

Measuring Competitiveness and Labor Productivity in Cambodia's Garment Industry

Cambodia's apparel factories have tremendous potential for increased productivity. Along with this productivity gain, Cambodia can move up the value chain to produce higher-quality garments.

The elimination of the global textile and apparel trade quotas on January 1, 2005 has brought about a dramatic shift in the world market for textiles and apparel products. China, with its vast supply of labor, significant upstream capacity in textiles manufacturing, efficient garment factories, and well-developed logistics infrastructure, has achieved breathtaking gains in exports in just the first few months of quota-free trade. Suppliers such as Mexico, South Korea, Mauritius, and South Africa, among others, have clearly suffered in comparison. Downward pressure on world prices has been strong in the first few months of unrestrained competition.

Cambodia's garment industry on the whole has managed to hold its own in the early months of this new era. Cambodian producers may be benefiting from uncertainty among U.S. and EU buyers, many of which are retaining multiple sources of supply while waiting to see how safeguard actions, or new quotas, against China, undertaken by the United States and European Union in early 2005, will play out. But safeguards will not last forever. The question for Cambodian producers is whether they can be cost-competitive when safeguards are lifted.

Recognizing the importance of improved productivity for firms' competitiveness, as well as for national economic growth, the U.S. Agency

for International Development supported a survey on productivity and efficiency in Cambodian garment factories, focusing on labor productivity and its determinants. Over a six-week period in February and March 2005, industry experts and economists collected data from more than 80 factories in Cambodia through interviews, site visits, and questionnaires. Industry experts then analyzed the results, benchmarking Cambodian firms relative to each other and based on data from five countries with similar or slightly higher hourly labor costs. They also conducted an econometric analysis of the determinants of labor productivity in the sample factories.

The purpose of this report is to identify strategies for improving the competitiveness of Cambodia's garment industry, while maintaining Cambodia's strong record on labor standards. The study emphasizes, in particular, the substantial scope for increasing labor productivity through improved management systems and training. In the innovative factory-level research summarized and analyzed in this report, the competitive strengths and weaknesses of Cambodia's garment manufacturers, benchmarking productivity in Cambodia

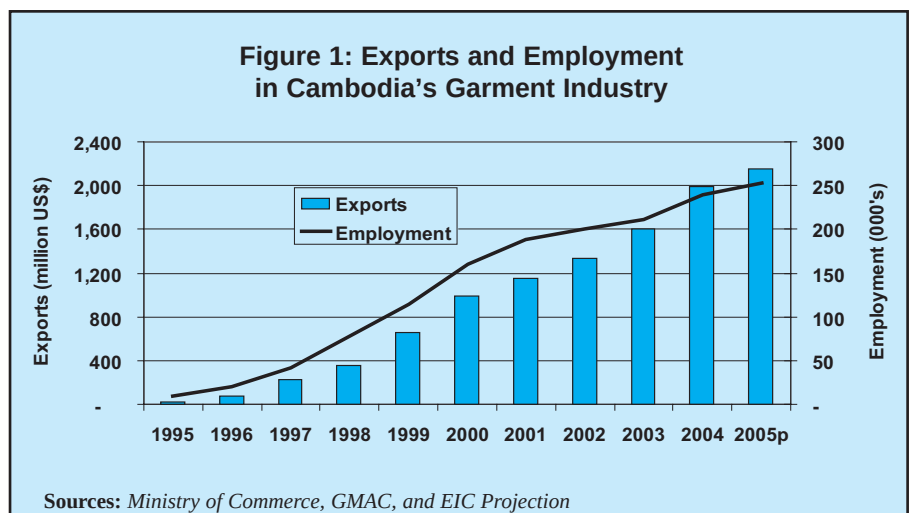
against that of garment industries elsewhere was also studied.

The Cambodian Context

One quarter million Cambodians are employed in the garment industry, and a greater number employed in supporting sectors. Workers are mainly women from rural villages; their remittances home sustain an estimated 20 percent of the country's 13 million people. Garment exports have grown dramatically over the past decade, from \$26 million in 1995 to \$2 billion in 2004. Apparel now accounts for nearly 80 percent of the country's merchandise exports. Most factories belong to foreign owners, mainly from China, Hong Kong, Taiwan, and Korea.

