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8. REFLECTIONS ON THE EFFECTS OF THE 985 PROJECT IN MAINLAND CHINA

INTRODUCTION

Socio-economic transformation and growth in China have led to unprecedented changes in higher education in the last three decades. The notion of a "world-class university" is high on the policy agenda at both government and institutional levels in China. National initiatives to further enhance leading universities' capacity and competitiveness is among the many ideas regarding higher education reform, including the 211 and 985 Projects.

In 1993, China initiated the 211 Project, aimed at developing 100 universities by the early twenty-first century that will take leading positions in the country's economic and social development and international competition. To further enhance public funding for higher education, the 985 Project was launched in 1998, which again reflected the government's goal and efforts to develop a tertiary education system of international standing. With the 211 and 985 Projects, new mechanisms for higher education governance are explored and a path to build world-class universities is developed. After ten years of practice in two phases, the 985 Project has enabled selected institutions to improve their research performance and competitiveness and to narrow the gap with universities already regarded as world-class (Liu et al., 2003). The 985 Project has started its third phase since early 2010. This chapter intends to provide an in-depth account and analysis of the 985 Project and its impact, as well as to explore issues in policies and practices of developing world-class universities in Mainland China.

THE BACKGROUND OF THE 985 PROJECT

Developing the Elite Sector

The idea of developing world-class universities is not a new idea in China. A few of the earliest Chinese universities were established precisely to develop the nation's competitiveness and to promote higher education. Peiyang University (founded in 1895, now Tianjing University), Nanyang public School (founded in 1896, now Shanghai Jiao Tong University), the Imperial University of Peking (founded in 1898, now Peking University), and Tsinghua College (founded in 1911, now Tsinghua University) are among these. The history of national initiatives to support leading universities can also be traced back to the early 1950s, when the Ministry of Education recognized six universities as "key

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universities." Since then, "a system of key universities" has been formed and developed, which has greatly influenced and shaped the higher education structure and its reform in China. The leading universities have been contributing to improving overall quality and playing an instrumental role in meeting the country's demands during the economic transition.

Since the start of China's reform and opening-up in the early 1980s, the government has consistently upheld the basic idea of using science and education in nation-building. The higher education sector has undergone expansion and reform since the 1990s, which has produced a large quantity of highly skilled workers, and to some extent has served the demands of economic development for skilled labour. However, international reports, such as the McKinsey Quarterly and the Global Competitiveness Report 2009-2010, shows that China is still less competitive in terms of knowledge creation and innovation (Lauder, Brown & Ashton, 2008; Schwab, 2009), and requires an overall improvement in the quality of its higher education sector. To further enhance the nation's global competitiveness, the government has adopted a national policy advocating the building of globally prominent universities over the past ten years and has launched a group of specific national initiatives to develop a number of world-class universities, including the 211 Project and the 985 Project.

The 211 Project Waking up Chinese Universities' Awareness of Excellence

Initiated in 1995, the 211 Project aims at developing about 100 universities and a number of key disciplines by the early 21st century. This funding scheme focuses mainly on four aspects of development: disciplinary and interdisciplinary programmes, digital campuses, faculty, and university infrastructure. Compared with other key state projects since the founding of the new China, it was not only the largest scale project in the field of higher education but also the highest level of block grant (Ministry of Education [MOE], 2008). This project clearly indicates that an international advanced level would be the standard, and it aspired to use such a key project to improve the international reputation and status of Chinese universities.

In the first two phases (1996-2000 and 2002-2006), the central government, local governments and selected universities themselves invested altogether 36.83 billion yuan (about US$5.44 billion), of which the central government provided 7.84 billion yuan (about US$1.16 billion). 45 percent of the total financial support was invested in disciplinary development, 29 percent in infrastructure development, 19 percent in digital campus development, and seven percent in faculty development (The 211 Project Coordination Group, 2007). Currently, the 211 Project is in its third phase (2007-present), with 112 universities supported by the project so far.

