

# **The Technocratic Trend and Its Implication in China**

By

Jungwon Yoon  
School of History, Technology, and Society  
Georgia Institute of Technology  
685 Cherry Street, NW  
D.M. Smith Bldg.  
Atlanta, Georgia 30332-0345

Presented at the Science & Technology in Society: An International Multidisciplinary Graduate Student Conference, Washington, DC, March 31-April 1, 2007

## **Abstract**

*Since the early 1980's, the post-Mao China has been governed by three generations of technocratic leadership. As a result of massive elite transformation under new leadership of Deng Xiaoping in the 1980s, technocrats emerged at the core leadership of the Chinese Communist Party in China. In fact, China is now governed more and more by men who trained in higher education in science and engineering fields. Full-fledged technocratic leadership is firmly established in Chinese politics. During the past two decades, however, three successive generations of this technocratic leadership in China, specifically described as 'the engineers-turned-politicians,' have promoted the national economic growth and led to modernization. This technocratic trend embedded in Chinese politics now has important implications for social, environmental, and political issues emerging in China today. At the same time, it also raises the questions for future Chinese leadership and its accompanying effects.*

## **Introduction**

The massive Chinese elite transformation of the 1980s serves as the opening of 'new technocratic era' in the contemporary China. After the death of Mao Zedong in 1976, who was a founder of the Chinese Communist Party (CCP), new generation of leadership, characterized as technocratic, has become dominant in the political realm of Mainland China. Under Deng Xiaoping in the early 1980s, CCP engaged in recruiting new members from different social and occupational backgrounds into leadership (Cheng and White 2003). While the CCP, under Mao's regime, was largely led by soldiers, peasants, and the worker class, in post-Mao China, they were all replaced by highly educated scientists and engineers.

In order to achieve successful political and economic reform, Deng Xiaoping and his associates employed the 12<sup>th</sup> Party Congress (1982-87) in the early 1980s to begin the replacement of the revolutionary elite generation by a technocratic elite generation (Mills 1983). Subsequently, this elite transformation reached a peak in the 13<sup>th</sup> (1987-1992), 14<sup>th</sup>

(1992-1997), and 15<sup>th</sup> (1997-2002) Congress. Most new leaders in post-Mao China were “men trained as engineers and natural scientists who have worked as engineers, economic planners, and industrial manager” (Zang 1993, 789). In recent years, the dominance of the technocratic leadership is still clearly found in the composition of the Central Committees (CC) of the 16<sup>th</sup> Congress of the CCP, which is regarded as a political elite group in the country. The “technocratic turnover”, occurred in the early 1980’s, in fact, has marked a turning point to make a stepping stone of national modernization and economic development in China. The successful reforms under the technocratic leaderships since the early 1980s resulted in unprecedented rates of economic growth in China.

In addition, the significant elite transformation and large influx of technocratic experts into politics, consequently, pave the way to produce a larger number of scientific elites in Chinese society. In fact, elite transformation in post-Mao China brought about social changes during the past two decades: 1) college enrollment has greatly increased over this period; 2) a majority of college students are engineering majors; and 3) a majority of middle-level and high-level cadres are highly educated (Cheng and White 1990). In recent years, there has been a remarkable increase in the number of both foreign and domestic graduate degree recipients, especially in science and engineering (S&E). As a result of the meritocratic and technocratic trends, China has now produced the largest number of S&E degree recipients in the world, who have enough potential to be elite technocrats in future.

This paper examines technocratic trends in Chinese politics in which the full-fledged technocratic leadership was established. In order to do this, I pay particular attention to the distinctive features of Chinese technocrats, so called ‘engineers-turned-politicians’ based on the following inquiries: 1) what are the origin and background of Chinese technocratic elites?; 2) how have they come to power?; 3) in what ways do they differ from their

predecessors as well as their counterpart of West?; and 4) what does this technocratic leadership imply in Chinese society?

In the following sections, I first review the literature on technocracy and the Chinese historical context for technocracy, then describe the empirical data and discuss some of findings and its implications.

### **China's Technocracy: Theoretical and Historical Perspectives**

The theory of technocracy first appeared by Howard Scott in the United States in the early 1930s (Akin, 1997). In general, “the word “technocracy” was adopted by a social movement in the United States in response to the Great Depression” (Cheng and White 1991, 369). During the depression, some advocates of technocracy argued that modern socio-economic problems could only be solved by application of the natural sciences. Thus, early ideas of technocracy are that 1) “modern problems, which originate from technological change, can only be reduced by the application of more advanced technology and 2) government, which was supposed to handle all types of problems, should consist of experts—particularly scientists and engineers” (Cheng and White 1991, 368).

From the technocracy advocate's perspective, elite transformation is in accord with the functional needs of societies, so that the most highly valued skills tend to become the basis elite recruitment (Zang 1993). For example, when religion is highly value in society, priests are the elite; when political orthodoxy is valued, personal commitment to official ideologies becomes a prerequisite for high status (Cheng and White 1990). In the same manner, in contemporary society, under the impact of progressing scientific and technological revolutions, scientific and technical expertise has become a basic credential for leadership (Zang 1993). As Daniel Bell (1974, 358) points out, “in the post-industrial society, technical skill becomes the base of and education the mode of access to power; those (or the elite of the

group) who come to the fore in this fashion are the scientists.” “Society is now complex that only experts can estimate the implications of a decision, therefore, technical expertise should become a prerequisite for leadership“ (Cheng and White 1991, 368). Based on these assumptions, technocracy is defined as “a political system in which the determining influence belongs to technicians of the administration and of the economy“ (Bell 1973, 348), and “a technocrat is a trained professional with a leadership position” (Cheng and White 1991, 368).

