



Kurdistan Regional Government
Ministry of Planning

An Assessment of the Present and Future Labor Market in the Kurdistan Region—Iraq

Implications for Policies to Increase Private-Sector
Employment



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LABOR AND POPULATION

Preface

This study addresses the question of how the Kurdistan Regional Government (KRG) can improve the private-sector labor market in the Kurdistan Region–Iraq (KRI). Policymakers want to guide the KRI toward a private-sector–driven economy. Doing so will involve creating mechanisms by which job-seekers can develop the right skills and find employers who will hire them, employers can find the employees they need, and the government can create an enabling environment in which the best matches between job-seekers and employers can be made.

Accordingly, this project provides necessary inputs toward improving KRG labor-market policy and the matches between job-seekers and employers through four steps. First, it estimates the likely number and education levels of new job-seekers through 2020. Second, it conducts an original, scientific survey to learn about employer perceptions of skill gaps in the KRI. Third, it investigates sectoral employment growth in comparison economies to identify promising growth sectors. And fourth, it outlines policy steps for the government to take, including the possibility of starting a formal labor-market information system, to improve the functioning of the private-sector labor market.

This study should be of interest to policymakers in the KRG, residents of the KRI and of Iraq more generally, anyone with a specialization or interest in Middle East and developing country labor markets, and those with a research focus on the Middle East and North Africa.

This research was undertaken within RAND Labor and Population. RAND Labor and Population has built an international reputation for conducting objective, high-quality, empirical research to support and improve policies and organizations around the world. Its work focuses on labor markets, social welfare policy, demographic behavior, immigration, international development, and issues related to aging and retirement with a common aim of understanding how policy and social and economic forces affect individual decisionmaking and the well-being of children, adults, and families.

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Summary

The Kurdistan Regional Government (KRG) is striving to develop a private-sector–led economy in the Kurdistan Region–Iraq (KRI), in which the private sector will serve as the main employer of KRI residents. Operating under its own government since 1992, and recognized as a formal political entity under the authority of the Iraqi Constitution of 2005, the KRI has experienced rapid growth in its infrastructure and services in recent years but would like to broaden this growth throughout the private sector. Improving the labor market—the focus of this study—can help support the continued growth of the private sector.

To improve the labor market to support private-sector growth and development, three goals should be pursued. First, job-seekers should develop the skills that employers need and be able to find employers who will hire them. Second, employers should be able to find the employees they need with the right skills. Third, government policies should create an enabling environment in which the best matches between job-seekers and employers can be made.

Accordingly, this study provides necessary inputs toward improving KRG labor-market policy and the matches between job-seekers and employers through four steps. First, it estimates the likely number and education levels of new job-seekers through 2020. Second, it conducts an original, scientific survey to learn about employer perceptions of skill gaps in the KRI. Third, it investigates sectoral employment growth in comparison economies to identify promising growth sectors in the KRI. And fourth, it outlines policy steps for the government to take, including the possibility of starting a formal labor-market information system, to improve the functioning of the private-sector labor market.

For the private-sector labor market to function well, it needs to be supported by effective, broad government policies related to business regulation, financial markets, and the legal system. Although we did not examine these issues within the scope of this research, we recognize that the labor-market policies we discuss are linked to broader policy actions and therefore constitute a useful but not complete program for improving the private-sector labor market. Other steps are described more fully in other research that the RAND Corporation has done for the KRG.

The Composition of the Labor Force Is Changing

According to recent data, the majority of the KRI labor force has up to a grade 6, or primary, education. Trends suggest that new labor-market entrants will be much better educated than the labor market as a whole. The KRG has carried out a number of initiatives to universalize education and in 2007 made education through grade 9 compulsory, up from grade 6. In

addition, the population is expanding, as is the number of postsecondary-education institutions. These changes are likely to have a long-term effect on the labor market by increasing the education of the workforce.

We estimate that the number of new labor-market entrants with only a grade 9 education will be smaller than the number of labor-market entrants from the upper grade levels. We project that from late 2012 through 2020, approximately 44,600 to 51,500 people (5,000 to 5,700 annually) will enter the labor market immediately after leaving school with a grade 9 education. We project that from late 2012 through 2020, approximately 127,000 to 137,000 people (14,000 to 15,200 annually) will enter the labor market immediately after leaving school with a grade 12 education.

There has also been rapid growth in enrollment in both two-year and four-year higher-education institutions. The number of labor-market entrants with two-year and four-year postsecondary degrees should increase as well. We project that from late 2012 to 2020, approximately 85,000 people (9,500 annually) will enter the labor market immediately after leaving the education system with two-year postsecondary degrees. We project that in that same period, approximately 130,100 people (around 14,500 annually) will enter the labor market immediately after leaving the education system with four-year postsecondary degrees.

Employers Demand Technical Knowledge, Practical Experience, and Soft Skills

Beyond examining changes to the composition of the KRI labor force, this study conducted a baseline assessment of employer demand for skills using a survey of 360 employers. In our survey, we gathered data on the following areas: workforce composition (including education and nationality), hiring plans and practices, skills in greatest demand, challenges hiring within the KRI, types of occupations most difficult to fill, perceived labor-force gaps, and employer-provided training. We also interviewed numerous employers about these issues.

Employers we interviewed consistently cited graduates' lack of adequate preparation, although our survey revealed that a majority generally rate graduates as prepared for work. About 40 percent of employers in the survey noted inadequate preparation of graduates at the secondary level.

A third of employers indicated that they plan to hire non-KRI nationals to meet their future workforce needs. Large companies seem to be the main source of hiring outside the KRI and are also potentially an important source of future jobs. A quarter of employers reported that they had difficulty filling jobs requiring a secondary degree. Among those who did, they cited as reasons lack of experience, lack of education qualifications, and skill shortcomings. The most frequently cited occupations for which it was difficult to find local staff were the technical ones (for example, master technicians and engineering technicians). In interviews, employers emphasized the need for basic vocational and technical skills that are in high demand in the labor market.

Our analysis of the interviews and the survey further substantiated the importance that employers give to soft skills, such as communications and interpersonal interaction, as well as to work ethic, teamwork, and problem-solving. Employers in our survey emphasized customer handling; communications skills, such as written and oral communications; and willingness

to work hard. For higher-skilled jobs, employers look for numeracy and English language skills coupled with some practical technical experience.

A modest share of employers (20 percent) provide training to their employees, and when it is provided, it is generally in areas specifically related to the job rather than in developing soft skills or language skills. Employers cited lack of funds, inability to spare staff time, and lack of training options in areas of need as constraints to providing training to employees.

Employment Is Likely to Grow Most Rapidly in Such Services Sectors as Construction, Transportation, and Domestic Trade

The employer survey provided insight into skills in demand now and potentially in the future. This can help KRG policymakers improve the educational system to supply the desired skills. Another approach is to consider which sectors are most likely to grow as a way to identify where the new graduates through 2020 are likely to find employment.

To understand potential futures for the economy of the KRI, we drew on historical evidence about how employment in small and medium-sized resource-rich economies developed. We selected a set of countries with characteristics similar to those of the KRI. We then investigated the evolution of employment in those economies in major sectors and in manufacturing industries, focusing on sectors and industries that were large and had experienced above-average employment growth.

Three major sectors experienced above-average employment growth across a large number of countries and time periods. These included (1) construction; (2) transport, storage, and communications; and (3) wholesale and retail trade. These sectors are already growing rapidly in the KRI. KRG policymakers have been emphasizing manufacturing and agriculture as high-priority sectors for employment growth. We found that in some countries, these sectors did indeed grow in terms of employment. But rarely did both grow rapidly in a single economy; more commonly, services sectors were the leading growth sectors for employment.

Seven manufacturing industries have shown a tendency toward above-average employment growth. These include (1) food and beverage manufacturing; (2) nonmetallic mineral products; (3) basic metals; (4) fabricated metal products; (5) chemicals and chemical products; (6) rubber and plastics products; and (7) transport equipment other than motor vehicles, trailers, and semi-trailers. Some of these industries may be well placed to grow in the KRI. These include food and beverage manufacturing, given the KRI's agricultural resources; nonmetallic mineral products, given the KRI's mineral resources; and both the chemical products industry—which includes petrochemicals—and the rubber and plastics products industry, given the KRI's access to petroleum resources.

Labor-Market Information Systems Can Serve as Tools to Monitor Labor-Market Performance

This study shows that the KRI's labor market and economy are changing rapidly and that it is useful to collect and analyze data on supply and demand for skills to formulate effective labor-market policies. In their effort to develop better labor-market information, many countries have designated public offices to be responsible for collecting and compiling labor-market

data, similar to the new responsibility of conducting quarterly labor-force surveys, assigned to the Kurdistan Region Statistics Office (KRSO). These offices or departments can compile and analyze labor-market data to help inform decisionmaking by employers, employees, educational institutions, policymakers, and others involved in the labor market.

The institutional arrangements and procedures that coordinate the collection, processing, storage, retrieval, and dissemination of labor-market information are known as Labor Market Information Systems (LMISs). An ideal LMIS is made up of seven elements grouped into three categories: (1) labor supply (labor, education, and qualification statistics; register of foreign residents), (2) labor demand (labor-market needs assessments), and (3) labor-market matching (register of job-seekers and job offers, information provided by private placement agencies). The KRG has already made progress in assembling some of these elements through labor-force surveys, availability of administrative education data, and a new labor exchange, Kurdistan Works. In addition to these seven elements, an LMIS is generally run by a labor-market observatory (LMO). The primary function of an LMO is to collect disparate information from various sources and then process and analyze it to have it in a usable format for the intended users of an LMIS. The success of an LMO, as well as the overall success of an LMIS, depends in large part on the degree to which the LMO is able to effectively coordinate across different government ministries and between the public and private sectors.

Despite the current popularity of LMISs, there is no consensus among labor-market researchers as to their actual economic effects. Although there is no evidence that LMISs worsen labor-market outcomes, there is a lack of rigorous evaluations on their effects or cost-effectiveness. A number of studies provide evidence that the availability of labor-market information improves the functioning of labor markets and that elements of LMISs, such as job-search assistance, can improve labor-market outcomes. However, other research also finds that LMISs often fail and that the difficulty of establishing them is often underestimated.

Suggested Policy Actions for the KRG to Meet Private-Sector Labor-Market Needs

KRG policymakers can take a number of steps to improve the labor market for the benefit of the private sector.

Policy Directions Relevant to the Postsecondary Education System

Although the system is producing graduates, there is room to improve their preparation for the workforce. Recent reforms to the higher-education system have been implemented partly to address many of the problems highlighted by employers. But the higher-education system can take further steps.

Build links with the private sector through private-sector advisory boards. These can establish ongoing input into curriculum and program decisions that will help students become better prepared for the demands of the private-sector labor market.

Build links with the private sector through career centers and job fairs. Career centers can help teach students how to look for work, where potential job opportunities are, and how to better prepare themselves for their lives after education. Job fairs can provide a mechanism for matching employers with job-seekers and educate students about opportunities.

Improve student work experience through expanded and improved internships. The survey and interviews showed that employers value some amount of work experience. This experience can be gained through internships. A number of internship programs exist currently, but our interviews indicated that in many of these, students do little work and learn few skills. However, others are reported to be demanding and lead to job offers. University career centers can take the lead in strengthening current internship opportunities by working with employers and students to raise expectations about what should result from an internship. The next step would be to learn from these experiences to expand successful approaches over time.

Policy Directions Relevant to All Segments of the Current and Future Labor Market

Institute a regular labor-market needs assessment survey. Many of our recommendations for improving the labor supply are derived from findings of the survey. Regular systematic data-collection activities should be conducted to gather information about labor-market needs. The data collected can be used to understand emerging trends and help plan education and training.

Focus on the development of skills that are applicable to a broad selection of likely growth sectors. Our analysis of other economies suggests that the most likely large employment gains will come in such sectors as construction; transportation, storage, and communications; and wholesale and retail trade. To gain advantage from these likely growth sectors and yet still retain the possibility of having a workforce prepared for the favored sectors of manufacturing, agriculture, and tourism, KRG policymakers should make sure that education and training include skills applicable to a broad range of sectors.

Guard against barriers to the growth of manufacturing and agriculture. Barriers could include skills gaps, an unfavorable regulatory environment, or poor trade infrastructure. Skill development in the KRI should not be tailored to or focused only on these sectors. In addition, many of the skills for these sectors could be taught at high-quality secondary vocational schools and postsecondary technical institutes and colleges.

Continue reforms of government hiring. Government employment is still seen as the preferred employment option by many graduates of the postsecondary education system and even of the secondary education system. The KRG has expressed a desire to limit the expansion of the public sector and has received a plan to do so from earlier work by RAND. The KRG should continue to reform its government employment practices.

Steps to Consider for a KRG LMIS

If the KRG is considering whether to establish an LMIS, we recommend that it take the following steps. Even if the KRG determines that it will not create an LMIS, it would benefit from carrying out the steps below that relate to data collection and dissemination.

Fully consider the costs and benefits of developing an LMIS. An LMIS could prove to be of value by creating an agency that provides a central point of coordination and develops analytical capabilities that would take full advantage of the variety of data available. However, such an agency could also prove costly, fail to attract qualified individuals, fail to coordinate appropriately, and unnecessarily limit the availability of data to users. If establishing an LMIS is judged to be appropriate, then the KRG should proceed with the next steps.

Create an action plan for developing a KRI-wide LMIS, the first step of which should be to determine a structure for an LMO that will operate the LMIS. Decisions to be made for the LMO include in which ministry or ministries it will reside, how it will be

funded and staffed, and how it will achieve institutional cooperation. After the LMIS and LMO begin operations, the plan should be to gradually add to the functions and capacities of the LMIS as the LMO gains experience and as it builds the necessary inter-institutional coordination framework.

Build a website (or expand the website of the KRSO) to make available all existing resources on labor-market information. This new website can serve as the basis for an LMIS and begin the process of information flow between suppliers of the information and the various users. In addition, it can serve as the first publicly available single-source resource for up-to-date and comprehensive information on the private-sector economy within the KRI.

Build a qualifications registry by establishing a data-sharing agreement with the KRI's education and training institutions. This may be done either directly or via existing data-sharing arrangements between the Ministry of Education, the Ministry of Higher Education and Scientific Research, and the schools.

Work with KRG's residency and border control agencies to collect data on the entry of foreign workers. Since the KRI has been home to an increasing number of immigrants, both from other parts of Iraq as well as from outside countries, it becomes increasingly important for the KRG to keep records of the numbers and skills of these immigrants to have a reliable portrait of the available stock of labor within the KRI.

Have the LMO institute regular labor-market needs assessments in different sectors. This will update and improve on the baseline findings conducted by RAND on labor-market needs and skills gaps. Since the KRI's economy is undergoing rapid expansion and changes, it is imperative that the understanding of skills gaps and private-sector labor-market needs be updated periodically to remain relevant and informative.

Have the LMO work with private employment placement agencies to create a mechanism for sharing information with the newly established LMIS. Since private employment agencies are active within the KRI's private-sector economy, having a window into their activities will be crucial as the private sector continues to develop rapidly within the KRI.

After an LMIS is fully functioning in its role of offering policy support, have the LMO explore creating links to or integrating the labor-market matching function for today's employment needs. Data-sharing links could be developed so that the LMIS gains greater visibility into job applicants and job openings. A formal relationship could also enhance the labor exchange's abilities to serve job-seekers, as it now seeks to do, such as by providing projections of the fields in which job opportunities will develop.

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Abbreviations

ANETI	Agence Nationale pour l'Emploi et le Travail Indépendant (Tunisia)
GDP	gross domestic product
GNI	gross national income
IFC	International Finance Corporation
IHSES	Iraq Household Socio-Economic Survey
IKN	Iraq Knowledge Network
ILO	International Labour Organization
INS	Institut National de Statistiques (Tunisia)
IsBD	Islamic Development Bank
ISIC	International Standard Industrial Classification
IT	information technology
K–12	kindergarten through grade 12
KRG	Kurdistan Regional Government
KRI	Kurdistan Region–Iraq
KRLFS	Kurdistan Region Labor Force Survey
KRSO	Kurdistan Region Statistics Office
LFPR	labor-force participation rate
LFS	labor-force survey
LMIS	Labor-Market Information System
LMNA	labor-market needs assessment
LMO	labor-market observatory
MENA	Middle East and North Africa

MOE	Ministry of Education
MOHESR	Ministry of Higher Education and Scientific Research
MOLSA	Ministry of Labor and Social Affairs
MOP	Ministry of Planning
NESS	National Employer Skills Survey (United Kingdom)
OECD	Organisation for Economic Co-operation and Development
PPP	purchasing power parity
UKCES	United Kingdom Commission for Employment and Skills
UNIDO	United Nations Industrial Development Organization
USAID	U.S. Agency for International Development

Introduction

Background

The Kurdistan Region–Iraq (KRI) is developing rapidly. Fueled by its natural resource wealth, the economy is growing especially in infrastructure and services. Although a large share of the economy remains in the government sector, the Kurdistan Regional Government (KRG) has been promoting a larger role for the private sector. To develop a private sector that can further fuel and sustain this economic growth, KRG policymakers will need to take steps to develop a more robust labor market that can supply the necessary skills. This study addresses the issue of how the KRG can promote a labor market that is responsive to the needs of the private sector.

To develop a more robust private-sector labor market, three broad goals must be reached. First, job-seekers will need to acquire the necessary skills that meet employer demand and that can be deployed on the job readily. Second, employers should be able to make job-seekers aware of jobs and should be able to find the employees who possess the needed skills. Third, government policies should create an enabling environment in which the best matches between job-seekers and employers can be made.

This study provides necessary inputs toward improving the KRG’s labor-market policies and the matches between job-seekers and employers. First, it estimates the likely number and education levels of new job-seekers through 2020. The composition of the KRI labor force is likely to change. The kindergarten through grade 12 (K–12) education system has seen tremendous expansion in recent years. Enrollment is increasing because of population growth but also as demand rises for basic (grades 1–9) and secondary (grades 10–12) education. Furthermore, the KRG has mandated education through grade 9, rather than through grade 6, as was the case before this reform, and so it is likely that more people will stay in school and complete at least a basic education. Accompanying this growth in K–12 education is increasing demand for postsecondary education, as evident by the rapid expansion of enrollment in both two-year and four-year postsecondary institutions. These trends have implications for the preparation of labor-market entrants as well as the type of jobs they might be searching for.

Second, this study conducts an original, scientific survey of employers to learn about labor demand. The survey elicits employer perceptions of the KRI labor force, including areas of perceived weakness. It also tries to understand employer hiring practices and the extent to which employers look outside the KRI to fill their demand for labor and the reasons for doing so. The survey also solicits from employers their views about the most important skills that

prospective employees should possess. These are the skills toward which education and training institutions will ultimately need to orient their programs.

The third component of this study is an investigation of sectoral employment growth in comparison economies to identify potential growth sectors. The KRG can formulate policies to address today's labor-market needs using employer input, but it also needs to anticipate likely sector growth to identify the background and skills that employers will need in the future. This component examines the growth trajectories of comparison countries to identify the broad economic sectors and the specific manufacturing industries likely to grow in the KRI.

Finally, the fourth component of this study outlines policy steps for the government to consider, including establishing a Labor Market Information System (LMIS) to support policymaking and improve the functioning of the private-sector labor market. Through this study, we demonstrate the types of analyses that need to be undertaken to monitor the performance of the labor market. An LMIS could facilitate this activity by compiling data, developing an in-house capability to analyze the data, and regularly disseminating data and indicators for use by policymakers and others.

Well-functioning private-sector labor markets also strongly benefit from broader government policies, such as those related to business regulation, financial markets, and the legal system. Although we did not examine these issues within the scope of this study, we recognize that the labor-market policies we discuss are linked to broader policy actions and therefore constitute a useful but not complete program for improving the private-sector labor market. Other steps are described more fully in other research that the RAND Corporation has completed for the KRG (Hansen et al., 2011). Even in the absence of other reforms, however, the data collection and analysis and skill development policy directions discussed in this report will contribute to better labor-market performance.

Data and Methods

We relied on a number of data sources in this study.

- **Ministry of Education (MOE) enrollment data for basic and secondary grades.** We used MOE enrollment data from the 2004–2005 academic year to the 2009–2010 academic year and projected enrollment growth from earlier work (Vernez, Culbertson, and Constant, 2012) to estimate the number of people leaving the system at grade 9 and grade 12 and therefore available to join the labor market.
- **Ministry of Higher Education and Scientific Research (MOHESR) enrollment data for all public higher-education institutions in the KRI.** We used the MOHESR aggregate enrollment data from academic year 2006–2007 to academic year 2011–2012 to calculate transition rates from one year to the next and then applied those transition rates to our MOE projected enrollment through 2020 to develop estimated labor-market entrants from two-year technical institutes and four-year universities. We used detailed enrollment data by department discipline from academic year 2008–2009 to academic year 2011–2012 to develop shorter-term projections of the number of people with specific disciplinary training leaving the system to potentially enter the labor market.
- **Kurdistan Region Labor Force Survey (KRLFS 2012).** In 2012, in cooperation with RAND, the Kurdistan Region Statistics Office (KRSO) fielded a new labor force survey,

with plans to field the survey quarterly (Kurdistan Region Statistics Office, 2012). We used this recently completed household survey to examine labor-force participation rates, labor-force education levels, and employment patterns.

- **Iraq Household Socio-Economic Survey 2007 (IHSES, 2007) (Central Organization for Statistics and Information Technology, Kurdistan Region Statistics Organization, and World Bank, 2008).** We used this household survey to supplement the data from the KRLFS on labor-force participation rates, labor-force education levels, and employment patterns.
- **The RAND Survey of Business Establishments 2012 (the RAND Skills Survey, RAND Corporation, 2012).** In cooperation with our colleagues from the RAND-KRG education research team, we conducted a survey of 360 business establishments in Duhok, Erbil, and Sulaimaniya to ask employers about their hiring practices, perceptions of the local labor force, and skills needed. RAND designed the survey, including the survey instrument and the sampling strategy. The survey was fielded by ASHARQ Co. Ltd., a survey firm based in Baghdad, Iraq. The KRSO and ASHARQ also provided valuable input into the contents of the survey and the sampling strategy (see Appendix A for the survey and Appendix B for details about the sampling strategy). Results presented in this report use governorate and sector-based sampling weights calculated using the KRSO's enumeration of housing and business establishments—an enumeration of all households and business establishments conducted in 2009 in preparation for a planned Iraq-wide census. To incorporate sampling weights to account for the different sizes of the firms interviewed, we extracted information from the World Bank Enterprise Survey, a multiyear, cross-national survey of business establishments.
- **Interviews with officials in the government, private sector, and universities.** RAND researchers have met with a variety of government officials, private business people, and representatives of education and training institutions since February 2010. We interviewed business representatives from all three governorates within the KRI representing a variety of industries, including construction, manufacturing, transport, infrastructure, services, tourism, finance, and information and communications technology. We spoke with small family-run companies as well as large international companies and included long-established companies as well as new companies. The interviews of government and university officials provided us with information on current and planned initiatives to align the supply of graduates with private-sector demand. The interviews with business people provided us with rich qualitative data about employers' perceptions of the local labor force—their assessment of the skill gaps and areas of main concern.
- **Existing secondary datasets.** To understand potential scenarios for sector employment growth in the KRI, we drew on data about other countries from the World Bank; the International Monetary Fund; the Center for International Comparisons of Production, Income and Prices at the University of Pennsylvania; the Organisation for Economic Co-operation and Development; and the International Labour Organization (ILO).
- **Document review.** We reviewed documents obtained from the KRI as well as the international policy and research literature on trends in the supply of occupations and skills, employer demand for skills, and use of an LMIS to guide policymaking.

Organization of the Report

In Chapter Two, we examine projected labor supply. We discuss the education levels of anticipated labor-market entrants and compare those to the current labor-force composition. In Chapter Three, we review our findings about employer perceptions of the local labor force, skill gaps, and hiring plans. In Chapter Four, we examine scenarios for future sectoral employment growth based on historical evidence in comparison economies. In Chapter Five, we review LMISs and their role in labor market analysis. We present our conclusions and recommendations in Chapter Six, the final chapter. In Appendix A, we provide the RAND Skills Survey, and in Appendix B, we provide technical details about the sampling strategy for the survey.

Education Levels, Skills, and Labor-Force Participation of Potential Future Labor-Market Entrants

A leading KRG policy goal is to create a more private-sector–oriented economy in which future job-seekers find employment in the private sector rather than relying on the government to provide jobs. In this chapter, we assess future labor supply through 2020 and provide projections of the number of future job-seekers, their level of education, and for those completing postsecondary education, their course of study. The analysis will help policymakers better understand how labor and human capital inputs into the future KRI economy might evolve and the types of occupations future workers are most likely to be trained for. The analysis will have implications both for the private sector and for the government-run education system. By examining the number of labor-market entrants and their education background, we can anticipate the types of skills that those leaving school and college will bring into the workforce, including whether there is a concentration of production of certain skills relative to others and the potential implications for the private sector. The findings in this chapter, in combination with those in the next chapter on assessing private-sector employer demand, allow us to start to explore whether the KRI education system is producing the types of employees that KRI businesses expect they will need.

We find that through 2020 relative to 2012, the number of people seeking employment and who have either a grade 9, grade 12, two-year institute, or four-year university education will be at least 396,000, more than one-third of the entire labor force as of July 2012. This equals 44,000 new job-seekers each year. Of these new labor-market entrants, more than half will have a two-year institute or four-year university education. In the labor market as of 2012, only 18 percent of people had a two-year institute or four-year university education. This means that the people leaving the education system to seek employment through 2020 will be far more educated than the people who had jobs as of July 2012.

This analysis has a number of shortcomings. As explained below, we rely on historical rates of participation in the labor force for different education groups and make a simplification that these do not change in response to changes in the economy or changes in employer demand for levels of education or skills. Furthermore, we do not account for any potential changes in the quality of the education delivered. However, data are unavailable to take account of these issues, and so we view our estimates as reasonable, taking into account available information. In fact, as we note below, our projections likely underestimate the number of future job-seekers.

We base much of our analysis on data from MOE and MOHESR. We begin with a description of our methods and their application to the KRI education system, and we then present statistics about the current labor market. Next, we present our findings on labor supply at different levels of education. After discussing limitations to our analysis, we conclude with implications for the KRI labor market.

Methods and Their Application to the KRI Education System

In any estimation of future labor-market entry, several types of data are needed. The first is the number of people who will become working age, defined as starting at age 15, and therefore could enter the labor force. The second is the proportion of these people who will seek work rather than stay in school or do other activities that are not employment. We aim to go beyond simply estimating labor-market entry, however, by estimating this entry by educational attainment. Accordingly, we must also estimate the number of people leaving the education system at different levels and then the proportion of these people who will seek work.

Not all people who leave the education system will seek employment. Those who do will become part of the labor force. Being part of the labor force means that a person either has some type of job or is unemployed, and being unemployed is generally defined as actively looking for work. People who do not have jobs but are not actively looking for work are not considered unemployed (ILO, 2011).

The proportion of the working-age population in the labor force is known as the labor-force participation rate (LFPR; ILO, 2011). There are two important points to note about labor-force participation. First, participating in the labor force does not mean having a job. It means either having a job or actively seeking a job. Second, people may choose not to participate in the labor force for a variety of reasons. A woman might choose to stay home to raise children, for example. On the other hand, a person might want a job but might have given up seeking one out of discouragement. That person would not be classified as participating in the labor force, even though she or he would like a job.

We estimate the number of labor-market entrants in two broad steps. First, we estimate the number of people leaving the education system. Because not all people who leave the education system enter the labor force, we next use historical LFPRs by age and education group to estimate the number of people joining the labor force, meaning specifically the number of people who either have employment or actively seek employment.

The KRI Education System

In the KRI, grades 1 through 9 are known as the basic education level, with grades 1 through 6 referred to as primary and grades 7 through 9 referred to as intermediate. Grades 10 through 12 are referred to as secondary and can also be referred to as preparatory education. The next level is the higher or postsecondary education system.

A reform in 2007 made basic education through grade 9 mandatory. Previously, completion only through grade 6 had been required. After completing basic education, students may continue to general secondary education, vocational secondary education, or entry into a four-year teacher institute, an option currently being phased out. Postsecondary options include two-year technical institutes, four-year technical colleges, and four-year universities (five and six years for certain courses of study, including medicine). The vast majority of university students attend government universities. The Ministry of Labor and Social Affairs (MOLSA) also oversees training centers in each of the governorates that provide training in various types of trades. Individuals can participate in those training centers without prior education qualification. Thus, there are avenues of additional training for students who exit the education system before completing their schooling.

In academic year 2011–2012, approximately 1.43 million students were enrolled in grades 1 through 12. An additional 90,272 were enrolled in the government higher education system

(Table 2.1). Enrollment in basic education was 76.3 percent of the total. The remaining share was in secondary education (17.7 percent), the two-year technical institutes (2.0 percent), and the four-year government universities (3.9 percent). The MOLSA training centers and the private universities accounted for a very small share of total education and training enrollment. Given their small size, we do not consider them in our analysis of potential labor-market entrant trends.

From academic year 2006–2007 to academic year 2010–2011, approximately 44.5 percent of all students enrolled in grade 12 in the previous academic year went to a technical institute or college, or a government university. Both of these numbers have increased—the number going to technical institutes and colleges went up by 276 percent, and the number going to universities went up by 29 percent. Accordingly, the mix has changed, with the proportion going to technical institutes and colleges rising relative to the proportion going to universities. However, the overall proportion going to postsecondary education fluctuated between 40 percent and 49 percent, with no obvious trend.

Education Exit Points

To project future labor-market entrants, we focus on people leaving the education system after the completion of basic (grade 9), secondary (grade 12), two-year postsecondary, and four-year postsecondary education. These four exit points are natural break points at which students choose to either continue with their schooling or potentially enter the labor force. Grade 9 is the final year in mandatory basic education, and grade 12 is the final year of voluntary secondary education. Most higher education institutions offer two-year or four-year academic programs.

For all points of exit from the education system, we focus on people who move within a short period of time to the labor market rather than those who might choose not to participate for several years and then enter the labor market. As a result, our analysis focuses on new labor-market entrants within a certain window after completing their education. This means that our projections may underestimate the actual number of new labor-market entrants. This may be particularly important for people with grade 9 or grade 12 education levels, because, as will be shown below, the LFPRs for such people in the immediate post-education age groups are extremely low. In addition, we do not account for people who leave the education system at points other than the completion of grade 9, grade 12, two-year postsecondary education, or

Table 2.1
Student Enrollment, by Type of Education Institution in the KRI, Academic Year 2011–2012

Type of Education Institution	Number	Percentage
Basic education (1–9)	1,163,805	76.3
Secondary (including vocational) education (10–12)	270,501	17.7
Technical institutes and colleges (two-year and four-year)	30,155	2.0
Government universities (four-year)	60,117	3.9
Total	1,524,578	100.0

SOURCE: Authors' computations based on data from MOE and MOHESR.

NOTE: Total percentage does not sum to 100 because of rounding.

four-year postsecondary education. If there are large numbers of such people, then our projections would further underestimate the actual number of total new labor-market entrants.

Ways to Project the Number of People Leaving the Education System

To obtain projections of labor-market entrants with up to a secondary school education (grade 12), we use the projections from Vernez, Culbertson, and Constant (2012), who developed student enrollment projections for grades 1–12. They used historical school enrollment data from academic years 2004–2005 to 2009–2010 and based their projections on calculating transition rates from one grade to the next and then building in assumptions about growth in population, increases in continuation rates from basic education to secondary education, and increases in the rate of gender parity, meaning the ratio of female-to-male enrollment.

Vernez, Culbertson, and Constant (2012) produced three estimates of enrollment growth during the period from 2010 to 2021: low (enrollment growth of around 69,000 students annually based on 5 percent annual growth in births and no change in completion rate of basic education and gender parity); medium (enrollment growth of around 85,000 students annually based on 6.5 percent annual growth in births and slow movement toward universal basic education); and high (enrollment growth of around 111,000 students annually based on 7.5 percent annual growth in births, a 90 percent basic education graduation rate, and gender parity by 2021). We use all three of these estimates in our labor-market projections.

These enrollment projections have a number of potential sources of error. The main challenge is lack of data on some key indicators, such as the number of new entrants into the education system after grade 1 in terms of new enrollees or returning students who may have discontinued their education at some point. Universalizing education up to grade 9 may increase demand in terms of remaining in school as well as returning to school. Although we can make some assumptions about those numbers, we cannot be certain that our assumptions are completely valid.

We used a similar approach to project higher education enrollment trends and estimate the number of individuals leaving the higher education system. We obtained total enrollment data from the MOHESR by university, year of enrollment, academic year, and gender across all government universities from academic year 2006–2007 to academic year 2011–2012. We first combined these data with the K–12 data to compute transition rates from grade 12 to both two-year and four-year postsecondary institutions by gender. We then computed transition rates from one year of postsecondary enrollment to the next. We were then able to project enrollment flows by year of enrollment and gender to 2020.

We also obtained detailed college and academic department–level enrollment data for each year of study from academic year 2009–2010 to academic year 2011–2012. The department-level data allow us to examine enrollment changes and expected number of graduates by specialization to understand the types of educational background that graduates are going to bring to the labor market. We were unable to make enrollment projections by course of study past 2015. Limitations to the data precluded us from computing reliable transition rates for both the two-year and the four-year institutions by field of study or discipline.

Applying LFPRs by Age, Gender, and Education

There are substantial differences in LFPRs between people of different ages, males and females, and people with different education levels. Therefore, we used different LFPRs for each set of leavers from the education system. To choose the appropriate LFPR, we identified groups that

were comparable to each set of leavers, recognizing that LFPRs are generally calculated for five-year age groups. For example, we identified the group most comparable to people exiting the education system and joining the labor force after grade 9 as those people ages 15–19 with a grade 9 education, because people who finish grade 9 are generally 14–15 years old. In contrast, we identified the group most comparable to people exiting the education system and joining the labor force after grade 12 as those people ages 20–24 with a grade 12 education, because people who finish grade 12 are generally 17–18 years old.

We drew our LFPRs from round one of the new KRLFS, fielded by the KRSO in July 2012. Our LFPRs include all those working-age individuals participating in the labor force and not currently enrolled in school. The LFPRs used in the projections are provided in Table 2.2, along with the specific comparison group used for each level of leavers from the education system.

