

## China's Social Credit System: Data, Algorithms and Implications

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### **Abstract:**

Data and algorithms for China's social credit system (SCS) are a topic of great current interest. Nonetheless, few details regarding China's SCS have been officially released. What is clear, however, is that China's social credit system uses broader criteria than Western systems to rank and rate entities. The system is expected to operate through a wider range of mechanisms at the public and private spheres in order to assess the trustworthiness of individuals, businesses, and professional sectors with a goal to reward good behaviors and punish bad behaviors. A full implementation SCS is expected to have wide-ranging impacts on the lives of individuals and organizations than Western-style credit systems. The SCS can be considered an instrument of an overarching ideology that simply reflects the interests of the CCP leaders.

**Keywords:** companies | government | economics | blacklisting | market research

### **Article:**

In 2014, China's State Council developed a roadmap and issued guidelines for establishing a social credit system (SCS) by 2020. By then, every adult will have a credit code in addition to a government-issued identity card. The existence of such a plan was reported in a document, which circulated through various levels of government (<https://chinacopyrightandmedia.wordpress.com/2014/06/14/planning-outline-for-the-construction-of-a-social-credit-system-2014-2020/>). Its broader aims include the promotion of positive economic and moral (promotion of socialist core values, such as patriotism, respecting the elderly, and working hard) behaviors. Factors, such as financial standing, criminal record, and social media behavior, will be used to assign every citizen a numerical rating (<http://www.ibtimes.com/china-use-big-data-rate-citizens-new-social-credit-system-1898711>). It is argued that the information included in the rating may also include what books people read.

Individuals with bad credit are likely to be subject to various sanctions, such as financial penalties (e.g., no housing or credit to start a company) and ineligibility for certain jobs.<sup>2</sup> High-status and influential positions, such as government official, news reporter, and CEO of a company, may require a certain minimum score.

As of early 2018, pilot versions of the program had been implemented in 30 cities (<https://theweek.com/articles/752442/chinas-black-mirror-moment>), which increased to 43 by early 2019 (<https://www.thenation.com/article/china-social-credit-system/>). The stated goal of the plan has been to contribute to constructing a harmonious socialist society. It aims to provide mechanisms for “rewarding trustworthiness and punishing untrustworthiness” (<https://www.bloomberg.com/opinion/articles/2019-01-24/why-china-s-social-credit-systems-are-surprisingly-popular>).

To be clear, China's SCS is more than just a single system. It uses several systems and uses punishments and rewards in order to improve governance and discourage disorder and fraud.

## **SOPHISTICATED AND COMPLEX ALGORITHMS**

There is little public information as to how the SCS will operate when it is fully implemented (<https://www.insurancejournal.com/news/international/2019/02/25/518567.htm>). The SCS uses extremely sophisticated and complex algorithms. Until now, there has been no such thing as a national “social credit score.” The criteria used in the SCS varied across municipalities that have implemented it. They have used systems based on letters or points. Different municipalities had different names, such as Plum Blossom Social Credit in Suzhou and Jasmine in Xiamen. Almost all have relied on data from social networks or smartphone apps and video surveillance (<https://www.thenation.com/article/china-social-credit-system/>).

A group of researchers recently used content analysis machine learning tools to analyze hundreds of thousands of entries from the Beijing SCS website (<https://www.cybertrust.in.tum.de/fileadmin/w00bzf/www/papers/2019-FAT-Engelmann-Chen.pdf>). The researchers found a higher degree of clarity as to how individuals and businesses get punished. For instance, most people on the blacklist had failed to pay their debts or committed a traffic violation. However, the positive list, also known as the redlist, was found to have a higher degree of vagueness. For instance, the individuals on the redlist were there for volunteer activities. However, there was a lack of clear criteria for defining what makes an individual a great volunteer.

### **Data and Algorithms From Government Departments and Private Sector Companies**

Based on this broad objective, various government departments and private sector companies are providing data and algorithms for the SCS. Some foundation for the SCS had already been laid by as early as 2015. In June 2015, the website of Credit China ([creditchina.gov.cn](http://creditchina.gov.cn)) was launched, which contained more than 1.13 million pieces of information on credit histories of some Chinese residents and firms, such as tax avoidance and failure to follow court rulings. Credit China's information comes from various government departments, such as the State Administration of Taxation, Supreme People's Court, National Development and Reform Commission, and the China Securities Regulatory Commission and local governments ([http://english.gov.cn/policies/latest\\_releases/2015/07/01/content\\_281475138273106](http://english.gov.cn/policies/latest_releases/2015/07/01/content_281475138273106)).

The government assigns universal social credit codes to organizations. These codes can be used as an ID number for the purpose of activities, such as registration and tax payments. Likewise,

all individuals have a national ID number. The existing social credit blacklists rely on these numbers. However, these codes currently are not scores or rankings.

