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Abstract¹

Using data from the World Bank's Enterprise Survey, this paper explores the determinants of firms' training decisions in Latin America and the Caribbean. The share of production for the export market and the size of the firm are key factors; training programs are not prevalent in all sectors. In addition, the share of workers receiving training depends on the age of the firm, and only for non-productive workers are differences observed across sectors. More detailed data from a Longitudinal Enterprise Survey in Chile are used to corroborate these findings. It is found that the percentage of workers receiving training is low and that the extensive and intensive margins of training are affected by different sets of firm characteristics. Finally, the results of a qualitative study in Chile suggest that training is mostly introduced to comply with certifications and standards imposed by domestic and foreign authorities. Training in larger firms may also be oriented to improve the work environment.

JEL classifications: J24, M53

Keywords: Training, On the job training, Latin America

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1. Introduction

The performance of Latin American countries in the aftermath of the liberalization reforms undertaken during the 1980s and 1990s has been disappointing (Schneider and Karcher, 2010). Not only does the region hold the unfortunate distinction of having the most unequal income distribution in the world, but also its economies have not evolved as expected. Moreover, firm productivity levels compared to other countries remain low. This lackluster performance may be related to the lack of relevant skills among the workforce and the low intensity of workers' human capital accumulation. In effect, the region is trapped in a high inequality/low productivity equilibrium, which can be considered a local version of the middle-income trap.

There are many plausible explanations for this underperformance. Many of them point out “institutional complementarities,” as expressed in Hall and Soskice (2004). This is due to the fact that overall performance, or underperformance, of an economy is related to different constituents of the productive system—macroeconomic variables, position in the value chain, corporate finances and governance, labor and inter-firm relations, and institutional frameworks, among other considerations. Therefore, studying how these elements interact may lead to a better understanding of the causes of the poor performance observed in Latin America.

After Latin-American countries exited the import substitution model, many of them followed a development strategy based on commodity-led models. This model relies heavily on low skilled workers, because, commodities “have volatile prices, face high competition in the global economy and create few knowledge-based assets”, as expressed in Sánchez-Ancochea (2009).

The accumulation of human capital has been extensively studied since the seminal work of Becker (1962). This literature considered training as a costly investment, and consequently it increases expected future productivity. However, this type of investment differs from physical investment in the ownership of this investment. When training increases general skills, the current and other possible employers of the worker benefit from this investment. When training augments skills specific to the production in a given firm, however, the benefit is confined to that firm. Empirically, Blundell et al. (1999) found that early training, which is mostly general, is relatively portable to other firms. Lillard and Tan (1986, 1992) showed that training in firms from sectors with a high rate of technological change is less mobile; in other words, workers have a tendency to stay in either the same firm or, at least, the same sector.

This important distinction between physical and human capital also leads to different investment paths. Increasing investment in human capital requires reaching an agreement on who would pay for training and how the increase in productivity would be shared between employer and employee. There is an extensive literature studying possible outcomes of this interaction. Weiss (1986) surveys this literature for non-strategic interaction between firms and workers, and Leuven (2005) surveys additional models in which strategic interaction between firms and workers is allowed.

Therefore, studying the underperformance of Latin-American countries must include an analysis of the relationship between firms and both skilled and unskilled workers. These relationships are consequences of institutions and characteristics of the labor market, which may affect firms' incentives to invest in skill formation (Almeida and Reyes, 2008). For instance, Latin American labor markets display features such as low rates of unionization, short job tenures, and a large informal sector.

This is of particular importance, considering recent work studying complementarities among physical capital, technology, innovation and skilled labor (e.g., Gancia, Zilibotti and Acemoglu, 2008, and Dostie, 2014). Any improvement in the quality of the workers within a firm can lead to substantial gains in productivity, firstly associated with the direct effect of a higher composition of skilled workers and secondly with the indirect effect related to complementarities with physical capital and technologies.

There are several ways in which on-the-job training may affect a firm. Productivity is the first obvious choice for assessing the impact of training on the firm. However, estimating this effect has been difficult, and the estimates range from large (Bartel, 1991 and 1995) to small (de Koning, 1994), to no effect (Black and Lynch, 1996 and 1997). Training can also have an impact on firm profitability. This impact is related to the strategic interaction between workers and firms, and how the contract defines who benefits more from the increase in expected future productivity. Barron, Black and Loewenstein (1989) and Blakemore and Hoffman (1988) have found that the productivity increase is roughly twice the size of the change in wages. Therefore, firms' profitability is positively impacted by training programs.

Finally, long-term competitiveness may also be impacted by more human capital accumulation within the firm. Bosworth and Wilson (1993) and Chapman and Tan (1990) show that improved composition of the labor force and the adoption of newer and high-level

technologies lead to an increase in long-term competitiveness. This mechanism is explained partly by the training of workers in new technologies and the adaptability of the firm to using new technology through continuous investment in its workers.

These works show that most of the benefits of training hinge on the institutional environment that a firm faces. Access to new technology, the composition of the labor force, the rule of law, and the composition of the sectors in the economy play an important role in determining the possible gains of on-the-job training. All of these dimensions must be accounted for when studying the situation of training programs in Latin America and the Caribbean.

This paper is organized as follows. The next section discusses the data used in the subsequent section. Section 3 presents several stylized facts on the firms providing training to workers. This exploratory step shows the conditions and context of Latin American on-the-job programs. Section 4 shows the results of various econometric models. These models capture the characteristics of the firms providing training. Section 5 turns to the specific case of Chile. Section 6 presents the qualitative study, and Section 7 contains the main conclusions.

2. Description of the Data

This study uses primarily two datasets. The first is the World Bank's Enterprise Surveys (ES). This dataset contains information from manufacturing and service sectors in more than 135 countries around the world. Surveys were collected during the period 2006-2014. However, many of the more developed economies are not in the sample.

For Latin America and the Caribbean, the available information for 2010 includes 29 countries.² The surveys are representative of non-agricultural private firms, and the focus is on the manufacturing and service sectors.

One potential problem with this dataset is variations in the response rate to questions associated with training programs. In particular, only one question (related to the existence or non-existence of training programs) can be used to study the 29 countries. Additional questions on training can only be analyzed for a subsample of countries. The main reason is that the application of the survey greatly differs from one country to another. In some countries only the basic questions were applied, and more specific information about training is not available. This is of

² Brazil's survey, performed in 2009, is used in this study.

particular importance for the econometric models, because their implications are limited to these subsamples.

Regarding the information used in this paper's exploratory portions and its econometrics models, we focus on questions that can simultaneously provide representativeness and economic intuition. In particular, we use the age of the firm, percentage of skilled workers, share of the production that is internationally traded (level of exports), sector, and size.

In order to refine our study of the determinants of on-the-job training, we use the *Encuesta Longitudinal de Empresas* (ELE), which is a longitudinal enterprise survey conducted in Chile in 2013. This survey is representative of all firms with sales of more than US\$30,000. This dataset also contains detailed information on firms and, in particular, information on training programs, the percentage of workers receiving training programs, and some characteristics of those programs.³ This richer dataset allow us to refine the findings provided by the ES, and validate some of the facts presented in the following section.

3. Stylized Facts

The empirical literature studying on-the-job training studies both firm and worker characteristics. For instance, Lillard and Tan (1992) found that educational attainment is determinant for post-school investment in human capital. They also found that training has a life-cycle component, and it is related to tenure in a job. They additionally found that industries with high level of technological change offer more training opportunities, but they focus on managerial and specific skills. Conversely, these sectors provide less training to technical and semiskilled positions within the firm.

³ The survey does not have information by worker, but there are questions on types of workers receiving training.

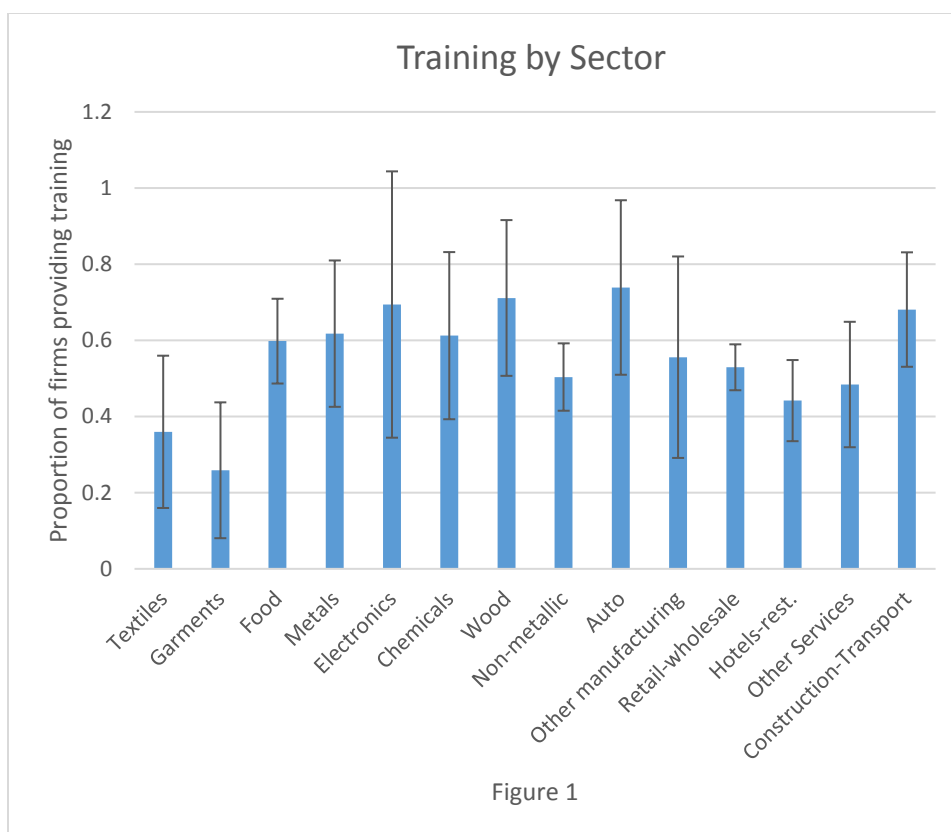


Figure 1 displays the proportion of firms in each sector that reported having formal training programs⁴ for permanent full-time workers during the last fiscal year. As expected, some of the sectors that use standard technologies, like garments, display lower levels of training programs. Sectors that require higher levels of technologies have more training programs on average. Note that the aggregation across countries is performed using the survey weights defined in the ES.⁵

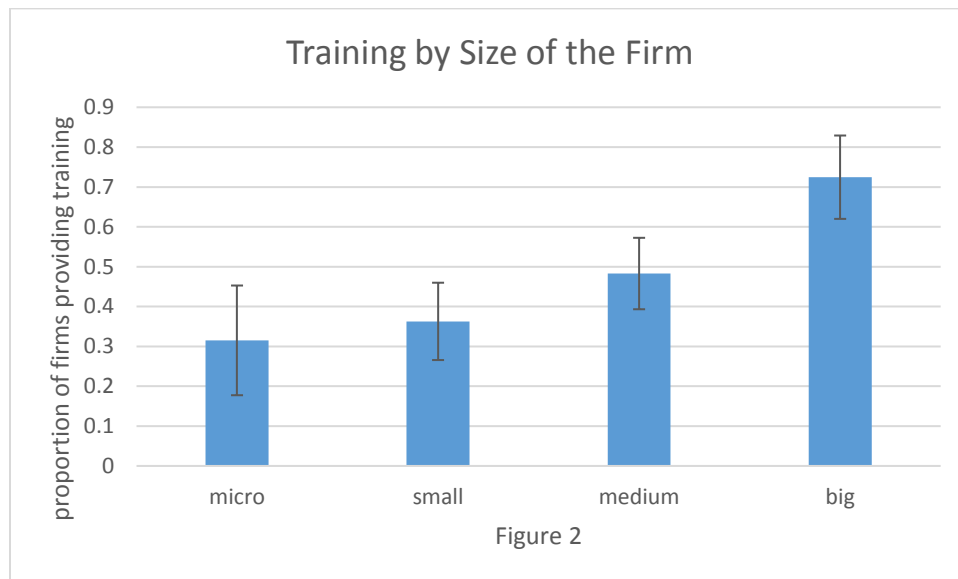
One possible source of within-industry heterogeneity is the size of the firm. Figure 2 displays the same statistic as Figure 1 but classifies firms according to size.⁶ From Figure 2 it is clear that the larger the firm, the more likely is to have a training program. This result, however,

⁴ According to the Enterprise Survey Manual, this refers to a training program that has a structured and defined curriculum. It may include classroom work, seminars, lectures, workshops, and audio-visual presentations and demonstrations. This does not include training to familiarize employees with equipment and machinery on the shop floor, training aimed at familiarizing employees with the establishment's standard operation procedures, or employee orientation at the beginning of an employee's tenure. In-house training may be conducted by other non-supervisory employees of the establishment, the establishment's supervisors or managers, or the establishment's training centers.

⁵ The design of the survey plays a role in these stylized facts. Errors, and consequently confidence intervals, are greater due to sample construction and weighing.

⁶ Firm size is classified as follows: micro, less than 5 workers; small, between 5 and 10 workers; medium, between 11 and 49 workers; big, 50 or more workers.

is only statistically significant when comparing larger firms with smaller firms (micro, small and medium). This is consistent with the findings of Bosworth and Wilson (1993) and Chapman and Tan (1990), in the sense that the composition of the labor force may play an important role to determine the possible benefits of training programs. Firms with more workers may benefit from their composition of the labor force more than firms with fewer workers. Blundell et al. (1999) also found that larger firms provide comparatively more training.



There is ample evidence that firms have a tendency to train the most qualified workers (Lillard and Tan, 1992; Bassanini et al., 2005; Huneus et al., 2012; Flores-Lima, González-Velosa and Rosas Shady, 2014). However, the information in the ES is not detailed enough to know the qualification level of the workers receiving training. We perform analyses of the qualifications at firm level, which is the best available proxy.

Figure 3a presents the proportion of firms providing training, classified by the percentage of workers with college degree. Firms with a higher proportion of workers with university degree provide more training, which is consistent with previous empirical evidence.⁷

⁷ The high confidence intervals are mainly explained by restrictions in the sample that represent the proportion of workers with university degree. The sample is composed mainly of manufacturing sector firms from 20 of 30 Latin American and Caribbean countries.

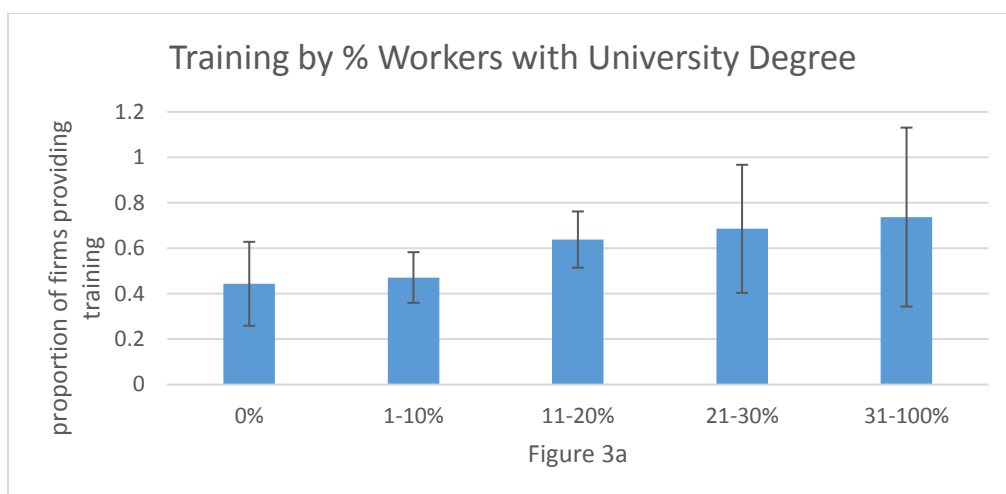
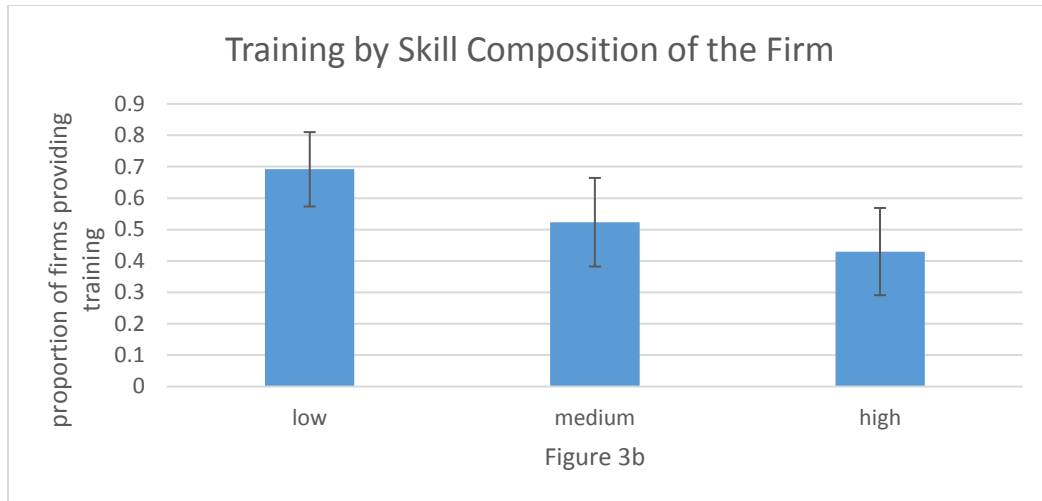


Figure 3b presents the proportion of firms providing training by average skill level⁸ of the firm's labor force. Training programs in Latin America are more prevalent among firms with relatively low skill composition of their labor force. Note that firms in the low skill composition classification have less than 30 percent skilled workers in their entire labor force. At the other side of the spectrum, firms classified as "high" have more than 60 percent of their workers in the skilled category. One possible explanation of the high training prevalence in firms with a majority of unskilled production workers is that training programs may act as remedial programs for low human capital levels. This is consistent with the low productivity of Latin American firms, which can be attributable to the lack of adaptability to new technologies, a consequence of a relatively unskilled labor force.

