



Understanding Enterprise Growth

Using multiple indicators to shed light on growth in micro-enterprises and the dynamics of firm growth over time

TALL

SOM FORTELLER

RAPPORTER / REPORTS

2020 / 53

Håkon Frøysa Skullerud

Håkon Frøysa Skullerud

Understanding Enterprise Growth

Using multiple indicators to shed light on growth in micro-enterprises and the dynamics of firm growth over time

In the series Reports, analyses and annotated statistical results are published from various surveys. Surveys include sample surveys, censuses and register-based surveys.



Funded by European Union

© Statistics Norway
When using material from this publication,
Statistics Norway shall be quoted as the source.

Published 21 December 2020

Print: Statistics Norway

ISBN 978-82-587-1254-8 (printed)
ISBN 978-82-587-1255-5 (electronic)
ISSN 0806-2056

Symbols in tables	Symbol
Category not applicable Figures do not exist at this time, because the category was not in use when the figures were collected.	.
Data not available Figures have not been entered into our databases and are therefore unknown.	..
Confidential Figures are not published so as to avoid identifying persons or companies.	:
Decimal punctuation mark	.

Preface

This pilot was initiated and funded by Eurostat, through the grant program. The pilot was a joint effort among several European countries, with coordinating project managers from Eurostat and several participating European countries. The pilot covered three different areas within enterprise growth, called working programs (WPs), of which Norway participated in all.

This is the final report from Norway. Three interim reports, called methodological templates, were delivered in the course of the project. They are provided as an appendix to this final report. The first two (WP I and III) were delivered in March 2020, while the last one (WP II) was delivered in November 2020.

Definitions and table set outs were harmonized among the participating countries, as part of the pilot, through multi-lateral meetings, email consultations and analyses performed by the Eurostat project managers on the basis of intermediary tables delivered from the participating countries. Accordingly, the tables produced in this pilot differ slightly from those described in the terms of action.

Statistics Norway, 3 December 2020

Per Morten Holt

Abstract

Statistics on ordinary high growth enterprises (10 or more employees) have since 2014 been reported annually to Eurostat. To explore aspects of high growth not covered by the reporting, a pilot with three different working programs (WP) were set up. WP 1 relates to high growth in micro enterprises (1 to 9 employees). WP 2 focused on growth beyond the three-year horizon in the high growth definition. In WP 3 on scale-ups very high growth, growth in prominent enterprises and growth to become prominent enterprises were addressed. The output and experiences from the pilot will be used for evaluating the potential to expand the current reporting.

Table set-outs, high growth definitions and reference years were decided by the participating countries and project managers from Eurostat, in a joint effort. High growth in micro enterprises was defined as absolute growth by 3.31 or more employees in three years, instead of the relative definition used in the reporting, to avoid an overwhelming number of micro high-growthers. For larger enterprises, several growth measures were applied. Most results apply to the 2014-2017 period (WP 1 and 3) and the 2015-2018 period (WP 2). To increase the validity of the study, the time series at an overall level were expanded and two alternative high growth and large decline definitions were tested.

High growth was found to be less frequent among sole proprietors, and more frequent among group participants. However, turnover growth may have been inhibited in group participants, due to economic transfers within the group. Young micro high-growthers grew faster than the older ones and reached their size by the end of the period. They were more likely to become a scale-up, as well, while there were small differences between young and old enterprises in the ability to sustain high growth. Micro high-growthers and employee scale-ups were particularly frequent in industry I. For turnover scale-ups the picture was mixed, while industry J had the highest share of sustained high growth. Mergers and acquisitions, though few in number, were heavily overrepresented among the micro high-growthers.

High growth and large decline were more frequent among micro enterprises than among ordinary enterprises, according to the alternative estimations. The dynamics were fairly balanced in most categories, but enterprises with decline in turnover dominated the largest size group. Oil and gas extraction was hit particularly hard. Growing in both employees and turnover was much harder than growing in just one of these variables, at least when looking at simultaneous growth.

Enterprises showed quite different high growth trends between 2011 and 2018, depending on the high growth criterion. When defined according to absolute or relative employee growth, the share of micro high-growthers and scale-ups rose gently through most of the time series, with a distinct depression in 2015. When defined by relative turnover growth, on the other hand, a large peak was seen in 2012, followed by a depression in 2015 and a gentle increase from there. A similar trend was seen in a Nordic study, when defining growth by full-time equivalents (FTEs). Oil prices appear to be the major driver at large, while a counter-cyclic expansionary may have subdued the depression caused by low oil prices in 2015.

Merging and acquisition does not as such bring growth to the economy. This supports keeping mergers and acquisitions outside the target population of most tables in this pilot. The activity level was far better reflected by turnover and FTE than number of employees, while implementation of "A-ordningen" data on employment from 2015 caused a positive shift in the coverage of very minor positions. Both speak for defining high growth in relative terms by turnover and FTE instead of employees. The relative definitions were more versatile and allow a more comprehensive and transparent picture of the business dynamics to be given.

Sammendrag

Statistikk over ordinære høyvekstforetak (minst 10 ansatte) har blitt rapportert årlig til Eurostat siden 2014. For å utforske aspekter ved høyvekst som ikke omfattes av rapporteringen, ble det satt opp en pilot med tre forskjellige arbeidsprogrammer (WP). WP 1 var relatert til veksten av mikroforetak (1 til 9 ansatte). WP 2 fokuserte på vekst utover treårsperioden i definisjonen av høyvekst. I WP 3 på scale-ups ble svært høy vekst, vekst i fremtredende foretak og vekst mot å bli fremtredende foretak belyst. Resultatene og erfaringene fra piloten vil bli brukt til å evaluere potensialet for å utvide den nåværende rapporteringen.

