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Karnataka: Secondary Education and The New Agenda for Economic Growth

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ABBREVIATIONS AND ACRONYMS

CSS	Centrally Sponsored Scheme
GOK	Government of Karnataka
GSDP	Gross State Domestic Product
HS	High School
ITI	Industrial Training Institute
NFHS	National Family Health Survey
NSS	National Sample Survey
PUC	Pre-University College
SC	Scheduled Caste
SSLC	Secondary School Leaving Certificate
ST	Scheduled Tribe
TFR	Total Fertility Rate

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This report was written by Sajitha Bashir (Task Manager). Mangat R. Saluja and Basant Kumar Pradhan (Consultants) undertook preliminary analysis of the National Sample Survey (NSS) data on employment and unemployment, 1993/94. Vinod Vyasulu and A. Indira (Consultants) conducted the tracer study of secondary school leavers and employer interviews. Gaurav Siddhu provided assistance for the preparation of tables and charts and further analysis of the NSS and tracer study data. Anjali Manglik provided production support. Gertrude Cooper assisted in the final editing of the report.

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Introduction

1. Karnataka has recorded impressive growth in the 1990s, with state income growing at 8 percent per annum, driven largely by expansion of the industrial and service sectors. This impressive performance has not reduced rural poverty levels or regional disparities to a great extent partly because growth in agriculture has been limited and because industrial growth has been narrowly based and geographically confined relying mainly on the IT sector in the Greater Bangalore area.

2. The Government of Karnataka has embarked on a range of reform measures to promote private enterprise and competition, improve business regulation, increase investment in infrastructure and disseminate new farming technologies. However, the success of the new agenda for growth and the possibility of a more equitable distribution of its benefits will depend partly on the availability of a skilled and flexible labor force that could be employed in modern enterprises competing in a global market. Increasingly, secondary education of good quality is considered by both employers and new entrants into the labor force, as a prerequisite for employment in the modern sector.

3. This report addresses three major concerns of policy makers in Karnataka on which there is little prior information or research

(a) Is the expansion in student places at the secondary and higher secondary levels justified on economic grounds?

(b) Do secondary school leavers from disadvantaged or poor backgrounds perform worse in the labor market and in continuing into higher education than students from more advantaged backgrounds?

(c) Is vocational training a desirable alternative to general higher secondary education in terms of improving labor market performance?

4. This report uses state-specific data on employment, unemployment and earnings from the National Sample Survey (NSS) 1993/94 and from a tracer study of secondary, higher secondary and vocational graduates conducted in February – March 2001. A small sample of employers was also interviewed. Over 2,000 students from 110 institutions in four districts selected through multi-stage stratified sampling, who had appeared for their respective terminal examinations in 1998, or three years prior to the survey, were traced and interviewed to find out about patterns of transition to the labor market or higher education, labor market performance and the usefulness of their training. Heads of sample institutions were also interviewed to assess their opinions about skills required in the labor market and the actual skills of secondary school graduates.

The Labor Market Performance of Secondary Education Graduates

5. Chapter 2 addresses the first of the three policy questions listed above. There are many sound political, social and cultural reasons for providing secondary education for a state that is rapidly trying to transform itself into an equitable and advanced society. Among the economic reasons for expanding coverage of secondary education are improved labor productivity and earnings of secondary graduates, a more equitable distribution of earnings, external benefits arising from reduced fertility and infant mortality and improved health and nutrition status of children and the long-term impact on economic growth. The analysis in this chapter focuses on the labor market performance of the secondary graduates.

6. The analysis uses two indicators of labor market performance estimated from the NSS data: the rate of return to investment in education and the level and duration of unemployment. Private rates of return are calculated by estimating a standard earnings function in which the log of earnings is regressed on years of education, experience and experience squared. Earnings data are available from the NSS only for regular workers who comprise 13 percent of the workforce. These functions are estimated separately for males and females and for workers in the private and public sectors. The results show that the private rate of return to an additional year of schooling is 10 percent; for women the rate of return is 13 percent and for men, it is 9 percent. The public sector rewards education at a higher rate (10.5 percent) than the private sector (7 percent).

7. Private rates of return to investment in different levels of education are estimated using the 'short-cut' method, which assumes that the age-earnings profiles are flat. The private direct costs of different levels of education are estimated form the NSS 95/96 survey on education (and deflated to 1993/94 levels). Males have a higher private rate of return (20 percent) to investment in elementary education than females (12 percent). At other levels of education, the rate of return for females is higher and the most striking result is the extraordinarily high rate of return of 50 percent for females with secondary education (compared to 14 percent for males).

8. Including the public cost of education (the per pupil budgetary expenditures at each level of education) lowers the rate of return at each level of education. These rates are comparable to those obtained in other countries and to other types of investment. For males, the rates of return for the elementary, secondary and higher secondary levels of education, on inclusion of public costs are 17, 13 and 13 percent, respectively; for females, they are 9, 40 and 12 percent, respectively.

9. These relatively higher rates of return to investment in secondary education suggest that expansion of secondary education may be justified but they do not themselves indicate that public provision of secondary education is required. The justification for public provision of secondary education would depend on externalities and equity considerations. There are several other reasons why these rates may not be sufficient to guide policy decisions regarding future expansion of secondary education. First, differences in earnings by education level and hence the rates of return are strongly influenced by the recruitment and wage policies of public sector, which employs 60 percent of regular workers. Second, rates of return are affected by the level and structure of unemployment. Third, it is difficult to make inferences about the overall rate of

return to investing in secondary education when earnings data are available for only a small proportion of the workforce.

10. The NSS data on unemployment reveal that while the overall unemployment rate in the state is low (2 percent), it is significantly higher among the youth (15 percent). Almost 60 percent of all the unemployed are in the 15-24 year age group. Unemployment rates are significantly higher for those with secondary education and more, and among these, much higher for females than males. The duration of unemployment is also much longer for educated people. In rural areas, about half the unemployed with secondary education and 86 percent of college graduates had been unemployed for more than a year; in urban areas, more than two-thirds of the former and three-quarters of the latter had the same experience. By contrast, the majority of the unemployed who had no schooling secured a job in less than six months.

11. The tracer study conducted in early 2001 provided more recent data on the labor market performance of new entrants with secondary education into the labor force and the patterns of transition into higher education. The transition rate from secondary to higher education is very high: about two-thirds of the lower secondary students and 87 percent of the higher secondary students who had passed their respective terminal examinations continued further studies.

12. Among those who had failed the examination or discontinued their studies, very few were employed even 3 years after leaving school. Job opportunities outside the Bangalore area for those who could not pursue further studies were extremely limited and starting salaries were very low, at Rs. 1,000 – 1,500 per month. Among those not working, about 80 percent of SSLC graduates and 58 percent of PUC graduates had responded to advertisements and 34 percent of the latter had also registered at the employment exchange. This indicates that many of those categorized as 'not working' were in fact, available and looking for employment, i.e., they were employed. Most of those currently not working expected higher starting salaries and wished to work in the public sector; clearly existing job opportunities in the private sector are not considered attractive. The employer interviews, although few in number, suggest that limited expansion of employment in the private sector is one reason for the unemployment of secondary education graduates; however, skills mismatch may also partly explain this phenomenon.

13. An analysis of the growth in aggregate employment shows that employment in the 'organized' sector which mostly recruits educated workers, has been slow mainly because of the slow down in public sector recruitment. If these trends continue and are not counter-balanced by more rapid growth in employment of educated workers in the 'unorganized' sector, further expansion of secondary education is likely to lead to an increase in the level of unemployment among the educated youth.

14. In the light of the labor market performance of secondary education graduates, expansion of secondary education needs to be handled with caution. The high rate of return points to a lack of supply but the high unemployment rate suggests a lack of demand for those skills. This clearly indicates that the labor market is fragmented with high rewards to secondary education in the public sector and a lack of opportunities in the private sector. Karnataka does, however, have two reasons for expanding secondary education. The first is an equity reason because current levels of participation among the poor in the 13-17 year age group are as low as 20 percent in the

lowest income groups compared to over 80 percent for the top quintile. The second is a more strategic reason. The education profile of Karnataka's workforce is poor in comparison with that of countries it is competing with in the global market. For the state as a whole, the mean educational attainment of the workforce was 3.2 years in 1993/94, which was far below that of other East Asian countries. International evidence also suggests that there are strong effects on overall economic growth and increasing returns to scale for investment in education, when human capital in a population reaches a threshold level. However, the expansion of secondary education needs to be accompanied by the pursuit of reforms aimed at promoting the expansion of the labor market through private sector development. Policy efforts should also concentrate on improvements in the quality of secondary education to address skills mismatches, as employer reports reveal that many secondary education graduates entering the labor market in the private sector lack the skills required by modern industries and services.

Factors Influencing Graduation, Continuation into Further Education and Employment

15. The third chapter presents the background and school characteristics of lower secondary students who passed the Secondary School Leaving Certificate (SSLC) and higher secondary students who passed the Pre-University College (PUC) examinations on the first attempt, those who passed on repeat attempts and those who failed. This is followed by a presentation of the results of logistic regressions, run separately for SSLC and PUC students, that examine the effect of these background and school characteristics on: (i) passing the terminal examination; (ii) passing the terminal examination on the first attempt; (iii) continuation into higher studies; and (iv) getting a job, for those who do not continue into further education. The dependent variable in each case is the natural logarithm of the odds ratio of passing, passing on the first attempt, continuation into higher studies and getting a job, respectively.

16. The findings of the regression analysis confirm that students from more deprived family and social backgrounds are less likely to pass the terminal examinations; less likely to pass on the first attempt and less likely to continue further studies. Girls are not disadvantaged, but those from Scheduled Caste (SC) or Scheduled Tribe (ST) family backgrounds and, with parents having limited education, have a lower probability of passing than others. Students from low-income families are less likely to continue their studies after the SSLC level. The results of the regression analysis of those who obtained employment proved difficult to interpret, probably due to the small size of the sample and the fact that most of those working were from the Bangalore urban district.

17. The quality of facilities and education in the high school/PUC attended by the student has a positive impact on the probability of passing both at the SSLC and PUC levels. The significant variables are the student-teacher ratio, adequate library facilities, the quality of teaching and the availability of books and laboratory facilities. Not all variables are significant in all regressions but the results do show a relationship between school quality and student outcomes.

18. Students in government-run high schools at the SSLC level have a lower probability of passing the SSLC terminal examinations, either on the first or repeat attempts; they also have a

lower probability of continuing their studies after the SSLC level. The type of management of the institution does not seem to make a significant difference at the PUC level.

19. However, the most striking and arguably *the most important result is the strong impact of primary level education on the probability of passing both at the SSLC and PUC levels.* In the case of the SSLC regressions, the significant variable is 'English-medium instruction at the primary level'; in the case of the PUC, it is 'attendance in a government-run primary school'. It is possible that the latter also partly captures the effect of the language of instruction since government schools provide instruction only in Kannada. This interpretation suggests that those who studied in Kannada at the primary level are at a disadvantage at both the SSLC and PUC levels. However, it is also possible that the variable 'English-medium instruction at the primary level' partly captures the impact of studying at a private school, since only private schools provide English-medium education. *Disentangling the effects of private school and medium of instruction is not easy, since the two are highly correlated.*

20. The medium of instruction in high school also influences the probability of continuing further studies. Among both SSLC and PUC students, those who had English-medium education at the SSLC level showed better chances of passing their terminal examinations. This additional result strengthens the argument that it may be the language of instruction rather than the private school effect that favorably influences outcomes.

21. The 'marginal' effects for each explanatory variable in each regression were calculated for the 'modal' student. As an illustrative example, in the regression on passing the SSLC, the probability for passing for the 'average' student is 0.79. The variables with the strongest marginal impacts are 'student attended a government high school' (-0.13) and 'student attended an English-medium *primary school*' (+0.15). Similarly, for the regression on passing SSLC on the first attempt, the marginal impact is that of studying in an English-medium *primary school* (+0.24). For the regressions on continuing into further education, among both the SSLC and PUC students, the strongest marginal impact is that of studying in an English-medium *high school* (+0.17).

22. The results have significant implications for educational policy and suggest that an integrated approach to language of instruction at different levels is required if equity in educational outcomes is to be promoted. If English-medium education at the primary level increases the chances of passing at the secondary level, but is provided only in private schools that are accessible to higher-income and more privileged groups, students from poor and disadvantaged groups are denied equitable opportunity to complete secondary education with satisfactory quality.

23. This analysis does not by itself indicate that the problem at the primary level is instruction in Kannada *per se* or that the solution is to promote English-medium education at the primary level. What it highlights is the mismatch in the content of education between the primary and secondary levels. Students apparently require proficiency in English at the secondary and higher secondary levels (even if they are studying in Kannada) but English language teaching in government schools begins only in class 6 and is reportedly of poor quality.

24. The policy options to improve the outcomes of the poor and disadvantaged students are to strengthen English language teaching in government schools at the primary level, improve instruction at the secondary level in Kannada medium schools, especially in science and mathematics (through teacher training, books and materials) or enable more students to attend private schools. These options need to be considered carefully and they are not all mutually exclusive.

25. One important conclusion of this analysis is that the existing policies to encourage participation of students from SC or ST or agricultural families in higher education, including financial incentives and reservation of seats in institutes of learning, have not been entirely successful in ensuring equitable outcomes at the secondary level. This, in turn, affects the chances of such students in continuing their education. Karnataka needs to improve equity in the outcomes of secondary and higher education, in particular, for the SC/ST students, those who are from poorer and less educated family backgrounds and those studying in government institutions (especially at the high school level). In order to do this, it needs to improve the quality of primary education, including issues relating to the language of instruction and the mismatch in curricular content between different levels, in tandem with directly improving the quality of secondary education by lowering the very high student-teacher ratios in some high schools and investing in laboratories and libraries. The analysis suggests that raising the quality of primary education in combination with steps to strengthen secondary education will have a greater impact on improving outcomes for the disadvantaged than improving the quality of secondary education alone. However, these regressions are more in the nature of exploratory analyses and need to be further refined to take into account problems of omitted variables and self-selection bias.

The Labor Market Performance of Vocational Training Graduates

26. The tracer study results show that skills training in specific trades do seem to enhance job prospects and wages of graduates of Industrial Training Institutes (ITI) in comparison to those who have only general secondary education. Industrial skills training is also considered necessary by employers. Both students and employers are willing to invest in training – students invest in additional skills training, and employers are willing to provide opportunities for on-the-job training, provided the foundations for benefiting from such training exist. However, part of the advantage that ITI students enjoy over the SSLC students who join the labor market appears to be due to the fact that the skills and knowledge of the latter are at very low levels. Employers consider SSLC students "unemployable" in the skilled jobs required by the modern industrial and service sectors and are unwilling to invest in training of SSLC graduates, preferring to recruit ITI graduates, where possible.

27. The study findings reveal, however, that *expansion of vocational training as currently configured in Karnataka is not desirable.* Vocational training in the state is not responsive to the changing labor market; relatively few of the vocational training graduates get employment even several years after graduation due to the obsolescence of many trades, rapid changes in technology and production systems and the slow growth of employment in the manufacturing system.

28. Due to the high wastage in the system and the higher unit costs of vocational training, the *current system of vocational training may turn out to be less cost-effective than general secondary education*, even though more vocational graduates get employed and their earnings are higher than that of SSLC students. Further, currently, the ITI's are not catering to the most disadvantaged sections (even among the secondary education graduates). Public investment to expand *the existing system of vocational training* does not appear justified on either efficiency or equity grounds.

29. Nevertheless, it is clear that specialized skills training is required to improve the earnings and productivity of school leavers and to cater to the needs of the changing labor market. Improving the quality of general secondary education is a pre-requisite so that it becomes worthwhile for students and employers to invest in specialized skill training. Without this, any additional investment in vocational training alone is unlikely to produce the intended benefits of improving earnings and productivity, especially of the poor and rural youth. The specific areas that need attention are oral and written communication skills, in both Kannada and English, and improving the teaching of mathematics and science, especially the practical applications of these subjects in the world of work.