However, since the idea of technocracy first appeared in the West, Western-oriented concept of technocrat may be not completely compatible to Chinese case. According to Guy J. Pauker (1976), Western technocratic ideas were in “response to the disruptions created by the impact of science and technology in countries which were industrializing successfully” (Pauker 1976, 1199). On the other hand, Chinese technocrats are primarily economic planners, concerned with the question of how to overcome various obstacles to the modernization and development of their countries, and aiming at achieving rapid economic growth.

In addition, given that the notion of technocracy in the West emerges from, and operates within the framework of political freedom and democracy, Western technocrat may tend to more interest in technical rather than political issues and concern themselves with tasks rather than power (Zang 1993). However, one might also think that technocrat may abuse power and undermine democracy because of their control over the flow of information, but this view is usually rejected, since the legitimacy of Western technocracy, in general, lies in technical expertise rather than in certain political ideology and power (Zang 1993).

By contrast, some scholars of socialist countries found that communists in former Eastern Europe and the Soviet Union were replaced by pragmatic technocrats who are the post-communist political elite. They argue that “under the impact of industrialization, a new managerial-technocratic class primarily composed of intellectuals would emerge” (Cheng and

White 1991, 372). According to Kendall Bailes (1978), in the Soviet Union, after Stalin's death, Soviet technical experts emerged as "the single largest element from which the ruling elite have been recruited" (Bailes 1978, 3). The emergence of political technocrats in post-Stalin Eastern Europe between the late 1950s and late 1980s may be similar to its counterpart of post-Mao China.

In brief, notions of Western technocracy do not fit well the case of post-Mao technocratic leadership. For example, according to Max Weber (1992), contemporary politics consists two groups of new elites—technically trained professional career administrators and professional party politicians. However, this can not be applied to China, where no clear line now divides the politicians from the technocrats since the technocrats in China are all simultaneously party officials (Cheng and White 1990). In this case, political technocracy would be a better typology for the current Chinese leadership than the general notion of technocracy. Therefore, the theory of technocracy, used in earlier studies of post-industrial countries and post-Stalin Eastern Europe, can be partially adapted to Chinese case.

#### *China's Transition to Technocracy*

Some scholars argue that China was traditionally a meritocratic society, but this meritocratic tradition was sharply reversed in Mao's regime, especially during the Cultural Revolution (Cheng and White 1990). In traditional China, education served as a main path to upward social mobility. Although not all members of the ruling class were educated, "passing official exams was just one of the mechanisms for social and political mobility" (Cheng and White 1990, 17). Some Chinese scholars also argue that "money could be directly translated into higher statuses through the purchase of studentship, offices, and official titles" (Ping-ti 1967, 256) but education was usually "ladder to success" (Cheng and White 1990). However, men who hold "official position through examination were always generalists, not specialists, not technocrats in a modern sense" (Cheng and White 1990, 17).

During the Republican period from 1912 to 1949, “China experienced ceaseless civil conflicts between warlords” (Cheng and White 1990, 18), and then between political parties—the CCP and the Nationalist Party. At that time, a majority of political leaders came from the military field. On the other hand, during the Mao’s era, a large number of peasants, workers, and soldiers, many of them illiterate flocked into the Red Army and CCP (Cheng and White 1990). As a result, a majority of political leader were soldiers, peasants and members of the urban lower-middle class (Scalapino 1972). The recruitment to cadre positions was generally based on class background, seniority in joining the CCP, and political loyalty—rather than on education background, technical training or administrative competence.

However, this trend was reversed after Deng Xiaoping moved to the top of the power structure following the death of Mao in 1976. In 1978, as a vice-premier, Deng constantly claimed that “intellectuals should not be treated as an “alien force” but should be respected as the “core of the modernization programme”” (Cheng and White 1990, 12). As the leading modernizer, he launched the post-Mao reforms with the motive forces: 1) first and foremost, the party under the leadership of the modernizers was seeking to revive the broken-down economy and full of poverty in the country and 2) the party and other elites in the government and military have united on a clear ambition to propel China toward the ultimate goal of becoming a modern, industrial economy of wealth and advanced technologies. Thus, during the reform era, old revolutionary cadres were replaced with people who are politically reliable, young, better educated, and professionally competent. A majority of these new leaders are all educated engineers. Thus, this massive leadership transition in the early 1980s identifies the emergence of technocracy in post-Mao leadership.

Li Cheng and Lynn White’s study (1990) also shows that the Chinese political elites in the early 1980s consist mainly of specialists who are trained in natural and physical sciences,

instead of generalists. In their study, three traits—technical education, professional occupation and leadership position—are all basic criteria in the definition of a technocrat. By examining the educational backgrounds, academic major, careers and recruitment pattern of the 13<sup>th</sup> Central Committees (CC) of the CCP, they found that technocrats played a role of both party officials and government bureaucrats. In addition, they argue that new elite technocrats have come to power both because of their advanced educational background and because of protégé systems. Consequently, the recruitment and promotion of new technocratic leaders is based on personal connections as well as on educational criteria and formal procedure.

