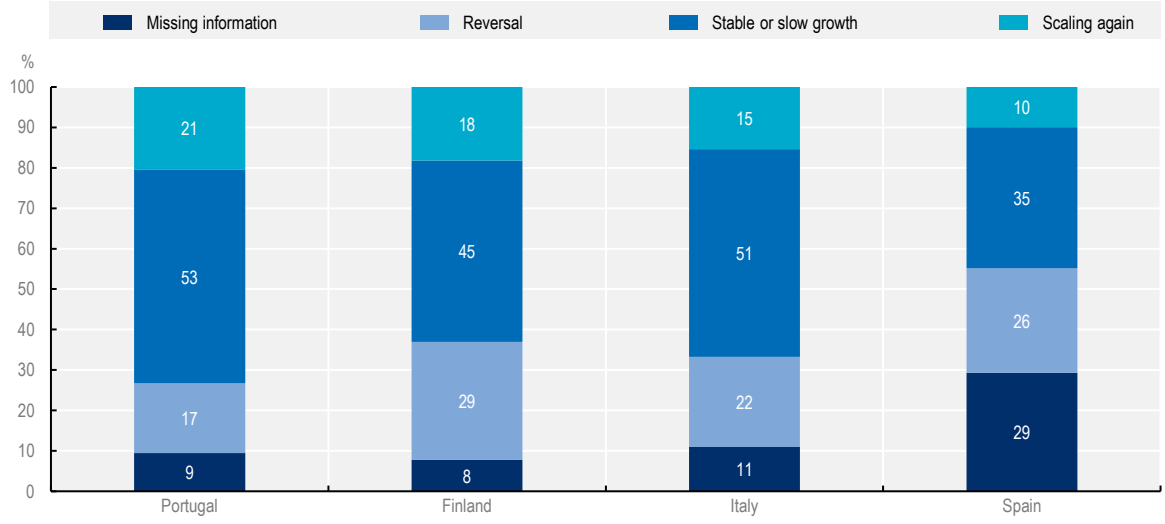
Annex A. Additional charts and tables

Sustainability of turnover scalers in employment growth

Scaling-up is a sustainable transformation for 40% to 70% of employment scalers, which remain at their new scale or continue to grow after the first high-growth episode. In addition, 14% to 32% of these employment scalers continue scaling up in turnover in the following 3-year period. The pattern of sustainability repeats for turnover scalers. On average across 4 countries, 59% of turnover scalers consolidate the new scale or continue growing. However, it is slightly less common for turnover scalers to turn into employment scalers than for employment scalers to continue scaling up in turnover. Between 10% and 21% of turnover scalers scale in employment in the 3 years after they scaled up (Figure A A.1). The lower probability of future employment growth for turnover scalers shows that it is more difficult to scale in employment and only a few firms undergo this transition. Employment growth can also be a predecessor of turnover growth. Firms that plan their business expansion might first prepare for the increase in demand by hiring the needed employment and, in the next phase, expand the output.

Figure A A.1. Turnover scalers are less likely to continue scaling up in employment