With the support of the project, the infrastructure and other conditions improved significantly at high-level Chinese universities, markedly enhancing the overall strength of the institutions. More importantly, the 211 Project was a wake-up call to Chinese universities to compete internationally, and has inspired the thinking of

universities on relevant concepts, such as "world-class" and "excellence" (Cheng, 2011). However, there was still a large gap between China's leading universities and their international peers, in terms of faculty, management and governance, and knowledge creation and innovation. Also, due to the large number of universities and research centres supported, the investment received by each individual university was rather limited, which reduced its institutional impact. To more quickly narrow the gap and further enhance public funding for higher education, the government launched the 985 Project in 1998.

IMPACT OF THE 985 PROJECT IN THE FIRST TWO PHASES

Goals and Policy Context

China's 985 Project illustrates the government's goal and efforts to develop a tertiary education system of international standing. The Ministry of Education (MOE) (1998) issued an "Action Plan to Revitalize Education for the 21st Century" and agreed to pursue the 985 Project to establish a number of world-class universities and to develop a number of key research centres of excellence. This project aims to explore new mechanisms for higher education governance, improve the global competitiveness of universities and develop world-class universities with Chinese characteristics. The 985 Project was implemented in two phases (1999-2001 and 2004-2007) and is currently undergoing its third phase (2009-present).

Altogether, 39 universities selected by the government have benefited from this project, with 34 universities selected for Phase I and another five universities added in Phase II. Nine of the 39 universities[1] are top of the list to be developed into world-class universities, and the rest are expected to be developed as world-known universities (i.e. a slightly lower level of achievement but still possessing an international reputation), as stated in the Project policy document (MOE, 2008). It is worthwhile mentioning that these 39 selected universities are only less than two percent of the total higher education institutions in Mainland China.

Implementation and Management

The government plays a dominant role in the organization and management of the Project. The universities participating in the Project are selected by the government. The MOE and Ministry of Finance (MOF) together founded the 985 Project Management Group and the 985 Project Working Group, whose main duty is to discuss, formulate, implement and examine the policies and strategic planning for the Project. In response, the selected universities founded similar groups at institutional level, to coordinate and implement policies and regulations assigned by the central government.

To receive funding, the selected universities submit their project proposals and funding budget plans for review by the MOE and MOF. After the MOE and MOF approve the proposals and budget plans, the selected universities compose a

detailed plan on how the financial support will be spent on each programme annually. Only after passing a further examination of the budget plans by relevant agencies invited by MOF can the universities be granted and receive their funding from the government. The MOE and MOF are also accountable for the examination and evaluation of the selected universities' performance, readjusting the financial support to each university in the following phase according to the evaluation results (MOE, 2008).

Financial Support

The MOE and MOF at the central government level, the local governments of the provinces in which these selected universities are located, and other governmental organizations, collaborate to provide extra financial resources.[2] The total amount of funding received by a selected university depends on different factors, such as the university's position, goals, the status it is expected to achieve in the world system, and the local government's financial situation.[3]

In Phase I, the total financial support for the 34 universities was about 25.5 billion yuan (about US$4 billion), with 54 percent of the funding from the central government. The nine top listed institutions were offered about 42 percent of the total funding. Other than the general goal of creating world-class universities in the "Action Plan to Revitalize Education for the Twenty-First Century," however, the MOE issued no documents concerning the specific objectives and tasks of the first phase, so the selected universities had a significant level of autonomy in implementing the project and allocating funding resources based on their specific situations at each university.

In Phase II, the total funding reached 41 billion yuan (about US$6 billion), with about 46.1 percent from central government. Unlike the more general requirements of Phase I, Phase II of the 985 Project clearly delineated five tasks: reforming institutional governance, upgrading the quality of faculties, building up research platforms, improving infrastructure and promoting international exchanges and cooperation. Most of the funding from the central government (12.9 billion yuan out of 18.9 billion yuan) was spent on building up research platforms, which resulted in the creation of 372 platforms for scientific and technological innovation, as well as philosophical and social scientific innovation. Again, the top nine universities received about 40 percent of the total funding (985 Research Group, 2010). However, with an increased number of the selected universities in Phase II, the average amount of funding for each project was slightly less than that of Phase I.

