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World Bank Lending for Higher Education and Research:

Lessons and implications for Eastern Europe

Abstract

World Bank strategies for reforming and rehabilitating higher education and research systems in Eastern Europe are examined in the context of its world-wide lending experience in higher education. Information is presented on the kinds and distribution of Bank higher education investments from 1963 to 1991. Attention is given to recent projects in Brazil, China, and Hungary that have significantly influenced the way the Bank has understood key issues involved in restructuring higher education and research systems in Eastern Europe. The importance of creating the right incentives for institutions and researchers is emphasized as well as the fragility of economic and political systems in the region.

Résumé

Les stratégies de la Banque Mondiale au titre de la réforme et de la revalorisation de la recherche et de l'enseignement supérieur en Europe de l'Est sont examinées sous l'angle des prêts internationaux qu'elles concèdent dans le domaine de l'enseignement supérieur. Des données sont fournies sur la nature et la répartition des placements effectués par la Banque Mondiale dans l'enseignement supérieur entre 1963 et 1991. L'auteur centre son attention sur les projets récents au Brésil, en Chine et en Hongrie qui ont considérablement influencé la manière dont la Banque a saisi les problèmes clés liés à la restructuration de la recherche et de l'enseignement supérieur en Europe de l'Est. La nécessité de créer des mesures d'incitation appropriées pour les établissements et les chercheurs y est mise en valeur au même titre que la fragilité des systèmes politiques et économiques de cette région du globe.

The World Bank's lending strategy for human resource development in Eastern Europe emphasizes the importance of restructuring education and training systems to facilitate the transition to market economies. Projects have generally combined initiatives directed to transforming the organization and content of vocational and technical training with support for efforts to break down the compartmentalization of the higher education and research systems.

The World Bank's first major education sector investment after the dramatic political changes of the late 1980s was a 1991 loan to Hungary which included programs designed to promote development of new interdisciplinary fields of study and research neglected during the socialist period, upgrade scientific instrumentation in universities and government scientific institutions, increase opportunities for young scientists, and expand foreign language training. These were intended to support introduction of normative financing of public higher education institutions and establishment of an autonomous foundation to allocate research support in basic sciences on an open competitive basis. Other project components supported reform of secondary vocational and adult training.

In Poland, an educational restructuring project is being appraised that will support reorganization and reform of vocational and technical education, including creation of new higher technological institutes offering short-cycle programs to prepare students for employment in the industrial and service sectors. In Bulgaria, a project is being prepared with components intended to strengthen career guidance and vocational training, improve monitoring of student performance and program effectiveness, and to establish new funding mechanisms to support research mainly in applied scientific fields important to private sector development.

While these projects reflect the diverse circumstances and different priorities of the borrowing countries, there are many commonalities. Bank investments support the "structural adjustment of the human capital producing sectors . . . to the new political and economic realities," particularly "the change in the function of labor markets from social welfare and redistribution to economic productivity and efficiency" (Harbison, 1991, pp. 7-8). The introduction of market mechanisms has led to sharp reductions in industrial output throughout the region and, combined with decreased subsidization and privatization of some public enterprises, increasing unemployment. This has focused concerns on the need for comprehensive national strategies for retraining the labor force, restructuring the relationship between education and the employment sector as well as for maintaining and eventually increasing human re-

source and capital investment in modernizing the technological bases of production systems.

This paper examines Bank strategies for reforming and rehabilitating higher education and research systems in Eastern Europe in the context of its world-wide lending experience in higher education since 1963. The overall objective is to show how the Bank is attempting to apply lessons learned to its evolving lending program in higher education investments from 1963 to 1991. The first section describes the volume of lending and distribution of projects. The second considers projects in Brazil, China, and Hungary that have significantly influenced the way the Bank has understood the key issues involved in restructuring higher education and research systems in Eastern Europe. The final section draws attention to special circumstances that the Bank must take into account if its present and future lending activities are to be effective.