All garment production is sold for export. The United States, which buys roughly two-thirds of Cambodia's exports, and the European Union, which buys most of the rest, are Cambodia's primary export markets. As much as one-third of Cambodia's garments are manufactured for the one brand label client, The Gap. Other brand labels figure prominently in Cambodia's production for export.

This article is compiled from the original USAID-funded report, prepared by Nathan Associates. The authors of this report are Lynn Salinger of Associates for International Resources and Development; Sok Hach, Chea Samnang, and Neou Seiha of Economic Institute of Cambodia; and Mauro Pereira, Heinz Reich, and Jan Urlings of Werner International.



The 1999 U.S.-Cambodia Bilateral Textile Agreement linked quota access in the U.S. market to factories' compliance with international labor standards, as monitored by the International Labor Organization. Cambodia has subsequently earned a reputation among buyers as having a socially responsible manufacturing platform from which to source garments.

In the post-quota environment, however, filling the social responsibility niche cannot compensate for a lack of competitiveness on other fronts. To remain in the pool of acceptable suppliers, Cambodian factories must remain competitive. Working with authorities to address the costs of administrative red tape and corruption, estimated to amount to 7 percent of total sales value in a recent Cambodian government report, is part of the answer. Toward this end, Cambodia is committed to improving the investment climate by introducing streamlined trade facilitation procedures.

Cambodian factories can also address competitiveness through management decisions. Yet they must do so without lowering wages, restricting benefits, or skimping on the working environment, any of which risks worker strikes, a reduction in quality, or the deterrence of foreign investment. The central challenge to Cambodian producers' continued success and the ability to be competitive is to retain their standing as socially responsible manufacturers while improving productivity and efficiency.

Benchmarking Productivity

The degree of technological and managerial sophistication among garment companies in Cambodia varies widely. The survey found that although some companies are improving technically, the majority of garment factories in Cambodia require both technical and managerial training.

Box 1: Sample Survey Design and Implementation

This study was carried out by collecting data on structure and performance from garment firms through a sample survey. The objective of the survey was to establish the main variables influencing Cambodian garment industry competitiveness, particularly regarding management decisions internal to firms.

Scope and Sample Selection

The sample population for the survey consisted of the entire GMAC membership, which in February 2005 totaled 238 factories. To get the survey underway as rapidly as possible, GMAC leadership informed all factories about the opportunity to take part in the survey. Those who participated were promised individual productivity benchmarking reports.

The level of detail of the information requested by the survey, as well as the time commitment implied by cooperation, was substantial. Nonetheless, the survey reached one-third of Cambodia's entire industry. The research team visited 82 factories and collected 70 completed questionnaires. Of those received, 66 were from factories visited and 4 from factories that were not visited.

Data Collection

The survey collected qualitative and quantitative data. In-factory interviews were conducted by research teams composed of one technical garment expert and one economic researcher. In one day, each two-person team could visit as many as four factories. Two teams made visits during a six-week period in February and March 2005. To gain a qualitative sense of factory operations, the team usually spent two hours visiting an entire factory during work hours, observing everything from the warehousing of raw materials and accessories to the cutting and assembly processes to garment finishing and shipping. The garment expert toured the factory with a representative of management (e.g., owner, general manager, product manager) and generally ended the visit by making some immediate observations and recommendations.

Questionnaires were distributed by e-mail before the factory visit. The questionnaire was composed of six sections: general profile, organization profile, technical factory profile, financial profile, quality and service profile, and sourcing profile. At the outset of the factory visit, the economist spent about an hour explaining the questionnaire and data definitions. Because the questionnaires were complex, they were left with the factory managers to allow the factory to collect the information. It took an average of two days for factories to gather data from several departments and make the calculations necessary to complete the questionnaire. Electronic or paper copies were subsequently returned by the factories. Follow-up was time-consuming. Half the questionnaires were not complete when returned, and half of the factories that completed the questionnaires asked for assistance in completing them.

Limitations to the Survey

Labor-intensive field work such as for this survey often has limitations. In this case, because Cambodia's garment factories have been monitored regularly for labor standards compliance, managers are weary of being interviewed. And because Cambodia's garment industry comprises mainly foreign-owned factories, financial and operations data are often held by the foreign head office and thus are difficult to obtain. Furthermore, the responsiveness of factories to such a study may be a function of factories' performance level (real or perceived), thereby resulting in selection bias in favor of better-performing factories.