Tabelloppsett, høyvekstdefinisjoner og referanseår ble bestemt av deltakerlandene og prosjektlederne fra Eurostat i fellesskap. Høyvekst i mikroforetak ble definert som absolutt vekst på minst 4 ansatte i løpet av tre år, i stedet for den relative definisjonen som brukes i rapporteringen, for å unngå et overveldende antall mikro høyvekstforetak. For større foretak ble det brukt flere vekstmål. De fleste resultatene gjelder perioden 2014-2017 (WP 1 og 3) og perioden 2015-2018 (WP 2). For styrke studien ble tidsseriene utvidet på et overordnet nivå og to alternative definisjoner av høy vekst og stor nedgang testet.

Høyvekst forekom sjeldnere blant enkeltpersonforetak, og hyppigere blant foretak i konsern. Omsetningsveksten kan ha blitt hemmet hos foretak i konsern på grunn av økonomiske overføringer internt i konsernet. Unge mikro høyvekstforetak vokste raskere enn eldre og tok dem igjen i størrelse innen utgangen av perioden. De hadde også større sannsynlighet for å bli en scale-up, mens det var små forskjeller mellom unge og gamle foretak i forekomsten av opprettholdt høyvekst. Mikro høyvekstforetak og scale-ups med hensyn til ansatte forekom spesielt hyppig i næring I (overnatting og servering). For omsetnings-scale-ups var bildet blandet, mens næring J (informasjon og kommunikasjon) hadde den høyeste andelen foretak med opprettholdt høy vekst. Fusjoner og oppkjøp omfattet få foretak, men var sterkt overrepresentert blant mikro høyvekstforetakene.

Høy vekst og stor nedgang var hyppigere blant mikroforetak enn vanlige foretak, ifølge de alternative beregningene. Vekst og nedgang var nokså balansert i de fleste kategorier, men foretak med synkende omsetning dominerte i den største størrelsesgruppen. Olje- og gassutvinning ble rammet spesielt hardt. Høyvekst i både antall ansatte og omsetning var mye sjeldnere enn høyvekst i bare en av disse variablene, i det minste når man ser på samtidig vekst.

Foretakene hadde ganske forskjellige høyveksttrender mellom 2011 og 2018, avhengig av kriteriet for høyvekst. Når den ble definert med utgangspunkt i absolutt eller relativ vekst i antall ansatte, steg andelen mikro høyvekstforetak og scale-ups svakt gjennom det meste av tidsserien, men med en tydelig dupp i 2015. Når den ble definert med utgangspunkt i relativ omsetningsvekst, derimot, kom det en stor topp i 2012, etterfulgt av en bratt nedgang fram til 2015 og en svak økning derfra. En lignende utvikling ble sett i en nordisk studie der vekst ble definert ut fra antall årsverk. Oljeprisen ser ut til å ha vært den viktigste driveren, mens motkonjunkturpolitikk dempet nedgangen grunnet lave oljepriser rundt 2015.

Fusjon og oppkjøp gir ikke vekst i økonomien, isolert sett. Dette støtter avgjørelsen om å holde fusjoner og oppkjøp utenfor populasjonen til de fleste tabeller i denne piloten. Aktivitetsnivået uttrykkes langt bedre med omsetning og årsverk enn antall ansatte, mens bruk av sysselsettingsdata fra A-ordningen fra og med 2015 ga et positivt brudd i dekningsgraden for svært marginale stillinger. Begge deler taler for å definere høyvekst i relative størrelser, og basert på omsetning og årsverk i stedet for antall ansatte. De relative definisjonene var mer anvendelige og gjør det mulig å gi et mer omfattende og transparent bilde av foretaksdynamikken.

Contents

Preface	3
Abstract	4
Sammendrag	5
1. Introduction	7
1.1. Background.....	7
1.2. Objective	8
2. Data sources, estimations and definitions	8
2.1. Data sources.....	8
2.2. Definitions, coverage and estimations.....	8
3. Quality assurance, quality control and uncertainty	13
3.1. Quality assurance and quality control	13
3.2. Uncertainty	18
4. Results	18
4.1. High growth in micro enterprises.....	18
4.2. Scale-ups, young high-growthers and prominent enterprises	33
4.3. The after high growth perspective	36
4.4. International participation	38
5. Recommendations	39
5.1. Recommendations	39
5.2. Further work.....	40
References	42
Appendix A: Abbreviations	43
Appendix B: Templates for methodological reporting	44
List of figures	66
List of tables	67

1. Introduction

1.1. Background

Statistics on high growth enterprises have since 2014 been reported annually to Eurostat (EU 2008, 2014). However, the definition of high growth enterprises (HGEs) used in the reporting has some limitations. There are two different definitions of HGEs in use within Eurostat and OECD:

- A high-growth enterprise (growth by 10 % or more) is an enterprise with average annualised growth in number of employees greater than 10 % per year over a three-year period (t-3 to t) and having at least 10 employees in the beginning of the growth (t-3).
- A high-growth enterprise (growth by 20 % or more) is an enterprise with an average annualised growth greater than 20 % per year over a three-year period. Growth can be measured by the number of employees or by turnover.

The former is the definition used in the reporting. The latter is known as the OECD-Eurostat definition (EU 2020), and was used by Eurostat prior to the 2009 finance crisis and is used currently by OECD outside the EU. This inconsistency in definitions reduces the comparability of statistics on HGEs between countries within OECD and possibly between statistics within EU.

Enterprises having less than 10 employees are excluded from the reporting. However, they account for a large share of enterprises and contribute significantly to the economy. Many of them have a potential for high growth. There have been two main reasons justifying the exclusion of these very small enterprises:

- Excluding the smallest enterprises prevents distortion of the overall picture by the overwhelming number of high-growth micro enterprises (the "small size class bias").
- Defining high growth among the smallest enterprises in accordance with the standard Eurostat definition would lead to counter-intuitive results. For example, an enterprise with three employees, which temporarily employs another one at the end of a three-year period, even in a small position, would be considered a high-growth enterprise under this definition.

The three-year period used for defining high growth enterprises does not allow for monitoring the development of HGEs in a longer run. Accordingly, the definition does not reveal whether the growth is sustainable or not.