It is important to note that LFPRs in the KRI are relatively low for both males and females below age 25, but especially for females, and especially for females ages 15–19. Data from the IHSES (Central Organization for Statistics and Information Technology, Kurdistan Region Statistics Organization, and World Bank, 2008) indicated that the vast majority of young women ages 15–19 who are not in school are not in the labor force either because they are married or because of social reasons (left further undefined). For young men ages 15–19, the predominant reasons are either no desire or disability. Higher LFPRs among older cohorts suggest that at least some of these girls and boys enter the labor force as they get older. However, we do not have available data to confirm this.

A Profile of the Recent Workforce

According to the KRLFS, the number of individuals ages 15 and over in the labor force and not currently enrolled in school was approximately 1.2 million in 2012 (Table 2.3). The largest percentage of the labor force reported that it had no education (38 percent), followed by 22 percent with a primary education as the highest level, meaning that three out of five people in the labor force had a primary education or less. As will be shown below, this is likely to change through 2020 and beyond.

Table 2.2
Labor-Force Participation Rates Used in the Projections of Labor-Market Entrants

Exit Point from Education System	Comparison Group		LFPRs	
	Age	Education Level	Male	Female
Grade 9	15–19	Grade 9	0.26	0.03
Grade 12	20–24	Grade 12	0.77	0.15
Institute (two-year)	20–24	Institute (two-year)	0.72	0.49
Bachelor's degree or above (four-year)	25–29	Bachelor's degree or above	0.81	0.80

SOURCE: Kurdistan Region Statistics Office, 2012.

NOTES: The comparison group is the demographic group whose LFPR would be most like that of people leaving the education system at each point. For females exiting the education system at grade 9, we use the LFPR for all females ages 15–19 regardless of education, because the sample size of females ages 15–19 with completion of grade 9 is too small in the KRLFS for reliable estimates.

Table 2.3
Distribution of Education in the Labor Force

Education Level	Number of Labor-Force Participants	Percentage
No education	460,749	38.5
Primary	258,444	22.6
Basic or intermediate	109,232	9.1
Secondary	75,035	6.3
Diploma or institute (two-year)	119,874	10.0
Bachelor's degree or above	95,146	7.9
Currently enrolled	79,431	6.6
Total	1,197,910	100.0

SOURCE: Kurdistan Region Statistics Office, 2012.

NOTES: Number of participants does not sum to the total because of rounding. Tests of statistical significance show that the 95 percent confidence intervals of the following education groups in the labor force overlap: (1) basic or intermediate and diploma or institute (two-year); (2) basic or intermediate and bachelor's degree or above; (3) secondary and currently enrolled; and (4) bachelor's degree or above and currently enrolled. This means that for these pairs of groups, the share of the labor force may be the same.

Examining the education level of the labor force in more detail, we find that although the majority of labor-force participants had a primary education or less as their highest level of education attained, younger cohorts tended to have much better education than older cohorts (Table 2.4). Among labor-force participants, the 25–29-year-old cohort has the highest levels of education, with more than 28 percent completing two-year or four-year postsecondary education.

There is a marked difference in LFPRs between males and females (Table 2.5). Looking at the LFPR for individuals ages 15 and over, including those currently enrolled in school, female participation in the labor force was 11 percent for those ages 20–24 and then increased to 21 percent for those ages 25–29. On the other hand, 80 percent of males ages 25–29 participated in the labor force, and this percentage increases with older age groupings until around ages 40–49.

Labor-Market Entrants Exiting the Education System

We now present our estimates and projections of labor-market entrants who exit the education system after grade 9, grade 12, two-year postsecondary education, and four-year postsecondary education. For those exiting after grade 9 and grade 12, we present data on estimated entrants from 2006 through 2012 and then from 2012 through 2020. For those exiting the postsecondary education system, we present data on the number of estimated entrants from 2007 through 2012 and then from 2012 through 2020. Data availability prevented us from estimating labor-market participants from the latter group in 2006.

Table 2.4
Age and Detailed Education Background of the Labor Force, Ages 15 and Over

Age Group	Percentage Share Within Age Group								Total
	Percentage Share of Labor Force	No Education	Primary	Intermediate or Basic	Secondary	Diploma or Institute	Bachelor's Degree or Above	Currently Enrolled	
15–19	4.7	36.0	25.6	2.1	0.5	0.3	0.0	35.5	100.0
20–24	14.0	28.3	25.3	11.3	3.9	8.0	7.4	15.8	100.0
25–29	18.4	35.4	17.2	8.5	4.2	14.7	13.7	6.3	100.0
30–34	16.6	40.0	25.9	8.1	4.2	8.6	9.2	4.0	100.0
35–39	13.9	39.6	21.6	12.4	6.3	12.2	5.5	2.4	100.0
40–44	13.3	37.7	23.6	10.0	11.0	10.3	5.3	2.1	100.0
45–49	7.3	37.9	17.5	11.9	11.2	12.7	6.5	2.2	100.0
50–54	3.5	34.3	18.6	6.9	14.5	12.0	11.8	1.9	100.0
55–59	4.9	59.0	15.6	4.6	7.2	5.4	6.4	1.8	100.0
60–64	2.0	58.4	19.4	5.6	7.3	1.0	8.2	0.2	100.0
65+	1.4	79.7	9.0	1.3	5.9	3.3	0.9	0.0	100.0

SOURCE: Kurdistan Region Statistics Office, 2012.

NOTE: Total percentages may not sum to 100 because of rounding.

Table 2.5
Labor-Force Participation Rate, by Age and Gender, Ages 15 and Over

Age Group	Males	Females
15–19	0.20	0.02
20–24	0.56	0.11
25–29	0.81	0.21
30–34	0.94	0.17
35–39	0.94	0.19
40–44	0.92	0.20
45–49	0.89	0.12
50–54	0.77	0.11
55–59	0.74	0.08
60–64	0.50	0.04
65+	0.18	0.01

SOURCE: Kurdistan Region Statistics Office, 2012.

NOTE: These LFPRs are for all people ages 15 and over, regardless of their level of education and whether they are enrolled in school.

We make the break between 2011 and 2012 because the first round of the KRLFS was fielded in July 2012, and we use those data to benchmark the KRI labor market. We make a simple assumption that people who left the education system in 2012 were not counted in that survey but instead joined the labor market starting in August.

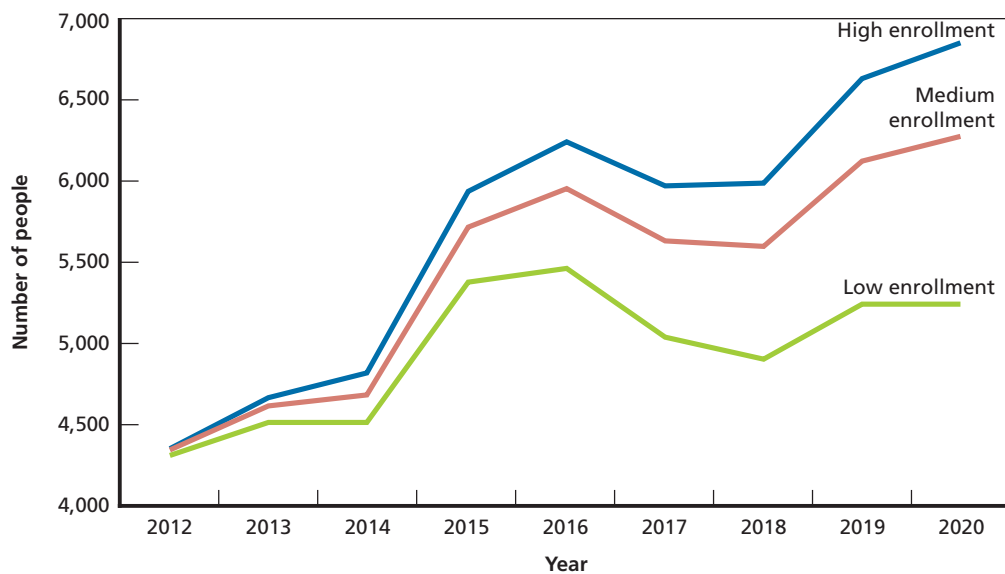
For labor-market entrants exiting the education system after grade 9 and grade 12, our estimates for 2006 through 2009 are based on actual education data, and our estimates for 2010 through 2020 are based on projected education data. In addition, we present estimates using the low, medium, and high enrollment projections of Vernez, Culbertson, and Constant (2012). For labor-market entrants exiting the education system after postsecondary education, our estimates for 2007 through 2012 are based on actual education data, and our estimates for 2013 through 2020 are based on projected education data. We based our projections of postsecondary education enrollment on the medium K–12 enrollment projections of Vernez, Culbertson, and Constant (2012).

Projected New Entrants After Grade 9

We estimate that about 23,900 people who had completed grade 9 went directly from the education system to the labor market from late summer 2006 to late summer 2011. This is an average of about 4,000 per year. We project that this will increase through 2020 (Figure 2.1). We project that from late 2012 through 2020, approximately 44,600 people under the low-enrollment scenario, 48,900 people under the medium-enrollment scenario, and 51,500 people under the high-enrollment scenario who complete grade 9 will enter the labor market. This is equivalent to 5,000, 5,400, and 5,700 labor-market entrants per year, respectively.

In 2012, approximately 109,000 people in the KRI labor force had a grade 9 education or less. Measured against the summer 2012 size of the labor force, the cumulative totals of new

Figure 2.1
Estimated Number of People Entering the Labor Market After Completing Grade 9



SOURCE: Authors' computations based on data from MOE and the Kurdistan Region Statistics Office, 2012.

RAND RR489-2.1

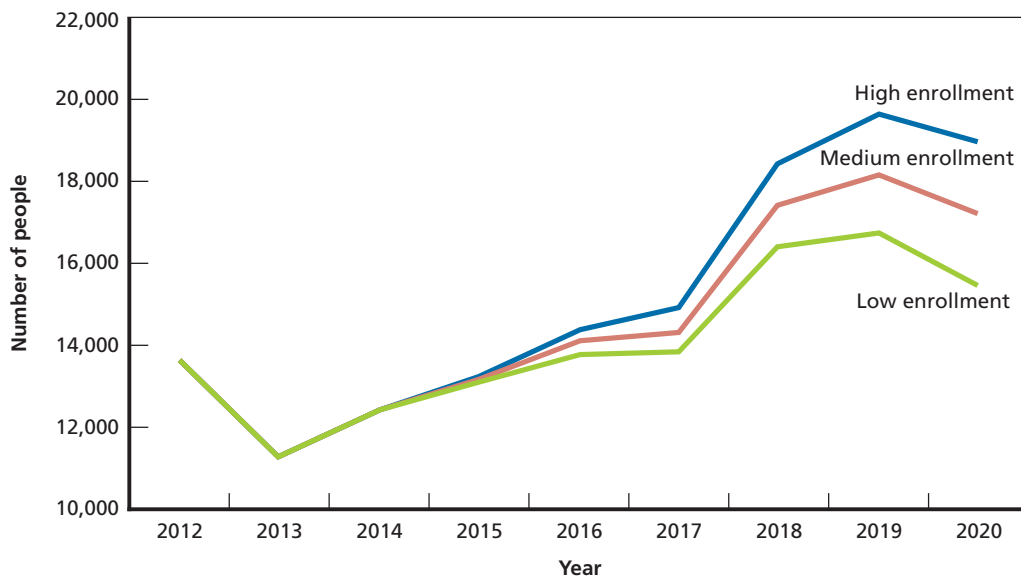
entrants starting in 2012 amount to between 41 percent and 47 percent of all people with a grade 9 education or less in the 2012 labor force but between only 3.7 percent and 4.3 percent of the total labor force. We note that this is likely an underestimate of the number of low-education people entering the labor force, because we exclude people who leave the education system before grade 9 as well as those who leave the education system after completing grade 9, do not enter the labor force immediately, and then enter the labor force after a delay. As will be seen below, even though the number of low-education job-seekers to enter the KRI labor pool will grow, this will be the slowest-growing portion of the future KRI labor force.

Projected New Entrants After Grade 12

We estimate that about 50,800 people who had completed grade 12 went directly from the education system to the labor force from late summer 2006 to late summer 2011. This is an average of almost 8,500 per year. We project that this will increase through 2020 (Figure 2.2). We project that from late 2012 through 2020, approximately 127,000 people under the low-enrollment scenario, 132,000 people under the medium-enrollment scenario, and 137,000 people under the high-enrollment scenario who complete grade 12 will enter the labor force. This is equivalent to 14,000, 14,600, and 15,200 labor force entrants per year, respectively.

In 2012, approximately 75,000 people in the KRI labor force had completed grade 12 and not gone on to postsecondary education. Measured against the summer 2012 size of the labor force, the cumulative totals of new entrants starting in 2012 amount to between 168.7 and 182.5 percent of all people with a grade 12 education in the 2012 labor force. Relative to the size of the total labor force, this amount of new entrants is between 10.6 percent and 11.4 percent of the 2012 total labor force.

Figure 2.2
Estimated Number of People Entering the Labor Market After Completing Grade 12



SOURCE: Authors' computations based on data from MOE and the Kurdistan Region Statistics Office, 2012.
NOTE: Our data are insufficient to allow us to explain the decline in labor-market entrants in 2013.

RAND RR489-2.2

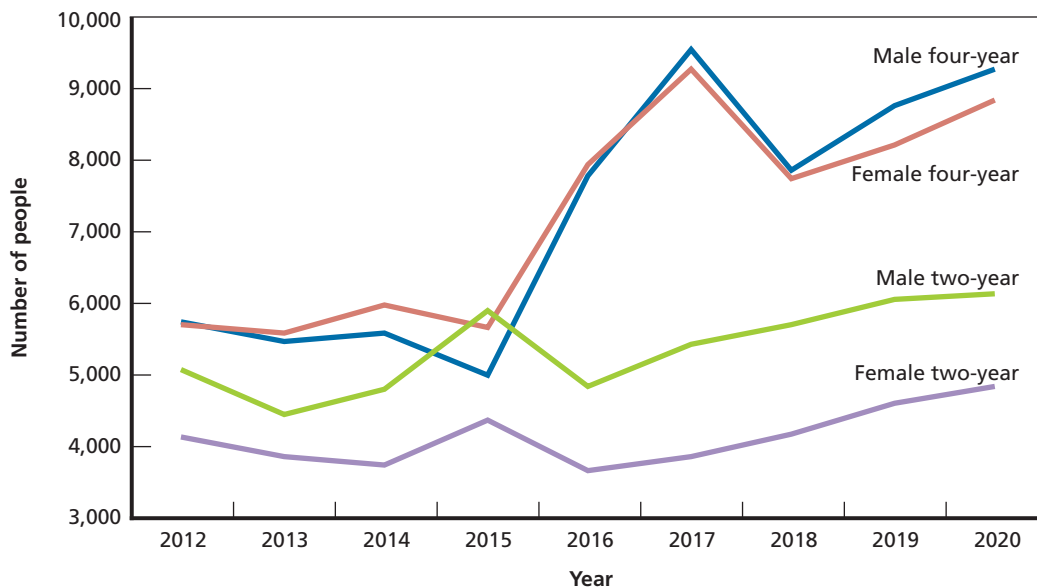
As with our figures for labor-market entrants with a grade 9 education, we may underestimate the actual number of labor-market entrants with a grade 12 education. We exclude the people who do not enter the labor market immediately but then decide to enter the labor market with a delay following their completion of grade 12. Furthermore, with improving gender parity levels in the education system, female enrollment in secondary schools will increase, and so the number of females who potentially enter the labor force as well as go on to college will rise. If the female LFPR for this age group and education level rises, then the number of new labor-market entrants will increase.

Projected New Entrants After Institute and University Completion

We estimate that about 23,400 people who had completed their two-year institute education and 47,600 people who had completed their four-year university education went from the education system to the labor force from late summer 2007 to late summer 2011. Combined, this is an average of 14,200 people per year—4,700 for two-year graduates and 9,500 for four-year graduates.

Looking forward, we project that this will increase dramatically through 2020 (Figure 2.3). We project that from late 2012 through 2020, at least 215,700 people with a postsecondary degree, or about 24,000 people each year, will move directly from the education system to the labor force. We project that this will include 85,000 institute graduates, of which 48,400 are men and 37,200 are women. In annual terms, these numbers are 9,500 institute graduates, of which 5,400 are men and 4,100 are women. We also project that this will include 130,100

Figure 2.3
Estimated Number of People Entering the Labor Market After Completing Two-Year and Four-Year Postsecondary Degrees



SOURCE: Authors' computations based on data from MOHESR and the Kurdistan Region Statistics Office, 2012.

NOTES: Data are insufficient to allow us to explain the large increase and then dip in labor-force participation in 2017 and 2018 among people enrolled in four-year institutions, and the temporary increase in labor-force participation in 2015 among people enrolled in two-year institutions.

university graduates, of which 65,100 are men and 65,000 are women. In annual terms, these numbers are 14,500 university graduates, of which more than 7,200 are men and more than 7,200 are women.

As of July 2012, the KRI labor force had 120,000 participants whose highest degree was a two-year postsecondary diploma and 95,100 participants whose highest degree was a university degree for a total of 215,000 people with a postsecondary degree. The number of projected two-year diploma-holders through 2020 is 71.4 percent of the number of diploma-holders in the labor force in 2012 and 7.1 percent of the entire 2012 labor force. The number of projected four-year degree-holders through 2020 is 136.8 percent of the number of university degree-holders in the labor force in 2012 and 10.9 percent of the entire 2012 labor force. Combined, these numbers of new labor-force entrants from 2012 through 2020 with postsecondary degrees amount to 100.3 percent—almost exactly double—the number of postsecondary degree holders in the labor force in 2012 and 18.0 percent—or more than one-sixth—of the entire 2012 labor force.

This projected increase, as with our other projections, is based on current enrollment in the K–12 system, historic rates of progression from grade 12 to universities and from year to year in universities, and historic LFPRs. But it also will depend on the capacity of universities to host an increasing number of students. The KRG has expanded its public four-year university system, with one new university established in 2009 and four new universities established in 2010. There has already been a dramatic expansion of four-year university enrollment. According to data from MOHESR, in the 2006–2007 academic year, about 47,000 students were enrolled in these universities. In academic year 2011–2012, that number was about 60,000.

Postsecondary Labor-Market Entrants by Subject

Besides projecting the numbers of new labor-market entrants with postsecondary degrees through 2020, we examined enrollment and estimated entry into the labor force by field of study for a shorter time period.¹ We made two simplifications in these estimates. First, we assumed that all people in the final year of their program in the 2011–2012 academic year would leave the education system to become potential labor-market entrants at the end of that year. Second, we assumed that all people in the first year of their program in the 2011–2012 academic year would complete their education and then leave the education system to become potential labor-market entrants at the end of their academic programs.

We begin with technical institutes and colleges, which primarily have two-year programs. We focus on the two-year programs and their enrollment by discipline in academic year 2011–2012, for which we have the most recent data, obtained from the MOHESR. According to this enrollment and using the LFPRs discussed above, we estimated labor-market entrants by subject in 2012 and 2013.

There has been a four-fold enrollment increase in the technical institutes and colleges, from 7,553 enrollees in academic year 2006–2007 to 30,155 in academic year 2011–2012. Of the students in 2011–2012, 27,433 were in two-year technical institutes. Examining the distribution of enrollees by two-year fields of study, we see the greatest share in business administration and related fields (54.5 percent), followed by medical and health-related fields (15.0 percent), technical and skilled trades (10.4 percent), information technology (8.6 percent), agri-

¹ In the original data, discipline names were not consistent across years. We therefore grouped these disciplines into logical categories that would provide an indication of trends in education within similar subjects.

culture (3.4 percent), and then all other fields (8 percent)—a category that includes fields with relatively small enrollments, such as media, photography, and tourism (Table 2.6). According to enrollment in the academic year 2011–2012, students who we estimate will have finished their degrees in 2012 and 2013 and entered the labor market appear to have a variety of specialized skills that could potentially be in demand in the private sector, especially in business administration and related fields.

The two-year technical institutes have experienced tremendous growth in the past five years, and their capacity to accommodate this growth has been strained (Constant et al., 2013). Demand for this type of education could continue to grow, but capacity constraints may also play a role in the pace of that growth.

For four-year institutions, we estimated labor-market entrants by subject in 2012 and 2015. The labor-market entrants in 2012 would be those in their fourth year in academic year 2011–2012, and the labor-market entrants in 2015 would be those in their first year in academic year 2011–2012. As before, we multiply the number of people who leave the education system by the appropriate LFPR, since not all people choose to enter the labor market.

The largest group of labor-market entrants in 2012 is estimated to have been from arts and humanities and education, followed by math and science, business administration, and Islamic science and law (Table 2.7). In 2015, the largest group of labor-market entrants is again estimated to be from the arts and humanities fields, followed by education, and then math and science. However, there is dramatic growth between 2012 and 2015 in business administration, which is projected to take fourth place, followed by Islamic science and law in fifth. The number of engineering labor-market entrants is also expected to grow a great deal, by almost 23 percent over four years. As with enrollment in two-year institutions, it appears that people in four-year universities are moving into subjects that could potentially be in demand in the private sector, in particular business administration and engineering.

Table 2.6
Enrollment and Estimated Labor-Market Entrants, by Discipline, in Two-Year Postsecondary Institutions, 2012 and 2013

Discipline	2011–2012 First-Year Enrollment		2011–2012 Second-Year Enrollment		Number of 2012 Anticipated Labor-Market Entrants	Number of 2013 Anticipated Labor-Market Entrants
	Males	Females	Males	Females		
Agriculture	152	282	163	324	248	276
Business administration and related fields	2,884	3,325	3,985	4,748	3,706	5,196
Technical and skilled trades	864	798	695	507	1,013	749
Medical- and health-related fields	957	1,123	900	1,135	1,239	1,204
Information technology	455	782	469	662	711	662
Other	492	482	534	715	590	735
Total	5,804	6,792	6,746	8,091	7,507	8,822

SOURCE: Authors' computations based on data from MOHESR and Kurdistan Region Statistics Office, 2012.

Table 2.7
Enrollment and Anticipated Labor-Market Entrants, by Discipline, in Four-Year Postsecondary Institutions, 2012 and 2015

Discipline	2011–2012 First-Year Enrollment		2011–2012 Final-Year Enrollment		Number of 2012 Anticipated Labor-Market Entrants	Number of 2015 Anticipated Labor-Market Entrants
	Males	Females	Males	Females		
Agriculture and veterinary sciences	359	564	279	428	666	869
Arts and humanities	1,923	2,187	2,132	1,976	3,884	3,880
Business administration	994	615	666	549	1,150	1,526
Education	1,421	1,864	1,838	2,166	3,779	3,098
Engineering	583	505	526	359	839	1,029
Islamic science and law	743	524	625	469	1,036	1,201
Math and science	1,007	971	804	950	1,655	1,870
Medical- and health-related fields	172	268	197	197	372	414
Technical	374	338	388	360	707	673
Total	7,576	7,836	7,455	7,454	14,089	14,560

SOURCE: Authors' computations based on data from MOHESR and the Kurdistan Region Statistics Office, 2012.

NOTE: Some engineering university students join the labor market in 2016 rather than 2015 because their degree course takes five years rather than four, and some medicine and health university students join the labor market in 2017 because medical education lasts six years.

How the Estimates and Projections Might Change

Throughout this chapter, we have noted how our estimates and projections might change depending on our simplifications and methods. In this section, we reiterate some of these warnings and introduce a few more.

In all of our estimates, we use historic LFPRs. The number of people entering the labor force in the future might change if LFPRs change, going up if LFPRs rise and down if LFPRs fall. Because we do not have adequate information with which to forecast whether LFPRs will go up, down, or stay the same, we judged that the safest course would be to use constant and historic LFPRs. Likewise, we use historic transition rates from grade to grade and post-secondary education year to postsecondary education year. If more people were to choose to go on to higher levels of education, then the level of education of future labor-market entrants would be even higher than we have projected. Furthermore, if in-migration of school-age or postsecondary-education-age people were to outpace out-migration from the KRI, enrollments in the education system would rise, as would the projected number of labor-market entrants.

In our projections of people with less than a postsecondary level of education, we exclude those who leave the education system at grades other than 9 and 12. Because, in fact, there are people who leave at all grade levels, the actual number of new labor-market entrants will be higher than we have forecast. In addition, we exclude people who leave the education system,

do not immediately join the labor market, and then join the labor market after a delay of several years. Our analysis accounts only for those people who leave the education system and then join the labor market soon after they finish their education.

In our projections of future enrollment in the postsecondary education system, we have assumed a constant rate of graduation from secondary school because we have data on graduation rates for only one year. We estimated graduation levels because only those people who graduate can continue on to postsecondary education. If this rate were to rise, more people would likely enter postsecondary education, and the education level of future labor-market entrants would also rise above the levels we project. As noted above, postsecondary technical education includes two-year institutes and four-year colleges. For ease of computation, we exclude the people in years three through five from our projections. This means that we are further underestimating future labor-market entrants. Such people averaged 5.0 percent of all enrollment in postsecondary technical institutes and colleges from academic year 2006–2007 to academic year 2011–2012. Finally, some university programs run five or six years. Again, for ease of computation, we excluded all people in years five and six in universities, again leading to an underestimate of projected future labor-market entrants. Such people averaged 1.9 percent of all enrollment in universities from academic year 2006–2007 to academic year 2011–2012.

Implications for the Private-Sector Labor Market in the KRI

In relative terms, the share of new labor-market entrants with only a grade 9 education will be smaller than the share from the upper grade levels. Their ability to find jobs will depend not only on the extent to which private businesses need low-skill workers but also on the extent to which such businesses prefer foreign low-skill workers. Currently, many foreign workers come from Turkey, but some also come from Lebanon, Uganda, Nepal, Sri Lanka, and many other countries.

On the other hand, the share of those with a grade 12 education is rising. In addition to universalizing education through grade 9, it is anticipated that, over time, continuation rates into the preparatory school years will increase and more students will complete grade 12, the final grade in the general and vocational education system. Grade 12 graduates may still have difficulty finding jobs unless the private sector develops rapidly or they acquire the necessary secondary-level skills that can be easily deployed in the labor market. For example, training in vocational and practical-oriented skills may increase their chances of finding employment. General education secondary graduates will have basic literacy and numeracy skills but may need additional practical skills or on-the-job training to become more attractive to employers.

There has also been rapid growth in enrollment in both two-year and four-year higher education institutions. If this trend continues, we expect the share of labor market entrants with two-year and four-year degrees to increase as well. Graduates of two-year and four-year institutions will have some of the skills that are or will be in high demand in the private-sector labor market. However, some skills could be met by a more robust secondary school system, particularly with vocational and technical skills.

Students in both the two-year and four-year institutions appear to be making attempts to respond to the needs of the labor market through their choice of subjects to study. However, there remains a question about their expectations for the types of jobs they will be able to secure. Furthermore, although our projections through 2015 indicate that a large cohort of

graduates in fields likely to be desired by the private sector, such as business administration and engineering, will enter the labor market, a larger share of new labor-market entrants will continue to major in the arts and humanities. This may not be a problem because, as will be shown in the next chapter, employers are looking for individuals with communications and interpersonal skills, also known as soft skills, as well as English language and customer service skills, and arts and humanities students may bring such skills to the market.

One potential problem that KRG policymakers will need to be alert to is the accelerating demand for postsecondary education that has placed pressure on education infrastructure and potentially compromised quality. Enrollment in two-year institutions has grown especially rapidly, and new programs offered in areas such as information technology (IT), tourism, and business administration are in high demand among students. Some of these and other programs could be offered at the secondary vocational level, leaving postsecondary-level education for advanced vocational training and qualifications. They could also be provided by private technical institutions, which may be quicker than public institutions to adapt to market needs. Nonetheless, relatively lower student demand currently for vocational training at the secondary level and increasing demand for postsecondary training means that postsecondary institutions could continue to face enrollment pressure.

In the next chapter, we present information about the demand side of the labor market—the current and future needs of the private sector. The findings from this chapter and the next are meant to help KRG policymakers assess the alignment between what the education sector is producing and what the labor market needs.

Skills Gaps and Expected Private-Sector Labor Demand in the Kurdistan Region–Iraq

In the previous chapter, we estimated the future numbers and education levels of people finishing their education and seeking employment—the *supply* side of the labor market. Here, we summarize the types of skills and occupations that private-sector employers need—the *demand* side of the labor market, with particular focus on those skills perceived as missing among the existing labor force. The combination of findings in these two chapters can shed light on where the supply of and demand for skills are not aligned. We identify current labor needs among private-sector employers, as well as perceived problems in meeting those needs according to private-sector business people, experts in academia, and government officials. We combine a wealth of qualitative findings from conversations and stakeholder interviews that RAND has conducted since 2010 with quantitative findings from a survey we developed exclusively for RAND research—the RAND Survey of Business Establishments, which we also refer to as the RAND Skills Survey—to learn systematically from private enterprises in the KRI about job vacancies and opportunities for growth as well as perceived gaps in skills among the KRI labor force.¹

The survey focused on the skills of residents of the KRI because, in our interviews, policymakers consistently expressed a desire for the KRI to have an economy in which its residents could succeed at finding private-sector employment. Although we focused on local—meaning KRI—employees, we also asked questions about the skills and employment of Iraqis from outside the KRI and people from outside Iraq.

The analysis in this chapter will help policymakers better understand which job skills or areas of study may warrant future attention to not constrain development of KRI’s private economy. The findings can also be used to inform both education and labor-market policies about current and future labor needs. It is important to keep in mind that the rapid growth and development taking place in the KRI make it necessary to conduct regular enterprise surveys to assess skills needs. The private-sector demand for skills is likely to continue to evolve.

The findings of this chapter provide analysis of the views of employers and insights into training and skill-development needs. Many other factors may affect labor-market performance and the desire of employees to work hard, such as laws regarding the labor market and opportunities people may have outside the private labor market. In earlier work, we found through interviews and data analysis that many people want to hold a government job because even though private-sector salaries are higher than government salaries, government benefits,

¹ This survey was developed jointly by the RAND KRG Labor and Education projects, with input from officials of the KRSO and ASHARQ Co. Ltd., and was fielded by ASHARQ Co. Ltd. Final results included 360 completed responses. All results shown are weighted by governorate, sector, and size, unless otherwise noted. See Appendix A for details on survey sampling and weighting.

job security, and work hours are far better than those offered in the private sector (Hansen et al., 2011). Furthermore, interviews indicated that many people can be supported by a family member who has a government salary or by some form of public assistance and so they may be reluctant to build skills for or to take a private-sector job. Accordingly, the findings of this chapter constitute one input, but not the only input, into labor policy reform.

We begin this chapter with an examination of KRI employer perceptions of local labor, hiring experiences, and reported hiring practices from our survey and interview data. We then discuss employer demand for skills—the skills they emphasize that job candidates should possess. Throughout, we draw from other studies that have examined employer demand for skills and draw parallels to our findings in the KRI. We then discuss employer-provided training and barriers to providing that training. We summarize our findings in the final section.

Survey Methods

We provide the survey in Appendix A, and we discuss the survey, sampling, and weighting strategy in more detail in Appendix B. Here, we provide general information about our sample and discuss study limitations. Our sample was obtained primarily using the 2011–2012 Kurdistan Region Companies Directory, a listing of formal businesses in the KRI compiled by the Kurdistan Federation of Chambers of Commerce and Industry. Our survey partner, ASHARQ, systematically sampled firms from the directory, excluding firms with fewer than five employees, until it obtained a sample of 360 firms that met our goal of at least 50 companies within each of the categories in our three dimensions (geography, sector, and size):

- Geography—We sampled enterprises in all three governorates: Duhok, Erbil, and Sulaimaniya.
- Sector—We divided the economy into three broad sectors: mining and manufacturing, infrastructure, and services and professions.
- Size—We divided enterprises into three size classes: small, with five to 19 employees; medium, with 20 to 99 employees; and large, with 100 or more employees.

We chose to exclude firms with fewer than five employees for several reasons. First, we expected these types of firms to find it difficult to respond to the questions in the survey. Second, as very small enterprises, they are less likely than larger enterprises to hire employees with specialized or advanced skills, instead favoring people with more general skills. Because even slightly larger enterprises will need people with both general and specific skills, we considered it appropriate to focus on firms with five or more employees, given constraints on time and budget. Third, most very small firms are unlikely to have rapid employment growth and, given current practices in the KRI labor market, are likely to keep hiring within family groups. Finally, we used the International Finance Corporation and World Bank multiyear, cross-country enterprise survey program (International Finance Corporation and World Bank, 2013) as a reference point, and those surveys generally exclude firms with fewer than five employees.

In our analysis of the survey data, we focus on the point estimates, meaning the specific numbers found in our survey results. However, where appropriate, we test and note whether some of these point estimates for different groups may overlap in a statistical sense, because

survey methods may not reflect the exact numbers as found in the population. If two figures are found not to overlap statistically, their difference is referred to as statistically significant, meaning that their difference is not merely random due to our survey methods or other causes.² Because of our small sample size, we were not able to detect statistically significant differences in a number of our comparisons, and in those cases, we focus on discussing the point estimates. We note statistical differences in our comparisons at the 5 percent or better level, meaning that there is a 5 percent or lower probability that the numbers being compared are actually the same in the population.

For certain questions in the survey, only a subset of employers gave responses. These responses are known as *conditional* responses, meaning that they apply only to a subset of firms that are part of a certain category or condition. The conditional percentages reflect the fact that certain questions were relevant to only a subset of employers. For example, only a subset of employers responded that they provide training to employees. Thus, a subsequent question in the survey on the types of training provided applied only to the subset that originally indicated that they provide training and thus had the opportunity to respond to the question on types of training provided. In reviewing the analysis of the questions that generate conditional responses, we provide both the conditional responses and the results for all firms in the sample, known as the *unconditional* responses. We interpret the findings both within the context of the sample subset as well as a share of all the employers surveyed.

Our findings have some important caveats. Our sampling approach is restricted to formal businesses with five or more employees primarily situated in the capital of each governorate. Thus, our findings may not be generalizable to very small firms, to firms in rural areas, or to firms in the secondary cities of the governorates. We have no reason to believe that there are systematic differences between firms across the urbanized areas, but there could be important differences between firms in urban and those in rural areas.

In addition, we asked employers about jobs requiring a secondary school degree and jobs requiring a postsecondary school degree. The empirical literature finds that for many occupations, at least in the United States, there is little meaningful distinction between jobs requiring a postsecondary degree and those requiring a secondary degree (Gottschalk and Hansen, 2003). Jobs that might be subjectively classified as not requiring a postsecondary degree are often filled with individuals possessing a postsecondary degree who are paid a wage premium.