Productivity is low at all stages of garment manufacturing in Cambodia. Although the country's factories produce mostly basic garments, productivity is well below 70 percent. Compare this rate to those of the best-organized and -controlled production units in the world, which can achieve productivity of 85-90 percent.

The productivity gaps observed are due to a variety of factors:

- Many companies do not have a clear organization chart. This encourages overstaffing of many positions. Ratios of indirect to direct personnel are not within internationally accepted ranges.

- Proper standard times do not exist for various production operations. There is a complete absence of attention to the issue of time lost by worker inefficiency.

- Problems of inadequate space and poor layout exist. The layout in most companies can be improved, thus considerably reducing time spent on handling materials.

- Line balancing is poor resulting in excessive waiting times on the line.

- Many companies lack product specifications and therefore do not carry out proper production planning. Most factories' core product lines are concentrated in garment basics, of simple design and construction methods, and lower added value.

- Although some control of work in progress is exercised, it is not to the minimum acceptable level. Fabric consumption and waste are not controlled. Savings in this area could reach 10 percent of fabric costs.

- With regard to capital investments, machinery is generally in good working condition, but maintenance is weak. Very few companies apply a proper preventive maintenance program for machines. The time spent on repairs is not recorded.

- Training at both the operator and supervisor levels is unsatisfactory. The introduction of a selective recruitment system to identify the potential of current and prospective employees

Box 2: Defining and Measuring Labor Productivity

A crucial determinant of competitiveness is the productivity of key inputs. For light manufactures, such as garments, this means labor. This is in contrast to a "heavier" manufacturing sector, such as textiles, whose overall productivity depends more on the mix of technology and capital and less on labor.

Increasing labor productivity is not only key to improving a firm's competitiveness, it is widely acknowledged as the key to improving national economic well-being. Increases in labor productivity allow workers-wages to rise. With increased productivity and wages come rising living standards. Productivity enhancements in one industry also have spillover effects into other industries, as new domestic and foreign investors are encouraged to invest in the local economy.

Measuring Labor Productivity

Most simply, productivity is the ratio between output and inputs. Within a factory, apparel engineers or garment factory managers and line supervisors measure the number of garments produced by a line of sewing machine operators in a specific time frame. Another productivity measure is labor efficiency, which is a comparison of the time spent working productively to the total time spent at work.

To compare productivity estimates across products, factories, or even industries, economists define labor productivity as the production value added generated by each worker. In this case, labor productivity equals the value of production divided by labor input. Labor input is measured by total work hours. Labor productivity can thus be estimated at the national, aggregate level and for specific industries in an economy.

Determinants of Labor Productivity

Labor productivity is determined by a range of variables. Studies have identified several sets of variables that determine labor productivity across industries and countries: human capital, capital utilization, innovation, firm characteristics and management, competition and openness to trade, and industry environment.

The survey of Cambodian garment factories asked for data on a broad range of variables:

- 1- Structural characteristics, such as the size of the factory, physical layout of the workspace, workplace design, materials handling, and use of advanced technology;

- 2- Product characteristics, such as the complexity of product design;

- 3- Labor- and workforce development -related practices, such as wages, benefits, workforce stability characteristics, operative skills and motion patterns, the relative participation of Khmer and expatriate factory management and workers, recruiting procedures that include aptitude testing, pre-employment and on-the-job training, the percentage of work time lost to strikes and absenteeism, and the rate of labor turnover;

- 4- Characteristics related to a firm's position in the global value chain, such as a firm's product mix, the degree of concentration of its client base or export markets, the duration of the manufacturing process, whether the factory is accredited by external organizations, the extent to which the factory manages its own sourcing;

- 5- Management variables, such as the allocation of personnel between direct (manufacturing) and indirect (management) positions, and whether a firm performs efficiency measurements or conducts benchmarking analysis.

as well as their capacities for retraining and advancement is recommended. Middle management (i.e. supervisors) needs to be of a higher caliber. On-the-job and on-line training for supervisors and managers is essential to understand better management techniques in the management and control of their departments.

With sufficient interest, effort, and resources applied to basic production techniques and managerial disciplines, Cambodia's garment factories have tremendous potential to increase productivity. Improvements in productivity of 15-20 percent can be achieved with the right commitment

and climate. An increase in productivity could be coupled with improved quality and the production of higher-priced garments with more design and labor content to give Cambodian factories' profitability an additional boost.