30. In addition, Karnataka needs to explore new institutional approaches to provide this training and a diversification of its sources of financing. First, instead of offering a separate vocational stream at the PUC level with occupation-specific courses which faces low student demand, it could offer greater diversity of courses and flexibility to students in *the general academic PUC stream*, which would enable students to access a range of jobs, especially in the services sector. Second, in the short run, it could close down many of the redundant courses in the ITI s, and modernize the curricula, teaching methods and infrastructure for those courses that are in demand in the labor market. Seeking employer participation and financing for this endeavor would be required both to reduce the burden on the public exchequer and to make institution-based training more responsive to the labor market and employer needs. This approach would be especially relevant for the medium-sized industries trying to upgrade their technology and production systems, which currently operate at the district headquarters and small towns and which require a skilled workforce.

31. Finally, Karnataka should explore new approaches for upgrading the skills of secondary school students who do not appear for or pass the SSLC exam, as well as students who have only elementary education, who still comprise the majority of new entrants into the labor force (and will continue to constitute the majority for the next decade). These students, who do not complete secondary education, work in low technology, low-skill, agro-based industries and the self-employed sector. Institution-based, occupation-specific skills training is both expensive and inflexible to cater to the enormously diverse needs of this workforce. Karnataka needs to examine the experience of other newly industrializing countries, especially those of South-East Asia, to select appropriate cost-effective mechanisms for providing skills training that are in line with its overall strategy for promoting rural development and non-farm employment.

Chapter 1 - Introduction

I. Karnataka's New Agenda for Economic Growth

1.1 Karnataka has recorded impressive growth in the 1990s, with gross state domestic product (GSDP) growing at 8 percent per annum, driven mainly by the industrial and services sectors. Growth in agriculture has, however, been limited. During the 1980s, the state benefited from increased public investment and, since the early 1990s, from national policies to liberalize the economy, including partial deregulation of industry and the real depreciation of the rupee. Much of the industrial expansion has occurred in high-technology industries employing skilled workers and Bangalore, the state capital, has gained the reputation of being the Silicon Valley of India.

1.2 Industrial growth has, however, been narrowly based and geographically confined. Within the manufacturing sector, the IT (information technology) sector, based in the Greater Bangalore area, has contributed to growth in a major way. Almost 40 percent of medium- and large-scale units and 25 percent of small-scale units are located in the Bangalore urban district, which also accounts for a third of the total investment in the state. Growth in non-farm employment opportunities in other areas has been relatively limited. The relatively low growth in agricultural productivity has meant that poverty reduction in rural areas has been much less than in urban areas. Agriculture has not benefited from the Green Revolution, largely because of limited irrigation. Concentrated in a small area of the state, the irrigated area is currently less than one-quarter of the total cropped area in Karnataka.

1.3 To sustain and improve upon its growth performance, reduce regional disparities and increase opportunities for non-farm employment, the Government of Karnataka (GOK) is attempting several measures to encourage private enterprise. First, it has begun addressing the problems of severe infrastructure bottlenecks, especially in power, transport and communications. Second, it is introducing fiscal and governance reforms to promote competition, improve business regulation and ensure that government funds are used efficiently and directed to appropriate programs and sectors. Third, it is attempting to reduce regional disparities in income levels through a more balanced geographical distribution of economic activities. Fourth, it hopes to stimulate growth in agriculture through increased investment in irrigation and new farming technologies.

1.4 The Bank's Policy Note on 'Improving Business Environment for Sustained Growth and Poverty Reduction' has identified a range of reform issues that have an immediate bearing on facilitating greater private sector investment and creating new non-farm employment opportunities.[1] The note suggests measures for simplifying rules and regulations for private sector investors, a more flexible labor market policy, improving access to finance, minimizing the efficiency cost of taxation, facilitating a more rational allocation of land and removing small-scale industry reservation. The note also examines specific policy reforms in five industries that are considered to have growth potential, namely software, IT-enabled services, exportable garments, engineering and exportable horticulture.

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[1] Discussion draft, August 2000.

1.5 Apart from these factors, the success of the new agenda for promoting economic growth will also depend on the availability of a skilled and flexible labor force that could be employed in modern industries and services. Technology, organizational changes, globalization and its impact on the markets for both goods and services, are making new demands of the workforce. Increasingly, an educated workforce — with at least secondary education — is considered a pre-requisite for firms that wish to improve their competitiveness and shift to new markets and products. Further, growth and the extent to which it contributes to raising the income levels of the poor and marginalized sections will depend, in part, on the education levels attained by these groups.

1.6 Recognizing the importance of education for realizing its goal of improved growth with equity, the Government of Karnataka has declared its intention to achieve universal elementary education by 2007. At the secondary and higher secondary education levels, policymakers in Karnataka are concerned with three major issues: (i) the high social demand for expansion of and improvement in the quality of secondary and higher secondary education, particularly among children of backward communities and from rural areas; (ii) the high failure rates among students at the secondary and higher secondary levels, and the disproportionately high representation of students from poor and disadvantaged backgrounds among those who fail at these levels, rendering them unable to continue into higher education or access the more remunerative jobs; and (iii) the apparently enormous unemployment and under-employment among young people who have reached or graduated from class 10 or pre-university education, especially among rural youth and those from poor backgrounds. This has led to the demand for more vocational training at the higher secondary stage, especially for rural youth. The implicit assumption here is that there are skill deficiencies in labor supply, which make secondary education graduates "unemployable" in emerging jobs. Specifically, there is concern that students from rural and poor backgrounds do not have the skills needed to compete in the global economy.

1.7 However, little information is available on the labor market performance of students with secondary or higher secondary school qualifications, particularly of those who fail the terminal examinations and are unable to continue with higher education. Statistics regarding the number of people who are registered with the employment exchanges are often cited as evidence of high unemployment. Currently, approximately 1.3 million people with secondary education or above are registered with the employment exchanges, but many continue to register themselves even after securing a job in the private sector in the hope of being considered for a job (even on a temporary basis) in the public sector. No analysis has been undertaken of the state-level data on employment and earnings collected through household surveys conducted by the National Sample Survey (NSS).

1.8 This report addresses the above major policy concerns in Karnataka, based on primary data collected from a tracer study of lower secondary and higher secondary students and household survey data. It seeks answers to three main questions:

(a) Is the expansion in student places at the secondary and higher secondary levels justified on economic grounds?

(b) Do secondary school leavers from disadvantaged or poor backgrounds perform worse in the labor market or in continuing into higher education than students from more advantaged backgrounds?

(c) Is vocational training a desirable alternative to general higher secondary education in terms of improving labor market performance?

II. Data Sources and Structure of the Report

2.1 The report uses data from two main sources: (i) the state-specific data for 1993/94 from the National Sample Survey on employment and unemployment; and (ii) a tracer study commissioned by the Bank to examine the performance of secondary and higher secondary students, together with interviews with some employers. The tracer study and employer interviews were conducted between February to April 2001. The NSS data have been used to analyze sector-wise employment patterns by levels of education of the labor force, the rates of return on different levels of education and the extent and duration of unemployment among young educated workers. The tracer study provides more recent information on the activity status and earnings of new educated entrants into the labor force. These data have been analyzed using logistic regression analysis to determine the effects of prior education and socio-economic status on performance in examinations, labor market outcomes and continuation into higher education.

2.2 The rest of this chapter describes the secondary education system in Karnataka and the growth and structure of the labor force. The subsequent chapters are organized around each of the three main policy questions raised above. Chapter 2 focuses on the first question and presents results of the analysis of the NSS data and relevant findings from the tracer study and employer interviews. Chapter 3 presents evidence on the performance of secondary and higher secondary students in passing the terminal examination, transition to higher education or entering the labor market and whether students from poorer or disadvantaged backgrounds have less favorable backgrounds have less favorable outcomes. Chapter 4 analyzes the performance of the graduates from the ITIs and presents employer reactions to the quality of vocational training and suggestions for possible improvement.

Box 1.1
Data Sources

NSS data: As a part of its quinquennial survey in employment and unemployment, the NSSO collects data from a sample of randomly selected households, chosen through stratified multi-stage sampling, using structured interview schedules. The survey was conducted from July 1, 1993 to June 30, 1994 and the survey period was divided into four sub-rounds with an equal number of sample villages and urban blocks being allotted for survey in the four sub-rounds. A total of 35,300 persons were surveyed in Karnataka. Data were collected on the activity status of all persons in sampled households i.e. for workers, for those seeking or available for work and those remaining out of the labor force. A worker could be self-employed, in wage employment or be employed on a casual basis. Activity status was measured with reference to a year ("usual status"), 7 days preceding the date of survey ("current weekly status") and each day of the 7days preceding the date of survey ("current daily status") Persons who were either 'working' (employed) or 'seeking or available for work' (unemployed) constituted the labor force. Data on earnings are available only for regular and casual workers.

Tracer Study[*] : As a part of the preparation of the Karnataka Economic Restructuring Loan, the World Bank commissioned a tracer study of secondary school leavers. The universe comprised all high school, higher secondary (PUC) and vocational training (ITI) students who had appeared for their respective terminal examinations in 1998, approximately 3 years prior to the survey period (February – April, 2001). Four districts of the state were selected through a stratified sampling procedure based on the pass/fail rates of students in that year. The districts selected were Bangalore Urban, Bangalore Rural, Gulbarga and Dharwad. A total of 2,073 students were traced (SSLC-1,223; PUC-641 and ITI-209) from 101 institutions, covering the government, aided and unaided sectors (HS-53; PUC-28 and ITI-20). Data were collected from students and heads of institutions through personal interviews. Data were collected on the transition of students to higher education or the labor market; the employment and wage earnings of those who were working; the extent and nature of unemployment among new entrants into the labor force; the perceptions of students regarding further education and training requirements; and the availability of jobs and employer needs. However, the survey distinguished only between those who were studying, working or not working; the latter category does not correspond to the standard definition used by NSS for the unemployed. The questionnaire did include an item on current job search activities and therefore enables identification of those who could be considered unemployed and those who are out of the labor force.

*Details of methodology, sampling and questionnaires are provided in Vyasulu *et al* (2001), "Education and Labor Markets in Karnataka". Draft report

III. Secondary and Post Secondary Education in Karnataka

3.1 The secondary education cycle in Karnataka currently comprises classes 8-10, but class 8 is likely to be added to the elementary cycle in 2003, shortening the secondary level to two years (classes 9-10). Enrollment in secondary education, offered in government and private high schools, was close to 2 million in 2000/01. Just over half of the relevant age group is enrolled in

secondary education institutions, the rest having dropped out before reaching class 8. After completing class 10, students take the Secondary School Leaving Certificate (SSLC) examination, the first common public examination in the state. Over half a million students take this examination, but published results indicate that only 45 percent pass the examination, although many are known to repeat the examination.

3.2 After passing the SSLC examination, students can branch into several streams. The most important, numerically, is the 2-year higher secondary stream, known as Pre-University education, the terminal examination for which, conducted by the Pre-University Board, is the main qualification for entry into tertiary education. This stream is overwhelmingly the first choice of secondary school graduates, and currently accounts for four-fifths of students enrolled in any education institution after class 10, not including the tertiary education level. The other options after class 10 are the polytechnic diploma programs and vocational training offered at Industrial Training Institutes (ITIs) run by the Ministry of Labor, financed by the Central government and overseen by the Directorate of Vocational Education.[2] Pre-University education consists of an academic stream (enrolling the majority of students) and a small vocational stream. It is offered in PU colleges (PUCs), which may be independent colleges, or attached to high schools or degree colleges. Enrollment at this stage is about half a million. Again, less than half of those who appear for the terminal examination pass; in some years, including 2000-01, the pass percentage rate has been as low as 35 percent.

3.3 Opportunities for further education, beyond the higher secondary stage, are largely available only to those who pass the PUC examination; those with vocational training cannot directly enter tertiary education, although polytechnic graduates can join degree level engineering programs. Students can enter polytechnic programs after the PUC course, provided they have studied science courses at the PUC level. It is estimated that the majority of those who pass the PUC examination go on to tertiary education.

IV. Growth and Structure of the Workforce in Karnataka

4.1 According to the provisional household listing in the Census of 2001, the estimated population of the state is 52.7 million compared to 44.98 million in 1991. Population growth has slowed considerably in the last three decades, the decadal rate of growth coming down to 1.9 percent per annum between 1991 and 2001 from 2.1 percent in the previous decade. Between 1992 and 1998, the total fertility rate (TFR) declined from 2.85 to 2.13 (National Family Health Survey – 1st and 2nd rounds).

4.2 While the total population growth rate is expected to decline to 1.2 percent per annum over the next ten years (2001-2011), the population in the working age-group (15-59 years) is expected to grow at the annual rate of 2 percent. Although no official estimates are available for the projected increase in the labor force, this is likely to grow at almost the same rate as the working-age population (or slightly below this rate if participation in education at the post-secondary school level, including the PUC, ITI and other vocational and polytechnic institutes, improves). In 1993-94, the NSSO estimated that the labor force in Karnataka was 17.9 million

[2] Until recently, another option was the elementary teacher-training program. The entrance qualification for this program has now been raised to pre-university education.

strong.[3] Currently, the number approaches 21 million and labor supply is expected to increase to over 25 million workers in 2011, assuming a rate of growth of 2 percent per annum.

4.3 The structure of employment in the state is similar to that of other Indian states. Karnataka's workers are employed mostly in rural areas and in agriculture – about three-quarters of its workers are in the rural areas and two-thirds in agriculture. Female workers comprise one-third of the total workforce and are heavily concentrated in agriculture and in the rural areas. Following agriculture, manufacturing employs the largest share of workers, followed by community and personal services (11 and 10 percent, respectively). Within manufacturing, the overwhelming number of workers are employed in labor-intensive manufacturing (food products and textiles).

[3] Estimates of the population and total number of workers obtained from the surveys are generally lower than those of the Census. For the 1993-94 survey, the extent of under-estimation of the population is about 11 percent. The survey estimates the number of workers to be 17.9 million in 1993-94, compared to the 1991 Census figure of 19 million workers.

Chapter 2 - The Labor Market Performance of Secondary Education Graduates

I. Introduction

1.1 The economic justification for investing in education arises from the fact that education increases labor productivity and earnings, has redistributive effects and yields external economic benefits in the form of higher economic growth, improved health and reduced fertility. Apart from economic reasons, there are several political, social and cultural reasons for the expansion of secondary and higher education. Among these is the fact that an educated citizenry can participate actively in democratic processes and contribute to promoting social cohesion. The favorable impact of education on fertility control and the health and nutrition of young children, are also desirable outcomes in themselves.

1.2 In an effort to assess the economic benefits of education, several different aspects of labor market performance have been examined. The chapter draws on analysis of state-specific data from the NSS 1993-94 survey on employment and unemployment, the tracer study of secondary school leavers and interviews with a few employers. It examines three issues: (i) the rates of returns to investment in education which indicates how the productivity of this investment compares with that of other investments; (ii) the nature and duration of unemployment among youth as reflected in the NSS data and tracer study data and (iii) the transition patterns of secondary and higher secondary school leavers to higher education and the labor market, the proportion of unemployed, current earnings and expectations of students regarding future earnings, student perceptions regarding the usefulness of their education and views of employers regarding job opportunities for secondary school graduates and their capabilities.

1.3 Finally, the chapter discusses three broader issues relating to the long term economic development of Karnataka which are relevant in taking policy decisions regarding the expansion of secondary education: (i) the gap between the projected demand and supply of educated workers and whether Karnataka is likely to face a shortage of skilled workers in the medium term (ii) the current participation levels in secondary education of poor households and the need to distribute the benefits of economic growth and (iii) how Karnataka compares with other countries in the educational attainment of its workforce.

