Study “Can Skills and Competencies for Trade Be Taught?”

Final Report - Preliminary Draft

October, 2010
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Executive summary

Integration of literature review, qualitative analysis and quantitative analysis
1 Introduction

The World Bank, through its Multilateral Donor Trust Fund for Trade and Development, Fundación Chile and Chile’s National Council of Innovation for Competitiveness have developed the study “Can Skills and Competencies for Trade be Taught?”. It assesses the certification of labor competencies and the influence that these could have on firm competitiveness and productivity.

Openness to trade and success in export markets are correlated with several positive externalities. The competitive pressure associated especially with high-value added export markets is thought to reward productive and efficient firms, spur technological learning, and possibly improve organizational and management practices. Furthermore, there is evidence that over time these benefits do not remain confined only to exporting firms, but are transmitted throughout the economy.

To be able to compete in high-value added export sectors, firms tend to seek more and better human capital. The ability to create an adequate supply of skilled workers through education and training becomes essential to achieving and sustaining success. Since 1999, Chile has experimented with programs to define labor competencies and provide competency-based training and certification to workers in, inter alia, its most dynamic and export-oriented sectors.

The process of creating competency-based standards for various industries in Chile, and the training and certification of workers in export oriented firms, has led to the development of the National System of Labor Competencies Certification and has had an outreach of 30,000 certified workers in 15 sectors of the economy. Fundación Chile maintains a database with information of the certified workers, the companies in which they work and the processes and standards developed. This information, supplemented by various other data sources, has enabled the analysis of a number of facets of the certification experience.

The study “Can Skills and Competencies for Trade be Taught?” aims to understand and gauge several factors related to the impact on and the benefits for exporting firms participating in using competency-based certification, from the perspective of Chilean firms and workers. The study comprises three core elements: a literature review on the certification of labor competencies in the tradables sector, a qualitative analysis of the perceived benefits for firms and individuals of participating in the certification process, and a quantitative analysis centered on the productivity and economic benefits for firms of being involved in the process. The literature review sets a conceptual international framework to the analysis of the Chilean case. The qualitative and quantitative analyses, present a complementary view on the different types of benefits, economic and non-economic, for workers and for companies, of participating in labor competency
certification processes. Specifically, the qualitative analysis explores in depth and from direct sources (managers and workers) what are the perceived impacts of labor competency certification, focusing mostly on productivity issues and their relation to human resources management aspects. The quantitative analysis explores numeric evidence that may contribute to identify if and how certification affects productivity, and what is the role of complementary training on the potential impact (e.g. leveraging).

The report is organized as follows: firstly, the main conclusions and policy orientations resulting from the study are presented. Next, an introduction to the Labor Competency Certification Program at Fundación Chile is offered in order to explain the framework in which the certification was developed. Then, the objectives and methodology of study are described. Afterwards, the results are presented in detail, starting with the literature review, following with the qualitative analysis and concluding with the quantitative one. Finally, the main results of the study are discussed with a comparative perspective based on the conclusions provided in the three elements of the study.
2 Main conclusions and policy orientations

Integration of literature review, qualitative analysis and quantitative analysis
3 Labor Competency Certification Project at Fundación Chile

3.1 Background

The Project of Labor Competencies Certification commenced in 1999 with the aim of promoting the development of human capital in Chile, in the framework of a Lifelong Learning system. This incorporated the approach of labor competencies as an innovative model to develop, evaluate and recognize knowledge, skills and abilities that thousands of workers have acquired during their lifetime.

The initiative was jointly developed by the National Training and Employment Service (SENCE), ChileCalifica Program, Fundación Chile and business associations from key productive sectors of the Chilean economy. During its implementation, the project was funded by the Multilateral Investment Fund of the IDB, the World Bank, through ChileCalifica Program; SENCE, the Ministry of Agriculture, CORFO and participant businesses and industries.

To date, 15 productive sectors have participated in the project. Their results are translated into 322 occupational profiles and 777 labor competencies units, raised from the best practice identified with leading companies from each sector, impacting 30,000 workers who have participated in the evaluation and labor competencies certification processes.

The Labor Competencies Certification project had as central objective to establish the institutional and methodological basis to develop a national system of labor competencies certification, by conducting a pilot experience of training and certification, based on labor competency criteria expressed as performance requirements from the same companies and workers. The initial experience covered the sectors of construction, mining and tourism.

Specifically, the project sought to: (i) develop an institutional framework that articulated actors involved, (ii) identify in each participating productive sector the competencies areas in which was relevant and pertinent to provide certification standards and mechanisms, (iii) define and validate with each participating production sector a set of certification competencies that, altogether, establish the critical occupational profiles for each sector, (iv) designing an evaluation and labor competency certification system, including criteria procedures and instruments, (v) design the basis for a system to assess the quality of training programs in the competencies areas included in the project, (vi) test the defined evaluation and certification mechanisms with a group of workers and companies of the participant sectors, (vii) positioning and disseminate the
products / services of the system at national and international levels, and (viii) design and propose an institutional and financial platform for the system.

3.2 The Relevance Of Labor Competency Certification

The certificate is a guarantee of what it states. In the case of labor competencies certification, it accredits that the worker meets the performance standards in relation to the labor competencies defined by the productive sector, regardless the way in which they were acquired. It formally recognizes the skills that people have, to perform the functions that characterize their job or occupation.

In this context, the project built, validated and disseminated standards of labor competencies in 15 productive sectors and occupations. This process was developed in conjunction with key players from the sectors (companies, officers, employees, experts, international references, etc.), especially incorporating people with extensive experience in their occupations. These validated competencies were grouped into Occupational Profiles that reflect the most common working structures for each sector.

This is part of a larger scheme that sought to install a demand driven National Labor Competencies Certification system in Chile. This intends, based on the specification of performance standards required to successfully complete a task, to ensure, inter alia, that the individual is competent to perform a particular productive function. Thus, through the certification process, those who hold jobs defined by this system can establish the performance level they have in the market, enabling an appropriate exercise of their functions and improved employability and job mobility.

The system also benefits companies by improving their human resource management and achieving increased competitiveness through its human capital efficiency and productivity. This is possible given that firms, by having labor competency standards defined and validated by industry stakeholders can streamline their recruitment processes and performance evaluation, can better orient their investment in training and development and can improve levels of job satisfaction and organizational climate.

In another area, the competencies standards associated with different occupations skills enable to assure the quality of education and training, by clearly specifying the expected learning outcomes in terms of skills development, and therefore, increasing the pertinence of training courses offered by training agencies and having a more transparent training market.

Finally, the establishment of competencies standards promotes the alignment of the curricula at the secondary technical education and higher education, with the requirements of the productive sector, facilitating the development of employability skills and career guidance for young people.

3.3 The Process Of Labor Competency Certification

To obtain the labor competencies certification, it is necessary to go through a process of evaluation of the worker’s skills, knowledge and abilities, which involves the participation of various actors. Specifically, the certification process requires assessing the results of an
individual's work performance, and determining, by an accredited certification body, if the individual is competent or not yet competent.

**Stages of the process of certification**

1. The first step is to identify the productive sectors of the national economy where it is necessary to increase its workforce competitiveness in order to improve its responsiveness to the environment’s challenges. Then, to analyze the current situation and projections in terms of human capital needs for the sector and its main associated activities.

2. After selecting a key productive sector to boost, it is necessary to have the commitment and participation of key actors of the system, namely, employers and workers’ associations, leading companies, experts, institutions and industry bodies, inviting them to actively participate in the process of defining competencies standards.

3. The third step is the definition of labor competency standards in key areas and occupations of the productive sector. This is done through the functional analysis method complemented with the definition of behavioral skills associated with the defined functions. The work is performed directly with businesses and workers, incorporating best international practices. This stage ends with the construction and edition of documents containing standards or units of Labor Competency Standards associated with each job function and a first version of the Occupational Profile around the concept of occupation.

4. After defining the standards, these are validated with sectorial stakeholders. This consists of disseminating widely the products obtained to then incorporate comments and contributions from the industry representatives. Then, sectorial competencies are obtained, which may be used and adopted by all companies of the sector, on a national basis.

5. The competency standard is a valuable input to adapt the education and training offer according to the needs of the productive sector. This translates into modular curricula and learning outcomes requirements for secondary and tertiary technical education, given that it reflects the employers’ requirements for job functions in a particular occupation.

6. The competency standard is used to assess the level of worker’s performance. Taking as reference the labor competency standards that make up the occupational profile, it can be applied a set of evaluation tools and procedures to workers, thereby creating a series of evidences that show the person's job performance. This process ends determining if the
worker is Competent or Not Yet Competent in the performance of their duties, "communicating" this attribute to the market through the certificate attesting his/her labor competencies.

7. The wide dissemination of labor competencies standards promotes their adoption and implementation not only by leading companies organized in associations or guilds, but also ensures its availability for small and medium companies, independent workers and education and training institutions that are interested in meeting the requirements of a sector for a particular occupation. In this way, it is assured that this public good- which may benefit an entire sector of the economy- may become the "common currency" to guiding efforts for employability, education, training and labor mobility.

8. Due to constant changes to which the national economy is subjected, it is important to update the standards according to the industry needs and the occupational profiles. For this, it must be taken into account changes in technology, management models and other innovation challenges, reviewing and adjusting the relevant sets of competencies standards according to the dynamism of each sector. After the upgrade, the cycle resumes with a new validation of standards (step 4). The standards’ term of validity is determined by the main stakeholders of each sector, which are best suited to determine how long will prevail the technological and occupational assumptions considered in their construction.

The following figure presents a summary of the main stages of the labor competency certification process.

Figure 1. Stages of labor competency certification process
3.4 Achievements Of The Labor Competency Certification Project

The main achievements of the Labor Competency Certification Project can be summarized into:

- National coverage of the evaluation experience / certification with 30,000 workers.
- Sectors of the project correspond to clusters selected by the National Council of Innovation for Competitiveness to design the National Strategy for Competitiveness.
- Interaction with companies facilitates the adoption of competencies model in the selection, performance evaluation and purchase of training.
- Main services sectors have validated standards: tourism, logistics and transportation, training, trade.
- Installation of a common methodology for identifying and raising standards of competencies.

- Accessibility standards for small and medium enterprises.

- Certification with the development of transversal occupational profiles which cut across various sectors: health and safety, energy efficiency, management of small companies.

- Competency profiles for the system’s operation: Evaluation of competencies, processes audit to the processes of competencies assessment.

- Construction of Occupational Profiles and labor competencies standards catalog.

- Construction of certification, standards, evaluators and certifiers records.

- Educational material and training plan for competency-based training.

### Table 1. Number of certified workers by sectors and subsectors

<table>
<thead>
<tr>
<th>SECTORS / SUBSECTORS</th>
<th>NUMBER OF CERTIFIED WORKERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>TURISM</td>
<td>4,653</td>
</tr>
<tr>
<td>GAS/ELECTRICITY</td>
<td>1,381</td>
</tr>
<tr>
<td>FRUIT</td>
<td>6,610</td>
</tr>
<tr>
<td>WINE</td>
<td>1,853</td>
</tr>
<tr>
<td>OLIVE OIL</td>
<td>268</td>
</tr>
<tr>
<td>PROCESSED OLIVES</td>
<td>148</td>
</tr>
<tr>
<td>PROCESSED FOODS</td>
<td>2,527</td>
</tr>
<tr>
<td>GREENHOUSE VEGETABLES</td>
<td>290</td>
</tr>
<tr>
<td>FLOWERS</td>
<td>143</td>
</tr>
<tr>
<td>CATTLE</td>
<td>1,639</td>
</tr>
<tr>
<td>METALMECANIC</td>
<td>1,294</td>
</tr>
<tr>
<td>LOGISTIC</td>
<td>4,557</td>
</tr>
<tr>
<td>FISHING AND AQUACULTURE</td>
<td>771</td>
</tr>
</tbody>
</table>
3.5 National System Of Labor Competency Certification

In August 2008, Law 20.267 came into force, creating the Labor Competencies Certification National System and refines the Status of Training and Employment. It also creates the System’s Commission as a body with legal personality and own patrimony, which is related to the President of the Republic through the Ministry of Labor and Social Welfare.

Its mission is to increase people’s labor competencies, through assessment and certification processes aligned with labor market demands and favoring its articulation with a range of competency-based job training.

At the same time, it promotes the competence approach in formal education at college and tertiary levels, in innovation and production promotion programs, in staff management at the firm level, in social programs and job placement systems, in a lifelong learning scheme.
4 General objectives and methodology of the study

The objective of this study is three-fold:

1. Understand and gauge several factors related to the impact on and the benefits for exporting firms participating in using competency-based certification, from the perspective of Chilean firms and workers. To the extent possible, to assess how such certification—and any training related to being certified—may be contributing to or associated with firm competitiveness and success in selected export sectors.

2. Make policy recommendations for low- and lower-middle income countries on creating the needed worker skills for export sectors.

Aiming to reach a comprehensive and multi-dimensional perspective of the costs and benefits of labor competencies certification in companies of exporting sectors, the methodology of the study includes:

1. Literature review of labor competencies certification with an international perspective and special focus in tradable sectors;

2. Quantitative analysis of the linkages between labor competencies certification, training and exports, at a company level for a sample of sub-sectors;

3. Qualitative analysis based on on-site visits, interviews and a questionnaire on the direct and indirect costs and benefits of labor competency certification; and

Next are described these phases and its corresponding outputs.

1. Literature review on the certification of labor competencies in tradable sectors

The literature review looks at the varieties of ways competencies have been defined, taught, and certified through published accounts of specific national experiences with existing programs, with special attention to their use in firms engaged in international trade.

2. Quantitative analysis of the linkages between labor competencies certification, training and exports
The quantitative analysis is focused on exploring, at a company level and for a sample of sectors, the possible linkages between labor competencies certification, training and exports. Three groups of exporting firms are selected for specific industries: (i) firms that participated in the process of defining labor competencies and occupational profiles and also certified workers; (ii) firms that certified workers but did not actively help define competencies; (iii) firms that neither helped define competencies nor use certified workers. The research attempts to understand how firms in these three groups differ:

- In the numbers of workers sent for certification and/or the number of certified workers hired;
- In the types of other formal training programs and strategies used in conjunction with certification;
- In assessing changes in productivity for certified versus non-certified workers;
- In competitive strategy, execution, and success in their given segments of the export markets in which they operate; and
- As far as possible, to reach preliminary conclusions on the extent to which differences in performance are related to use more and more relevant skills by certified workers, or by associated factors, or by a combination.

The quantitative analysis uses as main source the database managed by Fundación Chile, which presents for the period 2000 – 2009, data on the certifications by worker, company, year, and sector and data on companies participating in the definition of competency profiles. In addition to this database, the research draws on the following Chilean data sources: the National Service for Training and Employment database of statistics on training, including public and private expenditures, hours of training and people trained, by firm; Customs Service data on exports by firm for specific categories of exported products; and the National Institutes of Statistics, in particular data from the Annual National Industrial Survey, containing several data on inputs and outputs of firms’ production.