Growth dynamics of turnover scalers in the three years after scaling



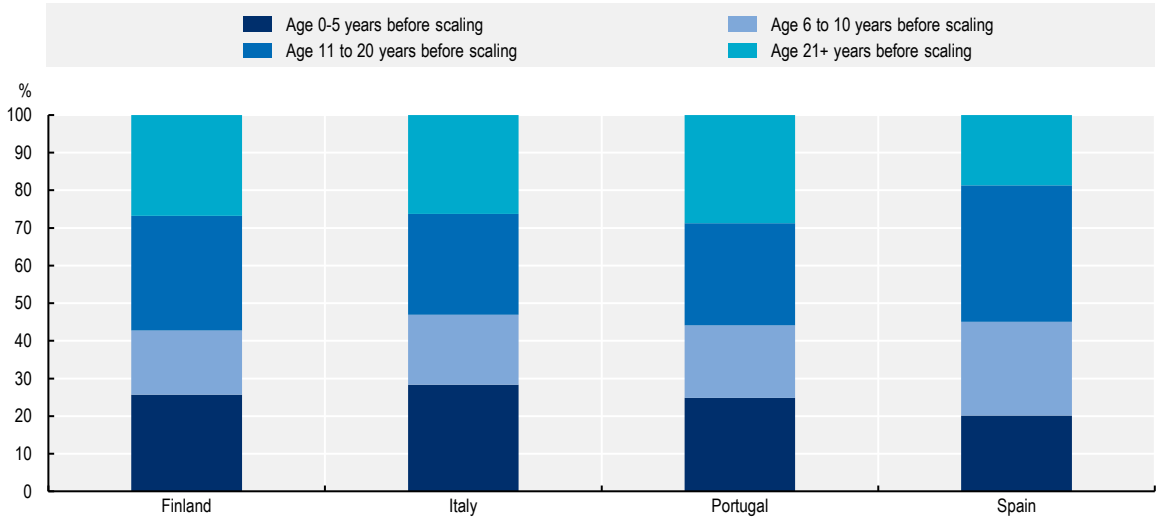
Note: Turnover scalers grow in employment by at least 10% per year over 3 consecutive years on average, as defined in Box 1.2. The sample includes scalers that end their first 3-year scaling period between 2011 and 2015 in Finland, 2004 to 2015 in Italy, 2013 to 2014 in Portugal and 2006 to 2015 in Spain. The sample is limited to the non-financial business economy. Owing to methodological differences, figures may differ from official statistics.
Source: Calculations based on microdata sources from four countries. See Annex B for more information.

Redistribution of turnover scalers by age group

The characteristics of the firm, including size and age, play a similar role in predicting scaling up in turnover scalers as in employment scalers. For example, the probability of being a scaler decreases with a firm's age. However, one notable difference is that there is a higher proportion of old firms among turnover scalers than among employment scalers (Figure A A.2). One-quarter of turnover scalers are small- and medium-sized enterprises (SMEs) established 21 years ago, while their share among employment scalers is 20%. At the same time, the group of young firms is smaller among turnover scalers. One-quarter of turnover scalers are young firms, compared to 28% of employment scalers.

Figure A A.2. Young firms constitute a smaller share of turnover scalers

Share of turnover scalers in all scalers by age category

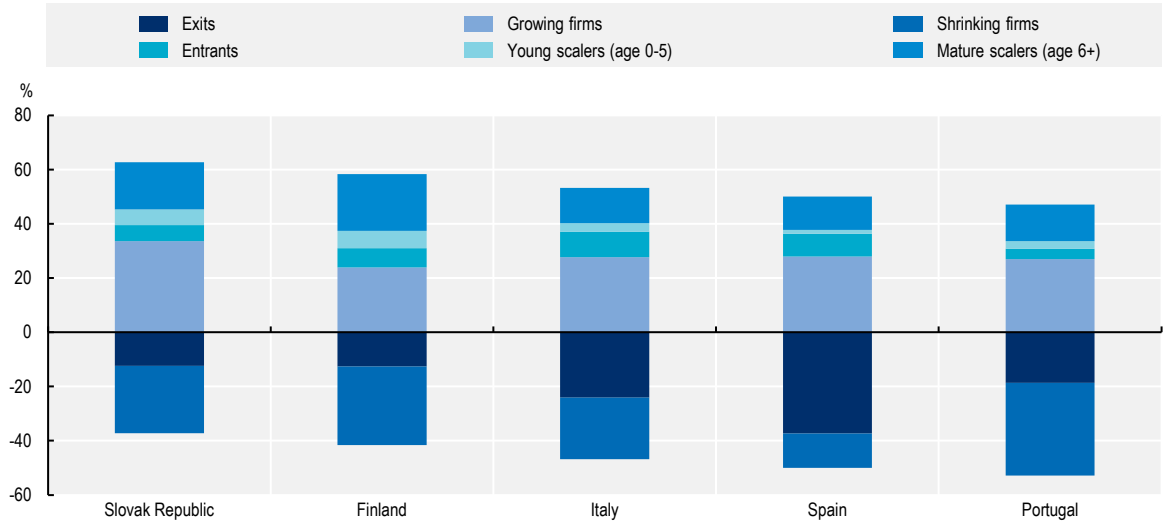


Note: Turnover scalers grow in employment by at least 10% per year over 3 consecutive years on average, as defined in Box 1.2. The sample includes scalers that end their first 3-year scaling period between 2011 and 2015 in Finland, 2004 to 2015 in Italy, 2013 to 2014 in Portugal and 2006 to 2015 in Spain. The sample is limited to the non-financial business economy.
Source: Calculations based on microdata sources from four countries. See Annex B for more information.