By contrast, Xiawei Zang, in his studies of the CC of the 14<sup>th</sup> CCP, argues that the post-Mao Chinese leadership should be “viewed as bureaucratic or political technocracy, rather than just a technocracy”(Zang 1993, 792). In his study, Zang distinguishes sharply between two important terms—technocrats and bureaucrats. While Zang follows Cheng and White’s definition of technocrat, he distinctively defines bureaucrats as state or party cadres who have worked in the government system and organization with or without college engineering degrees. Zang contends that “the rise of technocratic experts in politics has not resulted in their monopoly of political power in post-Mao China; career bureaucrats are an important political force” (Zang 1993, 801). In his analysis, the 14<sup>th</sup> CC (1992-1997) of the CCP is “characterized as an alliance between career bureaucrats and technocrats” (Zang 1993, 801). Zang argues that the career bureaucrats need the technocrats for their advice and expertise toward the national goals of economic development and modernization, and thus need to share power with them. The technocrats, however, also “need to cooperate with the career bureaucrats in order to climb up the political hierarchy” (Zang 1993, 801). Thus, in the post-Mao leadership, the technocrats have come to power because of their party patrons and membership and also they are largely interested in power. Zang asserts that “both

bureaucrats and technocrats were promoted during the 1980s and did not replace each other” (Zang 1993, 801). Indeed, they maintained their alliance for climbing the political ladder.

In another study of the 15<sup>th</sup> CCP leadership, Cheng and White reveal that top technocrats are no longer under the shadow of political patrons or other veteran leaders. The composition of the 15<sup>th</sup> CC of the CCP was clearly dominated by technocrats. All members of the Standing Committee (SC) of the CC’s Politburo (PB), the most powerful group in the country, are technocrats (Cheng and White 1998). After Deng’s death in 1997, Jiang Zemin—China’s top technocrat became the core of the third generation of leadership in the CCP. Under Jiang’s leadership, the 15<sup>th</sup> Party Congress finally endorsed a full-fledged technocratic leadership (Cheng and White 1998). Cheng and White also argue that although China’s technocratic elites have come to power because of their educational and professional qualification, nepotism and particularism remain influential in the formation of the 15<sup>th</sup> CC in succession to the 13<sup>th</sup> and 14<sup>th</sup> Party Congresses.

Therefore, based on theoretical concept and assumption of technocracy and empirical studies, this study explores elite transformation and characteristic of elite technocrats in recent leadership of the CCP. The study primarily follows the analytical framework of the Cheng and White’s 2003 study of Chinese technocrat. As a result, their concept and definition are used in this study.

## **Data and Method**

In order to trace origin and characteristic of technocrat in the political leadership in China, this study examines the most elite groups in the country—Central Committee (CC) of the CCP, including the CC’s Politburo (PB) and its Standing Committee (SC), and the Chinese Academy of Science (CAS). Three types of data about members of above-mentioned elites groups are described: 1) demographic data on age and sex; 2) educational

backgrounds; and 3) career and recruitment pattern, including work experiences in different organizations (e.g., party, government administration, military). All data source and table employed in this study are mostly derived from Cheng and White's studies (2003) and Cong Cao's publication of *China's Scientific Elite* (2004).

### *The Central Committees of the CCP*

Many Chinese political studies have focused on the CC of the CCP to understand the country's politics. According to Zang (1993, 787), "the CC has served as a useful avenue for top policymakers to transmit ideas to Chinese society, and its composition may be seen as an institutional expression of developmental approaches." In general, the membership of the CC represents China's political elites, and "change in the composition of the CC often reflect broad social, economic, and political changes in the country at large" (Zang 1993, 787). Particularly, the SC of the CC's Politburo indicates the most powerful political figures in Chinese politics. Among those three political elite groups—SC, CC, and PB—technocrats are identified as people who have three traits: technical educations at the college level or above in S&E, professional experiences, and leadership. In order to assess trend of technocrat in the leadership of CCP, the study mainly uses data for biographical traits of all 356 16<sup>th</sup> CC members (in 2002, a total of 189 party leaders were elected to full membership and 158 named as alternates).

### 2) *The Chinese Academy of Science (CAS)*

This study also examines scientific elite group in China—the Chinese Academy of Sciences in Beijing. CAS is at the top of the scientific hierarchy in PRC and is a type of an academy which combines research with honor conferring activities. CAS is a unique group of scientists in China, possessing a reputation similar to their counterparts in other countries, such as members of the National Academy of Sciences in the United States, fellows of the

Royal Society of London in England (Cao 2004). Recently, CAS comprises eighty-four research institutes with 45,000 research staff scattered throughout the country. It is designed to assume academic leadership in formulating and implementing science policy and in leading scholarly activities at the national level. It does this through its five academic departments: mathematics and physics, chemistry, biological sciences, earth sciences and technological sciences (Cao 2004).

The important aspect of CAS members in this study is that these members have been appointed by loyal party members, especially the CC membership of the CCP. According to Cong Cao (2004), CAS members tend to be dual elites. For example, CAS presidents have been both elite natural scientist and party members. Becoming a member of the CCP Central Committee gives elite scientists an opportunity to be a member of the political elites, as well as enhanced social prestige. Since the majority of the CC members are scientists or engineers, scientific elites might be encouraged to join the CCP leadership. Given this assumption, this study examines how many Chinese scientific elites have entered to political leadership and become to dual elites.

## **Empirical Findings**

There has always been considerable turnover in the history of CCP leadership. Table 1 indicates elite turnover on the previous CC and its PB since 1956. It shows that the proportion of new members on the CC exceeds 50%, since 1982, but most elite turnover occurred during the 13<sup>th</sup> Party Congress (1987-92). Cheng and White (2003) argue, at the 13<sup>th</sup> Party Congresses, the CCP promotes a great number of new leaders who can be identified as “technocrats” to top core leadership positions. According to Table 1, the 13<sup>th</sup> CC shows the highest level of circulation in the post Mao era.