The selection of sectors to be analyzed, associated to companies which have participated in the certification process, is based on the following criteria:

- A portion of their output is exported.
- They have companies that certify their workers and companies that do not certify their workers. For those companies that certify their workers, the number of certified workers is relevant.
The greatest period of certification of workers was 2007 or before.

The analysis then explores the linkages between labor competency certification and firm’s productivity, in particular in terms of exports, differentiating by sector and focusing on three main variables: certification of workers, participation in the definition of competency profiles and training of the certified workers.

3. Qualitative analysis of the perceived benefits of labor competencies certification for firms and workers

The qualitative analysis examines the potential impact and benefit of competency-based worker certification in exporting firms in Chile. It aims at understanding what are the costs and benefits associated to labor competency certification at the firms and worker levels. The qualitative analysis complements the quantities one, offering a first-hand comprehensive view from the people directly affected and/or participant of the certification process.

From the worker perspective, this analysis aims to explore the perceived benefits of certification in terms of job performance, employability and salaries, self-esteem and other aspects related to their appraisal of their own work and the company in which they work. From the company’s view, the analysis seeks to understand how managers regard the certification process and its potential relation with productivity, internal and external company’s reputation, human resources management, training plans and market positioning. Also, at both levels, the willingness to pay for certification services is assessed.

The method used in the qualitative analysis is structured interviews, applied to company managers and workers from companies of selected sectors. The selection of sectors is common to the qualitative and quantitative analyses, seeking more comparability and depth in the overall study. Firms within sectors are organized in two groups: companies which both, certified and defined profiles, and companies which certified but did not participate in profile definition. Workers are grouped into those who participate in the certification process and those who did not. Interviews are planned for each group of sector-company-worker.
5 Literature review

5.1 Introduction

Firms generally seek to acquire a competent and stable workforce, as well as to maintain and upgrade the aggregate knowledge and skills of their workers at the lowest possible cost. In doing so, they routinely face imperfect and assymetrical information, together with recruiting, turnover, and other transaction costs. When they hire individuals whose skills are not a good match for the needs of a given firm, local labor regulations may make it very expensive to change or release these workers.

Certifications of labor competencies are thought to decrease asymmetries of information for firms. By making the quality and quantity of individuals’ skills observable by current or potential employers, certification in theory may lead to higher overall employment, greater labor market mobility, and optimal job placement in a “free-agent” economy. For firms, certification should decrease the transaction costs of selecting and placing workers, improve the ability of managers to match skills to tasks, and increase the effectiveness of outsourcing by making it possible to identify competent external suppliers. Certification may thus enhance organizational performance, promote continuous improvement of efficiency, and increase productivity and profits.

Individuals, meanwhile, generally seek employment that most fully utilizes their skills and provides commensurate compensation. They endeavor to communicate the quality, depth, and breadth of their skills to potential employers quickly and inexpensively. Failure to convey their potential may lead to lower salaries, lack of promotion, inability to transfer to better positions within a firm, and/or inability to move to better opportunities at other firms. Given the asymmetries of information that typically exist between firms and individuals in labor markets—and their associated cost—public intervention to mitigate this problem can optimize outcomes. Systems for the certification of labor competencies are designed to provide this desired mitigation. For individuals, certification promises to boost pay, enhance self-esteem, improve job satisfaction, and augment psychological well-being.

This paper reviews the published literature on certification of labor competencies in commercial occupations. It does not review or address issues related to labor competency certification when its fundamental rationale is public safety or other public purposes. Certifications related to public health and safety typically have been in existence for a long time, are usually mandatory, and tend to be carefully regulated by governments. This type of certification tends to document the

1 World Bank Education Working Paper Series, No. 17
competency of nurses, doctors, lawyers, accountants, architects, engineers, and many other public workers (Bailey and Merritt, 1995, 28). The certification of teachers is a more recent idea that has not been readily accepted.

As noted above, the basic rationale for certification of individuals in commercial occupations is the mitigation of information asymmetries. Such certifications have proliferated more recently, are usually voluntary and often not centrally regulated. Examples include certifications of information technology specialists, auto mechanics, hospitality employees, specialized agricultural workers, transport and logistics workers, and human resource professionals, among others. Of course, some workers in commercial occupations undertake tasks that have public safety implications and concomitant certifications, such as sanitation certification of food service employees. For the purposes of this literature review, those labor competency certifications whose principal purpose is economic will be the focus; such certifications are neither social nor necessarily related to a public purpose.

This distinction is important: certifications whose rationale is economic are often voluntary. Their voluntary nature implies self-selection, meaning that some individuals choose to certify and others do not. Moreover, it implies choices, actions, and costs for firms that certify the labor competencies of their employees, sectors that encourage this behavior among their firms, and governments that adopt labor competency certification systems. This paper thus reviews the literature that seeks to explain the rationale behind these decisions and the impacts that they have, especially on productivity and income.

This review has five sections. The first section describes the different features of certification and certification systems. It provides a short taxonomy, defines labor competency certification and the systems associated with it, explains how these systems fit into broader national qualifications frameworks, and discusses their common institutional arrangements. The second section examines the advantages and disadvantages of these systems, while the third explores what is known about their impact. In general, the empirical evidence currently available for answering key questions is mostly insufficient or tempered by endogeneity concerns. This paper therefore calls for more, and more carefully designed, future research. An exception to the current knowledge gap comes from the information technology (IT) sector, and in the fourth section, a study linking certifications to wage premiums is highlighted. The fifth and final section offers some conclusions and suggests possible avenues of future research.
5.2 Features Of Certifications And Certification Systems

The universe of certifications is large and growing: individuals, sectors, firms, products, processes and practices, among others, are being certified.²

For individuals, the certification of labor competencies usually involves verification of their ability to accomplish an identified task at a particular level of proficiency. A certification may be broad (such as ensuring the problem-free performance of a local area network of linked computers) or narrow (such as demonstrating a consistent ability to successfully prune wine-growing grape vines). The distinction between certification of specific, task-oriented competencies and broad, professional competencies proceeds along a continuum. This review focuses on the narrow end of this continuum.

Similarly, certifications are associated to varying degrees with the completion of formal (often academic) training, with success contingent on standardized licensing and other examinations, as well as practical tests of abilities to be used on the job (the focus of this review). In practice, it is often difficult to distinguish between aptitude (the potential to acquire a skill or certain knowledge); possession of knowledge (the mastery of information and related content), and competency (the ability to regularly perform a given physical or cognitive task at an acceptable level of quality). This difficulty will be discussed further below, but in general this review concerns itself with the third (and narrowest) alternative.

5.2.1 Definitions
Vargas (2002, 112) argues that labor competency certification is a public, formal, and official recognition of an individual’s occupational skills. He argues that certification can stand for “the termination of a training process; a person’s capacity for the practice of certain occupations; and/or the possession of the competencies defined by a standard, regardless of where or when they were acquired.” Irigoin and Vargas (2002, 44–45) describe certification as necessarily embedded in a larger system—a formally established institutional arrangement wherein a cycle is undertaken to identify, standardize, update, and

² Certifications exist for firms and products as well as for individuals. For firms, there are certifications regarding the way business is conducted and processes are run. Some of these certifications are conferred through widely accepted standardized evaluations (e.g., ISO 9000, ISO 14000), while others are conferred on the basis of more subjective criteria by a variety of organizations that grant fair trade, organic, green, animal-friendly, cruelty-free, and geographic-origin certifications, among others. Firms that voluntarily engage in certification are typically at the cutting-edge of workplace and product practices. They look closely at skills and processes to ensure quality and often engage in certification to signal product features sought by more affluent consumers. Corbett, Montes-Sancho, and Kirsch (2005) found that firms that seek process certifications are more productive and more likely to export; their research also found that the decision to seek initial ISO 9000 certification was followed by significant abnormal improvements in financial performance, though the exact timing and magnitude of the effect varied.
evaluate the qualifications of workers. Bouder and others (2001, 172), on the other hand, see certification as both “a process and an outcome: a process that involves implementing standards and defining the criteria by which these standards are assessed, and an outcome resulting from these assessment procedures, whether or not they lead to the award of a qualification.” Table 1 gives examples of available certifications.

Table 1. Sample of Available Certifications

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Type of certification and/or provider</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public safety protection</td>
<td>Government-mandated professional licensing</td>
<td>Doctors, nurses, architects, civil engineers, electricians, pharmacists, therapists</td>
</tr>
<tr>
<td>Quality assurance for widely used services with high technical requirements</td>
<td>Industry or professional association-provided certification</td>
<td>Lawyers, accountants</td>
</tr>
<tr>
<td>Compliance with technical standards</td>
<td>Industry or professional association-provided certification</td>
<td>Institute of Electrical and Electronics Engineers</td>
</tr>
<tr>
<td>Labor competency</td>
<td>Industry- and/or job-specific certification of labor competencies</td>
<td>Certifications by companies such as Microsoft and Cisco; automotive repair certifications</td>
</tr>
</tbody>
</table>

5.2.2 The place of certification systems in national qualifications frameworks

Labor competency certifications systems may be part of national qualifications frameworks (NQF). In these cases, the certifications given are typically seen as a type of qualification. The International Labour Organization’s Recommendation on Human Resources Development, 2004 (no. 195) describes NQFs as a means to promote recognition and certification of skills within a holistic strategy that seeks, inter alia, to develop labor market information and improve the quality, relevance, and accessibility of education, pre-employment training, and development of competencies (Allais 2010). Tuck (2007, v) agrees with the efficacy of this approach, defining a qualifications framework as:

“an instrument for the development, classification, and recognition of skills, knowledge, and competencies along a continuum of agreed levels. It is a way of structuring existing and new qualifications, which are defined by learning outcomes, i.e., clear statements of what the student must know or be able to do, whether learned in a classroom, on the job, or less formally. A qualifications framework indicates the comparability of different qualifications and how one can progress from one level to another within and across occupations or industrial sectors and even across vocational and academic fields.”

Although the comprehensiveness of qualifications frameworks vary widely, many NQFs serve as overall quality assurance mechanisms for their country’s education and training
systems; they may also be the foundation upon which other quality assurance arrangements are built (Allais 2010). Some NQFs are designed on the premise that different educational subsectors (i.e., basic education, vocational education and training, tertiary education, lifelong and adult education) serve different segments of the labor market and have different institutional imperatives and linkages. Successfully designed NQFs connect these subsectors in a single coherent framework (AQF 2009).

A recent draft report on the implementation and impact of NQFs across 16 countries (Allais 2010, 2) for the ILO asserts, “[T]here is some evidence of increased numbers of certificates which recognize existing skills, knowledge, and abilities of workers and potential workers being awarded, although this is on a small scale in most of the countries in the study.” Among the 16 countries studied, 5 (South Africa, Mauritius, Australia, New Zealand, and Scotland) have attempted or are attempting to implement comprehensive NQFs that include a subframework for skills and/or workplace learning certificates. Two (Chile, Mexico) have attempted to implement frameworks for occupational standards related to workplace learning, with some attempts to apply these frameworks to the vocational education and training sector (Allais 2010, 9).

More generally speaking and to varying degrees, NQFs may also:

- describe the nomenclature and key characteristics of each and all nationally recognized and accredited educational qualifications;
- provide guideline information on the linkages between different qualification types;
- specify the authority for accrediting qualifications and the requirements for issuing qualifications in order to protect the reputation and authenticity of both the qualifications and the issuing institutions;
- describe potential cross-sector qualification linkages, pathways, and recognition of prior learning;
- provide levels or equivalencies of qualifications within the framework itself; and
- facilitate international recognition and comparability of qualifications (Allais 2010).

These features may enhance the effectiveness of certifications, although this conjecture remains to be verified empirically.

### 5.2.3 Common institutional arrangements of labor competency certifications

The institutional arrangements of labor competency certification systems vary widely and are not comprehensively reviewed in this paper. Rather, the paper describes the typical set-up and common stakeholders of various systems, as well as commonalities and differences among existing systems and frequent pitfalls with their implementation.
It is important to remember that labor competency certification systems as they exist today are not new and have evolved continuously over time. For example, in Germany and England certification of apprentices developed along with training standards in the late nineteenth and early twentieth centuries. Both France and Spain had systems for certification of labor competencies prior to 1930 (Bouder et al. 2000).

**Typical set-up of a labor competency certification system**

Vargas (2002, 109) describes a typical set up (and illustrates it, as per Figure 1) as follows:

A training and certification system comprises three levels: direction, executive, and operational levels. The Direction level is usually a participative area in which workers, employers, and the government sector set up the “rules of the game” that are usually sanctioned by legal norms. The Direction establishes the structure of the system and appoints those in charge of the functions of training, evaluating, and certifying. Participation by the State is highly desirable because it provides an excellent opportunity to regulate aspects such as access, equity, quality, and transparency.

At executive level, the organization is nearly always sectoral and in most cases made up by the workers and employers of a specific occupational sector (for instance, forestry, automotive industry, leather and footwear manufacture, etc.). Methodologies are applied at this level for the identification of competencies and development of performance standards.

An essential function of the sectoral level is to check on the quality and relevance of the operational level implementing the training, evaluation, and certification, which is fundamental to ensure that it meets the needs detected and that the certificates are reliable, i.e., that they effectively attest to what they purport to certify.

**Figure 1. Outline of a Training and Certification System**

![Diagram of a Training and Certification System](source: Vargas 2002, 109.)
Training, evaluation, and certification take place at the operational level. A substantive point of discussion is whether such functions should be carried out by the same or different institutions.

**Common stakeholders**

The stakeholders of labor competency certification systems are the individuals or groups who have a vested interest in ensuring that certification standards, or results, are appropriate. They are often key decision makers: persons who determine whether or not a program gets implemented and is successful. The literature describes four major categories of stakeholders: governments, firms, individuals, and “other.” This last category includes a variety of players:

- Consumers who depend on the competency of certified workers.
- Providers of educational and training programs, who offer the education and training required to achieve the credential and may even administer and manage the program. Universities, community colleges, private schools, vendors of training programs, professional and trade associations, and internal training departments fit in this category.
- Union leaders who can use certification as a tool for affiliate advancement and training. Vargas (2002) suggests that because worker representatives participate in the establishment of the skills profiles that serve as the basis for certification, it has been included among collective bargaining issues.

Within firms, some authors further divide the category into a variety of substakeholders. Hale (2000) mentions four:

- Supervisors with a vested interest in the competency of the workforce that they oversee.
- Senior management, which must ensure that a certification program is a good investment of firm resources and employee time.
- Human resources staff, legal personnel, and internal auditors who want a voice in the design and implementation of any internal certification program, since they are responsible for dealing with employee relations, lawsuits, and compliance issues.
- Internal or contracted support staff, such as administrative and information technology staff, who design and manage a program's database.