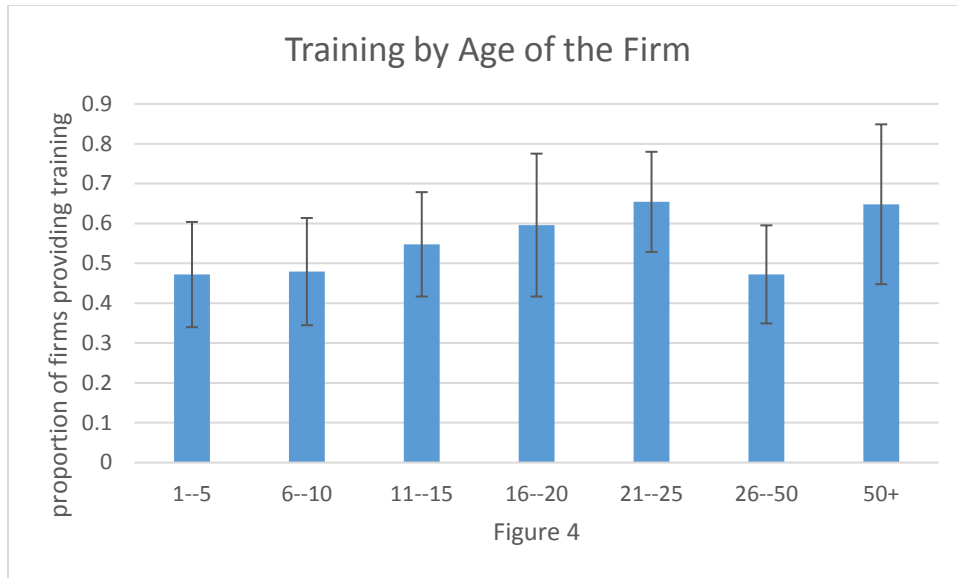
The evidence from Figures 3a and 3b indicates that firms may tend to provide more training when their labor force has more education, but at the same time the skill composition of the labor force matters. Figure 3b also suggests that larger firms provide more training, because they have a larger share of unskilled workers.⁹ Therefore, the composition of the labor force matters, but in a different way than the evidence presented in Bosworth and Wilson (1993) and Chapman and Tan (1990).

⁸ The skilled/unskilled classification comes directly from survey questions L4a and L4b. On one hand, skilled workers have some special knowledge or (usually acquired) ability in their work. Skilled workers may have attended a college, university or technical school or may have learned their skills on the job. On the other hand, unskilled workers do not require special training, education, or skill to perform their job.

⁹ In Latin American countries, according to the Enterprise Survey, the percentage of unskilled workers in large firms is 38 percent, while unskilled workers in micro and small firms range are 10 percent and 11 percent, respectively.

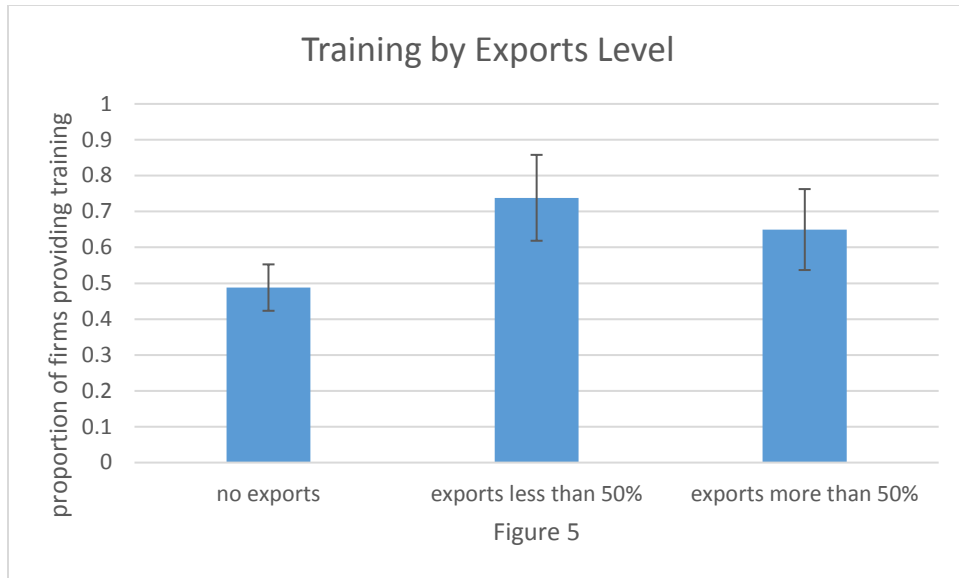


Firms also differ in their age, as a firm's age may affect its adaptability to new technologies. It is likely that recently created firms use the newest technology, while older firms must invest in human capital accumulation to keep up with new technologies. They also invest in training to increase the adaptability of the firm. Figure 4 displays the percentage of firms providing training by age of the firm. Regrettably, the precision of the survey prevents us from drawing many conclusions from the figure. However, the evidence suggests that newer firms provide less training than older firms, but only for the range 1 to 25 years. This may be consistent with the idea that older firms start investing to adopt newer technologies. But it may also be the case that those firms are in sectors where consolidation provides more benefits than adaptability. In the garment industry, for instance, a firm's advanced age may be a proxy for good business decisions and control of relevant sector-specific factors. In these cases, firm age can indicate less inclination to train workers and adopt new technologies.



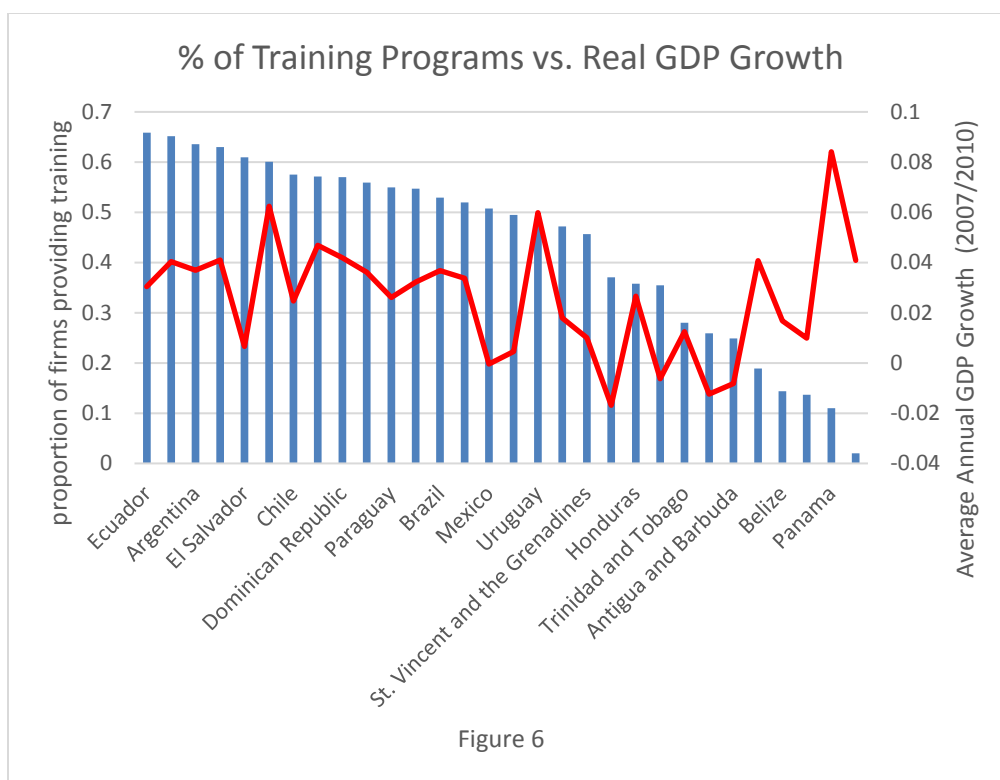
International trade is important for Latin American firms because it increases their expected profits through access to larger markets. Many Latin American countries have relatively sparse populations and therefore small domestic markets. This condition makes it desirable for firms to access larger and wealthier foreign markets. However, not all firms meet the standards and competitiveness levels required to participate in international markets. These differences across firms may lead to differences in labor force conditions and production settings between export and non-export firms.

In Figure 5, we classified firms into three groups by level of exports: i) firms that do not export, ii) firms for which exports represents less than 50 percent of their sales, and iii) firms that export more than 50 percent of their sales. Figure 5 suggests that exporting firms consistently provide more training than firms that do not export. Interestingly, firms in which exports account for less than 50 percent of sales display the highest percentage of training programs. This result is consistent with a growing body of literature that relates export participation to an increase in skill utilization within firms (Verhoogen, 2008; Brambilla, Lederman and Porto, 2012; Bastos et al., 2016). This theory indicates that expertise in international business and foreign languages, product quality upgrading, and adoption of more skill-intensive technologies are the main mechanisms leading to an increase in training programs for workers.



Macroeconomic conditions, as a part of the economic environment, also affect on-the-job training. Persistent high employment and higher production volatility may reduce the probability of obtaining training. However, we are only using the ES for one specific year, and therefore, the only macroeconomic condition that can be compared across countries is GDP. Figure 6 shows the percentage of firms providing training programs by country, and its comparison with average GDP growth over the period. It is clear that GDP growth is not a good predictor of the training programs offered in each country. This is not consistent with the evidence mentioned in Lillard and Tan (1992), where training is related to changes in the expected growth rate of production.

In order to better understand why firms provide training, we combine the information from these stylized facts into a more comprehensive and robust framework. The next section provides estimations of regression that combine many of the factors analyzed here. Thus, we will be able to contrast the result of the estimation with some of the findings presented in this section.



4. Econometric Strategy: ES

Our first approximation to understand the determinants of on-the-job training is to use an econometric model. The ES data allow us two possible econometric approaches to studying the firm's decision to provide training to its workers. First, we use the information from the same question presented in the previous section to create a probit model. It is important to note that the question regarding the existence of training programs is a dichotomic one. Therefore, probit or logit estimation is the obvious choices; we present the results for the probit models.¹⁰ However, using a probit can only inform on the probability of training, and not necessarily the quantity or, more specifically, the percentage of workers receiving training. Therefore, it is important to be cautious about these results. One benefit of using this approach is that the question used to construct the probit is one of the questions with the highest response rate. Thus, these sets of results are representative of most firms in Latin American and Caribbean countries.¹¹

¹⁰ Results for the logit estimations are available upon request.

¹¹ The regressions presented in this section represent a subsample of Latin American and Caribbean countries. We dropped from the regressions all countries that have only manufacturing and services as their sector classification. These 10 countries have very small GDPs, and all of them are in the Caribbean. Additional details are available upon request.

The results from the previous section suggest that age of the firm, skill composition, size, sector, and level of exports level may be related to the existence of on-the-job training programs. Table 1 presents the results of different probit models, each with a different set of control variables, and Table 2 shows the marginal effects. Surprisingly, age of the firm is not statistically different from zero, although we introduce a more flexible functional form. It is important to notice that in these regressions we are not controlling by skill composition, but we study this issue in subsequent regressions.

As we observe in Figure 5, level of exports plays an important role in the likelihood of existence of training programs in a firm. This result is consistent across specifications, and the quadratic specification allows us to conclude this effect is not monotonically increasing.

The size of the firm is also an important determinant of the existence of training program in a firm. One plausible reason for this dependence on size is the nature of the question. It is important to note that the survey investigates if the firm did or did not have training programs for its workers. Therefore, it is more likely that firms with more workers present some type of training programs. This possible relationship between the existence of training programs and size is displayed in both Table 1 and Table 2.

With respect to the production sectors, Tables 1 and 2 indicate that most of the sectors are indistinguishable from the excluded category (textiles). The only sectors that seem to provide more training are wood, furniture and automobile,¹² which require relatively low-skilled workers. Therefore, it appears to be very important to study what type of workers is mostly receiving training.

One alternative for studying the importance of labor force characteristics in relation to the existence of training programs is to introduce skill composition into the probit model. We define skill composition as the percentage of full-time skilled workers over the total number of full-time workers in the firm. Tables 3 and 4 display the probit results and the respective marginal effects.

¹² While some automobile factories are in Latin American and Caribbean (LAC) countries, they engage solely in manufacturing. The design of new cars takes place in headquarters in Europe and the United States.

Table 1. Probit: Firms Providing Training (ES)

VARIABLES	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4
Age of the Firm	0.00505 (0.00417)	-0.00204 (0.00447)	0.00219 (0.00386)	-0.00432 (0.00419)
(Age)^2	-2.57e-06 (2.05e-06)	9.15e-07 (2.20e-06)	-1.17e-06 (1.89e-06)	2.03e-06 (2.06e-06)
Exports	0.0441*** (0.0133)	0.0325*** (0.0120)	0.0335** (0.0144)	0.0210* (0.0124)
(Exports) ^2	-0.000446*** (0.000146)	-0.000341*** (0.000132)	-0.000341** (0.000158)	-0.000227* (0.000137)
Garments			-0.282 (0.405)	-0.431 (0.421)
Food			0.373 (0.331)	0.389 (0.358)
Metals/Machinery			0.582 (0.395)	0.563 (0.416)
Electronics			0.313 (0.595)	0.150 (0.620)
Chemicals/Pharmac.			0.621 (0.419)	0.378 (0.439)
Wood/Furniture			0.952** (0.422)	0.939** (0.475)
Plastic/Non Metallic			-0.271 (0.341)	-0.327 (0.365)
Automobile			0.933** (0.466)	0.886** (0.452)
Other Manufacturing			-0.201 (0.545)	-0.302 (0.501)
Retail/Wholesale			-0.143 (0.327)	-0.101 (0.345)
Hotel/Restaurant			-0.272 (0.365)	-0.222 (0.379)
Other Services			-0.173 (0.355)	-0.148 (0.393)
Construction/Transp.			0.0518 (0.374)	-0.0953 (0.411)
Small		0.330 (0.231)		0.396* (0.228)
Medium		0.848*** (0.217)		0.790*** (0.221)
Big		1.447*** (0.256)		1.482*** (0.260)
Constant	0.0986 (0.153)	-0.423* (0.239)	0.208 (0.346)	-0.305 (0.406)
Observations	12,834	12,834	12,832	12,832

Source: Authors' calculations based on World Bank's ES.

Notes: Robust standard errors in parentheses. The independent variables are binary. * Coefficient is statistically significant at 10 percent level; ** at 5 percent level; *** at 1 percent level; No asterisk means that the coefficient is not different from zero with statistical significance. All estimates control for country and year. The excluded variables are for size (micro) and sector (textiles).

Table 2. Probit: Firms Providing Training (ES), Marginal Effects

VARIABLES	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4
Age of the Firm	0.00192 (0.00158)	-0.000723 (0.00159)	0.000778 (0.00136)	-0.00143 (0.00139)
(Age)^2	-9.78e-07 (7.75e-07)	3.25e-07 (7.80e-07)	-4.14e-07 (6.69e-07)	6.73e-07 (6.84e-07)
Exports	0.0168*** (0.00492)	0.0115*** (0.00420)	0.0119** (0.00511)	0.00698* (0.00410)
(Exports) ^2	-0.000170*** (5.44e-05)	-0.000121*** (4.61e-05)	-0.000121** (5.63e-05)	-7.53e-05* (4.53e-05)
Garments			-0.100 (0.143)	-0.143 (0.139)
Food			0.132 (0.117)	0.129 (0.118)
Metals/Machinery			0.207 (0.139)	0.187 (0.137)
Electronics			0.111 (0.211)	0.0498 (0.206)
Chemicals/Pharmac.			0.220 (0.147)	0.125 (0.144)
Wood/Furniture			0.338** (0.147)	0.311** (0.155)
Plastic/Non Metallic			-0.0960 (0.121)	-0.108 (0.121)
Automobile			0.331** (0.161)	0.294** (0.147)
Other Manufacturing			-0.0713 (0.193)	-0.100 (0.166)
Retail/Wholesale			-0.0506 (0.116)	-0.0336 (0.114)
Hotel/Restaurant			-0.0964 (0.129)	-0.0735 (0.126)
Other Services			-0.0612 (0.126)	-0.0490 (0.130)
Construction/Transp.			0.0184 (0.133)	-0.0316 (0.136)
Small		0.117 (0.0832)		0.131* (0.0772)
Medium		0.301*** (0.0770)		0.262*** (0.0716)
Big		0.514*** (0.0830)		0.491*** (0.0802)
Observations	12,834	12,834	12,832	12,832

Source: Authors' calculations based on World Bank's ES.