We do not have enough evidence to determine whether this is also true in the KRI. In our survey, we allowed employers to subjectively determine what jobs might require a secondary rather than a postsecondary degree, and thus each employer may classify these jobs differently. This enabled us to generate general recommendations to guide secondary and postsecondary institutions in program and curriculum development. The findings suggest that 25–40 percent of surveyed employers have concerns about the preparation of graduates from all types of KRI education institutions. We discuss the specific implications of this and other findings in the next section.

Finally, it is important to note that many responses reflect the perceptions of employers and should be interpreted as such. Employer rating of recent graduates is not in and of itself a complete measure of the productivity of labor but, rather, a single dimension.

² We compute adjusted Wald test statistics appropriate for survey data to examine statistically significant differences between the means of different groups.

Employer Perceptions, Recruiting Experiences, and Hiring Practices

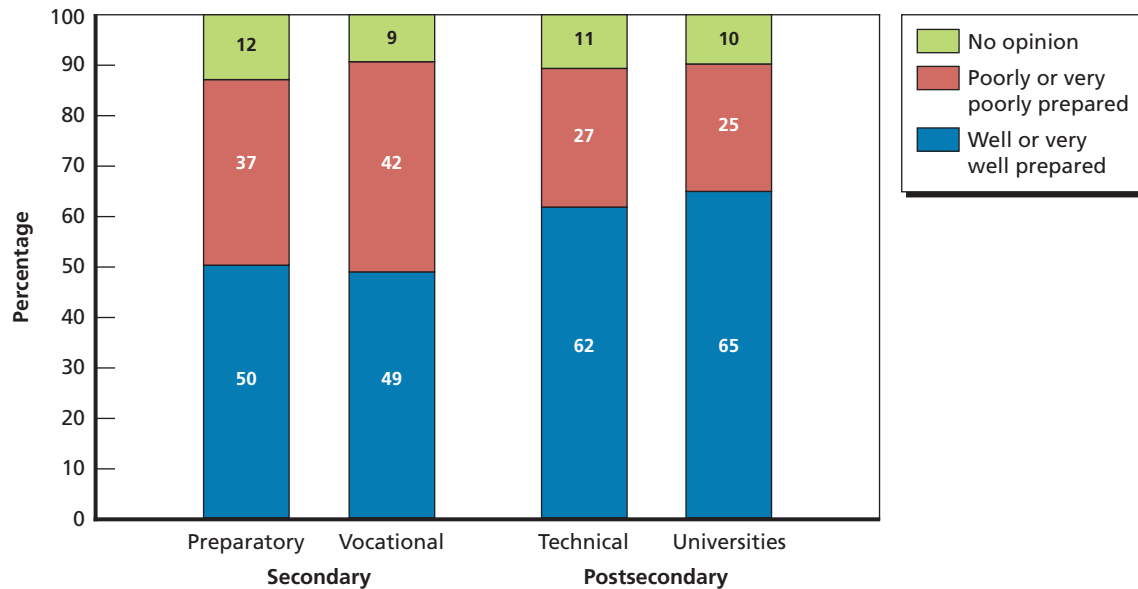
Employer Perceptions of KRI Labor

To understand perceptions of the KRI workforce, we asked employers in our survey about the preparation of graduates from secondary and postsecondary education institutions (Figure 3.1). About 40 percent of employers surveyed rated secondary school and vocational school graduates as poorly prepared or very poorly prepared, and about 25 percent rated graduates of two-year and four-year postsecondary institutions as poorly prepared or very poorly prepared.

Our interviews with employers, experts in academia, and government officials suggest that these shortcomings may be a by-product of the traditional education system, which in the past emphasized memorization of facts rather than critical thinking, analytical reasoning, and collective discussion—skills that are typically required in the workplace. Although this is changing with the onset of new reforms in the KRI education system, the perception among at least some employers is that it is still a problem. However, it is important to note that about one-half of employers in our survey rated secondary graduates as well prepared or very well prepared, and more than 60 percent rated graduates of postsecondary institutions as well prepared or very well prepared. Although this is somewhat at odds with what we found in our qualitative data, our qualitative findings were derived from interviews primarily with large, multinational firms, which generally require individuals with more specialized types of skills.

A growing body of evidence documents the significant skills shortages and gaps facing many countries in the Middle East and North Africa (MENA) region (United Nations, 2003, 2004, 2005, 2009, and 2012). The central thesis in these United Nations reports is that poor human development in the region is largely attributable to persistent structural failings, includ-

Figure 3.1
Employers' Perceptions of Graduates' Preparation for Work, by Type of Education Institution



SOURCE: RAND Corporation, 2012.

NOTE: Question: How prepared for work are graduates from <type of school> within the Kurdistan Region of Iraq? (n = 360).

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ing a history of poor investment in human capital (education and training). The International Finance Corporation (IFC) and the Islamic Development Bank (IsDB) report that only 20–35 percent of private-sector employers in the countries covered by a survey considered university graduates to be appropriately skilled (Saudi Arabia was the exception at 50 percent). The percentage of employers considering graduates from technical and vocational education and training institutions to be prepared was even lower and ranged between 10 percent and 25 percent, depending on the country (IFC and IsDB, 2011). Our own findings from the RAND Skills Survey suggest that employers in the KRI seem to have a more favorable view of recent graduates. Nonetheless, at least some employers view recent graduates as not being sufficiently prepared for work.

In countries outside the MENA region, employers sometimes do not report that entry-level employees are prepared. A recent study of employer perceptions of the preparation of recent hires found that around half of employers in the United States, India, and Turkey rated their recent hires as prepared for entry-level positions versus a higher share in Saudi Arabia (55 percent). On the other hand, a smaller share of employers rated recent hires as prepared in Germany (43 percent), Mexico (40 percent), Brazil (31 percent), the United Kingdom (36 percent), and Morocco (20 percent) (Mourshed, Farrell, and Barton, 2012, p. 40).

Employer Hiring Experiences

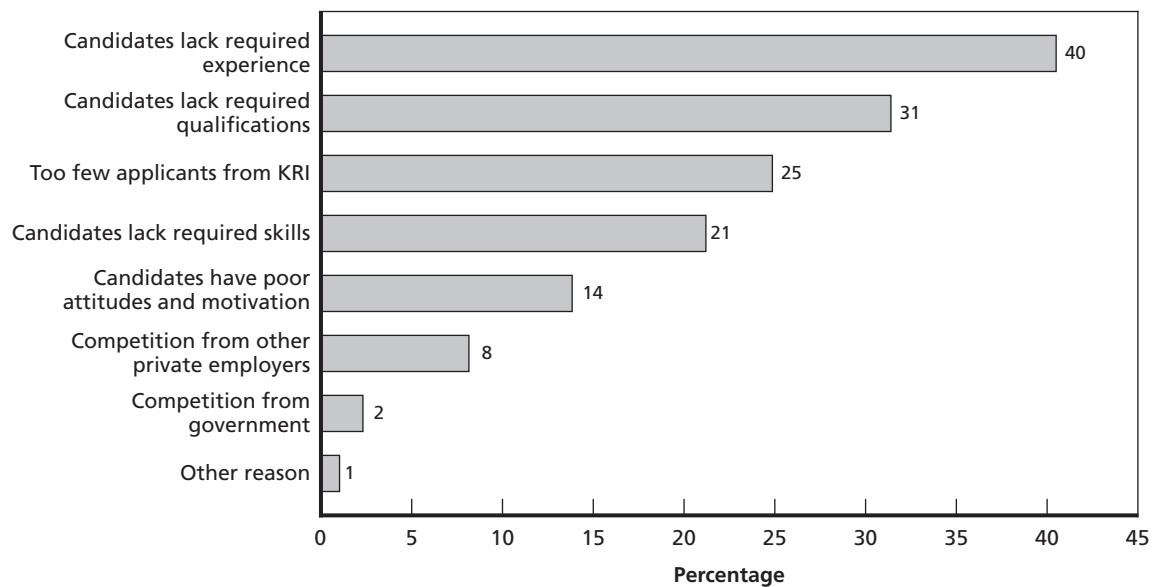
Employers were asked about the difficulties they face when hiring from within the KRI for jobs that require a secondary school degree (general or vocational). Approximately 25 percent reported that they had difficulty filling those jobs.³ Thus, the majority of employers reported not having a problem hiring for positions requiring a secondary degree. Only those employers who reported having a problem were then asked about the reasons for their problems hiring. Among that subset of firms, the most frequently cited reasons for difficulty filling those positions included candidates' lacking experience (40 percent), candidates' lacking sufficient education qualifications (31 percent), too few applicants (25 percent), and candidates' lacking the necessary skills (21 percent) (Figure 3.2). Given that most of the employers did not report facing difficulties filling positions, fewer than 10 percent of all employers sampled (the unconditional percentage) reported any one of the reasons for difficulties cited above.

However, among those who did report difficulties filling those positions, it is instructive to examine whether some difficulties were meaningfully different in a statistical sense. We examined differences among employers by size. We examined the top four barriers reported: lack of experience, lack of qualifications, too few applicants, and lack of skills. We found statistically significant differences at the 5 percent level or better between large employers and both small and medium-sized employers, with a greater share of large employers reporting difficulties finding candidates with the required skills and the required experience.

These findings suggest a number of important considerations regarding the match between supply and demand for skills. A quarter of employers, more likely the larger ones, report that they cannot find individuals who possess the skills needed to meet their needs. It suggests that certain skills are missing from the local labor force or that the level of training in required skills is inadequate or not sufficiently developed. Up to this point, we have examined whether

³ We found that among the 25 percent who report difficulties filling positions with nationals from the KRI, approximately 71 percent rated secondary school graduates as poorly or very poorly prepared, and 55 percent rated vocational school graduates as poorly or very poorly prepared.

Figure 3.2
For Employers Reporting Difficulties, Reasons for Difficulties Hiring for Jobs Requiring a Secondary School Degree with Candidates from the KRI



SOURCE: RAND Corporation, 2012.

NOTES: Question: What are the main difficulties behind being able to fill those vacancies with Iraqi Nationals from the Kurdistan Region? (n = 83). Percentages shown are conditioned on employers responding that they face difficulties hiring for jobs requiring a secondary school degree. A majority of employers did not respond that they faced difficulties and thus were not asked the question on the reasons for the hiring difficulties.

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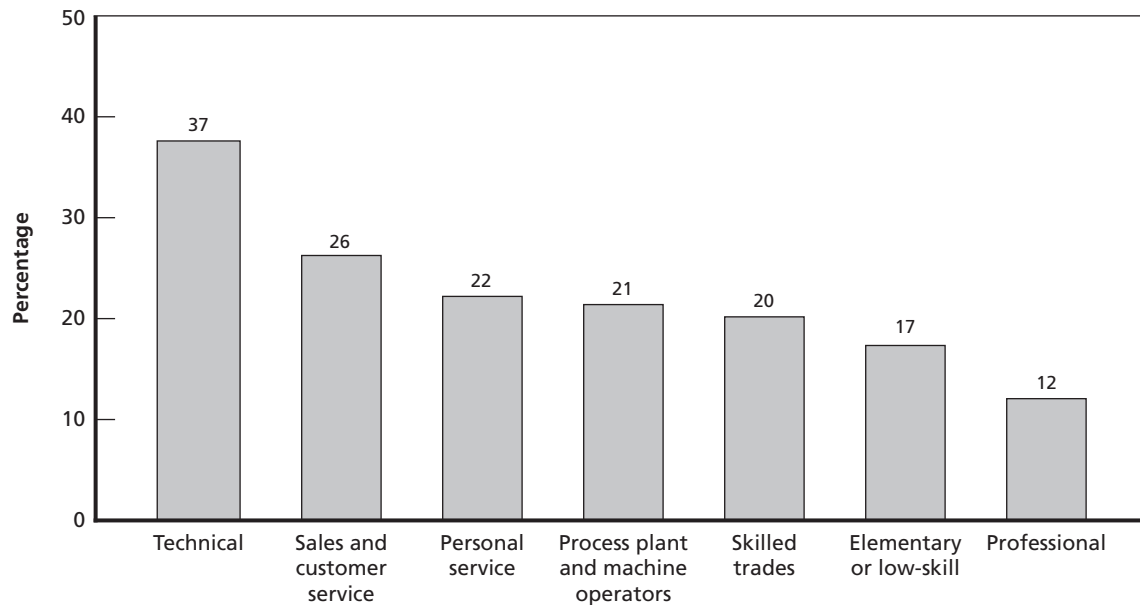
employers reported a shortcoming in the local labor market, and in a later section, we strive to discern which skills are highly valued by employers and that job-seekers should possess.

We also inquired about difficulties hiring within the KRI for specific occupations (Figure 3.3). Close to 30 percent of employers reported that they had difficulties hiring within the KRI, and of those, the most difficult types of occupations to hire for were the technical occupations (37 percent). This constitutes 11 percent of our entire sample (the unconditional percentage), and thus fewer than 10 percent of all surveyed employers reported difficulties hiring into any one of the other occupations displayed in the figure. These occupations are typically filled by technicians with training in such fields as diagnostics and maintenance and generally support professional and managerial staff. Technical occupations in many countries typically require some advanced vocational training or qualification.⁴ In general, there were few statistically significant differences across occupations, likely because of the small sample size in this case.

By comparison, in the United Kingdom, the NESS found that among employers who reported that they had hard-to-fill vacancies from the local labor market, the hardest-to-fill occupations were reported in the skilled trades (41 percent of the vacancies were considered

⁴ In the United Kingdom National Employer Skills Survey (NESS), associate professionals and technical occupations “usually require an associated high level vocational qualification, often involving substantial period of full time training or further study” (IFF Research Ltd., 2007, p. 16).

Figure 3.3
For Employers Reporting Difficulties, Percentage Saying That They Had Difficulties Hiring Local Labor, by Type of Occupation, 2012



SOURCE: RAND Corporation, 2012.

NOTES: Question: In which of the following occupation categories is it difficult for you to hire locally? (n = 104). Percentages shown are conditioned on employers responding that they face difficulties hiring local labor. A majority of employers did not respond that they faced difficulties hiring local labor and thus were not asked the question of the type of occupation they faced difficulties hiring for.

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hard to fill) followed by professionals (26 percent), caring services (25 percent), associate professionals (23 percent), machine operators (22 percent), and managers (21 percent).⁵

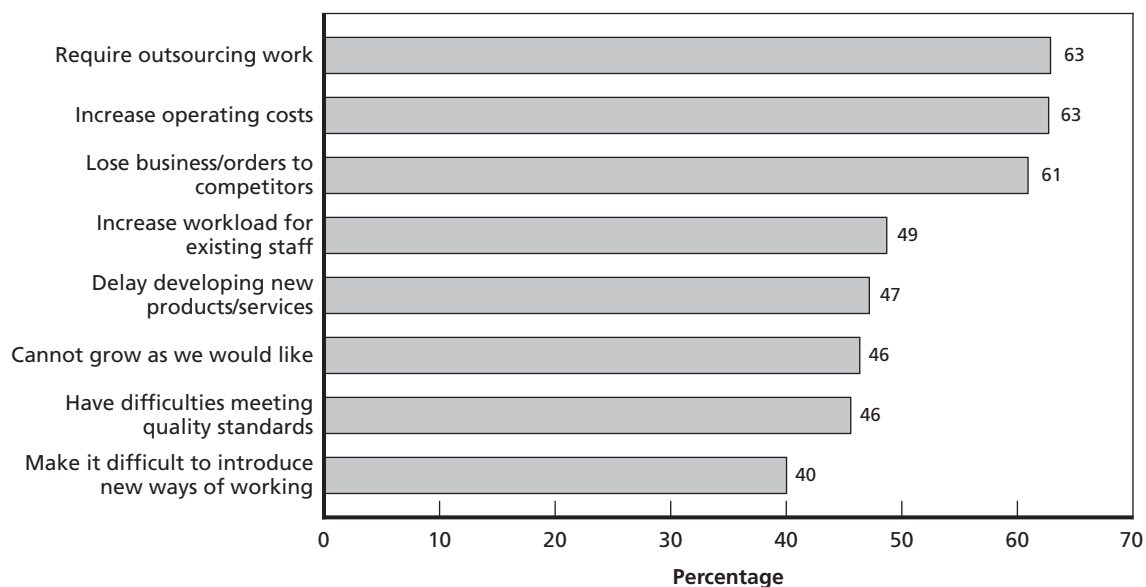
Effect of Hiring Difficulties

Among our surveyed firms that reported difficulties hiring locally (30 percent), the most frequently cited effects on their business include having to outsource work (63 percent), facing increased operating costs (63 percent), and losing business to competitors (61 percent) (Figure 3.4). These numbers constitute just over 20 percent of all surveyed firms (the unconditional percentage). Overall, these three effects were more likely to be reported than the rest, although no one effect of hiring difficulties stood out above the rest. In general, and likely because of our small sample size, we did not detect statistically significant differences by size among these effects.

Skills gaps and their effects are a major issue for employers in the Middle East. A study found that a greater share of firms in the MENA region (24 percent) reported that skills gaps were a major or very severe obstacle to current business operations compared to the share of firms in Latin America and the Caribbean (20 percent), Europe and Central Asia (20 per-

⁵ The United Kingdom Commission for Employment and Skills (UKCES) conducts the NESS, a nationally representative telephone-based survey of employers. The survey gathers data on current job vacancies and skills requirements. Among all employers in the UKCES NESS, 3 percent reported hard-to-fill vacancies as a result of skill shortages. Among large employers (100+ employees), that share was between 11 and 13 percent (Vivian et al., 2011).

Figure 3.4
For Employers Reporting Difficulties, Percentage Reporting How the Difficulties Hiring Local Labor Affect Their Business, 2012



SOURCE: RAND Corporation, 2012.

NOTES: Question: Generally speaking, are the difficulties hiring locally affecting your business in any of the following ways? (n = 126). Percentages shown are conditioned on employers responding that they face difficulties hiring local labor. A majority of employers did not respond that they faced difficulties hiring local labor and thus were not asked the question of the effects of these difficulties on their business.

RAND RR489-3.4

cent), Africa (18 percent), East Asia and the Pacific (17 percent), and South Asia (15 percent) (Schwalje, 2011). A World Bank enterprise survey of private-sector employers in the Sulaimaniya and Erbil governorates revealed that around 51 percent of the 96 firms interviewed in Sulaimaniya and around 32 percent of the 63 firms interviewed in Erbil indicated that an “inadequately educated workforce was a major constraint to their business” (World Bank, 2011).

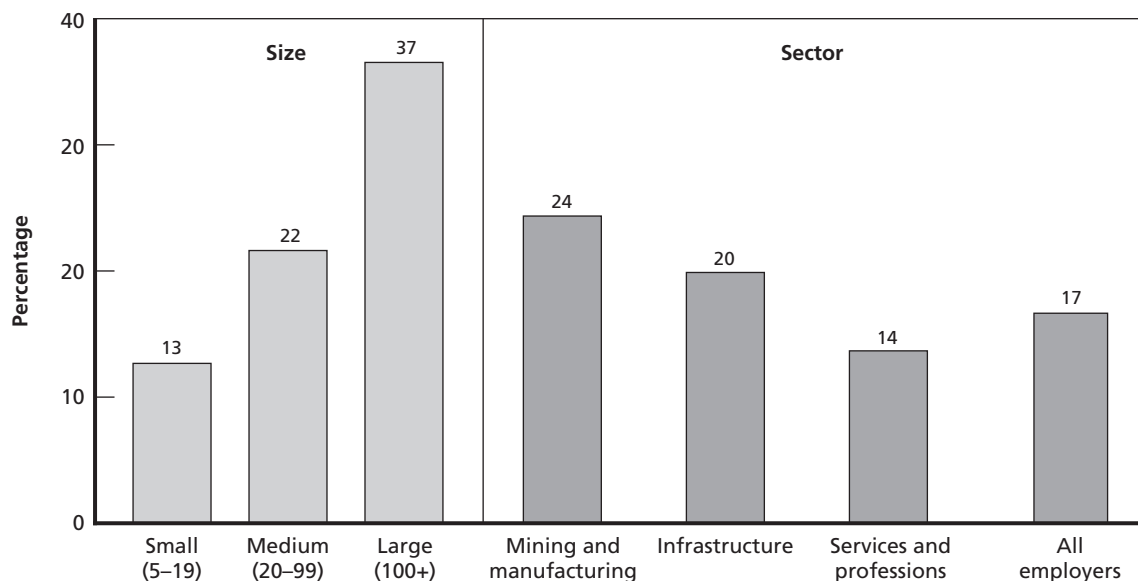
A 2009–2010 survey by the U.S. Agency for International Development (USAID) (through its Tijara program) of mainly small and medium-sized enterprises across 15 governorates in Iraq found that approximately 19 percent of employers surveyed cited “lack of qualified technicians” and “lack of manual laborers” as having a severe effect on their business, and 18 percent of employers surveyed indicated that “low level of skills and education” and “inadequate vocational training” had a severe effect. Other cited concerns included lack of trained higher management (14 percent) and lack of trained middle management (13 percent). Despite these concerns, the vast majority of businesses (93 percent) reported that they were able to find the unskilled workers they needed and 79 percent reported that they were able to find the skilled workers that they needed (USAID–Iraq, 2010a). These findings should be placed alongside our results, which indicated that a smaller share of employers (70 percent) is able to find individuals for certain types of occupations. In general, the findings across studies suggest that most employers might be able to find employees in the KRI, but at least some remain concerned about the adequacy of the preparation and training of those employees.

Employer Hiring Practices

To understand the potential demand for workers, we asked employers about their current workforce and planned hires. We gathered information on the share of employees by nationality to get a sense of the extent to which employers rely on labor from outside the KRI (non-KRI Iraqis and foreign nationals) to meet their workforce demand. Reliance on labor from outside the KRI could be an indicator that the skills that employers require are in short supply within the KRI. On average, among small firms (5–19 employees), approximately 13 percent of their employees are reported to be non-KRI nationals. Large firms have the highest share of non-KRI nationals at 37 percent (Figure 3.5). These differences were found to be statistically significantly different at the 1 percent level, meaning that there is only a 1 percent probability that they are actually the same in the entire population. Employers from both the mining and manufacturing sector and the infrastructure sector report a statistically significantly greater share of foreign nationals than employers in the services and professions. The average employer reports that 17 percent of its employees are non-KRI nationals.⁶

A notable share of employers reported that they often had to look for employees who are from outside the KRI to find the adequate level of skills and preparation (Figure 3.6). Among employers surveyed, 29 percent of small-sized firms indicated that they seek employees from outside the KRI to fill their workforce ranks, whereas 38 percent of medium-sized firms (20–99 employees) and 37 percent of large-sized employers (100+ employees) seek employees

Figure 3.5
Percentage of Employees from Outside the KRI, Currently Employed, by Business Establishment Size and Economic Sector, 2012



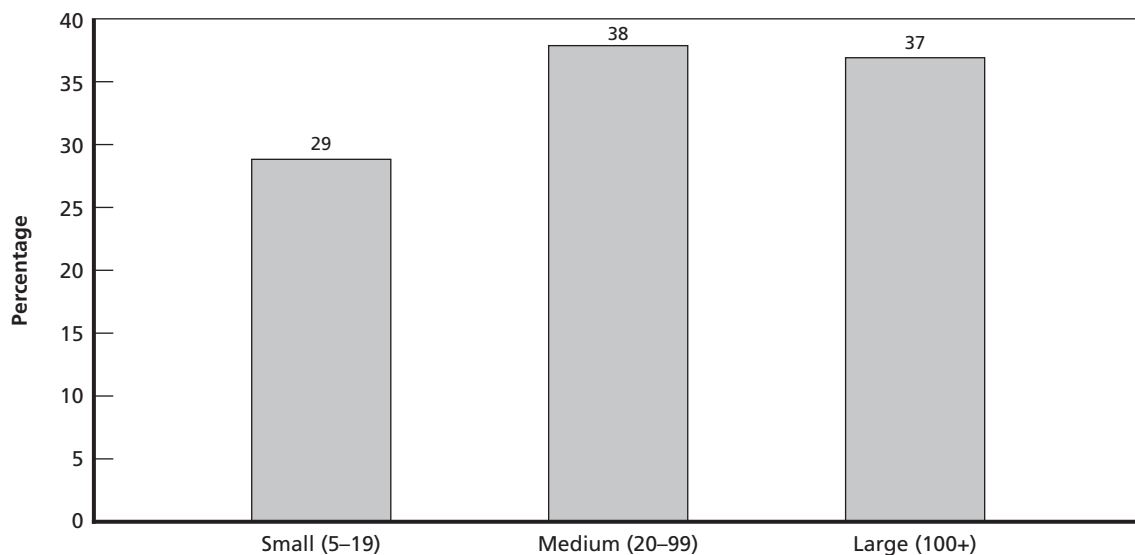
SOURCE: RAND Corporation, 2012.

NOTE: Question: What is the number of employees who are Nationals from the Kurdistan Region of Iraq; Nationals from other Parts of Iraq Outside of the KRI; Nationals of other countries? (n = 355).

RAND RR489-3.5

⁶ This could be overstated. Using a self-reported measure of the size of employer in the KRLFS, around 10 percent of household members employed in private-sector firms with five or more employees report that they were born outside the KRI. Although the KRLFS indicator is not strictly comparable, it is a useful reference point.

Figure 3.6
Percentage of Employers Indicating That They Somewhat Often or Very Often Have to Seek Employees from Outside the KRI, by Business Establishment Size, 2012



SOURCE: RAND Corporation, 2012.

NOTE: Question: Generally speaking, how often do you find that you need to look for job candidates who are not nationals from the Kurdistan Region in order to find an adequate level of preparation and skills when making a hire? KRI? (n = 360).

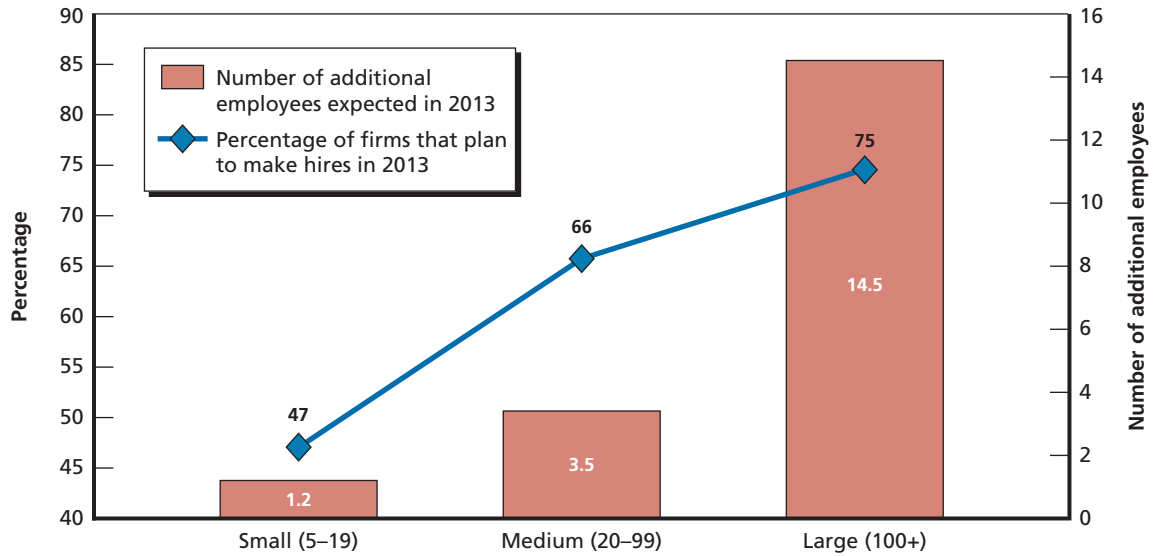
RAND RR489-3.6

from outside the KRI. These figures were not statistically significantly different from each other. However, the point estimates do suggest that a notable share of future hires could also be drawn from outside the KRI to meet the needs of employers. Over the long run, employers may view hiring locally as less costly, and importing high-skilled labor especially may offer an important signal to future graduates about skills in demand. Additionally, importing high-skilled labor could provide an opportunity for knowledge transfer.

We asked employers about future planned hires (Figure 3.7). A majority of large firms (75 percent) reported that they planned to expand their workforce in the coming year (each firm by an average of around 14 to 15 employees). However, large firms are the smallest share of total firms in the KRI. Fewer than half of small firms (47 percent) and more than half of medium-sized firms (66 percent) reported that they would be expanding their workforce: an average of one employee for small firms and an average of three to four employees for medium-sized firms.

Employee recruitment in the KRI tends to occur largely through word-of-mouth and informal networks rather than formal recruitment mechanisms (advertisements, recruiting agencies, websites, other listing services) (Figure 3.8). This reflects the current level of development of the economy. Many firms are family-owned and run, and the family maintains control of the business and sometimes expects younger family members to join the business. A majority of the employers we interviewed noted that they used informal networks to find their employees. Our quantitative findings also confirm the centrality of social networks: 63 percent of firms mention “word of mouth/family or informal network” as a recruitment method they have used in the past two years to find new employees. Large companies (70 percent), on

Figure 3.7
Percentage of Employers Indicating That They Plan to Expand Their Workforce in the Coming Year and Number of Net Hires, by Business Establishment Size, 2012

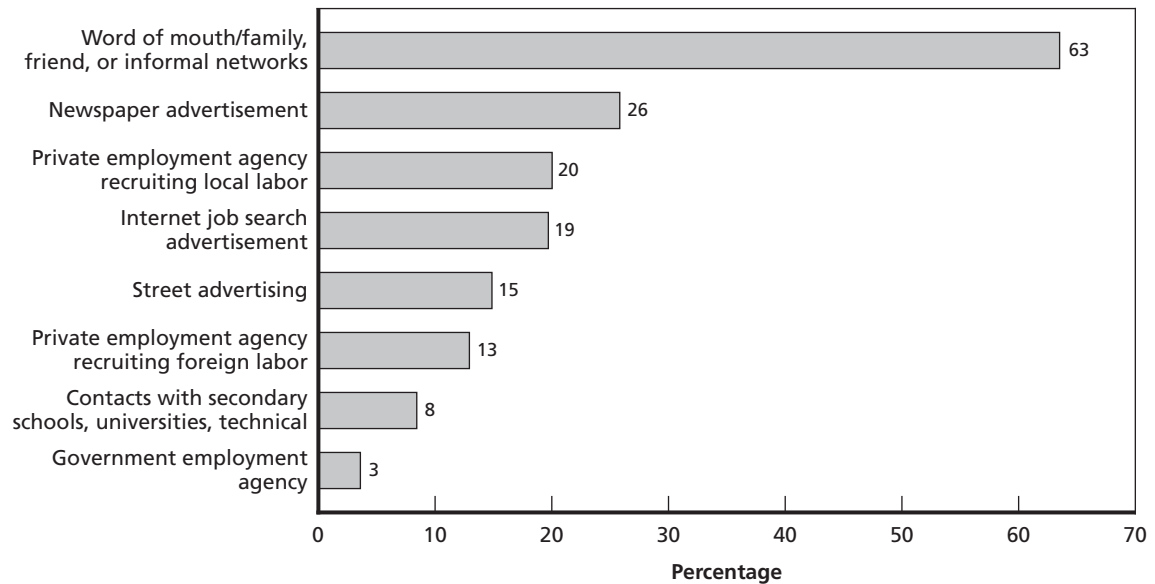


SOURCE: RAND Corporation, 2012.

NOTE: Question: Write down the number of employees by which you expect to expand labor force in the next 1 year. (n = 360).

RAND RR489-3.7

Figure 3.8
Percentage of Employers Indicating Which Method They Use to Recruit New Employees, 2012



SOURCE: RAND Corporation, 2012.

NOTE: Question: What recruiting methods have you used in the past two years? (n = 360).

RAND RR489-3.8

the other hand, are statistically significantly more more likely (at the 1 percent level) to report using private employment agencies to recruit local labor than both small (14 percent) and medium-sized companies (20 percent). Large companies also report making more use of agencies to recruit foreign labor, and both large and medium-sized companies are significantly more likely to report using newspaper advertisements. Our interviews with larger and internationally invested companies also suggested the use of more formal mechanisms to recruit labor.

Employer Demand for Skills

In this section, we present findings from our qualitative and quantitative data to focus expressly on the topic of skills: Which skills are viewed as important for employees and new hires to possess, and which specific skills are viewed as lacking among the local labor force, including recent graduates from educational institutions within the KRI.

Skill Set Classifications

Our qualitative and quantitative data collection included many questions about necessary skills for job applicants to possess, as well as perceptions among employers about the availability of skills among graduates of the KRI's general and vocational secondary schools, technical institutes, and universities. Drawing from the literature, we inquired in our survey about 20 types of skills that fit into six broad categories listed below.

- work attitude, work ethic, and motivation
- communications and interpersonal (also known as soft skills)
- reading, writing, numeracy, and computer literacy
- foreign language (with a focus on English and Arabic)
- job-specific knowledge and experience
- management and administrative.

Some of these, such as work ethic, may be considered personal attributes. However, such attributes can be learned, and therefore they may be considered skills. Learning could take place in a formal setting, such as a school, or informally and self-directed, for example when an employee sees that showing a good work ethic will lead to a higher salary or career advancement.

Employers in our survey were asked to choose the three most important skills that they look for in a job candidate. We first asked about jobs requiring a secondary degree and then about jobs requiring a postsecondary degree (Table 3.1). The table shows the percentage of employers who ranked that skill among the top three skills. We ranked each skill relative to other skills based on the percentage of employers who chose that skill among the top three. For example, for jobs requiring a secondary degree, 42 percent of employers chose customer-handling, followed by willingness to work hard (32 percent), written communications (32 percent), and oral communications (29 percent) among their top three.⁷ For jobs requiring a postsecondary degree, top rated skills by the percentage of employers choosing them

⁷ Customer-handling refers to professionally dealing with customers, addressing their concerns, and solving their problems and may involve interaction face-to-face, over the phone, or in writing.