**Commonalities and differences among systems**

Morra (1993), then Director of Education and Employment Issues in the Human Resource Division of the U.S. General Accounting Office, reviewed eight standards and certification systems for occupations that required less than a bachelor’s degree for entry-level employment. Her study found several common elements in certification systems, including industry ownership and control, recertification requirements to keep certificateholders’ skills current, national portability of credentials, and integration of industry standards and
education providers through some sort of accreditation program. Among these elements, she argued that industry ownership and control was most important for the development of a successful certification system.

Despite the aforementioned commonalities, research by Bouder and others (2001) on the European Union illustrates a variety of differences regarding the main characteristics and institutional implementation arrangements of the national certification models of Germany, France, Spain, and England. The evolution of vocational training and labor competency certification standards has been intertwined in these countries; this back-and-forth relationship is reflected in table 2.
Table 2. Certain Features of Certification Systems in Countries of the European Union

<table>
<thead>
<tr>
<th>Feature</th>
<th>Germany</th>
<th>France</th>
<th>Spain</th>
<th>England</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Main characteristics</strong></td>
<td>Enterprise-centre alternating training (dual system). Enterprise responsible for training</td>
<td>Education and VT regulated by Ministry of Education. Recognition of previous adult learning. Various certification programmes in enterprises</td>
<td>Three training subsystems: Regulated training in educational cycle; Occupational training for the unemployed; Ongoing training for workers</td>
<td>National framework of competency levels governed by a National Authority in educational and occupational aspects</td>
</tr>
<tr>
<td><strong>Governing body</strong></td>
<td>Federal VT Institute (BIBB)</td>
<td>Ministry of Education</td>
<td>National Qualifications Institute (INCUAL)</td>
<td>Qualifications and Curricular Authority (QCA)</td>
</tr>
<tr>
<td><strong>Standards</strong></td>
<td>National standards set by BIBB</td>
<td>National benchmarks set by the Ministry of Education</td>
<td>Occupational profiles established by Royal Decree</td>
<td>Standards established under the leadership of corporate members</td>
</tr>
<tr>
<td><strong>Strengths</strong></td>
<td>Occupational practice. Enterprise-led training. Single national standards</td>
<td>Highly reliable governance (public and national in scoped). Integrated education and VT</td>
<td>National benchmarks focalized on different customers. VT incorporated into educational system</td>
<td>Comprehensive, integrating national framework. Education and VT merged together</td>
</tr>
<tr>
<td><strong>Critical aspects</strong></td>
<td>The efficiency of the dual system is questioned due to its narrow focus on a single practice</td>
<td>Employers are critical of diplomas, which they think have low applicability due to a prevalence of academic contents</td>
<td>Need for greater coordination among initial, ongoing, and occupational training systems</td>
<td>Excess of qualifications and descriptions in an effort to be too objective</td>
</tr>
<tr>
<td><strong>Historical background</strong></td>
<td>First regulations for industrial training, 1925. Dual training, 1964.</td>
<td>First School of Arts and Crafts, 1803. Establishment of CAP, 1919</td>
<td>Technical Institutes first established in 1925. First certificates issued in mid-70s. General Educational Law passed in late 80s</td>
<td>Private training initiatives 1878 (City and Guild). Competency standards, late 80s</td>
</tr>
</tbody>
</table>

*Sources:* Vargas 2002, based this table on QCA (2001); Bouder et al. (2001); Fretwell 2001. *Note:* a. QCA is now known as the Qualifications and Curriculum Development Agency; it is scheduled to be closed in March 2011 (see QCDA Web site, http://www.qcda.gov.uk/about/96.aspx, accessed December 2010).

There are also a wide range of certification applications in Latin America; table 3 compares their intent and principal actors.
Table 3. Features of Certain Certification Experiences in Latin America

<table>
<thead>
<tr>
<th>Identification</th>
<th>Programme of occupational quality certification in the tourism sector, Brazil</th>
<th>Pilot programme of occupational competencies’ certification, Chile Califica</th>
<th>Standardization and certification of occupational competencies, Mexico</th>
<th>Vocational training institutions* (several countries)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coverage</td>
<td>Hotel trades and tourism</td>
<td>Tourism, construction, mining —national level</td>
<td>National; occupations according to demand</td>
<td>Sectoral, by areas of attention</td>
</tr>
<tr>
<td>Standards</td>
<td>Based on Institute’s own functional analysis</td>
<td>Based on functional analysis</td>
<td>Based on functional analysis</td>
<td>Based on functional analysis and DACUM</td>
</tr>
<tr>
<td>Critical aspects</td>
<td>Transferability. Greater trade union participation. Accessibility for the unemployed.</td>
<td>Great coordination efforts of public-private sectors</td>
<td>Wide offer of standards, low demand for certifications. Integration with VTY</td>
<td>Becoming integrated with public employment and training policies</td>
</tr>
<tr>
<td>Strengths</td>
<td>High credibility among employers. Tripartite National Certification Council</td>
<td>Credibility deriving from actors involved. Lifelong educational approach</td>
<td>Credibility. High transferability. Private sector participation</td>
<td>Credibility. Technical proficiency of VTIS Association with the VT progress</td>
</tr>
</tbody>
</table>

Source: Vargas 2002, based on institutional documentation and his personal concepts.
Note: a. This column is not intended to include all cases; it shows only several countries where VTIs implement certification programs based on competency profiles.
**Frequent pitfalls of implementation**

Building a labor competency certification system is a challenging task that has high start-up and maintenance costs, significant uncertainty regarding impact, and substantial incentives for stakeholders to free ride.

In the literature, Morra (1993) warns of the long time periods required for a certification system to become established and accepted, noting a range of 2 to 7 years in her survey. She stresses the high cost of development and maintenance of labor competency certification systems, particularly in terms of in-kind contributions of staff time and materials. Morra then enumerates two major coordination difficulties: the inability to bring all stakeholders together in developing a certification system and the difficulty of forming industry coalitions and reaching agreements on standards. In her view, the former is compounded by the lack of uniform occupational definitions across employers, particularly in terms of specificity. Morra also highlights the typically insufficient structure for disseminating information and promoting certifications across industries.

Herschbach and Campbell (2000) maintain that certification can only be as good as the standards used. They agree with Morra that identifying and maintaining current job tasks and standards of proficient performance is labor intensive and costly, and that both require time and expertise. They add that unless job task standards are kept current, a certification system quickly grows outdated and dysfunctional. “An outdated certification system can hinder economic development and individual advancement because it locks VET into outdated skills. The scope of an initial certification system should thus not exceed the ability to maintain up-to-date standards through available human and financial resources” (Herschbach and Campbell 2000, 55).

### 5.3 Advantages And Disadvantages Of Labor Competency Certification Systems

#### 5.3.1 Advantages

The advantages of labor competency certification systems are best understood when considered from the perspective of different stakeholders.

Márquez (2001) maintains that for governments, certification solves an information problem by making the quality and quantity of individuals’ skills observable by potential employers. Removing this asymmetry of information is thought to lead to higher overall employment, greater transparency in labor markets, and greater equity for employees (i.e., their wages can both more quickly and accurately reflect their true skill levels). Vargas (2002) argues that certification advances equity because it facilitates the access of a greater number of workers to better jobs. By vouching for the capability of workers—particularly those who either did not have or complete formal education, certifications increase
workers’ chances of recognition and acceptance in the labor market. Bouder and others (2001) agree, noting that certification has made it possible for the middle and working classes in Europe to fill occupational and social positions from which they had up to then been excluded. Even today, certification programs in several European countries favor the inclusion of low-skilled workers as a method of incorporating them into training cycles.

Among the other advantages of certification, Barbagelata (1979) notes that it may also improve statistical information regarding a country’s employment and occupation structure. Araneda (2006, 16) adds that certification can help “achieve greater alignment between the human resource demands of the private sector, the supply of work-oriented training, and the formal mechanisms that recognize learning attained through formal, non-formal and informal settings.” Finally, because governments often provide or subsidize training, they have a vested interest in seeing how well certifications signal the information and tasks that individuals are expected to respectively know and do in given occupations.

For firms, Fertig, Zeitz, and Blau (2009) argue that certifications decrease the transaction costs of selecting and placing workers and increase the effectiveness of outsourcing by making it possible to identify competent external suppliers. This in turn typically enhances organizational performance, promotes continuous firm improvement, and increases productivity. Fertig, Zeitz, and Blau add that the rationale for certification can also be external, as firms may need to comply with local and/or international regulations, improve their public perception, or impress customers and other external stakeholders.

Hale (2000) sees the advantages of the certification of firms in a slightly different way. She argues that certification: helps firms establish uniform performance standards in order to rapidly deploy workers; applies a multidisciplinary approach to solving complex problems; integrates products, supply chains, and processes; and fosters employee development by updating and augmenting employee skills and knowledge. The latter, she says, raises the level of core competencies across an organization and helps retain and attract competent staff.

Acemoglu and Pischke (1999) argue that a firms’ motivation for certification is greater when it comes at the end of training, contending that certification encourages firm-sponsored training. When employees know that a certificate will increase their value in the labor market, they are likely to work harder in training programs that result in certification than in those that do not. Consequently, firms will invest more in training programs that result in certification because these programs increase employee training motivation and effort. In this sense, certification better aligns employer and employee incentives.

Finally, Rada (1999) argues that firms use certification as a tool to increase their market share. This happens frequently in the IT sector, where companies who teach about their
products and certify that learning simultaneously encourage the use of those products. This process is further explained later in this paper in the section on information technology certification.

For individuals, the motivation to seek labor competency certifications is also rooted in the benefits of fewer information asymmetries. Vargas (2002) highlights the role of certification in publicly recognizing the knowledge that individuals have and apply over and above their academic merits, giving practical experience its due. Bailey and Merritt (1995) argue that by making skills more transparent, certification gives access to a national labor market, thus promoting geographic and occupational mobility and appropriate job placement in a “free agent” economy. Along the same lines, Fertig, Zeitz, and Blau (2009) add that certification may also result in a possible boost in pay, enhanced personal self-esteem, and heightened psychological well-being made possible by a person’s increased sense of professionalism and employability.

**Figure 2. Different Expectations Regarding the Advantages of Certification**

*Source: Based on Vargas (2002).*
For other stakeholders, the likely advantages of certification are equally significant. Herschbach and Campbell (2000) say that for education and training programs, certification systems are an effective means of incorporating changing labor market requirements into program content, as well as developing and delivering high-quality instruction. Through a certification system, they argue, detailed information on knowledge and skills requirements, together with graduates’ test results, can be fed back into the instructional development and revision process, providing an important check on both internal and external program effectiveness. From the results of certification tests, it is then possible to ascertain whether courses and programs deliver the right content and whether learning is occurring. Herschbach and Campbell also argue that certification encourages the development of a workforce framework that links different forms and levels of education and training into a coherent whole that is responsive to labor market requirements. As Bailey and Merritt (1995) suggest, the latter framework is useful for both prospective and current students because it indicates what they must learn and provides them motivation to acquire the particular skills that they will use in the workplace.

With respect to trade unions, Vargas (2002) says that certification may facilitate their participation in the establishment of the skills profiles that will serve as the basis for training, evaluation, and certification.

5.3.2 Disadvantages
The literature outlines three disadvantages of labor competency certification systems: the risk of promoting “credentialism,” the risk of excluding certain groups, and the difficulty of separating knowledge from competencies.

Fertig, Zeitz, and Blau (2009) outline the first of these disadvantages. They maintain that certifications are double-edged, as they can be used as “credentials” in order to gain prestige, rewards, or influence. The authors argue that certifications can be used for extrinsic reasons that have little or nothing to do with improved work performance or competence. Reviewing the literature on “impression management,” they note that this literature provides ample evidence that people are prone to use impression management tactics to bolster their position in work organizations, even if these tactics have little or nothing to do with genuine performance.

Barbagelata (1979) of the ILO expresses a similar fear: with certification, employers may pay differently for equal work, thus violating a fundamental tenant of worker rights.

An aggravating factor associated with credentialism is the potential for labor competency certifications to be exclusionary. According to Fertig, Zeitz, and Blau (2009), labor market
economists have argued that one of the functions of certification is to provide a barrier to entering a labor market, thus increasing the wages of those possessing the certification. This result is exactly what detractors of certification systems predict and find unfairly exclusionary. Authors differ on the matter. Bouder and others (2001, 33) assert:

Traditional certification systems are more likely to make social stratifications more rigid than to enable individuals to have the socially and economically useful skills that they possess endorsed. The European Commission . . . seems to reflect this point of view when it writes that: “…society ‘locks out’ in this way much talent which is frequently unconventional but innovatory and that it therefore produces an elite which is not truly representative of the available human resource potential.”

Bouder and others highlight the difficulty of separating knowledge from competencies. Citing Bellier (1997), they note that certifications which reference academic knowledge often strengthen and increase social segmentation. On the other hand, certifications intended to highlight and identify individuals’ aptitudes, thereby helping them to achieve recognition from which they are currently excluded and promote their integration by enabling a fairer and more efficient use of human resources.

This tension between academic and occupational knowledge was discussed by Barbagelata (1979). He maintained that the two disadvantages of certification were that it could: (i) equalize differences between those who had pursued higher education and those who had not, thus unfairly impacting the former, and (ii) undermine the importance and prestige of occupational qualifications and certifications (i.e., accountant, dentist, etc.), presumably by substituting experience for academically acquired certification or its equivalent.

The next section endeavors to gauge the extent to which the advantages and disadvantages of certification considered here have manifested in experience.

5.4 Impact Of Labor Competency Certification Systems

Grounding a discussion of the advantages and disadvantages of labor competency certification systems in solid evidence is not easy. The literature regarding impact is scarce; what does exist is often poorly referenced, more anecdotal than empirical, excessively narrow in focus, or based on findings from public safety–related professions. Moreover, much of the evidence of the positive impact of certification relates to certificates associated with training, rather than those associated with recognition of on-the-job competencies.

Vargas (1979, 114) of the ILO asserts, “[T]here is plentiful evidence in Latin America that unemployment is higher among those with fewer years of certified education or
who lack specific training (and consequently have no certificates),” but does not cite references to support this claim.

Morra (1993) maintains that organizations who sponsor certification systems believe that certifications garner higher wages for the certified. Although most evidence is anecdotal, she cites evidence from the International Association of Bridge, Structural, and Ornamental Ironworkers, which represents many ironworkers employed as welders. The latter estimates that certified welders in the USA earn $10,000 to $12,000 more per year than noncertified welders.

Quan, Dattero, and Galup (2007) concur that wage premia exist for IT certifications, but take the analysis one step further by quantifying these premia and demonstrating that their size is job- and industry-specific. They use survey data from various sources to build a comprehensive model that estimates the increment to wages of various IT certifications. Their findings are discussed in the IT case study presented in the following section.