II. Returns to Education for Regular Workers

2.1 The economic returns to education in India have been estimated using the standard human capital earnings function which regresses the log of income on years of schooling and experience. The estimated coefficient for the education variable in this regression provides an indication of the private rate of return to an additional year of schooling. The rates of return to different levels of education have been approximated by the "short-cut" method, which assumes that the age-earning profiles are flat curves, since inclusion of dummy variables for different levels of education in the earnings function was not possible.[4] The private rates of return, as well

[4] Details of the earnings function specification, definition of variables and methodology used in the 'short-cut' ' method are described in Annex 2.1. For a description of the 'short-cut' method, see G. Psacharapoulos (1995). "The Profitability of Investment in Education: Concepts and Methods." World Bank.

as rates adjusted to account for the public cost of education, have been calculated using this method.

2.2 The NSS provides information on the earnings of regular and casual workers, comprising 13 and 34 percent of the workforce, respectively, which can be related to individual education levels. Reported earnings are for the reference week preceding the survey.[5] Information about the earnings of the self-employed, who constitute 52 percent of the workforce, was not gathered. The data for regular workers, when extrapolated for the year, can be deemed reliable, unlike for casual workers. As a result, private rates of returns could be calculated only for regular workers. Further, as the survey did not collect data on years of experience, experience was obtained as the difference between the age of the person and the years of schooling attained.

2.3 Within the category of regular workers, average earnings increase with higher levels of education. Average earnings of secondary level graduates were found to be 2.9 times that of illiterate workers and 1.7 times that of workers with elementary level education (Table 2.1). The earnings differential stemming from education levels was found to be especially large for females: a middle-school graduate female regular worker earned 40 percent more than an illiterate worker, while a female secondary school graduate earned four times as much and a female college graduate, over seven times as much as an illiterate worker.

Table 2.1
Relative Wages of Regular Workers by Level of Education (1993/94)
(Illiterate Regular Worker's Wage = 1.00)

	Regular Workers		
Level of education	**Male**	**Female**	**All persons**
Illiterate	1.00	1.00	1.00
Up to primary school	1.49	1.12	1.70
Middle school graduate	1.63	1.43	1.96
Secondary school graduate	2.36	3.85	2.88
Higher secondary school graduate	2.78	4.48	3.38
College graduate	4.26	7.10	5.18
Average	2.41	3.12	2.83

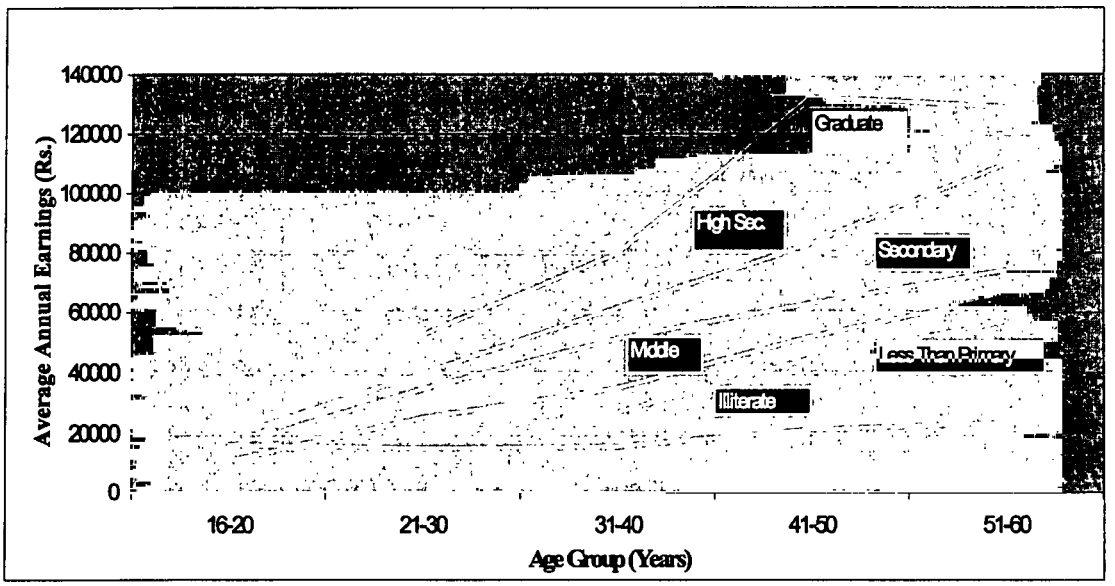
Source: Calculated from NSS data

2.4 The age-earnings profile shows that while the earnings advantage for different education levels is relatively small for young workers, it increases with age, suggesting that the main monetary benefits of higher levels of education accrue over the worker's lifetime and not at the time of entry into employment (Chart 2.1). The earnings advantage that college graduates enjoy over workers with lower levels of education increases substantially after age 30. Since job

[5] The estimates of workers are based on current weekly status so as to enable analysis of wage earnings which are available only for the seven days of the reference week before the household was surveyed.

mobility is relatively low in Karnataka, as in other Indian states, most of this advantage would arise from the prospects for promotion within the job. Higher education enables workers to access jobs that provide more possibilities for promotion later in life.

Chart 2.1
Average Annual Wages of Regular Workers by Age Group and Level of Education



Source: NSS data

2.5 The estimate of the private rate of return, based on the earnings function model discussed above, to an additional year of schooling is about 10 percent (Table 2.2 (a)).[6] Women realize a higher rate of return on educational investments (13 percent) compared to men (9 percent).[7] The public sector rewards education more than the private sector: the rate of return to a year of schooling is 10.5 percent in the public sector and 7.5 percent in the private sector.

[6] See Annex 2.1 for details.
[7] This difference may also reflect selectivity bias as participation rates of women are much lower and women in the labor force do not constitute a random sample of the total population.

Table 2.2. (a)
Earnings Function Results (1993/94)
All Workers and Separately by Sex and Public/Private Sectors

Sectors	Variables and t-Values									
	Constant	T-values	Years of schooling	T-values	Yrs. of experience	T-values	Experience squared	T-values	R-squared	No. of observations
All persons	8.76	156 66	0.10	31.59	0.06	13.87	-0.009	-8.09	0 4367	1746
Males	8.83	148.20	0 09	27.28	0.07	14.12	-0.001	-8.65	0.4321	1428
Females	8.40	68.44	0 13	17.67	0.05	4.28	-0 0006	-2.56	0.5052	318
Public	9.09	86 36	0.10	22.50	0.04	4.99	-0.0003	-1.57	0.3722	916
Private	8 93	125.75	0.07	15.54	0.06	9.27	-0 0009	-6.46	0.2792	830

Calculated from NSSO data; the dependent variable in the natural logarithm of weekly earnings

2.6 Rates of return on different levels of education, using the short-cut method and unadjusted for unemployment, are shown in Table 2.2 (b).[8] Rates of return on each level of education are high for both males and females, but the patterns are strikingly different for males and females. For males with elementary education, the private rate of return (that is, excluding the public unit expenditure on each student) is 19 percent, and for those with secondary and higher education, 14 and 17 percent, respectively. On elementary education, the rate of return for females is somewhat lower than that for males. The most striking result is the extraordinarily high rate of return of 50 percent for females with secondary education[9]; for males, the rate of return on secondary education is a little over 14 percent. For females and males with higher education, the rate of return is approximately the same. These differences are not caused by variation in the private direct costs of education, which are approximately the same for males and females at each level of education.[10] They are caused by the size of the earnings differentials between males and females at different levels of education. Females earn less than men at all levels of education, but the relative disadvantage is less for female secondary and higher education graduates than for elementary education graduates. As a result, they realize a much higher rate of return on investments in secondary education than men.

2.7 Including the public cost of education lowers the rates of return more for elementary and higher education, than for secondary education (since the secondary cycle is shorter). This is true for both males and females. For males, the rates of return for the elementary, secondary and higher secondary levels of education, on inclusion of public cost, are 17, 13 and 13 percent, respectively; for females, these are 9, 40 and 12 percent, respectively.

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[8] See Annex 2.1 for further details on data and methodology for estimating the rates of return.
[9] This is similar to the all-India figures for rate of return for females with secondary education, using wages of regular and casual workers. Wood and Calandrino (2001) report a figure of 64 percent.
[10] Private direct costs have been obtained from the NSS survey on education, 1995/96; estimates for 1993/94 were derived by adjusting for price increases.

Table 2.2 (b)
Rates of Return on Education for Regular Workers (in percent)
(1993/94)*

	Male		Female	
	Private	Including public cost	Private	Including public cost
Elementary	19.7	16.6	12.0	9.0
Secondary	14.4	13.1	50.0	40.0
Higher	16.6	12.7	17.0	12.0

* Calculated from NSSO data, using the short-cut method

2.8 The rates of return on secondary and higher education are likely to be higher if earnings of all wage-workers, regular and casual, are used. Earnings data of casual workers have not been used in this analysis because of the unreliability of extrapolating weekly earnings to the whole year (casual workers are likely to be unemployed for part of the year). A comparison of the weekly wage of casual and regular workers shows that the former is below that of regular workers at every level of education (although there are few casual workers who have college degrees). Moreover, the earnings of casual workers tend to stagnate over their lifetime, suggesting that they are trapped in low productivity jobs. In addition, regular workers get other economic benefits that are not available to casual workers, such as paid leave, medical and pension benefits, which are not included in the earnings data.

2.9 The private and public rates of return to investment in secondary education are relatively high and comparable to those in other countries. These rates of return suggest that investing in secondary education is worthwhile for private individuals at current levels of private expenditure; it is worthwhile even when public recurrent costs are included. However, the differences in earnings by education level, and hence the rates of return shown in *table 2.2(b)*, are strongly influenced by the recruitment and wage policies in the public sector, which employs 60 percent of regular workers.[11] The earnings differential between elementary and secondary education graduates in particular is likely to be strongly influenced by public sector policies as state-owned units recruit large numbers of secondary education graduates, while elementary education graduates are employed mainly in the private sector. Secondary school graduation is the minimum eligibility criterion for the pre-recruitment public service examinations that lead to clerical and manual jobs in most government enterprises. Earnings of lower level staff in government services are far higher than those in the private sector for workers with similar or lower levels of education.

2.10 There are several other reasons why rates of return may not be sufficient to guide policy decisions regarding future expansion of secondary education. First, rates of return can be affected by the level and structure of unemployment. Second, the analysis refers to only a small proportion of the workforce and it is difficult to make inferences about overall rates of return to investing in secondary education. Third, among the population of secondary and higher secondary graduates, those who eventually get employed are likely to be a non-random sample who might have earned more even without education, thus leading to over-estimates of the rates

[11] The small sample sizes do not allow the rates of returns for different levels of education to be estimated reliably for public and private sectors separately.

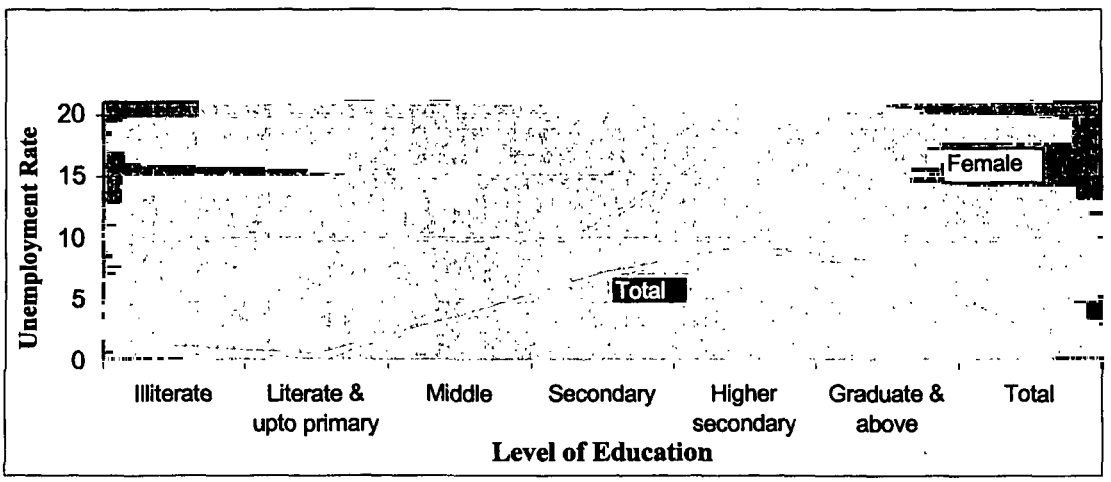
of returns. Finally, even if the rates of return calculated above indicate that investment in secondary education is worthwhile, they do not necessarily indicate that public investment is justified.

III. Unemployment among Educated Workers

3.1 The NSS data show that the average open unemployment rate in the state is low (about 2 percent) but among the youth, it is significantly higher (15 percent).[12] Almost 60 percent of all unemployed are in the 15-24 year age group. Another 18 percent are in the 24-29 year age group. Open unemployment declines substantially in the higher age groups. Hence, the extent and duration of unemployment by levels of education, which are discussed below, will broadly correspond to the experiences of high school, PUC or college students who have graduated a few years prior to 1993/94.

3.2 Unemployment rates are significantly higher for those with secondary education and more, and among these, much higher for females than males. Among those with secondary education, the unemployment rate is 7 percent, those with higher secondary education, it is 9 percent and those with college education, 8 percent (Chart 2.2). Especially striking are the much higher unemployment rates for females, which increase by level of education. For females with secondary, higher secondary and college graduate education, the unemployment rates are 11, 19 and 21, respectively. In contrast, unemployment among those with no education, both male and female, is less than 1 percent.

Chart 2.2
Unemployment Rates For Total And Female Population by Level of Education 1993/94



Source: NSS

[12] The NSS definition of an unemployed person is someone who is currently not working and is seeking work (in the reference period). Overall, the open unemployment rate in Karnataka is 2.3 percent. For rural areas, it is 1.5 percent; in urban areas, it is 4.7 percent. The total male unemployment is 2.5 percent and total female unemployment 1.9 percent. The unemployment measure used here is the weekly status.

3.3 As a result, those with higher levels of education were found to constitute a greater proportion of the young unemployed, especially in urban areas. About 46 percent of rural unemployed males in the age group 15-19 years had secondary education or more. In urban areas, about three-fourths of the male unemployed in the 20-24 age group had at least secondary education. These findings corroborate the perception that most of the openly unemployed youth are educated.

3.4 The duration of unemployment is also much longer for educated people. In rural areas, about half the unemployed with secondary or higher secondary education and 86 percent of college graduates had been unemployed for more than a year (Table 2.3). In urban areas, more than two-thirds of secondary or higher secondary school graduates and three-fourths of college graduates had the same experience. The majority of the unemployed who had no schooling secured a job in less than six months. Prolonged open unemployment is a characteristic of educated young people in urban areas.

Table 2.3
Proportion of the Unemployed by Level of Education and Duration of Unemployment (1993/94)

Rural	Illiterate	Literate & up to primary school	Middle school	Secondary school	High. sec. school	Graduate & above	All workers
Unemployed (%)							
For:							
< 6 months	87.64	100.00	61.08	16.84	32.88	1.58	50.76
6-12 months	6.74	0.00	17.91	29.57	18.53	11.99	14.99
12 months or more	5.62	0.00	21.00	53.59	48.59	86.43	34.25
Estimated unemployed (in nos.)	75,592	4,789	25,296	41,602	27,926	27,946	203,150
Urban							
Unemployed (%)							
For:							
< 6 months	83.68	51.82	24.01	16.39	28.85	8.13	25.97
6-12 months	7.10	0.00	11.70	16.96	14.07	17.14	13.62
12 months or more	9.23	48.19	64.30	66.64	57.07	74.73	60.41
Estimated unemployed (in nos.)	15,718	12,112	38,783	62,124	26,138	35,019	189,895

Source: NSS 1993/94

3.5 The level and duration of unemployment among the educated youth would argue against an expansion of secondary education. However, the existence of prolonged unemployment also suggests that labor markets are not functioning properly and this in turn can distort the private rates of return. Unemployment, especially if it is prolonged after entry into the labor force, will lower the private rates of return to secondary education but, other things being equal, may also raise the private rates of return to higher education by lowering the opportunity cost of pursuing higher education. This could fuel private demand for higher education and as a consequence raise the demand for secondary education as well.