IMPACT OF THE 985 PROJECT IN THE FIRST TWO PHASES

The 985 Project has enabled those selected institutions to improve their research performance and competitiveness and to narrow the gap with world-class universities (Liu, Liu, Cheng, & Wan, 2003; Deng, Wang, & Liu, 2010).[4] Key national bases for humanities and social sciences research and major national

laboratories have been established to enhance research. The selected universities have played an increasingly critical role both in higher education and in socio-economic reform in China (Liu, 2009). More specifically, the selected universities, particularly the nine top-listed institutions, have greatly improved their positions in the world rankings.[5]

Significantly Improved Selected Institutions' International Competitiveness

Since the implementation of the 985 Project, the selected Chinese research universities have improved their competitiveness, significantly closing the gap with other world-class universities in the world.

A key feature of a world-class university is a high concentration of talent, both in faculty members and students (Salmi, 2009). With their special state funding, the 985 Project universities have implemented various measures to improve faculty quality. In terms of faculty structure, the percentage of faculty holding a doctoral degree in these selected universities has increased from less than 20 percent in 1999 to more than 50 percent in 2008. The percentage of those with doctoral degrees from overseas has grown from 2.7 percent in 1999 to 6.0 percent in 2008. Currently, a group of 985 Project schools require a PhD from overseas as a basic condition of employment for new instructors without work experience. Special policies have been set up to attract a group of elite academics and internationally influential scholars. For example, Tsinghua University brought in the Nobel Prize-winning Professor Chen-Ning Franklin Yang, and the Turing Award winner Professor Andrew Chi-Chih Yao, as full-time faculty.

Meanwhile, these selected universities have played a dominant role in graduate education. More than 50 percent of total doctoral degrees in China are awarded by the 985 Project universities each year. The average number of doctoral students graduating from these universities has increased from 110 in 1998 to 550 in 2007. In terms of student quality, from 1999 to 2008, about 61 percent of the outstanding doctoral theses awarded by the MOE were from the 985 Project universities.

In terms of research output, in 1998, the 39 selected universities produced an average of only 240 papers each that were included in the Science Citation Index (SCIE) and the Social Science Citation Index (SSCI). By 2007, the average number of such papers for the universities participating in the 985 project had reached 1,200. In the same year, the original nine universities supported by the 985 project produced an average of 2,400 papers, exceeding the average output of the UK Russell Group universities and Australia's Group of Eight (both at 2,200), and closing in on the Association of American Universities' 60 member schools, with an average level of 2,800.

The 985 Project universities have improved their quality of education and research and have developed a number of world-class disciplines. Thomson Reuters developed the Essential Science Indicators (ESI) database, which collects papers in 22 disciplines, the world's top one percent in terms of the number of citations. In 2001, 985 Project universities were included in the ESI database in only 40 disciplines but, by the end of 2008, 140 disciplines from 34 of the

participating universities were selected. At the same time, ten 985 Project schools in 26 disciplines reached the top one hundred universities in the world in terms of the total number of citations.

With yearly increases in state investment and special 985 Project funding, the administration expenditures of high-level Chinese universities have gradually gained parity with those of world-class universities. In terms of purchasing power parity, in 2008 the total financial resources of Tsinghua University and Peking University were US$1.57 billion and US$1.28 billion respectively, and their total research expenditure were US$530 million and US$330 million respectively.

Significantly Enhanced Capacity for Scientific and Technological Innovation

The 985 Project universities play a leading role in conducting research and enhancing capacity for scientific and technological innovation.