At the Sixteenth CC in 2002, the proportion of newcomers on the CC was 61%, indicating that elite circulation to the 16<sup>th</sup> CC brings many new members. This may reflect a change of regime in the country—in 2002, Hu Jintao became the fourth generation of leadership in the CCP. At that time, the PB and SC—the most powerful and exclusive leadership group in China—also showed higher levels of circulation. In particular, SC, except Hu Jintao, all members are newcomers—this is the largest turnover in the history of CCP (Cheng and White 2003).

*Standing Committee (SC) and Politburo (PB)*

Table 2 shows demographical and biographical data of all 25 top party members of 16<sup>th</sup> Politburo. Except all nine SC members, almost all PB members are newcomers in 2002. However, 75% of the 16<sup>th</sup> PB hold the professional title of engineer or senior engineer and hold college degrees. All SC members are engineers. This is important evidence for the existence of technocrats in the current leadership of the CCP. Most members have obtained their college degrees from China's top engineering universities such as Qinghua University, or the most prestigious polytechnic universities in China. Data in Table 3 reveals a rapid increase in the number of CC members with college degrees since the massive elite transformation in 1987. In 2002, all members of PB obtained college degrees or other tertiary education in a military academy. More importantly, according to Cheng and White's study (2003), the number of PB members with advanced post-graduate degree has risen since 1992. In 2002, 16% of total members held post graduate degree mostly from China universities (Cheng and White 2003).

In 2002, the age range of all members of PB is from 55 to 67. According to Table 4, core leaderships are progressively younger in most transitions. In 2002, average member ages of SC, PB, and Secretariat are 62, 60.4, and 59.4, respectively.

*Central Committees (CC)*

Table 5 shows the average ages of all the CC members from 1956 to 2002. There is not much difference among the three most recent CCs, in which the average age has been around 55 or 56. However, this is much younger than the 62-to 64-year-old averages of the 1970's and 1980's CC, as well as the 60 year-old-averages of the recent PB. The transition of average age of the CC also shows that there were massive elite turnover in post-Mao CCP leadership. In particular, at the 13<sup>th</sup> Party Congresses, a great number of new members who were younger and well-educated replaced old members of the CC in 1987 (Cheng and White 1990).

Table 6 shows that women mostly have been underrepresented in the core leadership in post Mao era. Above all, the women's proportion of post-Mao CCP leadership has rather declined than Mao leadership from 1973 to 1982. According to Cheng and White (2003), only a few female leaders have been on the PB or Secretariat. They tend to be wives of leaders such as Jiang Qing (Mao's wife), or symbolic model workers. In fact, there is no women's representation in the recent PB (as a full member) or the Secretariat (Cheng and White 2003). Although there has been an increase in the number of women in the CCP in recent years, PRC women are usually absent in high-ranking leadership posts. As Cheng and White point out, "China's top leadership bodies in the post-Mao era increasingly are dominated by male technocrats" (Cheng and White 1998, 243). In addition, most CC members are ethnically Han, and other ethnic minorities (e.g, Huis, Tibetans, Manchus, Uighurs, Koreans, Miaos, Mongols, Tujias, Zhuangs, Buyi, Dai, Kazak, Li, Yao, and Yi) are also underrepresented in the 16<sup>th</sup> CC (see Table 7). The CC now has around 10% of total members from national minorities.

However, there are three trends in educational backgrounds of recent Chinese leaderships: 1) the increase in the number of college degree-holders, 2) the decrease in the

number of S&E degree holders, and 3) the increase in the number of foreign degree holders, or those who have a working experience abroad (Cheng and White 2003).

Table 8 shows a rapid increase in the number of CC members with college degrees since 1956. In 2002, almost all members of the 16<sup>th</sup> CC hold a college degree. This is unprecedented in PRC history. However, the percentage of CC members who majored in S&E dropped from 55.6% in 1997 to 45.6% in 2002 (see Table 9). Economists, lawyers, and a very few who were trained in humanities and social sciences, are more present on the CC. This is also unprecedented because throughout the history of the PRC, “social scientists have usually been marginalized and occasionally despised” (Cheng and White 2003, 581). However, since the number of lawyers in China has risen rapidly, “receiving a law degree has become a valuable credential for party leadership” (Cheng and White 2003, 581). The number of CC members with law degree rose from three (1.7%) to eight (4.1%) between the last two CC.

Another important trend in the educational backgrounds of CC members is that more CC members have studied abroad. By 2002, the number of Chinese students studying abroad was around 125,179 and 17,945 returned to China (The China Internet Information Center). This represents almost six times more students studying abroad in 1997. According to Cheng and White’s study (2003), among the 356 members of the Sixteenth CC, 32 had study or work experience abroad. In contrast to previous members who studied primarily in Eastern Europe and North Korea, most of the 16<sup>th</sup> CC members studied S&E in the West, especially to the United States (Cheng and White 2003).

However, the career paths of the current Chinese leaders seem complex. According to Table 10, 20% of the 16<sup>th</sup> CC members have mixed career path (e.g., a leader’s past work experiences have been in two or more sectors). Most have developed “their political careers by serving as director of a factory, head of an industrial bureau, mayor of a city, or minister

of the State Council” (Cheng and White 2003, 588). Table 10 also shows that 18% of CC members have a career as party cadres. However, formal channels for career advancement for technocrats were usually through family background, school ties, and work associations with senior leaders (by serving as personal secretaries, or *mishu*). Cheng and White (1998) also reveal in their study that nepotism and particularism were crucial in the formation of the 15<sup>th</sup> CC. Consequently, having work experience as *mishu* (personal secretary of high-ranking senior leaders) is important to build informal networks in order to enter into the leadership. The 8% of the CC have advanced their careers primarily through *mishu* work, but its proportion is not greater in 2002. On the other hand, the CC members, who came from the Youth League, are also important. The Chinese Communist Youth League (CCYL) is a youth movement of the PRC for youth between the ages of fourteen and twenty-eight, run by CCP. “CCYL cadres have long been seen as natural successors to party leadership” (Cheng and White 2003, 590). In 2002, 12% of the CC members came from the CCYL.