The definition does not discriminate between enterprises with respect to their economic significance, neither in terms of employment level (or turnover) nor absolute growth in the number of employees. Furthermore, it does not discriminate between different levels of growth. Consequently, the HGE definition alone is not sufficient to identify scale-ups.

Three different working programs (WPs) were set up within this pilot, to explore different aspects of high growth not covered by the current definition used in the reporting. The issues raised in WP 1 were related to the growth of micro enterprises. WP 2 aimed at understanding growth beyond the time horizon used in the HGE definition. In WP 3 very high growth, growth in prominent enterprises and growth into becoming prominent enterprises were addressed, to explore different aspects of scale-ups.

1.2. Objective

The objective of this pilot was to seek an understanding of growth in enterprises that is broader and deeper than provided by the current reporting. This includes:

- Measuring high growth over a 3-year period in micro enterprises, i.e. enterprises with 1 to 9 employees at the beginning of the period, with a definition yielding intuitive results and not distorting the overall picture by returning an overwhelming number of high growth micro enterprises (WP 1).
- Measuring development in high growth enterprises (HGEs) and high growth micro enterprises (HGMEs) in periods subsequent to the high growth period, to see if the growth is sustainable (WP 2).
- Exploring the growth in HGEs/HGMEs and prominent enterprises in further detail, by discriminating between different rates of high growth and by finding the growth pattern for the youngest and largest enterprises in terms of employment levels (WP3).

The output and experiences from the pilot will be used for evaluating the potential to expand the current reporting on HGEs.

2. Data sources, estimations and definitions

2.1. Data sources

The data source used for defining the population and estimating enterprise growth was the final business demography (BD) population, which builds on situation files ($t + 21 m$) from the business register (BR) and additional sources, including tax statements and the VAT register. These data were also used for categorizing the enterprises according to the agreed output tables and measuring the category sizes in terms of number of enterprises, employees, employed persons (WP 1 table 1, only) and turnover.

The structural business statistics (SBS) was used for measuring the category sizes in terms of gross value added (GVA).

2.2. Definitions, coverage and estimations

Definitions and coverage

The statistical unit, which is called enterprise in this report, is the *legal unit*.

The *basic population* includes active enterprises as defined in the BD, i.e. with employment or turnover in the reference year. Section O (Public administration and defence) is excluded. The same applies to the institutional sectors Norges Bank (Norway's central bank), central and local government. Enterprises in all other industrial activities and institutional sectors are covered. However, for some types of enterprises and some economical activities the coverage with respect to turnover and gross value added (GVA) is low. This applies to auxiliary enterprises, holding enterprises and enterprises having all their establishments sold or deleted, as well as the industries shown in table 2.1:

Table 2.1 Coverage with respect to turnover or GVA in industries with reduced coverage, per industry

Economic activity	Turnover	Gross value added (GVA)
A: Agriculture, forestry and fishing	Very low	None
B: Mining and quarrying	Low ¹	Ok
K: Financial and insurance activities	Low ²	None
P: Education	None	None
Q: Human health, social work	None	None
R: Arts, entertainment and recreation	Ok	Very low
S: Other service activities	Low ³	Low ³

1 Practically no coverage below 100 employees in industry 06 (extraction of oil and natural gas), ok in remaining section B.

2 Very low coverage in industries 64 (financial service activities) and 65 (insurance, pension funding).

3 No coverage in industry 94 (membership organisations), ok in remaining section S.

Source: Statistics Norway.

Sub-population, table breakdown and growth type definitions for each output table are shown in table 2.2 (below). The definitions were partly given in the grant call and partly developed in the pilot as a joint effort among Eurostat and the participating countries. In general, enterprises must have been founded before the first year of the high-growth period (WP 1 and 2) or the growth period (WP 3) to be included.

Table 2.2 Sub-populations, table breakdowns and growth types

Working-program	Output table	Breakdown	Type of enterprise	Types of growth
WP 1	1	Employee size classes * legal form	Micro, organic growth only	High growth: Growth in employees by at least 3.31 (in practice 4 or more, due to rounding) over a 3 years period from (t-3) to t.
WP 1	2	Employee size classes * group status	Micro, organic growth only	Same as WP 1, table 1.
WP 1	3	Industrial sections (NACE) * age classes	Micro, organic growth only	Same as WP 1, table 1.
WP 1	4	Employee size classes * type of growth	Micro	Same as WP 1, table 1.
WP 2	1	Group status	Ordinary, HGEs in (t-3) only	All growth (incl. negative): annualized growth in employees over a 3 years period from (t-3) to t, by growth class.
WP 2	2	Industrial sections (NACE)	Ordinary, HGEs in (t-3) only	Same as WP 2, table 1.
WP 2	3	Age classes	Ordinary, HGEs in (t-3) only	Same as WP 2, table 1.
WP 2	4	Group status	Ordinary, HGEs in (t-6) only	All growth (incl. negative): annualized growth in employees over a 6 years period from (t-6) to t, by growth class.
WP 2	5	Industrial sections (NACE)	Ordinary, HGEs in (t-6) only	Same as WP 2, table 4.
WP 2	6	Age classes	Ordinary, HGEs in (t-6) only	Same as WP 2, table 4.
WP 2	7	Group status	Micro, HGmEs in (t-3) only	All growth (incl. negative): total growth in employees over a 3 years period from (t-3) to t, by growth class.
WP 2	8	Industrial sections (NACE)	Micro, HGmEs in (t-3) only	Same as WP 2, table 7.
WP 2	9	Age classes	Micro, HGmEs in (t-3) only	Same as WP 2, table 7.
WP 3	1	Industrial sections (NACE) * age classes	Ordinary ¹ , organic growth only	Very high growth: annualized growth in employees by at least 20 % over a 3 years period from (t-3) to t.
WP 3	2	Industrial sections (NACE) * age classes	Ordinary ¹ , organic growth only	Very high growth: annualized growth in turnover by at least 20 % over a 3 years period from (t-3) to t.
WP 3	3	Industrial sections (NACE) * age classes	Ordinary ¹ , organic growth only	Very high growth: annualized growth in both employees and turnover by at least 20 % over a 3 years period from (t-3) to t.
WP 3	4	Industrial sections (NACE) * age classes	Micro, enterprise being maximum 10 years old	Growth expressed as employee size classes in year t.
WP 3	5	Group status * age classes	Micro, enterprise being maximum 10 years old	Same as WP 3, table 4.
WP 3	6	No further breakdown	Prominent	Growth expressed as employee size classes in year (t-9).