Notes: Robust standard errors in parentheses. The independent variables are binary. * Coefficient is statistically significant at 10 percent level; ** at 5 percent level; *** at 1 percent level; No asterisk means that the coefficient is not different from zero with statistical significance. All estimates control for country and year. The excluded variables are for size (micro) and sector (textiles).

Surprisingly, skill composition of the labor force appears to be statistically not different from zero. Age of the firm is still statistically not-significant, but level of exports remains significant and with the same functional form described in Tables 1 and 2. Size of the firm also remains statistically significant. One possible caveat of this set of regressions is related to the drop in sample size, associated with the lower rate of response to the specific question of number of skilled workers.

We present two robustness checks in the Appendix to assess whether the results are related to the change in sample or to the inclusion of the skill composition in the probit regressions. First, we re-estimate the regressions presented in Table 1, but with the same sample that we use in Table 3. Second, we add a dummy to control for the missing observations, and we impute values for the missing observations. These two sets of checks show that the results associated with exports level and size are robust to the changes in samples, but the results related to the sectors are more sensitive to the sample and therefore must be considered with some caution.

In order to have a better understanding of the conditions or determinants of on-the-job training, we must refine our measure of training availability. The ES offers an additional insight on this issue, asking firms in the manufacturing sector about the percentage of productive and non-productive workers that have received training in the last year.¹³ Regrettably, the response rate for these questions is considerable lower than for the questions used in the probit model.¹⁴ Only a third of the firms in sample used in Table 1 answered these questions. However, these questions allow us to study directly the number of workers receiving training. In particular, we use an OLS approach to estimate how the different characteristics of the firm affect the number of workers trained.

These sets of regressions allow us to compare, up to a point, the evidence from the probit estimation, with evidence from a direct measure of the relative intensity of training within the labor force. It is important to note that the probit regression includes non-manufacturing sectors,¹⁵ and thus we must be cautious about the comparison. However, these two sets of regressions may shed some light on the difference of the conditions associated with the existence of training programs, and the conditions associated with the intensity of training within a firm.

¹³ Questions L11a and L11b.

¹⁴ Only 55 percent of firms in the manufacturing sector answered these questions.

¹⁵ Manufacturing accounts for 61 percent of the sample.

Table 3. Probit: Firms Providing Training (ES)

VARIABLES	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4
Age of the Firm	0.00158 (0.00600)	-0.00746 (0.00603)	0.000111 (0.00564)	-0.00708 (0.00607)
(Age)^2	-8.36e-07 (2.94e-06)	3.58e-06 (2.95e-06)	-1.09e-07 (2.76e-06)	3.39e-06 (2.97e-06)
% of skilled workers	-0.00628 (0.00413)	-0.00489 (0.00418)	-0.00125 (0.00411)	0.000362 (0.00408)
Exports	0.0490*** (0.0183)	0.0375** (0.0162)	0.0347** (0.0175)	0.0217 (0.0155)
(Exports) ^2	-0.000462** (0.000199)	-0.000376** (0.000175)	-0.000320* (0.000189)	-0.000219 (0.000168)
Garments			-0.162 (0.410)	-0.344 (0.440)
Food			0.705** (0.349)	0.676* (0.387)
Metals/Machinery			0.762* (0.403)	0.774* (0.446)
Electronics			2.348*** (0.389)	2.123*** (0.432)
Chemicals/Pharmac.			0.714* (0.426)	0.448 (0.463)
Wood/Furniture			0.892** (0.435)	0.935* (0.514)
Plastic/Non Metallic			0.824** (0.362)	0.742* (0.393)
Automobile			0.894* (0.471)	0.877* (0.468)
Other Manufacturing			0.890* (0.481)	0.701 (0.442)
Retail/Wholesale			0.679 (0.852)	0.817 (0.633)
Other Services			-0.216 (0.550)	-0.00713 (0.554)
Small		0.695* (0.372)		0.921*** (0.343)
Medium		1.091*** (0.287)		1.206*** (0.287)
Big		1.847*** (0.330)		2.030*** (0.324)
Constant	0.100 (0.258)	-0.759** (0.353)	-0.720* (0.430)	-1.682*** (0.541)
Observations	7,699	7,699	7,698	7,698

Source: Authors' calculations based on World Bank's ES.

Notes: Robust standard errors in parentheses. The independent variables are binary. * Coefficient is statistically significant at 10 percent level; ** at 5 percent level; *** at 1 percent level; No asterisk means that the coefficient is not different from zero with statistical significance. All estimates control for country and year. The excluded variables are for size (micro) and sector (textiles).

Table 4. Probit: Firms Providing Training (ES), Marginal Effects

VARIABLES	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4
Age of the Firm	0.000600 (0.00227)	-0.00261 (0.00212)	3.87e-05 (0.00197)	-0.00229 (0.00196)
(Age)^2	-3.17e-07 (1.11e-06)	1.25e-06 (1.04e-06)	-3.79e-08 (9.63e-07)	1.10e-06 (9.57e-07)
% of skilled workers	-0.00238 (0.00152)	-0.00171 (0.00145)	-0.000438 (0.00143)	0.000117 (0.00132)
Exports	0.0186*** (0.00669)	0.0131** (0.00557)	0.0121** (0.00597)	0.00701 (0.00494)
(Exports) ^2	-0.000175** (7.30e-05)	-0.000132** (5.98e-05)	-0.000111* (6.48e-05)	-7.08e-05 (5.35e-05)
Garments			-0.0566 (0.143)	-0.111 (0.142)
Food			0.246** (0.119)	0.219* (0.122)
Metals/Machinery			0.266** (0.135)	0.250* (0.140)
Electronics			0.819*** (0.127)	0.686*** (0.136)
Chemicals/Pharmac.			0.249* (0.145)	0.145 (0.147)
Wood/Furniture			0.311** (0.148)	0.302* (0.162)
Plastic/Non Metallic			0.288** (0.123)	0.240* (0.124)
Automobile			0.312* (0.159)	0.284* (0.148)
Other Manufacturing			0.310* (0.163)	0.227 (0.139)
Retail/Wholesale			0.237 (0.295)	0.264 (0.203)
Other Services			-0.0753 (0.190)	-0.00231 (0.179)
Small		0.243* (0.135)		0.298** (0.119)
Medium		0.382*** (0.103)		0.390*** (0.0942)
Big		0.646*** (0.104)		0.656*** (0.0992)
Observations	7,699	7,699	7,698	7,698

Source: Authors' calculations based on World Bank's ES.

Notes: Robust standard errors in parentheses. The independent variables are binary. * Coefficient is statistically significant at 10 percent level; ** at 5 percent level; *** at 1 percent level; No asterisk means that the coefficient is not different from zero with statistical significance. All estimates control for country and year. The excluded variables are for size (micro) and sector (textiles).

Table 5 displays the results of OLS estimation approach for different sets of control variables. In this case the dependent variable is the percentage of productive workers receiving training during the last fiscal year. It is important to note that the ES allows us to study productive and non-productive workers separately.¹⁶ Table 5 shows that higher training for productive workers is mostly related to the size of the firm and the age of the firm. In this case, level of exports and skilled worker composition are characteristics that statistically do not affect the percentage of productive workers receiving training.

In terms of age of the firm, the functional form introduced in the regression implies that younger firms provide more training than older firms. This tendency changes for very old firms, as was shown in Figure 4.

The results for non-productive workers are presented in Table 6. Surprisingly, we note that sectors such as garments, food, chemicals and plastic display statistically significant more worker training than the excluded sector in the regression (textile). It is important to note that these results are for non-productive workers; in other words, we observe difference in training across sectors when we focus our attention on workers not engaged in production. The age of the firm presents an impact on training like that in the case of productive workers.

¹⁶ Productive workers are defined as workers (up through the line supervisor level) engaged in fabricating, processing, assembling, inspecting, receiving, storing, handling, packing, warehousing, shipping, maintenance, repair, product development, auxiliary production for plant's own use, recordkeeping, and other services closely associated with these productions operations.

Table 5. OLS: Percentage of Productive Workers Receiving Training (ES)

VARIABLES	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4
Age of the Firm	-0.570** (0.250)	-0.547** (0.253)	-0.509** (0.230)	-0.498** (0.237)
(Age)^2	0.000279** (0.000122)	0.000268** (0.000123)	0.000250** (0.000112)	0.000244** (0.000116)
% of skilled workers	0.0212 (0.157)	0.0181 (0.152)	0.0324 (0.151)	0.0297 (0.153)
Exports	-0.318 (0.585)	-0.252 (0.631)	-0.440 (0.519)	-0.409 (0.536)
(Exports) ^2	0.00235 (0.00685)	0.00178 (0.00721)	0.00337 (0.00630)	0.00312 (0.00640)
Garments			8.588 (21.84)	8.895 (21.33)
Food			12.02 (20.44)	12.41 (19.81)
Metals/Machinery			17.52 (20.93)	17.40 (20.46)
Electronics			-6.461 (21.60)	-6.212 (21.12)
Chemicals/Pharmac.			-1.462 (25.41)	-0.756 (24.47)
Wood/Furniture			17.70 (24.09)	17.52 (23.51)
Plastic/Non Metallic			8.065 (20.37)	8.666 (19.71)
Automobile			9.243 (23.18)	9.694 (22.58)
Other Manufacturing			6.651 (20.22)	7.533 (19.61)
Retail/Wholesale			-1.110 (24.40)	0.599 (24.03)
Other Services			6.474 (20.71)	8.565 (20.18)
Construction/Transp.			-24.91 (22.77)	-24.07 (22.14)
Small		-27.86*** (6.814)		-26.96*** (6.599)
Medium		-21.45*** (6.928)		-22.85*** (6.793)
Big		-27.29*** (7.891)		-25.65*** (6.552)
Constant	82.88*** (11.02)	105.8*** (12.33)	73.43*** (23.25)	96.70*** (22.66)
Observations	4,338	4,338	4,338	4,338
R-squared	0.077	0.082	0.111	0.112

Source: Authors' calculations based on World Bank's ES.

Notes: Robust standard errors in parentheses. The independent variables are binary. * Coefficient is statistically significant at 10 percent level; ** at 5 percent level; *** at 1 percent level; No asterisk means that the coefficient is not different from zero with statistical significance. All estimates control for country and year. The excluded variables are for size (micro) and sector (textiles).

Table 6. OLS: Percentage of Non-Productive Workers Receiving Training (ES)

VARIABLES	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4
Age of the Firm	-0.669*** (0.236)	-0.861*** (0.225)	-0.683*** (0.232)	-0.826*** (0.233)
(Age)^2	0.000327*** (0.000115)	0.000420*** (0.000110)	0.000333*** (0.000114)	0.000402*** (0.000114)
% of skilled workers	-0.0211 (0.196)	0.0607 (0.164)	-0.0129 (0.169)	0.0560 (0.154)
Exports	0.690 (0.685)	0.236 (0.611)	0.731 (0.678)	0.341 (0.602)
(Exports) ^2	-0.00818 (0.00742)	-0.00430 (0.00654)	-0.00826 (0.00720)	-0.00520 (0.00646)
Garments			35.61** (14.00)	31.97** (14.26)
Food			25.17*** (9.389)	23.33** (11.46)
Metals/Machinery			20.27 (14.12)	20.00 (13.32)
Electronics			16.63 (11.36)	11.77 (12.74)
Chemicals/Pharmac.			36.71*** (14.19)	30.43* (15.95)
Wood/Furniture			17.78 (18.23)	20.49 (15.44)
Plastic/Non Metallic			24.89** (9.907)	22.85** (10.78)
Automobile			25.00 (15.56)	21.48 (16.63)
Other Manufacturing			34.80*** (9.214)	26.66*** (10.24)
Retail/Wholesale			28.85 (21.07)	10.93 (22.42)
Other Services			4.679 (17.01)	8.778 (16.10)
Construction/Transp.			5.897 (15.71)	-1.783 (15.76)
Small		-5.182 (19.23)		0.234 (18.23)
Medium		1.775 (17.90)		1.546 (18.14)
Big		27.50 (17.72)		24.73 (17.76)
Constant	64.74*** (11.76)	62.02*** (20.33)	37.10** (14.62)	36.87 (23.12)
Observations	4,338	4,338	4,338	4,338
R-squared	0.082	0.167	0.139	0.196

Source: Authors' calculations based on World Bank's ES.

Notes: Robust standard errors in parentheses. The independent variables are binary. * Coefficient is statistically significant at 10 percent level; ** at 5 percent level; *** at 1 percent level; No asterisk means that the coefficient is not different from zero with statistical significance. All estimates control for country and year. The excluded variables are for size (micro) and sector (textiles).

5. Studying a Specific Case: Chile

Chile provides an ideal setting to improve our understanding of on-the-job training. The ELE survey contains detailed information on both firms and firms' training decisions. The survey contains key questions that allow us to compare the results and facts obtained from the ES with results obtained with this more detailed dataset. The most important difference between these two surveys is that ELE provides information on the number of workers receiving training and the type of training that is provided.¹⁷ The goal of this section is to use the Chilean case to improve our insights on the results obtained with the ES. Therefore, our first step is to construct stylized facts similar to the ones presented in the previous sections.

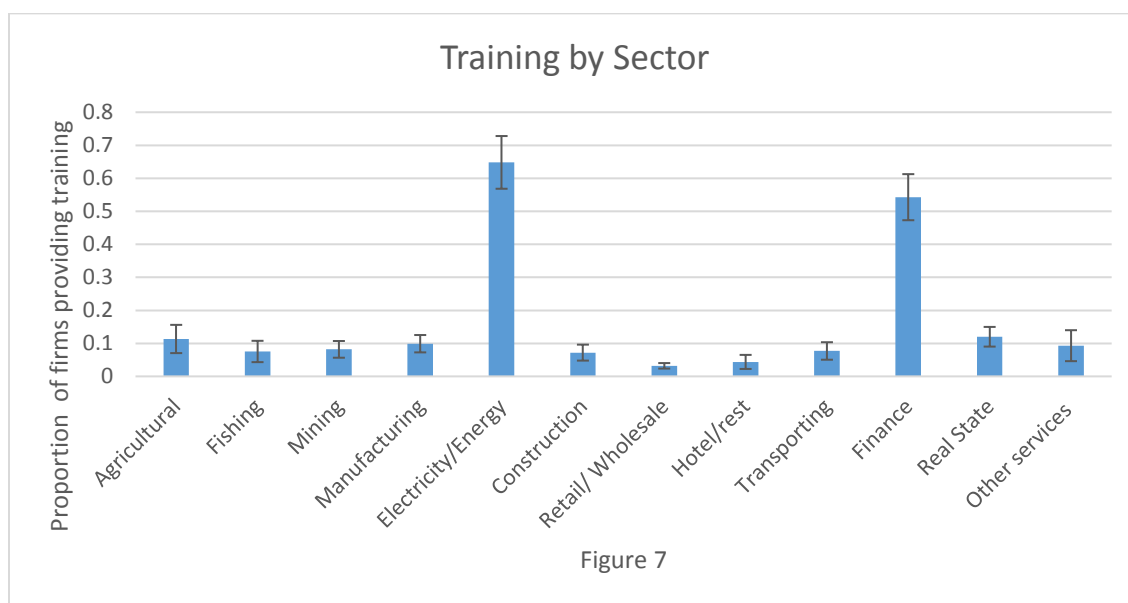
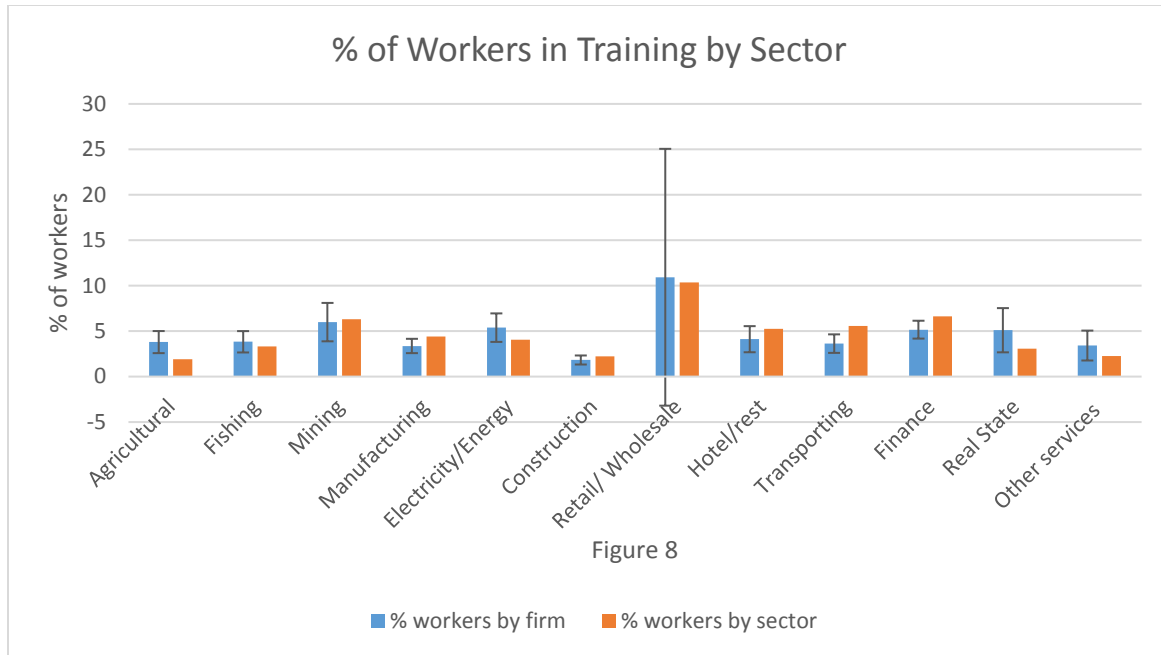


Figure 7 displays the proportion of firms by sector that provide training program to their workers. The ELE contains a question very similar to the dichotomic one used in Figures 1 to 6 for the ES. Thus, the main difference between Figure 7 and Figure 1 is sectors' classification. Figure 7 shows that the electricity, energy and finance sectors have a high presence of training programs. The other sectors offer training programs in less than 15 percent of their firms. These numbers are considerably lower than the percentages presented in Figure 1.

