1980

The role of education in economic growth

In my speech "Technology education and capitalist industrialization: a study of the rise of technological power in Western Europe and America,"[1] I dwelled on the relationship between education and economic growth in light of economic history. What I was driving at was that education is a major recourse for nations to groom technological personnel, and that only by putting a premium on education and the cultivation of talents can less developed nations boost their economic growth rates and catch up with and surpass the developed countries. As I put it in that speech, the role of education in economic growth has five aspects:

"First, education provides society with a supply of researchers and designers who can venture into the unknown, innovating in science, renovating and transforming productive technology. Without such contingents, the best a nation can do is to tag along after other nations, but in that way you cannot score major breakthroughs in science and technology.

"Second, education provides society with engineers and technicians who can master and apply advanced means of production. Without such technocrats, even if a nation has acquired sophisticated tools of production, it cannot put them to best use.

"Third, education brings forth production and technology managers well adapted to society's level of industrialization. Without teams of such managers, the production process can be prone to colossal waste in human, material and financial resources, making it impossible to benefit from the superiority of advanced productive technology.

"Fourth, education enhances society's scientific and cultural attainment, and sets the stage for promoting new products and disseminating and upgrading knowledge in science and technology. At the same time, education also lays the groundwork for the future growth of a nation's technological prowess, and guarantees the supply of a constant stream of high-caliber researchers, engineers and managers, and skilled workers.

1 This speech was delivered at Peking University's 1978 "May Fourth" Science Forum, and carried in *Social Sciences Front*, issue No. 4, 1978.

"Fifth, education enables society to preserve and disseminate its accumulation of scientific knowledge and productive experience free from barriers of time and space and national boundaries. It is through education that such accumulated knowledge and experience are spread from one nation to another and from one generation to another as humanity's shared assets."

I would like to go on with my observation of the relationship between education and economic growth on the basis of the speech I made and published two years ago. However, this paper has a different focus. While in my previous speech I looked into the major role education plays in expanding the economy and raising its growth rate, this paper underlines education's important role in ensuring economic stability and sustained growth, and in providing effective solutions to problems that have occurred or may occur in the process of economic growth. In other words, my previous speech was about economic growth *per se*, whereas this paper is a study of employment, balance of international payments, income distribution, financial balance, and other issues occurring in the process of stabilizing and sustaining economic growth. Furthermore, while my previous speech proceeded from the perspective of the economic history of Western Europe and America, this paper takes China's socialist economy as its focus and background.

This paper is delivered in four chapters dealing respectively with education's relationship with employment, balance of international payments, income distribution, and fiscal balance, so as to illustrate education's role in guaranteeing economic stability and sustained growth.

I. The "structural" nature of the employment problem can be solved by developing and restructuring education

Theoretically speaking, any nation can grow its economy either by expanding its workforce or by investing more in machines and equipment and improving workers' technical know-how and skills. The adoption of labor-saving technology and equipment may help cut down the material production sector's demand for workers in the course of economic growth. Consequently, given a constant population growth rate, economic growth

itself cannot ensure full employment. The number of jobs to be created through output increase is determined not only by the rate of production expansion, but also by which approaches are adopted for such expansion. If a country develops its economy not by hiring more workers but by adopting new technology and equipment and improving workers' cultural and technical proficiency, then the ability of its material production sector to absorb the workforce will be limited.

On the other hand, economic growth also entails a process of change in a nation's economic structure. The inexorable law of material production is that some old manufacturing industries decline or are phased out while new ones rise and grow. The ratio between material and non-material production in the national economy is changing as well. It is an irrevocable trend in economic growth for some non-material production industries to grow in strength along with their shares in the national economy. With the national economic structure changing constantly, those working in languishing or failed industries need to find new jobs elsewhere. The rising industries in material production, and particularly the burgeoning industries in non-material production, often run short of workforce. Thus the emergence and growth of new industries in both material and non-material production are major reasons why a nation can increase employment amidst economic growth.

The changing economic structure of a nation implies changes in both industrial and geo-economic structures. In China, underdeveloped regions may achieve a relatively higher economic growth rate, whereas developed regions may slow down, or grow at a relatively lower pace. Regions that either suffer a low growth rate or maintain a high growth rate mainly by spending more on technology and equipment will produce a glut of factory layoffs that will have to seek employment elsewhere, whereas regions with a high growth rate, those with a labor shortage in particular, are likely to accept the job-hunters.

These situations prove clearly that the employment problem confronting a country in the process of economic growth is mainly "structural." That is to say, the success or failure in tackling this problem hinges on whether the workforce structure – the makeup of workers of different trades, industries

and locations in a region's total number of workers – is commensurate with local economic growth rates and economic structural changes, and whether the workforce itself can meet the technical needs of local economic growth. When the structure of a workforce does not match the local economic growth rate and the changing local economic structure, and when workers' technical proficiency level falls short of the needs of economic growth, unemployment will unavoidably exist alongside a surplus of unfilled job vacancies.

