ECONOMIC ANALYSIS

A. Macroeconomic and Sector Context

1. Sri Lanka is a fast growing middle income economy with an average GDP per capita of $2,836 in 2011 growing at 6.5% with an investment to GDP ratio of over 30% in 2012. Sri Lanka is currently experiencing an unprecedented growth phase since the end of the political conflict in 2009 and is targeting to achieve a $4,000 GDP per capital level by 2016. A resilient economy that has grown at an average of 3–5% per annum in the past 3 decades, Sri Lanka now has the opportunity to grow at a rapid pace of 6-8% over the next decade. Sri Lanka has low unemployment levels of below 4% as a result of the recent boom in economic activity. However, more than half of those unemployed are the youth between ages 15–24, since 17.8% of youth remain unemployed. In fact, the youth employment rate among women is even higher at 21.6%.

2. Sri Lanka has made great strides in the human development sector in the last few decades. It now provides near universal access to primary and secondary education with a 91% completion rate for the basic education cycle (Grades 1–9). The challenges ahead are to substantially improve the quality and labor market relevance of secondary education to improve examination performance and senior secondary education graduation rates while providing equitable opportunities across the country. The skills education sector needs to be modernized with a focus on labor market relevance and increased participation in skills training from the private sector. These initiatives will, in turn, improve youth employment rates as they enable young people to transition to the skills, vocational, and higher education levels more easily and get higher paying jobs in the fast growing sectors of the economy. In order to accelerate growth, reduce youth unemployment rates, take advantage of the current demographic dividend with a low dependency ratio, and achieve its vision of becoming a knowledge economy, Sri Lanka needs to invest substantially in providing a sound foundation for Science and Technical education at the school level.

B. Economic Rationale and Demand Analysis

3. Micro-economic models focus on the private returns to education and skills training by way of increased earnings. Economic analysis for project-based lending to the education sector usually draws on these models to estimate economic internal rates of return (EIRR) for the project. A later section in this document discusses the EIRR for the education sector, drawing on existing analysis undertaken by the World Bank for the Government of Sri Lanka’s (the government) Education Sector Development Framework and Program (ESDFP), which seeks to improve access to quality education, contribute to human resource and skills development in Sri Lanka, promote inclusive growth enabled by higher education attainment, and help the country move towards a knowledge-based economy. However, using EIRR analysis as the only basis to underline the economic rationale is limiting as it does not reflect the synergies between the various sectors for the longer term government human capital development program. The economic rationale for investing in a program for human capital development is, in fact, well

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1 Country Economic Indicators (accessible from the list of linked documents in Appendix 2).
founded in the academic literature on macro-economic growth theory where human capital accumulation is a key driver of economic growth. The neo-classical Solow-Swan growth models of the 1950s focused on physical capital accumulation as the key to explaining differences in growth rates in cross country comparisons. Barro and Sala-i-Martin built on these theories to include human capital accumulation as a driver of economic growth. Empirical studies have found that technological change is also a major driver of growth. In the last couple of decades, endogenous growth theories have included technological change, research and development (R&D) and the diffusion of knowledge as key variables in the growth equation. Thus economic growth is driven, among other factors, by human capital accumulation and technological growth. The 1988 Lucas function finds that the per capita GDP growth rate is mainly a function of the human capital as a percentage of GDP growth rate and the growth rate of investment in physical capital as a percentage of GDP. Lucas’ growth model also highlights the importance of education in technological diffusion. His endogenous growth model points to the market externalities of education and skills training.