A primary task of Phase II of the 985 Project was to create technology innovation platforms. The state hoped to build cross-disciplinary platforms that would foster the overall advantages of universities' disciplinary strengths and improve their capacity to commit to, and drive, major research efforts. From 1999 to 2008, the 985 Project universities brought the number of projects under the *National Basic Research Program* (known as the 973 Programme), from the initial ten per year up to more than 30 per year in the last two years. In addition, the 49 technological innovation platforms at Tsinghua University and 21 other 985 Project universities were linked with ten major projects set up by 16 key national universities under the *National Medium- to Long-Term Development Plan for Science and Technology (2006-2020)*, which assumed an important and irreplaceable role in implementing major research projects in China.

In terms of patents, which represent technological innovation capacity, the 985 Project universities produced fewer than 400 patents in 1999, which increased to 6,000 in 2008, more than a ten-fold increase in ten years, and comprising almost one-tenth of all invention patents in China that year.

The State Natural Science Award, State Technological Invention Award and State Scientific and Technological Progress Award represent the highest level of national science and technology innovation in China. During the period 1999-2008, there was a significant increase in the number of times that, and the levels at which, the 985 Project universities received the three awards. Four of the five First Class Awards issued under the State Technological Invention Award (General Projects) between 1999 and 2008 were won by the 985 Project universities.

The Selected 985 Project Universities at the Forefront of Chinese Higher Education

Through the 985 Project, institutions supported by the project have further consolidated and strengthened their dominant position in Chinese higher education. The 39 universities selected by the 985 Project comprise only two percent of all

Chinese universities, but account for nearly half of national totals in terms of various indicators of quality and level.

With regard to development of human resources, the 985 Project institutions have prevailed at the forefront of Chinese universities in terms of quality of resources and conditions for development. The 985 Project Universities have 241 state-level human resources training bases, accounting for 64 percent of the total. The 985 Project universities established 879 – 53 percent – of the country's 1,664 national elite undergraduate courses. Since 1999, China has rapidly expanded graduate education, including increasing the number of doctorates from less than 9,000 in 1999 to over 40,000 in 2007. The 985 Project universities have conferred over 50 percent of all doctorates in China throughout this period, as mentioned previously.

In terms of high-level instructional resources, as of the end of 2008, science and engineering schools at the 985 Project universities employed 85 percent of the science scholars and 60 percent of the engineering scholars working at universities nation-wide. After the introduction of the Changjiang Scholars Award in 1998, distinguished professors and chair professors appointed by the 985 Project universities comprised 80 percent or more of the first nine groups of awardees.

In terms of research output, the 39 institutions under the 985 Project have published about 50 percent of SCIE and SSCI papers annually. The papers published by the original nine 985 universities themselves account for about 50 percent of the total published by 985 Project institutions.

Another indicator of the leading status of 985 Project schools is their tendency to pilot major higher education reforms in China; they also have more administrative autonomy compared to other institutions of higher education. Beginning in 2002, Peking University and six other 985 Project institutions were allowed to independently set up undergraduate disciplines. From 2003 on, 22 schools, comprised mainly of 985 Project institutions, were allowed to independently enroll students. In 2005, Peking University and Tsinghua University were allowed to set up doctoral programmes which do not need state approval.

To promote inter-school cooperation, the original nine universities selected by the 985 Project established the Consortium of China 9 Research Universities (C9) in 2009, and signed a "First-Class University Human Resources Training Cooperation and Exchange Agreement." The agreement includes the exchange of undergraduates and postgraduates for training, mutual recognition of credits, peer assessments of doctoral dissertations, and more (Song, 2009).

REFLECTIONS ON THE IMPACT AND MANAGEMENT OF THE 985 PROJECT IN THE FIRST TWO PHASES

The 985 Project intends to build excellence in teaching and research, and develop the elite sector to lead research and innovation. It has created a culture excellence in some Chinese universities. Despite these impressive achievements, research shows that a gap remains between the 985 Project universities and world-class

universities, and raises issues related to the project's organizational model, as well as issues in governance in general.