IV. The Tracer Study Findings

4.1 The tracer study commissioned by the Bank provided more recent data on the labor market performance of new entrants into the labor market, including information about the patterns of transition to higher education or the labor market for students who are in secondary, higher secondary and vocational training institutes, the earnings and occupations of those who obtained work and the extent and duration of unemployment amongst fresh graduates. Students were traced and interviewed in February-April 2001, approximately three years after they appeared for their examination in April 1998.

4.2 This section discusses the main findings with respect to secondary and higher secondary students, referred to as SSLC (Secondary School Leaving Certificate) and PUC (Pre-University College) students, respectively, according to the terminal examination for which they had appeared.[13] The results for the sample of students from the Industrial Training Institutes (ITIs) are discussed in Chapter 4. The distribution of sample students is given in Annex 2.2.

4.3 The pass rates among both categories of sample students were similar – about 57 percent of each category passed on the first attempt and another 17-19 percent passed on repeat attempts, taking the overall pass rate to 75 percent (Table 2.4).[14] Of the SSLC students, just over half were still studying; amongst PUC students, nearly 70 percent were studying. Particularly striking are the very low proportions of SSLC and PUC students who were currently employed (9 and 4 percent, respectively) and the very high proportions of students who were not working (33 and 23 percent, respectively). Of the category of students reporting themselves as self-employed - these students reported themselves as working in family businesses and enterprises - most could be treated as family helpers or unemployed.

[13] The Secondary School Leaving Certificate (SSLC) examination is the public examination at the end of class 10; the 2nd year pre-university (PUC) examination is at the end of the second year of the higher secondary stage.

[14] The overall pass rates for SSLC and PU students in the state as a whole for 1998 were lower (45 percent and 44 respectively). The higher pass rate in the sample was probably due to Bangalore Urban district, where the pass rate is significantly higher than for other districts.

Table 2.4
Current Status of Students who Appeared for the Terminal Examination in 1998

	SSLC	PUC
Number of Students (N)	**1223**	**641**
	As percentage of N	
Passed on first attempt	57	56
Passed on repeat attempts	17	19
Failed	26	25
Studying	51	69
Employed	9	4
Self-employed	9	6
Not working	33	23

Source: Tracer Study, 2001
Note: The proportion of students reporting themselves, as 'not working' does not correspond to the standard definition of 'unemployed' (see Box 1.1)

Continuation to higher stage of education

4.4 The transition rate from secondary to higher education is very high. More than two-thirds of the total number of students who passed the SSLC examination continued into further education (*table 2.5*). Among the PU students who had passed the examination, the transition rate into higher education was even higher – 87 percent. These results confirm the strong private demand for higher secondary education and for college education among those who have passed the secondary or higher secondary education examination. Secondary education, it would appear, is desired not for itself but as a gateway to higher education. Academic education is the choice of about 90 percent of all SSLC and PUC graduates. Only 5 percent entered polytechnics and about 2 percent entered the ITIs; the remainder chose other courses, mainly teacher training.

4.5 Amongst those who failed the examination, the proportion studying is very low among SSLC students, but almost one-fifth of those who failed the PUC examination are still studying (either repeating their examinations or taking some other course.)

Table 2.5
Current Status and Type of Courses by Pass and Fail Categories

	SSLC Pass	SSLC Fail	PUC Pass	PUC Fail
Number of Students (N)	**905**	**318**	**481**	**160**
		As percentage of N		
Studying	68	3	87	19
Employed	5	19	2	9
Self-employed	3	20	3	11
Not working	24	58	8	66
Number currently studying	615		447	
Of which studying in (percent):				
PUC	42.1		-	
Degree	45.6		88.6	
Diploma	5.7		4.9	
ITI	2.1		1.8	
Others	4.5		4.7	

Source: Tracer Study, 2001

4.6 Equally noteworthy are the low levels of employment amongst both the SSLC and PUC graduates, whether they had passed or failed. Only 5 percent of those who had passed the SSLC examination were working and 3 percent reported self-employment; 24 percent were not working and they constituted three-quarters of those who did not continue with their education. Similarly only 5 percent of PU graduates reported either employment or self-employment. Among students who failed the SSLC examination, about one-fifth was employed and another one-fifth reported self-employment. Amongst students who failed the PUC examination, 20 percent were either employed or self-employed. *The majority of those who failed at each of these levels are not working even three years after the examinations.*

Currently Employed and Currently Not Working

4.7 As the above discussion shows, the proportion of the employed is very small in both groups of students. The tracer study results indicate that job opportunities for those who could not pursue further studies after secondary or higher secondary education are extremely restricted, especially outside the Greater Bangalore area. SSLC students were found employed as unskilled workers, helpers, security guards, and so on. The starting salary was reported to be about Rs. 1,000 per month while the mean current salary was less than Rs. 1,500 per month.[15] Of the very few PUC graduates who reported work, there was greater variability in occupations – many were engaged as receptionists, cashiers, secretaries, teachers, although some were also working as unskilled helpers. Manufacturing provided employment to only one-fifth of those employed;

[15] Equivalent to the estimated per capita income in 2001.

most were employed in shops or in other service sectors. Less than 10 percent of those employed were working in the public sector.

4.8 Among those not working, about 80 percent of SSLC graduates and 58 percent of PUC graduates had responded to advertisements and 34 percent of the latter had also registered at the Employment Exchange. This indicates that many of those categorized as 'not working' were in fact, available and looking for employment i.e. they were unemployed. Most of those currently not working stated that the minimum acceptable salary would be Rs. 2,000 per month. The actual wage earned by those currently working was about half to three-quarters of this level. Many of those not working said they were hoping for a job in a government-run enterprise — and with a "good designation". Almost 90 percent of those not working were being supported by their parents.

4.9 Females were found to constitute a higher proportion of those not working – 64 percent and 55 percent, respectively, of out-of-work SSLC and PUC graduates. However, many may have withdrawn from the labor force due to social pressures and therefore should probably not be considered unemployed.

Perceptions and aspirations of students

4.10 The labor market performance of new entrants into the workforce raises the question of whether students regard education to be important for jobs. Those currently studying (mainly college degree or PUC courses) expressed expectations that higher education would substantially improve their earnings. The expected starting salary after completion of higher education was stated to be Rs. 5,000 per month (modal value), about five times the starting salary of those currently employed after secondary school education. Perceptions of the value of education were somewhat different among those who were not continuing their studies. Although they believed that education was necessary to improve their earnings and the likelihood of a job, 70 percent of those who had passed SSLC and were employed believed that they could have undertaken their present job with less education; 38 percent of the PUC-graduate employed also concurred in this opinion. Nearly half of the SSLC-graduate employed and one-third of the PUC-graduate employed said that none of the subjects they had studied was useful for their present jobs. Half of the PUC-graduate employed said that English was the most useful subject in their PUC course.

4.11 The three most important aspects of a desirable job, as rated by SSLC and PUC students, whether currently studying, employed or not working, were, a job in the public sector, security of employment and a "good designation" (implying an elevated social status). The overwhelming aspiration for a government job contrasts sharply with the fact that the majority of those employed were in the private sector. More students outside the Bangalore urban district consider a government job desirable than students in Bangalore, many of whom signaled a greater preference for the private sector, reflecting increasing employment opportunities in the private sector in the capital.

4.12 In short, it appears students do not consider secondary and higher secondary education adequate for "desirable jobs" and the actual labor market performance of those who are employed confirms these perceptions. Higher education is considered necessary to meet student

expectations of jobs and earnings, which have been largely shaped by public sector employment in the past. For students with just secondary or PUC education, employment prospects are limited and earnings in the private sector are low.

4.13 The high unemployment rates among the educated workers, as reflected in the NSS data, and the low proportions of those working as reflected by the tracer study data suggest that there are rigidities in the labor market. The dominance of the public sector in the market for secondary graduates and the fact that earnings are much higher in the private sector encourage secondary education graduates to "queue" for new jobs in the public sector. Secondary education graduates tend to have strong job preferences and those who are from better-off families are supported by their parents for extended periods of job-search.[16] Alternatively, rather than join the job market after secondary education, they prefer to continue into higher education in order to improve their chances of employment in the organized sector with greater job security and higher earnings.

V. Perceptions of Employers

5.1 Interviews with a sample of employers confirm that job opportunities are limited for SSLC and PUC graduates; many of the enterprises had not expanded their workforce in the last three years. While poor overall employment growth has constrained the absorption of workers with secondary education, employers also noted that the lack of knowledge and skills among SSLC graduates prevent their recruitment for skilled jobs. SSLC graduates are employed either in unskilled manufacturing jobs or as 'office boys' and helpers in service units. Service sector employers (travel agencies, accountancy firms) reported that SSLC students had not learnt the basic skills of communication or spelling required for desk jobs. Inadequate knowledge of English was also considered a handicap for these students; but employers were willing to consider students who had failed the PU terminal exam for service sector employment, as their knowledge of English is likely to be better.

5.2 Even in the manufacturing sector, employers reported difficulties in employing SSLC graduates for shop-level jobs as their low level of knowledge and skills and their attitudes towards learning new skills and ability to absorb made it difficult to train them for better-paid and more responsible jobs. A leading garment exporter in Bangalore reported that he employed SSLC students, mainly girls, who were offered training for a month to operate machines, and those with aptitude were trained for other skills as well. Male students were not willing to take these jobs, as the tailoring occupation is considered hereditary in character and with low social status. Most of the new entrants, although they had passed class 10 or the SSLC examination, could not read numbers or take measurements correctly, or read measurement and quality charts. The exporter said that it has been extremely difficult to inculcate quality consciousness amongst the employees, although quality is the key to success in the export market and explained that it was a question of attitude as much as skill. The employer interviews, although few in number, suggest that limited expansion of employment in the private sector is one reason for the unemployment of secondary education graduates; however, skills mismatch may also partly explain this phenomenon.

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[16] Similar phenomena are seen in other countries, notably Sri Lanka. See Eric Bell and Rapti Goonsehere (1999) *Sri Lanka – A Fresh Look at Unemployment.* World Bank.

VI. Demand and Supply of Educated Labor

6.1 Over the last decade, as a result of fiscal constraints, recruitment in the public sector, which used to absorb the majority of educated new entrants into the workforce, has virtually come to a standstill. Employment growth in the unorganized sector has been very modest, in contrast to the rapid growth in employment in the private organized sector. Between 1990 and 1998, according to the Fourth Economic Census, the total increase in employment in the non-farm sectors has been only 3 percentage points (5.23 million in 1998 compared to 5.08 million in 1990).[17] Many districts recorded a decline in the number of workers in the unorganized sectors. Two-thirds of these enterprises are very small 'own account' enterprises with less than 3 workers on average. A substantial increase in employment has occurred only in the organized private sector, where the number of jobs has almost doubled between 1994 and 1998. However, because it still accounts for less than 40 percent of total employment, the annual increment in jobs in the organized sector over the last 5 years is only about 70,000. Much of this increase has occurred in a few manufacturing and service sectors and has been confined to the Greater Bangalore area. Although employment of women in the organized sector has increased, its rate of growth is much lower than that for men.

6.2 A useful measure of the extent of imbalance between the aggregate demand and supply for educated labor is the ratio of vacancies in the modern industrial sectors (where the educated seek employment) to the number of new labor market entrants with secondary or higher education. In 2000/01, the number of educated entrants into the labor market was estimated to be 250,000. There is likely to be no new recruitment into the public sector in the foreseeable future. Estimated vacancies in the private organized sector (taking into account both attrition of existing employees as well as new jobs that are likely to be created based on recent trends in employment growth in the private sector), are only about 100,000 a year. Even if employment in the private sector continues to grow as it did in the latter half of the nineties, only half of the fresh labor market entrants with secondary or higher education will get jobs in this sector.

6.3 The size of the gap between the demand and supply of educated labor will depend on the rate of growth of employment in the modern industrial sectors, population growth and the rate of enrollment in secondary and higher education. Of these, population growth is outside the purview of short-term policy actions and, as population projections reveal, the size of the 15-24-year group will continue to grow for the next 10 years. Given this, and if employment in the modern industrial sectors does not increase, any expansion of secondary education and hence increase in the enrollment ratio in secondary and higher education, will only aggravate the problem of unemployment among these graduates at prevailing wage rates and the present structure of organized sector employment.

6.4 The solution to the problem of unemployment among the educated youth will depend crucially on the rate of growth of employment in the sectors that are willing to hire educated labor. At present, the main employers are enterprises in the 'organized sector'; given its small share in overall employment, the rate of growth of employment in the organized sector would have to more than double if the current annual output of educated youth seeking employment were to be absorbed. However, if employment opportunities in the non-agricultural *unorganized*

[17] The employment figures relate to the unorganized sectors only and include both unpaid and hired workers.

sectors expand at even 3 percent per annum, the annual increase in available jobs would exceed the current annual output of educated workers. *Thus, a reduction in the level of unemployment among the educated youth and the realization of the economic benefits of secondary education will depend to a great extent on the growth of output, technological upgradation and improvement in productivity and earnings in what is currently called the unorganized sector.*

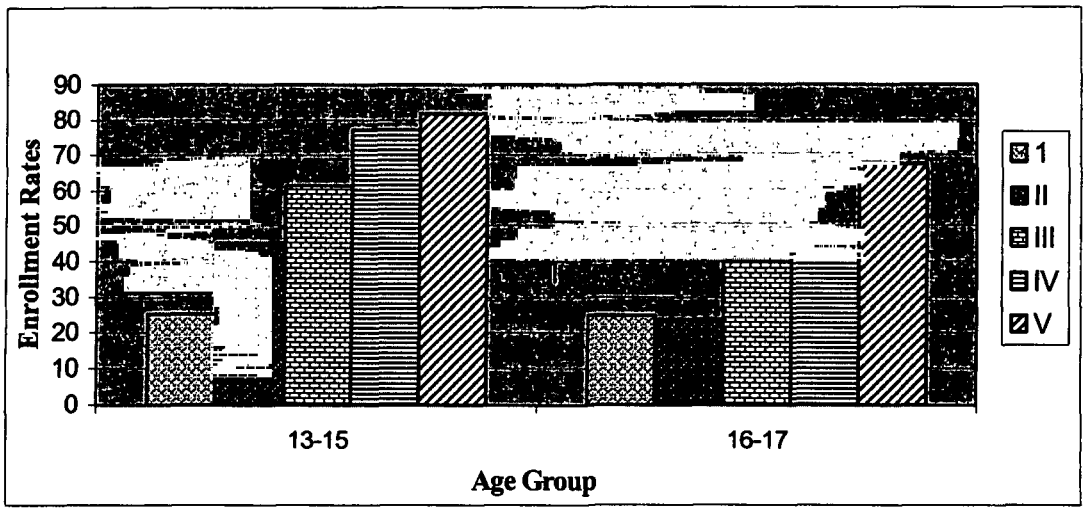
VII. Other Considerations for Expanding Secondary Education

7.1 In the light of the labor market performance of secondary education graduates, expansion of secondary education needs to be handled with caution. On the one hand, the high rate of return points to a lack of supply; on the other hand, the high unemployment rate suggests a lack of demand for those skills. This clearly indicates that the labor market is fragmented with very high rewards to secondary education in the public sector and a lack of opportunities in the private sector. Thus, any expansion of secondary education needs to be accompanied by an economic policy framework favorable to the development of the private sector and expansion of job opportunities. In addition, policy efforts must clearly concentrate on improving the quality of secondary education. Employer responses indicate a great variance in the quality of secondary education graduates entering the labor market in the private sector; those who fail the school leaving examinations or who just manage to pass them do not appear to have even basic skills.