¹ Additional condition: turnover must be at least 2,000 € at the beginning of the growth period.

Source: Statistics Norway.

Turnover and gross value added (GVA) are given in 1,000 NOK in the basic population and converted to 1,000 € applying yearly average exchange rates. In industrial section K, where turnover is missing, operating income is used as an estimate for turnover. Besides of that, all variable definitions in the input data follow the definitions in the source statistics.

Number of *employees* and *employed persons* for example include both full-time and part-time workers (i.e. both are counted by head). Number of employees is

counted in the mid December week, i.e. the week covering the 16th, in the current year. Employed persons are the yearly average of employees plus owner(s), in line with the Eurostat-OECD manual, and were rounded to the nearest integer in the data source. See “About the statistics” to the relevant source statistics for further details in variable definitions.

Enterprise age was derived from the validity date of the organization number, which is the date when the organization number was established¹. In other words, it was assumed that the enterprise was founded at the date when the organization number was established. According to the BD manual, the enterprise is founded when it first becomes active. There might be a lag from the organization number is established to the enterprise becomes active. The age is corrected for change of ownership (defined below), but not for discontinuation related to change in two of the following criteria: ownership (represented by enterprise name), economic activity (4-digit NACE code) and location (postal code and street address). Both deviations from the BD manual leads to a higher estimated age in this pilot compared to the Eurostat standard method as described in the BD manual.

Enterprise survival occurs in the Norwegian pilot if the number of employed persons was positive, or the turnover was positive or negative, at the end year. No exception was made for enterprises having zero employed persons and zero turnover in two or more consecutive years. This differs from the definition given in the BD manual, which has this exception, and leads to a higher number of survived enterprises in this pilot compared to the Eurostat standard method. Enterprises in industry K (Finance and insurance) are defined as survived also if the operating result is positive. Securities’ funds are defined as survived if not recorded as terminated.

Group status shows whether an enterprise is part of an enterprise group in the reference year or not. The group status is defined at the end of the growth period, reflecting that it is assumed more likely for an enterprise to enter a group than to leave one.

Organic growth means growth without mergers, takeovers and acquisitions. *Mergers* are enterprises being merged during the measuring period. All the old enterprises cease to exist, and a new one is created. *Takeovers* are enterprises taking over other enterprises. One of the old enterprises continues, while the other(s) cease to exist. *Acquisitions* are enterprises acquiring establishments from other enterprises. Takeovers are special cases of acquisitions, in which all the enterprise’s establishments are acquired.

According to the BD manual mergers are defined as not survived, but this conflicts with the idea in this pilot where mergers and takeovers were given dedicated breakdown categories. Acquisitions were included in the category of mergers and takeovers, because the idea of the complementary breakdown category organic growth was to measure the intrinsic enterprise high growth by excluding growth due to the acquisition of external means of production.

Change of ownership occurs where an enterprise has been terminated and its establishments transferred to another newly founded one. In such cases, the old enterprise is defined as continued and the founding year of the new enterprise is defined as the founding year of the terminated one, in line with the method described in the BD manual. This ensures that the age of the activity decides the

¹ In contrast to the registration date, which is the date when the organization number was registered in BR. Ideally these dates should always be the same, but in practice the registration date is in some cases later.

age of an enterprise being founded with the purpose of continuing an ongoing activity, and not the age of the organizational structure. In this pilot, changes of ownership are not included in organic growth. This should be considered analysed in more detail if the tables produced in this pilot are going to be reported on a regular basis. However, the potential error is minor as the number of changes of ownership is low. The difference in cohort sizes (WP 1 and 3) with and without adjustment of enterprise age due to changes of ownership is presented in table 2.3:

Table 2.3 Cohort sizes with and without adjustment of enterprise age due to change of ownership. Number of enterprises, by cohort (t = 2017).

Cohort	With adjustment (N enterprises)	Without adjustment (N enterprises)	Difference (per cent)
2017	20 950	21 584	-2,9 %
2016	29 660	30 329	-2,2 %
2015	26 960	27 385	-1,6 %
2014	23 839	24 383	-2,2 %
2013	21 771	22 218	-2,0 %
2012	21 100	21 412	-1,5 %
2011	15 615	15 632	-0,1 %
2010	13 819	13 578	1,8 %
2009	11 621	11 651	-0,3 %
2008	13 038	13 135	-0,7 %
2007	13 920	13 732	1,4 %
2006 and older	177 626	174 880	1,6 %

Source: Statistics Norway.

Three types of enterprises, according to size, are analysed in the different WPs. *Micro enterprises* are enterprises having 1 to 9 employees at the beginning of the high-growth period or, as in WP 3 table 4 and 5, one year after start-up. *Ordinary enterprises* had at least 10 employees at the beginning of the high-growth period, in accordance with the reporting. In WP 3 table 1-3 an additional condition is introduced, requiring that the turnover must be at least 2,000 € at the beginning of the high-growth period. *Prominent enterprises* are enterprises having 1000 employees in the reference year.

Enterprises without employees were not included in this pilot, due to varying coverage among the participating countries and because the inclusion of 0 employee enterprises could lead to false high growth enterprises in cases of missing reporting.