A 2004 Information Technology Association of America (ITAA) Workforce Development Survey of hiring managers indicated that the best methods for internal advancement among IT employees included both participation in formal on-the-job training (56 percent) and certification programs (55 percent). Some 71 percent of survey respondents said that certification or continuing education was either important or very important for advancement (ITAA 2004). Surveys rarely tell the whole story, however. In an article in ComputerWorld, journalist Pratt (2005) quoted many IT executives as saying that certifications had become "watered-down and diluted" as the number of IT certifications and third-party teaching centers had grown and certification exams became less stringent.

In the domain of public safety–related professions, literature on the impact of certifications is likewise scarce. For certifications associated with written tests of knowledge, Fertig, Zeitz, and Blau (2009) reports that few studies have directly examined the relationship between certification test scores and future job performance. Studies that have done so sometimes find little relationship between the two. Kleiner (2006) reviews studies on occupational licensing and reports that they have positive effects on service quality in some cases, but have little or none in others. Fertig, Zeitz, and Blau (2009, 203) note:

Indeed, researchers have concluded that certification tests cannot be held to the standard of predictive validity—that the test predicts effective future job performance (Kane 1982, 2004; Shimberg 1981). Instead, only content validity is seen as relevant (La Duca 1994; Raymond 2001)—whether the test taps into the knowledge and skills judged necessary for good practice.”

He concludes that existing empirical research on certifications lends minimal support to the positive rationale behind their existence.
Research is currently being conducted in Chile that will help decrease the existing knowledge gap. A few selected sectors participated in an innovative program to certify labor competencies in 2002. This program grew to include 30,000 individuals in 500 firms and 13 sectors and gave rise to the recently created National System of Labor Competency Certifications. Fundación Chile, the not-for-profit corporation that managed the certification program, the National Council of Innovation for Competitiveness in Chile, and the World Bank are currently conducting a detailed study to measure the impact of this certification on firm productivity in tradable sectors of the economy. Results are expected towards the end of 2010.

5.4.1 Impact of on-the-job training
When certifications are given at the end of training, Acemoglu and Pischke (1999) argue it that increases their impact because employees have more incentive to invest their time in such training. Almeida and Cho (2010, 69) find that regardless of the certification, there is a strong and positive correlation between higher productivity and the incidence of job training at the worker or firm level:

On-the-job training is an important channel through which workers upgrade skills and remain competitive in the labor market and firms adopt technology and innovation. In modern economies with constant technological change and increased competition, firms worldwide struggle to find workers with the right set of skills. The investment in job training allows workers to adopt and implement new technologies, eventually leading to increased firm productivity. Studies mostly in developed countries show that this training is positively associated with increases in individual workers’ wage growth and firms’ productivity and innovation.”

Table 4 summarizes some of the findings outlined in Almeida and Cho 2010.

Table 4. Effects of On-the-Job Training on Wages and Productivity

<table>
<thead>
<tr>
<th>Study</th>
<th>Effects on wages</th>
<th>Methodology</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developed countries</td>
<td></td>
<td>Panel analysis</td>
<td>Current training matters, while previous training has little impact, Wage premium is large</td>
</tr>
<tr>
<td>Lynch (1992)</td>
<td>On-the-job training: 0.2–0.36% wage increase per week of training</td>
<td>(USA, NLSY)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Apprenticeship: 0.1–0.26% wage increase per week of training</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Off-the-job training: -0.02–0.2% wage increase per week of training</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Developing countries</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Middleton et al. (1993)  | About 20% increase in earnings  | Survey on previous studies  |
Roshholm et al. (JDE 2007)  | Kenya and Zambia  | Formal training: 20% wage increase  | Matching estimation  | Larger returns for larger firms  

<table>
<thead>
<tr>
<th>Study</th>
<th>Effects on productivity</th>
<th>Methodology</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Developed countries</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black and Lynch (2001)</td>
<td>Not significant (likely underestimated, because of no information on stock of training)</td>
<td>Both cross-sectional and panel in the USA (manufacturing business survey)</td>
<td></td>
</tr>
<tr>
<td>Barron et al. (1989)</td>
<td>10% increase in hours of training results in 3% increase in productivity</td>
<td>A survey collecting detailed information on training and wages (USA)</td>
<td>Productivity increase is larger than wage increase, suggesting that firms extract rent</td>
</tr>
<tr>
<td>Almeida and Carneiro (2009)</td>
<td>Rate of returns: 6.7%–8.6%</td>
<td>Panel data for firms (Portugal, Balanco Social)</td>
<td>Takes into consideration the cost of training and estimates rates of returns</td>
</tr>
<tr>
<td><strong>Developing countries</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Acevedo and Tan (2010) | Mexico: 5–6%  
Chile: 7–9%  
Peru: 21–26%  
Colombia: 5% | Quasi-experimental approach using panel data and policy changes | Measures the effect of SME program participation, including training on wages and productivity |
| Biggs et al. (1995) | Kenya, Zimbabwe, and Ghana  | OLS and 2SLS | Estimates may be upward-biased due to selectivity |
| | 50–127% increase in output after training | | |
| Tan, Savchenko, and Peri (2003) | India: 27%  
Pakistan: 66%  
Bangladesh: Not significant  
Morocco: 48%  
China: 32%  
Bolivia: 34% | OLS estimation from investment climate surveys | |

Note: NSLY = National Longitudinal Survey of Youth 1979, OLS = Ordinary least squares, 2SLS = Two Stage Least Squares (2SLS)  

### 5.5 Evidence Of Certification Benefits In The IT Sector

The dearth of high-quality impact evaluations or cost-effectiveness studies of certification systems means that only partial conclusions can be drawn from existing data. This section draws on research from the IT sector to further ground the debate on labor competency certification systems, particularly those associated with training.

Quan, Dattero, and Galup (2007) provide evidence to support the rationale behind labor competency certification systems. They investigated the contribution of different generic and vendor-specific certifications to the overall wages of IT professionals across multiple job functions and industries and concluded that certifications: (i) could partially substitute for formal education and experience and (ii) were associated with job- and industry-specific
wage premia. They defined a wage premium as the salary effect of possessing a certain certification.

5.5.1 Overview of IT certification systems
In the IT sector, rapidly evolving technology creates a need for highly skilled individuals to apply, support, configure, and adapt new IT products and services. Industry participants use certification systems to encourage and ensure that industry members keep up with these changes. Although certifications have become widespread throughout the sector, they have no single standard and are not uniformly recognized among employers (Quan, Dattero, and Galup 2007).

IT certifications can generally be classified into two types: vendor neutral and vendor specific. The former are developed by a wide range of experts in a particular field, focus on foundational concepts relative to underlying technology, cover many products, and encompass a broad range of skills and abilities. Some notable generic certification bodies based in the United States include the National Association of Communication Systems Engineers (NACSE), the Computing Technology Industry Association (CompTIA), and the Institute for Certification of Computing Professionals (ICCP). Vendor-specific certifications come from companies such as Microsoft, Red Hat, and Cisco, which provide certifications focused on their specific products. Acquiring one of their certifications ensures vendor-specific knowledge and skills (Quan, Dattero, and Galup 2007).

Currently there are hundreds of certifications on the market. For example, on a Microsoft-run Web site that claims to have a complete list of certifications offered, 112 types are listed, most of which include more than one certification. According to GoCertify.com, as of December 2007, over 3 million people across the world had been awarded IT certifications. The most common of these was the Microsoft Certified Professional (MCP), which alone boasted over 2 million awardees.

It is important to note that the level of complexity of certifications varies widely. Some, like the Certified Information System Security Professionals (CISSP), require over five years of professional experience, passing a six-hour test that costs $450, and must be renewed every three years. Other certifications are less demanding. The Sun Certified Java Associate (SCJA), for instance, is targeted at newcomers to Java who are not necessarily working in technical positions, such as project managers, students, or developers for whom Java is not a primary requirement. In both cases, the amount of training that an individual

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must have before taking a certification test depends on their level of expertise. There is typically a fast-track route for those who are well-versed in the systems in which they are seeking certification. The Red Hat Certified Engineer (RHCE), for instance, is a performance-based test that measures competency on live systems. If a person is already an expert in Linux, they can take the exam directly or complete a single five-day overview course that costs $3,000.

Evidence suggests that nearly all stakeholders in the IT sector benefit from certification systems. Companies who use IT are interested in certified technicians because these workers have been trained and tested to manage specific systems and/or products. Individuals are interested in certifications because they communicate third-party verification of their skills to the labor market, and according to Quan, Dattero, and Galup (2007), because they are rewarded for it. Software manufacturers are interested in teaching technicians how to use their products because it encourages use of these products and disseminates them throughout the sector. They are interested in certifying those they train because it means they can guarantee a minimum level of competency and ensure that their products are adequately used. A paragraph on Novell Corporation’s Web site best illustrates a firm’s motivation for technician certification:

Novell Education’s mission is to drive global pervasive computing through quality education programs and products; its purpose is to increase literacy on Novell products and technologies and thereby foster Novell’s success worldwide. Novell Education plays a critical role in providing true pervasive computing by building the infrastructure of support and literacy that is necessary to drive and sustain that vision.  

For IT vendors who offer their own certifications, certifications have become a tool to disseminate products, penetrate the market, and gain market share.

5.5.2 Wage premiums associated with IT certification
Quan, Dattero and Galup (2007) built a comprehensive model to estimate wage premia associated with IT certifications for 10,630 IT workers in the United States. Their calculations focused on 9 job functions (representing 81 percent of respondents), 10 industries (representing 69 percent of respondents), and 10 popular IT certifications. These certifications can be classified as outlined in table 5:

| Table 5. IT Certifications in the Survey Sample of Quan, Dattero and Galup (2007) |

<table>
<thead>
<tr>
<th>Category</th>
<th>Certification</th>
<th># of respondents</th>
<th>% of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Security</td>
<td>• [ISC]2 Certified Information Systems Security Professional [CISSP]</td>
<td>452</td>
<td>4%</td>
</tr>
<tr>
<td></td>
<td>• Microsoft Certified System Engineer-Security [MCSE-S]</td>
<td>122</td>
<td>1%</td>
</tr>
<tr>
<td></td>
<td>• Cisco Certified Security Professional [CCSP]</td>
<td>114</td>
<td>1%</td>
</tr>
<tr>
<td>Database</td>
<td>• Oracle9i DBA Certified Professional [OCP]</td>
<td>900</td>
<td>8%</td>
</tr>
<tr>
<td></td>
<td>• Microsoft Certified Database Administrator [MCDBA]</td>
<td>256</td>
<td>2%</td>
</tr>
<tr>
<td>Networking</td>
<td>• Cisco Certified Internetwork Engineer [CCIE]</td>
<td>156</td>
<td>1%</td>
</tr>
<tr>
<td></td>
<td>• Red Hat Certified Engineer</td>
<td>540</td>
<td>5%</td>
</tr>
<tr>
<td></td>
<td>• Cisco Certified Network Professional [CCNP]</td>
<td>1,077</td>
<td>9%</td>
</tr>
<tr>
<td>Programming</td>
<td>• Sun Certified Programmer for the Java2 Platform [Java2]</td>
<td>409</td>
<td>5%</td>
</tr>
<tr>
<td>Project Management</td>
<td>• Project Management Professional [PMP]</td>
<td>80</td>
<td>1%</td>
</tr>
</tbody>
</table>

Source: Quan, Dattero, and Galup 2007.

Note: a. About 4% of respondents had earned multiple certifications.

The results of Quan, Dattero, and Galup (2007) suggest that the magnitude of the wage premia associated with certifications vary by type of certification, job function, industry, and number of certifications held. Table 6 is an example of the wage premia associated with CISSP in different job functions.

**Table 6. Wage Premia Associated with CISSP**

<table>
<thead>
<tr>
<th>Job function</th>
<th>Premium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data communications/ telecommunications</td>
<td>46%</td>
</tr>
<tr>
<td>Computer-related consulting</td>
<td>30%</td>
</tr>
<tr>
<td>Systems analyst</td>
<td>30%</td>
</tr>
<tr>
<td>Computer systems/ operations/ networking</td>
<td>27%</td>
</tr>
<tr>
<td>LAN/network systems</td>
<td>22%</td>
</tr>
<tr>
<td>IS/ MIS/ DP</td>
<td>18%</td>
</tr>
<tr>
<td>Systems engineering/ integration/ technical services</td>
<td>14%</td>
</tr>
</tbody>
</table>

Source: Quan, Dattero, and Galup 2007.

Note: CISSP – [ISC]2 Certified Information Systems Security Professional. IS= information systems, MIS= management information systems, DP= data processing.

Tables 7 and 8 show the wage premia of different certifications by job function and industry, with the acronyms associated with each certification heading each column.
Table 7. Wage Premia of Different Certifications by Job Function

<table>
<thead>
<tr>
<th>Job function</th>
<th>CCSP</th>
<th>OCP</th>
<th>CCIE</th>
<th>CCNP</th>
<th>RHCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer systems/ operations/ networking</td>
<td>56%</td>
<td>21%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Systems engineering/ integration/ technical services</td>
<td>17%</td>
<td>23%</td>
<td>18%</td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td>LAN/network systems</td>
<td>31%</td>
<td>37%</td>
<td>16%</td>
<td>26%</td>
<td></td>
</tr>
<tr>
<td>Support</td>
<td>47%</td>
<td>22%</td>
<td>32%</td>
<td></td>
<td>22%</td>
</tr>
<tr>
<td>Software application development</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Computer-related consulting</td>
<td>28%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IS/ MIS/ DP</td>
<td>41%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Systems analyst</td>
<td>20%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data communications/ telecommunications</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Quan, Dattero, and Galup 2007.
Note: See tables 5 and 6 for explanations of acronyms.

Table 8. Wage Premia of Different Certifications by Industry

<table>
<thead>
<tr>
<th>Industry</th>
<th>CISSP</th>
<th>OCP</th>
<th>MCDBA</th>
<th>CCIE</th>
<th>CCNP</th>
<th>RHCE</th>
<th>Java2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer / network consulting</td>
<td>33%</td>
<td>27%</td>
<td>45%</td>
<td>23%</td>
<td></td>
<td></td>
<td>38%</td>
</tr>
<tr>
<td>Government</td>
<td>14%</td>
<td>19%</td>
<td></td>
<td>27%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>14%</td>
<td></td>
<td></td>
<td></td>
<td>27%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consulting</td>
<td>20%</td>
<td>73%</td>
<td>27%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Finance/ banking/ accounting</td>
<td>19%</td>
<td></td>
<td>16%</td>
<td>19%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Software development</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Telecommunications</td>
<td></td>
<td></td>
<td>46%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health/ medical services</td>
<td>39%</td>
<td></td>
<td>27%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manufacturing</td>
<td>35%</td>
<td>22%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Computer-related distributor</td>
<td>44%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Quan, Dattero, and Galup 2007.
Note: See table 5 for explanations of acronyms.