7.2 The current labor market situation, however, may not be a good guide to the future, especially if private sector led growth leads to rapid expansion in employment and higher earnings in the private sector. In addition, there are two sound reasons for expansion of secondary education that should be considered, apart from the social benefits that were outlined at the beginning of the chapter: first, reasons of equity, and second, reasons of strategic consideration.

7.3 Overall enrollment ratios in secondary and higher secondary education are still low. Recent data from the National Family Health Survey (NFHS) for 1998/99 show that only 30 percent of those in the 15-19 age group are enrolled in secondary education. The comparable rates for rural males and females are 27 and 21 percent, respectively, and for urban males and females, 41 and 40 percent, respectively. NSS data for 1995-96 also shows that the enrollment rates of lower income groups are far lower than the average. About 58 percent of those in the 13-15 age group and 44 percent in the 16-17 age group were enrolled in 1995/96. However, as Chart 2.3 shows, enrollment rates in different consumer expenditure quintile groups are very disparate. Only about 20 percent of those in the 13-15 and 16-17 age groups from the poorest quintile are enrolled, compared to 80 and 70 percent, respectively, from the top quintile. In the 16-17-year age group, enrollment ratios are 40 per cent or less in all quintiles except the top one. Enrollment rates among the lowest quintile group are even lower in rural areas (not shown in Chart 2.3). Expansion of secondary education will benefit primarily those from the lower income groups, rural children and girls. These groups will be enabled to compete for the better paying jobs in the modern industrial sectors.

Chart 2.3
Enrollment Rates, by Quintile and Age Category
(1995/96)



Source: NSS, 1995/96

7.4 The second consideration for expanding secondary education is more strategic. The educational profile of Karnataka's workforce is poor in comparison with that of workers in countries it is competing with. Half the workers are illiterate and 22 percent are literate but have not completed even primary schooling. Educated workers with at least secondary level education comprise 15 percent of the total. Only 11 percent have completed higher secondary education, and 4 percent have completed college graduation.

7.5 International evidence suggests that there are strong effects on overall economic growth and increasing returns to scale for investments in education when human capital in a population reaches a threshold level.[18] For the state as a whole, the mean educational attainment of the workforce, the standard measure of human capital in a population, was 3.2 years in 1993/94. In the labor-intensive manufacturing sectors, the average length of education is less than 4 and in agriculture, it is less than 2 years. The current levels of human capital are far below that of countries that Karnataka is seeking to emulate in promoting private sector growth and compete with in global markets, such as Thailand, Malaysia, China or South Korea. The gradual improvement of quality of the workforce over the next fifteen years will occur mainly through raising the educational attainment of young entrants into the labor force, which calls for rapidly improving completion rates at the primary level and increasing enrollment ratios at the secondary level.

VIII. Conclusion

8.1 There are several socio-political, cultural and economic reasons to justify expansion of secondary and higher education. This report focuses on the narrower question of justification on economic grounds, primarily on the relationship between education and labor market

[18] World Bank (1997). *Primary Education in India.*

performance. The impact of education on economic growth and other external benefits are not considered here, though these are known to be considerable in terms of augmenting productivity, contributing to distributive goals and enhancing external economic benefits in the form of higher economic growth, improved health and reduced fertility.

8.2 Due to rigidities in the labor market and, in particular, the dominance of the public sector in recruiting educated workers, rates of return to investment in education and the level and duration of unemployment do not provide sufficient guidance on whether secondary education should be expanded on economic grounds alone. While the evidence for expanding secondary education solely on economic grounds is unclear, there seem to be grounds for expansion of secondary education to improve equity and allow Karnataka to raise the skill level of its workforce. However, any expansion of secondary education should be accompanied by policies to encourage private sector growth and an expansion of job opportunities. Further, employer reports reveal that secondary education students entering the private sector labor market often lack basic skills. There is a clear need to invest in improving the quality of secondary education while planning for any expansion. It is necessary to address both the constraints on the growth of employment in the private sector and the mismatch skills. As subsequent chapters show, there is also a need to ensure that participation in and outcomes of secondary education are more equitable.

Annex 2.1

Methodology for Estimating Rates of Return

This annex describes the methodology for estimating the rates of return to investment in education using the earnings function model and the 'short-cut' method.

Private Rate of Return Using the Earnings Function Model

The estimated earnings function model is:

$$\ln Y_i = b_0 + b_1 S_i + b_2 EXP_i + b_3 EXP_i^2 + e_i$$

where

Yi = weekly earnings
Si = years of schooling
EXP_i = Age – 14 – (S_i – 8) if $S_i > 8$ and EXP_i = Age – 14 if $S_i < 8$

This assumes experience starts at best at the age of 14; this may lead to underestimation of experience and also ignores child labor.

Years of schooling have been calculated as under:

	Illiterate	Literate	Primary	Middle	Secondary	Sr. Secondary	Graduates (general)	Postgrads and prof.
S_i	0	1	5	8	10	12	17	16

This relationship is estimated separately for rural and urban areas, by sex and by public/private sectors. The relationships are estimated for regular workers in Karnataka.

Private Rates of Return Using the 'Short-Cut' Method

The 'short-cut' method assumes that the age-earnings profiles are flat and that the average earnings of workers at each level of education do not vary over their lifetime. The cost of education is computed by using the annual private direct cost of education and the length of the relevant education cycle and an estimate of the opportunity cost. For both elementary and secondary education, it is assumed that opportunity costs, in the form of foregone earnings, are incurred by the student for 3 years.

The formula for deriving the private rates of return for elementary and secondary used here levels are:

Private rate of return for elementary education =

$$\frac{(ElementaryIncome - IlliterateIncome)}{(7 * Pvt\ Exp\ Elementary) + (3 * IlliterateIncome)}$$

Private rate of return for secondary education =

$$\frac{(SecondaryIncome - ElementaryIncome)}{(3 * Pvt\ Exp\ Secondary) * PvtExpSecondary) + (3 * ElementaryIncome)}$$

For higher education, the annual private opportunity cost is the mean income of higher secondary graduates. To compute the social rate of return, the per student public expenditure at each level of education is added to the private cost. Date on average earnings, length of the school cycle, private direct costs and public costs are given in the table below.

Table 2.6
Mean Earnings and Direct Costs by Level of Education (Regular Workers)

				Annual Direct Cost per School Year (Rs.)		1995/96
Education Level	**Mean Earning**		**Length of School Cycle**	**Private Expenditure**	**Public Expenditure**	**Private Exp.**
	(Rs./year) 1993-94		**Years**	**(Govt. + Aided) 1993/94**		**(Govt+Aided)**
	Male	**Female**				
Illiterate	10,968	4,538				
Elementary	17,829	6,473	7	285	935	323
Secondary	25,892	17,480	3	806	1922	916
Higher Sec	30,438	20,347	2	1444	2145	1641
Higher	46,717	32,209	3	2345	9969	2665

Source: NSS 1993/94 for mean earnings;
NSS 1995/96 for private expenditure; GOK budget documents for public expenditure per student

Annex 2.2

Table 2.7
Tracer Study – Sample Structure

	No. of Students in each category		
	SSLC	**PUC**	**ITI**
Proposed	1200	600	200
Achieved	1223	641	209
By gender:			
Male	52.2 %	54.9 %	90.9%
Female	47.8 %	45.1 %	9.1%
By type of institution:			
Government	29.8 %	23.2 %	27.3 %
Private aided	60.7 %	59.3 %	51.7 %
Private unaided	9.5 %	17.5 %	21.0 %
By social group:			
SC/ST	18.6 %	11.4 %	12.9 %
General	81.4 %	88.6 %	87.1 %
By district:			
Bangalore(U)	41.4 %	42.9 %	48.3 %
Bangalore(R)	13.1 %	12.5 %	11.5 %
Dharwad	25.3 %	25.1%	26.3 %
Gulbarga	20.3 %	19.5 %	13.9 %

Note: The sample of students from within each category was drawn from the universe of students who had appeared for the respective terminal examination in 1998

Chapter 3 – The Factors Influencing Graduation, Continuation into Further Education and Employment

I. Introduction

1.1 This chapter examines in greater detail issues relating to equity in outcomes at the secondary and higher secondary education levels. Specifically, it seeks to answer the question whether students from deprived or poorer social groups, comprising the majority of those who study in government educational institutions, are more disadvantaged in terms of passing the terminal examinations, labor market performance and continuation into higher education. The analysis in this chapter is based largely on data collected through the tracer study, supplemented by information obtained from interviews with heads of educational institutions.

1.2 Passing the terminal examination is the single most important factor that influences the outcomes of secondary or higher secondary schooling for students. It determines eligibility for continuing with further studies, which can improve earnings and employment status or, in the case of those entering the labor market, eligibility for more remunerative jobs. As noted in Chapter 2, about half the students pass the examinations on the first attempt, another quarter succeed only after repeating the examinations and one-quarter fail to clear them. The chapter begins with a discussion of the background and school characteristics of students who passed the SSLC and PUC examinations on the first attempt, those who passed on repeat attempts and those who failed. This is followed by a presentation of the results of logistic regressions, run separately for SSLC and PUC students, that examine the effect of these on: (i) passing the terminal examination; (ii) passing the terminal examination on the first attempt; (iii) continuation into higher studies; and (iv) getting a job, for those who do not continue into further education. The final section presents views of heads of institutions on the quality of education and the factors influencing continuing higher studies.

1.3 The regression analyses presented in this chapter are more in the nature of exploratory analyses. The findings raise important issues for government policies towards secondary education but they are necessarily tentative given the limitations of the data and the models that have been estimated. The concluding section of the chapter discusses some of these limitations and policy implications.

II. Family Characteristics and Educational Background of Students[19]

2.1 There are distinct differences in the family and social backgrounds of students who passed on the first attempt, passed on a repeat attempt and failed. The proportion of girls, however, was found to be roughly the same in all three categories at both the SSLC and PUC levels. Comparing the sample of SSLC students who had failed with that of students who had +passed on the first attempt, a greater proportion amongst the former was found to be from the

[19] The distribution of sample students by gender, stated Scheduled Caste or Tribe (SC or ST) background, type of school and region is given in Annex 2.2. The distribution SSLC students by government, government-aided and unaided institutions was found to be 30 percent, 60 percent and 10 percent respectively; and of PUC students, 23, 59 and 17 percent, respectively. The sample proportions are roughly in line with the distribution of the population of SSLC and PUC students in the state.

Scheduled Castes (SCs), and from families where parents have had no education and do not speak any English (Table 3.1). A quarter of those who failed were from SC background, compared to 14 percent of those who passed on the first attempt.

2.2 Of those who passed on the first attempt in the SSLC and PUC terminal exams, nearly half are from Bangalore. The majority of those who passed on repeat attempts as well as of thos who failed are from other regions. About 27 percent of the SSLC students who failed have fathers with no schooling and 58 percent have mothers with no schooling. Only 6 percent of those who failed reported having at least one parent with graduate level education, compared with 40 percent of those who passed on the first attempt. Those who failed are also from poorer backgrounds, with families engaged in agricultural occupations.

Table 3.1
Family and Social Background Characteristics of Students

	SSLC Students			PUC Students		
	Pass – on first attempt	**Pass – on repeat attempt**	**Fail**	**Pass – on first attempt**	**Pass – on repeat attempt**	**Fail**
As percentage of N:	**696**	**211**	**316**	**360**	**122**	**159**
Differentiated (as percentage of N) by:						
Gender						
Female	48	43	51	49	42	38
Social Class						
SC/ST	14	24	24	7	16	16
Town Class						
Metro	50	25	33	55	30	26
Father's Education						
No schooling	10	14	27	7	6	21
Elementary and below	29	37	39	22	35	43
Completed secondary	21	30	20	23	22	18
College education	40	20	6	47	38	16
Mother's Education						
No schooling	28	36	58	19	30	51
Elementary and below	33	47	34	30	31	30
Completed secondary	22	11	7	27	19	13
College education	17	5	1	23	18	5
Spoken English						
Father speaks English	46	30	11	56	45	24
Mother speaks English	21	6	3	31	18	8
Assets Owned						
Agricultural land	36	45	45	36	42	55
Color TV/ fridge/car	59	41	27	74	57	37

Source: Tracer Study, 2001

2.3 In the sample of PUC students, similar differences were observed in the social and economic backgrounds between those who had failed and with those who passed on the first attempt. The PUC students, taken together, were found to be from more advantaged families than the SSLC students as a whole, as many of those from deprived backgrounds would not have reached the PUC level, having failed the SSLC examinations. However, even within the PUC sample, a large proportion of those who had failed the PUC terminal examinations, in comparison to the sample of those who had passed, were from relatively disadvantaged groups.

2.4 There are also considerable differences in outcomes between students who have studied in government and private institutions. Among the SSLC students who passed on the first attempt, only a fifth were studying in government institutions at the time of the examination; two-thirds were from private government-aided institutions and 16 percent from private unaided institutions (Table 3.2). Students from government schools, however, comprised almost half of those who failed the terminal examination. Very few students from unaided schools were among those who failed.

2.5 *The type of school the student attended at the elementary level* has a striking impact on the performance at the SSLC terminal examination. Of those who failed, about 85 percent had studied in government schools and 13 percent in private government-aided schools at the elementary level; by contrast, of those who passed in the first attempt 38 percent had studied in private aided schools, and 18 percent in private unaided schools at the elementary level.

2.6 The effect of the elementary level education is equally pronounced at the PUC level. About 71 percent of those who failed in the PUC terminal examination had studied in elementary schools run by the government; of those who passed on the first attempt, 38 percent had studied in government schools at the elementary level.

2.7 The distribution of those who passed or failed in the terminal examination, by medium of instruction at the school level, is also noteworthy. About 45 percent of the SSLC students who passed on the first attempt had studied in English-medium schools. However, over 85 percent of those who passed on repeat attempts and over 90 percent of those who failed had studied in Kannada-medium schools.

2.8 The proportion of students who had taken additional private tuition prior to their examinations, also differs for those who passed on the first attempt, passed on repeat attempts and failed to clear the terminal examination. Only a quarter of SSLC students who failed had taken additional tuition, compared to 45 percent of those who passed on the first attempt. The former spent only about half of what the latter spent on private tuitions. Among PUC students, only 16 percent of those who failed had taken additional tuition, in comparison to nearly half of those who passed. The average expenditure on private tuitions at the PUC level was more than three times that at the SSLC level; while those who failed had also spent a considerable amount on private tuition, those who passed had invested even more.