¹⁷ We do not have information on the type of training by worker, as we only know the main three types of training provided by the firm.

The ELE survey contains information about the number of workers that received training in the last year. Using this question allow us to contrast the evidence presented in Figure 7, with more direct evidence of how prevalent training programs are by sector. Figure 8 shows the percentage of workers receiving training by sector during the year 2013. There are two alternatives for calculating the percentage of workers receiving training. The first is to calculate this percentage by firm and aggregate this information by sector. This is represented in Figure 8 by blue bars, with the respective confidence interval. Thus, we observe variation across sectors, and the degree of heterogeneity of this percentage within a sector. The orange bars are calculated using the total number of workers receiving training in a sector, divided by the total number of workers in the sector. In this case both statistics are similar, but we present subsequent figures in which these alternatives are quite different.

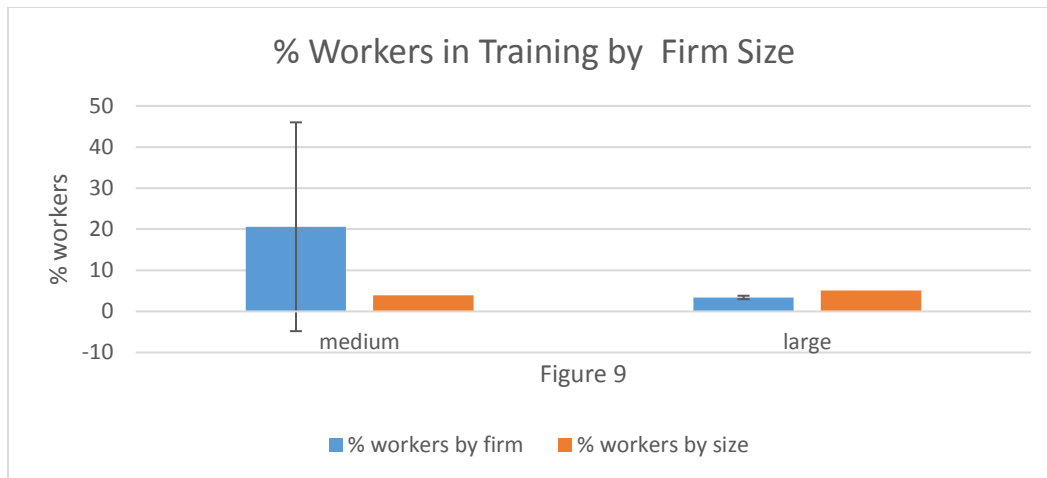
It is clear from Figure 8 that only a small share of workers receives training. Only in the retail and wholesale sector do more than 10 percent of workers receive training. Moreover, the sectors displaying a high percentage of existence of training programs in Figure 7 provide, on average, training to a relatively small percentage of workers. Other sectors that display lower percentage of existence training programs provide training to relatively more workers. These two figures highlight the possible great differences between studying the existence of training programs, with studying the percentage of workers receiving training. Subsequent figures present these two measures, to contrast these two different research questions.



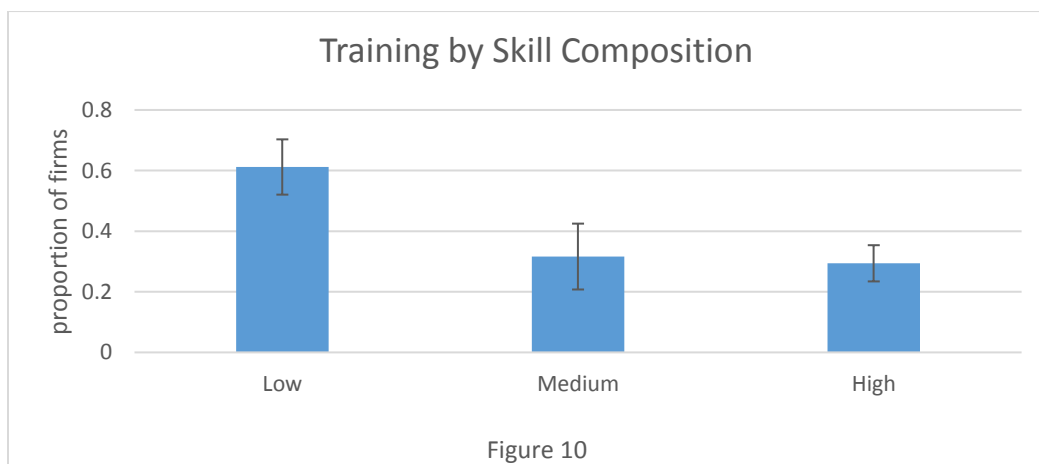
We also studied the percentage of firms providing training and the percentage of workers receiving training by size of firm. The size classification used in this figure is the same as that used for the ES; however, most of the firms in Chile are in the medium and large categories. We decide to use the same classifications to compare the results from the ES with the results from ELE. Only 1.5 percent of medium-size firms provide training, compared with 18.3 percent of large firms. This result corroborates the finding from the ES and shows that size is an important characteristic for firms deciding to provide training to their workers.

Figure 9 shows the percentage of workers receiving training. As in Figure 8, we calculate this percentage using two different approaches. In this case, we observe a great degree of heterogeneity within the medium-size sector.

It is clear that, when we focus our attention to the percentage of firms providing training by size, the evidence suggests that larger firms provide more training. But, when we observe the actual percentage of workers receiving training, medium and large firms provide relatively similar levels of training. Moreover, if we consider the heterogeneity within medium-size firms, it is possible that some medium-size firms are providing considerable more training than larger firms.



Like Figure 3, Figure 10 presents the percentage of firms providing training by the skill composition of the firm. Also, as in in Figure 3, the evidence in Figure 10 suggests that, when observing the proportion of firms offering training programs, firms with a higher percentage of skilled workers provide relatively fewer training opportunities.



However, when we study the actual percentage of workers receiving training, the percentages are very low and similar for all firms. Figure 11 shows the actual percentage, which ranges from 3.1 percent for firms with a relatively low-skilled workforce to 4.1 percent for firms with a high-skilled workforce. It should particularly be noted that the percentage of workers receiving training does not necessarily decrease with the percentage of skilled workers in the firm. This last result is consistent with both measures of the percentage of workers. In this case

heterogeneity increases with skill composition, and therefore it is difficult to conclude if there is a positive relationship between skill composition and percentage of workers receiving training.

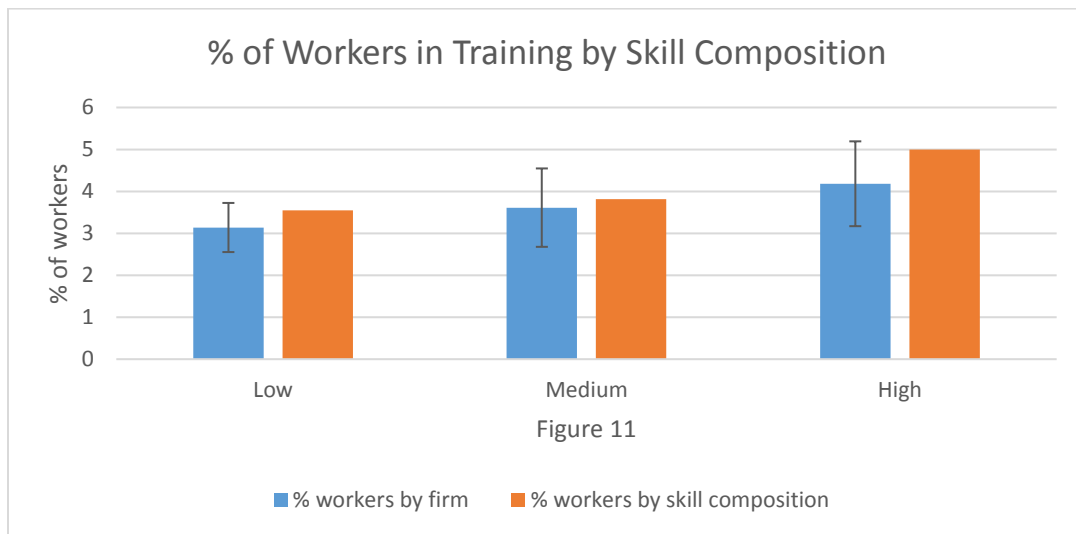


Figure 12, like Figure 4, presents the proportion of firms providing training. As in Figure 4, it seems that younger firms offer fewer training opportunities to their workers. This pattern, though, may reverse over time.

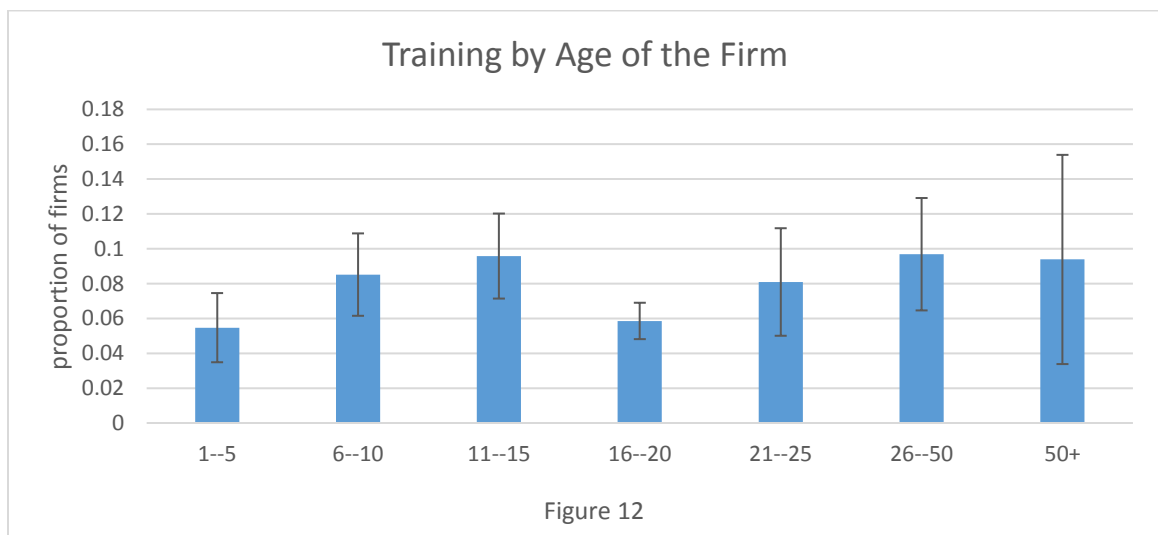


Figure 13 shows that firms aged 6 to 10 years old are considerably more heterogeneous regarding their decision of how many workers must engage in training. Moreover, Figure 12 also shows that relatively older firms provide more training.

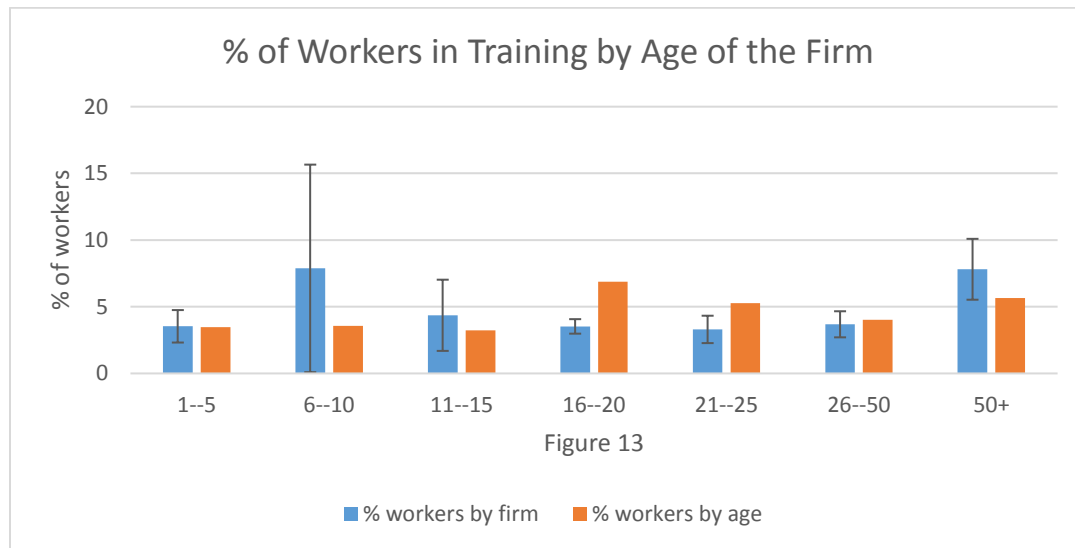
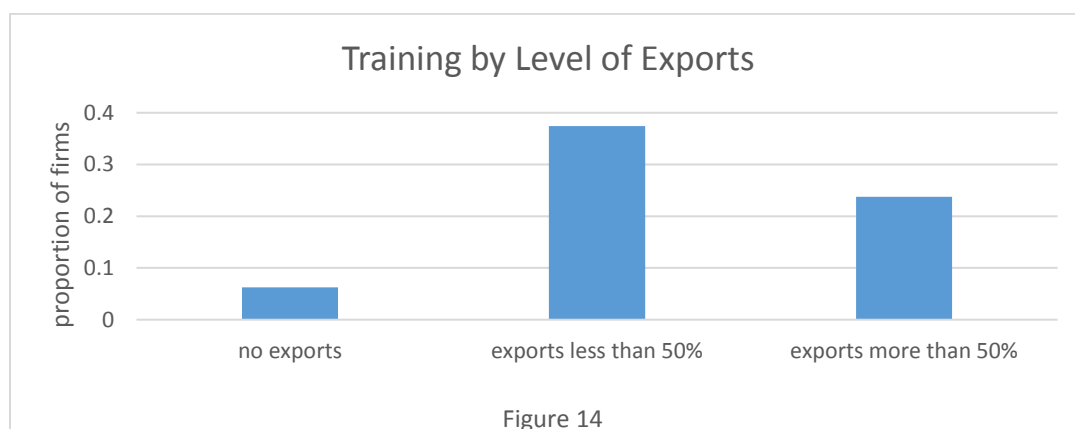
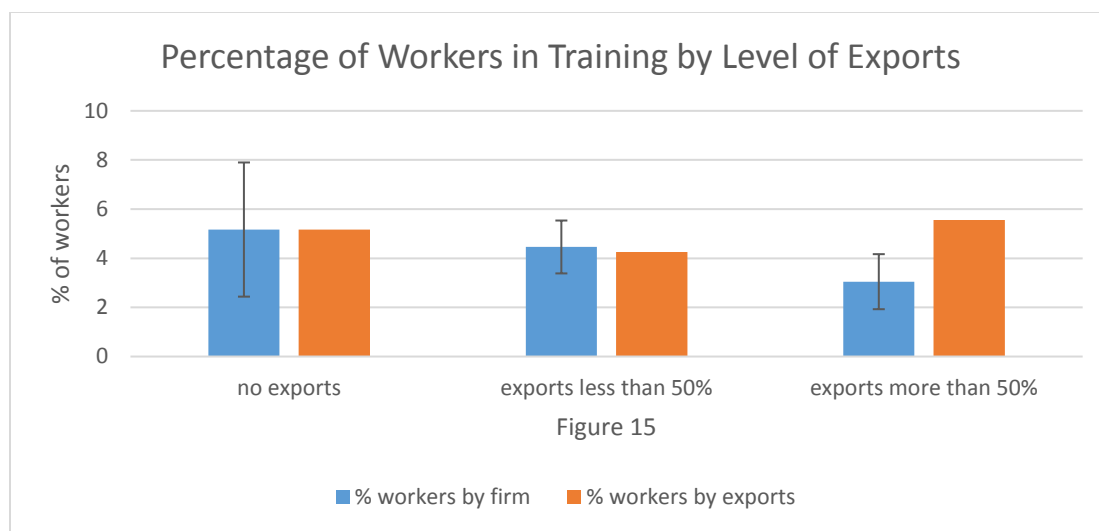


Figure 14, like Figure 5, presents the proportion of firms providing training by level of exports level. As in Figure 5, the percentage of firms providing training is higher for firms that export less than 50 percent of their sales. Exporting firms consistently offer more training programs than non-exporting firms.