Employment scalers contribute to 47% to 69% of gross job creation and turnover scalers to 51 to 71% of gross turnover growth. Turnover scalers are also major contributors to gross job creation (38-65%). To a lesser extent, employment scalers are also contributors to turnover growth. Between 27% and 47% of gross turnover growth is generated by employment scalers (Figure A A.3). Although the contribution of employment scalers to turnover growth is smaller in size than the equivalent share of contribution to job creation by turnover scalers, it remains substantial when taking into consideration that employment scalers are 50% to 80% less numerous than turnover scalers. An average employment scaler, therefore, contributes a similar share to turnover growth to the average turnover scaler.

Figure A A.3. Employment scalers account for one-third of gross turnover growth

Gross turnover creation and destruction by young and mature employment scalers and other non-micro SMEs, 2015-17



Note: Gross turnover creation is calculated as the total turnover added by all non-micro SMEs growing in turnover over the triennium. The contribution by each group of firms is reported as a percentage of the sum of gross turnover growth and gross turnover destruction in absolute value, which implies that, for each country, the positive and negative segments of the sum of the bars is 100 in absolute values. Scalers grow in employment or turnover by at least 10% per year over 3 consecutive years on average, as defined in Box 1.2. The sample includes firms with at least 10 and at most 249 employees. The sample is limited to the non-financial business economy. Owing to methodological differences, figures may differ from official statistics.
Source: Calculations based on microdata sources from five countries. See Annex B for more information.

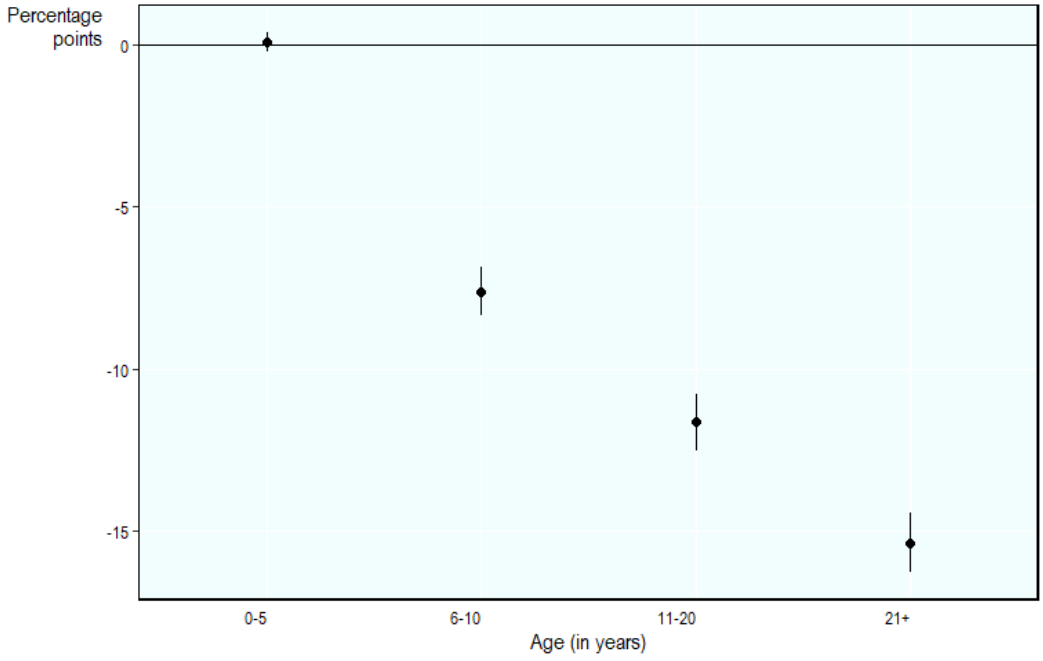
Measuring and visualising differences in structural factors between scalers and non-scalers with econometric analysis

Structural factors are firm characteristics that change only rarely over time, such as size group, industry, and location of a firm, or they change in an expected, incremental way, such as age. The probability of scaling up for firms within the same groups of structural factors is estimated in two different ways. The first simpler approach consists of calculating the share of scalers within each group, e.g. the share of scalers among firms with 10 to 49 employees. However, this metric may be prone to a composition bias. For example, firms in information technology are more likely to scale but they also tend to be smaller; the higher incidence of scalers among small firms can be only a sector-driven outcome.