#### *The Chinese Academy of Science (CAS)*

Unlike the assumption that some scientists could move to CC membership exclusively through work in educational administration and research institutions, only 5.2 % of the 16<sup>th</sup> CC members have professional experiences in education and research institutions. In addition, Table 11 shows only three CAS members have reached the Sixteenth CC memberships in 2002, indicating that very few become dual elites who are both scientific elite as well as political elite. This may indicate that elite recruitment in leadership might depend more on political and ideological elements or informal connections than technical or scientific careers or competences. The numbers of CAS members in the CC have gradually decreased since 1982.

## **Conclusions and Implications**

For many years, the term “technocracy” has appeared frequently in discussions of politics on Mainland China. Since the early 1980s, the post-Mao China has been governed by three generations of technocratic leadership over the past two decades. The composition of recent core leadership clearly reflects the technocratic trend in Chinese politics.

Several findings, however, confirms this trend and leads to some implications. Firstly, the recent CCP leaders are getting younger and better educated than their predecessors. In particular, the most powerful elite groups such as PB and its SC receive S&E college degrees and hold professional titles of engineer. Additionally, over half of the members of the CC have high educational background in S&E. However, some questions might be raised: how has this technocratic trend been promoted and maintained in Chinese politics over the past two decades? Is it due to improved national educational levels or a political system embedded in Chinese society? Based on historical background of technocracy in China, the technocratic political system was built under economic and political reform. Chinese technocrats have been called economic mobilizers, or modernizers for a long time. At this point, we might question whether this technocratic trend in Chinese politics is an effective tool for economic development, or a mere sustenance of political power for technocratic leadership.

Another implication is whether the technocratic trend in political leadership reflects the progressively increasing number of S&E degree holders in China. In recent year, more and more Chinese students receive S&E degrees than any other countries, including U.S. and Western Europe. In some ways, the technocratic trend in politics may attract many Chinese people to pursue S&E degrees as means to success in Chinese society. In other words, it may become culturally embedded which makes society more meritocratic as well as technocratic. From the policy’s point of view, however, there might be policy incentives to produce more

S&E experts for future China's global competitiveness. Thus, we might also need to explore what benefits are given to returnees who went abroad to study S&E.

In addition, we must also consider whether this dominant technocratic leadership actually benefits for China. While China has achieved rapid economic development over the past two decades, the social and economic costs of reforms have recently surfaced in society. The concentration of technocratic political system on economic development results in unbalanced societal development. For example, China recently has experienced serious environmental problem due to rapid development of industrial technology and also faced the problems of inequality, crime, and official corruption. These counterproductive effects now challenge and threaten the current technocratic leadership. Given the situation, China's leadership now has to respond to these problems. Some change has already occurred in the composition of the 16<sup>th</sup> CC. More generalists who study philosophy, economics, law and social science have come to leadership positions in 2002. This might be a response to emerging social problems that China's leadership realizes the need of general experts. This indicates a possibility that more generalists will come to power in the future similar that of like the West.

One of findings also shows that the China's leadership group is highly exclusive and conservative. For women and ethnic minority people, there are still barriers to enter core leadership, even if their qualifications have improved during the past decade. Furthermore, only a few scientific elites (CAS members) have entered to political leadership positions. This is because Chinese technocrats come to power not only because of their technical credentials but also because of their informal connections. On the one hand, this implies that nepotism and particularism are still prevalent in Chinese society and may be also the possible sources of the current political corruption. On the other hand, this may indicate that upward social mobility is, to some extent, restricted in Chinese society.

Finally, there is still a controversy over ‘Chinese technocrats.’ Some scholars deny the existence of technocrats in China, because in their view Chinese technocrat is not genuine technical experts but politicians who are engineers in name only (Cheng and White 1998). For a clearer picture of the Chinese technocrat, future research will require more precise measures and a more analytical approach.

## References

- Akin, William E. 1977. *Technocracy and the American Dream*. Berkeley: University of California Press.
- Bailes, Kendall E. 1978. *Technology and Society under Lenin and Stalin: Origins of the Soviet Technical Intelligentsia, 1917-1941*. New Jersey: Princeton University Press.
- Bell, Daniel. 1973. *The Coming of the Post-Industrial Society*. New York: Basic Books.
- Cao, Cong. 2004. *China's Scientific Elite*. London: Routledge Curzon.
- Cheng, Li and Lynn White. 1990. "Elite Transformation and Modern Change in Mainland China and Taiwan: Empirical Data and the Theory of Technocracy." *The China Quarterly* 121: 1-35.
- \_\_\_\_\_. 1991. "China's Technocratic Movement and the World Economic Herald." *Modern China* 17(3): 342-88.
- \_\_\_\_\_. 1998. "The Fifteenth Central Committee of the Chinese Communist Party: Full-Fledged Technocratic Leadership with Partial Control by Jiang Zemin." *Asian Survey* 38(3): 231-64.
- \_\_\_\_\_. 2003. "The Sixteenth Central Committee of the Chinese Communist Party." *Asian Survey* 43(4): 553-97.
- Mills, William deB. 1983. "Generational Change in China." *Problems of Communism* 32: 16-35.
- Pauker, Guy J. 1976. "Are There Technocrats in Southeast Asia?" *Asian Survey* 16(12): 1197-201.
- Ping-ti, Ho. 1967. *The Ladder of Success in Imperial China*. New York: Science Editions.
- Scalapino Robert. 1972. *Elites in the People's Republic of China*. Seattle: University of Washington Press.
- The China Internet Information Center. China Facts and Figures 2005. The China Internet Information Center. <http://www.china.org.cn/english/en-sz2005/kj/biao/21-8.htm>
- Weber, Max. 1992. *Economy and Society*, Guenter Roth and Claus Wittick (eds.). New York: Bedminster Press.
- Zang, Xiaowei. 1993. "The Fourteenth Central Committee of the CCP: Technocracy or Political Technocracy?" *Asian Survey* 33(8): 787-803.