Personnel and Training

Technical training is lacking at all personnel levels: senior managers, middle managers, technicians, supervisors, sewing operators, cutting-room personnel, and pressing, folding, and packing operators. Although sewing machine mechanics usually receive some basic training, this training needs to be supplemented to ensure effectiveness and comprehensiveness.

Some local training options already exist. For example, GMAC operates the Cambodia Garment Training Center. Small, private training institutes for basic sewing skills also can be found. However, these options have been ineffective in attracting middle management trainees or turning out industrially competent supervisors and operators.

The lower-than-desirable skills levels may be due to one or more of the following causes:

- Inadequate skill development and training for flexibility;
- Weak recruitment standards;

- Poor follow-up and supervisory control;

- Lack of realistic standards.

Supervisors, the first level of management, ensure that a production plan is successfully executed. They are, therefore, at the nucleus of a company's success. Supervisors are responsible for making things happen and seeing that things are done correctly, in terms of both quality and cost, and timeliness. Very few companies have trained their supervisors. Rather, section and line supervisors are usually trusted and experienced operators with little formal education.

They have not been trained to control their sections or achieve the desired production quantities on time, at the right cost, and with the best quality. Supervisors in Cambodia are highly paid work distributors rather than true line managers.

At the middle management level, Cambodian factories lack trained administrators, production planners, and method engineers. Accurate costing, good planning and programming, and realistic time standards are keystones of any productive garment business. Few companies visited had an industrial engineer. Industrial engineering (garment, method, and work-study engineers) is a vital to the future progress of the Cambodian garment industry.

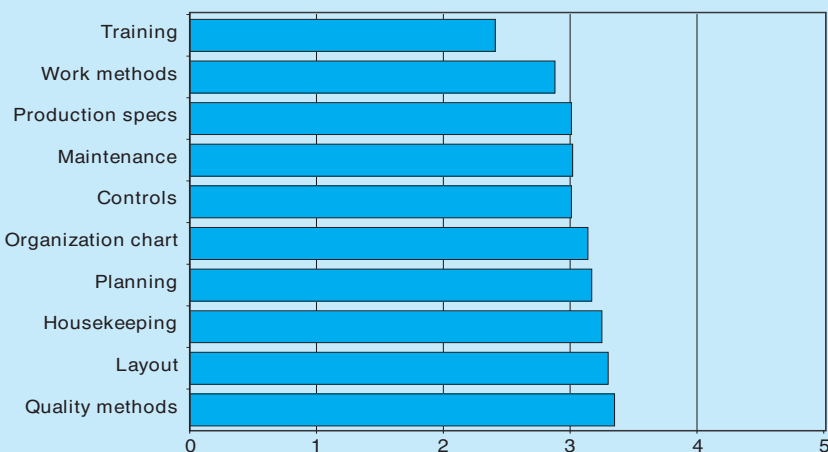
Box 3: Benchmarking Productivity Factors

Benchmarking is the process of identifying and adapting outstanding practices from organizations and companies around the world to assist an organization or company in measuring and improving its performance. The basis of a successful benchmarking exercise is a thorough understanding and knowledge of best practices in the relevant areas.

The metrics and quartile system of classification used in this study were derived from years of research and experience and a detailed understanding of best practices in the textile and garment industries. Factories with overall benchmarking scores in the top quartile are considered world-class manufacturers, while those in the fourth quartile are considered poor performers. Factories whose scores put them in the second and third quartiles are medium performers.

The information gathered from 82 factory visits and 4 additional questionnaires gives a comprehensive view of the garment industry in Cambodia. Cambodian factories' performance was compared to best practices in Cambodia and to the performances of garment industries in five reference countries (Brazil, China, Egypt, Mexico, and Turkey).

Figure 2: Factor Benchmarking



Benchmarking Score: 1=Insufficient, 5=Excellent

Source: Survey by EIC, Werner International, and AIRD, February 2005

Moreover, 40 percent of indirect personnel positions in the factories, according to survey respondents, are staffed by expatriates. The average incidence of foreign personnel is particularly high in critical middle management positions: 84 percent of production planners are foreign, as are 56 percent of work-study engineers and 54 percent of line supervisors. Some factories indicated that they are seeking to increase the representation of Cambodians in these ranks, believing that work and personal relations would flow more smoothly.

Machines

Because the garment industry in Cambodia is still relatively young, the average condition of the equipment is reasonably good. However, machines are typically operated at low levels of efficiency. This is often due to deficiencies in equipment maintenance. Lack of investment in maintenance, plus ineffective spare parts stock control, often leads to considerable lost production potential.