The firm-level data allow estimating the relative probability of scaling up controlling simultaneously for structural factors and this way reducing the potential composition bias.[1] The outcomes of the estimations generally confirm the results obtained from calculated shares within each group. For example, the propensity to be a scaler falls with the firm age. Firms in older age groups have a 7 to 16 percentage points lower probability to scale up than the youngest firms in Finland (Figure A A.4). This effect is an average difference across firms within the same size class and the same industry class, which means that the age impact is free of the potential influence of other structural factors.

Figure A A.4. Estimated propensity to scale up by firm age

Percentage difference of probability of being a turnover scaler in Finland as compared to young firms

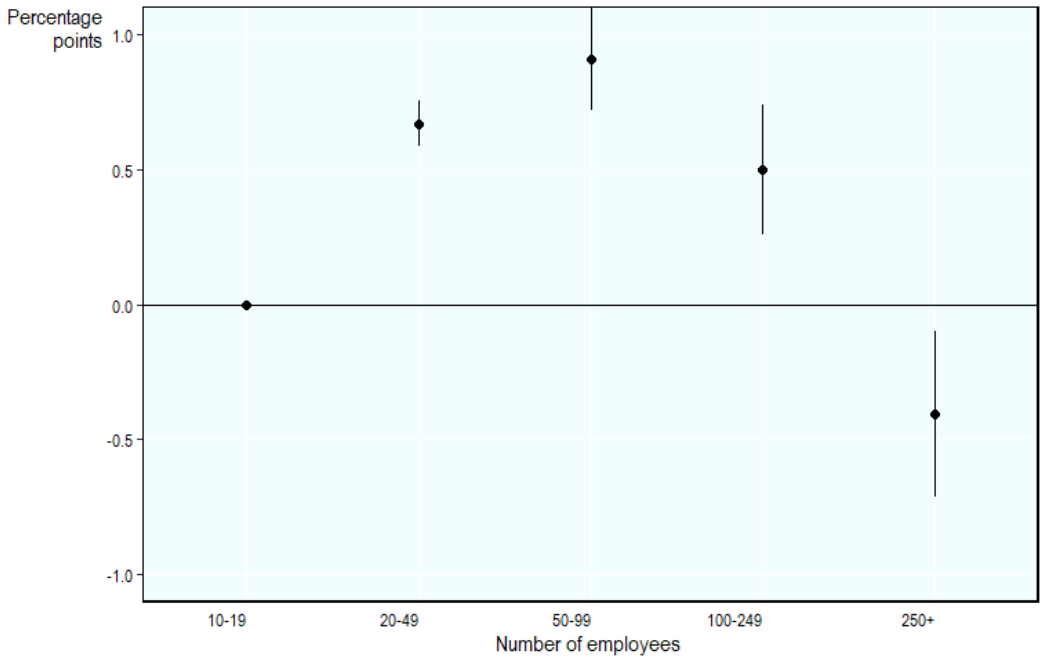


Note: Scalers grow in turnover by at least 10% per year over 3 consecutive years on average, as defined in Box 1.2. The graph indicates the magnitude of the probability to be a scaler compared to the baseline probability of scaling up among young firms. Points represent the estimated values and the vertical lines 90% confidence intervals. If the confidence interval crosses the zero line, the results are statistically insignificant. The vertical axis reports percentage differences in the probability of being a scaler between the given age group and young firms. The negative value implies lower levels as compared to the baseline. The regressions control for a year, size bin, sector and region fixed effects. The sample is limited to firms with at least 10 employees in the first year and surviving for the whole period. The sample includes observations from 2008 and 2018 in Finland.
Source: Calculations based on microdata sources from Finland. See Annex B for more information.