The algorithms and data developed and collected by private companies are also expected to be used. China has given permission to ten private companies to launch internet-based credit rating and ranking systems, which include Alibaba's Ant Financial and Tencent's paywall (<http://qz.com/519737/all-chinese-citizens-now-have-a-score-based-on-how-well-we-live-and-mine-sucks/>). Alibaba's Sesame Credit is arguably the system that is most admired by government authorities (<https://www.thenation.com/article/china-social-credit-system/>).

Some of the data are already used in government trials. For instance, since 2015, Hangzhou's system made use of the private credit-scoring system Sesame Credit. Unlike Western-style credit systems, Sesame takes into account a broad range of financial and social behaviors to assess consumers' trustworthiness and creditworthiness.<sup>3</sup>

Sesame Credit is supposed to serve the same basic functions to traditional credit scores, such as Fico in the U.S. Sesame Credit, however, uses opaque algorithms to determine creditworthiness. It monitors people's buying habits, credit records, and social circles. Its social credit scores also use a debtor's social network. This means that low-score contacts will negatively affect a consumer's score (<https://theconversation.com/chinas-dystopian-social-credit-system-is-a-harbinger-of-the-global-age-of-the-algorithm-88348>). While Sesame scores vary from 350 and 950, how Sesame's algorithms calculate the number is anybody's guess.

While banks store large amounts of consumer data on spending habits, strict regulations prohibit them from exploiting the data. Banks' lending decisions largely rely on standard industry scores. On the other hand, tech companies often exhibit a tendency to think they can store and analyze any data. Tech companies are subject to less strict regulations than banks and, thus, are more likely to engage in the abuse of personal information<sup>7</sup>.

### SCS in Relation to the Goals of the Chinese Communist Party

Understanding the goals of the Chinese Communist Party (CCP) is critical in order to get insights into this system. Broadly speaking, China's state strategies toward ICTs have been to balance economic modernization and political control.<sup>8</sup>

Table 1 presents some major categories of factors that are likely to be included in the SCS. The first thing that seems pretty clear is that a key goal of the CCP is to maintain the party's power monopoly. The CCP is, thus, interested in using modern ICTs as a tool for maintaining its political dominance and preventing the opposition from challenging that dominance. In this way, the SCS is viewed as an attempt by the CCP to take advantage of the advancement in computing and telecommunications and use sophisticated technologies such as artificial intelligence to tighten its grip over the public (<https://www.insurancejournal.com/news/international/2019/02/25/518567.htm>).

**Table 1.** Some major categories of factors likely to be included in the SCS.

Category	Explanation	Some possible examples of data (positive/negative impact on social credit)
Political activity and ideology	Negative attitudes towards the ideology of the CCP and behaviors that go against the norms of the CCP are penalized.	<ul style="list-style-type: none"> <li>• Criticizing the government on social media (-)</li> <li>• The nature of books read (+/-)</li> </ul>
Engagement in criminal, illegal, immoral and socially deviant lifestyle and behaviors	The rule of law is an important factor in determining the CCP's legitimacy. Also a stated goal of the plan is to contribute to constructing a harmonious socialist society.	<ul style="list-style-type: none"> <li>• Engagement in fraud and embezzlement (-)</li> <li>• Running a red light (-)</li> <li>• Selling contaminated and tainted food to consumers (-)</li> <li>• Using expired tickets, occupying reserved seats, smoking or playing music too loud on trains (-)<sup>8</sup></li> <li>• False advertising (-) (<a href="https://tinyurl.com/y3smwjoy">https://tinyurl.com/y3smwjoy</a>)</li> <li>• Generation of excessive pollution by companies (-)</li> <li>• Walking dog without a leash (-)</li> <li>• Causing public disturbances (-) (<a href="https://tinyurl.com/yd53emua">https://tinyurl.com/yd53emua</a>)</li> </ul>
Social engagement, interactions and nature of social networks	These factors can contribute to construction of a harmonious socialist society, reward trustworthy behaviors and punish untrustworthy behaviors	<ul style="list-style-type: none"> <li>• Taking care of parents (+)</li> <li>• Giving to charity (+)</li> <li>• Engaging in volunteer activities (+)</li> <li>• Being friends with "untrustworthy" individuals (-)</li> </ul>
Role as a productive citizen	Citizens that engage in productive economic activities contribute to the CCP's goal of economic modernization and promote socialist core values.	<ul style="list-style-type: none"> <li>• Spending too much time playing video games (-)</li> </ul>
Responsible consumer behavior	A goal of CCP is to promote positive economic behaviors that support socialist values.	<ul style="list-style-type: none"> <li>• Spending money on unnecessary products (-)</li> <li>• Avoiding extravagant consumption (+)</li> </ul>
Responsible financial behaviors	Responsible financial behaviors can promote the well-being of citizens.	<ul style="list-style-type: none"> <li>• Paying bills on time (+)</li> </ul>

