese government website citations by source type are shown in Fig. 7.

The distribution of Chinese government website citations is as follows: 5239 information compilations (39.04%), 3464 news and reports (25.81%), 1469 administrative information (10.95%), 930 public service information (6.93%), and 735 regulations and policies. The data shows a converging trend in government website citation types. Nearly 40% of the citations consist of information compilation, such as annual statistical reports and analysis reports. News and reports are another major citation type for SS&H research that accounts for

Table 4
Distribution of government media website citations from 1998 to 2009.

Government owned media	URL address	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Total
Xinhua Net	www.xinhuanet.com	0	0	0	18	51	150	410	637	1001	1210	1618	1757	6852
People's Daily Online	www.people.com	0	0	0	25	90	126	230	397	635	685	842	984	4014
CNNIC	www.cnnic.net.cn	0	2	7	17	31	46	54	62	74	102	119	121	635
CCTV	www.cctv.com	0	1	0	1	8	17	47	55	96	106	87	104	522
Chinese Court Net	www.chinacourt.org	0	0	0	0	0	2	15	26	86	78	87	109	403
southcn.com	www.southcn.com	0	0	0	0	0	7	33	43	59	87	58	61	348
Guangming Web	www.gmw.cn	0	0	0	0	1	2	6	27	75	83	72	71	337

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
☐ Guangming Web	0	0	0	0	1	2	6	27	75	83	72	71
☐ Southcn.com	0	0	0	0	0	7	33	43	59	87	58	61
☐ Chinese Court Net	0	0	0	0	0	2	15	26	86	78	87	109
☐ CCTV	0	1	0	1	8	17	47	55	96	106	87	104
☐ CNNIC	0	2	7	17	31	46	54	62	74	102	119	121
☐ People's Daily Online	0	0	0	25	90	126	230	397	635	685	842	984
☐ Xinhua Net	0	0	0	18	51	150	410	637	1,001	1,210	1,618	1,757

☐ Xinhua Net　☐ People's Daily Online　☐ CNNIC　☐ CCTV　☐ Chinese Court Net　☐ Southcn.com　☐ Guangming Web
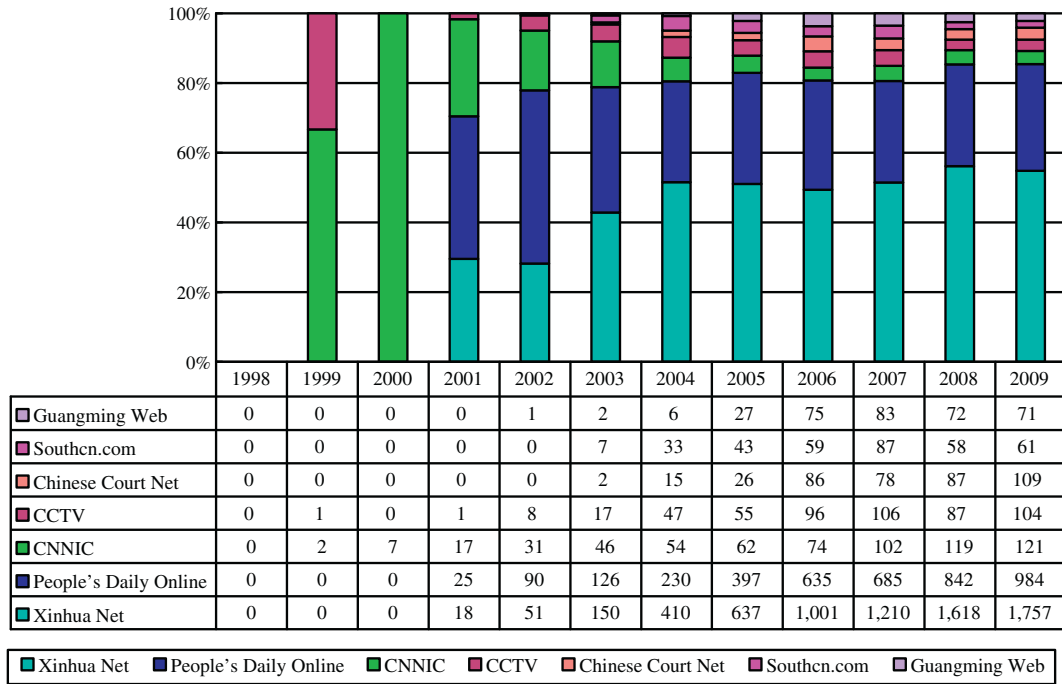
Fig. 5. Distribution of government media citations from 1998 to 2009.