This paradoxical coexistence of unemployment and superfluous vacancies means that while people are looking frantically for jobs, many jobs are left unfilled. How is it that people lose jobs while the economy keeps growing? The answer is that if economic growth is achieved for the most part by raising labor productivity while the population growth rate remains high, those coming of employment age are likely to fail to land suitable jobs. Even if these people are a non-factor, industries and regions with slow or stagnant growth lay off workers. This is particularly true of developing countries, where agriculture – known for its low labor productivity – often dominates the national economy. In the industrialization process, large numbers of villagers who have just quit farming may find it hard to land jobs. Unemployment – concealed unemployment[2] included – thus becomes unavoidable.

Why, then, are there vacancies that remain unoccupied? This is because, when the workforce structure does not tally with the prevailing economic growth rate and economic structure, the rising industries in both material and non-material production cannot find what they want badly: skilled workers and competent engineers, technicians, researchers, and managers. The same labor shortage can also occur in established industries in material production that maintain growth by relying heavily on new technology and equipment, so much so that even workers on their payrolls cannot measure up to what such new technology and equipment require of them. Seemingly unwanted jobs may also occur in newly developed places where required workers are

2 Referring to individuals who know that no suitable jobs are available but choose not to register as being unemployed, even though they would prefer to have a job – *Translator*.

in short supply. This is an outstanding problem with developing countries, where, for historical reasons, skilled workers that can keep pace with industrialization are scarce.

Generally speaking, the number of the jobless can never match the number of jobs awaiting them in a national economy. The ratio between the two numbers differs with the changes and readjustments in a nation's economic growth rate and economic and workforce structure. However, even if the two numbers match each other, they cannot offset each other, because workers of different proficiency levels and fields of work are not interchangeable under modern production and technological conditions. In the long run, the coexistence of unemployment and unfilled job vacancies in a nation's economic growth is not temporary, but, most probably, perpetual. That is to say, job vacancies may disappear when long-time job-seekers have found their jobs, but will occur again when new layoffs arrive on the scene. Unemployment, concealed unemployment included, is a waste of human resources, while job vacancies left unfilled are a waste of material resources – for them to exist at the same time is not only detrimental to economic growth, but also holds back the adoption and popularization of new technology and economic restructuring. The result is that the economy remains mired in low efficiency. Chronic joblessness can also be a major destabilizing factor for society.

In a nutshell, employment problems in a growing economy are attributable to the failure in reconciling the conflict between unemployment and unfilled job vacancies. Such is the "structural" nature of employment.

The employment problems confronting China are complicated. Some are universal to all economies, some are common to developing nations in economic development, but others are peculiarly China's own. These three categories of employment problems are intertwined. The universal ones stem from the fact that the increasing use of sophisticated machines and technological equipment has whittled down producers' need for workers, unskilled workers in particular. Those common to developing nations arise from the new job needs of large numbers of unskilled laborers that have just quit farming at the time of an agrarian society's transition to industrialization. The employment problems peculiarly of China's own are partly to be blamed

on incompetent labor administration, but most of them are attributed to the lopsided economic development resulting from the ten-year chaos of the "cultural revolution" that considerably narrowed down people's job options. These problems were aggravated by the excessive population growth in the late 1950s and the early 1960s. Today, those born in those years are coming of age or will soon become eligible for jobs. If the employment problems for these people cannot be properly handled, both society and the economy will be in jeopardy. The situation is also complicated by a dire shortage of skilled workers and the low labor productivity of those in their jobs. The dilemma facing China today is that while many job-seeking youths are having trouble finding jobs, factories, too, find it hard to fill jobs with qualified workers. A nation's aggregate volume of labor resources is derived by multiplying the total number of workers with their average level of technical competency – the chief indicator of labor quality. In that sense, China's aggregate volume of labor resources is by no means abundant because its workers' average skill proficiency is low despite their sheer numbers.

The solution to our nation's employment problems, in the final analysis, is to create a constant supply of new jobs to keep pace with economic growth. If we cannot create new jobs, the need for labor will shrink with the adoption of new technology, even if population growth is kept at a low level.

How to create new jobs? This involves the diverse economic sectors and forms of public ownership under the socialist system, as well as such factors as economic administration, various types of technical innovation, and the ratios between sectors and economic growth rate. These issues, however, are beyond the scope of this study. The topic at hand is this: Supposing substantial numbers of new jobs are created by readjusting and revamping the ownership structure, the economic system and the ratios between economic sectors, and by riding the nation's robust economic growth, can the nation come to grips with its employment problems? Given the "structural" nature of employment in our country, we can assert categorically that the disparity between the structure of the workforce and that of the national economy will never be eradicated without corresponding development in education and without restructuring the education system. The dilemma between "people

hunting for jobs" and "jobs seeking takers," too, will remain for a long time to come. The important role of education in tackling employment problems rests precisely on its ability to deliver the nation from that dilemma.