However, these results change completely when we study the percentage of workers receiving training. Figure 15 shows that non-exporting firms have a considerably higher percentage of workers receiving training. In particular, non-exporting firms train 5.1 percent of their workers in 2013, compared with only 3 percent of workers trained in firms with more than 50 percent of sales being exported. However, firms with no exports present more heterogeneity, and therefore it is difficult to conclude how different are the number of workers receiving training. When we study the number of workers receiving training by exports level, the results also suggest small variation across the groups. These results show that the presence of training programs does not imply a higher number of workers receiving training.



As we did for the ES, we use two econometric approaches to study in further detail the factors affecting the firm's decision to provide training. First, we use a probit estimation and take advantage of the dichotomic variable related to the existence or non-existence of training programs. Second, we use the percentage of workers receiving training to study the factors that may lead to an increase the number of workers accumulating human capital in a firm. Unfortunately, the ELE does not distinguish between the training of productive and non-productive workers, and therefore we cannot directly compare the OLS regressions from ELE with the OLS regressions from ES.

Table 7. Probit: Firms Providing Training (ELE)

VARIABLES	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4
Age of the Firm	0.00614 (0.0111)	0.000360 (0.0119)	0.00676 (0.0120)	0.00145 (0.0126)
(Age)^2	0.000117 (0.000174)	0.000188 (0.000189)	0.000119 (0.000188)	0.000185 (0.000201)
% of skilled workers	0.0413*** (0.0121)	0.0432*** (0.0123)	0.0224* (0.0125)	0.0255** (0.0127)
Exports	0.0361*** (0.0126)	0.0348*** (0.0110)	0.0361*** (0.0127)	0.0355*** (0.0110)
(Exports)^2	-0.000316** (0.000135)	-0.000315*** (0.000118)	-0.000302** (0.000135)	-0.000306*** (0.000117)
Fishing			0.371 (0.279)	0.545** (0.265)
Mining			0.0411 (0.213)	0.00660 (0.217)
Manufacturing			0.233 (0.220)	0.243 (0.222)
Electricity/Energy			2.227*** (0.296)	2.168*** (0.313)
Construction			-0.0544 (0.231)	-0.0386 (0.234)
Retail/Wholesale			0.0257 (0.238)	0.146 (0.242)
Hotel/Restaurant			-0.180 (0.234)	-0.214 (0.239)
Transport			0.346 (0.268)	0.606** (0.267)
Finance			1.763*** (0.282)	1.633*** (0.285)
Real State			0.819*** (0.254)	0.843*** (0.254)
Other Services			0.252 (0.283)	0.156 (0.292)
Medium		-1.487*** (0.311)		-1.586*** (0.309)
Constant	-1.068*** (0.144)	-0.842*** (0.149)	-1.197*** (0.260)	-1.025*** (0.264)
Observations	3,329	3,328	3,329	3,328

Source: Authors' calculations based on ELE3 from Chile.

Note: Robust standard errors in parentheses. The independent variables are binary. * Coefficient is statistically significant at 10 percent level; ** at 5 percent level; *** at 1 percent level; no asterisk means that the coefficient is not different from zero with statistical significance. The excluded variables are for size (large) and sector (agriculture).

Tables 7 and 8 show the results for a set of probit regressions and their corresponding marginal effects. As in Tables 3 and 4, we present results for different specifications, changing the set of control variables but including skill composition of the labor force. Similarly to the ES results, the level of exports is statistically significant across all specifications. However, skill composition positively impacts the probability of a firm providing training in the ELE, which is not found in the ES.

Table 8. Probit: Firms Providing Training (ELE), Marginal Effects

VARIABLES	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4
Age of the Firm	0.00182 (0.00327)	9.83e-05 (0.00324)	0.00191 (0.00336)	0.000376 (0.00326)
(Age)^2	3.46e-05 (5.19e-05)	5.13e-05 (5.23e-05)	3.35e-05 (5.34e-05)	4.78e-05 (5.26e-05)
% of skilled workers	0.0122*** (0.00351)	0.0118*** (0.00332)	0.00632* (0.00355)	0.00660** (0.00333)
Exports	0.0107*** (0.00369)	0.00950*** (0.00294)	0.0102*** (0.00352)	0.00918*** (0.00277)
(Exports)^2	-9.37e-05** (3.97e-05)	-8.61e-05*** (3.19e-05)	-8.53e-05** (3.79e-05)	-7.92e-05*** (2.99e-05)
Fishing			0.105 (0.0773)	0.141** (0.0665)
Mining			0.0116 (0.0601)	0.00171 (0.0561)
Manufacturing			0.0659 (0.0616)	0.0629 (0.0567)
Electricity/Energy			0.629*** (0.0770)	0.561*** (0.0744)
Construction			-0.0154 (0.0653)	-0.00999 (0.0608)
Retail/Wholesale			0.00726 (0.0672)	0.0379 (0.0622)
Hotel/Restaurant			-0.0509 (0.0671)	-0.0554 (0.0629)
Transport			0.0978 (0.0744)	0.157** (0.0680)
Finance			0.498*** (0.0739)	0.423*** (0.0687)
Real State			0.231*** (0.0677)	0.218*** (0.0617)
Other Services			0.0711 (0.0790)	0.0403 (0.0751)
Medium		-0.406*** (0.0801)		-0.411*** (0.0763)
Observations	3,329	3,328	3,329	3,328

Source: Authors' calculations based on ELE3 from Chile.

Note: Robust standard errors in parentheses. The independent variables are binary. * Coefficient is statistically significant at 10 percent level; ** at 5 percent level; *** at 1 percent level; no asterisk means that the coefficient is not different from zero with statistical significance. The excluded variables are for size (large) and sector (agriculture).

Tables 7 and 8 indicate that firms with a higher percentage of skilled workers offer relatively more training. These results are at odds with Figure 10, where firms with a higher proportion of low-skilled workers display a greater presence of training programs. At the same time, however, the results in Tables 7 and 8 are in line with the evidence presented in Figure 11, where the percentage of workers receiving training seems to increase with higher skill composition of the labor force.

Consistent with Figure 7, Tables 7 and 8 show that only the sectors of finance, real estate and electricity are consistently and statistically associated with higher presence of training programs than agriculture. Finally, the size of the firm is significant in the existence of training programs, with larger firms providing more training. This is consistent with the evidence obtained from the existence of training that indicates that larger firms provide 10 times more training than medium ones.

Table 9 shows the result using an OLS estimation approach to study the factors affecting the percentage of workers receiving training. This regression is over the sample of firms providing training, and therefore must be understood as a conditional regression. Table 10 displays the OLS regression for the unconditional sample, in which we impute a 0 percentage of workers in training for firms not providing training.

As expected from the differences presented in Figures 8 to 15, the characteristics that affect the percentage of workers receiving training differ from the results associated with the presence of training programs on each firm. In particular, level of exports is statistically not different from zero. Size is also a characteristic that does not impact the percentage of workers in training. This may be related to the high heterogeneity in percentage of workers by size displayed in Figure 9.

Surprisingly, most of the sectors are not statistically different from the excluded sector (agriculture). This last result is also consistent with the heterogeneity presented in Figure 8. Size appears to have some non-linear effect in training, which is consistent with the non-monotonic behavior presented in Figure 12.

Only skill composition is statistically significant across specifications. Firms that have a higher proportion of skilled workers tend to train more workers.

These results indicate that firms face two different problems. On one hand they decide if they would provide training to their workers. This type of decision is captured in the probit regressions. On the other hand, firms also choose the type and quantity of workers that would benefit from the training programs. The OLS regressions capture this set of decisions. The difference between the probit and the OLS regressions imply that there are different sets of factors affecting these decisions.

Table 9. OLS: Percentage of Productive Workers Receiving Training (ELE)

VARIABLES	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4
Age of the Firm	-0.00801 (0.0400)	-0.00376 (0.0424)	-0.0228 (0.0363)	-0.0186 (0.0379)
(Age)^2	0.000931* (0.000515)	0.000884* (0.000536)	0.00103** (0.000489)	0.000980* (0.000503)
% of skilled workers	0.208*** (0.0581)	0.204*** (0.0601)	0.202*** (0.0588)	0.199*** (0.0600)
Exports	0.0260 (0.0289)	0.0262 (0.0291)	0.0225 (0.0286)	0.0227 (0.0287)
(Exports)^2	-0.000227 (0.000308)	-0.000229 (0.000309)	-0.000210 (0.000298)	-0.000213 (0.000300)
Fishing			1.141 (1.251)	1.133 (1.243)
Mining			2.088 (1.453)	2.106 (1.456)
Manufacturing			0.480 (0.726)	0.487 (0.728)
Electricity/Energy			2.127 (1.352)	2.115 (1.350)
Construction			-1.314 (0.799)	-1.291 (0.801)
Retail/Wholesale			0.712 (0.814)	0.718 (0.815)
Hotel/Restaurant			1.549 (1.208)	1.562 (1.207)
Transport			-0.246 (0.901)	-0.369 (0.891)
Finance			1.652 (1.197)	1.675 (1.201)
Real State			0.107 (1.039)	0.108 (1.039)
Other Services			-0.461 (0.998)	-0.438 (1.000)
Large		-1.092 (1.029)		-1.235 (0.893)
Constant	1.981*** (0.553)	3.024*** (0.909)	2.109*** (0.773)	3.296*** (0.975)
Observations	2,150	2,150	2,150	2,150
R-squared	0.035	0.036	0.050	0.051

Source: Authors' calculations based on ELE3 from Chile.

Note: Robust standard errors in parentheses. The independent variables are binary. * Coefficient is statistically significant at 10 percent level; ** at 5 percent level; *** at 1 percent level; no asterisk means that the coefficient is not different from zero with statistical significance. The excluded variables are for size (large) and sector (agriculture).

In order to be more precise about this dual decision, we also estimate OLS using all the firms in the sample, imputing 0 percent of working in training for those firms that do not provide training. Table 10 displays these results.

Table 10. OLS: Percentage of Productive Workers Receiving Training (ELE), Full Sample

VARIABLES	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4
Age of the Firm	-0.0210 (0.0172)	-0.0236 (0.0173)	-0.0220 (0.0175)	-0.0243 (0.0175)
(Age)^2	0.00104*** (0.000335)	0.00105*** (0.000332)	0.00102*** (0.000333)	0.00103*** (0.000331)
% of skilled workers	0.0826*** (0.0205)	0.0800*** (0.0199)	0.0578*** (0.0183)	0.0552*** (0.0179)
Exports	0.0542*** (0.0194)	0.0506*** (0.0177)	0.0545*** (0.0187)	0.0513*** (0.0173)
(Exports)^2	-0.000497** (0.000201)	-0.000472*** (0.000182)	-0.000484** (0.000193)	-0.000461*** (0.000176)
Fishing			0.837** (0.412)	0.986** (0.409)
Mining			0.657* (0.368)	0.623* (0.366)
Manufacturing			0.339 (0.220)	0.356* (0.216)
Electricity/Energy			4.511*** (1.041)	4.432*** (1.043)
Construction			-0.129 (0.167)	-0.0816 (0.169)
Retail/Wholesale			0.230 (0.205)	0.363* (0.205)
Hotel/Restaurant			0.179 (0.245)	0.187 (0.248)
Transport			0.316 (0.279)	0.439* (0.260)
Finance			3.836*** (0.792)	3.748*** (0.793)
Real State			1.058** (0.487)	1.053** (0.478)
Other Services			0.180 (0.311)	0.121 (0.316)
Small		-0.103 (0.0997)		-0.780** (0.390)
Large		0.763*** (0.135)		0.731*** (0.130)
Constant	0.391** (0.178)	-0.165 (0.173)	0.238 (0.230)	-0.339 (0.230)
Observations	3,329	3,329	3,329	3,329
R-squared	0.033	0.043	0.053	0.062

Source: Authors' calculations based on ELE3 from Chile.

Note: Robust standard errors in parentheses. The independent variables are binary. * Coefficient is statistically significant at 10 percent level; ** at 5 percent level; *** at 1 percent level; no asterisk means that the coefficient is not different from zero with statistical significance. The excluded variables are for size (large) and sector (agriculture).

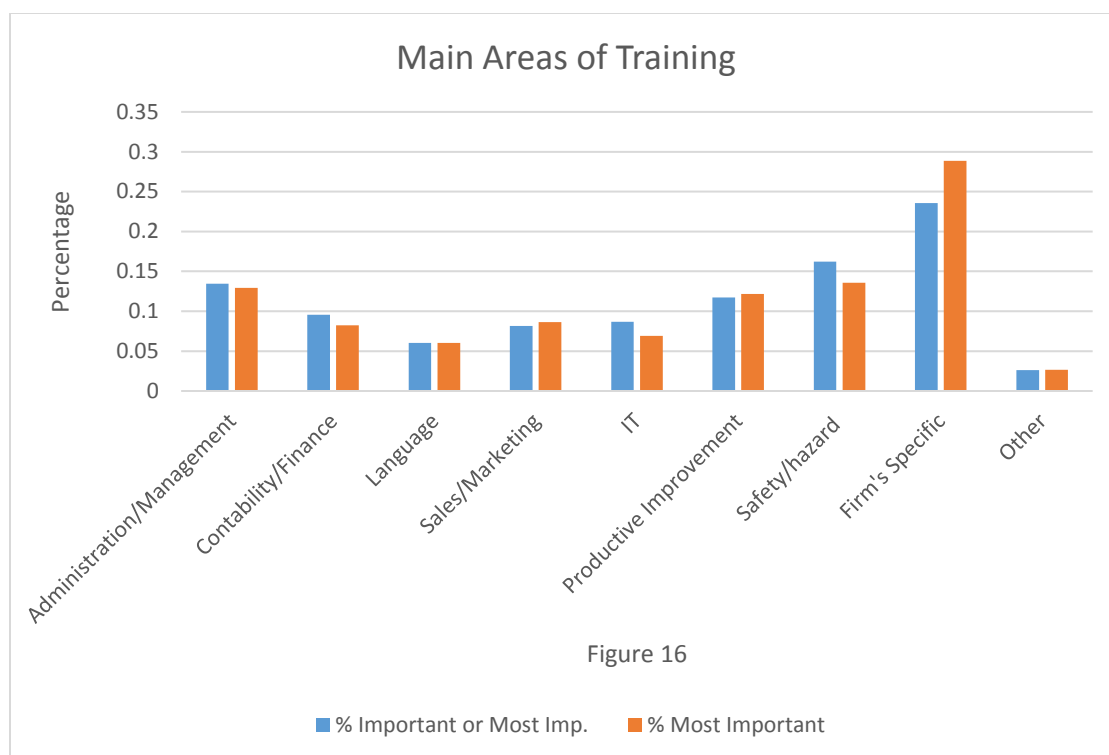
We observe now that the non-linear aspect of age is consistently statistically different from zero, and positive. The sign is the same as for productive workers in the ES in Table 5 but the magnitude is considerably larger.

The full sample regressions also indicate that level of exports plays an important role in determining the percentage of workers receiving training. In general, Table 10 corroborates most of the characteristics relevant to the existence of training displayed in the probit regressions of Tables 7 and 8.

The differences between Tables 9 and 10 give us additional insights on the double decision of intensive and extensive margin of training in a firm. Level of exports is important for the extensive margin, but its importance is not statistically different from zero when we study the intensive margin as displayed in Table 9. Table 10 shows that, when we combine these two decisions, level of exports is again significant. A similar pattern is observed for skill composition. Thus, these tables show that some characteristics, such as level of exports, may influence one and not necessarily both margins.

The ELE survey provides an additional insight of the on-the-job training decision. Firms are asked to sort the three main areas of training of their workers. These areas include productivity improvement, safety/hazard and hygiene, administration, firm-specific skills and information technology, among others. Using this information, we consider for each firm the most important area or we consider both the most important and another important area. Figure 16 shows the proportion of firms that consider a specific area of training the most important (or the combination of most important and important). In both cases, firm-specific skills are considerably more relevant for training than other areas. The next most important area is training related to safety, hazard and hygiene processes. Productivity improvement appears in third or fourth place, depending on the measure.

Figure 16 shows that, for the Chilean case, training in skills increasing productivity may be not the main objective of the training programs. This result can be related to the low productivity observed both in Chile and in Latin America and the Caribbean in general. Moreover, the relative importance of safety, hazard and hygiene processes may be related to international standards with which firms must comply in order to export their products. Finally, the importance of training in firm-specific skills may be a strategic measure to diminish the mobility of skilled workers. The qualitative study in the next section aims to clarify these issues.



6. Qualitative Study

The quantitative analysis indicated that many firms provide training, but only a small number of workers receive that training. Moreover, the majority of training seems not related to productivity improvements as such, but oriented to improve skills in other dimensions of the productive process.

To better understand these results, and provide in-depth information on why firms train and how they do it, we performed a qualitative study. This consisted of a series of semi-structured interviews with firms' decision-makers and relevant actors in the training sector. We interviewed the managers in charge of training programs in 13 firms. Companies were selected based on a qualitative structural sampling, which was constructed following the variables found to be relevant for training in the quantitative analysis. Three sampling criteria were considered:¹⁸ firm size—small (S) and large (L); sector—primary (P), services (S), Low to medium-low technology manufacturing (LM), and High to medium-high technology manufacturing (HM); and sales market—non-exporting (NX) and exporting (X). This type of sampling provides the maximum

¹⁸ For details of the sampling method and companies interviewed, see Annexes 2 and 3.

degree of variation in the discourses to be found. It is important to note, however, that because of access problems, especially with small firms, this qualitative study reflects more clearly the situation of large firms than of small firms. Moreover, high-technology manufacturing firms are particularly under-represented.