one quarter of total government website citations. By comparison, public service information and regulation and policy are less cited for scientific research.

5. Conclusions and recommendations

This article investigates the current state and trend of government website information cited by Chinese SS&H journals from 1998 to 2009 with comparison to SSCI sample data. The findings suggest that by understanding the current use of information from government websites, policy makers and the SS&H research community may learn more about the future trend, and thus doing a better job in the dissemination and utilization of such information.

5.1. Government website information shows a steady increased impact on SS&H scholarly communication in China

The percentage of government website citations rose from 4.37% in 1998 to 13.63% in 2009, representing an obvious increase. However, government website citations only account for 11.71% of the total web citations, which still lag behind .com websites (31.33%) and .org websites (17.94%). It is unveiled that the overall percentage of government
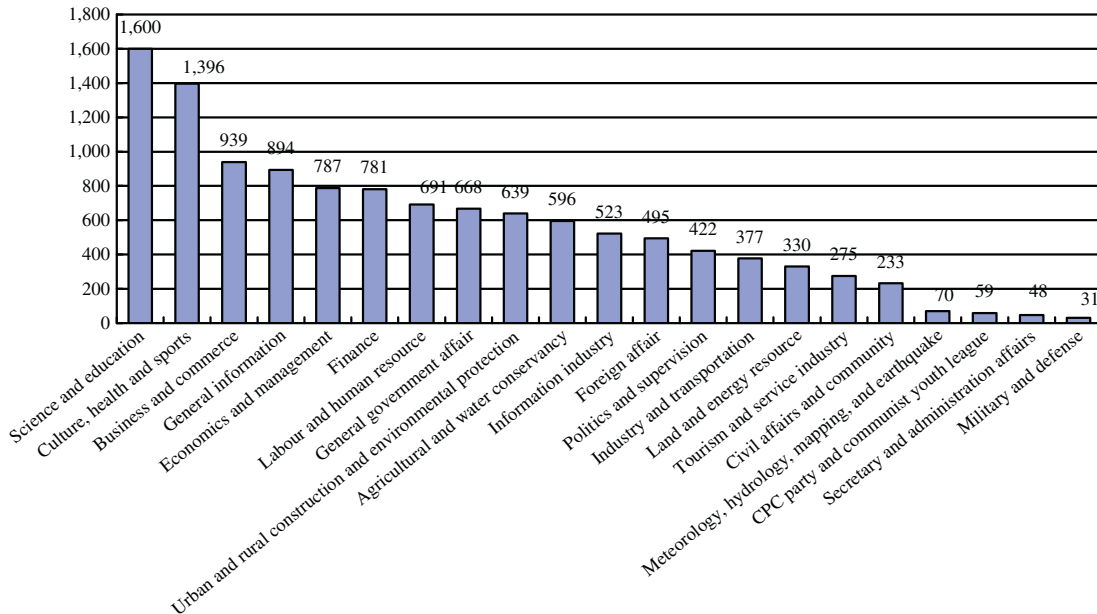

Fig. 6. Distribution of Chinese government website citations by subject from 1998 to 2009.

Table 5
Distribution of government website citations by subject.