TABLES

TABLE 1 Overview of Elite Turnover on CCP Central Committees and Politburos (1956-2002)

Year CC Held	Central Committee				Total Central Committee				Politburo							
	No.	New	%		No.	New	%		No.	New	%	Re-elected	%	% of Re-elected Who Remain from the Previous Politburo		
8th	1956	97	32	(33)	73	70	(95)	170	102	(60)	23	13	(43)	10	(57)	(83)
9th	1969	170	122	(71)	109	104	(95)	279	226	(81)	25	15	(60)	10	(40)	(43)
10th	1973	195	55	(28)	124	58	(46)	319	113	(35)	25	9	(36)	16	(64)	(64)
11th	1977	201	71	(35)	132	75	(56)	333	146	(43)	26	11	(46)	15	(54)	(60)
12th	1982	210	96	(45)	138	114	(82)	348	210	(60)	28	14	(50)	14	(50)	(54)
13th	1987	175	114	(65)	110	79	(72)	285	193	(68)	18	12	(66)	6	(34)	(21)
14th	1992	189	84	(44)	130	97	(75)	319	181	(57)	22	15	(68)	7	(32)	(39)
15th	1997	193	109	(57)	151	106	(70)	344	215	(63)	24	8	(33)	16	(67)	(73)
16th	2002	198	107	(54)	158	113	(72)	356	220	(61)	25	15	(60)	10	(40)	(42)

Source: Li Cheng and Lynn White, "The Sixteenth Central Committee of the Chinese Communist Party," *Asian Survey* (July 2003), pp. 553-97.

**TABLE 2 Backgrounds of All Members of the Sixteenth Politburo (2003)**

Name	Age	Native Province	Current Position	Occupational Title	Educational Background	Year Graduated	Year Joined CCP	Year Entered CC	Year Entered PB
<i>Hu Jintao</i>	60	Anhui	Secretary-general, PRC president	Engineer	Qinghua University	1965	1964	1982 (AM)	1992
<i>Wu Bangguo</i>	61	Anhui	Chair, NPC, PB SC member	Engineer	Qinghua University	1966	1964	1982 (AM)	1992
<i>Wen Jiabao</i>	60	Tianjin	Premier, PB SC member	Engineer	Beijing Institute of Geology	1967 (G)	1965	1987	1992 (AM)
<i>Jiu Qinglin</i>	62	Hebei	Chair, CPPCC, PB SC member	Senior Engineer	Hebei Engineering College	1962	1959	1987	1997
<i>Zeng Qinghong</i>	63	Jiangxi	PRC vice president, PB SC member	Engineer	Beijing Institute of Tech.	1963	1960	1997	1997 (AM)
<i>Huang Ju</i>	64	Zhejiang	Exe. vice premier, PB SC member	Engineer	Qinghua University	1963	1966	1987 (AM)	1994
<i>Wu Guanzheng</i>	64	Jiangxi	Secretary of CCDI, PB SC member	Engineer	Qinghua University	1968 (G)	1962	1982 (AM)	1997
<i>Li Changchun</i>	58	Liaoning	PB SC member	Engineer	Harbin Institute of Tech.	1966	1965	1982 (AM)	1997
<i>Luo Gan</i>	67	Shandong	PB SC member	Senior Engineer	Freiburg Ins. of Metallurgy	1962	1960	1982 (AM)	1997
<i>Wang Lequan</i>	58	Shandong	Party secretary of Xinjiang	Engineer	Central Party School	1986 (G)	1966	1992 (AM)	2002
<i>Wang Zhaoguo</i>	61	Hebei	Vice chair, NPC	Engineer	Harbin Institute of Tech.	1966	1965	1982	2002
<i>Hui Liangyu</i>	58	Jilin	Vice premier	Economist	Jilin Provincial Party School	1964	1966	1992 (AM)	2002
<i>Liu Qi</i>	60	Jiangsu	Party secretary of Beijing	Senior Engineer	Beijing Institute of Iron/Steel	1968 (G)	1975	1992 (AM)	2002
<i>Liu Yunshan</i>	55	Shanxi	Head, CCP Propaganda Dept.	Senior Engineer	Jining Normal School	1966	1971	1982 (AM)	2002
<i>Wu Yi</i>	64	Hubei	Vice premier	Senior Engineer	Beijing Petroleum Institute	1964	1964	1987 (AM)	1997 (AM)
<i>Zhang Lichang</i>	63	Hebei	Party secretary of Tianjin	Senior Engineer	Beijing Economics Cor. Uni.	1959	1966	1982 (AM)	2002
<i>Zhang Dejiang</i>	56	Liaoning	Party secretary of Guangdong	Engineer	Kim Il Sung University	1968	1971	1992 (AM)	2002
<i>Chen Liangyu</i>	56	Zhejiang	Party secretary of Shanghai	Senior Engineer	PLA Institute of Engineering	1963	1980	1997 (AM)	2002
<i>Zhou Yongkang</i>	60	Jiangsu	Minister, Ministry of Public Security	Senior Engineer	Beijing Petroleum Institute	1966	1964	1992 (AM)	2002
<i>Yu Zhengsheng</i>	57	Zhejiang	Party secretary of Hubei	Engineer	Harbin Mil. Engineering Ins.	1963	1964	1992 (AM)	2002
<i>He Guoqiang</i>	59	Hunan	Head, CCP Organization Dept.	Senior Engineer	Beijing Ins. Chem. Eng.	1966	1966	1982 (AM)	2002
<i>Gao Boxiong</i>	60	Shaanxi	Vice chair, CMC	Engineer	PLA Military Academy	1983	1963	1997	2002
<i>Cao Guangchuan</i>	67	Henan	Vice chair, CMC	Engineer	Military Eng. School, USSR	1963	1956	1997	2002
<i>Zeng Peiyan</i>	64	Zhejiang	Vice premier	Senior Engineer	Qinghua University	1962	1978	1992 (AM)	2002
<i>Wang Gang (AM)</i>	60	Jilin	Director, CCP General Office	Senior Engineer	Jilin University	1967	1971	1997 (AM)	2002 (AM)