In order to triangulate the information provided by the firms, we interviewed the CEO of a major private training provider, personnel from the studies division and the “training tax break” program (*franquicia tributaria*, FT)¹⁹ at the state training and employment office (SENCE), and a representative from the public agency providing support to exporting firms (ProChile).

We organized the information in two subsections: one related to why firms train, which includes general views on training as well as perceptions of obstacles and advantages to investment in skills, and the second related to how they train, including views on the training system in Chile, which firms train and when. Each section includes both views that are common to all firms, and views that are different according to the criteria established in the sampling. Firm size is associated with most of the difference in discourses on training. Conversely, the firm’s sector and its sales market mostly determine differences in how firms train.

6.1 How Do Firms Perceive Training and Why Do They Train?

Of all firms interviewed, none expressed negative conceptions about training. Training is generally perceived as a good thing, and one can even say in this regard, it constitutes a valence issue. In other words, it has inherently positive connotations: it is seen as an indicator of modernization and change, growth and future perspectives for firms, a tool for improving the internal climate and industrial relations, and as a device to signal the importance the workforce has for the management. This positive view goes beyond the difficulties associated with training, above all, the challenge of maintaining production processes while workers are trained, and its costs (see below).

The interviews reflect an ongoing process where training is gaining more importance inside the firms. In concrete terms, this process implies that training is evolving from being an arbitrary

¹⁹ The state’s tax break program (*franquicia tributaria*) allows companies to discount from their taxes up to 1 percent of their annual wage bill for the purpose of training and/or certification. The type of courses, institutions that can provide courses, and minimum duration and participants at the courses are strictly regulated. Moreover, the costs per course that can be discounted through the program depend on the respective worker’s salary. Workers with a gross salary lower than ca. US\$1,600 may discount up to 100 percent of their course’s costs, workers with a gross salary between ca. US\$1,600 and ca. US\$3,200 50 percent, and workers with a gross salary higher than ca. US\$3,200 may discount only 15 percent of a course’s cost.

decision, mostly taken on an individual basis without much planning and organizational effort, to being part of the long-term development plan of the company. In fact, the testimonies gathered—most notably in large firms—point to recent reorganization processes in their HR (Human Resources) departments aiming at increasing the relevance attributed to training and systematizing the processes associated with it. Two trends seem to come together to produce this transformation. The first is a domestic one related to empowerment of workers vis-à-vis management and a change towards less authoritarian management procedures.²⁰ This implies both a reconsideration of the value of the workforce in the company and the need to improve and update leadership skills. With respect to the latter, one company manager recognized:

Five years ago it was very different from how we work today. Now you need more tools; managing with a whip is over. First of all, our staff won't take it anymore, plus they have other job opportunities, unlike some time ago. [Managers] need to evolve, and it started from them. We did an assessment of what the technical and the soft abilities each of them required, and we designed a program for each of them (Firm 6: L, LM, X).

The second process relates to a global trend upgrading the significance of HR management, and therefore, the status of HR departments with positive implications for the conception of training inside firms. The representative of the local branch of a service multinational affirms: “This view, that HR is a ‘business partner,’ which is a concept that has been coined lately: never heard of it five years ago” (Firm 12: L, S, NX).

With respect to why firms train, the qualitative analysis confirms the suspicions raised by the quantitative analysis. Strictly speaking, the main reason to train is to comply with standards and/or certifications. This has different meanings according to the firm's size, sector, and sales market.

The most significant drive for training is **certification** requirements. These are the core of the training effort that companies do, since they represent the baseline for the companies' very existence and continued production. The degree to which firms feel compelled to comply is

²⁰ Recent investigations have revealed the particularities of corporate governance practices in Latin American, which lie at the heart of the authoritarian character of management and industrial relations. Among them, the fact that companies tend to be family owned and controlled, and that they organize in business conglomerates that are diversified into several economic sectors. The latter implies that they engage in complex governance structures to control the firms pertaining to the group, and that what characterizes them is mostly a hierarchical style of management rather than a specific know how related to productive processes per se. See Lefort (2010) and Schneider (2013).

directly related to the strictness of destination countries' legislations and sectors' regulations. One firm puts it in the following terms:

All these products [pharmaceuticals] are super regulated. And it's required by the authority that the person employed has completed this training list to be able to work (...). Therefore, the authority sets the minimum. I have tried to upgrade all my production plants to that level, so that I can also switch people (Firm 9: L, HM, NX)

Relevant standards to comply with are typically sector-specific. For example, in our sample, hygiene and sanitary standards are key for agriculture, food processing and pharmaceutical industries, while safety and hazard standards are particularly relevant for extractive industries (mining, forestry), capital-intensive manufactures (cellulose, plastic, chemicals), and contractors of electricity and telecommunication companies.

Large firms that are flagship companies in the country show an additional preoccupation when complying with standards, as they perceive themselves to be in the spot of public scrutiny. This coincides with the fact that they operate in capital-intensive sectors that are prone to both environmental and hazard/safety situations. One company expressed this in the following way:

Here, they are very strict. You know, it is like [company name] is always in the eye, so we need to invest a lot of money in safety, a lot in training. Therefore, in general every year you have at least one or two MASO [environment and workplace safety] activities (Firm 7: L, LM, X).

In addition to local regulation, a second drive for complying with standards is **clients**. Clients may be costumers or other companies that demand firms to follow certain standards and/or specific certifications. This is especially the case when domestic firms are suppliers of large multinational firms. The necessary training to comply with these standards is crucial since major sales contracts depend upon them. Sometimes this requirement extends downstream to the complete productive chain, affecting non-exporting firms supplying exporting companies since the latter need to make sure the former comply as well. As a result, exporting firms tend to be constantly audited by their clients and auditing their suppliers to check compliance with contract requirements in terms of standards and certifications.

The need to comply with foreign legislation that is often much stricter than domestic requirements, is also an important drive for training investments. This barrier is surmounted by investing in skills. Training becomes a crucial component of a firm's expansion plans when these

plans entail starting an export business, or in export firms, when entering more regulated markets.

Take the following illustration:

My standards are higher than those of the countries I export to, therefore it doesn't influence me directly [regarding my training needs]. Colombia is a different case. Exporting to Colombia would affect me, because the INVIMA [Colombian supervisory board for food and medicines] is much stricter than the ISP [Chile's supervisory board for food and medicines]. Colombian clients audit you, you need much higher standards than what you currently have. The idea is to achieve them progressively, but I don't have them today (Firm 9: L, HM, NX).

For large exporting companies the acquisition of worldwide standards and/or certifications is considered a fundamental part of transnational competition. The reason given for compliance is that all leading world companies meet the standards, or that it is part of firms' development and increasing complexity. This is the case, for example, with the FSC standard for forestry and wood processing industries, and the SAP operation management software.

Taken together, domestic and foreign legislation, and client-demanded certifications constitute the major driver explaining firms' investment in skills in our study. The second major reason why firms invest in skills is to maintain or improve their work environment, also referred to as "organizational climate." With respect to this, several alternative conceptions emerge. First, improving the organizational climate means having motivated workers.

[training] obviously has a final objective which is the competitiveness of the business; but it also has an objective that has to do with the employee. Actually, for us it is very important to motivate people. And we have seen that training is motivating (Firm 13: L, S, NX).

Second, training is also considered to be a tool to maintain a sense of justice and of equal opportunities among workers.

I make an encompassing thing. Also because of a matter of feeling that is internal, which is the other issue: "why him and not him?" In other words, you have to take care of the climate. Therefore, I try to give everyone a piece of the cake (Firm 9: L, HM, NX)

Finally, improving the organizational climate means giving workers access to certain decisions so that they feel involved in the company's processes. They therefore understand that their training is part of the growth of the company itself and is not an arbitrary decision. Take the following as an illustration:

This year we considered the workers in the process of capacity assessment and the design of training programs. Until last year, training was determined only by the superintendent and the manager. Sometimes the line chief was there as well. (...) So workers used to tell us: “I don’t know what I am being trained in; my boss sends me wherever he wants.” Now we give the two thousand [workers], two thousand training programs, and we upload them in the system. Then, it is visible to everyone (Firm 7: L, LM, X).

It is relevant to note that workers’ participation in management decisions on firms’ skills investment is highly variable. This seems to be strongly determined by the degree of hostility between management and trade unions, which in turn goes far beyond the specific issue of training. The hostility may come from an outright opposition from trade unions to training because workers feel it constitutes an imposition from the firm that affects their leisure time. On the other hand, workers are not offered any incentives for training (see next section). Since firms find it extremely difficult to measure productivity gains arising from their investment in skills, they usually do not reward training activities and consider them to be self-rewarding. Workers do not necessarily perceive it that way, especially because—as will be stressed in the following section—training usually takes place outside their official working time. Finally, managers perceive that workers’ participation in the decision entails certain demands from their side regarding the characteristics of the courses offered that the management either does not have the capacity or does not want to address.

6.2 Training, Productivity Gains, and Firm-Specific Needs

So far we have argued that firms’ investment in skills occur mostly for two reasons: complying with standards and improving work environment. However, albeit marginal, we also found that productivity does appear as a rationale for training especially in large firms. Take the following examples from large firms with different profiles:

Yes, it is visible and you know you have to do it [standard/certification-purpose training]. But your focus is always on increasing your productivity through training (Firm 7: L, LM, X).

If it [the training] doesn't translate into numbers, and into how much it impacts productivity beyond my own feeling or that of the COO (Chief Operations Officer), it really makes no sense (Firm 9: L, HM, NX).

However, productivity is a concept that carries multiple meanings for different people and is often employed in a rather non-technical sense. The qualitative exercise allows us to disentangle these different meanings. The standard labor-productivity concept related to the increase in output per unit of labor is present but often related and conflated with other concepts such as being able to correctly perform a task, or reducing the scrap from production processes. Other firms that mention productivity as a main goal for training speak later on of “competitiveness” (Firm 13: L, S, NX), or “profitability” (Firm 9: L, MH, NX) as if they were synonymous with productivity. Yet another relation between training and productivity goes through the effects of training on worker motivation: higher worker motivation means higher and better production. In this context, it is relevant to highlight that it is not necessarily different firms who hold different concepts of productivity: it is the same companies that use the term in different ways.

Table 11. Investment in Skills, Firm Profiles

	Profile 1	Profile 2	Profile 3	Profile 4
<i>Firm characteristics</i>	Small firm, non-exporter	Small firm, exporter	Large firm, non-exporter	Large firm, exporter
<i>Reason to invest in skills</i>	n.a.	Standards/certification	Standards/certification, organizational climate, productivity (depending on sector)	Standards/certification, organizational climate, productivity
<i>Main difficulties:</i>				
Interruption of production processes	Yes	Yes	Yes	Yes
Cost	Yes	Yes	No	No
Quality of courses	No	Yes	No	No

The qualitative exercise also helps solve the puzzle of why firms respond in surveys that the main reason to train is not for enhancing productivity but for firm-specific reasons. This leads us to the question what firms understand by “firm-specific” as a rationale for training. Following the firms’ responses, we may distinguish between two different meanings. One is related to the seal or culture of the company that distinguishes it from other competitors. Firms see training as a tool to teach their processes and also to transmit their “spirit” to newcomers, regardless of the qualification level of the company’s workforce. The second meaning of firm-specific training is related to processes firms perceive as being exclusive to their firm, but that may in reality also apply to other firms in the sector. The internal character of the training assessment process and the definitions of in-firm specific programs make them perceive training as induced by internal dynamics in circumstances that many firms may have come to similar results. Therefore the *specific* training requirements arising from these processes are seen as *firm-specific* when in fact they might reflect general or *sector-specific* requirements. The following citation is a good illustration:

Training has to do with the intrinsic necessity to train. (...) Training does not come as an external necessity... that we will grow, or that the market needs it, no. We do it [emphasis], we define it like this, and this year we will train in this. For example, this year it has to do more with leadership, empowering the different floors—so to speak—and talking about topics like feedback, team work, how to build leadership skills (Firm 6: L, LM, X).

6.3 What Makes Training Difficult?

While investing in skills is always desirable, the internal and external environment where training processes take place does not always favor it. As a HR manager puts it: “I am convinced that it is useful [training], that it works. But it requires a lot of effort from the trainee and the employer as well” (Firm 8: L, LM, NX).

The first and most common difficulty for training is that training entails a **suspension of the work process**. Training activities usually entail taking workers out of their respective work activities, which interferes with or impairs a firm's production process and cycles. This is a transversal concern that goes beyond a firm’s size or sector. For example, firms with production processes that include production lines, argue that one less worker in the chain implies not being able to finish the respective product. Other firms in sectors with seasonal production cycles argue

that there are times of the year when they simply cannot disrupt working rhythms. Conversely, while one may think small firms have less complex processes and therefore should find it easier to accommodate the requirements of training, sometimes the opposite is true precisely because of those firms' precariousness:

We are very conscious [of the need to train]. Unfortunately, we have the inconvenience of the schedules. We have so few workers that are functioning, that are hired, that we do not have many possibilities. Because, if one of them fails, the thing falls apart, or if two of them fail, about half of the company's operative area would be missing (Firm 5: S, LM, NX).

The need to interrupt production processes in order to train workers is controversial and gives rise to conflicts over training activities either between workers and managers or between HR managers and COOs.

The conflict between workers and managers arises mostly out of the decision of *when* training should take place. While managers would like it to occur outside working time, workers do not agree on having training activities during their leisure time. Since they cannot be forced to do so, the conflict is most of the times solved by scheduling courses during working hours, or half time during working hours, half time after work. In any case, training during working hours implies that firms need to mobilize extra resources to replace the workers that are attending the courses.

Here, a second conflict emerges. It is twofold. First, HR managers need to confront CEOs (Chief Executive Officers) over the extra resources needed to cover training expenses (including training itself and extra shifts). Secondly, COOs often do not agree on impairing the production process by taking workers out of their duty station, even when replaced by other workers. Therefore, HR managers need to negotiate.

With respect to the extra resources needed to train, the distance between large and small firms becomes evident. Small firms not only rely exclusively on government programs to fund training activities (see next section), but they also have no budget to replace workers in training activities.

Regarding to the conflict between HR managers and CEOs, companies stress the need for a good relationship and a CEO committed with investing in skills in order for training plans and activities to take place.²¹ One firm manager views it in the following terms:

²¹ This is true even for firms that are subsidiaries of multinational companies.

I believe that the compromise of the CEO for all these topics, especially HR, is crucial. Because in the end, this [training] will bring you a utility that you will not see in that minute, but that it also entails a cultural change and to push things for people to do, and it is a mentality change. But if she does not have the same discourse as you do, we have nothing else to do. (...) It happened to me once in a company. Many years ago, when I was just starting, I was just going out of the university. And of course: 'we must do training' and all. But it was just the discourse. So you never had real support, a continuity (Firm 9: L, HM, NX).

The **cost** of training is another difficulty, and it has different impacts on different types of companies. Even though large firms often allocate their own resources for training activities to complement or even replace state financing schemes, this budget remains subject to certain constraints, most notably economic cycles or firms' financial results. Faced with negative scenarios, firms need to look for other ways to fulfill their training necessities. In this context, the HR manager's motivation and proactive behavior are crucial.

Small companies, on the other hand, do not have the resources to replace workers under training. They fully depend on the state's tax break program as a financer and as a courses provider. The courses on offer through this program though, tend to be basic and standard, which keeps expectations on training fairly low. Particularly hard is the case of high-technology small firms, as the state's tax break program does not cover the expenses of the more specialized and more costly courses they require. One small firm providing engineering services expressed:

You have to consider that training—independent of how much a company is willing to do it or how much it wants to develop its workforce- is an investment problem. And what do you need for that? Money (S, S, NX).

Labor rotation is also a factor to be considered in the analysis. The higher it is, the less prone to invest in skills firms should be. Therefore, in sectors with short job tenure, training is expected to be more concentrated in general skills, rather than specific. When asked about this trade-off, firms reported being aware of a necessary risk. They give three reasons. First, there are sector and firm-specific skills workers have to acquire regardless of the possibility that they will migrate to a different company. These are related to standards, especially sanitary and safety/hazard. Second, in high labor rotation scenarios firms may lose a trained worker today but gain a trained worker tomorrow. Moreover, that same worker that left might come back at some point. So labor rotation is not necessarily or always harming a firm's investment in skills. Third, for companies, induction processes—which include some basic training—must be good enough to

produce motivation and loyalty, reducing the likelihood of workers being poached by a different company.

These considerations relate exclusively to training needs been identified by the firm. In contrast, training activities or courses proposed by workers themselves are viewed as accessory, and as a privilege companies may or may not confer on workers. In this sense, some companies do not accept training activities other than those strictly established by the firm. One firm with visible signs of conflict with workers suggested that higher skills imply improving a worker's employability beyond what is strictly needed, therefore increasing the possibility that the employee might leave with those new skills.