The results of Quan, Dattero, and Galup (2007) support the conclusions of individual surveys conducted before them. In a 2004 survey conducted by Certification Magazine, an IT industry publication, a large percentage of certified respondents said that they had higher average salaries compared to those who were not certified, and reported receiving a raise of up to 15 percent in the first year after receiving their primary certification. According to this article, almost half of the respondents believed that their primary certification played a significant role in earning the salary increase (Sosbe 2004). Many of the other surveys used in paper by Quan, Dattero and Galup came to similar directional conclusions, with actual percentages varying from survey to survey.

It is important to note that the samples of certified workers are representative of all IT workers, as individuals self-select to seek and gain certification. It is not presently possible
to know whether the wage premia result from the certification process itself, or from intrinsic characteristics such as high motivation that are associated with both good job performance and participation in certification programs. This caveat applies to research on certification generally; future research using experimental design or natural experiments could overcome this methodological obstacle in order to better understand certification effects.

5.6 Conclusion

This literature review has focused on the certification of specific, task-oriented labor competencies evaluated via practical tests of acquired abilities that will be used on the job. It took a systemic view that embedded certification in larger systems: “a formally established institutional arrangement wherein a cycle is undertaken to identify, standardize, update, and evaluate the qualifications of workers” (Irigoin and Vargas 2002, 44–45).

The certification of labor competency in commercial occupations is meant to overcome inherent asymmetries of information between individuals and employers. When successful, it may promote lower transaction costs for firms, better matching of workers to tasks, and greater organizational efficiency and, hence, productivity. For workers, certification may overcome information obstacles, leading to wages that reflect actual rather than perceived skills, greater job mobility, and higher job satisfaction and professional self-esteem. Governments have an interest in promoting certification when it is effective in overcoming the information asymmetries that decrease the efficiency of markets.

The rationale for certification of labor competencies for commercial occupations differs from certifications conducted for a public safety goal or other public purpose, although sometimes the two categories may overlap. Certification systems for labor competencies for commercial occupations may be promulgated by a wider range of actors and are usually more decentralized than safety-related certifications.

Certification systems may be nested within national qualifications frameworks, whose comprehensive categorization of skills and competencies may help bridge gaps in labor markets caused by the different foci of credentials conferred by formal education. Certification systems are not new; they appeared in their modern form in Europe more than a century ago. Potential stakeholders in or beneficiaries of certification systems include firms, individuals, governments, consumers, training institutions, and unions. The advantages vary by stakeholder, but are generally the result of improved information. The disadvantages are seen to derive from imperfect implementation of certification systems when “credentialism” and exclusion are increased. Review of the empirical data finds tentative support for the positive impact of certification systems, especially with respect to
wages in the information technology sector, where the best current data can be found. The magnitude of the wage premia, however, varies substantially by subsector. In other examples, it is difficult to disaggregate the effects of certification from the better-studied effects of on-the-job training.

5.6.1 Direction of future research
Labor competency certification must be further studied in order to fully understand the size, direction, and consequences of its impact. Moreover, since the start-up and ongoing maintenance costs of labor competency certification systems are high, cost-benefit analyses are desirable to determine whether the impact is worth the cost. To analyze the benefits of such systems, research is needed on three levels:

- at the micro level, to gauge the impact on individuals;
- at the firm level, to measure impact on productivity; and
- at the macro level, to evaluate potential effects on employment, equity, and labor mobility, among others.

The self-selection inherent in the certification of labor competencies for commercial occupations poses methodological challenges for researchers, but these challenges are superable through careful research design. As high-quality worker and firm-level data become increasingly available throughout the world, new avenues of fertile and innovative research become possible. This is certainly one of them.
5.7 References


Barrios, Edgar. 2000. “Competencias laborales, tema clave para la certificación en el Instituto Técnico de Capacitación y Productividad (INTECAP) de Guatemala.” Boletín 149, Centro Interamericano para el Desarrollo del Conocimiento en la Formación Profesional, CINTERFOR.


Cegielski, Casey G., and Dianne Hall. 2009. “An Exploration of the Perceived Value of Information Technology Certification between Information Technology and Human


6 Qualitative analysis

6.1 Key Findings

The main findings resulting from the exploratory qualitative analysis performed using semi-structured in-depth interviews with company managers and with certified and non-certified workers are the following.

Both, managers in charge of the labor competency certification processes within companies as well as workers, have clear motivations and apprehensions to participate in the certification. These are related to human resources management, market positioning, and workers’ employability and welfare; the following figure presents the main pro’s and con’s of certification perceived by both types of users before the certification process.

Figure 2. Main motivations and apprehensions from managers and workers to participate in labor competency certification

The expectations declared being present before the certification processes are clearly linked with the benefits observed after the process, being the latter more specific, conceptually robust and directive in terms of necessary company-level strategy and public policies.
The main benefits of the certification process are related with four organizational elements: in first place, the impact on people’s attitude and response towards their own job and the company in which they are employed; related to this, at a more macro level, improvements in human resources management, mostly based on more and better information on the required and available skills. On another scope, the strengthening of corporate image, at a local and global level, associated to the participation of external standardized evaluations and certifications. Finally, and integrating the previous elements, an increase in productivity, mainly via workers’ awareness regarding the functions performed and their own performance. The next figure presents the main benefits of labor competency certification resulting from the qualitative analysis.

Figure 3. Main benefits of labor competency certification perceived by managers and workers

Interesting to note is the fact that the ability of appropriating the certification benefits varies across firms, and the greater capacity to appropriate is observed in companies with human resources staff prepared for the analysis and development of competencies. These companies consider certification as an intrinsic reward opportunity for workers, while others with less preparedness regard it ‘only’ as an external reward, with not many implications in the day-to-day work. Usually, companies exploiting more the benefits of certification are large companies with presence in foreign markets and, within the four sectors analyzed in the study, concentrated in the wine sector.
As long as the relationship with training is concerned, both concepts, certification and training, are closely conceived, and in some cases, even confused. Workers and managers regard a high complementariness between certification and training; firstly, in the recognition of learning outcomes and the identification of training gaps and secondly, in the desired funding system, which according to interviewees, should be integrated for both processes. In some cases, certification is considered as a stage of the training process, and not as a valid activity by itself, signaling an even stronger integrity of the concepts. However, although the conceptual proximity of certification and training is transversal across different types of companies, their capacity to actually integrate them in a human resources management scheme depends on companies’ organizational development and strategy.

Finally, from a financial perspective, difficulties are observed to determine a potential monetary value of certification. This challenge is given mainly due to the lack of indicators and monitoring systems which may offer quantitative objective information on the benefits and impact of certification, particularly in terms of productivity. However, the general expectation is that certification should be eligible for the tax exemption currently available for training. Thus, the suggested funding model incorporates a public and private component and importantly, connects training with certification.

6.2 Objectives

Main objective

The main objective of the qualitative analysis of the study is to know and analyze the perception of the influence of labor competency certification in competitiveness and productivity in companies from export sectors which participated in certification processes during the period 2001-2008. This, at the company and worker levels, within the wine, fruit, aquaculture and processed foods sectors.

Specific objectives

1. Identify relevant dimensions, variables and indicators to assess the impact of competency certification on enterprises’ competitiveness and productivity;

2. Explore and analyze the main needs and expectations that arise from the company and its employees to participate in the competency certification;

3. Identify and analyze transmission mechanisms of the possible certification impact on business productivity;
4. Identify and evaluate the benefits that competency certification has had on workers and firms;

5. Identify and evaluate the costs that certification has had for workers and firms;

6. Identify and analyze differences in perception between companies and workers, and between the various productive sectors regarding certification of competencies and their impact on business competitiveness and;

7. Explore and analyze the valuation and willingness to pay for competency certification processes of workers and enterprises from the different productive sectors.

6.3 Methodological Aspects

An exploratory qualitative methodology was developed, applying in-depth interviews and focus groups. Semi-structured in-depth interviews have an interpretative and semi-inductive emphasis according to the categories identified during the study and the variables raised by interviewed managers and workers. This approach stresses the significances of the perceptions and experience of the certification processes.

Collection of information was developed as follows. Firstly, guidelines were designed with the inputs of professionals and technicians working in the Labor Competency Certification Program at Fundación Chile and of policy makers from the National System for Labor Competency Certification and the National Council of Innovation for Competitiveness. The inputs were obtained via focus groups and interviewees. These activities fed the design of guidelines for the semi-structured interviews. Three guidelines were developed: for interviews to human resource managers (or similar), to workers who were involved in the certification process and to workers who were not involved in the certification process. Secondly, semi-structured interviews were performed to company managers and to certified and non-certified workers. In third place, information was processed. This process consisted of transcribing audios and based on transcriptions, generating and analytical table organized according to the main categories of analysis. Finally, a descriptive analysis of the main results and research findings was developed.

Sampling design

The sample was designed considering four sectors which focus their production towards exports (wine, aquaculture, fruit and processed foods). The design targeted companies from the four sectors which between 2002 and 2008 performed labor competency certification of their workers. It was also considered as a relevant variable, the participation of companies
in the definition of the profiles used to assess competencies and to certify. Companies were
grouped based on the hypothesis that those organizations that had participated in profiles’
definition would have a greater degree of involvement and, therefore, a different
assessment of labor competency certification that those companies which did not
participate in the profile definition. Thus, two groups of companies were defined in the
sample: companies which 'certified and defined profiles' (CE PE) and companies which
'certified and did not define profiles' (CE NO PE).

Interviewed managers correspond to persons who coordinated internally the labor
competency certification, generally being human resources managers or plant managers, the
latter usually in the case of small companies. These were selected ensuring their willingness
to collaborate with the study and their contribution in terms of experience for the research.

In the case of workers, two types were considered in the study: those who were part of the
certification process and those who, being in the same conditions, did not participate. In
this way, it was attempted to investigate interests and valuations of both groups and to
differentiate the involvement of the process from its outcome.

The sample design is shown on the table below and consisted of four companies per sector,
two CE-PE and two CE-NO PE, interviewing in one CE-PE and in one CE-NO PE
companies, both managers and the two types or workers (certified and non-certified) and in
the other CE-PE and CE-NO PE companies, only managers. This design aimed to capture
not only a range of opinions from certified and non-certified workers, but also varied
sources of perceptions at a managerial level, which may be more indicative of the interest
and impact at the company level, which is the focus of the study.

Despite the sample definition, in practice, the aquaculture sector could not be consulted
because most companies are not operating due to the crisis affecting the salmon industry in
the recent years. Also, although the initial interest was to survey companies which have not
participated in competency certification, difficulties were faced to contact and accept the
request. Therefore, finally the sample was composed by companies from the sectors of
fruit, wine and processed foods, which certified their workers, participating or not in
profiles’ definition, between 2003 and 2008.

Table 1. Interviewing plan, to workers and managers, by sector

<table>
<thead>
<tr>
<th>Companies’ involvement</th>
<th>Workers</th>
<th>Managers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Certified</td>
<td>Not certified</td>
</tr>
<tr>
<td>1. Company which certified workers and</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>participated in profile definition (CE-PE)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2. Company which certified workers and did not participate in profile definition (CE-NO PE) 1 1 1
3. Company which certified workers and participated in profile definition (CE-PE) 
4. Company which certified workers and did not participate in profile definition (CE-NO PE) 

| Total companies from 3 sectors | 12 | 12 |

Note: In the processed food sector, additional interviews were included to one manager and one worker.

6.4 Results

Characterization of interviewed firms

The following characterization considers aspects of the firms which were interviewed that are analytically identified as relevant for the assessment of their participation in the certification process. The level of development of the organizational management stands out (organizational design, organization of production, competitive strategy, business model, among others) and directly related to this, the development and articulation with human resource management policies. Other elements considered in the characterization are the number of workers and the focus of exports in terms of geographical destination and type of final consumer.

In general, the consulted companies are large, mostly multinationals, where its production is destined mainly to foreign markets. These are companies seeking for high quality standards in production which operate under relatively developed management rules. They are characterized by having a seasonal production, a significant number of low-skilled workers or with low educational profiles, and poor working conditions in terms of stability and type of contract (fixed term). In times of increased demand of production, these company usually at least double its own staff with temporary workers who generally have continuity from one year to another, reaching the dynamics of 'permanent temporaries'.

The analyzed companies have been involved during the last years in production reorganization processes in order to achieve greater competitiveness. This has implied not only an ongoing review of technology trends, but the need to evaluate and define human resource management mechanisms which allow for a quick incorporation of organizational and productive good practices. These processes are articulated from the strategic definition
of production and human capital continuous improvement programs, which, in turn, generate among others, training and education continuation plans, health and safety plans, performance assessments and also actions towards enhancing community engagement and corporate image.

The following table summarizes the main features of the three types of companies distinguished in the analysis.

Table 2. Categories of companies and descriptive features

<table>
<thead>
<tr>
<th>Company category</th>
<th>Main features</th>
<th>Main sector(s) associated (from assessed companies)</th>
<th>Number of employees</th>
<th>Market targets</th>
</tr>
</thead>
</table>
| A                | • Mature companies expanding and diversifying exports  
                   • Active in improving production processes and HR management  
                   • Growing demand for workers with higher qualifications and transversal competencies | Wine | >200 | Global markets |
| B                | • Gradual production reorganization to operate in international markets  
                   • Reactive adaptation of HR management mechanisms as a means to improve production | Fruit and processed foods | 100 - 200 | Specific and localized markets |
| C                | • Permanent workers engage mostly in administrative work | Fruit and processed food | < 100 | Local markets |
Reduced HR management capacity

- **Company type A:** Those involved in global markets and which, in order to be competitive, have given a strong boost to improving their production processes, intensively using both physical and human capital. These companies have the following main characteristics:
  - Are companies with a large number of workers (over 200 employees).
  - Have a growing demand for workers with higher qualifications, which has resulted in plans for training and strengthening of human capital towards the continuous improvement of their workers’ capabilities and of working practices. It is also noted an effort towards further integration of human resource management with production processes, giving importance to know-how, multifunctionality and cross-cutting skills.
  - Are mature-stage companies, positioned in international markets that point to both an expansion and diversification of exports as a way of adding value.
  - Have been pioneers in their sectors on the modernization of production processes and human resource management, and in that sense, have incorporated into a competitive dynamic setting standards and certifications as signs of confidence in international markets.

Finally, we can say that most wine companies interviewed, comply with these characteristics.

"The wine industry is a very complex industry (...) we are exporting companies, the demands of developed countries, our overseas customers are different, they assess the quality, we have much competition internationally." Human Resources Manager. Wine Company. Group A.