4. Investing in human capital accumulation by means of quality education and skills training and simultaneously investing in Science and Technology to encourage innovation and research makes economic sense for Sri Lanka as it strives to accelerate growth and reduce youth unemployment. This multi-sectoral approach for human development adapted by the government will create a virtuous cycle of quality education and skills training which would spur growth which in turn will create more jobs and a higher demand for better quality education and skills training. In addition, the government plans to invest in initiatives such as research and technology parks and encourage innovation in economic growth sectors will have synergies with quality education and skills training. McMahon, Sakellaris, Wilson and others have studied the impact of research and development on “embodied” technology i.e. technological changes that get incorporated into new capital stock and find that investing in innovation and research and development (R&D) has a considerable downstream impact on industries using embodied technology and this then translates into improved productivity. Human capital accumulation itself can be defined as a function of years of education and skills training as well as the quality of education and training. Thus, human capital accumulation can be defined as a positive function of quality education (E), market driven skills training (S) and scientific and technical innovation (I) i.e. HC=F(E, S, I). As the Organization for Economic Cooperation and Development (OECD) report on workforce, skills and innovation summarizes, “...it is clear that there is a strong circular and cumulative interaction between knowledge, skills and innovation”. The simple diagram below illustrates this circular interaction. Recent studies and reports including World Bank 2013 World Development Report, McKinsey report on education to employment and ILO report on the World of Work all focus on the important issue of the urgent need to expand and improve the quality of secondary education and skills training in

developing countries. The proposed government medium-term program of human capital development is built around these synergies between good quality education, market relevant skills training and Science and Technology research to boost productivity and employment.

**Figure 1: Linkages between Education, Skills and Innovation**

5. The foundation for the government program of human capital development for a knowledge economy is a good quality school education program, with a focus on improving science and technical education at the school level. Recent academic literature on the economic benefits of education points to the importance of the impact of learning on economic growth rather than focusing only on years of education completed. Hanushek and Wolfman provide substantial empirical evidence that “differences in learning achievements matter more in explaining cross-country differences in productivity growth than differences in the average number of years of schooling or in enrollment rates”. They use test scores on international tests such as the Trends in International Mathematics and Science Study (TIMSS) in their specifications and find that cognitive skills are much more powerful in influencing individual earnings and thus economic growth and income disparities than merely years of education completed. The quality of education (as measured by test scores or learning outcomes) is a more significant determinant of growth rates amongst developing countries when compared with developed nations. It is particularly interesting that Science and Math scores stand out as individually significant in the growth equation. Recent studies and reports on Sri Lanka reveal that the private rates of return to secondary education (passing advance level (A/L)) in Sri Lanka are high averaging 15% for men and 18% for women, underlining the urgent need to invest in improving secondary education quality to increase completion rates and enhance learning. The 2012 labor force survey statistics show that unemployment rates were highest for those with an A/L qualification or higher at 8.6% (11.7% for females and 5.5% for males) compared

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with 5.9% for all females and 3% for all males. This highlights the poor quality and low employability of secondary school graduates in Sri Lanka. The proposed results-based lending (RBL) program to Sri Lanka for secondary education supports the ESDFP, which focuses on improving the quality of the secondary education sector and the employability of its graduates, with particular attention to improving math, science and technology learning outcomes.

6. In addition, Hanushek and Wolfman and Hawkes and Ugr15 among other studies, find substantial empirical evidence that reducing regional and socio-economic differences in cognitive skills has a significant impact on reducing income disparities. The equity focus of the proposed government program, particularly by ensuring that all districts have at least one good quality secondary school which offers all general certificate of education (GCE) A/L streams including Science, Commerce and Arts, is likely to have a significant impact on reducing regional and socio-economic disparities in education outcomes. Currently less than 30% of all secondary schools offer A/L Science and these are concentrated in richer, urban areas. Thus, the focus on Math, Science, and Technology in the proposed support to the government via capital investment in Science and IT laboratories and equipment and professional development and rational deployment of teachers in these subjects in all divisions of the country are expected to yield substantial economic benefits. The 1,000 Secondary Schools Development Program is also likely to increase economic efficiency by reducing the number of very small schools in the country and transferring students to the bigger secondary schools offering all streams in each division.

7. In an analysis on the impact of education on household welfare, Himaz and Aturapane16 find that household welfare has a significant positive correlation with the education level of the principal income earner of the household (Figure 2). The most recent Household and Expenditure Survey (2009/10) reveals that households where the household head has completed secondary education by passing the A/L examinations are likely to have 50% higher income more than households where the household head has passed only the O/L examination. Thus educational attainment is strongly correlated with poverty reduction and improved economic welfare in Sri Lanka. The proposed program focuses on systematic improvements in facilities and teacher training along with other quality inputs to improve these education attainment levels, and is thus expected to have a substantial impact on improving household welfare.