Last but not least, investing in skills is difficult as workers are not always motivated or willing to spend time in training activities. Managers even mention that unions are sometimes openly against training, as they consider it to be a non-paid activity that does not entail clear benefits to workers. This may be explained by several reasons. The first is lack of incentives. Workers do not receive higher salaries after being trained, nor are they necessarily promoted (see next section); in addition, they perceive training as being imposed on them, as they do not participate in the decision-making process.

I did the training needs assessment with the managers and mid-level heads of department only. Why? Because I feel that worker organizations are not yet ready to suggest something, without asking for something in return (Firm 9: L, HM, NX).

Cultural reasons—such as traditional employer-employee roles and organizational cultures within certain sectors—as well as low educational levels are also reasons brought up by managers as accounting for workers' lack of motivation for training. The latter is particularly common among low-skilled workers who, lacking formal educational degrees, do not see any value in acquiring further skills certificates. However, this varies significantly from firm to firm. In fact, other firms mention that it is precisely less qualified workers who are more open to taking advantage of training opportunities. One of the firms suggested there might be a gender difference: low-skilled women may be more prone to increasing their skills through training, while low-skilled men may be less inclined to do so.

6.4 What Makes Training Easier?

Among the firms interviewed, we identified certain conditions that facilitate investment in skills. These are related to some of the firm's features and the fact that these conditions help overcome some of the problems previously mentioned.

The first is being a subsidiary of a multinational. Multinationals usually assign greater importance to training than domestic firms, and they usually have standardized and sophisticated training schemes (see next section). When these firms arrive in a country or buy a domestic company, they bring their training programs with them. Related to this, the rotation of managers between multinationals and domestic firms constitutes one source of transfer of best practices in the field of training and investment in skills.

A second condition that makes training easier is being a large firm. Besides having fewer budget constraints, as stressed in the previous section, they have access to more information related to the availability of training courses offered. Given the resources of large firms, local training providers offer special deals and customized courses. Additionally, they have the possibility of building their own courses using their knowledge and internal experts.

Finally, when HR managers or those in charge of training are particularly motivated, they may be able to sustain training activities through downturns, to combine different internal and external resources and to get the necessary support for keeping training afloat and meeting training needs independently of financial constraints.

6.5 How, Who and When Do Firms Train?

There are significant differences in how, who and when firms train according to a firm's size, sector and sales market. Large firms have developed training processes and organizational capacities. This is reflected in the elaboration of annual training plans based on the identification of training needs or gaps and the possibility to pool their own resources with public programs. On the contrary, small firms rely on the State as a financier and training supplier—though indirectly through the OTEC²²—to carry out their training activities. Moreover, small firms' training activities are more arbitrary and unorganized, often being decided on a case-by-case basis. In this section we will describe these differences in depth.

²² OTEC is the name training providers receive in the skills formation system in Chile (Technical Training Organization, *Organización Técnica de Capacitación*). These are mostly private organizations specialized in the provision of training for firms that usually make use of the state's tax break program

Large firms have developed training programs that are specific to different categories of workers: low-skilled and high-skilled, blue collar, white collar and management. The programs can vary between training plans established at the beginning of every year, to more comprehensive curricula where a specific career plan for several years, with diverse stages and associated training activities, is devised for every single worker. Usually, the manager in charge of training establishes the plans with the help of the processing line's supervisors and team leaders. In this regard, large firms have developed capacities to detect training gaps based on standard indicators related to their training needs. The detection of these gaps is what serves to design the training plans.

Large firms have also been progressively incorporating indicators aimed at measuring the effect of training on the stated objectives of their investment in skills. Firms manifest the importance of such indicators both for evaluating the efficiency of their investment in skills, but also, as an evidence-based argument to convince or reassure CEOs that the company's resources are well invested. Take the following quote:

To make yourself [HR department] a space, you have to talk the same language as the CEO. They view us, people from HR, as: "Yes, it doesn't matter that much.". My boss [CEO] is open to training, but you have to talk the same language as he does. Therefore I started implementing processes, I developed indicators (...). I started to show him with results the importance of soft skills: "You know, people with bad performance in organizational climate indicators are causing 80% of the accidents" (...). This opened a way for us (Firm 7: L, LM, X).

However, the use of indicators to assess the efficiency of training is still an incipient process. Many firms use indicators such as workplace climate surveys to detect the effect of training on improving working environment and ex post surveys of supervisors to know whether they perceive improvements in workers' task performance after being trained. Firms may also use measures of the improvement in productivity to infer possible effects from training. In spite of this, firms do not possess the resources or methodology to properly establish the impact of training on different goals. Therefore, firms display a need to develop more rigorous instruments.

Table 12. Investment in Skills, Organization of Training by Firm Profile

	Profile 1	Profile 2	Profile 3	Profile 4
<i>Organization of training</i>	Case by case	Case by case	Training program	Training curriculum
<i>Use of indicators</i>	No	No	Yes, to assess needs and efficiency of training (indirectly)	Yes, to assess needs and efficiency (directly)
<i>Periodicity</i>	Almost never	Seldom or constant (depending on sector)	Constant	Constant
<i>Use of FT (franquicia tributaria)</i>	Low	Low or intensive (depending on sector)	Intensive	Low or intensive (depending on sector)

Notes: Profile 1= small firm, non-exporter; Profile 2= small firm- exporter; Profile 3= big firm, non-exporter; Profile 4= big firm, exporter. For details on the characteristics of each profile see Table 11.

This general organization of training activities in large firms varies according to the economic sector and the sales market. High technology-intensive sectors, particularly those embedded in the international economy—either as subsidiaries of foreign multinationals or as exporters—tend to have more organized training programs and better systems for identifying skills gaps and evaluating the effect of training.

One crucial characteristic of skills investment in Chile—and one common to all firms—is that the upgrading of skills is not reflected in on salaries. One firm even suggested that, in the case of blue-collar workers, it is cheaper for the firm to hire unskilled workers and train them using the state's tax break program than to hire skilled workers, because the firm can continue paying the lower salary of an unskilled worker even after that worker has gone through the whole training process. In this case, the state's tax break program allows firms to save on both the costs of training as well as the salary associated with hiring high-skilled workers.

Training activities are only indirectly associated with pay increases. As Chilean firms tend to have a modality of paying bonuses for productivity increases, inasmuch as productivity increases—whether as a consequence or independently of training investments—workers will receive additional payment.

Except for one case, this situation—i.e., that firms do not directly reward skills improvements—does not entail conflicts with workers and/or unions. In the context of an absence of direct monetary gains, firms emphasize that training is a win-win activity. HR managers employ time and effort to make the abstract gains from training visible. For example, they underscore that training increases workers' chances to apply for promotions and enhances workers' employability if they were to leave the company. In this sense, firms try to convince workers that, in spite of the lack of direct monetary incentives, training is always in their benefit. Take the following:

I try to present it as a win-win thing. To tell them: "Hey, you arrived here and did not know how to do this. Now you will leave here and will know SAP, will now Excel, will have experience with customers, or will have led a line of 5 workers that have never managed before. That is your gain, beyond the money" (Firm 9: L, HM, X)

With regards to career paths inside the firm, while training is always a requirement, it does not entail promotion. In other words, workers do not have specific incentives to engage in training activities other than the expectation that the acquired skills will eventually be of relevance when looking for another job or will be taken into consideration for promotion. This in turn relates to the fact that on-the-job training in Chile is generally considered to be less relevant than formal educational credential when it comes to skills certification.

When motivation is not enough to compel workers to participate in training activities, firms resort to imposing them unilaterally. Firms claim for themselves the authority over training since it takes place during working hours. Workers' participation in decisions concerning training activities is scant in regard to both participation (or non-participation) in training courses and the content of those courses. Among the large firms interviewed, only one made use of provisions in the State's tax break program that allow unions to manage up to 20 percent of the training resources available through the program.

With respect to how training is actually carried and organized, we have identified four modes. The first and most common one is external training. By making use of the State's tax break program, whether through training companies OTECs—or higher education institutions, companies receive a range of training offers that go from technical courses related to the use of specific machinery to more general skills (e.g., computing, finance) or soft skills (e.g., team work or leadership). This mode is common to all firms and it is the mode most frequently used by small ones.

A second mode of training is internal training. This refers to the acquisition of technical or soft skills from firm employees who have already been trained. Internal training may be part of an induction process for newcomers, conceived as constant retraining on critical topics such as security and hazard or aimed at strengthening some specific skills. Companies may resort to senior workers, line supervisors or experts to conduct this type of training, which is described as a permanent goal for the firm. Given its low costs and easy to handle organization, it is the most stable type of training. This mode is also common to all firms.

A third mode of training is external to firms but provided by firms' suppliers rather than specialized training companies. When firms upgrade tangible and intangible capital goods (machinery, software, etc.), they sign contracts with providers that usually include the provisions of the required training for their operation. This type of training can take place in-house or may require workers to travel abroad. This more specialized mode of training is visible mostly in large firms, but also in high technology-intensive small firms.

Table 13. Investment in Skills, Modes of Training Provision

	Mode 1	Mode 2	Mode 3	Mode 4
<i>Place of training</i>	External	In-house	In-house, External	In-house, External
<i>Provision of training</i>	External	Internal	External	External
<i>Provider</i>	Training provider (OTEC)	Own specialized workforce	Supplier company	Training provider (OTEC), Expert
<i>Type of Courses</i>	General skills (computing software, languages), Specific skills (operation of machinery), Soft skills (teamwork, leadership)	Orientation, Specific skills (operation of machinery), Soft skills (teamwork, leadership)	Specific skills (operation of machinery, specialized software),	Customized skills
<i>Periodicity</i>	High	High	Lower	Low
<i>Financing Source</i>	<i>Franquicia Tributaria</i> , Firm's resources	Firm's resources	Firm's resources	Firm's resources
<i>Firms' profile (see Table 2)</i>	Profile 1, 2 3 and 4	Profile 1, 2, 3 and 4	Profile 2, 3 and 4	Profile 3 and 4

Finally, the fourth type of training is a more specialized one, and it relates to customized courses. Firms may identify specific needs related to their operational activities and, given these specificities, they may ask OTECs to design customized courses for them, or alternatively, directly

ask an expert to provide the course they need. Given the specialized nature of this mode, it tends to be concentrated among large firms and requires them to disburse their own financial resources.

With respect to how firms finance their training activities, there are two sources: internal resources and the State's tax break program. The use of them depends largely on firm size. While small firms depend exclusively on the State's tax break program, large firms can balance their training expenses between the two and incorporate both options into their training budgets and programs. In practice, for large firms the State's tax break program represents a trade-off. When it comes to training their high-skilled workforce, the tax break covers only a low percentage of the costs.²³ In addition, the program entails some bureaucratic procedures that are seen as extra costs for the firm. In these cases, the balance between the program's costs and its benefits is not straightforward. Conversely, the tax break program offers them the opportunity to maintain some of their required training activities in case of economic downturns. In this sense, it is affirmed that large firms use both the state program and their own resources.

As courses need the approval of the training and employment agency (SENCE) to be part of the tax break program, companies that require special or specific training prefer to use their own resources to finance it. This gives them flexibility to design the courses according to their specific needs. In contrast, more standardized courses related to soft skills (e.g., team work, leadership) and general skills (e.g., computing programs, foreign language) are easier to find in the OTECs market. As a consequence, firms use the government's tax break to cover the costs of these courses.

Thus, while larger firms with higher utilities and established and institutionalized training processes tend to finance most of their training courses with their own resources, small firms rely heavily on public resources.

Their inability to establish organized long-term training plans has to do with their limited access to financial, organizational and informational resources and varies according to their sales market. The State's tax break program constitutes an important resource for small exporting firms who need to comply with foreign standards. However, their small size acts as a barrier to accessing high-quality courses.²⁴ On the other hand, small firms that do not export do not train on a regular basis, have limited knowledge regarding the tax break program, are not informed on the courses

²³ See footnote 18.

²⁴ We believe this is different in small firms that do not export but are suppliers of larger domestic firms whose export destinations require them to take care of standardization and certification of the full production chain.

offered, and expect these providers to approach them with information rather than actively look for training possibilities.

6.6 Areas of Training

As already mentioned, most of the courses firms sign up for relate to the development of standards and/or certification, and only a minority of courses are aimed at directly improving the workforce's skills level. Firms also place a great amount of emphasis on soft skills development activities, which seems to directly respond to their need to fill the gaps left by the formal education system.

The detection of training needs reveals different requirements according to the position in the organizational chart. Interviewees perceive a mismatch between the high technical skill level of managers, supervisors and team leaders and their poor management and leadership skills:

Our team leaders are too technical. They were born here, and know the sector very well. But they are like the typical good worker, bad boss. So today we identified that we need to teach them how to be a boss. And we developed a program for leaderships and department heads, supervisors, executives, to develop the abilities they require (Firm 6: L, LM, X).

On the bottom level of the organizational chart, they deal with the consequences of a low-quality secondary education system, especially in companies with a higher proportion of unskilled labor. Low education may not only impact on the motivation of workers to engage in training activities, but also leave a series of gaps in workers' formation related to issues such as responsibility, commitment, ability to communicate and to solve problems and teamwork. In this sense, constant soft skills courses become essential not only to maintain the workplace's climate, but also more generally to improve the capacity of workers to undertake their tasks correctly.

Finally, we asked about the recipients of training, asking managers about the distinction between low and high skills workers, their age, and roles (blue or white collar). We did not find any systematic practice or justification for providing training to one of these categories rather than another. On the contrary, most managers answered that training was provided to all, and that the decision to privilege one or the other in a specific year and/or situation has to do with the internal necessities of the firm. Therefore, when firms seek to fill gaps in their processes certification or improve the technological capability of the plant, mostly blue-collar workers are trained. On the other hand, when gaps refer to the use of information systems and/or managerial capacities, training goes mostly to white-collar workers. Likewise, depending on the specific necessities, at

some point firms may need to raise the skill standards of less-qualified workers, while at other points, they may focus on specific individuals with capacities to advance in the company's career path and occupy key positions, thereby increasing their already high skills. Finally, while it is true that firms need to train newcomers for them to acquire specific skills, they also need to invest resources in retraining programs for older workforce, sometimes even including secondary studies.

6.7 Summary

Our qualitative study allowed us to deepen some of the findings of the surveys analysis and better understand the reasons behind a firm's decision to invest in skills—i.e., why they train and how they do so. We found that firm size is associated with most of the difference in discourses about training, while the firm's sector and its sales market account for the larger differences in how firms train. The qualitative study confirms that the main reason why Chilean firms train is compliance with standards—hygiene, safety and hazard—imposed by domestic or foreign authorities, and by clients. In the case of large firms, they also train in order to improve the work environment, and to increase productivity, although productivity is a concept with multiple meanings and often non-technical ones.

We also found that the main difficulty that firms encounter when investing in skills is that training interrupts production processes, which is costly in terms of both replacing the workers under training and effects on production cycles. The cost of training, and the quality of training, is a hindrance faced mostly by small firms. In this sense, large firms and subsidiaries of multinational companies enjoy advantages in terms of financial resources, access to information, and organizational capabilities. While large firms can organize detailed training programs, use indicators to assess necessities and the efficiency of training, pool their own resources with those of the State's tax break program, and access a variety of training courses including customized ones, small firms train only on a case-by-case basis and depend exclusively on the state's program and the available supply of training providers.

7. Conclusions

Economies in Latin America and the Caribbean have displayed lackluster performance in the last three decades, which can in part be explained by the low average productivity levels observed in

the region's firms. The literature has found that increasing the average human capital level of workers leads to improvements in performance, particularly an increase in productivity.

Therefore, understanding the factors affecting firms' training decision can shed some light on the region's low productivity growth and, at the same time, it could inform us on the characteristics of firms providing more training.

Using the World Bank's Enterprise Survey, we focus our analysis on studying the characteristics of the firm that promote the existence of training programs. First, using exploratory analysis and second using two econometric approaches, we found that specific sectors, exports' level and the size of the firm are the most prominent factors affecting the presence of training program in a firm.

However, when we decompose the type of workers receiving training, between productive and non-productive workers, we found that the intensity of training for productive workers is sensitive to factors such as age and firm size. In contrast, training for non-productive workers is affected by factors such as age and specific sectors that in general use low technology. Therefore, we observe great heterogeneity in who receives training, and under which conditions.

Using a very detailed dataset from Chile, we corroborate some of the findings discussed. Moreover, this dataset allows us to compare the results associated with the existence of training programs with results regarding the percentage of workers receiving training. We found that only a small fraction of workers receive training, but a considerably larger share of firms claim to offer training programs. These results imply that firms provide few training opportunities, and only to a small number of workers. Additionally, we found great heterogeneity in the intensity of training programs, when we classify the firms by sector, size and age.

We perform empirical studies similar to those for the ES sample. These results corroborate that there is a dual decision involving: i) whether to offer training programs and ii) if such programs are offered, how intensive these programs are. We present evidence that the characteristics of the firm that affect one decision do not necessarily affect the other decision. For instance, level of exports level seems to affect the existence of training program, but age of the firm may impact the intensity or percentage of workers receiving training. Skill composition appears to matter for both decisions.

Finally, the qualitative study confirms that the main reason why Chilean firms train is for complying with the standards—hygiene, safety and hazard—imposed by domestic or foreign

authorities, and by clients. In the case of large firms, they also train in order to improve the work environment, and to increase their productivity, although productivity is a concept with multiple meanings, often non-technical ones.