"But it's also funny because you pass the worker a machine that costs US$ 140,000 ... I've always compared it to this: if I have a super car it is difficult for me to pass it to any person, but I pass some machines costing three or four times a supercar as if I passed anything. So that's why I think it's important to have the competency issue; it is a pillar that helps you handle the issue". Winemaker Wine Company. Group A

- **Company type B:** They have more gradually incorporated processes of production reorganization in view to operating in international markets. It can be said that these companies have been more reactive to the incorporation of human resources management mechanisms as a means to improve production. In this regard, several
human resource actions are directed towards the completion of studies and granting skills recognition to their employees. Type B companies have the following main characteristics:

- Have a smaller number of workers (between 100 and 200)
- Its exports are directed to specific and localized markets.
- Lesser development of human resources management, which depends on the departments of administration and finance or of a personnel department in charge of administrative staff primarily focused on accounting tasks.

This group is composed mostly by fruit and processed foods companies.

"... certification because otherwise you cannot export. Certification systems were not born for that, were born for continuous improvement, if you manage to get into that story in the long run is good, is not easy, especially in countries like ours where we’re still into accomplishing more than into developing the company". Human Resources Manager. Fruit Company. Group B.

- Company type C: They are smaller companies with fewer than 100 permanent workers, and mainly belong within the companies interviewed, to the fruit and processed food industries.
  - Permanent workers engage mostly in administrative work.
  - Although these are companies with a high level of technification, development of its production processes and competitive strategies, they have a reduced capacity of human resources management, which depends on the central administration. That is, there is no specific department for personnel administration, although they do have plans for training and regulation of studies.

"Something that has been leading the association is to communicate the urgency or the need that each company improves everything related to the training of its workers." Plant Manager. Fruit Company. Group C

6.4.1 Motivations and apprehensions for participating in Labor Competency Certification

Both, managers and workers have particular motivations to getting involved in the labor competencies certification process. At the same time, they have some apprehensions or resistances associated to the certification process and the effects it may have. Next, these are analyzed in depth.
Motivations

Managers’ perspective

Three main groups of interests or motivations are identified when assessing why companies choose to certify their employees in labor competencies. A first group includes the interests that emerge from an integrated view of the organization where the certification of labor competencies is articulated between production processes and human resource management. A second group of interests is generated from the opportunity of development for workers which may gain greater recognition, commitment and motivation. Managers perceive these benefits as potentially affecting the company’s economic performance by increasing workers’ productivity and also, the company’s social responsibility performance by enhancing its own workers wellbeing and opportunities. The third group centers on the motivations related to local and international image of the company.

It should be mentioned that the design of the certification program, in general, gives priority to low-skilled workers, who are usually on fixed-term contracts and to which the certification process may enhance their employability. Therefore, the interest in improving working conditions for this segment of workers is transversal, given that certification is seen as a tool which generates benefits in terms of training and development, but also in terms of commitment and loyalty to the company and its policies.

Labor competency certification in the interviewed companies inserts as part of the continuous improvement in their production processes aiming, among others, to obtaining various certifications which ensure the operation in international markets.

Therefore, the equation between the need for human resource management tools that enable the recognition and commitment, in addition to a reflection on the production processes, provides a fertile ground for the installation of labor competency certification, fostering its appreciation by the business representatives interviewed for this study.

"On the business side it [certification] is to professionalize the work, the production rate and also, that the employee feels valued".
Manager. Processed Food Company. Group B.

Next, the different interests for companies to certify competencies are described, noting that they may act simultaneously and are not exclusive between them:

Interests based on an integrated vision of the organization

There are interests that emerge from an integrated vision of the organization and its growing need for greater coordination between areas of production and human
resources. This implies that human resources teams have the interest and ability to analyze the results of the labor competency certification assessment and to incorporate them in the strategy to fulfill tasks and skills development. In these cases, the recognition to the employee is not only regarded as an external reward, but as an intrinsic one, from within the company. This recognition strengthens the feelings of achievement in workers, having positive effects on self-esteem and expectedly, on the overall organizational performance.

- Some of the companies where these interests are focused, are organizations that are facing changes in the organizational design and structure, re-engineering and changes in the strategic and competitive definition. Also, where competency certification is regarded as an opportunity to obtain relevant information for the definition of positions and workers’ performance with standardized indicators aligned to those regarding production processes and other human capital issues.

- These motivations are concentrated in companies from groups A and B, and mainly in those from the wine sector, which have strongly internalized the value of human capital in the production processes and as an element which adds value to their products in foreign markets.

"Especially because we were in a phase of reengineering and restructuring of our processes, we wanted to identify which elements of our structure were duplicating functions or were poorly assigned".  
Manager. Fruit Company. Group B

"The issue of reinforcing those points which could possibly be weak; I think being able to have a sector-specific certification is also a very important point". Oenologist. Wine Company. Group A.

"We were thinking about the issue of skills, thinking about how to work by competencies, we had installed the concern and started to investigate several things that were being developed abroad." Human Resources Manager. Wine Company. Group A.

"The company needed to train its people to face what was coming forward because we tended to modernize; if we want to compete with developed countries, we need to have also ad hoc human capital to meet the requirements, but also, we need to motivate our people".  
Human Resources Manager. Wine Company. Group A.

**Interests focused on providing training and human resource development**

A second group of interests correspond to those where the focus is on providing development and training elements framed in staff welfare policy and community responsibility. Certification is regarded as an important tool that, by recognizing the skills of employees, contributes to motivation, commitment and adherence to the guidelines of
the company. In these cases, the interest is generated under the assumption that performance recognition through certification has a positive impact on motivation to perform the work (for example, less time lost, better disposition and proactivity) and therefore, indirectly impacts on productivity. But it also generates a greater commitment with the organization that enhances the willingness of temporary workers to be employed again in the company in the following season. That is, it is expected that initiatives for the benefit of employees, generate greater commitment and loyalty to the employer. In this sense, labor competency certification is regarded as a win-win endeavor, which may benefit both workers and companies in economic and social dimensions.

"[With workers] that came back for many seasons to work with us, that need to certify them was created as they have many years of experience and some knowledge must have gained" Human Resources Manager. Processed Food Company. Group B.

"It's a bit of an issue of improving somehow the loyalty, because unfortunately, the agriculture sector depends a lot on the price; as people are hired on a short term basis, what rules is the price of work. So often people lose a bit of continuity or loyalty to the company because they get hired elsewhere to make a couple of pesos more (...) what we have tried, not only with this program in 2008, but overall, is to increase little by little the workforce loyalty". General Manager. Fruit Company. Group C.

For companies where these interests are concentrated, the certification is incorporated under similar dynamics to those of training, that is, within the staff development plans, setting as ultimate goal, recognition and improved self-esteem of workers.

These companies are concentrated in groups B and C of the fruit and processed food sectors, where resource management is focused on providing direct benefits to their workers, but have limited abilities to analyze the certification process’ results and to integrate them in the production processes.

"Many people who work with us, many women... who have no qualification... the positive side, from my point of view, was that the person dignified her [or his] work." Human Resources Manager. Fruit Company. Group B.

"We regard certification as training to the employee and further, we see the commitment that the employee acquires for the company; that sense of belonging, of being recognized, which will create a loyalty bond with us". Human Resources Manager. Processed Food Company. Group B.

"It certifies or recognizes in some way all his experience, all that he knows about what he is doing through a certificate and through an assessment and
that is good both, for the company and for the worker's self-esteem". Production Manager. Processed Food Company. Group B.

In addition, certification in these companies covers the unmet need from educational and training systems, on competencies for work and the specific demands of operational tasks.

"What I liked about it [certification] is that it is rather difficult to find training for technical skills". General Manager. Fruit Company. Group C.

"In this plant, there is a perception that there is no need for specialized workers (...) but today, with the very market requirements, all industries have been improved and have been acquiring technology (...) we realize that now the operator is not the typical rural operator; they must have more technical knowledge. For example, in cold storage and refrigerators and there is a flaw (...)technical schools have been concerned with training agricultural technicians, but there is no refrigeration technician, no cold storage technician, no electric technician". Head of production. Processed Food Company. Group B.

Interests centered on meeting standards

In parallel, we identify a third group of interests oriented towards guaranteeing compliance of international standards for operating in foreign markets.

These are companies seeking to maintain their already obtained certifications or that have started processes of management systems certification with international standards. Although they state that competencies certification is no requirement for obtaining these certificates, they consider it an element that facilitates compliance with the required human resources standards.

"There is a global trend to these certifications, of labor competencies, etc., therefore it is a trend that actually one has to incorporate to”. Plant Manager. Fruit Company. Group C.

"We have many visits from foreign customers who talk sometimes with the same workers (...) the image we offer is important (...) we have different certifications". Human Resources Manager. Wine Company. Group A.

“[the competency certification] was the kick-off which coincided with our whole process of ISO 2001 certification”. Human Resources Manager. Processed Food Company. Group A.
The graph below groups the different motivations to participate in labor competency certification for each sector. The motivations are grouped into: 1. Those arising from an integrated vision of the organization seeking mechanisms to articulate the areas of human resources and production; 2. Those focused on aspects related to recognition (commitment and loyalty to the company, development plans, self-esteem, etc.); and 3. Those related to the corporate image and herd behaviors towards certification. It must be noted that the figures presented are based on a limited number of interviews performed within the framework of a qualitative analysis and are therefore only indicative of trends but not exact figures, in the context of all companies participating in the certification process.

In terms of the types of companies pointing out certain different types of motivations, the following is observed. Wine companies center their interests in elements which contribute to human resources in relation to production, that is, their needs arise from an integrated view of processes. For its part, processed food companies have shared types of interest between the three categories, having a slighter stronger focus on the recognition and commitment of its workers, similarly to the situation of companies in the fruit sector.

Moreover, within the interests and motivations to certify labor competencies of the surveyed firms, some companies in groups B and C (fruit and processed foods) mention that they do not necessarily expect certification to give effective signals of workers’ performance. This is basically because in the low-skilled temporary workers segment, tasks are low in complexity and are controlled directly by managers.

"This is not really a big industry, at least for this plant... Therefore, in general if you ask the head of packing ‘How is that person?’, there is no need to assess whether she/he is competent or not, because he knows them closely”. Plant Manager. Fruit Company. Group C.

The latter is also related to the managers’ level of understanding and perceived appreciation of competency certification. It is actually observed, especially in companies from group C, that generic skills such as those associated with health and safety, are less installed as important issues and, therefore, competencies relevant to certify.

"Here the largest number of workers are truck loaders; they load and unload merchandise, so for that you do not need skilled personnel (...) under any point of view: that someone certified their labor competencies and now is performing better or have reached a better position; we’ve never seen that". Administration and Finance Manager. Processed Food Company. Group C.

Finally, and from another perspective, other mentioned motivations to participate in the certification are referred to the labor competencies certification program attributes that are
related to the professionalization of the institution offering the certification and the methodology proposed to certify.

Workers perspective

From the workers’ standpoint, participation in this type of programs, relates to the need of obtaining a credential that adds value to the curriculum, so as to enhance the employability, perceived by them as a better chance of labor insertion. Secondly, and especially significant for low-skilled workers, they project the possibility to professionalize their work and demonstrate their performance.

That is, certification represents not only obtaining a recognition of their experience and performance with an external guarantor, but also gives them the opportunity to reflect on their skills and achievements, getting a self-reward.

"I think it [certification] opens up other doors in terms of work, be willing to make a change and also it is useful for the curriculum and for learning ".
Certified worker. Wine Company. Group A.

"That the person hiring you assesses you and says 'you were in that process’ and passed it, passed it properly; that means you're a good worker".
Certified worker. Processed Food Company. Group B.

"When you come to work here, one does not know much and you think at first ‘I do not know how to pack’, I arrived as a packer, I didn’t know what was to be a packer, I thought it was taking the tray, put it in the box, close it and to go". Certified worker. Fruit Company. Group A.

For their part, workers who, being under the same conditions, did not participate in the certification process, have limited knowledge about certification, and so they do not show much interest in certifying themselves. However, the foresee certification as an opportunity to improve their qualifications and future employability possibilities.

The following figure summarizes the previous analysis on the motivations of both, managers and workers, to participate in labor competencies certification.
Figure 4. Motivations from managers and workers to participate in labor competency certification

Managers

- Integrated vision of the organization
  Labor competencies certification helps articulates production processes and human resource management
- Improvement of training provision and HR development
  Certification as a performance recognition tool with positive impact on workers’ motivation, commitment and loyalty to the company
- Meeting standards and image
  Certification facilitates compliance of international standards for operating in foreign markets
  Certification enhances corporate image

Workers

- Value to the curriculum
  Certification as a credential that enhances employability: better chances of labor insertion and salary increases
- Professionalization of work
  Possibility to improve and demonstrate their performance (especially significant for low-skilled workers)
- Self-regard
  Reflection on skills and achievements, getting a self-reward

Apprehensions

Regarding the apprehensions for participating in Labor Competency Certification to certify labor competencies, the consulted companies mention that initially there was concern about the workers’ expectations of achieving improvements in wages resulting from certification. In addition, in a couple of companies it was raised a strong fear from workers to be evaluated and the possible consequences of a negative evaluation.

“At first I was afraid of being evaluated poorly, that they found I performed poorly, but that was only at first”. Certified. Processed Food Company. Group B.
Also from the companies’ managers’ perspective, certain resistance to share information with other competitors within the industry was identified. This conflict affected the profile definition process as well as the certification per se, and was based on the chance that competitors identified errors in production process and on the limited practices to work jointly in improving productive processes throughout the sector.

"The only fear you could have was to think that people could believe that by being certified they were more expensive". Human Resources Manager. Fruit Company. Group B.

“...this coincided with the evaluation done to teachers and teachers were reluctant to assessments" Human Resources Manager. Processed Food Company. Group A.

"For us it was enriching, because first, we realized that there were many companies with profiles similar to ours, with very similar competencies, that it was no secret to anyone." Human Resources Manager. Processed Food Company. Group A.

On the other hand, in those companies that defined profiles, there is a greater interest in knowing the industry standards with profiles that have been raised from the basis, that is, from jobs in the same business. In that sense, the opportunity of comparing with their peers in the industry is foreseen.

"In general all the ISO and international standards, suggest that staff should be trained and I think that more than trained, there should actually exist a clear definition of the function performed". Plant Manager. Fruit Company. Group B.

For those companies which by their organizational structure, have limitations in the analysis and development of human capital, concentrated in group C, there is an observed need for competencies certification to be complemented with other actions that facilitates information processing and allow them to gain greater benefit from the implementation of the certification process. That is, companies in group C have a higher expectation from the potential of certifying workers and on the other hand, apprehension of the complementary actions required to exploit that potential, on how to use and give continuity to the certification of skills.

All in all, the main apprehensions identified in the qualitative analysis can be summarized into those presented in the following figure.
6.4.2 Contributions of Labor Competency Certification

In general terms, the different actors have a positive assessment of the certification process, noting contributions for both, workers and companies. Next are described the perceived
benefits in the various aspects of the organization and its connection with the Labor Competency Certification Project.