Source: Li Cheng and Lynn White, "The Sixteenth Central Committee of the Chinese Communist Party," *Asian Survey* (July 2003), pp. 553-97.

**TABLE 3 Change in Educational Level of the Politburo (1956-2002)**

<i>Educational Level</i>	<i>8th (1956)</i>		<i>9th (1969)</i>		<i>10th (1973)</i>		<i>11th (1977)</i>		<i>12th (1982)</i>		<i>13th (1987)</i>		<i>14th (1992)</i>		<i>15th (1997)</i>		<i>16th (2002)</i>		<i>Ratio of % in 16th PB to Average in Earlier PBs</i>		<i>Ratio of % on PBs Since 1987 to the Pre-1987 PBs</i>		
	<i>No.</i>	<i>%</i>	<i>No.</i>	<i>%</i>	<i>No.</i>	<i>%</i>	<i>No.</i>	<i>%</i>	<i>No.</i>	<i>%</i>	<i>No.</i>	<i>%</i>	<i>No.</i>	<i>%</i>	<i>No.</i>	<i>%</i>	<i>No.</i>	<i>%</i>	<i>No.</i>	<i>%</i>	<i>No.</i>	<i>%</i>	
No schooling	1	4.4	5	20.0	4	16.0	4	15.4	3	10.7	0	0	0	0	0	0	0	0	0	0	0	0	
Primary school	3	13.0	3	12.0	4	16.0	5	19.2	10	35.7	0	0	0	0	0	0	0	0	0	0	0	0	
Middle school	3	13.0	8	32.0	9	36.0	6	23.0	3	10.7	5	27.7	3	13.6	2	8.3	0	0	0	0	0	0	0
Military school	4	17.4	2	8.0	1	4.0	5	19.2	3	10.7	1	5.6	1	4.5	2	8.3	2	8.0	2	8.0	0.82	0.25	
University	12	52.2	7	28.0	7	28.0	6	23.0	9	32.1	12	66.6	17	77.2	18	75.0	19	76.0	1.59	2.25	—	—	
Post-graduate	0	0	0	0	0	0	0	0	0	0	0	0	1	4.5	2	8.3	4	16.0	—	—	—	—	
<i>Total</i>	23	100.0	25	100.0	25	100.0	26	99.8	28	99.9	18	100.0	22	99.8	24	99.9	25	100	—	—	—	—	

NOTE: Percentages do not add to 100 because of rounding.

Source: Li Cheng and Lynn White, "The Sixteenth Central Committee of the Chinese Communist Party," *Asian Survey* (July 2003), pp. 553-97.

**TABLE 4 Average Ages of CC Core Leadership Groups (1982-2002)**

CC	Year Held	PB Standing Committee	Politburo	Secretariat
12th	1982	73.8	71.8	63.7
13th	1987	63.6	64	56.2
14th	1992	63.4	61.9	59.3
15th	1997	65.1	62.9	62.9
16th	2002	62	60.4	59.4

Source: Li Cheng and Lynn White, "The Sixteenth Central Committee of the Chinese Communist Party," *Asian Survey* (July 2003), pp. 553-97.

**TABLE 5 Average Ages of Election to the Central Committee**

CC	Year Held	Average Age	DA/DY
8th	1956	56.4	
9th	1969	59	+0.20
10th	1973	62	+0.75
11th	1977	64.6	+0.65
12th	1982	62	-0.52
13th	1987	55.2	-1.36
14th	1992	56.3	+0.22
15th	1997	55.9	-0.08
16th	2002	55.4	-0.10

NOTE: DA = Difference of age, DY = difference of year. A positive ratio indicates an aging leadership, relative to the previous CC; the negative shows a shift to younger leaders. Ratio numbers suggest the extent of such change.

Source: Li Cheng and Lynn White, "The Sixteenth Central Committee of the Chinese Communist Party," *Asian Survey* (July 2003), pp. 553-97.