World Bank Patterns of Investment

Since 1963 the World Bank has had a prominent role in supporting the development of higher education systems in Latin American, Caribbean, African, Middle Eastern, Asian, and many European countries (Eisemon, 1992). In all, 281 higher education projects with 432 higher education components have been supported, amounting to a total Bank investment of more than US\$5 billion. That represents about one third (37%) of lending for education during the period of 1963 to 1991. World Bank investment in higher education has grown from an average of 17% of lending for education in the 1960s to 37% since 1986.

The World Bank became involved in lending for higher education at a time when many countries in Africa, Asia, and the Caribbean were becoming independent and when rapidly developing bureaucrasies, to manage public investments, were designed to stimulate economic growth. Between 1963 and 1975, a majority (61%) of projects supported universities. In the early 1970s, the justification for large donor and government investments in higher education, particularly in university development, were being questioned. Rate of return analyses suggested that developing countries were "over-investing" in higher education and that resources should be redirected to primary education.

This theme was amplified in World Bank educational research and policy statements throughout the 1970s and early 1980s. The 1971 Education Sector Policy Paper proposed more emphasis on primary and even nonformal education. The 1974 Education Sector Working Paper criticized the disproportionate allocation of education resources to secondary and higher education that served the modern sector, resulting in underfinancing of basic education which was the more efficient and more equitable investment.

The 1980 Education Sector Policy Paper, the most recent statement of World Bank policy for investment, focused on equity issues and on expanding access to basic education within the framework of measures to promote cost effectiveness and external efficiency. It raised concerns about reliance on manpower forecasting and the enthusiasm of many developing countries for vocational training, though it favored investments in polytechnics and other forms of technical training as an attractive alternative to high cost university studies. The number of World Bank investments involving universities declined between the mid-1970s and mid-1980s. Nevertheless, the volume of lending grew more than 50%, and higher education's share of education lending increased from 30% to 43%.

The volume of higher education lending has continued to grow although its share of education investments has declined somewhat. Nearly all of this relative decline can be attributed to rising support for primary education. In other words, the competing requirements of the higher education and primary education subsectors have been accommodated by the expansion of assistance for education generally.

Investment in European and Middle Eastern, and especially in East Asian, countries has grown more rapidly than lending to African or Latin American and Caribbean countries. In the most recent period (1986 - 1991), East Asian countries - principally China and Indonesia - accounted for 33% of project investments and nearly half (47%) of higher education lending. Lending to South Asian and European and Middle Eastern countries has also grown in recent years.

Table 1
Total higher education lending by region, 1963-1991 (Millions US\$)

Region	63-70	71-75	76-80	81-85	86-91	Total
	\$ M %	\$ M %	\$ M %	\$ M %	\$ M %	\$ M %
Africa	15.6 30.2	43.3 13.4	69.7 12.0	111.7 7.3	279.0 10.8	519.3 10.2
E. Asia	11.9 23.0	108.0 33.0	214.4 37.0	1,103.1 72.0	1,219.0 47.0	2,656.4 52.0
S. Asia	17.4 34.0	54.0 17.0	22.6 4.0	67.9 4.0	569.3 22.0	731.2 14.0
EMENA*	3.0 6.0	104.9 33.0	264.5 46.0	149.9 10.0	357.4 14.0	879.7 17.0
LAC**	3.7 7.0	12.4 4.0	7.4 1.0	100.4 7.0	165.5 6.0	289.4 6.0
Total	\$51.7	\$322.6	\$578.6	\$1,532.9	\$2,590.1	\$5,075.9

* Europe, Middle East, North Africa

** Latin American countries

Table 2***Total lending by type of institution supported, 1963-1991 (Millions US\$)***

Institution	63-70	71-75	76-80	81-85	86-91	Total
	No. \$ M %	No. \$ M %	No. \$ M %	No. \$ M %	No. \$ M %	No. \$ M %
Universities	10 \$32.3 63%	25 \$187.6 58%	26 \$268.0 46%	23 \$824.5 54%	38 \$899.7 35%	122 \$2,212.1 44%
S&T Research Institutes	0 \$0.0 0%	1 \$2.8 1%	0 \$0.0 0%	3 \$129.5 8%	13 \$604.8 23%	17 \$737.0 15%
Polytechnics	3 \$4.1 8%	9 \$32.6 10%	6 \$66.9 12%	9 \$149.5 10%	10 \$566.5 22%	37 \$819.6 16%
Technical Institutes	7 \$8.1 16%	30 \$75.2 23%	34 \$189.9 33%	19 \$240.1 16%	17 \$209.9 8%	107 \$723.1 14%
Teacher Training Institutions	15 \$7.2 14%	33 \$24.4 8%	34 \$53.7 9%	34 \$189.4 12%	33 \$309.2 12%	149 \$584.0 12%
Total	35 \$51.7 100%	98 \$322.6 100%	100 \$578.6 100%	88 \$1,533.0 100%	111 \$2,590.1 100%	432 \$5,075.9 100%