China heavily regulates organized civil society groups, free speech, and other civil rights. It is, thus, possible that the SCS may punish engagement in activities that are considered to be against what China classifies as anti-CCP actions.<sup>5</sup>

This program is reported to have remarkable similarities with the former East German system the Stasi. The Stasi is considered to be "[a]mong the most brutal and successful intelligence surveillance organizations of the Cold War Years." Virtually all factories, offices, military units, schools, universities, hospitals, churches, and other organizations were believed to have Stasi informers.<sup>9</sup> Modern technologies have enabled authoritarian governments to do things that were not possible during the Stasi era. Some analysts view the program as an expansion of the intensive surveillance of "sensitive groups, such as dissidents to include all people."<sup>2</sup>

Publicly questioning or challenge the viewpoint of the CCP would lead to a lower credit score. For instance, behaviors, such as those lowering one's score, were reported to include posting political opinions without the government's prior permission and describing a different history

than what the government has told would lead to a reduction in social credit. Publishing anything that annoys and embarrasses the government, such as the news related to the 2015 Shanghai stock market collapse, would also lower the score. It is argued that information included in the rating may also include what books people read.

The base of the CCP's legitimacy has shifted from Marx–Leninism to economic growth and prosperity. The CCP, thus, expects Chinese citizens and the country's firms to engage in socially or economically productive behavior. Thus, whereas the Stasi's goal was to minimize the threat of a revolt against the totalitarian government, China's credit code has broader aims, including the promotion of positive economic (e.g., avoiding extravagant consumption) and moral (promotion of socialist core values, such as patriotism, respecting the elderly, and working hard) behaviors. In this regard, many of the factors presented in Table 1 are linked to the CCP's goal of encouraging activities that support economic growth and prosperity and promote a positive image of the country.

## **IMPLICATIONS FOR INDIVIDUALS AND ORGANIZATIONS**

To be clear, the SCS is much more than a credit score in the financial sense. For instance, individuals with a bad “credit code” may experience negative consequences, such as being ineligible for certain jobs, housing, or credit to start a company. Likewise, a certain score may be needed to get a specific job.<sup>2</sup>

Individuals may not be able to get a loan or mortgage even if they engage in nonfinancial offenses, such as arguing with neighbors. Likewise, nonfinancial “good deeds” such as blood donation can lead to a reduced interest rate for loans.<sup>3</sup>

Individuals with a bad SCS score may not be able to buy business class train tickets. Some may not be able to take trains or flights at all.<sup>4</sup> In 2018, China banned people from buying plane or train tickets 23 million times due to low social credit scores (<https://www.theverge.com/2019/3/1/18246297/china-transportation-people-banned-poor-social-credit-planes-trains-2018>). Children are banned from going to elite schools if their parents lack a good social credit (<https://www.independent.co.uk/news/world/asia/china-social-credit-system-school-ban-family-travel-a8821371.html>).

Some apps would allegedly tell users if they are near someone who defaulted on debts (<https://tinyurl.com/yd53emua>). An important point to note is that privacy is not viewed as an important issue in China. The website of Credit China allows anyone to check anyone else's credit score. Moreover, a person's score is also a function of political opinions held by and behaviors of the person's friends and acquaintances. This means that individuals that have publicly opposed the CCP's ideology or defaulted on debts are likely to have more limited social networks.

Beijing's blacklist and redlist reportedly contain more companies than individuals. In 2018, over 3.59 million enterprises were added to the official blacklist (<https://www.scmp.com/economy/china-economy/article/2187332/chinas-social-credit-system-report-shows-richest-provinces-are>). Companies can be blacklisted for a number of reasons, such

as engagement in fraud and generation of excessive pollution. Blacklisted companies are not allowed to bid on projects, access security markets, take part in land auctions, and issue corporate bonds (<https://www.scmp.com/economy/china-economy/article/2187332/chinas-social-credit-system-report-shows-richest-provinces-are>). This might be an indication that China is implementing the social control mechanism more aggressively onto companies.<sup>4</sup>

In general, rewards are mostly handled by commercial entities. Individuals with good scores may get discounts at local businesses, pay lower heating bills, or get special invitations to community events (<https://www.npr.org/2018/10/31/662436265/china-tests-a-social-credit-score>). The state handles the punishments. Both work hand on hand to encourage socially responsible behavior.<sup>3</sup>

## SUMMARY

Data and algorithms for China's SCS are a topic of great current interest. Nonetheless, few details regarding China's SCS have been officially released. What is clear, however, is that China's social credit system uses broader criteria than Western systems to rank and rate entities. The system is expected to operate through a wider range of mechanisms at the public and private spheres in order to assess the trustworthiness of individuals, businesses, and professional sectors with a goal to reward good behaviors and punish bad behaviors.

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