Quality

Quality control is not just the separation of product seconds and repairs, but an integral part of every stage in the production process. Quality has to be produced; it cannot be inspected into a garment. Among companies that responded to the survey, the quality of sewing and raw-material selection generally was viewed as acceptable for the target markets. There is still significant potential to increase quality levels, however. Only a few of the companies visited had an adequate quality control system.

Control Systems

Control systems to monitor quality, waste, inventory, work in progress, and costs are essential to any efficient manufacturing company. Moreover, they are well within the means of even the smallest company.

The problem observed in Cambodian garment factories is a lack of disciplined systems and controls in the production department. Most executive managers are unaware of daily production levels, labor costs, efficiency standards, repairs, or work in progress.

The lack of work standards and production data makes it impossible to cost correctly. Most quoted costs are only rough estimates. Although material and labor costs are calculated on some basis of fact, overhead costs and general expenses are usually applied on an ad hoc basis.

Key Findings

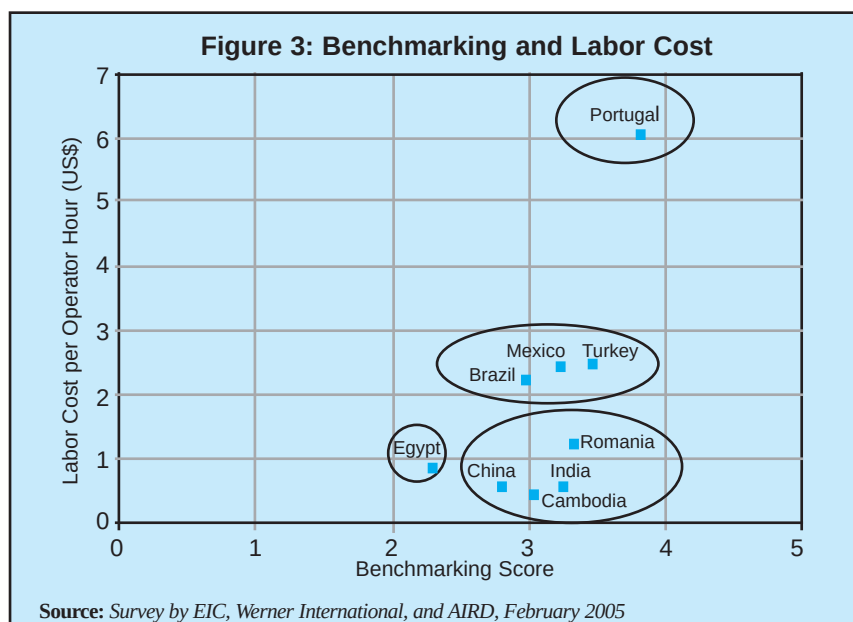
Among garment factories in Cambodia, the degree of technological and managerial sophistication varies widely. Only 7 percent of the Cambodian factories surveyed operate what could be considered world-class enterprises; more than three-fourths have significant potential for upgrading; and the rest lag enough that they will find it difficult to thrive in the post-quota environment of heightened global competition.

However, most factories require both technical and managerial training. Cambodia's apparel factories have tremendous potential for increased productivity, provided that they apply sufficient interest, effort, and resources to basic production techniques and

managerial disciplines. Improvements in productivity of 15 to 20 percent can be achieved; along with this productivity gain, Cambodia can move up the value chain to produce higher-quality and higher-value garments.

The following observations apply to nearly all of the Cambodian apparel factories surveyed:

- Training is weak; poor methods are therefore retained or transmitted rather than reviewed and remedied.
- Management information systems are deficient; inappropriate, inaccurate, or late data contribute to high overhead costs.
- Machines are typically operated inefficiently, and equipment maintenance is often inadequate.
- Many factories do not employ work-study (time measurement) methods and thus have no formal standards against which to evaluate operators. This lack impedes quality control and efforts to ensure product consistency.
- Staffing levels are generally too high relative to international best practice resulting from poor recruitment and supervisory practices as well as inadequate training.
- The range of products produced emphasizes basic construction and design, with very little added value. This forces Cambodian producers to compete directly with other low-wage countries.