Measuring points

The pilot analyses the growth in enterprise performance over a period of time. It was not obvious which measuring point (in time) to choose for the different breakdown variables. It could be at the start of the growth period or at the end of it. For certain variables, like group status, it could even be at any time during the growth period, which is equivalent to saying that participation in an enterprise group at any time during the growth period would label the enterprise as dependent.

In most cases, the measuring point in this Norwegian pilot complied with the specifications provided to all participating countries by the Eurostat project managers. In one case, group status in WP 2, clarification of the measuring point was provided late in the compiling period. In this case a pragmatic choice was made by the Norwegian side, and the measuring point in the Norwegian pilot differs from that provided by Eurostat (which is the year before the growth period). The choice of measuring point for this variable is assumed to have minor effect.

The measuring points for the breakdown variables are shown in table 2.4:

Table 2.4 Measuring point for breakdown variables, by output table

Breakdown variable	Working program	Output table(s)	Measuring point ¹
Size class (employees)	WP 1	T1, T2, T4	Start
Legal form	WP 1	T1	End
Group status	WP 1	T2	End
Age	WP 1	T3	End
Activity (NACE)	WP 1	T3	End
Growth type	WP 1	T4	Any
Group status	WP 2	T1, T4, T7	End
Age	WP 2	T2, T5, T8	Start - 1
Activity (NACE)	WP 2	T3, T6, T9	End
Size class (employees)	WP 3	T4, T5	End
Size class (employees)	WP 3	T6	Start and end
Group status	WP 3	T5	End
Age	WP 3	T1-T5	End
Activity (NACE)	WP 3	T1-T4	End

¹ *Start* = first year of growth period. *Start - 1* = the year before first year of the growth period (i.e. last year of the HGE period). *End* = last year of growth period. *Any* = any year within growth period.

Source: Statistics Norway.

The measuring point for the analysis variables (number of enterprises, turnover, etc.) is the end year of the growth period, which is also the reference year of the analysis.

Compilation and estimation

The compilation was made in a SAS Enterprise Guide program developed in this pilot. Two master datasets were made: a combined master dataset for WP 1 and 3 and a separate master dataset for WP 2.

The compilation of the master datasets had final annual BD populations as starting files. In WP 1 and 3 the population of year t formed the starting file, while in WP 2 the population of the final year in the high growth period was used. These starting files were linked to the annual BD population files of all years y within the analysed period(s) by organisational number for the enterprise and the establishment, respectively, in a descending order by year y . In this linking process the number of employees, employed persons and turnover for the starting year and final year of the measuring periods were added to the BD population file, as well as organization number and organization number date for all years y as a means to identify mergers/acquisitions and changes of ownership. Also, the annual average NOK to euro exchange rates were linked in this process. A final adjustment of founding year in case of change of ownership was made by linking annual situation files from BR ($y+45m$) to the BD population file in a similar descending order.

The master datasets were made from this gross BD population file by adding the following variables by micro data linkage (data source in parenthesis):

- WP 1 and 3: Gross value added (SBS).
- WP 1 and 3: Number of employees in year ($t-9$) (BR, annual file)
- WP 1 and 3: Number of employees in start-up year (BR, historic database).
- All WPs: Participation in an enterprise group (BR, group database).

Growth was estimated per enterprise or at population level by four different principles, dependent on number of employees at the measuring point (table 2.3) and the perspective to be analysed:

- Micro enterprises: absolute growth in three years by 3.31 employees or more.
- Ordinary enterprises: annualized percentage growth by specified growth categories.

- Young micro enterprises: number of maximum 10-year old enterprises by specified size categories.
- Prominent enterprises: number of enterprises by specified size categories at two different points in time.

The respective output tables were compiled and categories estimated from these master datasets according to the definitions given in the pilot (table 2.1), simply by where-statements and aggregation.

Treatment of missing values

Where values for the variable defining the growth were missing in the starting year or end year of the reference period, the enterprises were excluded from the population. In line with the guidelines to the grant, enterprises with zero employees in the starting year were also excluded.

Missing values for variables not defining the growth were counted as 0, in order to have the number of enterprises consistent for all variables. For number of employees, employed persons and turnover there were quite few missing values where the real values were expected to be different from zero, while for GVA the number of missing values was significant. For example, in WP 1 tables 1-3 missing GVA values were found in 19 per cent of the enterprises in 2017. However, only 1.4 per cent had a positive turnover indicating a GVA value different from zero. In WP 3 tables 1-3 missing GVA values were found in 2.6 per cent of the enterprises in 2017, all of which with a positive turnover (due to the 2,000 € threshold). Practically all missing GVA values in the examined tables were in the industrial sections A and R within activity group ‘Other’, which are poorly covered by the SBS.

In WP 1 tables 1-3 the missing GVA values were proportionately distributed between high growth and other enterprises, while in the WP 3 tables 1-3 they were overrepresented in the high growth categories according to employees (table 1), proportionately distributed between high growth and other enterprises according to turnover (table 2), and underrepresented in the high growth categories according to both criteria (table 3).

3. Quality assurance, quality control and uncertainty

3.1. Quality assurance and quality control

The micro data used in this pilot had already been used in the production of official statistics. Hence, no editing of micro data was considered necessary.

To assure good quality of the data processing, cohort sizes in the master dataset used for producing the WP 1 and 3 tables were controlled against cohort sizes in the national business demography (BD) survival statistics (Statistics Norway, 2020c). Since the WP 2 master dataset was compiled in a very similar manner as the WP 1 and 3 master dataset, the results of the quality control were considered to be valid for WP 2 as well. Industry A (Primary industries) is excluded in BD on survival, while included in this pilot. Hence, industry A was excluded from the quality control. In addition, industry sector O (Public administration and defence) is excluded from both populations.