World Bank lending for higher education has been mainly directed to institutions which supply education systems with teachers to facilitate expansion of school enrolments or the productive sectors with technicians. Since 1986, for instance, about a third (30%) of higher education investments have supported teacher training and 24% have been directed to polytechnics or technical training institutions. The proportion of university projects has increased slightly since the early 1980s - to 34% in the period 1986 - 1991. Support for national scientific institutions which carry out advanced training and research is very recent. Together with universities that in many developing countries employ most scientists and engineers engaged in research and development, World Bank lending to these institutions between 1986 and 1991 accounted for nearly half (46%) of project investments and 58% of higher education lending.

Lending Experiences, Lessons Learned

Rehabilitating China's higher education and research system

The Bank's lending program to China illustrates the range of activities it supports, the successes of a comprehensive integrated approach to rehabilitation of higher education systems as well as some of

the difficulties experienced in transforming the training and research systems of countries with socialist economies. Nine projects have supported strengthening the different tiers of the higher education subsector within the framework of China's Four Modernizations Plan of 1980. The first project (1980) provided \$285 million for improving scientific and technological training at about a third of the country's elite national universities.

World Bank funding facilitated construction and/or rehabilitation of university laboratories and libraries, updating instructional and research programs with foreign scientific expert assistance, and upgrading the professional qualifications of academic staff through foreign training. Project implementation was guided by a Chinese Review Commission comprised of many of the country's leading scientists as well as by an International Advisory Panel. Somewhat similar international advisory structures were developed and implemented successfully in earlier Korean science and engineering projects.

The next three projects, two agricultural training projects (1983, 1984) and a polytechnic/television university project in 1983, were concerned with expansion of agricultural and technical universities and specialized training and research institutions like the National Rice Research Institute. A Second University Development Project was approved in 1985 to strengthen economics and engineering programs at 35 national universities supervised by government ministries. But neither this project nor the previous ones were intended to address in any significant way the increased pressure for expansion of the country's very selective system of higher education. They were mainly designed to enable China's elite higher educational institutions to catch up in scientific training and research after a long period of professional isolation during the Cultural Revolution.

The Provincial Universities Project (1986) embraced the largest, most diverse component of the higher education subsector - 60 of the country's more than 700 second-tier medical, technical, agricultural, and comprehensive universities. Although the project gave importance to quality improvement measures such as staff development, curricular reform, and investments in laboratories and libraries, more importance was placed on expansion of enrolment than in earlier projects. The project was implemented in the context of a radical decentralization of the State Education Commission's responsibility for financing and directing the growth of higher education at the provincial level.

Subsequent projects have supported university presses to increase the availability of instructional texts (1989) and one of the most recent, the Key Studies Development Project (1991), attempts to strengthen postgraduate training and research at 133 State Key Laboratories and

Special Laboratories, either at selected national universities or in institutes administered by the Chinese Academy of Science. A large network of State Key Laboratories was established in the early 1980s to concentrate research and training resources at centers of excellence designated by the State Planning Commission. Seventy-five laboratories, selected through a competitive peer review process, will receive support for research and postgraduate training. Priority has been given to proposals fostering collaboration between university departments and research laboratories. A particularly innovative feature of this project is a pilot program to improve laboratory management. As in the early university development and polytechnic projects, international program advisory groups will be established to monitor activities, except in this case the panel chairperson and most members will be Chinese.