Table 3.1
Top Three Most Important Skills, by Level of Schooling Required for the Job

Skill	Secondary		Postsecondary	
	Percentage	Rank	Percentage	Rank
Work attitude, ethic, and motivation				
Willingness to work hard	32	2	19 ^a	7
Willingness to learn	13	9	11	14
Positive attitude	15	7	18	8
Communications and interpersonal				
Oral communications	29	4	20 ^a	5
Written communications	32	3	19 ^a	6
Customer-handling	42	1	21 ^a	4
Teamwork	15	8	10	15
Problem-solving	8	16	6	19
Reading, writing, and computer literacy				
General IT	17	6	16	12
Professional IT	8	17	10	16
Numeracy	8	15	21 ^a	3
Reading	7	18	17 ^a	11
Writing	8	14	17 ^a	10
Language				
English	9	13	21 ^a	2
Arabic	11	11	9	18
Job-specific knowledge and experience				
Specialized technical knowledge	6	19	18 ^a	9
Practical technical experience	18	5	24	1
Management and administrative				
Management	11	10	15	13
Office administration	11	12	10	17

SOURCE: RAND Corporation, 2012.

NOTES: The table shows the percentage of times each set of skills was chosen as a top three most important skill set for job applicants to possess. Authors ranked the skill based on the percentage of employers indicating it is in the top three (n = 360).

^a Indicates that the difference between the share of employers rating this skill among the top three for jobs requiring a postsecondary degree is statistically significantly different at the 1 percent level from the share of employers rating this skill among the top three for jobs requiring a secondary or vocational degree.

among the top three were practical technical experience (24 percent), numeracy, English, and customer-handling (all 21 percent). We tested for statistically significant differences between the two groups and found that employers are statistically significantly more likely to emphasize communications skills, customer-handling, and willingness to work hard than other skills for secondary-level graduates and numeracy, reading, writing, English, and specialized technical skills for postsecondary graduates. In the remainder of this section and for ease of discussion, we review the findings from the survey and employer interviews by each skill grouping above.

Worker Attitude and Motivational Skills

Employers we surveyed emphasized willingness to work hard and positive attitude for both jobs requiring a secondary degree and jobs requiring a postsecondary degree (Table 3.1). In the survey, we also asked employers to rate employee attitude and work ethic. Although a majority expressed general agreement with statements that they are satisfied with the attitudes toward work and the work ethic of their employees who are from the KRI, sizable shares of employers expressed dissatisfaction with attitudes toward work (18 percent) and work ethic (31 percent). In our discussions with employers, we heard complaints that the local labor force within the KRI displayed a poor attitude toward work. Private employers suggested that they hire expatriate labor because those workers are more willing to work longer hours and put forth greater effort. This sentiment was cited both by private businessowners as well as public officials in our qualitative discussions.

Communication and Interpersonal Skills

These types of skills are also referred to as soft skills because they require communicating with customers and work colleagues or working on teams and problem-solving (International Labour Organization, 2008, 2010b; World Bank, 2010; Axmann, 2004). Hard skills refer to the substantive or technical core knowledge required for the job. In our survey of employers, soft skills were considered especially important for jobs requiring a secondary degree. The importance of these skills is also supported in the literature, where we found increasing emphasis by employers on these types of skills. For example, “the ability to think in functional matters, to plan precisely, to anticipate difficulties, and to implement solutions that truly respond to problems” are considered desirable skills by employers (Axmann, 2004, p. 3; ILO, 2010a).

Literacy

We group reading, writing, numeracy, and computer skills under a broad category of literacy. These include the basic reading comprehension and writing skills useful for writing reports and longer documents, as well as some basic math skills and computer skills that are also becoming increasingly relevant. In general, these types of skills came through as statistically significantly more important and valued among professional job applicants for those jobs that require a technical institute or university degree than secondary or vocational education (Table 3.1). Additionally, among our surveyed employers, around 36 percent expressed dissatisfaction with their employees’ writing and language skills, which is a significant share of employers expressing concern about a basic skill required for the job.

Foreign Language Skills

Foreign language skills, most predominantly English language skills but also Arabic language skills and sometimes Turkish language skills, were commonly cited in both our qualitative and

quantitative findings as being important and valued by private-sector employers. Among jobs that require a secondary school or vocational degree, 11 percent of employers placed Arabic skills in the top three, and 9 percent ranked English skills in the top three. Among those jobs that require a technical institute or university degree, English ranked in the top three 21 percent of the time and Arabic 9 percent of the time. The emphasis on English language for the higher-skilled positions is generally consistent with our qualitative findings, which were gathered primarily from large companies and multinationals. That is, our qualitative interviews with employers suggest that English in particular is important to have especially for skilled professional positions.⁸

Employers noted that English language knowledge gave applicants an edge in job interviews and that almost any job would be open to an English language speaker because firms would then train that person, expecting that the job-specific skills could be more easily learned than the English language. In addition, employers noted that the combination of English language skills and IT skills was highly valued. Some larger private employers even told us that a good command of English was mandatory for them to make a hire, and one participant from a company with international investment said that the official language of their company was English. However, even those we interviewed who hire employees with technical and vocational training consistently look for English or Arabic skills, pointing out that many machines have instructions in English or Arabic, but rarely Kurdish.

Similarly, because the KRG has decided to emphasize the development of its tourism industry, a command of foreign languages is essential. Thus, at any level and across a variety of industries, it is clear that foreign language skills are a valuable asset for employment in the private sector. Language is also an issue when considering leveraging employer-provided training, because technical training outside the KRI is often conducted in English.

Job-Specific Knowledge and Experience Skills

Employers emphasized both specialized technical knowledge and practical experience for jobs requiring a postsecondary degree and practical experience for jobs requiring a secondary degree. A common theme that arose in many of our conversations and interviews with employers is that there is a dearth of specific professional-level skills among the local labor force. Even where university graduates have a relevant degree in the subject, some employers noted that the content of the degree is not as rigorous or up-to-date as necessary. This leads private employers who need specialized professional skills to bring in employees from outside the KRI, either as consultants or occasionally as permanent employees. This makes the KRI not so different from many MENA region economies. Representatives of the private sector have argued that in some MENA countries (primarily the Gulf region), where job creation has been high, a substantial proportion of those jobs, especially the high-skilled ones, tend to go to expatriates. Expatriates, private-sector representatives argue, tend to possess the requisite skills and the motivation to fill those jobs (Saudi Basic Industries Corporation [SABIC], Booz & Company, and World Economic Forum, 2012).

⁸ We note that this may be because many, but not all, of our conversations were conducted in English with Kurdish or Turkish translation. Some of our conversations were conducted in Arabic with Kurdish or English translation. None of our conversations were conducted solely in Kurdish or Turkish, although a very small portion of our conversations were conducted solely in Arabic.

Many of our interviews with business people also revealed a sentiment that technical and vocational skills, taught at secondary vocational schools or postsecondary technical institutes, were missing among the local labor force. Employers cited the need for plumbers, carpenters, and other trade skills and in some cases felt compelled to bring in workers from outside the KRI to fill those positions. Employers described a local cultural bias in which few people viewed entering a vocational trade as a path to a satisfactory job and lifestyle, even when vocational jobs go unfilled by local workers. Employers emphasized the importance of practical experience for both secondary and postsecondary types of jobs, suggesting a need to incorporate practical training as part of curricula at both levels.

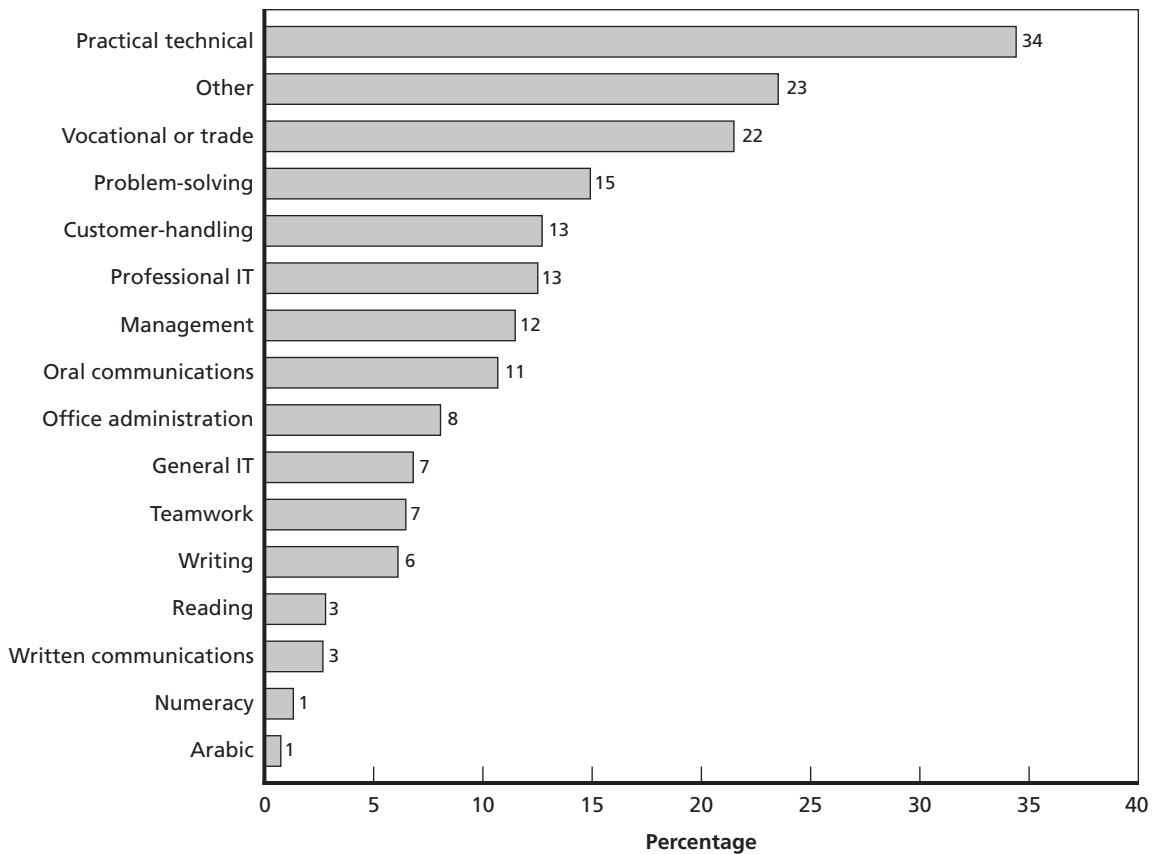
Management and Administrative Skills

Management skills broadly encompass the ability to organize a workforce and company, identify, prioritize, and delegate tasks appropriately, and ensure the smooth operation of an enterprise. Administrative skills are a related set of skills with more emphasis on organizing work, recordkeeping, logistics, and other administrative tasks. A common theme that arose in many of our qualitative discussions and interviews was the lack of “modern management methods”—the knowledge of how to organize and structure a company, arrange the lines of control, communicate across different departments within a company, and delegate tasks. Our quantitative survey results show that management skills in general are viewed as important, particularly for jobs requiring a technical institute or university degree. Around 15 percent of employers ranked management skills as one of the top three most important skills for jobs requiring a technical institute or university degree (Table 3.1).

Salesmanship and Commercial Skills

Our quantitative survey does not ask specifically about “salesmanship” skills—the ability to attract a customer and successfully develop commercial activity in the form of new or increased sales. However, this theme came up in our qualitative conversations and interviews as important across a variety of sectors, including IT and the service industry. Employers noted that their employees did not know how to approach sales tasks and sometimes lacked the motivation to find new customers. Basic customer satisfaction skills also seem centrally related to the objective of growing a private-sector economy considering that a large share (over 60 percent) of business establishments in the KRI as of 2009 were in some sort of business sector for which salesmanship and basic commercial skills are likely to be centrally important. These sectors include wholesale and retail trade, motor vehicle sales and repair, hotels, restaurants, and tourism. These skills are likely to be closely related both to the attitude and motivational skills mentioned above as well as to basic communications and interpersonal skills. However, salesmanship skills include the additional element of needing to attract and subsequently persuade a customer to make a purchase of some sort.

Figure 3.9
Type of Training Provided in Firms Reporting Some Form of Training, 2012



SOURCE: RAND Corporation, 2012.

NOTES: Question: What kinds of formal training are offered to employees? (n = 73). Percentages shown are conditioned on employers responding that they provided training. A majority of employers did not respond that they provided training and thus were not asked the question on the types of training provided. In cases where only a subset of our employers responded to a question, one or more strata of size, location, and sector contained only one sampling unit and a variance could not be computed. In those cases, a variance was computed by taking the average variance across strata with multiple sampling units.

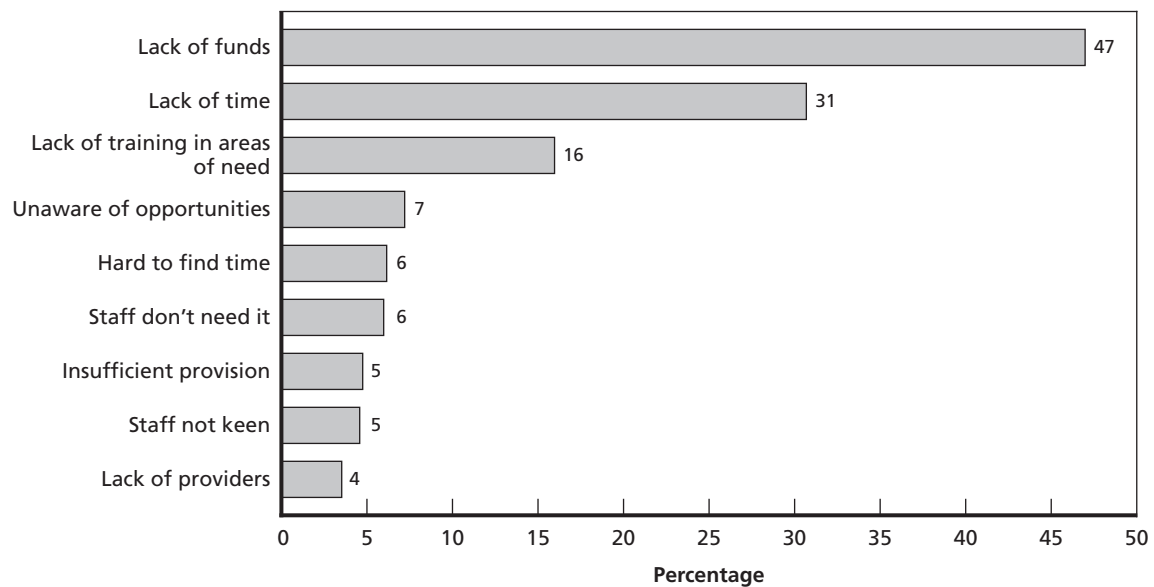
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Employer-Provided Training and Barriers

We wanted to understand what types of training were provided by employers to address skills gaps or to upgrade employee knowledge and skills (Figure 3.9). Around 20 percent of employers reported that they provide training to employees.⁹ Of employers who reported providing training, the most frequently cited was in practical, technical, or workplace skills; vocational or trade; and other types of training specific to the employer. A smaller share of employers reported providing training in languages or literacy skills. Over the entire sample of surveyed employers, fewer than 10 percent (the unconditional percentage) provide training in any one of the areas shown in the figure.

⁹ By way of comparison, in 2009, a survey of 55 countries found that 36 percent of firms reported offering training. This ranged from 5 percent of firms in Indonesia to 80 percent of firms in Samoa (World Bank, undated).

Figure 3.10
For Employers Reporting Barriers to Training, Percentage Noting Specific Barriers to Providing Training, 2012



SOURCE: RAND Corporation, 2012.

NOTES: Question: What barriers have been preventing your organization from providing more training for employees at this location? (n = 68). Percentages shown are conditioned on employers responding that they encountered barriers to providing training. A majority of employers did not respond that they encountered barriers and thus were not asked the question on the types of barriers encountered. In cases where only a subset of our employers responded to a question, one or more strata of size, location, and sector contained only one sampling unit and a variance could not be computed. In those cases, a variance was computed by taking the average variance across strata with multiple sampling units.

RAND RR489-3.10

The relatively low share of employers providing training suggests that they could be facing obstacles to provide training. This is not supported by findings from our survey, as only 24 percent of employers indicated that they encountered obstacles. In fact, approximately 66 percent of employers reported that they neither provided training nor faced obstacles to providing training. This suggests that employers may simply be choosing not to provide training. Among those who cited barriers, the most frequently cited was lack of funds (47 percent) (Figure 3.10). Although this was most frequently cited by those who cited barriers, it is still less than 10 percent (the unconditional percentage) of all surveyed employers. Less-frequently cited but still cited by a large share of employers (31 percent) was difficulty sparing staff time to get training and unavailability of training in the areas required (16 percent). In our interviews with employers, some expressed concern over spending the resources to train their staff for fear that the employees would leave soon after training to go to a government job or a competitor. This means that many of these skills are missing in the local labor force, but this also creates opportunities for policy interventions to alleviate the problem. The following examples requires further study to ensure that they can be effective but include targeted subsidies and other incentives or lowering the relative desirability of government employment.

Implications for the Private-Sector Labor Market in the KRI

Our qualitative interviews, mostly with large firms and multinationals, revealed a general dissatisfaction with the preparation of KRI graduates for work. This is in contrast with our survey findings of a broader group of employers, which suggested that the majority of employers in the KRI view graduates (particularly postsecondary graduates) as prepared for work. Even based on surveys of employer attitudes in other countries, included in our review of the literature (IFC and IsDB, 2011; Mourshed, Farrell, and Barton, 2012), the findings suggest that employers in the KRI generally have a more favorable view of recent graduates than those in other countries both in the region and outside. However, at least some employers surveyed did indicate concerns about the preparation of recent graduates and reported difficulties hiring locally.

A quarter of employers reported difficulties filling positions requiring a secondary or vocational degree with locally hired labor. Among that share, the most frequently cited reason was lack of experience followed by lack of qualifications. Nonetheless, those citing difficulties remain a relatively small share of all surveyed employers (fewer than 10 percent). Although a third or more of surveyed employers reported that they somewhat often or very often had to look for non-nationals of the KRI to fill their workforce needs, fewer than 20 percent of the workforce is made up of non-KRI nationals. Large firms are more likely to employ non-KRI nationals and, although these firms represent a small share of all firms in the KRI, they reported the greatest growth potential in terms of new hiring. As more and more large firms establish operations in the region, there is a potential for an increasing trend toward hiring individuals from outside the KRI to meet workforce needs.

Around 30 percent of employers cited difficulties hiring for certain occupations. Among those employers, the most frequently cited occupations for which it was difficult to find local staff were the technical occupations, such as master technicians and engineering technicians. This remains around 11 percent of all surveyed employers (unconditional percentage). Nonetheless, in interviews, employers reiterated a demand for basic vocational and technical skills coupled with practical experience.

Firms were also asked to indicate the top three skills they looked for in candidates for jobs requiring a secondary degree and separately for jobs requiring a postsecondary degree. Employers emphasized customer-handling for jobs requiring a secondary school degree as well as for jobs requiring postsecondary education and training. Employers were more likely to emphasize communications skills, such as written and oral communications, as well as a good work ethic in candidates for positions requiring a secondary school education. For jobs requiring a postsecondary degree, employers looked for practical technical experience, numeracy, IT skills, and English language skills.

The survey substantiated the importance that employers we interviewed gave to soft skills, such as communications and interpersonal interaction, as well as teamwork and problem-solving. Most employers interviewed emphasized the need for job-seekers to have practical experience, and this skill was rated highly by employers for jobs requiring either education level. With the rapid economic expansion of the KRI and the opportunities for further growth that has attracted multinationals, more and more private-sector employers are also looking for individuals with additional language ability—especially Arabic or English. Employers stated that knowledge of a second language is important both to facilitate communication as well as benefit from training programs that may be available only in Arabic, English, and sometimes Turkish.

Scenarios for Sectoral Employment Growth in the Kurdistan Region–Iraq

We have so far provided information on the future supply of labor and on employer demand for skills. As the economy grows, certain economic sectors likely will gain employment more rapidly than others. These sectors will have the companies with the greatest hiring activity and will provide the most opportunity to future job-seekers. In this chapter, we aim to give KRG policymakers a better idea of potential futures for sectoral employment growth in the KRI from 2010 through 2025.

To understand potential futures, we drew on historical evidence about how employment in small and medium-sized resource-rich economies has developed. Specifically, we selected a set of countries with characteristics similar to those of the KRI, including natural resources, agriculture, and tourism. We narrowed that set by including only countries with a per capita gross domestic product (GDP) that the KRI could reach over the next 15 years. We then investigated the evolution of employment in those economies.

We did so in two ways:

- First, we analyzed how employment grew in the major sectors of the economy.
- Second, we analyzed how employment grew in specific manufacturing industries, since increasing manufacturing employment is a priority of KRG policymakers.

We found that in some cases, manufacturing did indeed grow. But more commonly, services sectors, such as construction; wholesale and retail trade; and transport, storage, and communications, were the leading growth sectors for employment in our comparison countries.

These results do not predict future employment in the KRI. However, they do present scenarios that can guide policymakers as they prepare the next generation for the job opportunities that will exist in 10 to 15 years.

In this chapter, we first show how we selected our comparison countries. We then analyze how employment evolved in the major economic sectors of these countries. Following that, we present employment growth patterns in specific manufacturing industries. We conclude the chapter with a discussion of implications for the KRI economy.

Country Selection

Our first step was to select comparison countries. In a recent article, Justin Yifu Lin, the chief economist of the World Bank, and Célestin Monga (2011) outlined a new method, called the Growth Identification and Facilitation Framework, that policymakers could use to identify

sectors that might show promise in the future. This method involves selecting countries that, compared to the target country, have a similar structure in their relative amounts of labor, capital, land, and other resources (known as the endowment structure of a country), have a 100 percent higher per capita income, have grown rapidly for two decades, and have sectors that can trade their products internationally and have grown rapidly for two decades as well.¹ This strategy should not be viewed as a blueprint but instead is meant to provide insight into the various ways that these economies grew.

Unfortunately, data limitations did not allow us to fully quantify the KRI's endowment structure, sector structure, and even per capita income. In addition, we wanted to investigate the potential growth of sectors that do not trade their output internationally. Accordingly, although we followed the spirit of the Growth Identification and Facilitation Framework, we modified it a great deal to use it for our purposes. First, we chose a 15-year time frame because the KRG, as a young government, is still developing its abilities to develop longer-range policies. Second, because of data limitations, we were less exact in our screening criteria, choosing countries that had natural resources and agricultural potential—characteristics of the KRI economy; a broadly similar population; and a level of per capita GDP in 2010 that the KRI could feasibly reach by 2025, rather than countries with twice the per capita income, because of uncertainties about the KRI's gross regional product. The development patterns of such economies between 1995 and 2010 could provide valuable lessons for the KRI regarding the future path of its own economy.

The specific criteria for inclusion of countries in the comparison list are as follows. In each case, we chose screening criteria that would eliminate extremes, such as no oil production or no agricultural sector.

- **2010 per capita GDP of between \$6,000 and \$16,000 in terms of purchasing power parity (PPP).** This range reflects income levels that KRI could expect to reach in 15 years. Although the GDP of the KRI is not known, estimates by several analysts have put the figure in the \$5,000 range, sometimes in nominal terms and sometimes in PPP terms. For convenience, we base our analysis on the idea that KRG per capita PPP GDP is around \$5,000, so the range of \$6,000 to \$16,000 reflects an average annual growth rate of between about 1 percent and 8 percent. In the 11 15-year periods from 1985–2000 to 1995–2010, there were 807 instances of developing countries achieving annual growth of between 1 percent and 8 percent over 15-year periods, or 64 percent of growth patterns for all developing countries in all periods. This suggests that 1 percent to 8 percent can be achieved, but not all countries do so. This screening criterion led, independently, to the exclusion of 136 countries.²

¹ Sectors that produce goods traded internationally are known as tradables sectors. We discuss these sectors below. We thank Professor Justin Yifu Lin for personal communications clarifying our understanding of the Growth Identification and Facilitation Framework (Lin, 2013).

² We used the variable “cgdp” from the Penn World Tables version 7.1 for our PPP per capita GDP data (Heston, Summers, and Aten, 2012). PPP terms (in 2010 international dollars) support a more accurate cross-country comparison than U.S. dollar data. PPP terms take account of the fact that the same goods and services may have very different prices in different countries. For example, a haircut in the KRI might be very cheap compared to a haircut in the United States, but people generally earn more in the United States, so the U.S. haircut might seem cheap to them whereas the haircut in the KRI might seem expensive to a laborer there. For episodes in which we found 807 instances of developing countries' growing at an annual rate between 1 percent and 8 percent over 15-year periods, we used the variable “NY.GDP.PCAP.PP.KD,” per

- **1995 annual natural resource depletion levels of above 1 percent of gross national income (GNI).** This screening criterion was chosen to reflect the fact that the KRI is rich in oil resources. Specifically, the KRI reportedly has 45 billion barrels of proven oil reserves (*The Review*, 2013b). This means that if the KRI were an independent country, it would have the tenth-largest proven oil reserves as of 2012, just behind Libya but ahead of Nigeria. Already, expected oil production for 2013 is 250,000 barrels per day, with a target of 1 million by 2015. In 2012, 1 million barrels per day would have made the KRI the world's twentieth-largest oil producer, behind Libya and ahead of the United Kingdom (BP, 2013; *The Review*, 2013b; Stanley, 2013). We used data that include not only energy depletion but also net forest depletion and mineral depletion, since the effect of such depletion on the labor-market structure and on the macro economy is similar. This screening criterion led, independently, to the exclusion of 80 countries.³
- **1995 agriculture value added above 3 percent of GDP.** Historically, what is today the KRI was a leading wheat-producing area of Iraq (McDowall, 2004, pp. 117–118). Although the agricultural sector is still being rehabilitated, there is widespread agreement that it has high potential because of favorable climate, land, and water conditions. The extent of this potential is, as yet, not well defined. Because most developing countries have sizable agricultural sectors, this screening criterion was chosen to eliminate those with very small or no such sectors. This screening criterion led, independently, to the exclusion of only 25 countries.⁴
- **1995 population of between 5 million and 50 million.** By adding this screening criterion, we were able to focus on economies with populations (and hence, labor markets) that in 1995 were not smaller than that of the KRI today but that are also not more than ten times larger. This criterion is especially important given economies of scale and network effects that could determine the structure and dynamics of labor markets. This screening criterion led, independently, to the exclusion of 111 countries.⁵

We also noted, but did not screen on, percentage of employment in tourism.

capita GDP in PPP terms in constant 2005 international dollars, from the World Bank's World Development Indicators, as of June 11, 2013.

³ Figures were obtained from the 2012 version of the World Development Indicators (indicator name: "Adjusted savings: natural resources depletion [% of GNI]"). The definition in World Development Indicators is: "Natural resource depletion is the sum of net forest depletion, energy depletion, and mineral depletion. Net forest depletion is unit resource rents times the excess of roundwood harvest over natural growth. Energy depletion is the ratio of the value of the stock of energy resources to the remaining reserve lifetime (capped at 25 years). It covers coal, crude oil, and natural gas. Mineral depletion is the ratio of the value of the stock of mineral resources to the remaining reserve lifetime (capped at 25 years). It covers tin, gold, lead, zinc, iron, copper, nickel, silver, bauxite, and phosphate." For screening purposes, countries were not dropped if data were missing.

⁴ Figures were obtained from the 2012 version of the World Development Indicators. The definition in World Development Indicators is: "Agriculture corresponds to ISIC divisions 1–5 and includes forestry, hunting, and fishing, as well as cultivation of crops and livestock production. Value added is the net output of a sector after adding up all outputs and subtracting intermediate inputs. It is calculated without making deductions for depreciation of fabricated assets or depletion and degradation of natural resources. The origin of value added is determined by the International Standard Industrial Classification (ISIC), revision 3. Note: For VAB countries, gross value added at factor cost is used as the denominator." For screening purposes, countries were not dropped if data were missing.

⁵ Figures were obtained from Penn World Tables version 7.1.

The resulting list includes 14 comparison countries: Algeria, Argentina, Azerbaijan, Chile, Colombia, Ecuador, Guatemala, Kazakhstan, Malaysia, Peru, Romania, South Africa, Tunisia, and Venezuela (Table 4.1). This group includes a diverse set of economies from different parts of the world. These economies have varied economic, geographic, and cultural characteristics and have developed in the past years in different ways, ranging from “growth miracles” to notable macroeconomic failures. Beyond their diversity, the countries in the list share with the KRI such characteristics as significant natural resource extraction, employment in tourism, and the potential for sizable agricultural sectors. Some have large Muslim populations, and two, Azerbaijan and Kazakhstan, are landlocked countries.

We can divide these countries into four groups of similar size, by defining high growth as an annual growth rate of larger than 2.3 percent or more and low growth as annual growth rate below that level and by defining low volatility as a coefficient of variation of 1 or less and high volatility as a coefficient of variation of greater than 1 (Table 4.2). The coefficient of variation

Table 4.1
Comparison Countries

	2010	1995			1995–2010	
	Per Capita GDP (PPP)	Population (1000s)	Agricultural Value Added (% GDP)	Tourism Employment (% GDP)	Annual GDP Growth (%)	GDP Growth Standard Deviation (%)
Algeria	7,221	28,089	10.5	2.0	2.1	1.8
Argentina	14,512	35,274	5.7	2.8	2.7	4.8
Azerbaijan	10,752	7,555	27.3	1.9	11.7	7.8
Chile	15,961	14,207	9.2	2.7	3.1	3.1
Colombia	8,975	36,532	15.3	2.0	1.3	3.0
Ecuador	7,346	11,266	—	1.7	1.8	3.6
Guatemala	7,071	10,028	—	1.6	1.4	1.3
Kazakhstan	15,380	15,878	12.9	0.9	6.8	5.9
Malaysia	13,993	20,339	12.9	6.4	2.3	5.0
Peru	9,010	23,863	8.8	1.7	3.3	3.6
Romania	11,761	22,687	21.4	3.4	3.5	4.8
South Africa	8,908	42,228	3.9	2.1	2.2	2.2
Tunisia	7,532	8,947	13.0	7.0	2.1	2.0
Venezuela	11,778	21,549	5.5	2.6	0.1	7.2

SOURCES: Heston, Summers, and Aten, 2012; World Bank, undated; World Travel and Tourism Council, undated.

NOTE: Tourism employment is the direct contribution of travel and tourism to employment; annual GDP growth is the compound average annual growth rate.

Table 4.2
Country Groups

	High Growth	Low Growth
Low volatility	Group 1 Azerbaijan (11.70, 0.66) Kazakhstan (6.82, 0.85) Chile (3.06, 0.99)	Group 3 South Africa (2.24, 0.96) Algeria (2.13, 0.86) Tunisia (2.11, 0.92) Guatemala (1.35, 0.92)
High volatility	Group 2 Romania (3.47, 1.35) Peru (3.30, 1.06) Argentina (2.66, 1.74) Malaysia (2.31, 2.08)	Group 4 Ecuador (1.75, 1.97) Colombia (1.37, 2.15) Venezuela (0.15, 18.69)

SOURCE: Authors' computations from Heston, Summers, and Aten, 2012.

NOTES: Numbers in parentheses are the growth rate and coefficient of variation from 1995 to 2010. The growth rate shown is the geometric mean, also known as the compound average annual growth rate. The coefficient of variation is the standard deviation of annual growth rates divided by the arithmetic average of annual growth rates.

is the standard deviation divided by the average and is a common measure of volatility.⁶ First are those that have had rapid growth from 1995 to 2010 with little volatility. Second are those that have had rapid growth with large amounts of volatility. Third are those with slow growth and little volatility. Fourth are those with slow growth and large amounts of volatility. We can then see if the best-performing countries evolved any differently from the worst-performing countries and what implications this may have for the KRI.⁷

According to these numbers, the growth performance of Azerbaijan, Kazakhstan, and Chile would be the most desirable for the KRI to emulate, although that of Romania, Peru, Argentina, or Malaysia would be welcome as well. In contrast, the growth performance of Ecuador, Colombia, or Venezuela would be something that the KRI should try to steer away from. Unfortunately, we do not have sufficient data to include Algeria, Chile, and Guatemala in the analysis, so the remainder of this report focuses on 11 countries.

Growth of Employment in Major Sectors

In this section, we explore the evolution of employment in the comparison countries. To do so, we show how overall employment and employment by broad sector has changed in the period 1995 to 2009. We show the broad sectors in Table 4.3.

We used employment data from the ILO. Unfortunately, data were not available for all countries for all years. Accordingly, we show patterns only for those countries for which we had

⁶ We computed the coefficient of variation using the arithmetic mean of growth rather than the compound annual growth rate.

⁷ For some countries, the growth rate is sensitive to the base year. We calculate growth rates starting with the level of per capita GDP in 1995. However, Azerbaijan and Kazakhstan had negative growth of –27 percent and –12 percent from 1994 to 1995, respectively, and so our computations could have been somewhat different had we started with the level of per capita GDP in 1994. This would have had larger effects on the coefficient of variation than on the long-term growth rate, however.

Table 4.3
Broad Economic Sectors

Agriculture, hunting, and forestry
Fishing
Mining and quarrying
Manufacturing
Electricity, gas, and water supply
Construction
Wholesale and retail trade; repair of motor vehicles, motorcycles, and personal and household goods
Hotels and restaurants
Transport, storage, and communications
Financial intermediation
Real estate, renting, and business activities
Public administration and defense; compulsory social security
Education
Health and social work
Other community, social, and personal service activities
Private households with employed persons
Extra-territorial organizations and bodies

SOURCE: United Nations Statistics Division, undated.

NOTES: The table shows major economic sectors according to revision three of the International Standard Industrial Classification (ISIC rev. 3), the classification system used in the data of ten of the comparison countries. In our data, sectors in Venezuela are classified according to ISIC rev. 2, an older version, but the sectors were similar enough that we included Venezuela in the analysis.

at least five years of data. This eliminated Algeria, which has data only for 2001 through 2004; Chile, which has data only for 2002; Guatemala, which has data only for 2006; and Tunisia, which has no data for 1995 or later.⁸

We then focused in each country on those sectors that

- grew faster than the economy as a whole, from the first available year starting in 1995 to the last available year in that country's data
- employed more than 5 percent of the total workforce in the last available year in that country's data.