A Gap Remaining between 985 Project Institutions and World-Class Universities

Despite the rapid growth in the number of papers published internationally by the 985 Project universities, with the quality of such papers also increasing rapidly as reflected by the number of citations, they still produce very little leading academic research that has a significant international impact. *Nature* and *Science*, two comprehensive scientific journals with very high reputations, have become known for consistently publishing cutting-edge research in various disciplines. There has been no significant increase in the annual number of papers from the 985 Project universities in these two publications over the decade of the 985 Project, demonstrating a continuing gap with world-class universities in this area.

The 985 Project's investment in faculty building has reached several billion yuan; the state has also established the Changjiang Scholars and other special human resources programmes to attract Chinese scholars overseas to return to work in China. A survey indicated, however, that only a small number of the returning scholars' academic reputations are comparable to those of their international counterparts (Zweig, 2006). Of a total of more than 6,000 researchers in the ISI high-cited researcher database,[6] there were more than 100 high-cited scientists each from the world-class universities Harvard and Stanford, while three of the 985 Project universities each had only one highly-cited scientist listed. This indicates that these selected universities still have very few academics with high international influence. In addition, no scholar from Mainland China has yet won any of the most authoritative of the international academic awards, the Nobel Prize or the Fields Medal for mathematics.

There is a common view concerning the gap between the 985 Project universities and world-class universities in terms of achievements by their leading researchers, which holds that China's high-level universities are in the process of moving from accumulating quantity to improving quality and, if the current strategy and input intensity is continued, Peking and Tsinghua Universities should be among the ranks of world-class universities in another 10 years. Some scholars believe, however, that funding is only one of many conditions for building a world-class university; Chinese universities, which lack academic freedom and a conducive external environment, will find it difficult to develop truly world-class universities based on increased funding alone (Ngok & Guo, 2008).

Existing Research Models or Research Culture not Fundamentally Changed

An important task of Phase II of the 985 Project was to break down research organizational models based on the boundaries of traditional disciplines, to set up interdisciplinary research platforms, and to develop effective operational mechanisms to solve major basic science problems and practical issues. Since the existing appraisal system assigned more value to principal investigators, however,

the contribution of other research project participants did not receive proper recognition. Meanwhile, it was extremely difficult to achieve major innovations and, after participants successfully initiated a project platform, it was common for them to divide and subdivide the funding and pursue their own, less risky, research projects. The goal of innovative research organizational models was therefore not truly realized.

In recent years, the overall research funding at 985 Project institutions has grown rapidly, much of it from different government departments for huge research projects. During the decision-making process, officials in charge of these projects have a great influence over of the targets of the funding. Some critics have therefore pointed out that China's scientists are well aware that the projects obtained by a few powerful officials and scientists, using their personal relationships, are deemed to be the most important. This has resulted in researchers investing much of their energy into management and relationships with those in control of the resources, and not on academic work (Shi & Rao, 2010). This unhealthy culture has not only caused a waste of research resources, but has also spawned abnormal academic competition, impeding innovation and the output of high-level research.

The Organization Model of the 985 Project has Produced Some Adverse Effects

The 985 Project is a centralized, outcome-oriented funding programme. The government steers the funding procedures, "cherry-picking" elite institutions where centres of excellence will be established (Salmi, 2009). In terms of organization and management, the 985 Project seems to be a less open, less transparent, with a less competitive mechanism, compared to that of other national initiatives in other countries, such as Centres of Excellence in Japan and the Excellence Initiative in Germany. It is true that the competitive environment within individual institutions has been stimulated throughout the implementation of the 985 Project and universities are increasingly aware of global competition influenced by other external drivers, such as world university rankings (Marginson, 2006; Salmi, 2009). However, the government has organized the funding programme with little transparency in the selection and evaluation processes, with no publicly available clear criteria and requirements. Nor did the 985 Project issue a policy document explaining the amount to be invested in each institution and the basis for it. The choice and funding of the universities was essentially achieved through non-public consultations between the universities and the higher education authorities. Thus, the 985 Project can be regarded as a vertically organized, non-competitive allocation mechanism.