The national BD survival statistics was preferred to the reported BD for the quality control, as definitions and versions of micro data were more comparable with those used in the pilot. The main differences between the national and the reported BDs are:

- National BD does not have positive employment or turnover as a criterion for counting new enterprises. This causes differences in the number of new enterprises and enterprise age due to slow start-ups (i.e. taking a year or more from creation to getting employment or turnover) and “paper enterprises” (i.e. empty registrations not leading to any business activity). However, positive employment or turnover is still a criterion for survival in both BDs.
- National BD does, as the reported BD, identify changes of ownership by the transfer of the local kind-of-activity unit (LKAU) organization numbers to a new enterprise. However, it does not identify continuations by match in two or more of the following criteria: ownership (represented by enterprise name), economic activity (4-digit NACE code) and location (postal code and street address). This causes a small number of survivals (about 1 per cent) to remain unidentified in the national BD. However, the matching procedure is not “water proof” and hence there could be errors on both sides.
- The national BD builds on more final data on employment and turnover, as the most updated employment and turnover data are not ready before the reporting deadline.

As a result, the national BD has a substantially higher number of new enterprises and a slightly higher number of survived enterprises than the reported BD, on average 4 per cent. Consequently, the survival rates are significantly lower in the national statistics.

Table 3.1 Number of enterprises¹ in national and reported business demography (BD) on survival

Survival years	2017 National BD	2017 Reported BD	2017 Difference	2018 National BD	2018 Reported BD	2018 Difference
New	62 028	34 557	-44 %	61 533	35 988	-42 %
1	26 822	27 359	2 %	27 347	27 019	-1 %
2	23 824	24 332	2 %	24 571	21 986	-11 %
3	19 670	18 489	-6 %	19 948	20 084	1 %
4	16 646	16 502	-1 %	16 974	15 657	-8 %
5	15 268	12 822	-16 %	14 650	14 197	-3 %

¹ Excluding industry A (Primary industries) and O (Public administration and defence).

Source: Statistics Norway.

Controlling pilot against national BD cohorts

The control against national BD cohorts had as an initial assumption that cohort sizes of year $y = 2012-2016$ in the pilot master dataset for year $t = 2017$ and national BD cohorts of newly founded enterprises in 2012-2016 having survived to 2017 were equally large. The control was, however, found to be imprecise, mainly due to differences in the definition of survival. In the pilot an enterprise is defined as survived if it has reported positive figures on employed persons or turnover for year t , or in industrial section K if it has reported positive figures on employed persons, turnover or operating income for year t . In the national BD on survival the enterprise must have had employed persons or turnover in both the cohort year y and year t , in addition to the years in between with no more than one consecutive year's break.

This inconsistency in definitions is of minor importance in the regular BD growth statistics, which has a downward cut-off at 10 employees at the beginning of the growth period. However, in this pilot the inconsistency causes significant differences to the population used as basis for the BD on survival (i.e. including micro enterprises). The differences arise from two types of situations:

- Unstable activity (i.e. two or more consecutive years without employment and turnover).
- Missing reporting (i.e. real employment or turnover in either founding year or consecutive years between cohort year y and reference year t was not reported).

There are other inconsistencies in cohort definitions between the two populations, as well. In this pilot the cohort of year y is defined from enterprises founded in year y . The BD survival cohort of year x , on the other hand, is based on enterprises founded in the cohort year x , as well as enterprises founded in the previous year $x-1$ that were not part of the BD population that year. Accordingly, in a comparison between a given cohort in this pilot and the corresponding cohort in BD on survival for year $y = x$, a difference in cohort sizes arises from time lag in registrations and late backdatings of enterprise founding. The difference consists of two parts pulling in opposite directions:

- All survived enterprises in the BD survival cohort of year x^2 , which were founded in year $y^3 = (x-1)$. These enterprises are covered in cohort $x-1$ in this pilot, but in cohort x in BD on survival.
- All survived enterprises in the BD survival cohorts of year $(x+1)$, which were founded in year $y = x$. These enterprises are covered in cohort x in this pilot, but in cohort $x+1$ in BD on survival.

The difference in cohort sizes between the two populations due to time lag and backdatings was calculated for 2012 to 2016, as these were the survival cohorts (i.e. the years in which the numbers of survived enterprises are measured) in the most recent BD on survival at that time. The part of the difference in cohort sizes between WP 1 and WP 3⁴ in this pilot and BD on survival being caused by time lag and backdatings is shown in table 3.2:

Table 3.2 Difference in number of enterprises¹ between cohorts in WP 1 and WP 3 in this pilot and cohorts in BD on survival due to time lag and backdatings, by cohort ($t = 2017$)²

Cohort	Number of enterprises in the BD survival cohorts of year $(x+1)$, founded in year $y = x$	Number of enterprises in the BD survival cohort of year x , founded in year $y = (x-1)$	Net difference between cohort size in this pilot and BD on survival ³
2016	NA ⁴	1218	NA ⁴
2015	1218	497	721
2014	497	25	472
2013	25	32	-7
2012	32	26	6

¹ Excluding industry A (Primary industries) and O (Public administration and defence).

² $t =$ reference year.

$y =$ cohort year in this pilot, before adjusting for establishment transfer. Number of enterprises measured at $(t+21 m)$.

$x =$ cohort year in BD on survival. Number of enterprises measured at $(x+21 m)$.

³ Positive number means that the cohort in this pilot is the larger one.

⁴ NA = Not available.

Source: Statistics Norway.

As table 3.2 shows, the difference in cohort sizes between the populations of this pilot and BD on survival arising from this inconsistency alone ranges from insignificant to nearly one thousand enterprises, or 4 per cent. The cohorts tend to be larger in this pilot compared to BD on survival, and the differences tend to decrease with cohort age. This is partly because older cohorts are smaller due to termination (“death”) of enterprises. It also seems that time lag and backdating were less frequent in older cohorts. For the most recent cohort in this pilot

² Measured at $(x+21 m)$.

³ Measured at $(t+21 m)$.

⁴ In WP 2 the cohort sizes in year t are based on the populations of $(t-3)$ and $(t-6)$, respectively, and hence the figures are somewhat different though the pattern is expected to be roughly the same.