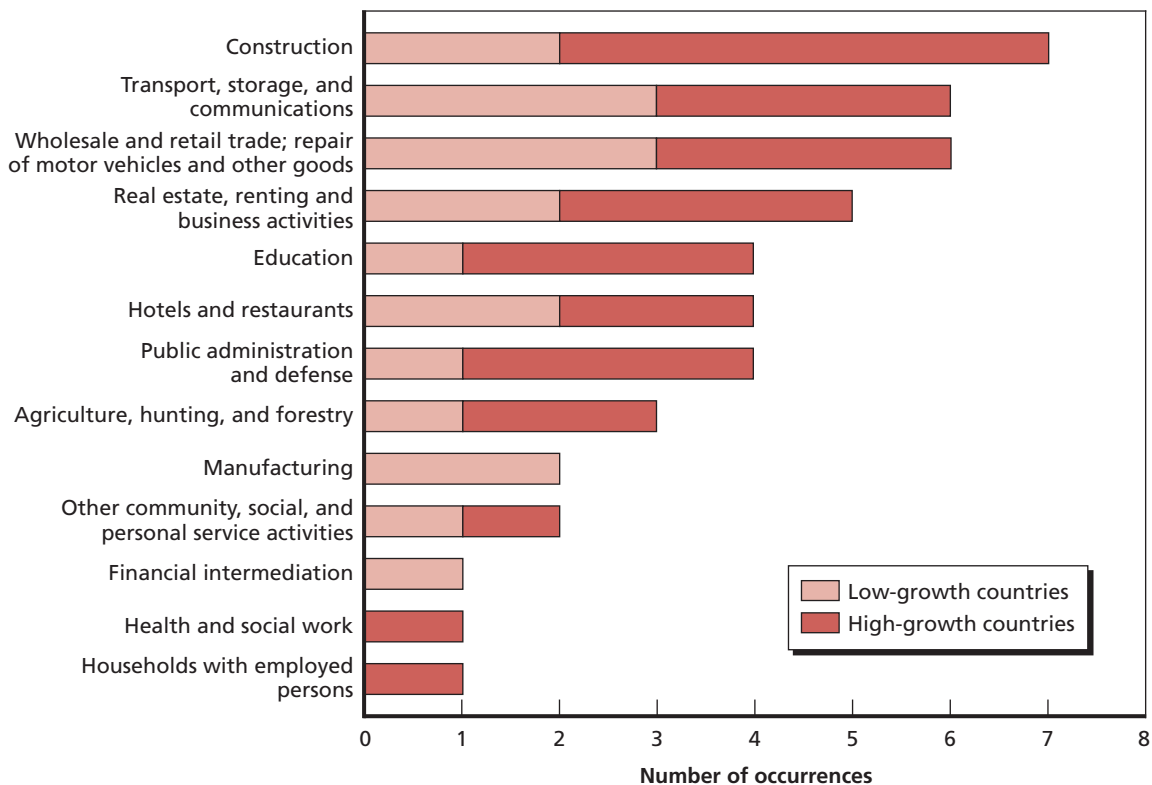
In other words, we selected sectors that encountered above-average employment growth and that employed a substantial share of the labor force.

⁸ In all countries except Venezuela, sectors are classified according to revision three of the International Standard Industrial Classification (ISIC rev. 3). Sectors in Venezuela are classified according to ISIC rev. 2, an older version, but the sectors were similar enough that we included Venezuela in the analysis.

We first did this using the longest time period available for each country, even though these periods are different for each country. The results showed that among the majority of countries in the sample, the following four sectors consistently had above-average employment growth and constituted a sizable share of employment: (1) construction; (2) transport, storage, and communications; (3) wholesale and retail trade; and (4) real estate, renting, and business activities (Figure 4.1). These sectors had above-average employment growth and had a sizable share of employment in both high-growth and low-growth countries. Running a similar analysis with a lower threshold that includes industries employing 3 percent of a country’s employees (as opposed to 5 percent) gave similar results, except for a much stronger prevalence of the public administration and defense sector and the real estate, renting, and business activities sector.

As noted, the countries analyzed in Figure 4.1 had data for different time periods. This is not wholly satisfactory because different sectors might have done well globally during dif-

Figure 4.1
Sectors with Above-Average Employment Growth and a Substantial Share of Employment
(Number of Occurrences in Nine Countries)



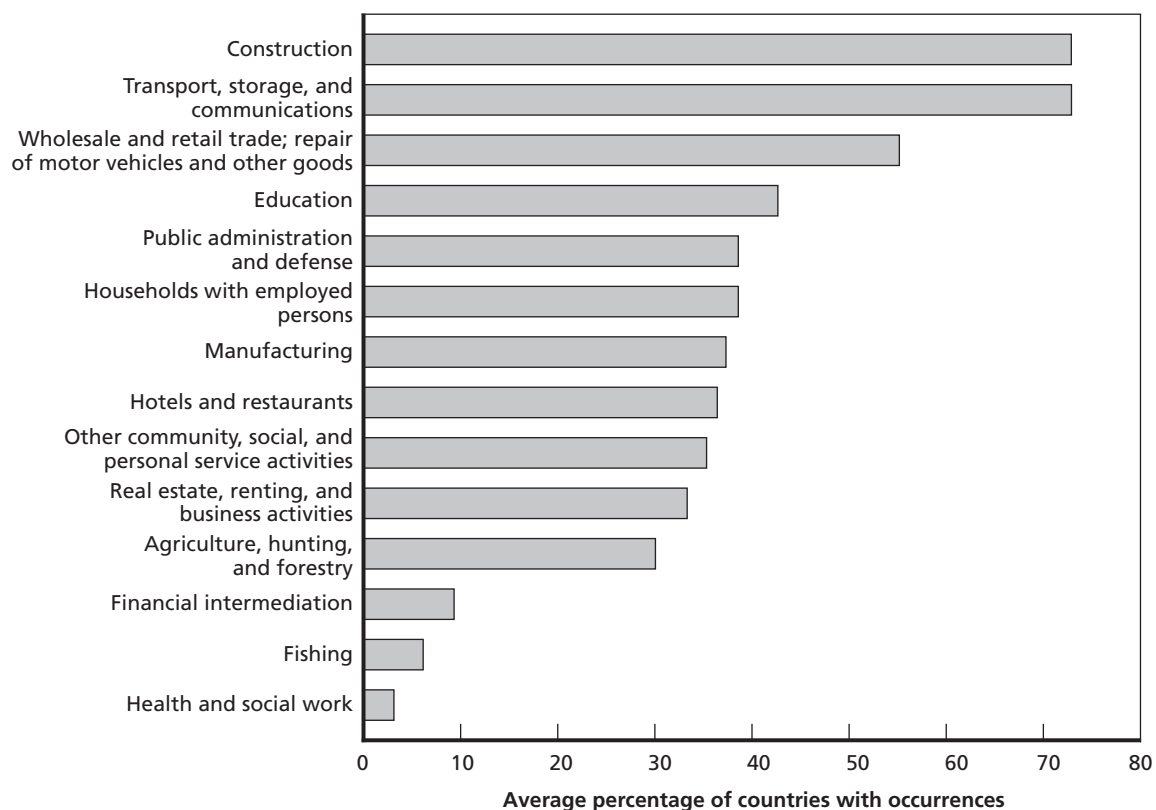
SOURCE: Authors’ computations from ILO, 2012.

NOTES: (1) An occurrence is counted when a sector employs more than 5 percent of a country’s employees and when its employment grows faster than that of the whole economy. (2) The countries in the sample and the time periods of their data are Argentina (1995–2006), Azerbaijan (2003–2008), Colombia (2002–2008), Ecuador (1999–2006), Kazakhstan (2001–2008), Malaysia (2001–2008), Romania (1995–2008), Peru (1996–2008), South Africa (2000–2008), and Venezuela (2001–2008). (3) The following four sectors did not have any occurrences and do not appear in the figure: electricity, gas, and water supply; extraterritorial organizations and bodies; fishing; and mining and quarrying.

ferent time periods. If this were the case, the results may be capturing global growth trends rather than country-specific sectoral growth trends. To overcome the time period differences that underlie the data in Figure 4.1, we also examined the data on four separate time periods for the subset of countries that have complete data during each of these periods. This enabled us to assess which sectors remained important across different time periods and country selections. These time periods were 1996–2006 (three countries with data for the full time period), 1999–2006 (four countries), 2001–2006 (eight countries), and 2003–2008 (eight countries).

The results were similar to our original analysis, suggesting that these growth patterns were typical for economies such as the KRI's, rather than being unique to one specific time period. We condensed our results for each time period into the percentage of countries in which a particular sector was large and had above-average employment growth. We then took the average of these percentages across the four time periods (Figure 4.2). The four sectors that most often were both large at the end of the period and experienced above-average employment growth are (1) construction; (2) transport, storage, and communications; (3) wholesale and retail trade; and (4) education. Furthermore, they were likely to be large and experience

Figure 4.2
Prevalence of Substantial and Above-Average Employment Growth Sectors in Four Time Periods



SOURCE: Authors' computations from ILO, 2012.

NOTES: (1) An occurrence is counted when a sector employs more than 5 percent of a country's employees and when its employment grows faster than that of the whole economy. (2) The countries in the sample are Argentina, Azerbaijan, Colombia, Ecuador, Kazakhstan, Malaysia, Romania, Peru, South Africa, and Venezuela. (3) The following three sectors did not have any occurrences and do not appear in the graph: electricity, gas, and water supply; extraterritorial organizations and bodies; and mining and quarrying.

above-average employment growth in each of the periods, not just in one or two. Interestingly, the real estate, renting, and business activities sector, which in Figure 4.1 was identified as large and with above-average employment growth, does not appear as notable on these dimensions in Figure 4.2. This suggests that it had above-average employment growth only during a specific time period and not across many time periods.

Countries sometimes have economic policies targeting specific sectors. Such targeted policies are also known as industrial policy. This raises the issue of whether the sectors that most often had above-average employment growth were specifically targeted. This appears to be unlikely. A scan of the economic policies of these 11 countries shows that since the early 1990s, with some exceptions, industrial policies involved either cross-sectoral programs, such as finance for small and medium-sized enterprises, or support for agriculture, manufacturing, or exports. In contrast, our analysis showed that sectors in which employment grew the most were not those that most frequently enjoyed favorable government support. It may be the case that supported sectors had higher employment growth than they would have had without support, but it is also the case that supported sectors did not routinely have employment growth greater than employment growth in the economy as a whole.

Implications

To summarize the findings in Figures 4.1 and 4.2, we divided the various sectors roughly into three categories (Table 4.4). The categorization helps identify sectors that are likely to have above-average employment growth and a sizable share of employment in the KRI, sectors that are not likely to have above-average employment growth or a large share of employment, and sectors that could have above-average employment growth and a large share of employment under specific circumstances.

These findings imply that the KRI could expect the following three sectors to employ a substantial share of the workforce and have above-average employment growth compared to the rest of the economy: (1) construction; (2) transport, storage, and communications; and (3) wholesale and retail trade.

At the same time, some sectors are not expected to be major sources of jobs and job growth. These include financial intermediation; fishing; health and social work; mining and quarrying; and electricity, gas, and water supply. Interestingly, international experience suggests that we should not expect KRI's energy-related sectors—mining and quarrying, and electricity, gas, and water—to become sectors with large amounts of employment. A closer look into the data revealed that even though in Argentina, Malaysia, and Kazakhstan these sectors experienced exceptionally above-average employment growth, they did not employ a substantial portion of the workforce. Of the countries in our sample, Kazakhstan had the largest mining and quarrying and electricity, gas, and water sectors, employing only 2.4 percent and 2.1 percent, respectively, of the economy's workers in 2008. Instead of employing large numbers of people, these sectors are capital-intensive, and their output and revenues serve as inputs into the growth of other sectors.

The remaining sectors are those that might prove to provide significant employment but only under specific circumstances. These include (1) education; (2) public administration and defense; (3) households with employed persons; (4) manufacturing; (5) hotels and restaurants;

Table 4.4
Categorization of Economic Sectors According to Frequency of Above-Average Employment Growth and Having High Employment Share

Category	Sector	Implications
High frequency and low variance	Construction	Likely to have above-average employment growth and a large share of KRI employment
	Transport, storage, and communications	
	Wholesale and retail trade, and repairs	
Moderate frequency and high variance	Education	Could have above-average employment growth and a large share of KRI employment under specific circumstances
	Public administration and defense	
	Households with employed persons	
	Manufacturing	
	Hotels and restaurants	
	Other community, social, and personal service activities	
	Real estate, renting, and business activities	
	Agriculture, hunting, and forestry	
Low frequency	Financial intermediation	Not likely to have above-average employment growth and a large share of KRI employment
	Fishing	
	Health and social work	
	Mining and quarrying	
	Electricity, gas, and water supply	
	Extraterritorial organizations and bodies	

SOURCE: Authors' analysis based on data from ILO, 2012.

(6) other community, social, and personal service activities; (7) real estate, renting, and business activities; and (8) agriculture, hunting, and forestry.

Agriculture, manufacturing, and tourism have been identified by KRG policymakers as particularly important in their view of the growth of the KRI.⁹ Agriculture has been emphasized because, historically, the KRI has been the most important agricultural region of Iraq and has a climate and water resources conducive to agriculture. But it has also been emphasized as part of a desire for greater self-sufficiency and security. There is interest in industry because under previous Iraqi regimes, the central government withheld industrial investment from Kurdish areas, and industry is viewed as a desirable source of employment. As with agriculture, there is also a desire to make locally what is needed locally. A detailed analysis of employment growth in the manufacturing sector appears below. Tourism has been empha-

⁹ In dozens of interviews since February 2010, KRG policymakers have emphasized the importance of these sectors in their vision of the economic development of the KRI. More recently, in two separate interviews, Herish Muharam, the head of the Kurdistan Board of Investment, has said that these are the priorities of the board (Marcopolis.net, 2013; *The Review*, 2013a).

sized because the KRI has a more diverse geography and milder climate than the rest of Iraq (N. Barzani, 2007; M. Barzani, 2009).¹⁰

These three sectors experienced above-average employment growth and had a sizable share of employment only in the following subset of comparison countries:

- Manufacturing had above-average employment growth and a large share of employment only in South Africa and Colombia. These two countries experienced relatively modest GDP growth (categorized in Group 3 and Group 4, above).
- Agriculture, hunting, and forestry had above-average employment growth and a large share of employment only in Azerbaijan, Ecuador, and Peru.
- Manufacturing and agricultural employment both increased faster than employment growth in the economy as a whole only in Peru and only during certain time periods. Hence, if KRI policymakers would like to see a significant expansion of both agriculture and manufacturing, the pattern of similar economies suggests that this will be difficult.
- Hotels and restaurants, which may serve as a proxy for tourism, had above-average employment growth and a large share of employment in Peru, Malaysia, Ecuador, and possibly South Africa.¹¹

Another convenient way to summarize these results is by dividing sectors into what are known as tradables and nontradables.¹² Tradables include agriculture, hunting, and forestry; fishing; mining and quarrying, which includes petroleum; and manufacturing. These are known as tradables because they make products that are easily traded on the international market, for example because their value is high relative to their shipping cost. The other sectors, such as hotels and education, generally provide goods and services that are consumed where they are produced. This is because they are difficult to ship or because the cost of shipping them is extremely high relative to their value. For example, it is generally much cheaper to have a routine dental checkup in one's own city than it is to travel abroad for a dental checkup or to bring in a foreign dentist to conduct the checkup. We note that with the advance of information and communications technology, some of these nontradables, such as education, are becoming tradables. But in general, the traditional division of sectors has remained valid.

The results of the analysis above revealed that the KRI should expect that its major employment growth will come from the nontradables sectors. The relative growth of employment in nontradables sectors characterized both high-growth and low-growth economies. On the other hand, the tradables sectors were rarely major drivers of job growth. It is certainly possible that the tradables sectors could experience employment growth above that of the economy as a whole in the KRI, but it is unlikely that such growth will occur in both manufacturing and agriculture together.

¹⁰ Investment projects that go through the Kurdistan Board of Investment may receive a variety of favorable business terms, including easier access to land, tax incentives, and favorable financing (KRG, 2006). As of March 2013, the board was working to increase the incentives it could offer to projects in agriculture, industry, and tourism (*The Review*, 2013a).

¹¹ Data for South Africa combine the hotels and restaurants sector with wholesale, retail trade, and repairs. Together they constituted 22.9 percent of the workforce and grew 26.9 percent from 2000 to 2008, but it is impossible using these data to identify whether hotels and restaurants, separately, grew rapidly and had a large share of employment.

¹² Sachs and Larrain, 1993, pp. 657–689.

In some ways, this is a standard pattern for growing economies.¹³ At some level of income, demand for nontradables rises as incomes rise. Since nontradables are produced in the country in which they are consumed, employment would naturally shift to production of nontradables as demand for nontradables rises.

Growth of Employment in Manufacturing

We now turn to the growth of specific manufacturing industries. Even though manufacturing has not proved to be a robust source of growth in our comparison economies, increasing employment in manufacturing is a priority of KRG policymakers. Therefore, we investigated which manufacturing sectors grew the most in our comparison countries.

As before, data were not available for all countries for all time periods. When data were available, we looked at growth from 1995 to 2009, but the periods were different for some countries. In addition, we did not have adequate data for Algeria, Chile, Guatemala, Peru, or Venezuela, but we did have data for Tunisia.

We divided manufacturing into 23 industries and classified them as high-technology or low-technology based on work by the Organisation for Economic Co-operation and Development (Organisation for Economic Co-operation and Development [OECD], 2011b).¹⁴ Of the 23 industries, eight are high-technology and 15 are low-technology (Table 4.5). Manufacturing employment data are from the United Nations Industrial Development Organization (UNIDO, 2012).

We then identified industries that

- grew faster than the whole manufacturing sector, from the first available year starting in 1995 to the last available year of data
- had an employment level of more than 5 percent of the total manufacturing workforce as of the last available year of data.

This allowed us to identify manufacturing industries that employed a substantial share of workers and experienced above-average employment growth.

We first did this using the longest time period available for each country, even though these periods were different for each country. The results showed that the food and beverages industry was the manufacturing sector most likely to have above-average employment growth and have a large share of manufacturing employment among our comparison countries (Figure 4.3). This was true in high-growth countries and low-growth countries. Other industries that had above-average employment growth and were large in at least three countries were non-metallic mineral products, basic metals, and fabricated metal products. All four of these industries are considered low-technology.

Running a similar analysis with a lower threshold that included industries employing 3 percent of the manufacturing workers, as opposed to 5 percent, resulted in similar industries appearing as large and with above-average employment growth, except for a much stronger

¹³ Anderson, 1987.

¹⁴ For the division of manufacturing into separate industries, we use the 23 manufacturing industries in ISIC rev. 3 (United Nations Statistics Division, undated).

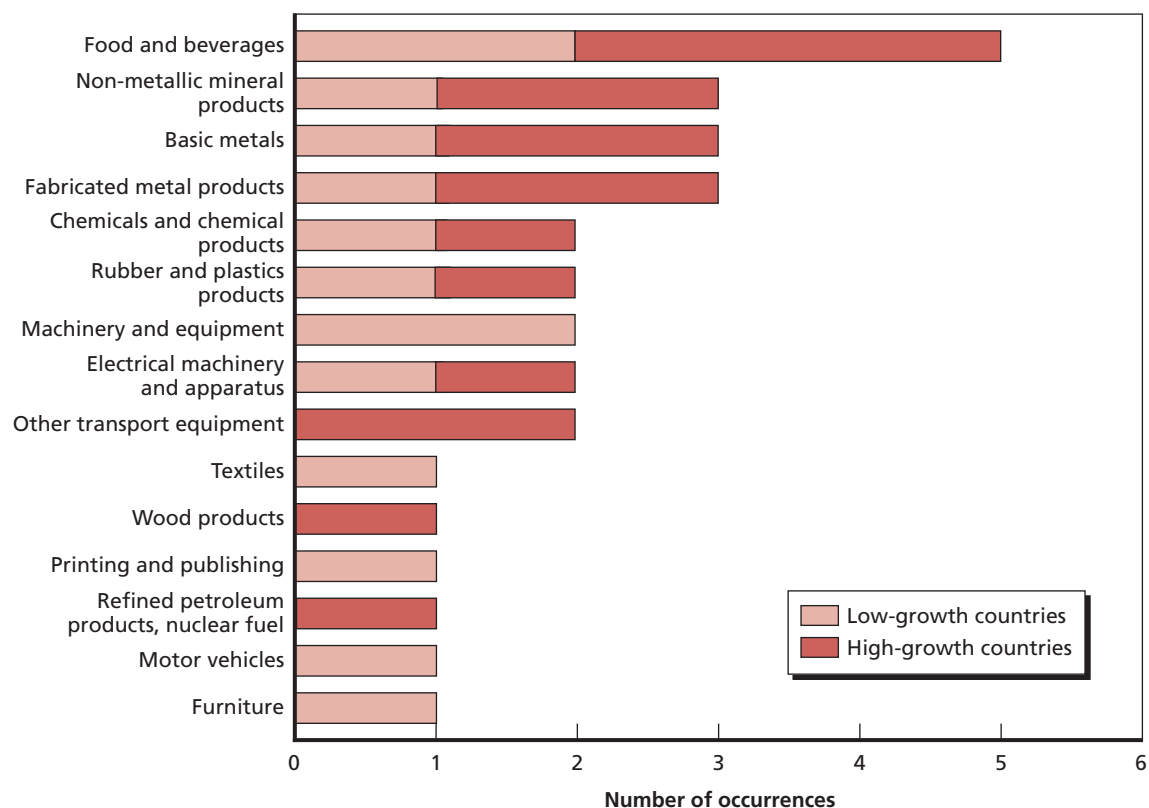
Table 4.5
Manufacturing Industries and Technology Levels

Industry	Technology Level
Manufacture of food products and beverages	Low
Manufacture of tobacco products	Low
Manufacture of textiles	Low
Manufacture of wearing apparel; dressing and dyeing of fur	Low
Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness, and footwear	Low
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	Low
Manufacture of paper and paper products	Low
Publishing, printing, and reproduction of recorded media	Low
Manufacture of coke, refined petroleum products, and nuclear fuel	Low
Manufacture of chemicals and chemical products	High
Manufacture of rubber and plastics products	Low
Manufacture of other non-metallic mineral products	Low
Manufacture of basic metals	Low
Manufacture of fabricated metal products, except machinery and equipment	Low
Manufacture of machinery and equipment not elsewhere classified	High
Manufacture of office, accounting, and computing machinery	High
Manufacture of electrical machinery and apparatus not elsewhere classified	High
Manufacture of radio, television, and communication equipment and apparatus	High
Manufacture of medical, precision, and optical instruments, watches, and clocks	High
Manufacture of motor vehicles, trailers, and semi-trailers	High
Manufacture of other transport equipment	High
Manufacture of furniture; manufacturing not elsewhere classified	Low
Recycling	Low

SOURCES: United Nations Statistics Division, undated; OECD, 2011b.

NOTES: The table shows manufacturing industries according to revision three of the International Standard Industrial Classification (ISIC rev. 3). The technology level is the authors' modified version of that found in OECD, 2011b. The classification system defines manufacturing as the physical or chemical transformation of materials or components into new products. For example, bottling of milk would be considered manufacturing as part of "Manufacture of food products and beverages," although maintaining a herd of dairy cows would be classified in an entirely different sector, "Agriculture, hunting, and forestry" (Table 4.3). Likewise, production in a refinery of petrol from crude petroleum would be considered manufacturing as part of "Manufacture of coke, refined petroleum products, and nuclear fuel," even though the extraction of crude petroleum would be in an entirely different sector, "Mining and quarrying" (Table 4.3).

Figure 4.3
Manufacturing Industries with Above-Average Employment Growth and a Substantial Share of Employment (Number of Occurrences in Nine Countries)



SOURCES: Authors' analysis based on UNIDO, 2012; United Nations, undated.

NOTES: (1) An occurrence is counted when an industry employs more than 5 percent of a country's manufacturing sector employees and when its employment grows faster than that of the whole manufacturing sector. (2) The countries in the sample and the time periods for which they have data are Argentina (1995–2002), Azerbaijan (1995–2009), Colombia (2000–2005), Ecuador (1995–2008), Kazakhstan (1998–2007), Malaysia (2000–2008), Romania (2003–2008), South Africa (1995–2009), and Tunisia (1995–2002). (3) The following eight industries did not have any occurrences and do not appear in the graph: tobacco products; wearing apparel, fur; leather, leather products, and footwear; paper and paper products; office, accounting, and computing machinery; radio, television, and communication equipment; medical, precision, and optical instruments; and recycling.

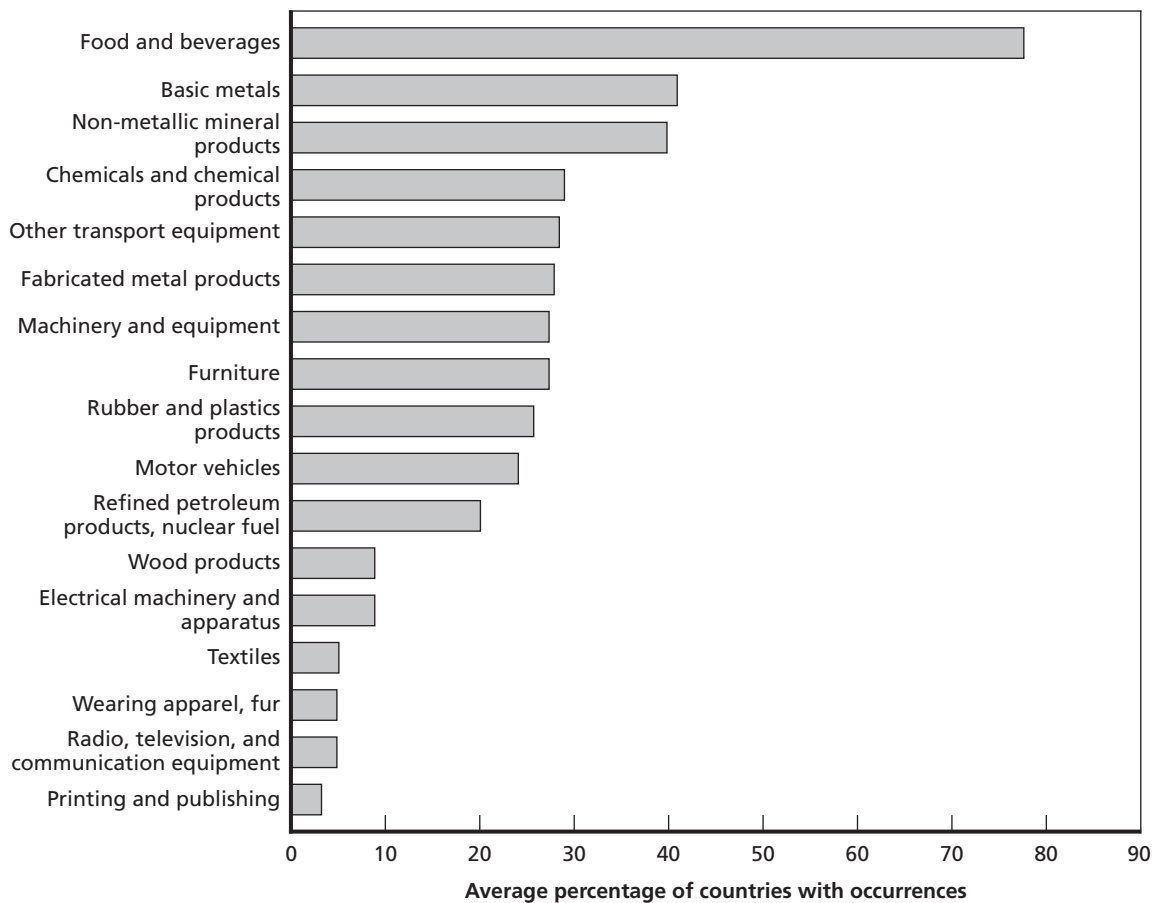
RAND RR489-4.3

prevalence of the printing and publishing industry. The reason for this is that even when this industry had above-average employment growth, it usually employed between only 3 percent and 5 percent of the manufacturing labor force.

As with the analysis of economic sectors given earlier in this chapter, we needed to see whether using different time periods for each country affected the results. In our manufacturing analysis, we also examined the data on five time periods for the subset of countries that have data during these periods. These periods were 1995–2008 (three countries), 1995–2002 (four countries), 2003–2008 (five countries), 2000–2005 (six countries), and 1998–2007 (four countries). This enabled us to assess which sectors remained important across different time periods and country selections.

We condensed our results for each time period into the percentage of countries in which a particular industry was large and had above-average employment growth. We then took the

Figure 4.4
Prevalence of Industries with Substantial and Above-Average Employment Growth in Five Time Periods



SOURCES: Authors' analysis based on UNIDO, 2012; United Nations, undated.

NOTES: (1) An occurrence is counted when an industry employs more than 5 percent of manufacturing sector employees and when its employment grows faster than that of the whole manufacturing sector. (2) The countries in the sample are Argentina, Azerbaijan, Colombia, Ecuador, Kazakhstan, Malaysia, Romania, South Africa, and Tunisia. (3) The following six industries did not have any occurrences do not appear in the graph: tobacco products; leather, leather products, and footwear; paper and paper products; office, accounting, and computing machinery; medical, precision, and optical instruments; and recycling.

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average of these percentages across the five time periods. Once again, food and beverages, basic metals, and non-metallic mineral products were among the top manufacturing industry based on employment growth and level (Figure 4.4).

Using the manufacturing analysis, we have identified seven industries that have shown a tendency both toward above-average employment growth and having a large share of manufacturing employment across our sample countries (Table 4.6). This combination of growth and size occurred across various time periods.

The first six industries in the list all had high employment and above-average employment growth in both high-growth and low-growth countries. All of them were also categorized as low-technology industries. The seventh on the list, "other transport equipment," differed in two

Table 4.6
Seven Top Manufacturing Industries in Terms of
Employment Share and Growth

Industry	Technology Level
Food and beverages	Low
Non-metallic mineral products	Low
Basic metals	Low
Fabricated metal products	Low
Chemicals and chemical products	Low
Rubber and plastics products	Low
Other transport equipment	High

SOURCES: Authors' analysis based on UNIDO, 2012; United Nations, undated; and OECD, 2011b.

ways. First, it was classified as high-technology, and, second, it had high levels of employment and above-average employment growth only in high-growth countries.

As noted above, the 11 countries in the analysis often had policies supporting the growth of manufacturing. Such policies usually targeted the manufacturing sector in general and enabled private decisions to guide investment. Therefore, it makes sense that most of the manufacturing industries we found to have above-average employment growth were associated with the endowment structure of the countries in which they grew, such as reliance on natural resources. In fact, in some countries that supported specific industries, those industries were not among the top industries in terms of employment growth. The food and beverage industry is to some extent different. This industry enjoyed considerable government support in some comparison countries and often had above-average employment growth.

Some of the industries that had above-average employment growth in the comparison countries may be well placed to grow in the KRI. These include food and beverages, given the KRI's agricultural resources; non-metallic mineral products, given the KRI's mineral resources; and both the chemical products industry—which includes petrochemicals—and the rubber and plastics products industry, given the KRI's access to hydrocarbon resources.

Even if these and other manufacturing sectors should grow, it is not certain that they will make a major contribution to overall employment generation. In most of our countries, their contribution was small. However, most of our comparison countries already had established manufacturing sectors. The KRI, because of its unique history, does not have a well-established manufacturing sector, suggesting that there may be room to grow. Nevertheless, the evidence suggests that growth in manufacturing will be only one piece, and not the major piece, of employment generation.

Implications for the Private-Sector Labor Market in the KRI

This analysis takes a longer-term perspective than the analyses of labor supply and labor demand in previous chapters by presenting selected case studies of employment growth in

economies to which the economy of the KRI can be compared. Although these case studies do not predict how employment in the KRI will grow, they show patterns of how employment has grown in similar economies that have an income level the KRI could reach in the next decade or 15 years.

In general, the most robust employment growth in the comparison countries came in the nontradables sectors. This suggests that, in preparing the workforce of the future, KRG policymakers will want to enable young people to gain the skills needed in those sectors. Top occupations in the three most important broad economic sectors highlighted above are largely those that need technical and vocational skills, such as construction trades workers, and those that need communication and customer-handling skills, such as retail sales workers. Key points for KRG policymakers include the following:

- There is likely to be growth in demand for skills related to construction, such as engineering and skilled trades.
- There is likely to be growth in demand for people who have good communications and customer-handling skills, which are needed in the service-oriented retail, hotel, and tourism industries.
- Business skills are likely to be in demand as well, for example in such sectors as wholesale trade and transport.
- Technical communications skills may be needed as the communications sector grows.

Increasing employment in the tradables sectors is a priority of KRG policymakers. These include agriculture, mining, petroleum, and manufacturing. Top occupations in the four most important manufacturing industries highlighted above are largely those that need technical and vocational skills, such as production occupations, assemblers and fabricators, and metal and plastic workers. There is also likely to be demand for advanced technical skills, such as those used by engineers and plant and system operators, and for business skills, such as those used by business operations specialists.

The fact that these sectors have generally not been the largest contributors to employment growth in comparison countries raises a note of caution. Past growth patterns of other countries do not necessarily mean that employment in these sectors will grow slowly in the KRI or that these sectors will have a small share of overall employment. However, those patterns suggest three important policy considerations:

- **KRG policymakers will need to be especially vigilant regarding any barriers that may exist to the growth of agriculture, mining, petroleum, and manufacturing and work to remove them.** Such barriers could include skills gaps; an unfavorable regulatory environment; complex rules and high costs that limit new, private companies from starting in those sectors; or poor trade infrastructure, among others. Agriculture, mining, petroleum, and some manufacturing industries may be compatible with the comparative advantage of the KRI. If so, additional useful policy steps by the KRG could include encouraging companies in more economically advanced countries to invest in the KRI, improving infrastructure, creating industrial parks or export processing zones, or providing tax or financial incentives for a short time but not by creating import protection or granting monopolies (Lin and Monga, 2011). If these sectors, especially agriculture or manufacturing, are not compatible with the KRI's comparative advantage, provid-

ing subsidies or other positive incentives could lead to inefficient investment and slower employment growth economy-wide.

- **Skills development in the KRI should not be tailored to or focused only on the tradable sectors.** Developing skills for a diversified set of sectors will be useful, as will the development of skills that can serve multiple sectors.
- **Although four-year university enrollments have increased, university education may not be required for many of the jobs that these sectors need.** Many of the skills needed in the future could be taught at high-quality secondary vocational schools, and for advanced qualifications, at the postsecondary technical institutes and colleges. The postsecondary technical colleges have seen a rapid expansion in enrollment, but their infrastructure has not been able to adapt and quality may have been compromised. A higher-quality secondary vocational system that trains students in marketable skills and trades may relieve pressure on the two-year technical institutes and colleges, which then can focus on the advanced technical qualifications. On the other hand, the university system is expanding rapidly, but the curriculum is not necessarily aligned with labor-market needs. Furthermore, expectations of graduates about the types of jobs they should have compared to the types that are available may not match. Better alignment between the secondary and postsecondary system and labor-market needs is necessary for the growth of the KRI private sector.