Looking at the results, the 985 Project does indeed encompass a number of China's recognized top universities, but there are some universities that have received support for reasons not related to their academic level. More importantly, due to the absence of an open, competitive process, many institutions at a level comparable to the 985 Project schools (including those receiving support from the project only later), have not had access to such support. The direct result of this

government-led approach, one that lacks openness, is that the universities must focus a great deal on their relationship with the MOE. The MOE's power and control over institutions of higher education has actually increased, which is not conducive to university autonomy over their own management and development.

In addition, the 985 Project has exacerbated an imbalance in the development of universities in China. Having enjoyed a good foundation, these 985 Project universities have naturally formed an elite sector in Chinese higher education. With additional focused investment from these national initiatives, these selected universities have even expanded their edge over other universities, while the majority of China's higher education institutions are forced to second- or third-class status and have lost a fair opportunity to compete. Hence, China's building research capacity and excellence has been criticized as starving the bottom and feeding the top (Altbach & Wang, 2012).

CONCLUSION

The 985 Project is a centralized outcome-oriented funding programme. The government steers the funding procedure, "cherry-picking" elite institutions where research and teaching excellence will be established. Even during the financial crisis of 2008 when governments in the West tended to cut the funding, the Chinese government consistently invested in these national initiatives to develop education and research. Since its implementation, the international competitiveness of the selected universities has significantly improved, their technological innovation capacity has been enhanced, and their leading positions in China's higher education have been further consolidated. However, there is still a gap between these selected 985 Project universities and their international counterparts in terms of research and innovation quality. Research and academic culture has not fundamentally changed.

Bearing these issues in mind, the MOE reiterates the strategic importance of building world-class universities in China, and confirmed it would continue with the implementation of the third phase in 2012 (MOE, 2013). Issues and concerns raised in the first two phases have been tackled and responded to in the third phase. For example, the MOE has more detailed and clearer regulations and policy guidance in terms of the Project's goals, implementation and organization, accountability and responsibilities, funding procedures and evaluation processes. Similar to the goals in the first two phases, the third phase of the Project also focuses on international competition as well as serving for the country's needs, and aims to develop world-class disciplines and research, as well as to enhance the governance model and academic culture in Chinese higher education. The funding duration has been extended from three years to ten years, to ensure a long-term and sustainable funding mechanism. The MOE and MOF invite influential academics and professionals from both China and abroad to form the 985 Project Expert Committee, and work closely with these experts in terms of policy-making and implementation. Also, the MOE and MOF are in charge of procedural evaluations.

The annual funding allocated to each selected universities will also depend on their evaluation results in the previous year (MOE, 2013).

NOTES

[1] The nine universities are Fudan University, Harbin Institute of Technology, Nanjing University, Peking University, Shanghai Jiao Tong University, Tsinghua University, University of Science and Technology of China, Xi'an Jiao Tong University, Zhejiang University.

[2] Only Tsinghua University and Peking University received financial support solely from MOE and MOF. The rest of the 39 universities are funded by both MOE and the local governments or other funding bodies.

[3] Generally speaking, the financial contribution from the central government and local governments are largely equal. However, in relatively developed areas, the expenditure from the local governments is more than that of the central government; and vice versa for those less developed areas.

[4] If not otherwise specified, the statistics in this section are from The 985 Project Report (1999-2008). Beijing: Higher Education Press.

[5] For example, according to the Academic Ranking of World Universities (SJTU, 2010), the number of Chinese universities in the top 300 increased from none in 2000 to seven in 2010; and the number of Chinese universities in the top 500 increased from four to 22.

[6] ISIHighlyCited.com, a database of highly-cited scientists, screened and listed the world's most frequently cited 250-300 researchers in all subject areas.

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