We also found that the main difficulty that firms encounter when investing in skills is that it interrupts production processes. Consequently, larger firms may have an advantage in making training decisions, which is consistent with the econometric results for both the ES and the ELE.

References

- Almeida, R., and A. Reyes. 2008. "The Incentives to Invest in Job Training: Do Strict Labor Codes Influence this Decision?" World Bank Social Protection Discussion Paper 0832. Washington, DC, United States: World Bank.
- Barron, J.M., D.A. Black and M.A. Loewenstein. 1989. "Job Matching and On-the-Job Training." *Journal of Labor Economics* 7:1-19.
- Bartel, A.P. 1991. "Productivity Gains from the Implementation of Employee Training Programs." NBER Working Paper 3893. Cambridge, United States: National Bureau of Economic Research.
- . 1995. "Training, Wage Growth, and Job Performance: Evidence from Company Database." *Journal of Labor Economics* 13: 401-25.
- Bassanini, A. et al. 2005. "Workplace Training in Europe." Discussion Paper 1640. Bonn, Germany: IZA/Institute for the Study of Labor.
- Bastos, P., J. Silva and R. Proença. 2016. "Exports and Job Training." *Review of International Economics* 24(4): 737–756.
- Becker, G. S. 1962. "Investment in Human Capital: A Theoretical Analysis." *Journal of Political Economy* 70: 9-49.
- Black, S. E. and L. M. Lynch. 1996. "Human-capital Investments and Productivity." *American Economic Review* 86:263-7.
- . 1997. "How to Compete: The Impact of Workplace Practices and Information Technology on Productivity." NBER Working Paper 6120. Cambridge, United States: National Bureau of Economic Research.
- Blakemore, A. and D. Hoffman. 1988. "Seniority Rules and Productivity: An Empirical Test." Tempe, United States: Arizona State University. Mimeographed document.
- Blundell, R. et al. 1999. "Human Capital Investment: The Returns from Education and Training to the Individual, the Firm and the Economy." *Fiscal Studies* 20(1): 1-23.
- Bosworth, D.L., and R. A. Wilson. 1993. "Qualified Scientists and Engineers and Economic Performance." In: P. Swan, editor. *New Technologies and the Firm: Innovation and Competition*. London, United Kingdom: Routledge.
- Brambilla, I., D. Lederman and G. Porto. 2012. "Exports, Export Destinations, and Skills." *American Economic Review* 102(7): 3406-38.

- Chapman, B.J., and H.W. Tan. 1990. "An Analysis of Youth Training in Australia, 1985-88: Technological Change and Wages." Canberra, Australia: Australian National University. Mimeographed document.
- De Koning, J. 1994. "Evaluating Training at the Company Level." In: R. McNabb and K. Whitfield, editors. *The Market for Training*. Aldershot, United Kingdom: Avebury.
- Dostie, B. 2014. "Innovation, Productivity, and Training." IZA Discussion Papers 8506. Bonn, Germany: Institute for the Study of Labor (IZA).
- Flores Lima, J.G.R., C. González-Velosa and D. Rosas Shady. 2014. "Cinco Hechos: Sobre la Capacitación en Firma en América Latina y el Caribe." Washington, DC, United States: Inter-American Development Bank.
- Gancia, G., F. Zilibotti and D. Acemoglu. 2008. "Technology-Skill Complementarity and Competition Policy." Meeting Papers 408. Stonybrook, United States: Society for Economic Dynamics.
- Hall, P., and D. Soskice. 2004. "An Introduction to Varieties of Capitalism." In: P. Hall and D. Soskice, editors. *Varieties of Capitalism: The Institutional Foundations of Comparative Advantage*. Oxford, United Kingdom: Oxford University Press.
- Hatzichronoglou, T. 1997. "Revision of the High-Technology Sector and Product Classification." OECD Science, Technology and Industry Working Paper 2. Paris, France: Organisation for Economic Co-operation and Development (OECD).
- Huneus, F., O. Landerretche and E. Puentes. 2012. "Multidimensional Measure of Job Quality: Persistence and Heterogeneity in a Developing Country." Series Documentos de Trabajo 357. Santiago, Chile: Universidad de Chile, Departamento de Economía.
- Leuven, E. 2005. "The Economics of Private Sector Training: A Survey of the Literature." *Journal of Economic Surveys* 19(1): 91-111.
- Lefort, F. 2010. "Business Groups in Chile." In: A.M. Colpan, T. Hikino and J.R. Lincoln, editors. *The Oxford Handbook of Business Groups*. New York, United States: Oxford University Press.
- Lillard, L.A., and H.W. Tan. 1986. "Private Sector Training: Who Gets It and What Are Its Effects?" Santa Monica, United States: Rand Corporation.
- . 1992. "Private Sector Training: Who Gets It and What Are Its Effects?" *Research in Labor Economics* 20:1-62.

- Sánchez-Ancochea, D. 2009. "State, Firms and the Process of Industrial Upgrading: Latin America's Variety of Capitalism and the Costa Rican Experience." *Economy and Society* 38(1): 62-86.
- Schneider, R., and S. Karcher. 2010. "Complementarities and Continuities in the Political Economy of Labor Markets in Latin America." *Socio-Economic Review* 8(4): 623-651.
- Schneider, B.R. 2013. *Hierarchical Capitalism in Latin America: Business, Labor, and the Challenges of Equitable Development*. New York, United States: Cambridge University Press.
- Verhoogen, E. 2008. "Trade, Quality Upgrading, and Wage Inequality in the Mexican Manufacturing Sector." *Quarterly Journal of Economics* 123(2): 489-530.
- Weiss, Y. 1986. "The Determination of Life Cycle Earnings: A Survey." In: O. Ashenfelter and R. Layard, editors. *Handbook of Labor Economics*. Amsterdam, The Netherlands: North-Holland.

Appendix

Annex 1. Robustness Checks on Probit Regressions

Table 1B. Probit – Firms Providing Training ES

VARIABLES	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4
Age of the Firm	0.00294 (0.00613)	-0.00660 (0.00623)	0.000356 (0.00577)	-0.00715 (0.00624)
(Age)^2	-1.49e-06 (3.01e-06)	3.16e-06 (3.05e-06)	-2.28e-07 (2.83e-06)	3.42e-06 (3.05e-06)
Exports	0.0469** (0.0185)	0.0360** (0.0163)	0.0340* (0.0179)	0.0219 (0.0157)
(Exports) ^2	-0.000451** (0.000200)	-0.000370** (0.000176)	-0.000315 (0.000192)	-0.000220 (0.000170)
Garments			-0.171 (0.415)	-0.340 (0.443)
Food			0.723** (0.344)	0.670* (0.371)
Metals/Machinery			0.779* (0.407)	0.770* (0.439)
Electronics			2.346*** (0.391)	2.124*** (0.433)
Chemicals/Pharmac.			0.727* (0.424)	0.444 (0.455)
Wood/Furniture			0.920** (0.432)	0.927* (0.504)
Plastic/Non Metallic			0.846** (0.359)	0.736* (0.378)
Automobile			0.913* (0.471)	0.872* (0.460)
Other Manufacturing			0.897* (0.481)	0.699 (0.438)
Retail/Wholesale			0.686 (0.856)	0.814 (0.629)
Other Services			-0.221 (0.553)	-0.00633 (0.554)
Small		0.705** (0.359)		0.919*** (0.341)
Medium		1.147*** (0.279)		1.200*** (0.286)
Big		1.909*** (0.319)		2.024*** (0.313)
Constant	-0.162 (0.220)	-1.007*** (0.315)	-0.782** (0.392)	-1.660*** (0.480)
Observations	7,699	7,699	7,698	7,698

Source: Author calculations based on World Bank's ES.

Note: Robust standard errors in parentheses. The independent variables is binary. * Coefficient is statistically significant at 10 percent level; ** at 5 percent level; *** at 1 percent level; no asterisk means that the coefficient is not different from zero with statistical significance. All estimates control for country and year. The excluded variables are: for size is Micro, and for sector is textiles.

Table 2B. Probit – Firms Providing Training ES

VARIABLES	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4
Age of the Firm	0.00340 (0.00410)	-0.00319 (0.00436)	0.00252 (0.00378)	-0.00361 (0.00415)
(Age)^2	-1.76e-06 (2.01e-06)	1.48e-06 (2.14e-06)	-1.33e-06 (1.85e-06)	1.68e-06 (2.04e-06)
% of skilled workers	-0.00521 (0.00404)	-0.00374 (0.00411)	-0.000749 (0.00402)	0.00114 (0.00402)
No Missing (dummy)	0.703*** (0.215)	0.602*** (0.214)	0.294 (0.349)	0.320 (0.377)
Exports	0.0403*** (0.0132)	0.0288** (0.0120)	0.0332** (0.0140)	0.0196 (0.0122)
(Exports) ^2	-0.000410*** (0.000145)	-0.000308** (0.000131)	-0.000339** (0.000154)	-0.000217 (0.000134)
Garments			-0.287 (0.402)	-0.459 (0.426)
Food			0.377 (0.341)	0.425 (0.381)
Metals/Machinery			0.561 (0.394)	0.559 (0.427)
Electronics			0.359 (0.575)	0.212 (0.593)
Chemicals/Pharmac.			0.605 (0.422)	0.370 (0.450)
Wood/Furniture			0.933** (0.425)	0.960** (0.489)
Plastic/Non Metallic			-0.320 (0.340)	-0.368 (0.376)
Automobile			0.918** (0.466)	0.896* (0.460)
Other Manufacturing			-0.142 (0.571)	-0.222 (0.521)
Retail/Wholesale			0.0745 (0.461)	0.218 (0.487)
Hotel/Restaurant			-0.0583 (0.489)	0.0954 (0.511)
Other Services			-0.0289 (0.447)	0.0652 (0.493)
Construction/Transp.			0.276 (0.495)	0.232 (0.536)
Small		0.320 (0.236)		0.397* (0.227)
Medium		0.767*** (0.224)		0.806*** (0.221)
Big		1.387*** (0.260)		1.517*** (0.258)
Constant	-0.0482 (0.156)	-0.512** (0.247)	-0.0209 (0.485)	-0.652 (0.541)
Observations	12,834	12,834	12,832	12,832

Source: Author calculations based on World Bank's ES.

Note: Robust standard errors in parentheses. The independent variables is binary. * Coefficient is statistically significant at 10 percent level; ** at 5 percent level; *** at 1 percent level; no asterisk means that the coefficient is not different from zero with statistical significance. All estimates control for country and year. The excluded variables are: for size is Micro, and for sector is textiles.

Annex 2. Qualitative Findings

How do firms perceive training?

Training is seen as an indicator of modernization and change, growth and future perspectives for firms, a tool for improving the internal climate and industrial relations, and as a device to signal the importance of the workforce to managers. In this sense, training is perceived as a good thing, and has inherently positive connotations. Moreover, the importance associated with training is growing, and so are the organizational capacities dedicated to it.

Why do firms invest in skills?

The main reason to invest in skills is to comply with standards and/or certifications imposed by local authorities, foreign markets, and/or clients. The second major reason to invest in skills is to maintain or improve a firm's work environment, thereby motivating workers, providing a sense of equal opportunities, and making workers feel involved with firms' performance.

How do firms perceive the relation between investing in skills and productivity growth?

One of the reasons firms invest in skills is to enhance their productivity, especially large firms. This is based on the view that training and productivity are closely related. However, the meaning of productivity is not univocal, and often has diverse connotations for firms ranging from competitiveness and profitability to worker motivation. Moreover, this perceived relation is hard to test, and firms rely on indirect measures such as surveys on work climate or worker performance.

What makes investing in skills harder/easier?

Training activities imply taking workers out of their respective duties, interfering with a firm's production process and cycle. This gives rise to conflicts between workers and managers, and between HR managers and COOs, over the allocation of the costs of training. The overall cost of training is another difficulty, which is especially strong in small firms. Finally, worker motivation is a further constraint for investing in skills. Workers lack incentives for training, as this does not necessarily involve promotions or higher salaries. Moreover, low educational attainment and cultural patterns affect workers ability to view training as a long-term investment.

Contrariwise, subsidiaries of multinational firms and large firms find it easier to invest in skills. While the former accord a higher relevance to training and have well-established processes, the latter face fewer constraints in terms of resources and information, and enjoy privileged relations with training providers. Finally, motivated HR managers may be able to pursue and sustain training activities in spite of reluctant CEOs or in the face of economic downturns.

How, who and when do firms train?

Large firms have developed training processes and organizational capacities for the identification of training needs or gaps and the design of annual training plans. These are tailored to different workers' categories. Large firms also have the possibility to pool their own resources with public programs, thereby increasing their training activities. On the contrary, small firms rely on the State to finance their investment in skills. Moreover, small firms' training activities are more arbitrary and unorganized, being often decided on a case-by-case basis.

Do firms invest more in general or specific skills? How do they manage worker turnover?

While firms provide both general and specific training, they perceive their investments to be firm-specific. This is because much of the training is aimed at introducing newcomers to the firm's culture and productive processes. Consequently, regardless of the actual portability of the skills transmitted, there is the belief that training processes are firm-specific. Partly because of this, firms do not see high rotation rates as a hindrance for investing in skills. This view is strengthened by three further considerations: sector-specific skills related to certifications need to be acquired regardless of the poaching risk; high labor turnover implies losing trained workers, but also gaining workers trained by other firms; finally, firms perceive they can make a difference by motivating workers and creating loyalty through well designed induction processes.

Annex 3. Qualitative Sampling

- Subject of interview

CEO, HR manager, deputy HR manager.

- Sampling criteria

Using the quantitative study, we defined three sampling criteria, size, sector, and sales market.

Size:

For reasons of access, we took as small firms those with less than twenty workers. However, in order to make sure to capture real differences in the discourses, in the medium/large (L) category we only took firms with more than 80 workers

- S (micro and small company): Company with less than 20 workers.

- L (large company): Company with more than 80 workers.

Sector:

Defined according to the SITC Rev.2 classification and following Hatzichronoglou (Hatzichronoglou, 1997) for manufacturing:

- P (primary): Agriculture and hunting, Forestry, Fishery, Mining and extraction

- MB (low and medium-low technology intensity manufacturing): Rubber and plastics; Shipyards; Other manufactures; Nonferrous metals; Non-metallic products; Fabricated metals; Oil refinery; Ferrous metals; Paper and pulp; Textiles and garment; Food; beverages and tobacco; Wood and furniture.

- MA (high and medium-high technology intensity manufacturing): Aerospace; Computing and office machine; Electronic and communication apparatuses; Pharmaceutical products; Scientific instruments; Motor vehicles; Electrical Machinery; Chemicals; Other transport equipment; Non-electric machinery.

- S (services): Electricity, gas and water; Financial, Real estate and business services; Construction; Commerce; Transport and telecommunications; Other services.

Sales market:

This cut was also decided for access reasons. In order to produce meaningful discourse differences, we took as non-exporting only firms with close to zero exports.

- X: Firm exports more than 25% of its produce.

- NX: Firm exports less than 25% of its produce.

Sampling matrix

			Sector			
			P	LM	HM	S
Size	S	X				
		NX				
	L	X				
		NX				

Annex 3. Characteristics of Firms Interviewed

			Sector			
			P	LM	HM	S
Size	S	X	Firm 1 (S, P, X): Sector: Agriculture Number of workers: 20 (average, ranges between 12 and 30 according to season). Exports: 50% to 90% depending on product. Interviewee: CEO.			
		NX	Firm 2 (S, P, NX): Sector: Agriculture Number of workers: Exports: No Interviewee: Head of Administration.	Firm 5 (S, LM, NX): Sector: Fabricated metals Exports: No Number of workers: 5 Interviewee: CEO		Firm 10 (S, S, NX) Sector: Construction; Electricity, gas and water Exports: No Number of workers: 26 Interviewee: Head of HR
	L	X	Firm 3 (L, P, X): Sector: Mining Exports: Number of workers: Around 4000 Interviewee: Deputy HR manager	Firm 6 (L, LM, X) Sector: Rubber and plastics Exports: Yes Number of workers: 520 Interviewee: Deputy HR manager Firm 7 (L, LM, X) Sector: Paper and pulp Exports: Yes Number of workers: Around 2000 Interviewee: HR manager		Firm 11 (L, S, X) Sector: Electricity, gas and water Exports: Yes Number of workers: 1000 Interviewee: Head of Training
		NX	Firm 4 (L, P, NX) Sector: Agriculture Exports: No Number of workers: 200 Interviewee: Deputy HR manager	Firm 8 (L, LM, NX) Sector: Food and beverages Exports: No Number of workers: 330 Interviewee: HR manager	Firm 9 (L, HM, NX) Sector: Chemicals, Pharmaceuticals Exports: Less than 5% of produce. Number of workers: 80 Interviewee: HR manager	Firm 12 (L, S, NX) Sector: Electricity, gas and water Exports: No Number of workers: 2500 Subsidiary of multinational Interviewee: Organizational development manager and Deputy organizational development manager Firm 13 (L, S, NX) Sector: Electricity, gas and water Exports: No Number of workers: 100 Subsidiary of multinational Interviewee: Head of HR