Labor-Market Information Systems

We have so far presented findings on projected labor-market entrants and their education and qualifications, employer demand for skills, and the likely trajectory of sectoral growth in the KRI's economy. As the KRI's economy continues to develop, and because of the KRG's expressed interest in achieving market-driven development with a growing share of private-sector employment, the KRG will benefit from monitoring labor-market trends with up-to-date and comprehensive information. Such information can help the KRG better respond to labor-market developments and inform policy decisions. In addition, as the economy develops and employers need employees with scarcer, more-specialized skills, informal job-search networks may not suffice as the primary way to match labor demand with labor supply as is done currently. More sophisticated and transparent matching processes may become necessary.

In their effort to develop better information, many countries have designated public offices to be responsible for collecting and compiling labor-market data. This is similar to the new duty of conducting quarterly labor-force surveys (LFSs) assigned to the KRSO in 2012. These offices or departments can compile and analyze labor-market data to help inform decision-making by employers, employees, educational institutions, policymakers, and others involved in the labor market. In some countries, public offices, sometimes the same ones assigned to collect and compile labor-market data, also oversee a labor-exchange service to match labor supply with labor demand, similar to the new Kurdistan Works website, started by the KRG in September 2013. Other countries reserve this matching function for the private sector, and many countries have both public and private efforts.¹ Whether run by the private or the public sector, a labor exchange operates as a central clearinghouse to match available jobs with job-seekers. In particular, public or private employers seeking new employees submit available job descriptions and can search the resumes of job-seekers who have used the exchange to advertise their availability and credentials.

The institutional arrangements and procedures that coordinate the collection, processing, storage, retrieval, and dissemination of labor-market information and that may host a labor exchange are known as a Labor Market Information System (LMIS) (Mangozho, 2002). As our work on labor-market supply and demand progressed, KRG policymakers requested that we also consider whether an LMIS is appropriate for the KRG in developing its labor policies and improving the private-sector labor market. Considering the possibility of an LMIS is also consistent with a broader KRG goal of having data-driven policy development. We do so in this chapter.

¹ A simple example of a private-sector labor-matching body would be the website Monster.com in the United States.

We emphasize the data-collection, analysis, and dissemination features of the LMIS, rather than the job-exchange features, because the two need not be connected to operate effectively. Although a public exchange can help the government compile timely data on job searches and vacancies, a private exchange could be run more efficiently.

Evaluation of LMISs

Establishing an LMIS has become more common in recent years in many developing and middle-income countries. The majority of developed countries already have LMISs in place. Multilateral institutions such as the World Bank, ILO, and the International Organization for Migration are or have recently been sponsoring projects to establish or improve LMISs in a variety of countries worldwide. Developing and developed countries, in turn, are increasingly adopting or establishing LMISs in the hopes that collecting and disseminating information on the labor market can help them track progress and implement appropriate policies to encourage labor-market development.

Despite their current popularity, there is no consensus among labor-market researchers on the actual economic effects of an LMIS, and there appear to be no definitive studies on their value. Although there is no evidence that LMISs worsen labor-market outcomes in any way, there is a lack of rigorous evaluations on the effects or the cost-effectiveness of LMISs (Murray, 2010). On the other hand, because numerous factors contribute to job search, career planning, educational offerings, business decisionmaking, and economic development, measuring the value of an LMIS can be difficult (Woods and O’Leary, 2006). In addition, a number of studies provide evidence that elements of LMISs can improve labor markets. These include studies finding that labor-market information improves the functioning of labor markets (cited in Woods and O’Leary, 2006), job-search assistance, career counseling, and Internet-based labor-market information and can improve labor-market outcomes (Murray, 2010).

However, this does not provide conclusive evidence that a comprehensive LMIS housed in a single institution can work well. In fact, there is counterevidence in some developing countries. During the 1990s, 22 of 24 World Bank technical and vocational education and training projects in sub-Saharan Africa included some form of LMIS to help create greater responsiveness to market forces. Results were mostly disappointing and implementation had problems. With one possible exception, no case of best practice could be drawn. The difficulty of establishing the LMIS was often underestimated (Johanson, 2002).

The true value of any LMIS for the KRI is likely to depend on how it would be designed, how often it would be used, how well it would function, and at what cost. We do not evaluate these measures in this chapter, since doing so is beyond the scope of the current study. Here, we explore in greater depth what an LMIS is, how it functions, and what current LMIS practices are in other countries to help provide context for the KRG to make an informed decision about whether an LMIS could be one useful tool for helping to develop the private-sector labor market. We also note two alternatives. The first is a decentralized privately provided system. The second is a decentralized government system, in which the most important functions of an LMIS continue to take place throughout the government, as is occurring now with the KRLFS and Kurdistan Works.

Labor-Market Information System Definition, Objectives, and Background

According to Murray (2010), the term “labor-market information” refers to three kinds of information: information about labor-market trends, including projections about future trends; information about specific job vacancies; and information about the skills, education, and other characteristics of individual workers.

An LMIS, in turn, can be thought of as the entity that collects, processes, and coordinates all available data on relevant labor-market information and stores and disseminates this information for use by all users in the labor market and in labor-market policymaking. Websites typically serve as outlets for the information in an LMIS. Users may include policymakers, educational and training institutions, researchers, career counselors, job-seekers, and employers. Collected data can include qualitative and quantitative information and should include information on both labor supply and labor demand. Besides pulling together information from various sources, an LMIS processes and analyzes it to produce tangible products for use by the various stakeholders to help in their planning. Well-functioning LMISs are intended to serve as a single source for access to reliable data and information to support informed decisionmaking on labor-market matters.

According to Martín (2011), an LMIS most commonly has two main objectives.

1. **Policy and decision support for tomorrow’s labor-market needs:** The first main objective of an LMIS is to enable better decisionmaking and policy planning, with an eye toward upcoming needs. An LMIS collects and processes relevant labor-market information to project future labor-market needs for skills (Martín, 2011). This is largely filled by the central data repository and dissemination functions of an LMIS. Students and other job-seekers, career counselors, educational and training institutions, and employers can use the information in this repository as an aid in their decisionmaking to plan for the future. The government itself is also a key user of an LMIS data repository, as representatives from various ministries can access the LMIS to help them decide which policies or programs to enact or repeal, in particular in the areas of labor-market and educational and migration policies (see Table 5.1 for examples of possible uses of an LMIS). Another potential advantage of having an LMIS includes having information about the current and future labor market available for educational and training institutes to ensure that course content is tailored to what is needed (Manzozo, 2002).
2. **Labor exchange for today’s labor market:** An LMIS can also serve a more immediate objective by working to improve the matching of labor supply and labor demand between job-seekers and employers offering jobs. This job-matching function of an LMIS aims to increase current employment, and the primary users of this function are employers looking to hire, job-seekers, and labor-market intermediaries such as career counselors.

In some countries, the LMIS primarily fills the first objective and the private sector primarily fills the second. It is therefore possible for an LMIS to fulfill only the first function of compiling labor-market statistics to inform decisionmaking. However, access to information about job vacancies, either at an individual level or aggregated by occupation and location, for example—information normally found in a labor exchange—will aid that decisionmaking.

Table 5.1
Summary of Data Inputs of an LMIS in Order of Priority

LMIS Function	LMIS Component	Notes
Labor-supply information	Labor statistics	Regularly scheduled quarterly LFSs by the KRSO can serve as a cornerstone of an LMIS; population and demographic data from household surveys such as IHSES 2007 and Iraq Knowledge Network 2011 could also be integrated.
	Education and qualifications statistics	MOE and MOHESR collect information on enrollment and matriculation; RAND has performed a baseline assessment of likely future labor-market entrants to the KRI. Similar analyses should be done over time to keep current.
Labor-demand information	Labor-market needs assessment	RAND's survey of 360 private employers can serve as a baseline LMNA; future LMNAs to update findings should be planned.
Labor supply information	Register of foreign residents	Establishing data-sharing with immigration or border control would give a complete portrait of the available stock of labor skills.
Labor-market matching function	Register of job vacancies or aggregated data on job vacancies	Information on job vacancies can provide LMIS users with up-to-date data on labor demand.
	Register of job-seekers	A job-matching function that includes registries both of job-seekers and available jobs can be developed only after establishing that KRG is willing and able to do so effectively and that the private sector is unable to do so.
	Information provided by private placement agencies	Private employment agencies are commonly used by private employers currently, and the KRG could encourage voluntary reporting of publicly reportable data and information (such as general placement statistics and most-sought-after occupational skills). These data would contribute to the data repository component and to the labor exchange.

SOURCE: Authors' analysis adapted from Woods and O'Leary, 2006.

NOTES: The Iraq Knowledge Network (IKN) survey was conducted by the federal Iraqi, KRG, and United Nations statistical authorities; results can be found in Central Statistics Organization, Kurdistan Region Statistics Office, and United Nations, 2012. It was a survey fielded in 2011, and so we refer to it as IKN 2011.

Integration and Processing of Data Across Ministries and Across Public and Private Sectors

A key ingredient for any functioning LMIS is the integration of many different data sources and types, often collected from both government and the private sector, into one comprehensive and usable database or set of linked databases. If an LMIS includes a labor-market matching function, this heightens the data requirements. All of this implies the need for information flows between the different ministries and other entities that input information into an LMIS and necessitates coordination and data-sharing. Such data-sharing across the various ministries of the KRG has not been ideal in the past (Berry et al., 2012) but is crucial to the successful establishment of a well-functioning LMIS. According to one report on setting up an efficient LMIS, "information is a good that only has value to the extent that it flows" (Martín, 2011). An LMIS needs to draw from the available producers and users of the different pieces of labor-market information, and their involvement is critical to an LMIS's success.

Also key to the success of an LMIS is the processing of relevant labor-market information. Previous RAND work has identified a pattern of underuse of existing sources of information (Berry et al., 2012). That is, merely having records stored on paper or even in an electronic

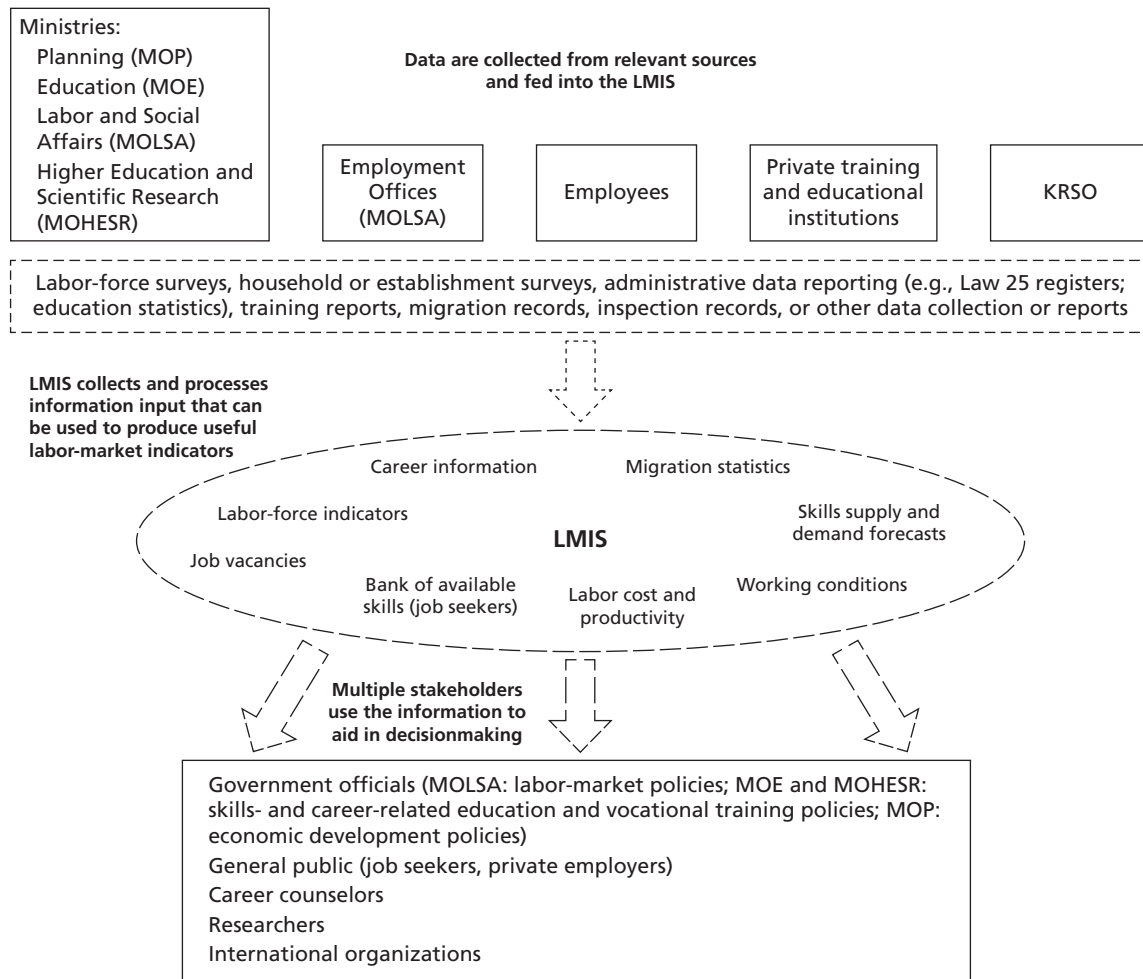
database does not necessarily mean that such records are useful if they are not processed and analyzed as a basis for decisionmaking. Labor-market analysts who compile and interpret available labor-market data to produce digestible products by the various users of an LMIS can fulfill a crucial role in making the LMIS a success.

Figure 5.1 demonstrates the intended flow of information from the various sources or inputs within the KRI that would supply a hypothetical LMIS, the integration and processing of that data by the LMIS office, and the outcomes and users of the information processed by the LMIS.

Does the KRI Need an LMIS?

The KRI can potentially benefit from an LMIS because of the KRI’s rapid economic changes and globalization. Recent efforts to strengthen the KRSO could make it an excellent starting

Figure 5.1
Labor-Market Information System Process Flow Diagram



SOURCE: Authors’ analysis of LMIS literature.

point for establishing and hosting an LMIS. However, we cannot determine here with what likelihood an LMIS would be successful in the KRI, and at what cost. Such factors would also depend on the precise design chosen for any LMIS, including whether to include both the data repository and labor-exchange functions.

Our research has found that, in the midst of rapid economic growth, KRG officials are often forced to make policy decisions based on disparate data sources or even based on no information at all. Decisionmakers in both the government and private sectors could benefit from up-to-date and systematic information to guide schooling and employment decisions. If an LMIS were established that could compile and disseminate timely and comprehensive information about the labor market, this could potentially help facilitate better decisionmaking by all people and organizations involved with the labor market, as long as its information is timely, accurate, and used.

Globalization has increased the importance of the efficient flow of labor-market information as an input for all economies to become or remain competitive internationally as rapid technological changes lead to rapid changes in the skills required and jobs available (Woods and O'Leary, 2006). As mentioned above, nearly all (if not all) industrialized countries have an LMIS, and increasing numbers of developing countries do so as well. It is argued that LMISs can allow greater labor-market efficiency in such a competitive global environment by serving as a central source for up-to-date information (Woods and O'Leary, 2006). Increasingly, countries are also recognizing the importance of integrating information on labor-force migration patterns as globalization breaks down traditional labor-market boundaries (Martín, 2011). This, too, could be relevant to the KRI, which appears to have high levels of cross-border labor migration, both inward and outward.

Because of the KRI's rapid growth and globalization, coupled with an oversized public sector, the KRG faces a challenge in developing labor-market policies that can encourage private-sector development. For example, issues include whether the KRG should limit the numbers of foreign workers allowed into the KRI and what sorts of educational programs of study the KRG should encourage its public universities to offer. A well-functioning LMIS that provides labor-market information analysis and dissemination could help the KRG develop data-driven policies that support its goals of private-sector development and job creation. Furthermore, labor exchanges, whether publicly run as part of the formal LMIS or privately run, could improve the matching of people with available jobs over current methods that rely largely on informal networks as a primary source of information.

However, an LMIS is useful only insofar as it enjoys sufficient cooperation and coordination across different government ministries and is actually used by the various users, which can be challenging in practice if such behaviors are not currently the norm. For example, a review of LMISs in six developing countries found that generally there was an underuse of available information and low levels of coordination across institutions in the selected countries (Martín, 2011). Furthermore, there is always the risk that a publicly operated LMIS will be very difficult to close if it turns out to be a poor use of resources. This suggests that a separate option for capturing whatever value an LMIS may provide is to house its separate elements in existing parts of the government, without starting an entirely new institution.

The KRG as Operator of an LMIS

Just as nearly all industrialized countries have an LMIS, in nearly all of them, the public sector operates the LMIS (Woods and O’Leary, 2006). Some employ highly structured and centralized approaches, and others use more decentralized systems or public-private partnerships, but most if not all include some role for the government. This is likely because the use of labor-market information by one person does not exclude any other person from using the same information. This is one characteristic of what is known as a “public good,” and governments are typically providers of public goods.² In addition, the use of labor-market information can have benefits beyond those that accrue to the user by facilitating more efficient functioning of the labor market overall, such as by having improved matches between employees and jobs and reduced transaction costs associated with job search. This ultimately can lead to economic growth. The fact that the use of labor-market information benefits not only the user, who might be willing to pay for that information, but others as well, who might not be willing to pay, means that the private sector will likely not produce the most socially beneficial amount of labor-market information and analysis.

Experience suggests that private-sector LMIS solutions tend to focus on particular sectors or industries but not cover a full economy within a country or region (Woods and O’Leary, 2006; for an example of this, see the case of India (International Network of Sector Skills Organisations, 2011)). To the extent that policymakers and educational institutions need full information about an economy, this can be limiting. Furthermore, LMISs function best when all users have equal access to the information to maximize its usefulness and relevance, which also suggests government involvement in the provision of an LMIS. Finally, because some of the key uses of an LMIS involve informing policy, whether determining the allocation of funding to specific programs or enacting or repealing laws or other government interventions related to the labor market, the government has an interest in ensuring that the information is standardized and complete. The need for coordination across government ministries to ensure information flow further suggests the value of a government role.

Other than the current status quo of no formal information-sharing mechanism, one alternative option to a publicly provided LMIS in the KRI is a decentralized market-driven system, perhaps combined with the regular conducting of publicly funded labor-market surveys such as the LFSs. However, the KRG has no real control over whether and how such a private system might form, nor any say over the types of information it collects and disseminates. If a private system were to develop on its own and did contain information specific to an industry or sector, this implies that in practice the KRG might still need to piece together disparate data sources periodically if it wants to gain complete information about all sectors, or more generally, simply have all relevant information available to inform its decisionmaking. Another option is to start or maintain the separate elements of an LMIS in different agencies of the government but institute data-sharing agreements and other links. The primary issues for KRG policymakers are the likely problems that arise with any centralized approach, the likely costs of operating an LMIS, and whether the potential benefits outweigh the costs.

² A “public good” is a term from economics that refers to any good or service that no one can be excluded from using and that when used by one person can still be used by any other person. The standard example is national defense. It is difficult for private companies to make a profit from providing goods or services that have public good characteristics, and so the good or service is underprovided unless the government provides it.

If the KRG decides to implement an LMIS, no matter how comprehensive such a system would be, data protections should be an important component. Any LMIS would have information about specific people, and there is an obligation to uphold confidentiality. Furthermore, data collection will depend on the cooperation of people and businesses, and that cooperation will be higher if people trust that their data will be protected (Berry et al., 2012). Therefore, safeguarding and protecting data should be incorporated in planning at an early stage.

Potential Policy and Other Questions for an LMIS

An LMIS is useful only insofar as it is up-to-date, reliable, comprehensive, and actually used by the various stakeholders. By used, we mean that users incorporate the processed data and information from the LMIS into their own policy planning or decisionmaking. This implies that we must know the intended uses of an LMIS, and the types of policy questions an LMIS is supposed to address.

A useful information system is one that provides the job seeker as well as the policy maker with information to assess the state of the labour market from their respective perspectives . . . it takes labour market statistics and other relevant facts and information, and converts them into answers to questions posed by decision makers at all levels of the labour market (Chernyshev with Standing, 1997, p. 476, as cited in Mangozho, 2002).

Since a well-functioning LMIS will provide information to different stakeholders to meet their different needs, in this section we review the most common or foreseeable needs and uses of an LMIS for the KRI. We also highlight examples of similar uses of LMISs by other countries. These country examples do not represent rigorous evaluations or endorsements of their systems but can serve to further illustrate potential uses of an LMIS in the KRI. Many countries have systems that effectively operate as LMISs with the same essential elements, although they do not call them by the name LMIS. Other countries have all the necessary elements or inputs for an LMIS but may be in the process of establishing a full-fledged LMIS that coordinates and shares this information effectively. For simplicity, we refer to these as LMISs. In the course of investigating this topic for the KRI, we reviewed the literature or official websites on the LMISs of Bahrain, India, Jamaica, Trinidad and Tobago, and Tunisia. Each of these countries has an LMIS, or an LMIS-like body, in some state of development, with different features and capacities. The choice of these countries is based on one of two criteria. First, we chose countries that could provide useful lessons to inform the development of an LMIS for the KRI. Second, we selected countries with certain economic and sociopolitical characteristics similar to those of the KRI. Table 5.2 summarizes the uses of an LMIS and the examples presented.

Government Officials Can Use an LMIS to Formulate Policies

Government officials, including national, regional, and local civil servants; members of parliament; and program or policy planners can use information contained in an LMIS to help inform policy development and decisions. For example, MOLSA runs a labor-matching service and training institutes in one office in each of the three main cities of the KRI. A comprehensive LMIS can help inform MOLSA officials of available job openings in a manner that is more systematic than now occurs. It could also identify the locations of job-seekers not now

Table 5.2
Users and Uses of an LMIS

Type of User	Activity or Use of an LMIS	Selected Examples
Government officials	Policy formulation, funding evaluation	Tunisia's new government has made employment and job creation cornerstones of its policies. The Institut National de Statistiques carries out quarterly labor-force surveys that can help inform policy decisions on such matters.
Employers and businesses	Employers use an LMIS to search for current labor (recruitment), as well as inform business planning: investment decisions such as opening new locations or offering on-the-job training of employees.	Jamaica, Trinidad and Tobago, Bahrain, and Tunisia all offer online labor exchange sites for employers to post available jobs or search for available labor.
Students	Identify occupations and skills in demand among employers; identify necessary educational credentials and long-term career outlooks, such as expected earnings over life cycle.	Jamaica's online LMIS offers a quarterly synopsis of "hot occupations" based on posted job vacancies in newspapers and online job matching services (including its own). It also offers basic details about necessary educational certifications and available courses of study.
Employees and job-seekers	Search for employment opportunities; search for information on whether and how to upgrade skills to advance career; register as unemployed to receive benefits, if available.	Bahrain's e-government website allows the unemployed to register with the government online and to search for new job opportunities and register for training programs approved by the Ministry of Labor. Jamaica's LMIS offers online advice for techniques on job-searching and interviewing.
Educational and training institutions	Check program offerings by other institutions, hiring trends by companies, and skill requirements for jobs to ensure that courses offered are appropriate.	India's training institutions set up large-scale operations to meet identified skills gaps found in a 20-sector LMNA study.
Intermediaries such as employment counselors, human resource specialists, parents, or teachers	Assess job openings and training or skill requirements to offer advice to job seekers or students.	Trinidad and Tobago's National Employment Service includes eight local employment centers with one-stop centers with a walk-in service that includes the opportunity to speak with an employment counselor.

SOURCE: Authors' analysis adapted from Woods and O'Leary, 2006.

being served by MOLSA employment offices and provide information underlying an outreach campaign. In addition, systematic information about job vacancies can provide guidance as to what types of programs the MOLSA training centers could offer. Moreover, information from an LMIS, which integrates data from various sources, could help assess the effects that such interventions are having on improving employment outcomes.

An LMIS could also help MOLSA, MOE, or MOHESR officials identify skills gaps in the current labor market and develop policies or design programs to bridge such gaps to encourage employment growth over the long term. For example, policies designed to attract high-technology industries must take into account the supply of and skills available among the current or future highly educated workforce (Mangozho, 2002), acknowledging that other factors could also be hindering growth in this sector, such as unfavorable investment conditions. Previous work by RAND for the KRG has discussed these factors (Hansen et al., 2011).

Policymakers in MOHESR also may use labor-market and demographic information contained in an LMIS to make decisions on allocation of funding to higher education and vocational training programs or to request changes to the number or types of programs, their locations, or the particular skills taught. Finally, if an LMIS included a labor-exchange service as well, data-mining of information about job matches and job openings could potentially provide policymakers with real-time updates on the status of the labor market at speeds faster than more traditional forms of data collection (Woods and O’Leary, 2006).

Examples from Other Countries. In the case of Trinidad and Tobago, the government set up and funded a Labour Market Council in 2003 to plan and supervise its new LMIS. The council had 22 members, including representatives from government, employers, employees, and the University of the West Indies. This council served a consultative function to government by processing labor-market information for government use and performing basic research tasks, advising the government on the scope and elements of the LMIS, and developing a three-year action plan for bringing the LMIS up to international standards. The council furthermore advised on the establishment of training programs and worked on public information campaigns as a public relations facility to increase public awareness and educate employees, employers, and others about the availability of the LMIS and its accompanying Electronic Labour Exchange function (Hosein, 2006). Acting on recommendations of this council from findings in the LMIS, the government of Trinidad and Tobago implemented a policy whereby its new National Employment Service is to be used to fill all government non–civil-service positions (Hosein, 2006). Such a policy can increase the relevancy of the LMIS as well as the transparency of government hires. More recently, the ILO has made attempts to create a common LMIS throughout the Caribbean, including Trinidad and Tobago’s system, to facilitate regional analysis by stakeholders (Cipriani College of Labour and Cooperative Studies, 2013).

In India, the government conducted its first multisectoral Human Resource and Skills requirements study in 2009 to 2010, covering 20 high-growth sectors. This study served as an LMNA to form the basis of its LMIS, which was used to determine where intervention was required for new policies to be developed as well as which sectors needed a curriculum review in the education and training institutions (International Network of Sector Skills Organisations, 2011).

Tunisia’s government runs the Institut National de Statistiques (INS) (the national statistics institute), which has carried out quarterly labor-force surveys on a continuous basis since 2010 (with an annual LFS from 2000 to 2009 on 163,784 households). The INS also runs a national register of employers. Tunisia is currently working toward integrating these tools (among others) into a full LMIS to inform policy- and decisionmaking in light of the new government’s decision to focus on labor-market development and job creation as cornerstones of its policy agenda (Martín, 2011).

Employers Can Use an LMIS to Find Employees in the Near Term and Make Investment Decisions over the Long Term

There are numerous potential uses of an LMIS based on the data repository function. Employers can use an LMIS to inform themselves about the local supply of labor, including available skills, training, productivity, wages, working conditions, collective bargaining agreements and local labor regulations governing collective bargaining, and health and safety issues (Mangozho, 2002). Such information is useful to inform personnel policies, timing and size of

investment decisions, and training and retraining policies for employees. When the LMIS lists information about vacancies, even at an aggregate level, employers can gain information about the competition for qualified employees.

The most immediate and common use of an LMIS by employers is as a labor exchange to help them locate and hire new employees, in instances when the LMIS includes this labor-exchange function. Some countries have LMISs with job-matching functions that are a relatively small part of their total operations and that compete directly with multiple private-sector solutions. These include many states in the United States, such as California.³ In other countries—for example, Tunisia—the job-matching function is a central component of an LMIS and serves as a major player in the labor market.

As noted in Chapter Three, in our survey and interviews of employers we learned that word-of-mouth is by far the most common source for hiring currently in the KRI. Yet as an economy develops and labor-market activity intensifies, such informal methods may not suffice. A number of employers we interviewed stated that they would trust a government-run more than a private-run website to find and recruit employees. Again, the precise design of any LMIS will depend on the needs and preferences of its users.

Examples from Other Countries. Employers in Tunisia can access the publicly available employment database run by the Agence Nationale pour l'Emploi et le Travail Indépendant (ANETI) to search for potential employees (as part of its labor-matching component). ANETI is a government-backed employment service that operates via a network of 91 employment offices with 1,100 employees and includes a centralized employment database (ANETI, 2013) that is directly operated by job-seekers and employers. One analyst has noted that this database is probably the best LMIS in the Middle East and North Africa region, and in 2010, it dealt with more than 400,000 jobseekers and facilitated 140,000 job offers (Martín, 2011). Other examples of countries with online labor exchange sites where employers can post available jobs or look for available employees include Jamaica, Trinidad and Tobago, and Bahrain. For a list of websites, see Table 5.3.

Job-Seekers Can Use an LMIS to Locate Available Jobs and as a Basis for Career Planning

Labor-market information from the data repository can help students and others planning their careers to learn about growth occupations and skills needs, identify what education or training is needed for different occupations, and understand what the long-term outlook for different career paths might be as they choose their courses of study or make career decisions.

The labor-matching component of an LMIS is the primary and immediate use for those seeking employment when the LMIS hosts such an exchange. Unemployed people who want jobs and employed people who want better jobs can also learn about new job opportunities from the job exchange. In addition, from the central data repository, they can learn about prevailing wages and working conditions of similar jobs to help in their salary negotiations or deciding whether to look for other jobs. They can also use information contained in an LMIS to make decisions about upgrading their skills to advance in their careers.

Examples from Other Countries. After India announced the findings of its 20-sector study, noted above, many job-seekers learned about new opportunities in different sectors.

³ For more on California's LMIS, see Employment Development Department (2013). For information for employers, see Employment Development Department (2010a). For information for job-seekers, see Employment Development Department (2010b).

Table 5.3
Labor Exchange and Labor-Market Information System Websites

Name (Country/Region)	Website
National Employment Agency and Self Employment Site (Tunisia)	http://www.emploi.nat.tn/fo/en/global.php
Ministry of Labour and Social Security Site for LMIS/ Placement Agencies (Jamaica)	http://www.mlss.gov.jm/pub/index.php?artid=4
National Employment Service (Trinidad and Tobago)	http://www.nes.gov.tt/
National Employment Service Job Search Portal (Trinidad and Tobago)	http://www.nes.gov.tt/searchjob.asp
eGovernment Portal (Bahrain)	http://www.bahrain.bh/wps/portal
Labor Market Information (State of California, U.S.A.)	http://www.labormarketinfo.edd.ca.gov/

NOTE: All websites were current as of January 21, 2014.

This provided information to help them upgrade their skills to benefit from these opportunities (International Network of Sector Skills Organisations, 2011, p. 22).

Bahrain's e-government website allows the unemployed to register their unemployed status with the government, as well as to search for new employment opportunities in a labor-exchange function. It also allows job-seekers to register for Ministry of Labour–approved training programs provided by private organizations. Trinidad and Tobago also has an online job-search capacity that allows users to search for available jobs by keyword, industry, education or certification level, location, and years of required experience.

Educational and Training Institutions Can Use an LMIS to Aid Course Planning

Education and training institutions can use information from an LMIS, including hiring trends by companies, skill requirements for different job categories, and program offerings by other educational institutions. Such information can help higher education programs or institutions that are meant to prepare individuals for employment to ensure that their course offerings, numbers and types of students to admit, and decisions about which faculty to hire are informed by the current and future needs of the labor market. Labor-market information on such factors as the changing mix of industries and occupations and specific technical skills required in a field of work can help training institutions adjust their program offerings to meet market needs (Woods and O'Leary, 2006; Mangozho, 2002).

Because rapid economic growth can mean rapidly changing demands for skills in the labor market, an LMIS can play an important role in ensuring that the educational system becomes or stays up-to-date. Although it can be difficult to enact rapid change in such factors as equipment and instructors, having timely information on skill needs that can inform the design of educational and training programs can be helpful in the globally competitive market (Woods and O'Leary, 2006). Furthermore, if an LMIS included a labor-exchange service or even data on job vacancies, educational institutions could use these data to learn the most up-to-date information on changing marketplace needs.

The potential advantage that an LMIS can offer is that it is a central location where education institutions, both public and private, can readily access information. The LMIS can be designed to meet the accessibility needs of multiple stakeholders. For example, the LMIS may include a web portal specifically targeted to education institutions and that presents labor-

market information in a way that is relevant to that particular stakeholder. Similarly, the LMIS may include other web portals designed for employers, policymakers, and the general public to access information in a way that is tailored to their needs and preferences.

Examples from Other Countries. After India's findings on its 20-sector study were announced, training institutions responded by setting up large-scale operations to meet the identified skills gaps (International Network of Sector Skills Organisations, 2011, p. 22). Bahrain's e-government website allows citizens and residents to find, register for, and pay online for public courses offered by the Ministry of Education. In addition, it allows people seeking training to register online for privately provided training programs approved by the Ministry of Labor.

Researchers Can Use an LMIS to Study Labor-Market Conditions

Researchers are another group of LMIS users. They draw on an LMIS's data repository to gather information in support of studies on labor-market conditions or even studies on other topics that must take labor-market conditions into account. Data derived from an LMIS can improve the quality of studies by allowing researchers to draw comparisons of labor-market conditions across space or time as long as the information collected by the LMIS is sufficiently detailed (Woods and O'Leary, 2006). Such studies can also be used to inform policymakers and program designers.

Examples of Other Services Sometimes Offered by an LMIS

Jamaica's LMIS includes online advice on job-searching and job-interviewing techniques, as well as a list of available resources for financial assistance in support of micro and small enterprises. In addition, it offers quarterly summaries of the latest "hot occupations" in the Jamaican labor market by sector, occupation, and necessary training or other qualifications. These analyses are based on a crosswalk of various newspaper and Internet job vacancy advertisements (including its own Electronic Labour Exchange). It also provides a quarterly tally of work permit approvals for those specific occupations that were granted the most number of foreign work permits to make up for shortages in qualifications and skills among the domestic labor force (Jamaica Electronic Labour Exchange, undated).