In some countries such as Italy and Spain, the probability of being a scaler among firms in different size classes is between 10-13% and smaller firms have a slightly larger probability to scale up. However, when age and sector variables are included in the evaluation, the marginal probability for firms of being scalers might increase with firm size. For example, in Italy, firms with at least 50 and at most 99 employees have a 1 percentage point higher probability of being a scaler and medium-sized firms with at least 100 and at most 249 employees scale half of a percentage point more than the smallest firms with 10 to 19 employees (Figure A A.5). In the results using simple averages by size class, the composition of age and sector has increased the overall probability of becoming scalers for small firms. Removing these composition effects shows that small size is a poor predictor of scaling up.

Figure A A.5. Propensity to scale up by firm size

Percentage difference in probability to be an employment scaler in Italy as compared to the firms with 10 to 19 employees.



Note: Scalers grow in employment by at least 10% per year over 3 consecutive years on average, as defined in Box 1.2. The graph indicates the magnitude of the probability of being a scaler compared to the baseline probability of scaling-up among firms with 10 to 19 employees. Points represent the estimated values and the vertical lines 90% confidence intervals. If the confidence interval crosses the zero line, the results are statistically insignificant. The vertical axis reports percentage differences in the probability of being a scaler between the firms in a given size group and firms with 10 to 19 employees. The positive value shows that the factor is higher than among the baseline, the negative sign implies lower levels as compared to the baseline. The regressions control for a year, age bin, sector and region fixed effects. The sample is limited to firms with at least 10 employees in the first year and surviving for the whole period. The sample includes observations from 2001 to 2018 in Italy.
Source: Calculations based on microdata sources from Italy. See Annex B for more information.

Country-specific analysis of dynamic factors from regression analysis

The analysis described in Chapter 4 considers a broad range of firm time-variant characteristics, comparing scalers with similar firms that share the same predetermined factors (size and age class, sector, location) but that do not scale. The tables listed in this section summarise these time-variant characteristics for each country where the analysis was possible and for both types of scalers. The results are organised into tables by topic as follows: innovation in Table A A.1. , human capital in Table A A.2, global markets in Table A A.3, financial indicators in Table A A.4, productivity and profitability in Table A A.5, and workforce characteristics in Table A A.6.

Table A A.1. Scalers differ from non-scalers in higher research and development (R&D) and information technology (IT) employment intensity

Innovative dynamic factors in scalers compared to non-scalers

Dynamic factors	Finland	Portugal
	Employment scalers	
Always different	Human resources (HR) employment (-)	
	IT employment (+)	
Anticipatory	R&D employment (+)	R&D employment (+)
		IT employment (+)
Transformational		
Never different	Marketing employment	Marketing employment
	Management employment	Management employment
		HR employment
	Turnover scalers	
Always different	R&D employment (+)	IT employment (+)
	Management employment (-)	
Anticipatory	IT employment (+)	R&D employment (+)
Transformational		
Never different	Marketing employment	Marketing employment
	HR employment	Management employment
		HR employment

Note: The table summarises the results on dynamic factors related to R&D, digitalisation, marketing, management and human resource employment. The results are obtained from regression analyses and describe the differences of scalers and non-scalers before the period of high growth (anticipatory phase), during the period of high growth and after high growth (transformational phase). The positive sign (+) shows that the outcome in the given factor is higher in scalers; the negative sign (-) shows lower levels in scalers as compared to non-scalers. If the difference is evident during all or most years of the analysis, the dynamic factor is classified as "always different". If no statistical difference is recorded during the seven-year period, the factor is classified as "never different". The analysis compares scalers and non-scalers of the same size group, age group, sector and location within the same year (Box 4.1). Scalers grow in employment or turnover by at least 10% per year over 3 consecutive years on average, as defined in Box 1.2. The sample includes observations from 2010 to 2016 in Finland and 2011 to 2017 in Portugal.
Source: Calculations based on microdata sources from Finland and Portugal. See Annex B for more information.