Subject	1998 (%)	1999 (%)	2000 (%)	2001 (%)	2002 (%)	2003 (%)	2004 (%)	2005 (%)	2006 (%)	2007 (%)	2008 (%)	2009 (%)
ZA General government affair	0 (0)	1 (0.15)	0 (0)	2 (0.30)	4 (0.60)	4 (0.60)	27 (4.04)	54 (8.08)	41 (6.14)	136 (20.36)	140 (20.96)	259 (38.77)
ZB Economics and management	0 (0)	0 (0)	1 (0.13)	10 (1.27)	19 (2.41)	38 (4.83)	48 (6.10)	49 (6.23)	105 (13.34)	109 (13.85)	188 (23.89)	220 (27.95)
ZC Land and energy resource	0 (0)	0 (0)	0 (0)	1 (0.30)	2 (0.61)	5 (1.52)	13 (3.94)	36 (10.91)	49 (14.85)	51 (15.45)	76 (23.03)	97 (29.39)
ZD Industry and transportation	0 (0)	2 (0.53)	1 (0.27)	0 (0)	5 (1.33)	14 (3.71)	18 (4.77)	49 (13.00)	25 (6.63)	67 (17.77)	69 (18.30)	127 (33.69)
ZE Information industry	0 (0)	1 (0.19)	5 (0.96)	28 (5.35)	36 (6.88)	43 (8.22)	48 (9.18)	60 (11.47)	50 (9.56)	70 (13.38)	83 (15.87)	99 (18.93)
ZF Urban and rural construction and environmental protection	0 (0)	1 (0.16)	1 (0.16)	2 (0.31)	6 (0.94)	9 (1.41)	45 (7.04)	31 (4.85)	81 (12.68)	155 (24.26)	154 (24.10)	154 (24.10)
ZG Agricultural and water conservancy	0 (0)	0 (0)	0 (0)	1 (0.17)	2 (0.34)	6 (1.01)	38 (6.38)	55 (9.23)	87 (14.60%)	72 (12.08)	136 (22.82)	199 (33.39)
ZH Finance	0 (0)	0 (0)	4 (0.51)	5 (0.64)	22 (2.82)	24 (3.07)	57 (7.30)	71 (9.09)	148 (18.95)	139 (17.80)	135 (17.29)	176 (22.54)
ZJ Business and commerce	0 (0)	2 (0.21)	1 (0.11)	3 (0.32)	4 (0.43)	42 (4.47)	38 (4.05)	106 (11.29)	221 (23.54)	203 (21.62)	123 (13.10)	196 (20.87)
ZK Tourism and service industry	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	8 (2.91)	10 (3.64)	26 (9.45)	41 (14.91)	45 (16.36)	56 (20.36)	89 (32.36)
ZL Meteorology, hydrology, mapping, and earthquake	0 (0)	0 (0)	0 (0)	0 (0)	1 (1.43)	2 (2.86)	1 (1.43)	3 (4.29)	6 (8.57)	4 (5.71)	21 (30.00)	32 (45.71%)
ZM Foreign affair	0 (0)	0 (0)	0 (0)	3 (0.61)	4 (0.81)	10 (2.02)	35 (7.07)	38 (7.68)	64 (12.93)	115 (23.23)	123 (24.85)	103 (20.81)
ZN Politics and supervision	0 (0)	0 (0)	0 (0)	0 (0)	2 (0.47)	3 (0.71)	30 (7.11)	37 (8.77)	65 (15.40)	82 (19.43)	96 (22.75)	107 (25.36)
ZP Science and education	0 (0)	0 (0)	0 (0)	7 (0.44)	23 (1.44)	43 (2.69)	68 (4.25)	120 (7.50)	171 (10.69)	275 (17.19)	428 (26.75)	465 (29.06)
ZQ Culture, health and sports	0 (0)	0 (0)	1 (0.07)	2 (0.14)	7 (0.50)	27 (1.93)	45 (3.22)	73 (5.23)	229 (16.40)	299 (21.42)	358 (25.64)	355 (25.43)
ZR Military and defense	0 (0)	0 (0)	0 (0)	0 (0)	2 (6.45)	0 (0)	3 (9.68)	4 (12.90)	6 (19.35)	6 (19.35)	3 (9.68)	10 (32.26)
ZS Labor and human resource	0 (0)	0 (0)	0 (0)	2 (0.29)	5 (0.72)	6 (0.87)	33 (4.78)	65 (9.41)	113 (16.35)	136 (19.68)	162 (23.44)	169 (24.46)
ZT Civil affairs and community	0 (0)	0 (0)	0 (0)	0 (0)	1 (0.43)	3 (1.29)	11 (4.72)	11 (4.72)	73 (31.33)	27 (11.59)	56 (24.03)	51 (21.89)
ZU Secretary and administration affairs	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2 (4.17)	2 (4.17)	6 (12.50)	12 (25.00)	14 (29.17)	12 (25.00)
ZV CPC party and communist youth league	0 (0)	0 (0)	0 (0)	2 (3.39)	0 (0)	2 (3.39)	1 (1.69)	2 (3.39)	0 (0)	19 (32.20)	13 (22.03)	20 (33.90)
ZW General information	0 (0)	0 (0)	0 (0)	0 (0)	6 (0.67)	25 (2.80)	73 (8.17)	86 (9.62)	32 (3.58)	195 (21.81)	240 (26.85)	237 (26.51)
Uncertain information	0 (0)	7 (0.45)	4 (0.26)	7 (0.45)	11 (0.70)	43 (2.75)	117 (7.49)	183 (11.72)	241 (15.43)	134 (8.58)	365 (23.37)	450 (28.81)
Total	0 (0)	14 (0.10)	18 (0.13)	75 (0.56)	162 (1.21)	357 (2.66)	761 (5.67)	1161 (8.65)	1854 (13.82)	2348 (17.50)	3039 (22.65)	3627 (27.03)