Trinidad and Tobago's National Employment Service includes eight local employment centers distributed throughout the country, with One Stop Career Resource Centers that provide a walk-in service for job-seekers to access job vacancies through bulletin boards and job postings, as well as receive help with resume-writing and job search tips (Ministry of Labor and Small and Micro Enterprise Development, 2007). It is planned that these centers will use the information in the LMIS as a source for advice and assistance (Hosein, 2006).

Bahrain's e-government portal offers services that are typical of an LMIS, such as allowing the unemployed to register as such with the government to access unemployment insurance benefits and providing employers a service to check the legality of foreign workers by using the worker's Personal Number, Work Visa Number, or Application Number.

What Might an LMIS for the KRI Look Like?

The academic and policy literature generally agrees on the key ingredients of an ideal LMIS and the types of data inputs involved. An optimal LMIS includes the following characteris-

tics: (1) timely, accurate, and relevant data; (2) flexible delivery models with wide accessibility; (3) effective governance and cost-effectiveness; (4) informed labor-market analysts; (5) availability of intermediaries to assist users of the LMIS; (6) education for users in how to acquire and apply the information from an LMIS effectively; and (7) basic interpretation and analysis of data, in particular, translating quantitative data into qualitative guidance on labor-market matters (Woods and O’Leary, 2006; Sharpe and Qiao, 2006). However, there is also wide agreement that every LMIS must adapt its data requirements, system design, and delivery approaches to the setting in which it will operate and to the available resources, and there is no predetermined formula for an LMIS’s architecture.

LMISs have a wide range of capacities and effectiveness across countries. Some countries with LMISs that have been around for years and enjoy significant institutional support have comprehensive systems that approximate an ideal case. However, the list of seven characteristics for an ideal LMIS above includes capacities beyond the basic collection and processing of information, such as linking the LMIS with national employment centers and career counselors (item 5, above) and including educational interventions to teach users how to use an LMIS effectively (item 6, above). Although such functions constitute an ideal case, we believe that they might go beyond the basic necessary ingredients for a beginning LMIS and are certainly going to add to the costs of operating any LMIS. Indeed, other countries that have just begun LMISs, typically developing countries, often start smaller in terms of the characteristics and functions of an LMIS, with an eye toward the long-term goal of building an ideal LMIS. A similar approach might be best for the KRI to minimize the initial startup costs and effort. Therefore, we consider the KRI context in greater detail in terms of government and labor-market organization and existing and planned data-collection activities.

To determine the types of data to be included in an ideal LMIS to fulfill item 1 in the list above, we adapt and modify Martín’s (2011) list because his list was designed expressly for developing countries, including Tunisia, which has an economic structure similar to that of the KRI.⁴ For the KRI, the data inputs of an ideal LMIS are

1. labor statistics
2. education and qualifications statistics (information about the training of the labor force)
3. register of residents from outside the KRI
4. an LMNA
5. register of available jobs
6. register of job-seekers
7. information provided by private placement agencies.

Items 1–4 on this list constitute the data repository component of an LMIS. Following Martín, items 1–3 most directly correspond to providing information on labor supply, whereas item 4 is more closely related to labor demand. Item 5 can also serve as part of the data repository component if it lists job vacancies in an aggregated form, such as by occupation or geography, or if it has individual job vacancies. Finally, items 5–7 combined serve a labor-market

⁴ We do not include all ten of Martín’s recommended data components of an LMIS, leaving out those we felt were not very applicable to KRI. In particular, we leave out “register of nationals living abroad,” since remittances may not be a primary means of support for KRI residents, and we leave out “international job database,” since international job offers for KRI residents may not be a large source of employment and out-migration.

matching function, although item 7 can also serve as part of the data repository by providing additional information on job vacancies. Martín (2011) recommends the creation of an LMO that serves as the office that encompasses the LMIS and integrates items 1–7 as well as analyzes and disseminates the collected and processed information (with its staff of labor-market analysts). We discuss an LMO as well as each of the seven data inputs in detail to clarify their precise functions and to describe how each data input might look specifically in the KRI context. We also discuss the relative prioritization for each of these data inputs as an LMIS is just beginning. As above, when we said that a new LMIS can have fewer than the seven characteristics of an ideal LMIS, a new LMIS can have fewer than all seven data inputs, since some of these data inputs are more essential than others as an LMIS is beginning operations. After discussing the seven data elements, we return to the issue of whether a KRG LMIS should include a labor-matching function. Table 5.2 summarizes and prioritizes these seven data inputs for their inclusion if the KRG chooses to build an LMIS.

Labor-Market Observatories

The primary function of LMOs is to collect disparate information from various sources and then process and analyze that data to have it in usable format for the intended users of an LMIS. LMOs operate as an inter-institutional office that coordinates information exchange and processing. The precise design of an LMO—how it is set up—is determined by the country or region that intends to launch an LMIS. The success of an LMO, as well as the overall success of an LMIS, depends in large part on the degree to which the LMO is able to coordinate effectively across different government ministries and between the public and private sectors. Many countries place their LMOs within their Ministries of Labor, and others expressly design an LMO as a cross-cutting entity that spans multiple ministries, precisely to ensure this coordination capacity. Ideally, LMOs are autonomous bodies with their own staff and budget; they can also be the responsible parties for conducting regular LMNAs, although in the KRI's case, the KRISO might be better suited to such an endeavor. In the KRG, MOLSA would be one natural home for an LMO as would the MOP, although the KRISO could also take the responsibilities of an LMO if that were deemed preferable, given the closely related responsibilities that it has already been assigned (including conducting quarterly LFSs).

Labor-Supply Information Inputs

Labor Statistics. The data on labor-market statistics are the heart of an LMIS. Most often in developing countries the best source for such statistics and information is a labor-force survey to provide representative estimates of labor supply and employment (Martín 2011). Recommended practice is to have at least yearly LFSs and, ideally, quarterly or continuous data collection to serve as a timely and accurate measure of the labor market. To capture information on labor migration, LFSs ideally should include an international migration module. Fortunately for the KRG, its current plans to undertake quarterly LFSs through the KRISO and in partnership with RAND means that it already largely has in place this cornerstone of an LMIS.

Other data elements that would be included in an ideal setting include information on the population and demographics. The KRI has already conducted a number of household surveys, often as part of an Iraq-wide survey effort, such as the Iraqi Household Socio-Economic Survey (Central Organization for Statistics and Information Technology, Kurdistan Region Statistics Organization, and World Bank, 2008) and the IKN (Central Statistical Organiza-

tion, Kurdistan Region Statistics Office, and United Nations, 2012). These can complement LFSs to provide these population and demographic variables to bolster the information on the likely size and composition of the labor force, both today and in the future.

Education and Qualifications Statistics. Another key input to an LMIS is a centralized database of available skills, training, and qualifications among the labor force. The most direct way to capture this is to collect such information directly from educational and vocational training institutions on enrollment, matriculation, and courses of study. Ideally, such information can be collected at the basic (grade 9), preparatory (grade 12), technical or vocational (two-year higher education), and university (four-year higher education) levels to be complete in scope. In the KRI, the MOE and the MOHESR already collect such data from public institutions. In Chapter Two, we analyzed such data covering recent years to generate projections of future labor-market entrants in the KRI. Therefore, these inputs could serve as baseline measurements of such statistics in any new LMIS. Ideally, the MOE and MOHESR eventually can incorporate findings from private educational and training institutions into their databases. Such inputs on enrollment and matriculation in all levels of education and the major course of study in higher education can be key to understanding the available skills of the current and future labor force. They should continue to be collected as well as integrated into any LMIS that may be developed.

Register of Residents from Outside the KRI. Increasingly important in today's fast-growing economy within the KRI is to have accurate, timely, and comprehensive data on immigrants into the region, both from other parts of Iraq and from other parts of the world. Often, such data are collected already by regional authorities in issuing work permits or allowing entry into the KRI. They could be incorporated into an LMIS that aims to provide a complete portrait of the available skills and qualifications of the local labor force.

Labor-Demand Information Inputs

Labor-Market Needs Assessment. Understanding the skills in demand among employers and, in particular, those skills that are difficult for employers to find in the labor force, is a key input to an LMIS and to the KRG's goal for private-sector development. Ideally, these needs can be analyzed separately by economic sector and perhaps by governorate as well. Given the amount of resources devoted to educational and training institutions, it is imperative for any economy to have a clear and up-to-date understanding of the skills needed in the marketplace, particularly as they may evolve with the processes of rapid economic growth and globalization.

This study's findings on skills gaps and needs based on a survey of 360 private enterprises across three broad economic sectors and all three governorates in the KRI, as well as interviews of employers undertaken by RAND since 2010, can serve as a baseline for this needs assessment. For example, technical knowledge, languages (English and Arabic), and "soft skills" (customer-handling, oral and written communications) were found to be in demand and suggest areas that educational institutions need to emphasize and to provide more opportunities for gaining practical experience for both secondary and postsecondary graduates. Ideally, enterprise surveys or other forms of in-depth interviews with employers, allowing for insights of the different skills and qualifications needs for different sectors, will continue into the future as a planned series to stay up-to-date in the face of rapid changes.

One further potential way to gauge labor needs among employers may be to analyze current job vacancies, whether posted on private sites online or in a newspaper or collected by the LMIS as part of its data analysis efforts or as part of a labor-exchange site hosted by the LMIS.

However, the usefulness of such an approach is likely to depend on the coverage and amount of detail included.

Labor-Market Matching Functions

As noted above, the KRG started a labor exchange in September 2013. Supported by the KRG Council of Ministers, Kurdistan Works (kw.krg.org) has the following characteristics, with all information current as of October 3, 2013:

- Job postings. There were 1,079 job listings. Kurdistan Works gets its listing by reposting job vacancies listed by private recruitment agencies and other job sites. Only private-sector positions are listed.
- Advice for job-seekers, such as defining what a CV is. Kurdistan Works also provides links to private recruitment agencies with which job-seekers could list their resumes.
- Training opportunities.
- A placeholder site for internships. The website will provide information on internships under a new program coordinated by universities, run in conjunction with the private sector and the KRG, and overseen by a board.
- Volunteer and charity opportunities.
- Links to relevant labor laws, the Ministry of Labor and Social Affairs, information for the Kurdish diaspora, the prime minister's message on the launch of Kurdistan Works, and the Kurdistan Careers recruitment and training fair at which it was launched.

Although the site has been launched, we provide basic information on what any comprehensive register should have so that KRG policymakers can ensure that they are offering employers and employment seekers the best service possible.

Register of Available Jobs. A comprehensive and timely register of available jobs from employers to represent current labor demand is a necessary part of any job-matching function, whether or not it is part of an LMIS. It is easiest if this were an online system, and many countries have registers online for employers to input their information, such as Trinidad and Tobago, the system of which allows job-seekers to search the available jobs database by required education, location, and other factors.

Besides being comprehensive, such a register would need to make sure that outdated records are deleted to stay up-to-date. In an ideal scenario, job-seekers could access this registry and search for potential employment by keyword, such as by job title, location, or qualification—for example, sales manager, Amedi, or Microsoft certified technology specialist. Or they could search by required educational level, availability, or other factors.

Register of Job-Seekers. A comprehensive and timely register of job-seekers will also ensure that any labor exchange is the best it can be. The most equitable way to do this is to have an online system that covers all of the KRI, coupled with employment centers in different locations that can offer a walk-in service with employment and career counselors for those who otherwise lack Internet access. A registry system should collect information from job-seekers on personal contact data, skills and qualifications, and work experience, as well as the types of jobs sought and availability (Martín 2011). It should also build on existing government programs, such as the unemployment registers maintained by MOLSA's Employment and Training Centers in each governorate. In fact, it appears that Kurdistan Works will do

this. The prime minister has said that the new website is designed to complement the programs developed by the Ministry of Labor and Social Affairs and urged support (N. Barzani, 2013).

To be successful, such a registry must have broad coverage of those seeking employment and some mechanism for deleting outdated records to stay up-to-date. In an ideal scenario, employers in search of employees could access this registry and search for potential candidates by keyword, such as by a certain skill or certification—for example, English, Microsoft Access, or certified electrician. Or they could search by educational level, availability, or other factors.

Information Provided by Private Placement Agencies. Job fairs hosted by universities and other educational institutions or headhunting agencies and other private market labor-matching agencies are beginning to play a large role in the KRI's private-sector economy. In fact, Kurdistan Works was launched at the second annual Kurdistan Careers recruitment and training fair, held in Erbil and organized by young people in the Kurdistan Region under the auspices of the prime minister. The ideal labor exchange would want to incorporate information from such agencies to enable its database on activities in the labor market to be complete. For the specific purposes of an LMIS, even without the job-matching function, such information would contribute to more comprehensive data on job openings.

Making the Most of a Labor Exchange. The Kurdistan Works labor exchange joins several private-sector labor exchanges already in existence, such as Aweza.com, the Jobs in Erbil Facebook page, Erbil Manpower, F-Jobs, Karox, Kodo Jobs, MSelect, newspaper advertisements, the websites of private employers (such as WHA Financial, listed on Kurdistan Works), and international labor exchanges used by employers in the KRI who want to find global talent. Although we do not know the level of use of these private exchanges, our interviews suggest that employers who use them are technologically advanced, or provide goods and services that are new to the KRI, or provide goods and services at high levels of international quality standards. This is consistent with the results of the RAND Skills Survey, which found that a large share of available job offers today remain among small and medium enterprises, which are often informal, and for which the most common method of recruiting new employees is by informal networks.

In addition, as noted above, there are also new job fairs hosted by universities and private organizations, as well as private recruitment agencies. The RAND Skills Survey of 360 firms found that private employers do report using private recruitment agencies (26 percent of the 360 firms report recruiting local employees using a private placement agency in the past two years, and 18 percent mentioned using them to recruit foreign employees) as well as contacts with schools or other educational institutions (10 percent).

Now that Kurdistan Works has been established, policymakers will need to ensure that it does not crowd out these private solutions, as they may be more nimble and innovative than a government solution. As of now, this does not appear to be an issue, since Kurdistan Works refers employers and job-seekers to these private solutions and builds its database off their listings. If the KRG starts a formal LMIS, it will also need to decide whether and how to integrate Kurdistan Works with the LMIS or keep it separate. Either way, policymakers would benefit if basic information on job vacancies and job-seekers were shared so that labor-market analysts and policymakers could observe employment trends.

Implications for the Private-Sector Labor Market in the KRI

The KRG will need to make numerous decisions and take numerous actions before deciding whether to start an LMIS. These include estimating staffing and costs; creating data-collection, handling, and analysis functions; and ensuring communication within the KRG and between the KRG, employers, and educational institutions. Although a full LMIS need not be created all at once, careful planning will be needed.

Previous RAND work in the KRI has found that although the KRG collects a large amount of data, these data are often of poor quality, there are gaps between what is collected and what is needed, and some collected data are not in usable form (Berry et al., 2012). Furthermore, communication between different government ministries, departments, or agencies is sometimes inadequate, and such communication is key to a fully functioning LMIS and in particular for the LMO office that facilitates the information exchange across ministries and branches of government.

The KRG's recent efforts to strengthen capacity within the KRSO, and its plans to implement regular quarterly LFSs, mean that much of the most important groundwork has already been laid if it decides to establish an LMIS, at least one that focuses on the data repository component. That is, the first necessary data inputs already exist (although improving their quality is still an ongoing task). What is needed now—the other primary starting input—is the institutional incentive to collect the data and other inputs from the various government ministries and from private-sector stakeholders and to establish a smoothly functioning operational framework that achieves coordination and flow of information across institutions. In particular, establishing an LMO—an institution designed expressly to collect and analyze information about the labor market from different government ministries and private-sector actors—is the first challenge the KRG must meet if it decides to launch an LMIS. However, an LMO must be able to overcome the current culture if it is to be a success. If it does not, it risks being an expensive venture with little effective benefit. Ensuring successful cross-ministry communications and buy-in from stakeholders is warranted, and this process might take time.

An LMIS will require a mechanism for collecting, storing, and managing data. It will also need to establish a link to other institutions that collect relevant data (KRSO, MOP, MOE, MOHESR, and MOLSA), and it will need the capability to manage, process, and report on the data to guide decisionmaking. Although much of the data will come from external sources, the LMO could collect its own data or commission data collection and analysis based on need and availability. Finally, in terms of data management, it will also need to protect the data from misuse.

These various requirements, the potential of creating a wholly new institution that could prove costly or could fail, and the poor track record of LMISs in some countries suggest another alternative for KRG policymakers. Many of the elements of an LMIS can have value on their own for policymakers, employers, job-seekers, educational institutions, and researchers. The KRG can therefore have separate agencies in a decentralized approach and either start the collection of useful information, such as by carrying out regular labor-market needs assessments, or strengthen the value of existing information, such as by making accessible aggregate educational data. This has already started with the new KRSO LFS. Over time, as the elements are in place, policymakers can revisit the idea of starting an LMIS if such a decentralized government system does not suit their needs.

Conclusions and Policy Directions

Since 2003, the KRI has witnessed tremendous growth in infrastructure and services, and this growth is likely to continue. Improvement in the functioning of the labor market can help sustain this growth, spread its benefits throughout the population by leading to the hiring of more employees from within the KRI, and further develop the private sector. This study has investigated three key aspects of the labor market. These are labor supply, labor demand, and likely employment growth sectors. It has also outlined a potential tool for KRG policymakers—an LMIS. KRG policymakers can pursue a number of concrete policy steps to take advantage of current trends and needs and to improve the labor market for the benefit of the private sector.

Policy Steps for Improving Labor Supply and Assessing Labor Demand

New job-seekers will be far better educated than many current participants in the labor market. As the KRI economy continues to grow and diversify, job-seekers will face a range of private-sector employment opportunities. Education and labor-market policy informed by market trends and skills requirements will be critical to ensure that secondary and postsecondary graduates in particular have skills for a growing, modern private-sector–driven economy. In this section, we discuss policy directions relevant to the postsecondary education system and then to all segments of the current and future labor market.

Policy Directions Relevant to the Postsecondary Education System

The majority of employers rate graduates as prepared or very well prepared for work, although at least some employers (up to 40 percent) rate secondary school graduates as poorly prepared for work. Up to a quarter of employers report that they are not able to fill vacancies with candidates from the local labor market. In those cases, candidates either do not possess the skills that private-sector employers are seeking, or skills are not sufficiently developed to meet their needs. It may be that some students lack guidance regarding private-sector employment opportunities and the qualifications and skills needed to take advantage of those opportunities. Recent reforms to the higher education system have been implemented partly to address many of the problems highlighted by employers. Universities have embarked on new efforts to change the first-year curriculum to include critical thinking and debate, computer science, basic science, and English. The curriculum for specific subjects is also expected to change. But the higher education system can take further steps.

Build links with the private sector through private-sector advisory boards. These boards would consist of local and foreign business leaders operating within the KRI who can

advise the KRG, postsecondary educational institutions, and even secondary educational institutions directly on private-sector needs. These advisory boards would provide ongoing input into curriculum and program decisions that can help students become better prepared for the demands of the private-sector labor market. A greater role for the private sector in an advisory board capacity will also help postsecondary institutions examine and undertake strategic decisions and secure resources that can support their contributions toward preparing the future labor force.

Build links with the private sector through career centers and job fairs. Graduates may not receive the appropriate signals about the private sector and the future labor market when making career decisions. Career centers can help teach students how to look for private-sector work, where potential job opportunities are, and how to better prepare themselves for their lives after education. Job fairs that focus on the private sector and that are sponsored by universities and their career centers, employer associations, or non-profit, non-governmental organizations, or even the KRG, can provide a useful mechanism for matching employers with job-seekers and further educate students about potential job opportunities.

Improve student work experience through expanded and improved internships. The RAND Skills Survey and our interviews showed that employers value some amount of work experience. Students are able to gain this experience through an internship. There are currently a number of internship programs, but our interviews indicated that in many of these, students do little work and learn few skills. However, others are reported to be demanding and lead to job offers. One role for the KRG in supporting internships is to promote university career centers. Career centers can take the lead in strengthening current internship opportunities by working with employers and students to raise expectations about what should result from an internship. The next step would be to learn from these experiences to expand successful approaches over time.

Policy Directions Relevant to All Segments of the Current and Future Labor Market

Institute a regular labor-market needs assessment survey. Many of our recommendations for improving the labor supply are derived from findings of the RAND Skills Survey. Currently, there are few systematic mechanisms in place in the KRI to assist with planning and informing labor-market policy. In addition to formal mechanisms to encourage private-sector stakeholders to participate in education planning and implementation, regular, systematic data-collection activities to gather information about labor-market needs should be conducted. This will provide data that can be used to understand emerging trends and help with planning education and training. In particular, we recommend conducting a study to better understand the large segment of business establishments that are of very small size (and that were excluded from this study). Given the predominance of this segment of business establishments, it would be important to understand the nature of the economic activities being undertaken by these establishments, opportunities for growth, and entrepreneurship opportunities particularly for recent graduates. This type of study would inform program initiatives such as the one undertaken by MOLSA to provide loans to recent graduates to start a business. It could also provide useful information on the hiring potential of this segment of the private sector.

Focus on the development of skills that are applicable to a broad selection of likely growth sectors. KRG policymakers have focused on increasing employment in manufacturing, agriculture, and tourism. There are certainly opportunities in all of these sectors, and they might prove to be key drivers of economic activity in the region. However, our analysis

of other economies suggests that the largest employment gains will most likely come in such sectors as construction; transportation, storage, and communications; and wholesale and retail trade. To gain advantage from these likely growth sectors, and yet still retain the possibility of having a workforce prepared for the favored sectors of manufacturing, agriculture, and tourism, KRG policymakers should make sure that education and training includes skills applicable to a broad range of sectors. These include engineering and skilled trades, communication and customer-handling skills (also known as soft skills), and business skills. Further, our analysis indicates that it would likely be counterproductive for KRG policymakers to try to direct the institutions that deliver skills training to focus on specific industries that may not generate significant new employment opportunities in the future.

Continue reforms of government hiring. Government employment is still seen as the preferred employment option by many graduates of the postsecondary education system and even of the secondary education system. Continuing to expand government hiring is unsustainable for two reasons. First, the government budget is already dominated by operating costs, at the expense of investment. Second, because government employment is preferred, continuing to offer such employment generously may harm the growth of the private sector. The issue of seeking a government rather than a private-sector job is not a problem specific to the KRI and its local labor force. This same problem is often observed in other, similar economies that have traditionally relied on the government and state enterprises as a primary source of employment creation. In previous work (Hansen et al., 2011), RAND provided a comprehensive plan for limiting government hiring and expanding private-sector hiring. The KRG should continue to work within this plan to reform its government employment practices.

Implementing a KRG LMIS

KRG policymakers have already taken the first important steps toward developing data and information systems that will help them make rational, far-sighted, labor-market policy. Indeed, using data for policymaking has been a long-standing goal of the KRG (Berry et al., 2012). If KRG policymakers choose to continue to develop information inputs into policy and to make useful information available to employers, employees, job-seekers, and students, then the development of an LMIS is a potential option for doing so. To do this, we recommend the following steps.

Fully consider the costs and benefits of developing an LMIS. An LMIS could prove to be of value by housing labor-market data, analysis, and dissemination in one agency. That agency could provide a central point of coordination and could develop analytical capabilities that would take full advantage of the variety of data available. However, such an agency could also prove costly, fail to attract qualified individuals, fail to coordinate appropriately, and unnecessarily limit the availability of data to users. In fact, at least some research has shown that the difficulty of establishing an LMIS is often underestimated, and the KRG has expressed a specific goal of limiting the size and the growth of the government. If establishing an LMIS is judged to be too costly, then the KRG can embark on strengthening its collection and dissemination of labor-market information in a decentralized fashion. For example, the KRSO can collect the different data elements and make them accessible. The KRG will still face the challenge of how to integrate these elements into a format usable by policymakers,

labor-market participants, educational institutions, and researchers. However, if establishing an LMIS is judged to be appropriate, then the KRG should proceed with the next steps.

Devise an action plan for developing a KRI-wide LMIS, the first step of which should be to determine a structure for an LMO. Once the decision has been taken by the KRG to establish an LMIS, the LMO is the institutional infrastructure managing and overseeing the LMIS. Decisions to be made for the LMO include in which ministry or ministries it will reside, how it will be funded and staffed, and how it will achieve institutional cooperation. The MOP or MOLSA would both be natural homes for an LMO that covers the whole of the KRI. If within the MOP, it is also possible that the KRSO itself expand its functions to serve as an LMO. Another option is to have an expressly inter-ministerial body. In these arrangements, the KRG could have one central LMO with directorates within each governorate to ensure geographic coverage and integration of the governorate directorates of ministries and data. Whichever arrangement is chosen, establishing an LMO and providing it with sufficient institutional support and strength are key basic ingredients to a successful LMIS. This decision also needs to be examined against the explicit and implicit costs associated with either option. For example, establishing a new government entity with its own staffing and resources may run counter to the KRG's goal of limiting the growth of the government sector.

Once a structure and home are decided, the LMO's first function can be to analyze the series of LFS data collected by the KRSO or arrange for the KRSO to conduct that analysis as an input into the LMIS. It can also incorporate immediately the findings and data collected by RAND on labor-market and educational matters, including the RAND Skills Survey of 360 private-sector employers and the projections about the skills of labor-market entrants in the coming years. The plan should then be to add to the functions and capacities of the LMIS gradually as the LMO gains experience and as it builds the necessary inter-institutional coordination. Eventually, the long-run goal for an LMIS should be to incorporate all of the data repository components (labor supply and demand), and if the KRG decides to include a labor-exchange function, the register of available jobs and job-seekers.

Enhance government websites to highlight labor-market statistics and information.

The KRG should build a website or expand the website of the KRSO to make available all existing resources on labor-market information. A new LMIS website linking to the KRSO website is also a possibility. Such information can initially include findings from the following data sources that are already collected or planned within the KRI:

1. the series of LFSs as each wave becomes available to provide basic labor-market statistics
2. findings from RAND's quantitative surveys and qualitative interviews of private employers to serve as a baseline LMNA on current skills gaps
3. findings from RAND's projections for the skills and education levels of labor-market entrants in the coming years based on data from the KRI's public education institutions to serve as a baseline qualifications register
4. findings from the IHSES, IKN, and other multilateral surveys to provide additional detail on labor-market and population outcomes, such as is already done on the KRSO's website.

This new or enhanced website can serve as the basis for an LMIS and begin the process of information flow between suppliers of the information and the various users. In addition, it can serve as the first publicly available single-source resource for up-to-date and comprehensive

information on the private-sector economy within the KRI. One goal for this website can be to communicate clearly and effectively with the people of the KRI that government employment will not be a viable option for most in the coming years and to showcase opportunities and career paths created by the growth in the KRI's private sector to make such opportunities more accessible. This implies that this website should include not only tabulation reports and raw data from those sources listed above but also some interpretation and recommendations that follow—that is, a digestible synopsis of these information sources. This could suggest that when thinking about necessary staffing for an LMO, not only labor-market analysts but also communications and public relations experts should be employed.

Establish a data-sharing agreement between the LMO and the KRI's educational and training institutions. To ensure that any qualifications register stays updated, regular—preferably annual—updates of enrollment and matriculation rates, as well as major courses of study from the higher education institutions, should become standard practice and be incorporated into an LMIS by the LMO. Data-sharing may take place either directly or via existing data-sharing arrangements between the MOE, the MOHESR, and the schools.

Work with KRG residency and border control agencies to collect data on the entry of workers from outside the KRI. Since the KRI has been home to increasing numbers of immigrants, both from other parts of Iraq as well as from outside countries, it is increasingly important for the KRG to keep records of the numbers and skills of these immigrants to have a reliable portrait of the available stock of labor within the KRI. If information on the qualifications of immigrants is not currently recorded, or if many of these immigrants are not entering the KRI legally, then either adapting border entry forms to collect information on education and skills or adding a migration module to the LFSs that targets this subpopulation become important priorities to ensure that such information can be collected. This information should then be fed into the LMIS and shared with other institutions and users.

Have the LMO make plans to conduct regular LMNAs in different sectors to update findings from the baseline findings by RAND on labor-market needs and skills gaps. Since the KRI's economy is undergoing rapid expansion and changes, it is imperative that our current synopsis of skills gaps and private-sector labor-market needs be updated periodically to remain relevant and informative. Such updated LMNAs can be carried out as repeated employer or enterprise surveys or by more informal discussions with medium and large employers from different sectors and governorates.

Work with private employment placement agencies to create a potential mechanism for information-sharing with the LMIS. Since private employment agencies are active within the KRI's private-sector economy, aggregate data on registered job-seekers, vacancies, and placement rates are useful inputs to understanding the performance of the labor market. For example, it will be beneficial if the KRG is updated on the indicators of the activities of private employment agencies periodically. Such indicators can include economic sectors of their clients (firms), total job vacancies they have filled, skill profiles of those jobs, and other information deemed necessary or important by an LMO.

More detailed data are also useful, but private employment agencies might not want to voluntarily report those data unless they see some benefit. Conceivably, the LMIS could be a useful platform for these agencies to publish information on job vacancies and job-seekers. The LMIS is likely to reach a KRI-wide audience, and agencies might find it beneficial to provide their information to expand their potential reach. Likewise, the LMIS could provide links to the agencies so that job-seekers become aware of their options during job searches.

After an LMIS is fully functioning in its role of offering policy support, explore the feasibility and appropriateness of linking to or integrating the existing labor-market matching function for today’s employment needs. In Chapter Five, we emphasized the primary role of the LMIS as a repository for labor-market data. The labor-market matching function is a secondary function and one that now exists outside an LMIS structure in the form of Kurdistan Works. Over time, data-sharing links could be developed so that the LMIS gains greater visibility into job applicants and job openings. A formal relationship could also enhance the labor-exchange’s abilities to serve job-seekers, as it now seeks to do, such as by providing projections of the fields in which job opportunities will develop.

The RAND Survey of Business Establishments 2012: The RAND Skills Survey

In summer 2012, RAND conducted a survey of business establishments (referred to as employers in this appendix) in the KRI to understand current labor force needs—the RAND Survey of Business Establishments 2012 (also referred to as the RAND Skills Survey). To date, to our knowledge, there has been no systematic assessment of labor-market needs; employer surveys have tended to focus on such issues as investment climate (Andersen et al., 2012) and the opportunities and challenges of doing business in Iraq (USAID, 2010a, 2010b). Where information on labor-force needs has been collected, it is mostly based on case studies or data collected from small groups of business leaders through interviews, focus groups, and forums. The RAND Skills Survey is intended to provide a basis for assessing human resources and skills needs in the KRI more systematically. This appendix provides the full text of the survey.

The RAND Skills Survey

Field Administration

1. Governorate ()

2. Name of district ()

3. Number of mahala/number of muqata

--	--	--

4. Number of zuqaq/number of street

--	--	--

5. Questionnaire number

--	--	--	--	--

6. Date of the interview day and month

Day

Month

--	--

--	--

7. Firm ID

--	--	--	--	--	--

8. Name of survey team member:

9. Survey team member ID

--	--	--	--	--	--

10. Supervisor ID

--	--	--	--	--

11. Data enterer ID

--	--	--

Survey team member

comments: _____

Dear Sir/Madam:

ASHARQ Company in cooperation with the RAND Corporation and the Ministry of Planning in the Kurdistan Region are conducting a scientific study to develop the workforce sector in the region. We ask for your cooperation to ensure the success of this study by responding to this interview.

EMPLOYER INTERVIEW

Instructions: We want to speak with the person who would have the best overview of recruitment issues, human resources and workplace skills at this site/office.

Notes to survey administrator:

(If the number of employees is less than five individuals, cancel the interview and exchange the company for another one where the number of employees is not less than five.)

1. Including you, how many people currently work for this business establishment in the Kurdistan Region? *WRITE DOWN THE NUMBER.*

**Write down the number of
employees in this business
establishment**

SECTION 1: BACKGROUND INFORMATION

2. Name of business establishment: _____
3. Title/position of interviewee at business establishment (*COLLECT BUSINESS CARD IF POSSIBLE*): _____
4. In what year did this business establishment start operations in the Kurdistan Region?

5. Please describe the ownership of this business establishment. *MARK AN "X" NEXT TO ALL MENTIONED.*

Type of business establishment	MARK AN "X" IN THE BOX FOR ALL THAT APPLY
Privately owned	<input type="checkbox"/>
Shareholder-owned (listed on stock exchange)	<input type="checkbox"/>
KRG fully or partially owned (mixed sector)	<input type="checkbox"/>
Central government (Baghdad) fully or partially owned (mixed sector)	<input type="checkbox"/>
Foreign-owned, please specify (WRITE-IN NAME OF COUNTRY) _____	<input type="checkbox"/>
Other, please specify (WRITE-IN) _____	<input type="checkbox"/>

6. Does this business establishment have operations outside the Kurdistan Region?

Yes	<input type="checkbox"/>
No	<input type="checkbox"/>

7. What is the sector of this business establishment? MARK ALL THAT APPLY. (More than one can be selected)

SECTOR	MARK AN "X" IN THE BOX FOR ALL THAT APPLY
Agriculture, hunting, forestry, and fishing	<input type="checkbox"/>
Mining and quarrying, including oil and gas extraction	<input type="checkbox"/>
Manufacturing	<input type="checkbox"/>
Electricity, gas, and water supply	<input type="checkbox"/>
Construction	<input type="checkbox"/>
Sale, maintenance and repair of motor vehicles and motorcycles; retail sale of automotive fuel	<input type="checkbox"/>
Wholesale trade and commission trade (not motor vehicles and motorcycles)	<input type="checkbox"/>
Retail trade (not motor vehicles and motorcycles)	<input type="checkbox"/>
Repair of personal and household goods	<input type="checkbox"/>
Hotels, restaurants, and tourism	<input type="checkbox"/>
Transport, storage, and communications	<input type="checkbox"/>
Banking and finance	<input type="checkbox"/>
Real estate, renting, and business activities	<input type="checkbox"/>

Public administration and defense; compulsory social security	<input type="checkbox"/>
Education and training	<input type="checkbox"/>
Health and social work	<input type="checkbox"/>
Other (Specify): _____	<input type="checkbox"/>

8. *Note: All remaining questions are about your business establishment's operations within the Kurdistan Region. What is the number of employees who work on average...? WRITE DOWN THE NUMBER.*

Work status	Write the number of employees in each space provided		
	Males	Females	Total
Part-time			
Full-time			
Other, please specify _____			

9. What is the number of employees who are ...? *WRITE DOWN THE NUMBER.*

Employee nationality	Write the number of employees in each space provided		
	Males	Females	Total
Nationals from the Kurdistan Region of Iraq (KRI)			
Iraqi nationals from other parts of Iraq outside of the KRI			
Nationals of other countries			

10. What is the number of employees who have attained the following level of education? *WRITE DOWN THE NUMBER FOR EACH LEVEL OF EDUCATION.*

Education level	Write down the number		
	Males	Females	Total
Illiterate/Has not received formal education			
Some schooling (primary/can read and write)			
Completed primary school			
Some secondary school			
Completed vocational school (preparatory industry or trade, etc.)			
Completed secondary school			
Institute/diploma			

Did not complete university

Completed university

SECTION 2: RECRUITMENT AND HARD TO FILL VACANCIES

Now, I'd like now to ask about recruiting for new employees.