Table A A.2. Summary of human capital dynamic factors

Human capital dynamic factors in scalers compared to non-scalers

Dynamic factors	Finland	Portugal
	Employment scalers	
Always different	Promotion of senior manager (+)	Primary education (-)
Anticipatory	University education: graduate degree (+)	University education (+)
Transformational	Low-skilled and medium-skilled (+)	Low- and medium-skilled (+)
	Low-educated (+)	High-school education (-)
	High-skilled employees (-)	High-skilled employees (-)
	University education: undergraduate degree (-)	PhD (+)
	Wage premium (+)	Promotion of senior manager (+)
Never different	Primary education	Wage premium
	Turnover scalers	
Always different	University education: graduate degree (+)	PhD (+)
	Promotion of senior manager (+)	
Anticipatory	Medium-skilled (-)	University education (+)
	High school education (-)	
	High-skilled employment (+)	

Dynamic factors	Finland	Portugal
Transformational	Medium-skilled (+ in the short run)	Medium-skilled (+)
	University education: undergraduate degrees (-)	High-skilled (-)
	Wage premium (+)	Wage premium (+)
		Promotion of senior manager (+)
Never different	Primary education	Low-educated (high school and less)
	Low-skilled	Low-skilled

Note: The table summarises the results on dynamic factors related to human capital. The results are obtained from regression analyses and describe the differences of scalers and non-scalers before the period of high growth (anticipatory phase), during the period of high growth and after high growth (transformational phase). The positive sign (+) shows that the factor is higher in scalers; the negative sign (-) shows that the factor is lower in scalers as compared to non-scalers. If the difference is evident during all or most years of the analysis, the dynamic factor is classified as "always different". If no statistical difference is recorded during the period of seven years, the factor is classified as "never different". The analysis compares scalers and non-scalers of the same size group, age group, sector and location within the same year (Box 4.1). Scalers grow in employment or turnover by at least 10% per year over 3 consecutive years on average, as defined in Box 1.2. The sample includes observations from 2010 to 2016 in Finland and 2011 to 2017 in Portugal.
Source: Calculations based on microdata sources from Finland and Portugal. See Annex B for more information.

Table A A.3. Summary of access to global markets by scalers

Globalisation factors in scalers compared to non-scalers

Dynamic factors	Finland	Portugal
	Employment scalers	
Always different		
Anticipatory		Exporter (+)
		Importer (+)
		Destination and source countries (+)
		Exported and imported products (+)
Transformational	Exporter (-)	
	Destination countries (-)	
	Source countries (-)	
	Exported products (-)	
	Imported products (-)	
Never different	Import status	
	Turnover scalers	
Always different		Exporter (+)
		Importer (+)
		Destination and source countries (+)
		Exported and imported products (+)
Anticipatory	Exporter (+)	
	Importer (+)	
	Destination and source countries (+)	
Transformational		
Never different	Number of products	

Note: The table summarises the results on dynamic factors related to access to global markets. The results are obtained from regression analyses and describe the differences of scalers and non-scalers before the period of high growth (anticipatory phase), during the period of high growth and after high growth (transformational phase). The positive sign (+) shows that the factor is higher in scalers; the negative sign (-) shows that the factor is lower in scalers as compared to non-scalers. If the difference is evident during all or most years of the analysis, the dynamic factor is classified as "always different". If no statistical difference is recorded during the period of seven years, the factor is classified as "never different". The analysis compares scalers and non-scalers of the same size group, age group, sector and location within the same year (Box 4.1). Scalers grow in employment or turnover by at least 10% per year over 3 consecutive years on average, as defined in Box 1.2. The sample includes observations from 2010 to 2016 in Finland and 2011 to 2017 in Portugal.
Source: Calculations based on microdata sources from Finland and Portugal. See Annex B for more information.

Table A A.4. Summary of financial factors

Finance factors in scalers compared to non-scalers

Dynamic factors	Portugal	Italy	Spain
	Employment scalers		
Always different			Cash flow (+)
Anticipatory		Loans (+)	Loans (+)
		Cash flow (-)	
Transformational	Loans (-)		
	Cash flow (-)		
		Current assets (+)	
Never different	Current assets		Current assets
	Turnover scalers		
Always different			
Anticipatory	Loans (+)	Loans (+)	Loans (+)
	Cash flow (+)	Cash flow (-)	
			Current assets (-)
Transformational			Cash flow (+)
	Current assets (+)	Current assets (+)	Current assets (+)
Never different			