**Motivation and recognition of workers**

Firstly, the most valued and widely and spontaneously identified by all the company managers interviewed, refers to the motivation and recognition of their workers. In this regard, they consider that certification meets the expectation of generating benefits in their employees’ self-esteem. This is directly linked to greater motivation to carry out their tasks and, thus somehow improving the productivity of certified workers.

Although this benefit is valued by all companies indistinctly, the perception relates to the ability of appropriating the recognition. That is, companies that have a greater capacity in their human resources staff for the analysis and development of competencies, mostly companies from group A and some from group B, consider certification as an intrinsic reward opportunity for workers, where it is not only the external guarantor that ensures the proper performance of the task, but it relates to the feelings of accomplishment and self-realization, with which the person can recognize their skills and improve their perception of their performance. By contrast, most companies in groups B and C, which regard certification and recognition only as an extrinsic reward from an external party, generate satisfaction and motivation only with limited effects on performances.

"It [certification] contributes by definitively recognizing his working experience with a document that says he is export fruit packer; this gives them a motivation and a different character, in the social environment." Area Manager. Fruit Company. Group B.

"By receiving this certification they are receiving a formal recognition that, although does not come from his boss, comes from a superior body". Human Resources Manager. Processed Food Company. Group A.

"I think there has never been done a work of recognition, this served to raise standards, was a recognition for the worker, the worker got enthusiastic with that, ‘the company is considering me’, my condition is improving, they know the work I do is good". Human Resources Manager. Processed Food Company. Group B.

In parallel, managers confirm the contribution of certification on increased commitment and loyalty generated in temporary workers who actually showed, according to companies surveyed, a greater willingness to being re-employed in the next period. They mentioned, for example, a decrease in rotation rates.
"I would say we have less rotation than in other years and I that confidently because I see the rotation and the number of settlements; there has been less rotation ". Human Resources Manager. Processed Food Company. Group A.

"These are people who go round the year in different jobs with us, so it is the same people that gets the certification with us returning to work in future seasons." Human Resources Manager. Wine Company. Group A.

"We have seen that all our people come back, everyone who has been certified has come back". Human Resources Manager. Wine Company. Group A.

On the other hand, managers consider that the benefits observed in this area have a limited effect over time and that must be complemented with other mechanisms so that motivation is maintained over time.

"A labor competency certification is a much more happy person working in his/her workplace; now attention, because that is not permanent in time." Plant Manager. Processed Food Company. Group C.

In relation to this benefit, the certificate-giving process, particularly during ceremonies, is referred to as a highly valued aspect of the Project, by both workers and managers representing the companies, given that it is the real and explicit recognition.

In this regard, we identify companies that conduct their own parallel ceremonies for giving certificates as a way of highlighting and motivating their employees. This practice is observed in companies that focus the recognition in the external reward (groups B and C).

"People who will receive the certificates go with their best outfits; sometimes we have been overwhelmed by them; they assign it a great importance". Human Resources Manager. Processed Food Company. Group B.

"That is our biggest benefit in this topic; that workers feel motivated, especially those who have never had a position, a diploma. So, besides engaging all of them to participate in the ceremony, we give them here, once again the diploma, in front of all workers (...) we show the pictures, we also mention when the program was starting, we congratulate when it was ending". Human Resources Manager. Processed Food Company. Group B.

**Incremental changes in productivity**

Secondly, we can examine as contribution of the certification, those incremental changes in productivity. In that sense, the consulted enterprises, agree that certification has been an extremely valuable tool as a human resource management mechanism oriented towards
changes in productivity. That is, a company that involves its workers in certification processes generates a reflection in the worker on their performance, that allows mending errors and deviations from the procedures that would directly impact on productivity and on the company’s economic performance. Although this highly relevant impact was mentioned by interviewees, no company offered concrete indicators or measures on such finding.

There are difficulties in assessing the positive effects of labor competency certification on productivity. Next are discussed aspects that influence this impediment to link both variables (certification and productivity):

a. The consulted companies, in most cases, have faced processes of changes in their organizational design and structure, as well as revisions of their business strategies to improve their competitiveness in foreign markets. Thus, they have implemented for some years, a number of changes in human resource management that dilute the sole impact of certification, making it impossible to isolate its specific contribution over the other measures implemented to improve quality management, productivity levels and positioning. That is, alongside certification, other variables are present that would be affecting the positive changes in the production process.

"I think so, I have the perception that yes, I think it has also been accompanied by other norms ISO, quality standards that the company has acquired over the past five or six years that I think are collectively working beyond the mechanical work which is done and we have taken advantage of this issue by trying to technically train our people". Oenologist. Wine Company. Group A.

"It coincided with organizational changes (...) it was an excellent year in everything, I could not estimate what percentage or participation had the program of setting these labor competencies standards, but certainly something must have set for it that way". Human Resources Manager. Processed Food Company. Group B.

b. Most of the consulted companies have not developed measurement systems and indicators in order to quantify the effects of certification over productive processes and, therefore, there is an inability to concretely assess and evaluate its impact. This is somehow contradictory to the opinion of some managers which regard the certification process as a step in the installation of a long-term system for developing workers’ skills. Furthermore, strengthening quantitative measures in the evaluation and certification process, as well as the development of monitoring indicators are
considered useful elements in optimizing the companies’ human resources and specifically, facilitating the coordination between Human Resources and Operation sections.

"I do not know the standards but I would say yes because, for example, in the process of corn this year it was done more than the previous year with the same amount of people and in less time". Staff Head. Processed Food Company. Group B.

"This quantitative assessment is also important because there should be some sort of index that allows measuring where you started and where you are. Today you see that you're producing more. In our case that we work a lot with incentives, effects are being rapid. There is no clear thing to say that before this process they produce five and today seven". Human Resources Manager. Wine Company. Group A.

"(...) Demonstrate to the production area in what processes they were having difficulties, in what processes it was needed to train people, for us it is important that they had this clear because it would help us to have higher productivity". Human Resources Manager. Wine Company. Group A.

"I feel that the system of assessment and profile definition, should be more quantitative, that is, perhaps to [measure] how long it takes to improve productivity or how much enthusiasm was put on quality issues, that is, did he placed the needed amount of mortar, or was it adequate the application of water to the plaster". Coordinator sector. Fundación Chile

c. Another difficulty to link certification to productivity, which is mainly observed in companies from the fruit and processed foods sectors, relates to the level of human resource development. We refer especially to companies in groups B and C where it was identified that human resource management is poorly developed, so they have limitations in further processing the results of the certification that allows its articulation with the production departments.

"It would have been different to be immersed in a more comprehensive training plan, have been tackling [issues] then, and following up later". General Manager. Fruit Company. Group C.

Even in type A companies, especially wine ones, which one can say they have been proactive and innovative in coordinating staff management actions with improvements in production, they mentioned the lack of indicators of such mechanisms. In that sense, all consulted firms indicated that labor competency certification is a tool which has not been exploited yet to its full potential. The elements with potential to be exploited includes not
only the identification of workers which meet certain standards, but also the use of sector-wide validated occupational profiles and the reports resulting from the evaluation process which offer feedback on the workers’ performance based on on-site and previous evidence of their competencies.

"To do this kind of things it is not just human resources work; in the case of the vineyard and due to the processes, we work with supervisors, with the heads of the areas, the oenologists, so that together we all define this. And also with workers, if they do it well and are successful experiences, I think that one should generate from there these assessments, I think that's something very good that should not be lost". Human Resources Manager. Wine Company. Group A.

"You may think that human resources develops as human resources, I believe that human resources is valuable as long as it is a contribution to the business. From this perspective we look [certification] as a bet for the business and I think that's very important to consider". Human Resources Manager. Wine Company. Group A.

For this reason, we can say that the consulted companies have a high valuation of the information provided by the Project on the results and assessments of their workers. However, they agree that, in general, the results themselves require further analytical work (treatment or synthesis) to be used as information which provides indicators on the workers’ performance.

"I believe that the report was very good, really good (...) the report went far beyond what is happening (...) To make improvements, I think it was too long, then the truth is that we had to reflect as area and pass it to production, agricultural technology in what was being done (...) I would have expected a synthesis that would allow us to quickly reach other areas with the most important topics (...) Demonstrate to the production area which processes had difficulties, in which processes it was needed to train people". Human Resources Manager. Wine Company. Group A.

It is mainly companies from fruit and processed foods sectors of groups B and C, which, given their weak human resource management, consider that results could have been delivered in a more finished way and with analyzed information on the performance of workers, allowing then further monitoring and integration to training plans.

"These results are not very useful, doing an analysis if there is no monitoring, what is the usefulness of knowing what is going on if afterwards there was no strategic plan in the medium and long term". General Manager. Fruit Company. Group C.
d. On the other hand, most of the certification in these sectors has focused on low-skilled temporary workers and positions, which, although companies identify as 'critical work' for production, they mentioned it would be necessary to intervene all the production chain to better visualize its implications.

"A specific activity within the overall activities of the two semesters was tackled; so pretending that from that activity, if then you never modified the rest of the activities, it would change productivity, no". General Manager. Fruit Company. Group C.

Corporate image

Regarding the company’s image, both locally and internationally, the consulted companies agree that certification has had positive effects, but again it is not possible to quantify. They consider that companies could further disseminate and exploit the participation and results of the certification process, in benefit of the company's image at local and global levels.

"One thing is to have it and the other thing is to promote and disseminate; in our case I believe it was not disseminated much, but Wines from Chile has disseminated a bit". Oenologist. Wine Company. Group A.

The relevance of a positive implication in terms of image, relates to these companies with the compliance and consistency with its strategic definition and, therefore, certification appears as a mechanism to be credible to the community.

Locally, a positive indicator in this respect, relates to the fact that they have noticed an improvement in the rate of return of temporary workers, that is, workers come back in greater numbers since they started with the training and certification development plans.

"In the regional social field we have been recognized by this training and this bet (...) we are recognized for always being excited in training and the development of such projects". Area Manager. Fruit Company. Group A.

In terms of international image, it is strongly linked with quality certifications and, especially, in the wine sector where branding and Corporate Social responsibility is highly valued. It is especially companies in group A, those who perceive a greater benefit on the business image as they have a vision of expanding its export markets where certification adds value to the entry and stay in those markets.

"We sell not only wine; we sell an image". Human Resources Manager. Wine Company. Group A.
"I think it's an interesting argument for export, it is important to argue that within our employees we have that percentage of people certified with a higher body, which is also important for our country". Human Resources Manager. Wine Company. Group A.

Human resources management

It is indisputable for all companies that participated in the study, the contribution made by the certification in relation to the tasks and functions performed by human resources areas. It was especially mention the savings in selection processes given that certified workers have priority for being hired.

"The first people we have hired again, are precisely those who have certified their competencies". Human Resources Manager. Processed Food Company. Group A.

In this regard, certification contributes to meeting the deficits of information on performance and productivity of workers, as well as information that contributes to the definition of position and functions.

"Competency certification assures that the person has the needed knowledge, and that results in efficiency, good results, continuous improvement; when one is sure that the person has the competency, it is given that there is a process improvement". Staff Head. Processed Food Company Group B.

"It was very useful for future recruitment and to further enhance the knowledge and to deliver training to the new people coming in, and with this knowledge, cover the gaps." Human Resources Manager. Wine Company. Group A.

Moreover, for these companies, it adds value to their management the fact that it is an autonomous and impartial party the one acting as guarantor of the competence of their employees.

"This certificate that is awarded is a backup for the employer to say: this person was evaluated by a competent body". Staff Head. Wine Company. Group B.

However, it is necessary to take into account that the perception of such benefits are reduced when it comes to certification of low-skilled workers. There are companies which do not perform staff selection given the shortage of workers in the high season, so they cannot select, but rather, hire all workers who arrive. On the other hand, being simple tasks those they develop and having direct supervision, the information on performance is
generated by direct heads spontaneously without perceiving major advantages in having standardized information.

"It is missing, I do not know if in the country, or at least in the agribusiness that at any given moment is very understaffed; often, in fact, you have to hire people you have to train and it is notorious the flaw precisely in job skills and therefore one has to spend much more time training; for that, we are all with an integrated system, which obliges us to train the person for the work to be performed". Plant Manager. Fruit Company. Group C.

Specifically, the benefits for workers have to do with the perception of professionalism of their work, that is, to obtain feedback on their performance that allows them to do their job with greater responsibility, identifying those aspects which may improve and allowing the opening to other industrial fields. In this sense, the worker obtains a benefit in the form of an intrinsic reward, which flow directly from feeling more productive observing an improvement in their achievements and performance of its duties.

"I used to take not seriously one’s work, and now one does it with more responsibility and that, the same certification, how I said before, has opened some labor areas beyond packing". Certified Worker. Company fruit. Group B.

“I was surprised because I thought you were going to be told what you had to do or how it should be done; it was the other way round, in practice you taught them what you did it, but I felt good because at the time when you being analyzed, they are asking the questions and everything, you're working”. Certified Worker. Processed Food Company. Group A.

From the emotional scope, the benefit is related to self-esteem and confidence to develop their tasks, especially in those with low-skills, considering that for many of them, this is the first credential in a process of capacity development. In this case, the reward is obtained extrinsically where it is an external agent who gives a testimony of the work performance.

"It was good because they gave it [the certificate] at the Centro La Araucana, the awarded it with a cocktail, then there was a dance so it highlighted the importance, one felt better". Certified Worker. Fruit Company. Group B.

In that sense, the certification ceremony has ample meanings associated with the ability to receive public recognition.

"When we went to get our certification to the provincial government, it was something nice, that you were named, you were applauded, it was valued what you do; this is to bring good the good of one and they tell you 'bravo'... you are apt to perform your work, you are trained, you have a qualification, in the long run this is for you". Certified Worker. Fruit Company. Group B.
On the other hand, certified workers mentioned certification as an opportunity the fact that a third party is the guarantor of the capacity and performance skills; it enhances the ability to fit into new jobs. In that sense, for them the certification has an important effect on employability.

"It's something you did not study and then received a certificate, I know it is not a title [a formal qualification], but it's something that may be useful later to accredit elsewhere, it is a good certificate". Certified Worker. Wine Business Group A.

"First, correct the mistakes, the details; second, open other doors in case I get fired here or I want to look for another job; third, the confidence that the company has in me, that and the change of position, that's confidence". Certified Worker. Wine Company. Group A.

"You think it again and again and you don’t believe you’re doing it well until you’re told... In the sense of motivation more than anything else, because it’s an outsider who finds you work right". Certified Worker. Processed Food Company. Group A.