website citation in relation to total web citation is 16.23%, which is lower than .org websites (31.35%) and .com websites (24.10%). Although CSSCI journal government website citation ratio (11.71%) is lower than SSCI journal (16.23%), it has increased at a rate higher than SSCI journals. The statistics indicate that government website information has lower impact on Chinese SS&H scholarly communication than its international counterpart, but its impact is steadily increasing in China. The findings suggest that the influence of Chinese government web information on SS&H scholarly communication is expanding.

5.2. The influence of government website information is higher on Chinese social science but lower on humanities

By discipline, most of the government web citations are generated in LIS, Economics and Political Science. Nevertheless, the disciplines that have the least government web citations are psychology (0.07%), Chinese literature (0.03%), foreign literature (0.02%), religious studies (0.01%), and archeology (1 citation, 0.01%). Such difference among disciplines may cause discrepancy in scholars' behavior when citing information from government websites. However, since the frequency of citing government website information is highly related to disciplinary research methodology, it signifies that there is no positive correlation between the amount of web citations and government website citations. Chinese social sciences disciplines indexed by CSSCI such as library and information science (16.55%), economics (13.73%), management (7.73%), political science (13.72%) and pedagogy (9.36%), which have higher percentage in citing government website information than those indexed by SSCI 2.02%, 6.26%, 7.22%, 6.01% and 3.32% respectively. On the contrary, Chinese humanities disciplines such as history and linguistics have a lower percentage in citing government website information when indexed in CSSCI than in SSCI (1.07% and 0.32% vs. 2.17% and 6.56% respectively). It is suggested that it is better for researchers in these disciplines to look for alternate sources of information indexed in SSCI database in lieu of CSSCI in terms of citing government information.