Comparing Cambodian benchmarking scores with those of other countries with similar or slightly higher hourly labor costs is instructive. Countries with higher labor costs, such as Portugal, perform better in terms of their benchmarking scores (Figure 5-3). A second group of countries Mexico, Brazil, and Turkey have higher labor costs than Cambodia and achieve benchmarking scores somewhat higher or similar to Cambodian producers. Located close to large consumer markets, they enjoy competitive advantages in transport and logistics costs and higher design input.

A third group of countries, including Cambodia, have comparable labor costs and benchmarking performance. Most factories in these countries do not sell directly to buyers, but are integrated into the global supply chain through foreign home officers or buying agents. The potential for improvement is substantial for these countries. The industry in the fourth group of countries, as represented in Egypt, lag far behind in efficiency and productivity.

A more detailed inter-country comparison of the specific factors that contribute to performance reveals Cambodia's deficiencies in training, work methods, and use of production specifications (Figure 5-5). Only a few Cambodian factories devote the needed time, space, or financial resources to training. The lack of training, combined with the weak capability of mid-level managers, results in poor engineering and a poor understanding of optimal work flow. Managers are also often unaware that proper implementation of controls, planning, and engineering can have strong, positive effects on productivity and the efficiency of operations.

The econometric analysis of the determinants of labor productivity, moreover, suggests that management variables, such as the relative importance of indirect personnel and the presence of an industrial engineering department, are as important as advanced technology use in determin-

ing factories' labor productivity. This finding has significant implications for factory managers and their investment decisions because it demonstrates that it pays to invest in people and systems as well as in equipment.

Recommendations

The most effective and low-cost strategy for raising labor productivity and quality in Cambodia's garment factories is training to address Cambodia's weaknesses in professional development, production controls and engineering, and organization of work. The highest priority is to train Cambodians in middle management-line supervisory positions and industrial engineering personnel.

These are the positions that have the greatest effect on the efficiency of resource use in the plant. Training for other positions, including operators and mechanics, is also desirable. Training should emphasize not only cost reduction methods, but also ways to improve efficiency in production, quality control, planning, and information systems.

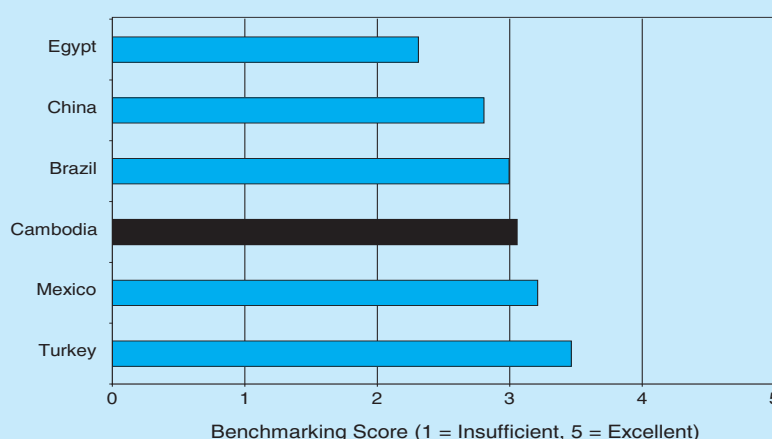
Most apparel companies do not have the in-house expertise or the resources to implement these recommendations. The establishment of a garment industry productivity training center would therefore help develop human resource capacity in this area. Initially, international experts would

train local personnel. When trainees have gained sufficient knowledge and expertise, they would replace expatriate experts in delivering productivity-enhancing advisory services to the industry. A number of practical issues in setting up such a center need to be considered, including modalities for financing, institutional affiliation and participation, and organizational structure.

Beyond the immediate needs of its garment industry, Cambodia has other longer-term training and institutional development needs. If Cambodia succeeds in making productivity gains while retaining its reputation as a country that adheres to labor standards, foreign investment will continue to flow into the country. Demand for operational, technical, and managerial skills in the industry will continue to grow. As it does, there will be a need to consider how to help those entering the workforce gain the practical skills they will need to succeed.

And, if Cambodia succeeds in moving up the development ladder to other types of manufacturing, it will need a workforce skilled in other technical, management, and trade-related areas. These longer-term requirements for education, training, and institutional development should be considered as government, industry, labor, and private and public foreign partners prepare for Cambodia's industrial and commercial future.

Figure 4: Cambodia and Average of Reference Countries



Source: Survey by EIC, Werner International, and AIRD, February 2005