11. How many new employees does your firm plan to hire in the next two years? *WRITE DOWN THE NUMBER.*

Year	Write down the number of employees you plan to hire
A. Next 1 year (2013)	
B. Next 2 years (2014)	

12-15 How many new hires by level of education and level of experience in the **next 1 year** ? *WRITE DOWN THE NUMBER.*

		Number of hires							
(12) Low education level		(13) Secondary or Vocational level graduates		(14) Technical institute		(15) University and higher degrees			
Experienced	Without experience	Experienced	Without experience	Experienced	Without experience	Experienced	Without experience		

NOTE TO INTERVIEWER: THE SUM OF Q12, Q13, Q14, AND Q15 SHOULD BE LESS THAN OR EQUAL TO THE ANSWER TO Q11A.

16. How many of your employees do you expect to leave their job in the **next 1 year**? *WRITE DOWN THE NUMBER.*

Write down the number of employees you expect to leave their jobs the next 1 year

17. [*Subtract response to Q16 from Q11A = Number of additional new hires*] Am I correct to estimate that you plan to expand [contract] your firm's operations with the hiring of approximately ___ new hires that do not replace currently existing staff in the **next 1 year**? *WRITE DOWN THE NUMBER.*

Write down the number of employees by which you expect to expand labor force in the next 1 year

18. Of all of the new hires you are planning to make in the **next 1 year**, how many are likely to be filled by people who are **NOT** Iraqi nationals from the Kurdistan Region of Iraq? *WRITE DOWN THE NUMBER.*

Write down the number of new hires in the next 1 year who will be from outside the Kurdistan Region of Iraq (KRI)

19. Thinking about jobs that require a secondary school or vocational school degree, what are the 3 most important skills or aptitudes that you look for in a job applicant?.....Now, what about job applicants for jobs that require a technical institute or university degree? What are the 3 most important skills or aptitudes for those jobs?

*(MARK AN "X" NEXT TO THE TOP **THREE** IN THE COLUMN AT THE RIGHT. THEN REPEAT FOR JOBS THAT REQUIRE A TECHNICAL INSTITUTUE OR UNIVERSITY DEGREE.)*

	A. MARK AN "X" IN THE BOX FOR THE TOP THREE SKILLS FOR JOBS THAT REQUIRE SECONDARY DEGREE	B. MARK AN "X" IN THE BOX FOR THE TOP THREE SKILLS FOR JOBS THAT REQUIRE A TECHNICAL INSTITUTE OR UNIVERSITY DEGREE
General IT user skills	<input type="checkbox"/>	<input type="checkbox"/>
Professional IT skills	<input type="checkbox"/>	<input type="checkbox"/>
Oral communication skills	<input type="checkbox"/>	<input type="checkbox"/>
Written communication skills	<input type="checkbox"/>	<input type="checkbox"/>
Customer handling skills	<input type="checkbox"/>	<input type="checkbox"/>
Team working skills	<input type="checkbox"/>	<input type="checkbox"/>
English language skills	<input type="checkbox"/>	<input type="checkbox"/>
Arabic language skills	<input type="checkbox"/>	<input type="checkbox"/>
Problem solving skills	<input type="checkbox"/>	<input type="checkbox"/>
Management skills	<input type="checkbox"/>	<input type="checkbox"/>
Numeracy skills	<input type="checkbox"/>	<input type="checkbox"/>
Reading skills	<input type="checkbox"/>	<input type="checkbox"/>
Writing skills	<input type="checkbox"/>	<input type="checkbox"/>
Office administration skills	<input type="checkbox"/>	<input type="checkbox"/>
Specialized technical knowledge	<input type="checkbox"/>	<input type="checkbox"/>
Practical technical (hands-on) experience	<input type="checkbox"/>	<input type="checkbox"/>
Willingness to work hard	<input type="checkbox"/>	<input type="checkbox"/>

Willingness to learn	<input type="checkbox"/>	<input type="checkbox"/>
Positive attitude	<input type="checkbox"/>	<input type="checkbox"/>
Any other skills or aptitudes(WRITE IN):		
<hr/>	<input type="checkbox"/>	<input type="checkbox"/>

20. For those positions that require a secondary school or vocational school degree, are the following skills available among the applicants that are **Iraqi nationals from Kurdistan Region?** (MARK YES, NO, OR DON'T KNOW FOR EACH ROW.)

Is this skill available? MARK AN "X" IN THE BOX FOR YOUR ANSWER.

	YES	NO	DON'T KNOW
General IT user skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Professional IT skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Oral communication skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Written communication skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Customer handling skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Team working skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
English language skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Arabic language skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Problem solving skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Management skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Numeracy skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reading skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Writing skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Office administration skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Specialized technical knowledge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Practical technical (hands-on) experience	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Willingness to work hard	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Willingness to learn	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Positive attitude	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Any other skills or aptitudes (WRITE IN):			
<hr/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

21. For those positions that require *more than a secondary degree (technical institute, university, or advanced degree)*, are the following skills *available* among the applicants that are **Iraqi nationals from the Kurdistan Region**? MARK YES, NO, OR DON'T KNOW FOR EACH ROW.

	Is this skill available? MARK AN "X" IN THE BOX FOR YOUR ANSWER.		
	YES	NO	DON'T KNOW
General IT user skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Professional IT skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Oral communication skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Written communication skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Customer handling skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Team working skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
English language skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Arabic language skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Problem solving skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Management skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Numeracy skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reading skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Writing skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Office administration skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Specialized technical knowledge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Practical technical (hands-on) experience	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Willingness to work hard	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Willingness to learn	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Positive attitude	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Any other skills or aptitudes (WRITE IN):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

22. Thinking about all of the positions that require at least a secondary or vocational school degree, have you had difficulties filling those vacancies with Iraqi Nationals from the Kurdistan Region? IF "YES", GO TO Q23. IF "NO" OR "I DON'T KNOW", GO TO Q24.

- YES
 NO
 Don't know

23. If you answered "YES" to Q22, what are the main difficulties behind being able to fill those vacancies with **Iraqi Nationals from the Kurdistan Region**? *MARK THE TOP THREE.*

	MARK AN "X" IN THE BOX FOR THE TOP THREE
Candidates do not possess the skills you look for	<input type="checkbox"/>
Candidates do not possess the education or training qualifications you look for	<input type="checkbox"/>
Candidates do not possess the work experience that you require	<input type="checkbox"/>
There have there been too few or no applicants among nationals from the Kurdistan Region	<input type="checkbox"/>
Applicants tend to have poor attitudes or motivation	<input type="checkbox"/>
Competition from other private employers	<input type="checkbox"/>
Competition from the government	<input type="checkbox"/>
OTHER: (WRITE-IN) _____	<input type="checkbox"/>
DO NOT READ OUT: Don't know	<input type="checkbox"/>

24. Have you had difficulties hiring locally for certain types of occupations? *IF "YES", GO TO Q25. IF "NO" OR "I DON'T KNOW", GO TO Q26.*

YES	<input type="checkbox"/>
NO	<input type="checkbox"/>
DON'T KNOW	<input type="checkbox"/>

25. In which of the following occupation categories is it difficult for you to hire locally? *WRITE THE LETTER OF THE TOP THREE OCCUPATIONAL CATEGORIES BELOW.*

OCCUPATIONAL CATEGORY
A. Elementary or low-skill occupations
B. Process, plant and machine operatives
C. Sales and customer service occupations

1: _____
 2: _____
 3: _____

D. Personal service occupations
E. Skilled trades occupations
F. Technical occupations
G. Professional occupations

26. For which specific jobs is it difficult for you to hire locally? *[WRITE THE NAME OF THE TOP FIVE OCCUPATIONS BELOW. If none named, SKIP to Q28.]*

1: _____
 2: _____
 3: _____
 4: _____
 5: _____

27. Generally speaking, are the difficulties hiring locally affecting your business in any of the following ways? Please answer “YES” or “NO” to each of the following. *READ OUT. MARK AN “X” NEXT TO “YES” OR “NO” IN THE COLUMNS. (RESPOND TO EACH QUESTION).*

	Is the difficulty affecting your business? MARK AN “X” IN THE BOX FOR YOUR ANSWER.	
	Yes	No
Lose business or orders to competitors	<input type="checkbox"/>	<input type="checkbox"/>
Delay developing new products, services	<input type="checkbox"/>	<input type="checkbox"/>
Cannot grow as we would like	<input type="checkbox"/>	<input type="checkbox"/>
Have difficulties meeting quality standards	<input type="checkbox"/>	<input type="checkbox"/>
Increase operating costs	<input type="checkbox"/>	<input type="checkbox"/>
Make it difficult to introduce new ways of working	<input type="checkbox"/>	<input type="checkbox"/>
Increase workload for existing staff	<input type="checkbox"/>	<input type="checkbox"/>
Require outsourcing work	<input type="checkbox"/>	<input type="checkbox"/>

28. What recruiting methods have you used in the past two years? *MARK AN “X” NEXT TO ALL MENTIONED. IF A GIVEN RESPONSE IS NOT LISTED, WRITE IT IN “OTHER.” (MORE THAN ONE OPTION CAN BE SELECTED.)*

	MARK AN “X” IN THE BOX NEXT TO ALL APPLICABLE
Government employment agency	<input type="checkbox"/>
Private employment agency recruiting local labor	<input type="checkbox"/>

Private employment agency recruiting foreign labor	<input type="checkbox"/>
Contacts with secondary schools, universities, technical or vocational schools	<input type="checkbox"/>
Word of mouth/family, friend, or informal networks	<input type="checkbox"/>
Newspaper advertisement	<input type="checkbox"/>
Internet job search advertisement	<input type="checkbox"/>
Street advertising	<input type="checkbox"/>
OTHER (WRITE IN): _____	<input type="checkbox"/>

29. If a centralized employment database were established in the Kurdistan Region, what are the most important characteristics it would need to have for you to use it to **both post vacancies and recruit potential job candidates**? MARK AN "X" NEXT TO THE TOP THREE SELECTED IN THE COLUMN AT THE RIGHT. (CAN SELECT MORE THAN ONE.)

	MARK AN "X" IN THE BOX FOR THE TOP THREE
Online access and sponsored by trusted source	<input type="checkbox"/>
Contains detailed information on job seekers including CV and references	<input type="checkbox"/>
Allows employers and job seekers to email directly from the website	<input type="checkbox"/>
Allows employers and job seekers to post and view opportunities anonymously	<input type="checkbox"/>
Free of charge	<input type="checkbox"/>
Can be automatically linked to company human resources management system database	<input type="checkbox"/>
Web portal can be customized	<input type="checkbox"/>
OTHER (WRITE-IN): _____	<input type="checkbox"/>

OTHER (WRITE-IN): _____	<input type="checkbox"/>
OTHER (WRITE-IN): _____	<input type="checkbox"/>

SECTION 3: CURRENT LABOR FORCE SKILLS GAPS

30 – 32 Now I want to focus on your existing workforce that are nationals of the **Kurdistan Region (KRI)**. I am going to read you a few sentences and for each one, you tell me whether you agree or disagree. **MARK A BOX FOR EACH RESPONSE.**

MARK AN “X” IN THE BOX FOR YOUR ANSWER.

	Strongly agree	Agree	Disagree	Strongly disagree	No opinion/ Don't know
30. <i>Among my workforce that originates from the Kurdistan Region of Iraq, I am satisfied with their attitudes towards work.</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31. <i>Among my workforce that originates from the Kurdistan Region of Iraq, I am satisfied with their writing and language skills.</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32. <i>Among my workforce that originates from the Kurdistan Region of Iraq, I am satisfied with their overall work ethic.</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

33 – 36 Now, I would like to ask you about how well prepared for work are graduates from Kurdistan Region of Iraq’s schools, technical institutes and universities For each of these, please tell me whether graduates are very well prepared, well prepared, poorly prepared or very poorly prepared for work. **READ OUT. MARK A BOX FOR EACH RESPONSE.**

MARK AN “X” IN THE BOX FOR YOUR ANSWER.

	Very well prepared	Well prepared	Poorly prepared	Very poorly prepared	No opinion/ Don't know
33. How prepared for work are graduates from <u>secondary schools</u> within the Kurdistan Region of Iraq...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34. How prepared for work are graduates from <u>secondary vocational schools</u> within the	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Kurdistan Region of Iraq...

35. How prepared for work are graduates from technical institutes within the Kurdistan Region of Iraq...
36. How prepared for work are graduates from universities within the Kurdistan Region of Iraq...

37. Generally speaking, how often do you find that you need to look for job candidates who are ***not*** nationals from the Kurdistan Region in order to find an adequate level of preparation and skills when making a hire? ***PLEASE CHOOSE ONE BY MARKING AN "X" FOR YOUR ANSWER.***

- | | |
|-----------------------|--------------------------|
| Very often | <input type="checkbox"/> |
| Somewhat often | <input type="checkbox"/> |
| Somewhat rarely | <input type="checkbox"/> |
| Very rarely | <input type="checkbox"/> |
| Don't know/no opinion | <input type="checkbox"/> |

SECTION 4: WORKFORCE TRAINING AND DEVELOPMENT

38. Does your firm provide training to employees? ***PLEASE CHOOSE ONE BY MARKING AN "X" FOR YOUR ANSWER. IF "YES" GO TO Q39. IF "NO" OR "I DON'T KNOW" SKIP TO Q42.***

- | | |
|------------|--------------------------|
| Yes | <input type="checkbox"/> |
| No | <input type="checkbox"/> |
| Don't know | <input type="checkbox"/> |

39. How does your firm provide training? Is it internal to your establishment, external, or both?

Type of training	MARK AN "X" IN THE BOX FOR YOUR ANSWER.
Internally provided	<input type="checkbox"/>
Externally provided through an outside firm	<input type="checkbox"/>
Both internally and externally provided	<input type="checkbox"/>

40. What kinds of formal training are offered to employees? (***MARK A BOX NEXT TO ALL MENTIONED.***)

	MARK AN "X" NEXT TO ALL MENTIONED
General IT user skills	<input type="checkbox"/>
IT professional skills	<input type="checkbox"/>
Oral communication skills	<input type="checkbox"/>

Written communication skills	<input type="checkbox"/>
Customer handling skills	<input type="checkbox"/>
Team working skills	<input type="checkbox"/>
English language skills	<input type="checkbox"/>
Arabic language skills	<input type="checkbox"/>
Problem solving skills	<input type="checkbox"/>
Management skills	<input type="checkbox"/>
Numeracy skills	<input type="checkbox"/>
Reading skills	<input type="checkbox"/>
Writing skills	<input type="checkbox"/>
Office administrative skills	<input type="checkbox"/>
Vocational or trade skills	<input type="checkbox"/>
Technical, practical, or job-specific skills	<input type="checkbox"/>
Any other skills (WRITE-IN)	<input type="checkbox"/>

Don't know	<input type="checkbox"/>

41. Who is eligible for any of the types of training that are offered to employees? *MARK ALL MENTIONED.*

	MARK AN "X" NEXT TO ALL MENTIONED
All employees	<input type="checkbox"/>
Unskilled labor	<input type="checkbox"/>
Skilled labor	<input type="checkbox"/>
Employees referred by a supervisor (skilled or unskilled)	<input type="checkbox"/>
New employees	<input type="checkbox"/>
Other, please specify (WRITE-IN)	<input type="checkbox"/>

42. Over the past year, have there been any barriers to providing training? *IF "YES" GO TO Q43. IF "NO" CONCLUDE INTERVIEW.*

- Yes
- No
- Don't know

43. What barriers have been preventing your organization from providing more training for employees at this location? *MARK A BOX NEXT TO ALL MENTIONED.*

	MARK AN "X" NEXT TO ALL MENTIONED
Lack of funds for training/training expensive	<input type="checkbox"/>
Can't spare more staff time	<input type="checkbox"/>
Staff now fully proficient/don't need it	<input type="checkbox"/>
Staff not keen	<input type="checkbox"/>
A lack of good local training providers	<input type="checkbox"/>
Lack of provision (e.g., courses are full)	<input type="checkbox"/>
Difficulty finding training providers who can deliver training where or when we want it	<input type="checkbox"/>
A lack of appropriate training/qualifications in the skills areas we need	<input type="checkbox"/>
Hard to find the time to organize training	<input type="checkbox"/>
Lack of knowledge about training opportunities and/or suitable courses	<input type="checkbox"/>
Other (WRITE IN): _____	<input type="checkbox"/>
Don't know	<input type="checkbox"/>

THANK YOU FOR PARTICIPATING IN THIS INTERVIEW.

The RAND Survey of Business Establishments 2012: Sampling Design

In this appendix, we describe our sampling methodology for the RAND Skills Survey. We review data collected by the KRSO through a 2009 enumeration of all households and businesses in the KRI. This enumeration, or census frame, collected basic information on each entity in the KRI, classifying each entity as a household or a business establishment. In theory, the list of business establishments through this enumeration represents the universe of businesses in the KRI as of 2009. We initially intended to use this list as our sampling frame, but encountered problems during the fielding of the survey, mostly in terms of locating the business using the address information contained in the sampling frame. It is useful as a source of general information on business establishments in the KRI. For example, it can be used to extract aggregate information on business establishments (distribution by geography, such as governorate, and distribution by sector, such as construction and retail). However, it requires a systematic update that is beyond this study's time and resources to permit use as a survey sampling frame. Additionally, information on size of the business establishments (in terms of number of employees) was missing for firms with more than nine employees. Approximately 17 percent of our sample came from the KRSO sampling frame, with the remaining obtained through a systematic random sample of firms using the 2011–2012 Kurdistan Region Companies Directory compiled by the Kurdistan Federation of Chambers of Commerce and Industry. We instead use the 2009 enumeration, which is available electronically, to understand the distribution of firms by certain key characteristics, such as governorate and economic sector, and to weight our sample. Because size information was incomplete from the KRSO enumeration, we also extract information on firm size distribution from the World Bank's Enterprise Surveys. The World Bank's Enterprise Survey program is an international, multiyear, cross-country survey of business establishments in emerging economies.

Basic Information on Business Establishments in the KRI

In our study, we are interested in including business establishments that are representative across three basic characteristics: (1) geography in terms of the three KRI governorates (Duhok, Erbil, and Sulaimaniya); (2) economic sector (mining and manufacturing, infrastructure, and services and professions, based on ISIC rev. 4); and (3) size (number of employees).

The 2009 enumeration of households and firms identified 226,924 business establishments in the KRI. The vast majority of these business establishments are not members of our population of interest. We are focused on the non-agricultural sector in the survey and on the private sector. Therefore, we restrict our population of interest to non-agricultural entities and to the private sector. Additionally, the majority of business establishments in the enumeration

(53 percent) are listed as one-person entities, and the vast majority of firms (90 percent) have fewer than five employees. We use the World Bank size classification framework considering establishments with 5–19 employees as small, 20–99 as medium, and 100 or more as large, and therefore our population of interest is further narrowed to those business establishments with five or more employees. We excluded firms with fewer than five employees because we assumed that these establishments are constrained in terms of new hiring and might find it difficult to respond to questions in our survey about skills requirements and hiring practices. We also reasoned that it is unlikely that business establishments with fewer than five employees will respond differently in a systematic way from other firms in the small size category, except perhaps to emphasize more of the basic skills. Furthermore, the World Bank Enterprise Surveys similarly focus on this same subset of firms across all countries including Iraq and the KRI. These surveys served as a useful benchmark for our study. We also exclude those entities without an ISIC (economic sector) designation. These steps narrow our population of interest to approximately 9,000 business establishments (Table B.1). Thus, an important caveat is that our findings are generalizable only to firms with five or more employees in the non-agricultural private sector and situated in the main governorate cities of Duhok, Erbil, and Sulaimaniya.

Examining the distribution of 8,689 firms, we find that around 41 percent of the business establishments are in Sulaimaniya, closely followed by Erbil (39 percent) and then Duhok (20 percent). Our target sample size of 360 firms to be surveyed, on the other hand, is more evenly distributed across governorates to ensure sufficient cell sizes to carry out comparisons across governorate where appropriate (Table B.2).

We also stratify our sample by economic sector, grouping business establishments into mining and manufacturing, infrastructure, and services and professions.¹ The majority of business establishments (66 percent) are in services and professions, followed by mining and manufacturing (23 percent), and infrastructure (11 percent). In our sample, a little more than half

Table B.1
Business Establishment Population of Interest, 2009

Characteristic	No. of Business Establishments
Total enumeration	226,924
Non-agriculture	172,248
Non-governmental, non-missing sector	151,722
5+ employees (target population)*	8,689

SOURCE: Kurdistan Region Statistics Office and Central Organization for Statistics and Information Technology (Iraq), 2009.

NOTES: The target population was reached after excluding the following establishments: agricultural (54,676), government (17,253), public (1,018), Board of Trade (227), missing or undefined sector (2,028), and fewer than five employees (143,033). The number of establishments with five employees or more is assumed because the enumeration listed employment as ranging from one to nine, and then missing, and we assumed that any establishment with missing employment data had greater than nine employees.

¹ Mining and manufacturing (ISIC codes 5–33) include mining and manufacturing entities; infrastructure (ISIC codes 35–43, 49–53, and 58–63) includes construction, transportation, and utilities; and services and professions (ISIC codes 45–47, 55–56, 79, 64–66, 68–78, 80–82, 85–99) include wholesale and retail trade, real estate services, and tourism. We group private entities into such sectors as public administration and defense, education, human health and social work, and arts, entertainment, and an “other” category under services and professions.

Table B.2
Distribution of Firms, by Governorate in the Population and Sample, 2009

Governorate	Population		Sample	
	Number	%	Number	%
Duhok	1,727	20	121	34
Erbil	3,386	39	120	33
Sulaimaniya	3,576	41	119	33
Total	8,689	100	360	100

SOURCES: Kurdistan Region Statistics Office and Central Organization for Statistics and Information Technology (Iraq), 2009, and RAND Corporation, 2012.

Table B.3
Distribution of Firms, by Sector, 2009

Economic Sector	Population		Sample	
	Number	%	Number	%
Mining and manufacturing	2,000	23	59	16
Infrastructure	925	11	116	32
Services and professions	5,764	66	185	51
Total	8,689	100	360	100

SOURCES: Kurdistan Region Statistics Office and Central Organization for Statistics and Information Technology (Iraq), 2009, and RAND Corporation, 2012.

NOTE: Percentages may not sum to 100 because of rounding.

of business establishments are in services and professions, whereas a third are in infrastructure, and 16 percent are in mining and manufacturing.

Table B.4 illustrates the distribution by economic sector and governorate for the population of business establishments in the KRI, and Table B.5 illustrates the same for our survey sample.

Combining information on the distribution of firms in the population and in the sample, we calculate the sampling weights by taking the ratio of the proportion of business establishments in the population to the proportion of business establishments in the sample (Table B.6). Thus, survey responses of business establishments that are overrepresented in the sample relative to the population are downweighted, and responses of business establishments underrepresented in the sample relative to the population are upweighted. For example, business establishments in infrastructure are downweighted because they are overrepresented in our sample relative to the population. On the other hand, business establishments in services and professions and mining and manufacturing are generally upweighted. Business establishments in Duhok governorate are downweighted because Duhok's share of business establishments in the population is smaller relative to its share in our survey sample.

Table B.4
Distribution of Firms in the Population, by Sector and by Governorate, 2009

Governorate	Mining and Manufacturing		Infrastructure		Services and Professions		Total	
	Number	%	Number	%	Number	%	Number	%
Duhok	356	4	169	2	1,202	14	1,727	20
Erbil	815	9	353	4	2,218	26	3,386	39
Sulaimaniya	829	10	403	5	2,344	27	3,576	41
Total	2,000	23	925	11	5,764	66	8,689	100

SOURCES: Kurdistan Region Statistics Office and Central Organization for Statistics and Information Technology (Iraq), 2009, and RAND Corporation, 2012.

NOTE: Percentages may not sum to 100 because of rounding.

Table B.5
Distribution of Firms in the Sample, by Sector and by Governorate, 2009

Governorate	Mining and Manufacturing		Infrastructure		Services and Professions		Total	
	Number	%	Number	%	Number	%	Number	%
Duhok	27	8	42	12	52	14	121	34
Erbil	17	5	40	11	63	18	120	33
Sulaimaniya	15	4	34	9	70	19	119	33
Total	59	16	116	32	185	51	360	100

SOURCES: Kurdistan Region Statistics Office and Central Organization for Statistics and Information Technology (Iraq), 2009, and RAND Corporation, 2012.

NOTE: Percentages may not sum to 100 because of rounding.

Table B.6
Sampling Weights, by Governorate and Sector, 2009

Governorate	Mining and Manufacturing	Infrastructure	Services and Professions
Duhok	0.55	0.17	0.96
Erbil	1.99	0.37	1.46
Sulaimaniya	2.29	0.49	1.39

SOURCES: Kurdistan Region Statistics Office and Central Organization for Statistics and Information Technology (Iraq), 2009, and RAND Corporation, 2012.

Because we lack reliable data on business establishment size in the population, we are not able to incorporate sampling weights by size using KRI-specific information. Although we can choose not to incorporate size in our weighting, we likely oversampled medium-sized and large-sized firms. Table B.7 illustrates the distribution of business establishment by size in our sample of firms.

To account for this issue, we looked to external sources of firm size distribution, such as the World Bank Enterprise Survey conducted on emerging economies. We drew from information on the distribution of firms by size in select countries to incorporate size into our weighting scheme. We extracted the distribution of firms by sector and size in middle-income countries, which is the World Bank classification that the KRI would fall under (Table B.8).

We incorporate the distribution by size and sector from the World Bank Enterprise Survey into the population distribution from the KRISO enumeration. We recompute our weights using this new information (Table B.9).

Initially, we sampled firms stratified by governorate and sector from the KRISO 2009 enumeration. As mentioned above, the absence of a size variable in the database did not allow us to ensure that we drew samples with sufficient variability in terms of size (number of employees). Our survey partner, ASHARQ, also encountered problems locating businesses because of incomplete address information. Furthermore, the lack of a telephone number in the database meant that ASHARQ often could not contact the firm to confirm number of employees before an in-person visit. Using the 2009 enumeration, ASHARQ successfully interviewed 60 firms.

Given time and resource constraints, we decided to supplement the sample from another source. We drew the remainder of our sample from the 2011–2012 Kurdistan Region Com-

Table B.7
Distribution of Firms, by Size Grouping
in Our Sample, 2012

Size Grouping	Number	%
Small (5–19)	181	50
Medium (20–99)	132	37
Large (100+)	47	13
Total	360	100

SOURCE: RAND Corporation, 2012.

Table B.8
Share of Firms, by Sector and Size of Middle-Income Countries in the World
Bank Survey, 2006–2010

Size Grouping	Overall	Mining and Manufacturing	Infrastructure	Services and Professions
Small (5–19)	58	52	49	71
Medium (20–99)	30	34	34	23
Large (100+)	12	14	17	6
Total	100	100	100	100

SOURCE: World Bank Enterprise Survey.

Table B.9
Sampling Weights Used in the Analysis, by Governorate, Sector, and Size

Governorate	Size	Mining and Manufacturing	Infrastructure	Services and Professions
Dohuk	Small	0.64	0.19	1.26
	Medium	0.33	0.12	0.58
	Large	NA	0.24	0.77
Erbil	Small	8.77	0.42	2.03
	Medium	1.42	0.41	1.18
	Large	0.69	0.23	0.44
Sulaimaniya	Small	3.57	0.48	1.37
	Medium	2.31	0.37	1.13
	Large	0.99	1.43	NA

SOURCES: Kurdistan Region Statistics Office and Central Organization for Statistics and Information Technology (Iraq), 2009, and RAND Corporation, 2012, and World Bank 2006–2010 Enterprise Survey.

NOTE: NA (not applicable) indicates that this type of firm was not included in our sample.

panies Directory. When initially contacting a firm using the directory to schedule an interview, ASHARQ inquired as to the size of the firm and then interviewed all selected firms until reaching a set quota within each size category. This is commonly referred to as quota sampling. Our goal was to ensure a minimum of 50 firms for each size category. ASHARQ contacted close to 400 businesses from the Companies Directory, around 80 percent of which fit the inclusion criteria. Thus, we supplemented our initial sample of 60 firms from the KRSO sampling enumeration with around 300 additional firms from the Companies Directory. We achieved a response rate of more than 90 percent on eligible firms. Such a high response rate is generally unusual in scientific studies, but it is likely that the survey firm achieved this high response rate because contact was attempted by phone (up to three attempts), the interview was conducted in person, and the firm carried a letter of encouragement from the Ministry of Planning, which is an important reassurance of study authenticity to both private- and public sector interviewees in the KRI.

Sample Size and Margin of Error

The sampling methodology for the survey uses stratified random sampling without replacement mostly using a business directory. We interviewed a total of 360 firms. We next discuss the sample size determination.

Assessing Sample Size

We begin with a very simple approach to assess our sample size, given time and cost considerations (Sullivan, 2010). Our basic parameter is the population proportion, and thus our equations will reflect this notation.

The sample size required to obtain a $(1 - \alpha) \times 100$ percent confidence interval for with a margin of error, E , is given by

$$n = \hat{p}(1 - \hat{p}) \left(\frac{Z\alpha}{E} \right)^2$$

where \hat{p} is a prior estimate of p . Since a prior estimate of p is not available, we will use 0.5 as our response distribution, which maximizes the sample size needed for any chosen level of confidence and margin of error. Thus, $\hat{p}(1 - \hat{p}) = 0.5(0.5) = 0.25$.

To assess our sample size, we can rearrange our formula above to determine the margin of error associated with our sample size and level of confidence.

$$E = \frac{Z\alpha}{2} \times \sqrt{\frac{\hat{p}(1 - \hat{p})}{n}}$$

Using 0.25 obtained earlier for $\hat{p}(1 - \hat{p})$ and our chosen level of confidence of 0.95 along with our chosen sample size of 360, we get the following:

$$E = 1.96 \times \sqrt{\frac{0.25}{360}} = 0.0517$$

A very basic power calculation suggests that we should be representative of the underlying population with a margin of error of ± 5.17 percent at the 95 percent confidence level. This is close to the standard margin of error of 5 percent used in scientific research and within the time and cost parameters for our study.

Sample Size Under Stratification Without Weights

The basic estimate of our sampling variability and associated margin of error of 5.17 percent above does not take into account the fact that we have stratified our sample by governorate, industry, and size. The effect of stratification is to break up a single survey into multiple independent surveys, one for each stratum (Deaton, 1997). In practice, stratification reduces the standard error of an estimate as the effective sample size increases compared to a non-stratified sample. However, if the sampled firms from a given stratum are not truly independent, if they have any correlation in an outcome of interest, then the stratified sample may operate as a clustered sample and there is *intracluster correlation* that we must take into account. In practice, high intracluster correlation means that each additional unit within clusters does not contribute much additional information to calculate an estimate of interest, thereby reducing effective sample size and increasing the margin of error relative to stratified samples with low intracluster correlation. To see this, we first calculate the *design effect* of our sampling methodology. The design effect is essentially a measurement of the ratio of the sampling variance under this stratification to what we would achieve under simple random sampling. The design effect, *DEFF*, is given by the formula:

$$DEFF = 1 + p(n - 1),$$

where n is the average cluster (stratum) size ($n = 13$ in our case), and p is the intracluster correlation coefficient for the outcome of interest—a measure of how much correlation there is between firms in a given industry, governorate, and size for that outcome.

In practice, design effects vary within a survey from question to question depending on the value of p . Given that our clusters are firms from a similar and broadly defined industrial classification within a governorate, we do not anticipate very high values for p . However, a very basic rule of thumb value for p is a relatively conservative 0.05, which implies that two firms chosen from the same cluster are 5 percent more likely to have a similar value than if they were chosen at random. This effectively makes each sampled firm from the same cluster provide less information than a new firm from a new cluster. In Table B.10, we calculate our *effective sample size*, n_{eff} as the ratio of our total sample size of $n = 360$ divided by our design effect, $DEFF$, for given intracluster correlation values for p . These values, in turn, can be used to calculate revised estimates for our margin of error, E , by substituting our effective sample size, n_{eff} in place of the total sample size, n :

$$E_{clus} = \frac{Za}{2} \times \sqrt{\frac{\hat{p}(1 - \hat{p})}{n_{eff}}}$$

where E_{clus} is our margin of error under a clustered sample. Using the most conservative estimate of $\hat{p}(1 - \hat{p}) = 0.5(0.5) = 0.25$ and a 95 percent confidence value of $Za/2$ gives us the following associated margins of error under different values of p .

From this table, we see that even under the most conservative scenario of a 50 percent outcome measure for \hat{p} and p of 0.05, our margin of error remains under 10 percent. However, if there is no intracluster correlation between randomly sampled firms within each strata, our sampling variability can improve and our margin of error could be smaller than the basic estimate of 5.17 percent.

Table B.10
Margins of Error Under Different Values of p

	$p = 0.005$	$p = 0.01$	$p = 0.05$
$DEFF$	1.06	1.12	1.6
n_{eff}	339	321	225
Margin of error, E_{clus}	± 5.32%	± 5.47%	± 6.53%

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Kurdistan Regional Government
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The study addresses the question of how the Kurdistan Regional Government can improve the private-sector labor market in the Kurdistan Region–Iraq (KRI). Doing so will involve creating mechanisms by which job-seekers can develop the right skills and find employers who will hire them, employers can find the employees they need, and the government can create an enabling environment in which the best matches between job-seekers and employers can be made. The study estimates the likely number and education levels of new job-seekers through 2020. It conducts an original, scientific survey to learn about employer perceptions of skill gaps in the KRI. Then, it investigates sectoral employment growth in comparison economies to identify promising growth sectors. Finally, it outlines policy steps for the government to take to improve the functioning of the private-sector labor market.

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