Developing education and spending more on it can help dovetail the workforce structure with a growing economy's need for workers at different technical levels and in different fields of work. To achieve that end, we have got to adapt our educational structure to the changing economic growth rate and structure, and act on the long-term need of economic growth to readjust the categories of schools and the setup of academic programs, and to variegate the schooling terms. Long years of observation reveal two options in this regard. In the first option, when existing and prospective job-seekers are not outnumbered by anticipated unfilled job vacancies, the main thrust of our effort can be directed at further improving education and raising workforce quality, so that every worker that has been educated or trained can qualify for more demanding jobs, thereby enhancing labor productivity and further promoting the adoption of new technology. In this way, not only can the needs of economic growth be met, but the number of unfilled job vacancies can be curtailed as well. In the other option, when the total number of existing and prospective job-hunters outgrows the anticipated number of unfilled job vacancies, we can lay equal stress on improving and universalizing education, so that more high-caliber professionals can be cultivated for the national economy while legions of job-waiters are tooled with one kind of skill or another to qualify for suitable jobs. To achieve this end, apart from further restructuring the economy to increase job vacancies, attention should also be paid to developing secondary technical and vocational education so as to put more job-seekers through training. The school term for students can be lengthened so as to curtail the number of prospective job-hunters and better prepare students culturally and technically for future economic growth needs. In other words, we would rather let our youngsters learn more knowledge and skill than keep them waiting for jobs when they are ill prepared in both skill and knowledge.

As things stand today, it is believed the second option is more workable for China for a long time to come. Thus, in education development and

reform, we cannot go single-mindedly after improvement to the neglect of the role of education in tackling the "structural" employment problem.

We should also remember that education reform cannot be accomplished overnight. For one thing, economic growth itself demands that our schools supply large numbers of well-educated and skilled workers who measure up to its needs. Failing this, stable and sustainable economic growth will be out of the question. For another, the economy's ever-changing sectoral, regional, and technological structures call for the adaptation of the education system. A certain level of national economic development is always consistent with a certain structure of education, with the latter changing in sync with the former. This fact should be considered when mapping out long-term national human resource plans.

So much for my analysis of the "structural" employment issue. The employment problems facing China today are "structural" in the main, but they do not stop merely at being "structural." "Individual occupation selectivity" is another social employment issue for present-day China. When job openings are available, people can still choose to stay jobless. They do not lack the needed education and skill, but they make this choice out of occupational considerations. The causes of this employment problem are manifold, but education can still play a role in tackling it. This is because the mission of educators is not limited to teaching cultural knowledge and technical expertise. Character building and education in revolutionary values are essential to students in this country.

II. Investment in education as a prerequisite for developing a knowledge-intensive economy; the gradual increase of knowledge-intensive exports as a strategic measure to improve China's balance of international payments amidst economic growth

As to the patterns of technological innovation for developing nations in the modernization process, I have voiced my opinions in my article "On the roles of capital-intensive and labor-intensive economies in the modernization

process of developing nations" (*World Economy*, issue No. 6, 1979). Because what I wanted to drive at in that article was that developing countries are not going anywhere if they choose to develop a capital-intensive economy more than anything else, I made no mention of the differences between skilled and unskilled labor and of the developmental trends of a labor-intensive economy. In this study, however, to explain why investment in education is a boon to stable and sustained economic growth, I find it necessary to look further into the patterns of technological innovation, or, to be specific, the role a knowledge-intensive economy can play in economic growth.

Theoretically speaking, a nation out to seek economic growth must boost its financial savings and raise funds for investment purposes. If the supply of funds is in shortage at home, something can be done to procure foreign funds under appropriate credit conditions and in light of the situation of the world capital market. The plus side of the use of foreign capital is that it helps overcome immediate foreign exchange and capital shortfalls and brings in advanced technology from other lands. However, in the long run, the commitment to repaying both principal and interest will eventually become a problem for the borrower. If the nation cannot increase its foreign exchange revenue from exports or other sources, balance of payments deficit may become a major hindrance to sustaining its economic growth.

Let us imagine a nation that is before or at the beginning of industrialization that has an abundant workforce, whose wages are low, and whose traditional exports of labor-intensive products have a competitive edge on the world market. Such a nation can use its foreign exchange earnings from exports to meet its domestic demand for technology and commodity imports and improve its balance of international payments. However, when industrialization reaches a certain stage, labor-intensive exports will gradually lose their edge and put the nation at a disadvantage for the following reasons:

First, a growing economy inevitably boosts national income gradually. While per capita national income rises on a yearly basis, worker wages go up as well. As a result, the gap in average wage between the nation and the developed industrial nations is likely to narrow down, thus diminishing the