Table 3.2
Type of School Attended and Extent of Private Tuition

	TOTAL SAMPLE - SSLC			TOTAL SAMPLE - PUC		
	Pass – on first attempt	**Pass – on repeat attempt**	**Fail**	**Pass – on first attempt**	**Pass – on repeat attempt**	**Fail**
Number of students (N)	**696**	**211**	**316**	**360**	**122**	**159**
As percentage of N:						
School/PUC Management (at time of exam)						
Govt.	21	36	48	24	20	33
Aided	64	62	50	64	75	64
Unaided	16	2	2	12	5	3
Type of School attended at Primary Level						
Government	42	70	85	38	47	71
Aided	38	26	13	43	43	21
Unaided	20	4	2	18	11	7
English medium of instruction						
In Class 1-4	45	16	6	51	35	18
In class 5-7	45	16	6	51	34	18
In class 8-10	46	18	8	55	39	24
Private tuition at time of exam						
Yes	45	42	25	47	46	16
Average expenditure on private tuition (in Rs.)	1137	856	577	3287	3361	2648

Source: Tracer Study, 2001

III. The Determinants of Passing

3.1 This section discusses the results of four logistic regressions. The focus of the analysis was on whether students from poor and educationally deprived backgrounds, who have studied in government high schools, have a lower probability both of passing and of passing on the first attempt. The dependent variable for each of these regressions is the natural logarithm of the odds ratio of: (i) passing the SSLC examination; (ii) passing the SSLC examination in the first attempt; (iii) passing the PUC examination; and (iv) passing the PUC examination in the first attempt. The complete list of explanatory variables used in each of the regressions, together with the descriptions of the variables is given in Box 3.1. In addition to variables describing the characteristics of the student's social background and student perceptions of school quality, institution-specific information was also collected (such as, pupil-teacher ratio, availability of library and other facilities, institutional responsiveness to job market developments, and so on). The data on pupil-teacher ratio was considered reliable only for high schools; at the PUC level, the student-teacher ratio varies across streams and an average would be unacceptable. All regressions were run with all the independent variables listed in Box 3.1; the results reported below, however, are for the step-wise regressions where only the 'significant' variables in each

regression were included as explanatory variables.[20] We discuss first the direction of the effect of each explanatory variable on the dependent variable before discussing the magnitude of the impact of social background and school characteristics on the probability of passing.

Box 3.1
Logistic Regression Analysis: Description of codes of variables

Code	Variable	Type	Reference level - 0	1
Family Background Variables				
GENDER-F	Gender	Category	Male	Female
SC/ST	SC/ST	Category	General	SC/ST
EDU-FATH	Father's education level	Continuous		
EDU-MOTH	Mother's education level	Continuous		
F-SPKS ENG	Father speaks English	Category	Father can't speak English	Father can speak English
M-SPKS ENG	Mother speaks English	Category	Mother can't speak English	Mother can speak English
HH INCOME	Household income	Continuous		
METRO	Metro	Category	Non-metro	Metro
Education Variables				
ASISST	Private tuition	Category	Didn't take private tuition	Took private tuition
ENGMDPRM	English medium at primary level	Category	Kannada at primary level	English at primary level
ENGMDSSL	English medium at SSLC level	Category	Kannada at SSLC level	English at SSLC level
GOVT	Govt. high school/ Govt. PUC college (at time of examination)	Category	Private school/college/inst.	Govt. school/college/inst.
GOVTSSLC	Govt. high school at SSLC level	Category	Private school at SSLC level	Govt. school at SSLC level
GOVT PRM	Studied in govt. school at primary level	Category	Private school at primary level	Govt. school
SAT-BOOKS	Student satisfaction with books and materials	Continuous		
SAT-LAB	Student satisfaction with laboratory facilities	Continuous		
SAT-LIBRARY	Student satisfaction with library facilities	Continuous		
SAT-TEACH	Student satisfaction with teaching	Continuous		
Institution data				
S-T RATIO (1)	Student-teacher ratio	Category	Good	Fair
S-T RATIO (2)	Student-teacher ratio	Category	Good	Poor
Admin-Lib1	Administrator satisfaction with library	Category	Good	Fair
Admin-Lib2	Administrator satisfaction with library	Category	Good	Poor

[20] Details of the regression with all variables with all the explanatory variables are reported in A. Indira and V. Vyasulu (2000). *Secondary Education and The Labor Market – A Survey in Karnataka.*

SSLC students

Passing the SSLC examination:

3.2 The significant variables are the father's level of education, whether the student studied in a government-run high school, whether the student had studied in the English medium at the *primary* level, student satisfaction regarding library and laboratory facilities and whether the student had additional private tuition. The impact of a more educated father was found to be positive, as was that of better libraries and laboratories, and private tuition. English-medium instruction at the elementary school level had a positive effect, while studying in government high schools had a negative effect.

Passing the SSLC examination on the first attempt:

3.3 As before, family background characteristics are significant determinants, but different characteristics emerge as significant variables in comparison to the first regression. Mother's education has a positive effect. Being a student from SC background has a negative effect. The effects of English-medium education *at the primary level* and studying in a government high school are the same as discussed above. Availability of facilities and of teaching quality, as judged by students' perceptions, also have the expected positive effects. In this regression, the pupil-teacher ratio in high schools and adequacy of library facilities (both as reported by school administrators) are also significant variables. The effects of the pupil-teacher ratio are as expected – as the student-teacher ratio worsens ('good' to 'fair' and 'good' to 'poor'), there is a negative effect.

PUC students

Passing the PUC examination:

3.4 The significant variables for the first regression are gender, the father's education level, private tuition, and student satisfaction with the quality of teaching and the type of school attended at the *primary* level. Studying in a government primary school has a negative impact on the chances of passing the PUC terminal examination.

Passing the PUC examination on the first attempt:

3.5 In the second regression, the significant variables are gender, whether the student is from a SC or ST background, whether the student is from the Bangalore urban district, mother's level of education and private tuition. An SC or ST background has a negative impact, while residence in the Bangalore urban district, mother's education and private tuition have positive effects.

3.6 These results confirm the hypothesis that students from the more deprived backgrounds have poorer outcomes at both SSLC and PUC levels. Students belonging to SC and ST family backgrounds are less likely to pass on the first attempt, at either level. An educated father and/or mother has a positive effect, but significantly, it is the latter variable which influences success in

clearing the SSLC and PUC examinations *on the first attempt*. The effect of studying in a government high school is negative for SSLC students, probably reflecting the lack of facilities and effective teaching-learning conditions in publicly provided secondary education. At the PUC level, it does not matter if the institution is run by the government or a private organization; what matters is whether the institution is in Bangalore or not, the location presumably being an indicator of the facilities, equipment and availability of required faculty in the institution.

3.7 *The effect of primary education on outcomes is striking*, especially in the SSLC regressions. In the SSLC regressions, the relevant variable that is statistically significant and has a positive effect is 'English-medium instruction at the primary level', but careful interpretation of its educational significance is required. English-medium instruction at the primary level may produce superior performance in examinations at the secondary level, not necessarily because this mode of instruction is pedagogically better, but because more or better secondary level books may be available in English; this may be especially true of mathematics and the sciences. Students who are more proficient in English may therefore perform better at the secondary level. At the PUC level, primary education in a government school has a negative effect on the probability of passing. Poor children, who are mainly enrolled in government schools and study in the Kannada medium, do not succeed in secondary education to the same extent as other children, even if they gain access to secondary education.

Table 3.3 (a)
Logistic Regressions – Determinants of Passing for SSLC Students

SSLC Students (N = 1158)						
SSLC PASS (Y 1= Pass 0 = Fail)				SSLC PASS in I ST Attempt (Y = 1 Pass on first attempt = 0 Pass on repeat attempt or fail)		
Variable	B	S.E.		Variable	B	S.E.
				SC/ ST	-0.38	0.17
GOVT High school	-0.66	0.16		GOVT High school	-0.65	0.16
EDU-FATH	0.17	0.04		EDU-MOTH	0.13	0.04
ENGMDPRM	1.56	0.26		ENGMDPRM	1.56	0.20
SAT-LAB	0.13	0.06		S-T RATIO (1)	-0.69	0.23
SAT-BOOKS	0.18	0.04		S-T RATIO (2)	-1.55	0.25
ASISST	0.35	0.17		ADMIN-LIB(1)	-0.80	0.27
Constant	-0.53	0.22		ADMIN-LIB (2)	-0.75	0.26
				SAT-TEACH	0.18	0.08
				SAT-BOOKS	0.17	0.04
				Constant	-0.09	0.45

Table 3.3 (b)
Logistic Regressions – Determinants of Passing for PUC Students

PUC Students (N = 618)					
PUC Pass			PUC Pass – on first attempt		
Variable	B	S.E.	Variable	B	S.E.
GENDER-F	0.41	0.21	GENDER-F	0.37	0.18
EDU-FATHER	0.16	0.05	SC/ST	-0.78	0.28
ASISST	1.23	0.28	METRO	0.98	0.18
SAT-TEACH	0.32	0.13	EDU-MOTHER	0.09	0.04
GOVTPRM	-0.73	0.25	ASISST	0.44	0.20
Constant	-1.08	0.63	Constant	-0.81	0.20

3.8 Whether the explanatory variables are positively or negatively related to exam performance in the above regressions show whether each variable raises or lowers the probability of passing, but the size of the coefficient does not reflect the magnitude of the impact on the probability. In order to assess the impact of specific family and school characteristics, the probability of passing has been calculated for the 'average' student (i.e., the student with modal values for all explanatory variables). The change in the probability of passing as a result of a change in each relevant characteristic indicates the 'marginal' effect of the variable at the modal values. In addition, the probabilities of passing for a student from a highly disadvantaged background and for one from an advantaged background have also been presented.

3.9 Table 3.4 summarizes these results for the four regressions given above. For the regression on passing the SSLC, the probability of passing for the 'average' student is 0.79. If the student's father had completed higher secondary (PUC) education, with all other variables retaining the same value as for the average student, the probability of passing would be 0.82, giving a marginal effect of 0.03 for the father's education. The variables with the strongest marginal impacts are 'student attended a government high school', and 'student attended an English- medium *primary school*'. While attendance in a government school lowers the probability for passing the SSLC terminal examination by 0.13, having studied in an English-medium primary school raises the probability by 0.15. The last two columns show that the probability of passing for a disadvantaged student is 0.52 compared to 0.97 for a student from a highly advantaged background.

3.10 Turning to the regression on passing SSLC on the first attempt, and highlighting only key results, the strongest impact is that of studying in an English-medium school *at the primary level*, which raises the probability by 0.24. The probability of a disadvantaged student passing on the first attempt is only 0.04, compared to 0.57 for a student who is from a more advantaged background. In the regression on passing the PUC examination, two variables have the largest impact: extra tuition, the marginal impact of which is 0.20, and attendance in a private school *at the primary level*, which raises the probability by 0.14. In the regression on passing the PUC examination at the first attempt, the variables with the greatest impact are 'residence in the Bangalore urban district' and an 'SC or ST' family background. While residence in Bangalore has a marginal positive effect of 0.24, the disadvantage of an SC or ST family background lowers the probability by 0.14.

Table 3.4
Effect of Family and Education Characteristics on the Probability of Passing

SSLC Pass

	Modal Student*	Father completed PUC	Studied in a govt. high school	Studied in the English-medium at the primary level	Private tuition	Father has no schooling, study in a govt. high school, Kannada-medium at the primary level	Father graduate, study in a private high school, English- medium at primary level
Probability	0.79	0.82	0.67	0.95	0.84	0.52	0.97
Change in probability#		0.03	-0.13	0.15	0.05	-0.27	0.18

Note *: The Modal Student is one whose father has completed secondary school; who has studied in a private high school and studied in the Kannada-medium at the primary level; who did not take private tuition; has poor laboratory facilities in the present school and is relatively satisfied with the availability of books at the present school.

SSLC Pass 1st Attempt

	Modal Student**	Mother completed primary education	SC/ST family background	Study in a govt. high school	Studied in the English-medium at the primary level	Mother has no schooling, SC/ST background, study in a govt. high school, Kannada- medium at primary level	Mother graduate, study in a private high school, Kannada-medium at primary level
Probability	0 10	0.14	0.07	0.05	0 34	0.04	0 57
Change in probability#		0.04	-0.03	-0.06	0.24	-0.06	0.47

Note **: The Modal Student is one who is not from an SC or ST family background; whose mother has no schooling; who studied in private high school and studied in the Kannada-medium at the primary school level; is at present in a school with a poor student-teacher ratio; poor library facilities; relatively satisfied with quality of teaching and availability of books.

PUC Pass

	Modal Student***	Girl	Father completed PUC	Private additional tuition	Studied in a private primary school	Father has no schooling, no private tuition, govt. primary school	Father graduate, additional private tuition private primary school
Probability	0.67	0.75	0.70	0.87	0.81	0.48	0.95
Change in probability#		0.08	0 03	0.20	0.14	-0.19	0.28

Note *: The Modal Student** is a male, whose father completed secondary education; who has not had additional private tuition; who studied in a government school at the primary level; and who is relatively satisfied with the teaching in his present school.

PUC Pass 1st Attempt

	Modal Student****	Girl	SC/ST	Bangalore	Mother completed primary education	Tuition	Boy, SC/ST, mother no schooling, non-Bangalore	Girl, non SC/ST, Bangalore, graduate mother, tuition
Probability	0.33	0.41	0.18	0.57	0.39	0.43	0.18	0.84
Change in probability#		0.08	-0.14	0.24	0.06	0.10	-0 14	0.52

Note **: The Modal Student** is a male; from a family that does not fall under the SC or ST list; does not live in the Bangalore urban district; whose mother has no schooling; and who does not have additional private tuition.

Note #: Compared to modal student

IV. Continuation into Further Education

4.1 As discussed in Chapter 2, continuation rates are very high for the PUC sample – about 87 percent of those who passed were studying at the time of the survey. Among the SSLC students, about two-thirds of those who passed were continuing in formal education. The relatively high continuation rates at both levels reflect the number and geographical spread of PUC and degree colleges in the state, which have increased tremendously in the last decade.

4.2 The social composition of the SSLC and PUC samples shows that while the share of SC students in the SSLC group is about proportionate to the proportion of those belonging to the Scheduled Castes in the total population (18 percent), their share in the PUC group is only 11 percent (Annex 2.2.). This is a reflection of the higher failure rates of SC students at the SSLC level. The poor quality of education received by these students at the elementary school stage affects their continuation into further studies, despite various incentives to offset the direct costs of schooling for SC students (scholarships and free books), reservation of seats, lower admission criteria and the practice of giving 'grace marks' to enable students to pass the SSLC examination.

4.3 Before turning to the determinants of continuing further studies, a brief description is presented here of the progression of SSLC and PUC students to the next stage of education and their choice of courses. Though not directly relevant to the main question addressed in this chapter, these data are of interest because they reveal high levels of repetition at the PUC level and the differences in the choice of subjects (or a course of subjects) between those who pass on the first attempt and those who pass on repeat attempts. For the SSLC sample, nearly 60 percent of those who passed in the first attempt are in degree level education (general or professional), the level they should have attained without repeating any subsequent academic year (Table 3.5). However, 25 percent are still at the higher secondary (PUC) stage, indicating a significant repetition rate in PUC education. Among those who passed the SSLC terminal examination on a repeat attempt, 90 percent are at the pre-university level, as would be expected because of their delayed entry, but 15 percent are only in the first year (not shown in table) – indicating another year of repetition either at the SSLC or PUC level. About 1 percent of those who passed the SSLC examination on the first attempt, chose the ITI courses and 7 percent chose diploma courses.

4.4 Ninety-four percent of those who passed the PUC terminal examination in the first attempt were in degree level education (general and professional). Most were in the third year of study (not shown in table), as would be expected if an academic year were not repeated. However, a significant proportion of students in the 'humanities' courses were found to have repeated more than one academic year (not reported in the table). Especially striking were the differences in the choice of degree level courses between those who passed on the first attempt and those who passed on a repeat attempt. Most of those who had passed in the first attempt were studying humanities subjects (33 percent), commerce (29) and engineering (22); *very few had opted for science degree courses*. On the other hand, among those who passed on repeat attempts, 22 percent were enrolled in science degree courses and a negligible number had opted for engineering courses. *This*

suggests that engineering is the first choice amongst the best PUC students in the science stream; it also suggests that repetition levels are highest in the science stream at the PUC level and that it is these repeaters who enter the science stream at the degree level. The results reflect on the poor quality of science education at the PUC level and the fact that degree level science education is adversely affected by the low levels of learning of students entering colleges.