Over the course of more than a decade and through multiple project investments, China's higher education system has been strengthened considerably. At the end of the Cultural Revolution, the government embarked on a massive effort to join the Newly Industrialized East Asian countries in terms of the production of scientists and engineers, and to promote technological innovation in agriculture and industry through increased access to scientific and technological expertise in other countries. World Bank assistance has facilitated China's re-entry into the international mainstream in many fields of scientific training and research. By the mid-1980s, the mainstream scientific output of Chinese scientists and engineers had grown considerably, reflecting the country's new scientific, education, and development priorities and increased international scientific cooperation. The qualitative expansion of scientific and technological training has been impressive, so much so that since 1988 the State Education Commission has frozen university intake out of concern for the qualitative implications of rapid enrolment expansion.

There were also important curricular reforms in engineering education and applied social sciences. For instance, in engineering, the number of different degree programs has been reduced from 665 to 100. Programs are still overly specialized by comparison to many industrialized countries where engineering education is organized on the premise that an engineering career involves performing various assignments requiring a wide range of practical expertise as well as a sound theoretical training and some social science knowledge in preparation for managerial responsibilities. Despite the Chinese effort to delink engineering education from manpower planning and create a labor market for engineers, the state-owned enterprises remain the principal employer of engineering graduates and the configuration of an engineer's professional responsibilities changed slowly until very recently.

The reform of programs in economics and financing was perhaps more successful. These were radically changed with profound long-term

implications for the training policy cadres who have played a central role in transforming the country's economy. In 1991, undergraduate programs in economics and finance at 250 universities and colleges were directed by the State Education Commission to begin using the new market economics syllabi developed by expert panels of Chinese and foreign scholars. "This would not have been possible," Hayhoe notes, "without Chinese consensus on both the need and direction of curricular reform, including recognition that western social science training models could be adapted to the Chinese situation" (Hayhoe, 1989, p. 62).

Supporting scientific training and research in Brazil

Like many Eastern European countries, Brazil is a major producer of science and technology and scientists and technologists. But it has not derived full benefit from its substantial research and training capacities for several reasons. The country's research and development capabilities are mainly concentrated in the public sector (Schwartzman, 1991). There is a very low level of private investment in research and development, and because of large, protected, oligopolistic internal markets, there are few incentives for technological innovation by private firms or state-owned enterprises (Dahlman, 1984; Schwartzman, 1991). Moreover, the country's work force is poorly educated and largely unskilled.

For many years, the World Bank provided little assistance to higher education apart from what was necessary to support Brazil's agricultural research system and expand further research on nonfossil fuels and the ecology of the Amazon basin. No rationale had been developed for greater involvement in the higher education system. Indeed, from a sectoral perspective, there was little justification for major investment.

The Science and Technology Project approved in 1985 reflected a radical change in the World Bank's approach. Better exploitation of the country's agricultural, mineral, and other natural resources was presented in this project as requiring increased investment in the country's infrastructure for scientific and technological training and research strained by the rapid growth of enrolments during Brazil's economic miracle from 1964 to 1979 and, subsequently, by economic crisis. A rationale for investment was developed, focusing on the implications of investments in research and training for economic growth and the country's poor performance on science indicators relative to OECD and many Asian countries.

Sector work identified the principal weaknesses of Brazil's higher education and national research systems as: (a) dispersion of scarce resources "across too many discrete activities" with the result that projects are inadequately funded; (b) "mismatch between availability and orien-

tation of scientific and technological expertise and the unexploited natural resource base"; (c) poor scientific support services and access to scientific information; and (d) ineffective mechanisms for setting scientific and educational priorities and funding projects (World Bank, 1985).

A human resource subprogram to expand postgraduate and diploma training in higher education institutions located in regions rich in natural resources, but scientifically and educationally less developed, was funded together with a large targeted research grants program in applied scientific fields open to researchers in universities and government scientific institutions. Procedures for peer review of research proposals were strengthened. A second scientific research and training project was approved in 1990 to "consolidate the fragile institutional reforms made in the first project, such as open competition, peer review and decentralized planning" (World Bank, 1990, p. 12). The project continues the focus on the public sector research system and "activities which the private sector will not finance." Additional funding is provided to the fields in the applied sciences supported by the earlier project and two more were added: materials science and environmental studies. Almost half of project funding will be expended for purchase of scientific equipment.