($y=2016$) the number of enterprises being included in BD cohort ($x=2017$) due to time lag and backdating was not known, and hence the difference for this cohort could not be calculated.

Another source of inconsistency is the definition of founding year in cases of establishment transfers. In both this pilot and BD on survival enterprises are defined as survived by establishment transfer if at least one of its establishments is taken over by a newly founded (i.e. being no more than one year old) enterprise and the old (i.e. ceding) enterprise is terminated no later than the transfer year. However, while in this pilot the founding year of the old enterprise is transferred to the new one, the founding year of an enterprise in BD on survival is never adjusted.

The part of the difference in cohort sizes between this pilot and BD on survival caused by establishment transfers is shown in table 3.3:

Table 3.3 Number of enterprises¹ with different founding year between the main population and BD on survival due to transfer of establishments, by cohort ($t = 2017$)

Cohort	Number of enterprises, by adjusted founding year in main population	Number of enterprises, by founding year in BD on survival	Net change in cohort size due to transfer of establishments
2016	.	33	-33
2015	1	41	-40
2014	6	29	-23
2013	4	30	-26
2012	13	33	-20

¹ Excluding industry sections A (Primary industries) and O (Public administration and defence).
Source: Statistics Norway.

The comparison shows that adjustment of founding year in cases of survival due to establishment transfer is an insignificant source to difference in cohort sizes between this pilot and BD on survival.

The overall results from the control against BD on survival are shown in table 3.4:

Table 3.4 Number of survived enterprises¹ in the main population and BD survival population, by cohort ($t = 2017$)

Cohort (survived years)	Main population (this pilot)	BD, survival (control)	Difference (per cent)
2016 (1)	29 660	27 085	9,5 %
2015 (2)	26 960	24 082	12,0 %
2014 (3)	23 839	19 842	20,1 %
2013 (4)	21 771	16 646	30,8 %
2012 (5)	21 100	15 268	38,2 %

¹ Excluding industry sections A (Primary industries) and O (Public administration and defence).
Source: Statistics Norway.

There is quite large difference in cohort sizes between this pilot and BD on survival. It was controlled that the differences in cohort sizes not being accounted for in table 3.2 and 3.3 were due to differences in the definition of survival, i.e. the rule that two years' consecutive inactivity defines an enterprise as not survived in the national BD on survival. Accordingly, the quality control shows that the vast majority of the inconsistency between this pilot and BD on survival is caused by differences in the definition of survival.

Comparing against national BD on high growth

The final BD population is used as data source for the reported BD on survival and high growth and for the national BD on survival. The national BD on high growth, however, builds on the preliminary BD population to increase the timeliness. This causes some additional differences when comparing the pilot results against the national BD on high growth.

The impact is large on industry R and S, in which the population in the final BD is one and a half and twice the size of the preliminary BD population, respectively, while minor in the other industries with changes in population size ranging from -7 to +4 per cent in all but one industries. Industry D+E had a 13 per cent decrease.

Other controls

The controls described above are, strictly speaking, covering only parts of the compilation, i.e. the parts compiling the main population. The remaining compilation was unique for each output table, and the quality assurance encompassed sound programming techniques like comparing the number of enterprises in the input and output datasets throughout the program and in totals across the output tables, assessment of the figure patterns in the output tables, etc.

The quality control of the master dataset turned out to be quite challenging due to extensive data programming in the BD source statistics, with later file versions (i.e. more “final”) building on and modifying earlier (i.e. more preliminary) ones. Hence, tracking the origin of variables to confirm definitions was quite tedious. A simplifying of data programs in both BD on survival and the BD source statistics seems warranted.

Change of data source for employment

Both fulltime and part-time workers are counted by head (i.e. not fulltime equivalents). Number of employees and persons employed are derived from ‘A-ordningen’ dating back to 2015. Before 2015 it was taken from the ‘AA-register’. The coverage in ‘A-ordningen’ is somewhat higher than in the ‘AA-register’ with respect to persons in very small positions. Hence, the number of employee high-growthers for the period 2012-2015 is likely to be slightly overestimated.

Changed accounting principle for turnover in industry B

The accounting principle for turnover in NACE 06 (Extraction of crude petroleum and natural gas), part of industry B (Mining and quarrying) enterprises in Statistics Norway’s accounts database was changed between 2014 and 2015 from gross to net operating income. The difference is due to billings between oil field operator and licensees and to purchases and sales of crude petroleum as a trading item. There were 52 enterprises in NACE 06 in the population in 2017, in total, corresponding to 2.5 per cent of all enterprises within other activities. Accordingly, the number of turnover scale-ups within other activities may have been slightly underestimated.

Micro enterprises within other activities

The share of micro enterprises and micro HGEs belonging to other (economic) activities was quite high in the Norwegian population. Table 3.5 and 3.6 show how these enterprises distribute according to industrial sections and institutional sectors:

Table 3.5 Micro enterprises within other activities, by industrial sections (t = 2017)

	Number of enterprises	Number of HGEs
Total	29 265	2 263
A: Agriculture, forestry and fishing	4 182	236
B: Mining and quarrying	234	32
H: Transportation and storage	6 081	523
K: Financial and insurance activities	542	46
L: Real estate activities	4 208	157
P: Education	1 369	150
Q: Human health, social work	5 664	339
R: Arts, entertainment and recreation	2 071	490
S: Other service activities	4 562	260
Other industries	352	30

Source: Statistics Norway.

Table 3.6 Micro enterprises within other activities, by institutional sector¹ (t = 2017)

	Number of enterprises	Number of HGEs
Total	29 265	2 263
2100 (A_IKKE-FIN): Private non-financial incorporated enterprises	15 613	1 309
7000 (D_IDEELL): Non-profit institutions serving households	3 430	488
8200 (E_HUSH): Unincorporated enterprises within households	8 212	283
Other sectors	2 010	183

¹ National codes.

Source: Statistics Norway.

Any difference in the share of micro enterprises and micro HGEs classified as other activities between Norway and other participating countries might be due to different coverages.