"I think it is well regarded that you are certified in something, either for risk prevention or whatever, if you are certified, you have more wisdom to perform next year in another company". Certified Worker. Fruit Company. Group B

Additionally, workers indicate that they actually feel greater motivation to perform their job responsibly, and greater commitment to the company that with tools such as certification provides signals of the valuation of their workers.

"With these things one clearly has a different engagement with the company because they are providing you opportunities as a worker, one gets more committed to one’s work, which is what matters to the company". Certified Worker. Fruit Company. Group B.

There are workers who have had promotions after certification; in these cases, they believe that certification was a contribution to enable them to make career development.

"I passed to a job with greater responsibility and less physical work because the work on the belt is very tiring; now I'm more relaxed, I can sit, I have to write, it is a change... I earn more, that's important, very". Certified Worker. Processed Food Company. Group A.

"I used to work at harvest grinding, in the time it was not harvest I worked at the wine storing and from a certain date until now I am the supervisor. It helped me a lot, I used to be only an operator and worked doing everything; now, not, I'm supervisor, I see the work". Certified Worker. Wine Company. Group A.
For their part, workers who are not certified center the benefit on aspects which will lead to improvements in their performance and professionalization of their tasks.

"It's good because sometimes you are not sure what your qualities". Not-certified worker. Fruit Company. Group B.

"Knowing what I really have to do, knowing what I'm doing well, that there is someone telling me "you have to do this and that and that", that is having like a course and being able of practicing well, to practice better". Not-certified worker. Fruit Company. Group B.

In conclusion, the benefits perceived by managers and workers can be summarized in four key aspects: motivation and recognition of workers, inputs for better human resources management, enhanced corporate image and incremental changes in productivity. The figure below present the main ways in which labor competency certification affect these aspects.

6.4.3 Relationship between Training and Labor Competency Certification

All companies consulted have training plans for their workers, which range from remedial studies to technical and vocational skills development programs. They make use of the tax exemptions available for training and in that sense they do have some kind of human capital development policy or actions.

Training plans are to a considerable extent driven by the requirements of international quality certifications norms and thus have some concrete guidelines to determine action plans.

"For example, the ISO..., says you have to have competent staff to fulfill, qualify anyone intervening the product, keep records, relevant training to have someone competent". Human Resources Manager. Fruit Company. Group B.

Similarly to the motivations for getting involved in labor competency certification, for these companies the motivations for training also include the motivation, recognition and welfare of its workers, and the expectedly consequent increase in performance and achievement of production standards.

"Obviously our mission, our vision is focused precisely at that, that people work in a pleasant atmosphere, providing the best tools so they can carry out their tasks in the best way ". Human Resources Manager. Processed Food Company. Group A.

"With no doubt, the company's strategy is a strategy to produce more, of better quality, with fewer claims and, in an industry as this one, clearly the worker's performance is important". Oenologist. Wine sector company. Group A.
Also, a trend to have more specialized training plans is observed, targeting particular needs delimited to functions, occupations and sectors. However, they remark the difficulty to find relevant and specialized training programs, suitable to the tasks required.

The relationship between the concepts of training and certification is close and debated from different perspectives. It is noted transversely and spontaneously that certification is conceptually regarded as a complement to training plans; however, the actual level of articulation between certification and training depends on companies’ organizational development and strategy. From a financial viewpoint, certification is naturally projected to have a similar financing system than training, comprising public subsidy and private counterpart.

In terms of the type of complementariness between certification and training, certification is seen as a process within the training system, rather than as an activity which in itself brings benefits on human capital and their productivity. The consulted enterprises refer to certification as the conclusion of a process of acquiring new knowledge and skills. It is also generalized the idea that certification offers the possibility to identify gaps that make training programs and performance evaluation more efficient.

"I believe that both [certification and training] are important and complementary. As long as I train people and they acquire a knowledge model, I have to assess whether it was effectively acquired, how well it was acquired and for that, a certification is useful". Plant Manager. Fruit Company. Group B.

"Within the certification process, some gaps were made evident and we had to cover these gaps with training". Human Resources Manager. Processed Food Company. Group A.

"There is clarity on the relationship we have to have because ultimately when you certify, you are going to establish gaps and those gaps are going to be met by training; in fact we face it ". Human Resources Manager. Wine Company. Group A.

Moreover, the possible similarity in certification and training future funding systems is related to the effectiveness of these processes. It is presented the argument that training may be more effective if there is a previous certification that allows evaluation and skills gaps’ identification and, therefore, both processes should be incorporated in a joint funding model.

"... that is, the only thing you can pass through SENCE is training, but why can’t you pass a certification? So that the person gets certified he has to pass through a
training process that is very important”. Human Resources Manager. Fruit Company. Group B.

It is noted, therefore, a close linkage between training plans and certification, for improvements in human resources management. Especially, for low-skilled workers and temporary workers, certification is enhanced with performance evaluations and with on-site training.

"The less skilled worker works temporarily; then we have a full planning for assessing temporary workers in order to keep the maximum of the season”. Chief Human Resources. Processed Food Company. Group C.

Companies with more developed human resource management (types A and B), show a higher articulation between certification and training by having been able to implement training programs that integrate competency assessment.

"Subsequent to that (certification) we defined and carry out a program in an agreement through a local university, oriented to these people, to try to strengthen, we would say, the knowledge they had applied to new technologies”. Staff Head. Wine Company. Group A.

In companies with limited management of human resources, the line between training and certification blurs, creating confusion between the two processes. This highlights the importance of achieving a better positioning of certification at the business level, clearly stating the benefits and advantages of the certification process itself.

"This training gave me no additional advantage or disadvantage over the training we've been doing with Sence tax exemption, as the traditional”. General Manager. Fruit Company. Group C.

“What is the difference between training and certification?”. Plant Manager. Fruit Company. Group C.

In that sense, and specifically for low-skilled workers, training and certification are tools that are not differentiated between them, having confusion on their concepts.

"That it was something positive fruitful for us, and even that afterwards, they will continue training us so that we could develop in other areas”. Certified worker. Processed Food Company. Group C.

"My thing was that, train myself, learn more”. Certified worker. Fruit Company. Group B.

Finally, one can conclude that the main differences and potential of certification in relation to training, refer to the fact that certification would have a higher potential in the identification and further development of specific skills development at the level of
productive processes, in the sectors considered. Furthermore, certification would have an important benefit in relation to level of motivation and recognition, given that with certification the employee perceives a higher internal and external reward that he/she is doing his/her job better and does not only acquire, as in the training, knowledge that may not necessarily be applied in the workplace.

"I think there is a benefit of the spirit for them; internally they are being recognized, I think there is a personal and internal issue that many people think, but nobody says it, but I think there is an important matter of self-esteem". Oenologist. Wine Company. Group A.

6.4.4 Assessment of Funding Models

It is necessary to consider that when monetarily valuing certification, difficulties arise in terms of assessing the (positive) effects of certification. That is, despite the benefits perceived, concern is raised for having indicators and studies to support the investment in such initiatives. In this sense, company managers demand a stronger promotion of certification at the country-level that includes dissemination of its benefits. This, in order to position labor competency certification as a common and well-known tool which adds value to the industry.

"It's not an easy thing to understand the added value that this certification will have. That it will have some recognition in the business, the economic added value that comes directly resulting of the costs and sales (...) I have to somehow, get to convince investors that the added value that will have a competency certification will eventually be traduced into some prestige, a seal on the box of apples, for example, that says this apple box meets these certification characteristics". Plant Manager. Fruit Company. Group B.

As long as benefits derived from labor competency certification are perceived more clearly, it is expected to be more feasible to determine a monetary value that allows companies to perform investment plans in certification.

As noted throughout the study, companies belonging to the wine sector and which are in group A are those that have managed to determine a higher value to the certification and, therefore, would have a greater willingness to pay for future certifications.

Smaller type B or C companies, from fruit and processed foods sectors, mentioned that a difficulty for funding has to do with variations in production from one year to another, indicating that the budget allocated for human capital development is subject to the previous year’s profits.
"Our company changes much year to year depending on the weather, products, raw materials and the costs involved. From the four years I've been here, each one has been different and therefore I can say an amount for next year [for certification]." Human Resources Manager. Processed Food Company. Group B.

Other consulted companies are betting that in the near future competence certification will be an entry condition for many international markets. So they have already committed resources to the certification of its workers. These are be large type A firms, which have a greater budgetary availability to certify their workers.

The projection on the willingness to pay for certification is strongly related to the financing model of training and to other human capital development budgets within enterprises. Therefore, it is expected that companies would jointly cost-analyze and budget training and certification.

"If we invest about 4 million [around USD 800] to train 10 workers... it would be ideal that the certification costs about 300 thousand [about USD 600]." Oenologist. Wine Company. Group A.

Most of the consulted companies indicate that if certification was eligible to use the current training tax exemption, their willingness to pay would be high. Thus, it is regarded appropriate to define a joint funding model, with costs shared between businesses and the state, given that the expected benefits, as signaled by interviewees, are not only for the company but for the country in terms of having workers with certified skills and higher productivity.

"Well, the certification should be through the tax exemption." Human Resources Manager. Wine Company. Group A.

"I do not drive the company's policies today about that; if you ask me, I believe there is willingness to pay for certification, because we are working hard in training with 100% resources from SENCE." Staff Head. Processed Food Company. Group B.

"I think that as long as certain exemptions are set, as with training, I insist, for us the training is an investment and if it includes certification, even more so, what better than working with certified workers, who know what they do." Human Resources Assistant. Wine Company. Group A.

Most of consulted companies indicate that there would be a greater willingness to pay for certification than for training. This, given that certification, on the one hand, helps to identify gaps for further training and on the other, the fact that the methodology is inserted
into the procedures and jobs, avoids stopping production processes and removing the worker from their duties.

Company managers indicate that resources used for certification may be better spent than in training because, as mentioned above, there are many training courses with poor orientation towards the needs of industry, while competency certification is developed based on the productive processes, responding directly to the particularities of each industry and sector.

"There are many companies that take advantage of its Sense exemptions, but its training often is not well designed to strengthen the competencies of workers. I have seen companies where people get trained and offer training, which of course culturally it has a value, but spend Sense exemption in things that are not for improvement". Staff Head. Processed Food Company. Group B.

Therefore, although it is currently difficult to determine a specific monetary value of certification, comparatively, in the consulted enterprises, there is a greater willingness to pay for competency certification than for training. In that sense, companies that currently engage in training costs, including additional resources than those of the tax exemption, have a higher willingness to pay for competency certification.

"Absolutely. what I would like is to tackle even more than what is being tackled by certifying the entire production process. I would spend a large proportion of the tax exemption in this [certification] ”. General Manager. Fruit Company. Group C.

"There should be no limits if a company is willing to certify all of its workers”. Human Resources Manager. Processed Food Company. Group A.

"I think there should be not so much difference with training because the more you certify, companies will be more competent, and so will require more competent people”. Human Resources Manager. Wine Company. Group A.

From the workers viewpoint, the willingness to pay is low. In general, they perceive that the benefit is greater for companies and they should be the ones to financing it. However, for those who had career development and implied an increase in wages, the willingness to pay is higher.

6.5 Conclusions And Policy Orientations

The main motivations for participating in the labor competency certification program are related to:
1. The need for tools and information that allow companies to coordinate human resources and operations management, in order to generate improvements in production processes and productivity of workers;

2. The need for recognition mechanisms that have a positive impact on employees’ motivation and engagement; and

3. The expected benefits in terms of the company's image locally and internationally.

The motivations identified from the consulted firms and workers are linked to the level of perceived benefits of the certification process. However, better policies and instruments for assessing and valorizing such benefits on the organizations and individuals are required.

Specifically, companies expect certification procedures to offer inputs for developing human resource management plans, understanding the linkages between certification and productivity.

"It will be necessary that our professionals engage with the relevance of certifying their staff. I think one have to get commitment at the head of area level; sometimes they have such a rooted commitment to what is the production that it is hard to persuade to distract them one moment to do an on-the-job certification". Staff Head. Processed Food Company. Group B

Though, in order for companies to appropriate such benefits, certain organizational conditions are determinant; namely, the ability to analyze and take action after the diagnosis on available and required skills. Thus, action in this direction would strengthen the impact of certification.

In order to recognize the benefits at sectorial and national levels, it is also manifested the need for greater positioning of labor competency certification systems. The consulted companies mentioned that they expect certification to be disseminated more clearly in terms of the current policy and of mechanisms to understand the range of action for the private sector.

In this sense, they expect the State’s initiative to promote certification, given their perception that, even with no quantifiable indicators, it is certainly an added value to compete in international markets, mostly due to its contribution to the professionalization and improvement of its human capital.

"First, a development through the State to give greater importance, to formally institutionalized it as something that can affect in, what I said, the added value to compete". Plant Manager. Fruit Company. Group C.
"This industry requires to have that level of competition, having highly skilled workers who have the ability to understand the business". Human Resources Manager. Wine Company. Group A.

At the same time, it is present the expected integration of certification and training in terms of public funding and also in terms of procedures designed to boost each other, resulting in more effective human capital development programs.

Regarding the validity of the instruments for certification, the consulted companies suggest the need to constantly update and review occupational profiles. They mention that an appropriate period would be three to five years.

"The profile is well, it must be renewed, updated; today a new competency may exist, a new position, a new job description. Or to that new things may be added because technology is changing, time is changing, the requirements are changing. Today, us, the wine industry, all industries are subject to ISO, CCHP, RC certification systems, what is being required in quality control in England. Then, I ultimately think that requirements are changing and then perhaps these profiles must be reviewed". Oenologist. Wine Company. Group A.

In terms of the impact on competitiveness, companies visualize a certification system not only as an instrument for internal improvement and management, but also as a source of information that could help establish comparisons with other companies.

"Probably, a more general and comparative analysis with other organizations, how we are in the ranking, how is the contribution of our employees, our staff, how we are generally in everything being done in industry (...) is like a Simce test". Area Manager. Fruit Company. Group B.

"I think it's an interesting argument for export, it is important to say that within our staff we have a certain percentage of workers certified by a higher body and that in the background, that is also important for the country". Human Resources Manager. Wine Company. Group A.

In conclusion, although motivations are present for participating in labor competency certification processes and benefits are recognized, signaled elements to boost labor competency certification in Chile are:

- Promotion and dissemination of the certification system and its benefits;
- Development of indicators and mechanisms to follow up its impact;

Simce is a standardized educational test applied at the school level in Chile.
• Increased feedback from certification processes and capacity building in companies to exploit the certification outputs in terms of defining human capital development programs, integrating certification and training;

• Public policy which, recognizing the benefits for the country-level competitiveness, incentivizes and supports certification associated to training.
7  Quantitative analysis
  7.1  Key Findings
  7.2  Objectives
  7.3  Methodological Aspects
  7.4  Results
  7.5  Conclusions And Policy Orientations
8 Overall comparative analysis of the main results

Integration of literature review, qualitative analysis and quantitative analysis