**TABLE 6 Female Representation on CCP Central Committees (1956-2002)**

CC	Year	Full Mebers		Alternates		Total	
		No.	%	No.	%	Members	%
8th	1956	44	4	3	4	7	4
9th	1969	13	7.6	10	9.1	23	8
10th	1973	20	10.2	17	13.7	37	11.5
11th	1977	14	6.9	24	18.1	38	11.4
12th	1982	11	5.2	13	9.4	24	6.9
13th	1987	10	5.7	12	10.9	22	7.7
14th	1992	12	6.3	12	9.2	24	7.5
15th	1997	8	4.1	17	11.3	25	7.3
16th	2002	5	2.5	22	13.9	27	7.6

Source: Li Cheng and Lynn White, "The Sixteenth Central Committee of the Chinese Communist Party," *Asian Survey* (July 2003), pp. 553-97.

**TABLE 7 National Minorities' Representation on Central Committees**

CC	Number	%
8th	9	5.2
9th	13	4.6
10th	18	5.6
11th	19	5.7
12th	31	8
13th	32	11.2
14th	33	10.3
15th	38	11
16th	35	9.8

Source: Li Cheng and Lynn White, "The Sixteenth Central Committee of the Chinese Communist Party," *Asian Survey* (July 2003), pp. 553-97.

**TABLE 8 Percentage of College-Educated CC Members (1956-2002)**

CC	Year of CC	%
8th	1956	44.3
9th	1969	23.8
10th	1973	NA
11th	1977	25.7
12th	1982	55.4
13th	1987	73.3
14th	1992	83.7
15th	1997	92.4
16th	2002	98.6

Source: Li Cheng and Lynn White, "The Sixteenth Central Committee of the Chinese Communist Party," *Asian Survey* (July 2003), pp. 553-97.

**TABLE 9 Academic Majors of Full Members of the 15<sup>th</sup> (1997) and 16<sup>th</sup> (2002) CCs who have College Degrees**

<i>Majors</i>	<i>15th CC (N = 180)</i>		<i>16th CC (N = 195)</i>	
	<i>No.</i>	<i>%</i>	<i>No.</i>	<i>%</i>
<b>Engineering and Science</b>				
Engineering	78	43.3	67	34.4
Geology	3	1.7	1	0.5
Meteorology	1	0.6	0	0
Agronomy	5	2.8	4	2.1
Biology	3	1.7	0	0
Physics	7	3.9	9	4.6
Chemistry	2	1.1	2	1.0
Mathematics	0	0	2	1.0
Architecture	0	0	3	1.5
Medical science	1	0.6	1	0.5
<i>Subtotal</i>	<i>100</i>	<i>55.6</i>	<i>89</i>	<i>45.6</i>
<b>Economics and Management</b>				
Economics and finance	7	3.9	10	5.1
Management	3	1.7	1	0.5
Accounting and statistics	0	0	2	1.0
Foreign trade	1	0.6	0	0
<i>Subtotal</i>	<i>10</i>	<i>5.6</i>	<i>13</i>	<i>6.7</i>
<b>Social Sciences and Law</b>				
Politics	2	1.1	6	3.1
Sociology	1	0.6	0	0
Party history and party affairs	4	2.2	7	3.6
Journalism	0	0	2	1.0
Law	3	1.7	8	4.1
<i>Subtotal</i>	<i>10</i>	<i>5.6</i>	<i>23</i>	<i>11.8</i>
<b>Humanities</b>				
History	1	0.6	4	2.1
Philosophy	2	1.1	4	2.1
Education	1	0.6	3	1.5
Chinese language and literature	5	2.8	6	3.1
Foreign language	7	3.9	6	3.1
<i>Subtotal</i>	<i>16</i>	<i>8.9</i>	<i>23</i>	<i>11.8</i>
Military Education, Military Engineering	<i>31</i>	<i>17.2</i>	<i>38</i>	<i>19.5</i>
Unknown	<i>12</i>	<i>6.7</i>	<i>9</i>	<i>4.6</i>
<i>Total</i>	<i>180</i>	<i>100.4</i>	<i>195</i>	<i>100.0</i>

Source: Li Cheng and Lynn White, "The Sixteenth Central Committee of the Chinese Communist Party," *Asian Survey* (July 2003), pp. 553-97.

Note: Percentages do not add to 100 because of rounding.

**TABLE 10 Primary Career Experiences of the 16th CC Members**

<i>Primary Career Experience</i>	Full Members		Alternate Members		Total	
	No.	%	No.	%	No.	%
Party functionary organs	34	21.8	17	12.6	51	17.5
Industrial enterprises	29	18.6	22	16.3	51	17.5
Chinese Communist Youth League (CCYL)	15	9.6	20	14.8	35	12
<i>Mishu</i> (personal secretary)	15	9.6	8	5.9	23	7.9
Rural administration	4	2.6	13	9.6	17	5.8
Education and research institutes	6	3.8	9	6.7	15	5.2
Financial and banking institutions	3	1.9	6	4.4	9	3.1
Foreign service	4	2.6	1	0.7	5	1.7
Other (Legal affairs, women's federation, sport, etc.)	4	2.6	8	5.9	12	4.1
Mixed	42	26.9	16	11.9	58	19.9
Unknown	0	0	15	11.1	15	5.2
<i>Total</i>	156	100	135	99.9	291	99.9

NOTE: Percentages do not add up to 100 due to rounding.

Source: Li Cheng and Lynn White, "The Sixteenth Central Committee of the Chinese Communist Party," *Asian Survey* (July 2003), pp. 553-97.

**TABLE 11 CAS members in the Chinese Communist Party Central Committee**

<i>CCP CC Year</i>	Year	CAS members in CC
8th	1956-69	0
9th	1969-73	3
10th	1973-77	3
11th	1977-82	3
12th	1982-88	9
13th	1988-93	8
14th	1993-97	7
15th	1997-2002	6
16th	2002-present	3

Source: Cong Cao, *China's Scientific Elite* (London: Routledge Curzon, 2004).