Table 3.5
Distribution of Students Pursuing Further Studies by Type of Course

	SSLC - CURRENTLY STUDYING		PUC - CURRENTLY STUDYING	
	Pass – on first attempt	Pass – on repeat attempt	Pass – on first attempt	Pass – on repeat attempt
Number of Students (N)	**443**	**161**	**313**	**102**
Currently studying in (as percentage of N)				
SSLC				
PUC	25	90		
ITI	1	5		
Diploma	7	2	3	6
General degree	38	1	72	79
Engineering/computer applications	21	2	22	11
Others	8	0	3	4

4.5 The analysis of activity patterns for each of the three years preceding the survey showed that most students did not change their activity status between studying, working or not working or studying. In other words, if a student had gained entry into the next stage of education, he or she persisted with that, repeating years if necessary. Those who joined work after or stayed at home, not working, after the terminal examination, did not attempt to rejoin studies later.

Regression Results

4.6 The dependent variable in each of the two regressions for SSLC and PUC students, respectively, is the natural logarithm of the odds ratio of continuing further studies. The significant variables found to be impacting the dependent variable for SSLC students were: attendance in an English-medium at the high school (SSLC) level, and household income and the education levels of the father and the mother, all of which have positive effects. Attendance in a government high school had a negative effect on continuing further studies. For the PUC students, the only significant variables are whether the student attended an English medium school *at the high school (SSLC) level*, and the education levels of the father and mother.

4.7 Income levels were found to be a constraint to continuing further studies at the end of the lower secondary stage but not, apparently, at the end of the higher secondary stage, possibly because most of the students at the higher secondary stage tend to be from

relatively well-off families. Equally important, those who are in government institutions at the SSLC level are relatively disadvantaged in terms of being able to continue their education (but not at the PUC level). *English-medium education at the secondary level* influences the likelihood of continuing further studies for both SSLC and PUC students.

Table 3.6
Logistic Regressions – Continuing Further Studies

SSLC Students (N = 1158)			**PUC Students (N = 618)**		
Variable	B	S.E.	**Variable**	B	S.E.
ENGMDSSL	0.69	0.17	ENGMDSSL	0.75	0.27
HH INCOME	0.25	0.06	EDU-FATH	0.18	0.06
EDU-FATH	0.10	0.04	EDU-MOTH	0.26	0.07
EDU-MOTH	0.13	0.04	Constant	-1.20	0.23
GOVT High School	-0.79	0.15			
Constant	-1.41	0.17			

4.8 Table 3.7 shows the probabilities for the modal student and the impact on the probability of continuing further studies due to changes in different background characteristics. For SSLC students, the probability of continuing further studies for the modal student is 0.4; the greatest impact on probability is that of study in an English-medium school at the SSLC level as well as study in a government-run high school. *The marginal impact of studying in an English-medium high school is 0.17 and the negative impact of studying in a government-run high school is (-)0.16.* Among PUC students, the probability of continuing further studies for the modal student is 0.54; if the mother has had primary level education, the probability is raised by 0.18. The marginal positive impact of having had English-medium education at the SSLC level is 0.17.

Table 3.7
Effect of Family and Education Characteristics on Probability of Continuing Further Studies

SSLC Continuing Further Studies					
	Modal Student*	Father completed PUC	Mother has primary education	English-medium at SSLC level	Government-run high school
Probability	0.40	0.42	0.49	0.57	0.23
Change in probability#		0.02	0.09	0.17	-0.16
Note *: The Modal Student is from a family with low income; whose father has completed secondary (PUC) education; whose mother has no schooling; who studied in a Kannada-medium private school at the SSLC level.					
PUC Continuing Further Studies					
	Modal Student**	Father completed PUC	Mother has primary education	English-medium at SSLC level	
3.4 Probability	0.54	0.58	0.72	0.71	
Change in probability#		0.04	0.17	0.17	
Note **: The Modal Student has a father with secondary (PUC) education; but a mother with no schooling; has studied in the Kannada-medium at the SSLC level.					

Note # Compared to modal student

V. Currently Employed Sample

5.1 The number of students who were working at the time of the survey was relatively small, especially at the PUC level, far fewer than what was anticipated. Most students reported getting their jobs through relatives and friends rather than through the employment exchange.

Regression results

5.2 The sample of students for the regressions comprised those who reported themselves as *not* continuing in higher education at the time of the survey. A common result for SSLC and PUC students was that gender negatively affected the dependent variable, while residence in the Bangalore urban district had a positive effect (Table 3.8). The fact that girls are less likely to be employed than boys, even if they were not pursuing higher studies, probably reflects the effect of social values and customs. Bangalore has considerably more job opportunities and hence students from this district are more likely to be employed. For SSLC students, higher household income and being from a government-run high school had a positive effect. On the other hand, an educated father and passing the SSLC examination had negative effects. At the PUC level, a Scheduled Caste or Tribe family background and attendance in a government institution had negative effects. These results are difficult to interpret meaningfully, partly because of the small size of the sample from outside Bangalore area.

Table 3.8
Logistic Regression – Currently Employed

SSLC Employed (N = 558)			PUC Employed (N = 180)		
Variable	**B**	**S.E.**	**Variable**	**B**	**S.E.**
GENDER-F	-2.02	0.22	GENDER-F	-2.77	0.56
METRO	0.75	0.21	SC/ST	-1.79	0.64
HH INCOME	0.27	0.10	GOVT PUC	-1.23	0.49
EDU-FATH	-0.18	0.05	METRO	2.58	0.56
PASS	-0.60	0.21	Constant	-0.19	0.28
GOVT High School	0.42	0.21			
Constant	0.41	0.27			

VI. Opinions of Heads of Institutions on Factors Influencing Outcomes

6.1 The opinion of heads of educational institutions, who were interviewed as part of the tracer study, provides additional information to supplement the findings reported above regarding the poor performance of disadvantaged students in school-leaving exams and the factors that contribute to this poor performance. Heads of government institutions said that two of the factors responsible for lowering the quality of secondary education are the inadequate academic preparation at the elementary education level and the lack of

facilities at the secondary education level to effectively teach the curriculum. First, students who entered secondary education had not acquired basic competencies in language and mathematics due to the poor quality of elementary school education, including the lack of continuous assessment and promotions to the higher classes being granted without attainment of adequate levels of learning. The first examination is conducted by district authorities only at the end of class 7 and most students who take the examination are allowed to enter secondary education (class 8). As a result, many students, especially those from rural and poor backgrounds, are ill prepared to cope with the more complex secondary education curriculum. Second, many basic facilities are lacking in high school and PU colleges, including library, laboratory and computer facilities. In most government institutions, there are no proper libraries and no librarians, only collections of books kept by some dedicated teachers in the staff room and shared with interested students. At the PUC level, even where library facilities exist, these are under-utilized since students have little time for reference work given their heavy syllabi. Laboratory facilities are minimal in government institutions – at the SSLC level, the principals reported that students go to the laboratory only to watch demonstration classes, which could be organized only when the equipment is functional and consumables are available. Computer facilities are new to high schools and PU colleges. Most private aided institutions have invested their own resources in training teachers and special classes are organized for students to get a basic understanding of computers; in government institutions on the other hand, very few have received the equipment and teachers have not been trained in the use of computers.

6.2 As a result, according to these principals, many students in government institutions either do not graduate from high school at all or pass with very low marks and therefore are not able to continue into higher education. Employment options for these students are very limited because many SSLC students were found to lack the ability to apply what had been taught – for example, to take measurements, comprehend a paragraph, or draft a letter. Language teaching is particularly poor and many students cannot easily write a sentence even in Kannada. Students, especially those from rural and Kannada-medium schools, lack oral communication skills and a functional knowledge of English which are required for work in the modern industrial sector. These opinions corroborate those expressed by employers, as described in the previous chapter.

6.3 Consequently, those who failed the SSLC examination got 'casual' (irregular) jobs only as helpers, unskilled labor and sometimes shop assistants. Those who are from an agricultural background or from self-employed families, returned to help in the family occupation. Those who passed the SSLC examination or PUC examination but did not continue with higher studies had only the option of 'Group D' jobs in the government (police constable, clerks, cleaners). Due to the limited number of jobs in the modern industrial sector, especially outside Bangalore, and due to the lack of skills of SSLC students, employers prefer to hire PUC students or even graduates as receptionists and typists (jobs, which SSLC students should be able to do if they had received an education of adequate quality). The overall economic environment and limited prospects for those who are likely to do poorly in the terminal examinations affects the morale and motivation of students; in turn, according to the heads of these institutions, the limited

aspirations of students in government high schools affects the morale of the teaching force, lowers their expectations of student performance and negatively impacts the quality of teaching.

VIII. Conclusion

7.1 The findings of the regression analysis confirm that students from more deprived family and social backgrounds are less likely to pass the terminal examinations; less likely to pass on the first attempt and less likely to continue further studies. Girls are not disadvantaged, but those from SC or ST family backgrounds, with parents having limited education, have a lower probability of passing than others. Students from low-income families are less likely to continue their studies after the SSLC level. The results of the regression analysis of those who obtained employment proved difficult to interpret, probably due to the small size of the sample and the fact that most of those working were from the Bangalore urban district.

7.2 The quality of facilities and education in the institution, which the student attended at the time of the examination, has a positive impact on the probability of passing both at the SSLC and PUC levels. These include the student-teacher ratio, adequate library facilities, the quality of teaching and the availability of books and laboratory facilities. Not all variables are significant in all regressions – partly because of measurement problems as in the case of the student-teacher ratio at the PUC level, explained earlier – but the results do show a relationship between school quality and student outcomes.

7.3 Students in government-run high schools at the SSLC level have a lower probability of passing the SSLC terminal examinations, either on the first or repeat attempts; they also have a lower probability of continuing their studies after the SSLC level. The type of management of the institution does not seem to make a significant difference at the PUC level.

7.4 However, the most striking and arguably *the most important result is the strong impact of primary level education on the probability of passing both at the SSLC and PUC levels*. In the case of the SSLC regressions, the significant variable is 'English-medium instruction at the primary level'; in the case of the PUC, it is 'attendance in a government-run primary school'. It is possible that the latter also partly captures the effect of the language of instruction since government schools provide instruction only in Kannada. This interpretation suggests that those who studied in Kannada at the primary level are at a disadvantage at both the SSLC and PUC levels. However, it is also possible that the variable 'English-medium instruction at the primary level' partly captures the impact of studying at a private school, since only private schools provide English-medium education. Disentangling the effects of private school and medium of instruction is not easy, since the two are highly correlated.

7.5 The medium of instruction in high school also influences the probability of continuing further studies. Among both SSLC and PUC students, those who had

English-medium education at the SSLC level (including PUC students) showed better chances of passing their terminal examinations. This additional result strengthens the argument that it may be the language of instruction rather than the private school effect that favorably influences outcomes.

7.6 The results have significant implications for educational policy and suggest that an integrated approach to language of instruction at different levels is required if equity in educational outcomes is to be promoted. If English-medium education at the primary level increases the chances of passing at the secondary level, but is provided only in private schools that are accessible to higher-income and more privileged groups, students from poor and disadvantaged groups are denied equitable opportunity to complete secondary education with satisfactory quality.

7.7 This analysis does not by itself indicate that the problem at the primary level is instruction in Kannada or that the solution is to promote English-medium education at the primary level. What it highlights is the mismatch in the content of education between the primary and secondary levels. Students apparently require proficiency in English at the secondary and higher secondary levels (even if they are studying in Kannada medium); however, English language teaching in government schools, begins only in class 6 and is reportedly of poor quality.[21]

7.8 The policy options to improve the outcomes of the poor and disadvantaged students are to strengthen English language teaching in government schools at the primary level, improve Kannada language instruction at the secondary level, especially in science and mathematics (through teacher training, books and materials) or to enable more students to attend English-medium private schools. These options need to be considered carefully and they are not all mutually exclusive.

7.9 One important conclusion of this analysis is that the existing policies to encourage participation of students from SC or ST or agricultural families in higher education, including financial incentives and reservation of seats in institutes of learning, have not been entirely successful in ensuring equitable outcomes at the secondary level. This, in turn, affects the chances of such students in continuing their education. Karnataka needs to improve equity in the outcomes of secondary and higher education, in particular, for the SC/ST students, those who are from poorer and less educated family backgrounds and those studying in government institutions (especially at the high school level). In order to do this, it needs to improve the quality of primary education, addressing issues relating to the language of instruction and the mismatch in curricular content between different levels, in tandem with directly improving the quality of secondary education by lowering the very high student-teacher ratios in some high schools and investing in laboratories and libraries. The analysis suggests that raising the quality of primary education in combination with steps to strengthen secondary education will have a greater impact on improving outcomes for the disadvantaged than improving the quality of secondary education alone. The opinions of heads of institutions, in addition to confirming these

[21] A proposal of the Dept. of Education to introduce English language teaching from Class 3 in government schools is pending with the government.

findings, also indicate that the morale and motivation of students and teachers in government institutions, which affect the quality of the educational process, are affected by the overall economic environment and the slow growth of employment in the modern sector.

7.10 The models reported above are 'step-wise' regressions where only the significant variables were included as explanatory variables, although the original regressions included all explanatory variables that should be theoretically included. Exclusion of the 'non-significant' variables in the final model did affect the magnitude of the coefficients of the other variables, but did not affect the sign or significance of these coefficients. Thus, although the magnitude of the marginal impact of a particular variable might be affected by retaining the original specification, the overall conclusions and implications for policy are unlikely to be affected. A potentially more severe problem arises from the fact that the effect on exam performance of the type of school attended by the student (at either primary of secondary level) maybe overstated because unobserved characteristics of the student (such as parental interest, own motivation and ability) may affect both outcomes and school choice. In this exploratory analysis, it has not been possible to deal with these issues adequately.

Chapter 4 – The Labor Market Performance of Vocational Training Graduates

I. Introduction

1.1 Vocationalization of education or providing specialized training in particular skills has been advocated in Karnataka, as in other states and countries, as the solution to growing unemployment among secondary school graduates. Vocational education was provided for nearly a decade in some higher secondary schools in Karnataka under a Centrally sponsored scheme, but has not proved to be a success for various reasons.[22] After the closure of the Central scheme, many of the institutions have effectively ceased to function. The other main avenues for vocational training are the Industrial Training Institutes (ITIs) under the Ministry of Labor.

1.2 There are enormous differences in the use of technology and requirements of skilled manpower across the industrial spectrum. Within manufacturing itself, three levels of technology and skills can be distinguished. At the *tehsil or taluka* (an administrative block within districts) level, there are the agro-based, low-technology, low-skill and labor-intensive industries such as processing of cereals and vegetable oils and wood-based enterprises. These industries use unskilled workers (with elementary education) or workers with minimal levels of training obtained in the Artisan Training Centers (under the Industries Department). At the district level, the industries have higher capital and skill intensity (sugar mills, foundries, auto components or printing press). Skilled workers for these industries are currently drawn from some of the ITI trades. At the third level, there are bigger industries, located in relatively few regions of the state, which use modern technology (automated machinery or electronic equipment) and require significantly higher skills and specialized training. These industries employ polytechnic graduates for the middle-level technician jobs and engineers and university graduates for higher-level jobs.

1.3 This chapter focuses on whether vocational training is a desirable alternative to secondary and higher secondary education in terms of improving the labor market performance of these graduates. The sample of students covered in this study was restricted to ITI students who had appeared for their terminal examinations in 1998. The vocational education graduates from PUC colleges were not included, as it was already known that few of them had obtained employment. The chapter examines, specifically, the social and economic background of students who take up vocational training, how many are employed, in what kind of jobs and at what wage rates; their job search efforts and aspirations; and their continuation into higher studies and choice of courses. The performance of ITI students is compared with SSLC students. Lastly, the chapter reports the perceptions of employers regarding the adequacy of ITI training and how they compare the capabilities of ITI graduates with secondary school graduates without specialized skill training.