5.3. Chinese scholars put increasing emphasis on citing authoritative central government website information or highly visible government-owned media information as supporting evidence

Chinese scholars increasingly choose to cite website information from ministries and commissions directly under the State Council and varied government-owned media. The most frequently cited sources are the National Bureau of Statistics, the Ministry of Commerce, and the Ministry of Education while the State Post Bureau, the State Administration of Foreign Expert Affairs, the State Bureau for Letters and Calls, and local government website are the least cited sources. Government-owned highly visible media such as Xinhua Net (owned by Xinhua News Agency) and the People's Daily Online (owned by People's Daily) have high citing rate, while thousands of local government websites and local government-owned media agencies are rarely cited. It is thus deemed necessary for local government and local government-owned media to publish more high-value information and to enhance their influence.

5.4. Chinese scholars prefer to cite current social topics with processed data

Government website information in education, culture, economics, finance, and other social topics have been frequently cited, while meteorology, hydrology, topography, and other academic fields as well as history, language and other humanities disciplines are rarely cited. Further analysis reveals that information compilation is one of the most cited government website information types. Edited and value added documents, such as statistical reports, statistical data, and analysis are often cited. It is further disclosed that the economic and social development statistics bulletin have been cited 334 times. Therefore, it is recommended to develop policies to encourage the disclosure and
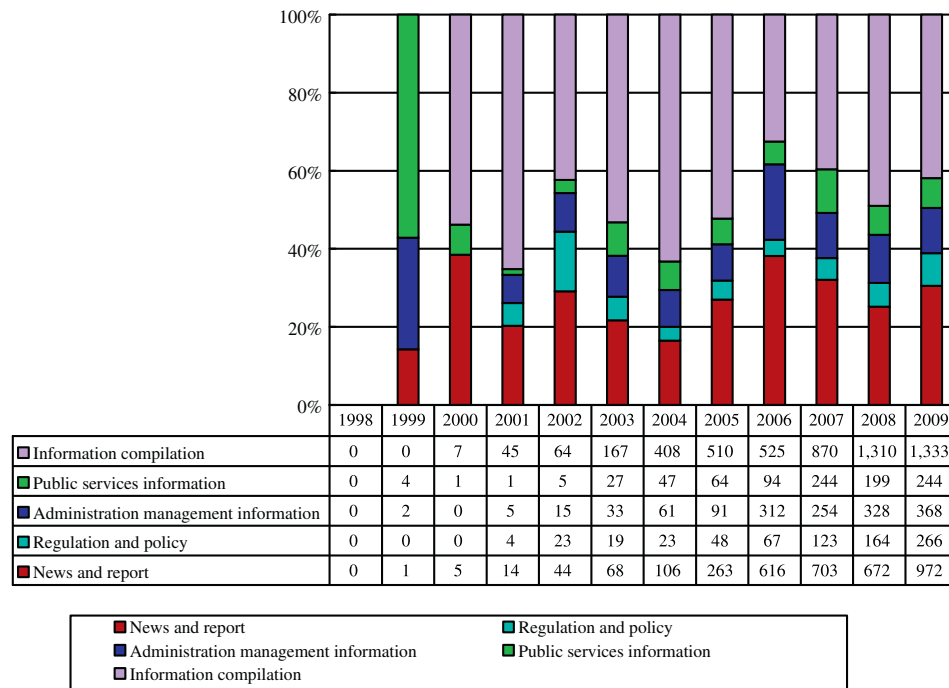
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
▣ Information compilation	0	0	7	45	64	167	408	510	525	870	1,310	1,333
▣ Public services information	0	4	1	1	5	27	47	64	94	244	199	244
▣ Administration management information	0	2	0	5	15	33	61	91	312	254	328	368
▣ Regulation and policy	0	0	0	4	23	19	23	48	67	123	164	266
▣ News and report	0	1	5	14	44	68	106	263	616	703	672	972

■ News and report　　　　　　　　　　■ Regulation and policy
■ Administration management information　　■ Public services information
■ Information compilation

Fig. 7. Distribution of Chinese government website citations by type from 1998 to 2009.

diversification of data to make citations more balanced among social and technological topics.

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