Note: The table summarises the results on dynamic factors related to finance. The results are obtained from regression analyses and describe the differences of scalers and non-scalers before the period of high growth (anticipatory phase), during the period of high growth and after high growth (transformational phase). The positive sign (+) shows that the factor is higher in scalers; the negative sign (-) shows that the factor is lower in scalers as compared to non-scalers. If the difference is evident during all or most years of the analysis, the dynamic factor is classified as "always different". If no statistical difference is recorded during the period of seven years, the factor is classified as "never different". The analysis compares scalers and non-scalers of the same size group, age group, sector and location within the same year (Box 4.1). Scalers grow in employment or turnover by at least 10% per year over 3 consecutive years on average, as defined in Box 1.2. The sample includes observations from 2006 to 2012 in Italy, 2011 to 2017 in Portugal, and 2007 to 2013 in Spain.
Source: Calculations based on microdata sources from three countries. See Annex B for more information.

Table A A.5. Summary of results for productivity

Productivity in scalers compared to non-scalers

Dynamic factors	Finland	Portugal	Italy	Spain
	Employment scalers			
Always different				Profitability (+)
Anticipatory	Productivity (+)	Productivity (+)	Productivity (+)	Productivity (+)
			Profitability (-)	
Transformational	Productivity (-)			
	Profitability (+)	Profitability (+)	Profitability (+)	
Never different				
	Turnover scalers			
Always different				
Anticipatory	Productivity (-)	Productivity (-)	Productivity (-)	
	Profitability (-)		Profitability (-)	Profitability (-)
Transformational	Productivity (+)	Productivity (+)	Productivity (+)	Productivity (+)
	Profitability (+)		Profitability (+)	Profitability (+)
Never different				

Note: The table summarises the results on dynamic factors related to the productivity and profitability of firms. The results are obtained from regression analyses and describe the differences of scalers and non-scalers before the period of high growth (anticipatory phase), during the period of high growth and after high growth (transformational phase). The positive sign (+) shows that the factor is higher in scalers; the negative sign (-) shows that the factor is lower in scalers as compared to non-scalers. If the difference is evident during all or most years of the analysis, the dynamic factor is classified as "always different". If no statistical difference is recorded during the period of seven years, the factor is classified as "never different". The analysis compares scalers and non-scalers of the same size group, age group, sector and location within the same year (Box 4.1). Scalers grow in employment or turnover by at least 10% per year over 3 consecutive years on average, as defined in Box 1.2. The sample includes observations from 2010 to 2016 in Finland, 2006 to 2012 in Italy, 2011 to 2017 in Portugal, and 2007 to 2013 in Spain.
Source: Calculations based on microdata sources from four countries. See Annex B for more information.

Table A A.6. Scalers employ a younger workforce, more foreign workers and in some cases fewer women

Workforce diversity factors in the 2011-14 scalers compared to non-scalers

Dynamic factors	Finland	Portugal
	Employment and turnover scalers	
Always different	Employees' average age (-)	
	Age of top manager (-)	
Transformational	Foreign employment (+)	
	Employment scalers	
Always different		
Anticipatory		
Transformational		Female employment (-)
Never different	Female employment	
	Gender of the top manager	Gender of the top manager
	Gender wage gap	Gender wage gap
	Turnover scalers	
Always different	Female employment (-)	
	Top manager man (+)	
Anticipatory		
Transformational		Female employment (-)
Never different		Gender of the top manager
	Gender wage gap	Gender wage gap

Note: The table summarises the results on dynamic factors related to workforce diversity. The results are obtained from regression analyses and describe the differences of scalers and non-scalers before the period of high growth (anticipatory phase), during the period of high growth and after high growth (transformational phase). The positive sign (+) shows that the factor is higher in scalers; the negative sign (-) shows that the factor is lower in scalers as compared to non-scalers. If the difference is evident during all or most years of the analysis, the dynamic factor is classified as "always different". If no statistical difference is recorded during the period of seven years, the factor is classified as "never different". The analysis compares scalers and non-scalers of the same size group, age group, sector and location within the same year (Box 4.1). Scalers grow in employment or turnover by at least 10% per year over 3 consecutive years on average, as defined in Box 1.2. The sample includes observations from 2010 to 2016 in Finland and 2011 to 2017 in Portugal.
Source: Calculations based on microdata sources from Finland and Portugal. See Annex B for more information.