Much of the rationale presented for these project investments rests on the assumption that Brazil is not producing enough high quality science and well trained scientists and engineers. The problem is insufficient research and training capacities rather than insufficient utilization of the country's public higher educational and research assets by productive sectors. Yet the appraisal report for the most recent project draws attention to many areas of concern. The public sector, it notes, may finance as much as 90% of total science and technology investment, a much higher proportion than in many OECD and East Asian countries (World Bank, 1990, p. 34). While state funding has declined from the early 1980s as a result of continuing austerity, federal government spending on basic research has remained stable, reflecting "the political power of the Science and Technology community" (World Bank, 1990, p. 35). Ten per cent of national investment in advanced scientific training and 40% of competitive research funding, most of which is captured by universities, is derived from World Bank loans (Wolff, 1991, p. 6).

Macroeconomic reforms introduced by the federal government in 1990 have profound implications for whether the country will ultimately benefit from investments in expanding its higher education and research system. Protected internal markets are being opened and firms encouraged to compete, with tariffs being reduced substantially. State-owned enterprises which account for a substantial share of national research and development investment will soon be privatized. Such measures might lead to greater utilization of the research and training capabilities in

universities and in government scientific institutions. Much will depend on the policies the country develops to stimulate private investment in research and development and also on investment in increasing the educational and skill level of the labor force.

Reforming Higher Education and Research in Hungary

The political and economic context of the Bank's 1991 investment in reform of Hungary's higher education and research system is more dynamic than in either China or Brazil. A radical reform of the structure and financing of higher education and research is being supported in order to expand access to higher education, encourage curricular reforms, and unify the country's higher education and research systems which are presently the responsibility of different ministries and scientific academies.

In conjunction with the implementation of the World Bank project, a Higher Education Law was presented to the national parliament in 1992 to re-organize the public higher education system, allow public institutions to levy fees, change the procedures for allocating state support to students and institutions, legitimize the establishment of private institutions, and create funds to support research, institutional rehabilitation, and innovation as well as to establish new policy structures to guide the growth of the higher education system (COHE, 1991).

The Higher Education Law brings all public and private higher education within the authority of the ministry responsible for higher education which will be advised by a Committee for Higher Education and Research comprised of representatives of the various ministries concerned with higher education, university records and administrators of government scientific institutions, and local and even foreign experts. The Committee will formulate norms for financing public and private institutions and make recommendations to parliament on public expenditure for higher education through the ministry.

Although higher education will continue to be supplied primarily by the state, public and private institutions will compete for state support. Support will be distributed to institutions and students through various funds. Students will receive payments from the state Student Fund for part of the costs of accommodation, boarding, textbooks, and, in addition, loans to pay these and other costs interest-free for ten years. A Tuition Fund will provide support to institutions based on their efficiency and other parameters of performance as well as the costs of the programs they offer. Budgetary incentives will foster qualitative improvements and curricular innovations.

The Higher Education Research Fund will selectively support proposals from institutions that fall outside the mandate of other national research councils while the Facilities Fund can be accessed by institutions for extraordinary capital investments. Universities and colleges will be allowed to determine and allocate intake except in the case of certain professional faculties (e.g., medicine, dentistry, veterinary medicine) whose enrolment will be controlled by the Committee for Higher Education and Research. The institutions will be able to obtain additional income from private sources without reduction of their operating budgets, set salaries and wages of academic and nonacademic staff, and manipulate other aspects of their cost structure, subject to minimum accrediting standards adopted by the Committee for Higher Education and Research to determine eligibility for support from the Tuition Fund.

The project shares some features of the China and Brazil projects described above, especially the reliance on open competitive funding mechanisms to motivate reforms, with the difference that the scope of the reforms supported is much broader. A "catching up" with the Higher Education in Europe Fund will be established with a World Bank credit to provide incentives to institutions to introduce new programs, integrate the research functions of government scientific institutions with the teaching activities of universities as well as to promote collaboration with other European institutions. The Fund provides interim support for the comprehensive reforms envisaged in the Higher Education Law.