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[22] These include: outdated equipment which has not been maintained; unqualified instructors; lack of relevance of the courses for the job marked; the lack of motivation among students, probably as a consequence of al the above. See GOK (2001), *Sub-sector Study on Secondary and PUC Education.*

II. Tracer Study Findings

2.1 Only about 5 percent of students who pass the SSLC examination enter Industrial Training Institutes (ITIs) – this is shown by both the tracer study data and state level aggregate data (on the number of students passing SSLC and the first-year enrollment in ITIs). Tracer study data show that these students are from less advantaged backgrounds than SSLC and PUC students who had passed, but more advantaged than the SSLC and PUC students who had either discontinued their studies or failed in the terminal examinations. *The ITIs are currently not catering to students of the most deprived or poorest sections*, as entry into the ITIs is also governed by marks secured in the SSLC terminal examination, which are correlated with social background factors.

2.2 The pass rate among the ITI sample was found to be very high – over 87 percent, compared to approximately 55 percent at the SSLC and PUC levels. In fact, a relatively high percentage (about 70 percent) passed in the first attempt.

2.3 There are very few girls in the ITI sample (Table 4.1). The proportion of SC and ST students among those who failed is higher (24 percent) than among those who passed (11 percent). A greater proportion of those who passed came from more advantaged backgrounds as shown by parental education level and asset ownership.

Table 4.1
Background of ITI Students

	Pass – on first attempt	Pass – on repeat attempts	Fail
Number of Students (N)	**146**	**37**	**26**
As percentage of N:			
Gender			
Female	10	---	15
Social Class			
SC/ST	11	11	24
Town Class			
Metro	48	46	54
Father's education level			
No schooling	12	14	12
Elementary and below	39	24	43
Completed secondary	30	43	31
College (not necessarily completed)	18	19	15
Mother's education level			
No schooling	29	38	42
Elementary and below	44	29	35
Completed secondary	22	27	19
College (not necessarily completed)	6	5	4
Assets owned			
Agricultural land	32	27	42
Color TV or refrigerator or car	58	59	50

Source: Tracer Study, 2001

2.4 Of those ITI students who passed on the first attempt, 41 percent were not working and 18 percent were pursuing further studies; only 34 percent were employed three years after the terminal or graduating examination (Table 4.2). The labor market performance of those who passed on the first attempt is better than that of those who repeated the examination or failed. The external efficiency of the training system is low. Absorption into jobs is very slow, as indicated by the year-wise activity status. In 1998, of those who passed on the first attempt, more than half were looking for a job; only 12 percent had found jobs and another 7 percent were recruited as apprentices. The next year, 23 percent were employed and another 18 percent were employed as apprentices. In the year 2000, 41 percent were employed, but this ratio fell to 34 percent in 2001 because a number of students re-entered further studies.

Table 4.2
Current Status and Activities of ITI Students since 1998

	Pass – on first attempt	Pass – on repeat attempt	Fail
Number of Students (N)	**146**	**37**	**26**
Current status in 2001			
(as percentage of N)			
Studying	18	19	12
Employed	34	30	27
Not working	41	52	46
Activity in 1998			
Studying	15	68	50
Looking for job	56	27	35
Employed	12	5	4
Apprentice	7		
Not actively seeking work	10		
Activity in 1999			
Studying	16	32	23
Looking for job	36	54	38
Employed	23	14	19
Apprentice	18		
Not actively seeking work	8		19
Activity in 2000			
Studying	12	19	19
Looking for job	27	41	23
Employed	41	30	31
Apprentice	7	8	4
Not actively seeking work	14	3	23

Source: Tracer Study, 2001

2.5 Among those pursuing higher studies (about one-fifth of the sample), half were currently enrolled in general academic programs (PUC or college degree level) and the rest in polytechnic diploma programs.

2.6 The proportion of ITI graduates who were working was found to be higher than among SSLC and PUC students.[23] Half the ITI graduates who were not continuing further studies were working; of the SSLC and PUC graduates, only one-third of those not continuing higher studies were working. Clearly, ITI graduates do seem to have an advantage over the SSLC and PUC students in terms of securing employment.

2.7 Among those currently employed, ITI graduates enjoyed some advantages over SSLC students.[24] Like the SSLC students, over 80 percent of the ITI graduates are employed in the private sector. Most ITI students, however, are employed as skilled workers or apprentices in skilled jobs (Table 4.3); on the other hand, almost half of the SSLC students are involved in unskilled work. About three-quarters of the ITI students are engaged in production and repair or maintenance work in manufacturing; in comparison, nearly all of the SSLC students are engaged as assistants in shops and petty service establishments, as helpers in transportation services and security guards. ITI graduates also get higher starting salaries than their SSLC counterparts; their current salary levels were also found to be higher. About one-quarter of ITI graduates receive various employment benefits such as provident fund, medical leave and benefits, whereas very few of the SSLC students are eligible for the same benefits.

2.8 The perceptions of employed ITI graduates and their attempts to improve their labor market performance also indicate that the majority of students feel that their training enhances their opportunities in the labor market. A third of these students said that they could do the same job with less education or training (Table 4.4). In contrast, three-quarters of the employed SSLC students said they believed that they could do their current job with less education. The ITI graduates said that most employers resorted to oral interviews before selection and felt that employers were most interested in the subject studied during training; in comparison, SSLC students said that they had not gone through any formal recruitment method and did not feel that their current or prospective employers were specifically looking for any particular skill or knowledge in recruiting them. Most of the latter were recruited through friends and relatives, while a significant proportion of ITI graduates directly applied for the job. About four-fifths of the ITI students were looking for another job, but less than 40 percent of SSLC students were actively searching for a change. In addition, ITI graduates invested considerable amounts in additional training, especially in computer courses, since they felt this enhanced their employability; a negligible proportion of SSLC students who were currently working had done so.

[23] As a proportion of those who were not continuing further studies in all three categories.
[24] The PUC example is excluded from this comparison because the tracer study found very few of these students employed.

Table 4.3
Currently Employed – ITI and SSLC Students

	ITI	SSLC	SSLC
	Pass – on first attempt	**Pass – on first attempt**	**Fail**
Number of Students (N)	**52**	**40**	**59**
As percentage of N:			
Level of employment			
Unskilled worker	4	35	46
Skilled worker	48	55	41
Apprentice/trainee	38	10	5
Others	10		8
Type of work			
Outdoor/sales job	8	10	
Research/development job	2		
Production job	40	15	10
Maintenance/repair job	33		10
Office/Shop Assistant	17	45	15
Others		30	65
Hours worked per week	50	53	53
Monthly Salary (Rs.)			
Males – starting	1,756	1,354	1,037
Males – current	2,045	1,335	1,452
Benefits received			
Leave with pay	23	18	7
Weekly holiday	37	43	25
Provident fund	29	10	10
Medical leave	25	13	7
Medical allowance	29	8	5
Accident insurance	12	8	3

Source: Tracer Study, 2001

2.9 The high levels of unemployment among ITI graduates appear to be due to limited growth in employment in the manufacturing sector in Karnataka, the mismatch between the trades taught in the institutions and the skills sought by employers and, possibly, the low quality of training. Almost all the employed ITI graduates were recruited by organizations in the Bangalore urban district area, where diversified and technologically developed industries have been established. In other districts of Karnataka, the small size of individual enterprises, low-technology production processes and the limited number of jobs in the manufacturing sector constrain the employment of these graduates. It is also possible that some of the ITI graduates were unwilling to take up employment in manufacturing industries, showing a preference for employment in government desk jobs, which is consistent with their socio-economic background.

Table 4.4
Perceptions of Currently Employed ITI and SSLC Students

	ITI	SSLC	SSLC
	Pass – on first attempt	**Pass – on first attempt**	**Fail**
Number of Students (N)	**52**	**40**	**59**
Student Responses **(As percentage of N):**			
How useful is education in employment?			
Not at all useful	15	20	19
Somewhat useful	52	67	67
Very useful	33	13	14
Could you do with lower education?			
Yes	33	65	75
What do employers look for? ***(% students giving highest rank)***			
Medium of instruction	10	20	17
Subjects studied	52	10	15
Marks obtained	21	20	14
Job interview result	13	15	22
Looking for a change of Job			
Yes	82	39	35
Current job search through			
Newspaper ads	8	3	
Friends or relatives	46	77	83
School or college	1		
Employment exchange	8	5	
Direct application	37	15	17
Method of recruitment			
Written test	33	10	
Oral interview	88	28	22
Taking Additional course or training			
Yes	25	8	17
Type of Course			
Computer Training	64	Negl.	Negl.
Apprentice Training	7		
Average amount spent on additional course (in Rs)	3146		

Source: Tracer Study, 2001

III. Employer Perceptions

3.1 This section reports the opinions of a small number of employers and the Joint Director of Employment and Training regarding the usefulness and quality of ITI training. These employers perceive the government-run ITIs (numbering 101) to be generally of higher quality than the private institutions (totaling 351) because of better equipment and faculty. Some of the government-run ITIs enjoy international standing and their graduates emigrate to Singapore and the Middle East after employers conduct

campus interviews. By and large, however, the quality of ITI training is perceived to be very poor in both types of institutions.

3.2 Employers reported that the number and nature of jobs in the manufacturing sector had changed in the last decade due to changes in the economic environment. The number of public sector jobs had declined, both in general government and in public enterprises. For example, overall employment in the Indian Telephones Industries Ltd. (ITIL), one of the public sector companies covered in the employer interviews, had declined from 18,000 to 8,000 in the past few years. Although the company has enrollment quotas for apprenticeship training, no ITI graduate has been absorbed after apprenticeship. Recruitment for government jobs has all but ceased, except for posts of teachers and police constables.

3.3 Rapid developments in technology have rendered many occupations and trades – such as the trades of turners, machinists or grinders and draftsmen – obsolete, while others need to be modified. Many of these trades have lost their relevance for the labor market, in the face of automation. Engineering trades (fitting, electronics, electrical and mechanical, welding, tool- and die-making, and turning) are in high demand from students, but syllabi are out-dated and the faculty are out of touch with changes in technology and work organization. A single technician needs to have an integrated course dealing with two or more skills and be capable of managing three to four operations at a time. The ITI classification of trades as taught, however, is still based on the concept of narrow specialization.

3.4 In addition to the obsolescence of some of the trades taught at the ITIs, there is little student demand for some of the 'hereditary' trades, such as carpentry, because of the social stigma attached to these and, presumably, because students entering the ITI s come from higher socio-economic backgrounds.

3.5 One major problem cited by employers even in relevant courses (such as industrial engineering) is the weak theoretical understanding of ITI graduates of basic scientific concepts and principles; this impedes application of their learning and further learning on the job. One employer, a trader in special alloys and steels, cited the example of an ITI student lacking basic knowledge of chemistry and the chemical composition of materials. Employers suggested that the curriculum may not provide enough room for a strong theoretical training and the faculty may not have the necessary knowledge to impart this training. The faculty is selected from among those who have passed the National Trade Certificate Examination and have some work experience. Interactions of the institutes with industry are negligible.

3.6 The medium of instruction at the ITIs is English, which may also hamper the performance of students, especially those from rural backgrounds. In fact, the technical vocabulary in any trade is relatively limited (about 1,000 words) and it may be preferable, in the opinion of these employers, to teach this as an English technical paper along with English communication skills, while ensuring that the basic concepts and skills are taught in Kannada.

3.7 A placement officer in the Directorate of Training tries to find placements for ITI graduates. Apprenticeship training of 1-3 years is offered in about 3,000 units registered under the Apprenticeship Act, under which enterprises have fixed quotas for each of the various trades. These enterprises are obliged to take these apprentices, although the trades themselves may have become obsolete for the enterprise. For many companies, taking on ITI graduates as apprentices for one year has become a financial burden because of the stipend that is payable to them. Many small-scale industries that offered apprenticeship training have closed down due to changes in the market. The ITIs themselves keep records of which students got jobs or how much they earned.

3.8 Although there is no critical shortage of skilled manpower at present, employers expressed the belief that shortages in skilled manpower required for high-technology industries could emerge if employment in private manufacturing expands. Currently, SSLC and PUC students do not have the required skills or attitudes employers are seeking, for either service or production related work The quality of the SSLC students who enter the labor market is often so poor that it is not considered worthwhile to invest in further specialized training for them. The ITIs, on the other hand, are training a number of people who are not needed by industry and who often do not have basic scientific understanding. Should the demand for skilled workers expand rapidly, the number of secondary and ITI graduates with the required profile who currently enter the labor market would not suffice.

IV. Conclusion

4.1 The tracer study results show that skills training in specific trades does seem to enhance job prospects and wages of ITI students in comparison to those who have only general secondary education. Industrial skills training is also considered necessary by employers. Both students and employers are willing to invest in training – students invest in additional skills training, and employers are willing to provide opportunities for on-the-job training, provided the foundations for benefiting from such training exist. However, part of the advantage that ITI students enjoy over the SSLC students who join the labor market appears to be due to the fact that the skills and knowledge of the latter are at very low levels. Employers consider SSLC students "unemployable" in the skilled jobs required by the modern industrial and service sectors and are unwilling to invest in training of SSLC graduates, preferring to recruit ITI graduates, where possible.

4.2 The study findings reveal, however, that *expansion of vocational training as currently configured in Karnataka is not desirable.* Vocational training in the state is not responsive to the changing labor market; relatively few of the vocational training graduates get employment even several years after graduation due to the obsolescence of many trades, rapid changes in technology and production systems and the slow growth of employment in the manufacturing system.

4.3 There is currently a great deal of wastage in the system; if the higher unit costs of providing vocational training were taken into account (which could not be done during

the course of this study), *the current system of vocational training may be less cost-effective than general secondary education*, even though it seems relatively more effective than general secondary education in terms of labor market performance. Further, currently, the ITI's are not catering to the most disadvantaged sections (even among the secondary education graduates). Public investment to expand *the existing system of vocational training* does not appear justified on either efficiency or equity grounds.

4.4 Nevertheless, it is clear that specialized skills training is required to improve the productivity of school leavers and to cater to the needs of the changing labor market. Improving the quality of general secondary education is a pre-requisite so that it becomes worthwhile for students and employers to invest in specialized skill training. Without this, any additional investment in vocational training alone is unlikely to produce the intended benefits of improving productivity, especially of the poor and rural youth. The specific areas that need attention are oral and written communication skills, in both Kannada and English, and improving the teaching of mathematics and science, especially the practical applications of these subjects in the world of work.

4.5 In addition, Karnataka needs to explore new institutional approaches to provide this training and a diversification of its sources of financing. First, instead of offering a separate vocational stream at the PUC level with occupation-specific courses which faces low student demand, it could offer greater diversity of courses and flexibility to students in *the general academic PUC stream*, which would enable students to access a range of jobs, especially in the services sector. Second, in the short run, it could close down many of the redundant course in the ITI s, and modernize the curricula, teaching methods and infrastructure for those courses that are in demand in the labor market. Seeking employer participation and financing for this endeavor would be required both to reduce the burden on the public exchequer and to make institution-based training more responsive to the labor market and employer needs. This approach would be especially relevant for the medium-sized industries trying to upgrade their technology and production systems, which currently operate at the district headquarters and small towns and which require a skilled workforce.

4.6 Finally, Karnataka should explore new approaches for upgrading the skills of secondary school students who do not appear for or pass the SSLC exam, as well as students who have only elementary education, who still comprise the majority of new entrants into the labor force (and will continue to constitute the majority for the next decade). These students who do not complete secondary education, work in low-technology, low-skill, agro-based industries and the self-employed sector. Institution-based, occupation-specific skills training is both expensive and inflexible to cater to the enormously diverse needs of this workforce. Karnataka needs to examine the experience of other newly industrializing countries, especially those of South-East Asia, to select appropriate cost-effective mechanisms for providing skills training that are in line with its overall strategy for promoting rural development and non-farm employment.

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