Figure 2: Economic Welfare by Education Level of the Principal Income Earner of a Household


C. Project Alternatives and Project Performance Monitoring System

8. The proposed program will use an RBL approach. This approach shifts the focus from supporting inputs and monitoring expenditures to the key results of the program using disbursement-linked indicators (DLIs) based on the government’s own program (ESDFP). This modality provides financing for the government’s own program for the secondary education sector. It ensures longer term institutional development and sustainability by helping strengthen compliance with government’s own fiduciary and procurement systems and linking disbursement to key program results. Since government has a well formulated medium-term program for secondary education for the next 5 years, it is more effective for ADB to provide financing for the entire program rather than to a ring-fenced project, using a traditional sector investment loan modality. A policy loan is also not as appropriate for this operation as it does not allow for focus on secondary education sector program results. The DLIs themselves strengthen the economic rationale for the program and for the RBL modality. Disbursement for this program will be linked to achieving key results, which are part of the government’s ESDFP. All the DLIs help strengthen the government’s own program for secondary education while focusing monitoring of key results, which will help cement the pathways between good quality education and skills training to improved innovation, productivity and better job prospects, accelerated growth and improved welfare for the country as a whole.

D. Cost Benefit and Sensitivity Analysis

9. The World Bank undertook an EIRR analysis for the ESDPF in 2011.\textsuperscript{17} Since the scope and costs of the ESDFP remain largely unchanged, this analysis is valid for the ADB ESDP as well. In addition, since this RBL program supports ESDFP in its entirety, it would be redundant.

to re-do the WB EIRR analysis which was done for the entire ESDFP. The RBL-R paper recommends that ADB assessments be done for the entire government program, rather than for any particular aspects of it. There has been no substantive costing or program changes in the 2012–16 ESDFP for which the World Bank EIRR analysis was done when compared with the updated 2013–17 ESDFP. Thus, the World Bank EIRR analysis has been used here.

10. The World Bank economic analysis concludes that the EIRR for the ESDPF could vary between 29% with a net present value (NPV) of $359 million in the low case scenario to an EIRR of 33% with a NPV of $429 million in the middle case scenario with a maximum estimated EIRR of 38% with a NPV of $500 million in the high case scenario. The benefits stream is composed of higher wages due to increase in the number of people employed as well as projected increase in earnings due to better quality education. Standard discounting techniques are applied. The alternative scenarios are based on different assumptions of increases in number employed and different assumptions about increase in earnings. The low case scenario assumes that 70% of secondary school graduates find employment and their earnings increase by 7.5% compared to present earnings due to better quality education. The middle case scenario assumes that 80% of graduates find employment with an earnings premium of 8.5% and the high case scenario assumes that 90% of graduates find employment with an earnings increase of 9.5%. It is clear that under any set of assumptions, the program is expected to have a high rate of return and net present value.

E. Distribution Analysis

11. National averages mask considerably wide regional and socio-economic disparities in senior secondary education outcomes. These disparities are mirrored in the distribution of schools, facilities and teachers. Although there are sufficient numbers of senior secondary schools and teachers, there are too few 1AB schools i.e. with 7% of all schools in the country offering science stream for the ordinary and advance level (O and A level) examinations and disproportionate numbers of them in rich, urban areas. In addition, the low pass percentage in Science subjects at the O level reflects the lack of laboratory facilities and poor quality Math and Science teaching in most schools. The lack of subject specific teachers at the school level particularly in remote areas is problematic. By supporting the medium-term education sector program, ADB will help finance the upgrading of secondary schools distributed all across the country to enable them to offer Science and Technology streams and have the facilities and teachers required to provide good quality education to students across the country. The focus of the DLIs on equity is evident in the support to the 1,000 Secondary Schools Development Program which selects at least one school from each division in the country and through an additional DLI to monitor specialized teacher deployment to these schools.

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18 ADB. 2013. *Piloting Results-Based Lending for Programs*. Manila.
20 Schools offering all options of Arts, Commerce and Science at the A level are labeled 1AB schools in Sri Lanka.