Implications for Future Lending in Eastern Europe

While it is premature to speculate about the outcome of the Bank's project in Hungary, there are several lessons that can be drawn from the earlier investments in China and Brazil in fostering reform of higher education and research that are pertinent to other countries whose economies are in transition.

First, though a great deal of change can be accomplished by creating incentives and providing funding for institutional reforms, the macroeconomic environment must be supportive. That is particularly the case of reforms designed to increase the curricular flexibility and responsiveness of training programs to emerging labor market needs. Where progress toward creating open markets and expanding the role of the private sector is slow, curricular reforms that anticipate changes in the labor market will be difficult to carry out as the Bank's experience with engineering education in China illustrates.

In scientific and technological fields, the problem is compounded by the sharp decline in industrial output that usually accompanies market

reforms. At least initially, open markets do not generate new investment in research and development activities or much demand for scientists and engineers – whatever their training. Unemployment of scientists and engineers has risen rapidly throughout Eastern Europe and enrolments in scientific and technological fields have fallen in several countries. This suggests that reform efforts should concentrate on developing programs in fields in the applied social and natural sciences, especially economics, management, and the environmental sciences, that were largely neglected during the socialist period, and for which there is already evidence of a growing demand for graduates.

Second, the establishment of unitary, transparent, competitive funding mechanisms to overcome the fragmentation of the higher education and research systems characteristic of many Eastern European countries is not likely to produce a radical change in the structure of these systems in the absence of more fundamental financing reforms of the kind contemplated in Hungary. In China and Brazil, competitive research and training-funding mechanisms have the more limited and more achievable objective of increasing international scientific cooperation and promoting institutional collaboration. They have been effective in sustaining research and training activities in scientific and technological fields under conditions of resource scarcity. However, there are clearly no long term solutions to the compartmentalization of scientific training and research. A change in the way core budgets for teaching and research institutions are generated and allocated is needed.

The strategy in Hungary is to diversify sources of support for training and research and to supplant existing funding mechanisms with new funds administered by agencies that will enjoy considerable autonomy *vis-à-vis* the ministries responsible for universities and government scientific institutions. Predictably, the proposal has provoked strong opposition from the sectoral ministries, such as the ministries of agriculture and health which operate their own training and research institutions, as well as from the scientific academies.

Third, prospects for reform are not likely to improve without greater political stability and legitimacy and more attentiveness on the part of governments and the Bank to the democratic context of the reform process. The scientific communities of Eastern Europe are politically powerful like those in China and Brazil, but their claims on scarce public resources are generally weaker, largely because of their formerly privileged status during the socialist period. Nevertheless, reforms are no longer promulgated; they must be politically negotiated with the parties concerned.

The establishment of participatory parliament forms of government after 1989 led to greater political autonomy for higher education and scientific institutions. The governance and management of these institutions was democratized and state intrusion reduced considerably except, significantly, insofar as their financing is concerned. Meaningful autonomy in how institutions raise and utilize resources and in regard to matters affecting their costs, such as levels of remuneration, is essential to both financing and curricular reforms. But mechanisms of accountability acceptable to higher education and scientific institutions as well as to the state will be necessary to support further devolution of government control.

An important legacy of the socialist period is a pervasive (and well founded) distrust of the executive organs of government, especially by elected parliamentarians. This is exacerbated both by the proliferation of political parties and interest groups and by frequent changes in government. The result is that legislation involving reform of higher education and scientific institutions is highly detailed, crafted to circumscribe government authority in implementation, and receives intense political and public scrutiny. Passage of important reform legislation is stalled in Hungary, Romania, and in an increasing number of other Eastern European countries.

Finally, even under the most favorable circumstances, multiple investments will be required to support the reform process in Eastern Europe. The World Bank will have to work with governments in formulating a long-term comprehensive investment strategy as it did in China throughout the 1980s, supported by a series of project investments directed simultaneously to different institutional components of the higher education and research system. Funding for curriculum reform, rehabilitation of instructional and research infrastructure, staff training, and other qualitative improvements must be mutually reinforcing and provided in conjunction with increased national investment, both public and private. High priority should be given to assisting governments to strengthen management of their higher education and research systems and institutions.

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