3.2. Uncertainty

The figures in the output tables are based on registers, which are in principle full counts. Hence, there are no sample errors.

However, there are imperfections in registers, as well, leading to uncertainty. The most predominant uncertainty in this pilot is caused by registration lag, most often due to late or missing reporting from the enterprise. This includes both the establishing of enterprises and changes in enterprise attributes, such as economic activity. As indicated by table 3.2 (above), the uncertainty related to time-lag is relatively small.

In connection with new registrations the respondent is to state whether this is a new activity or a change in ownership. In cases where such information is lacking a duplicate check against existing enterprises is carried out in order to identify possible ownership changes. All changes are not intercepted in these routines, and the number of newly-established enterprises is assumed to be somewhat high seen in relation to the number of new registrations.

Industries with reduced coverage in turnover or GVA are shown in table 2.1. Enterprises with missing or zero turnover in start year or end year of the growth period are excluded. In cases where turnover is reported positive and GVA is missing, this leads to an underestimation of GVA. Most enterprises in industrial sections A and R within activity group 'Other activities' have missing GVA.

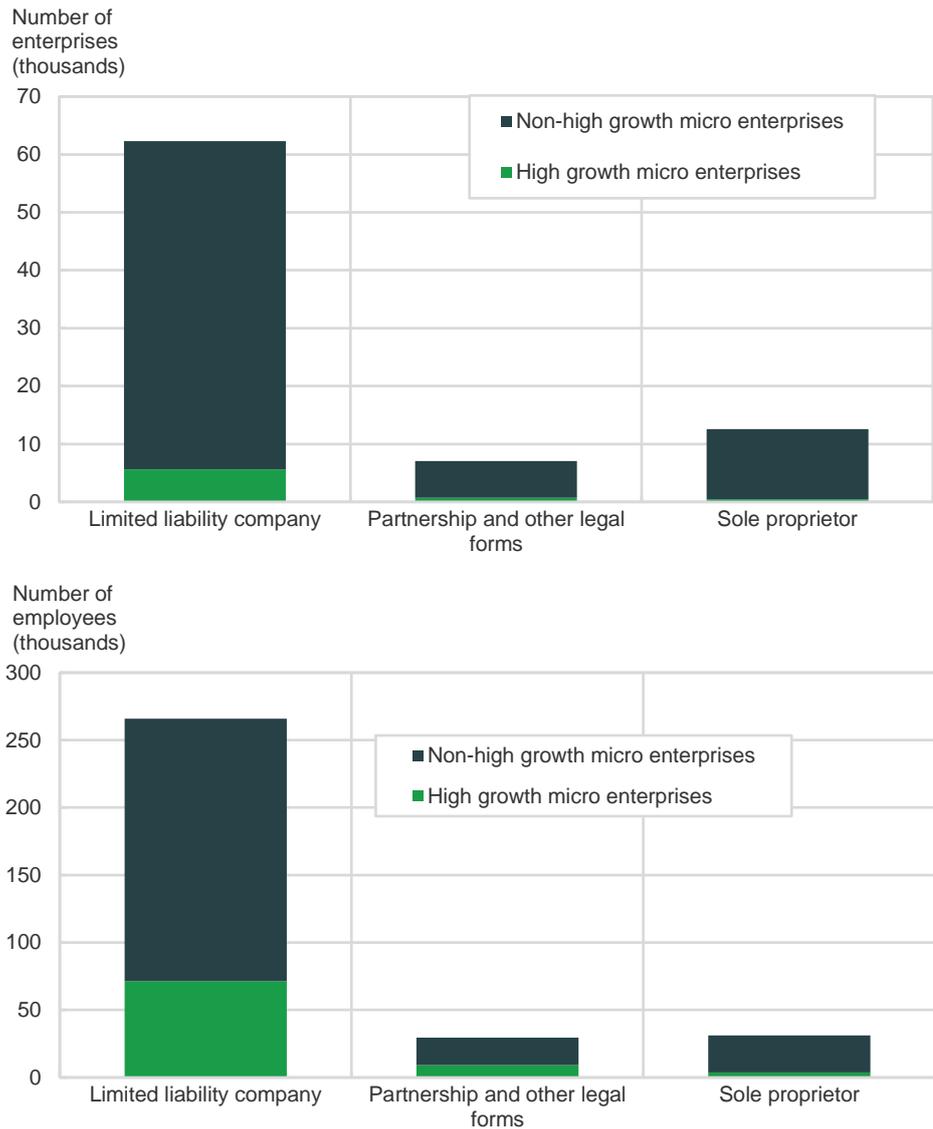
4. Results

4.1. High growth in micro enterprises

Legal forms' influence on high growth

Growing fast was more common among micro Limited liability companies and Partnership and other legal forms than Sole proprietors. Between 9 and 10 per cent of the micro enterprises within the first two legal forms experienced high growth between 2014 and 2017, while only 3 per cent of the Sole proprietors (figure 4.1).

Figure 4.1 High-growth and non-high growth micro enterprises¹, by legal form. Number of enterprises and number of employees. Growth period = 2014-2017



¹ Organic growth, only.
Source: Statistics Norway.

Not surprisingly, the high-growthers' shares of the employees at the end of the high growth period were generally higher than their shares of enterprises – comprising 27, 31 and 12 per cent for the three legal forms, respectively.

Enterprise turnover and gross value added (GVA) show a similar pattern, though being even more skewed in favour of Limited liability companies regardless of growth rate, which means that Limited liability companies generally produce higher turnover and GVA per enterprise and employee than other legal forms.

Sole proprietors are small companies comprising about half the enterprises in Norway. However, only 15 per cent of the micro enterprises are sole proprietors, as most of them have no employees and fall below the cut-off limit. Among sole proprietors having employees, the number of employees is lower than for other micro enterprises, as can be seen from the low number of employees for sole proprietors – both high-growthers and non-high-growthers – in figure 4.1 (lower panel).

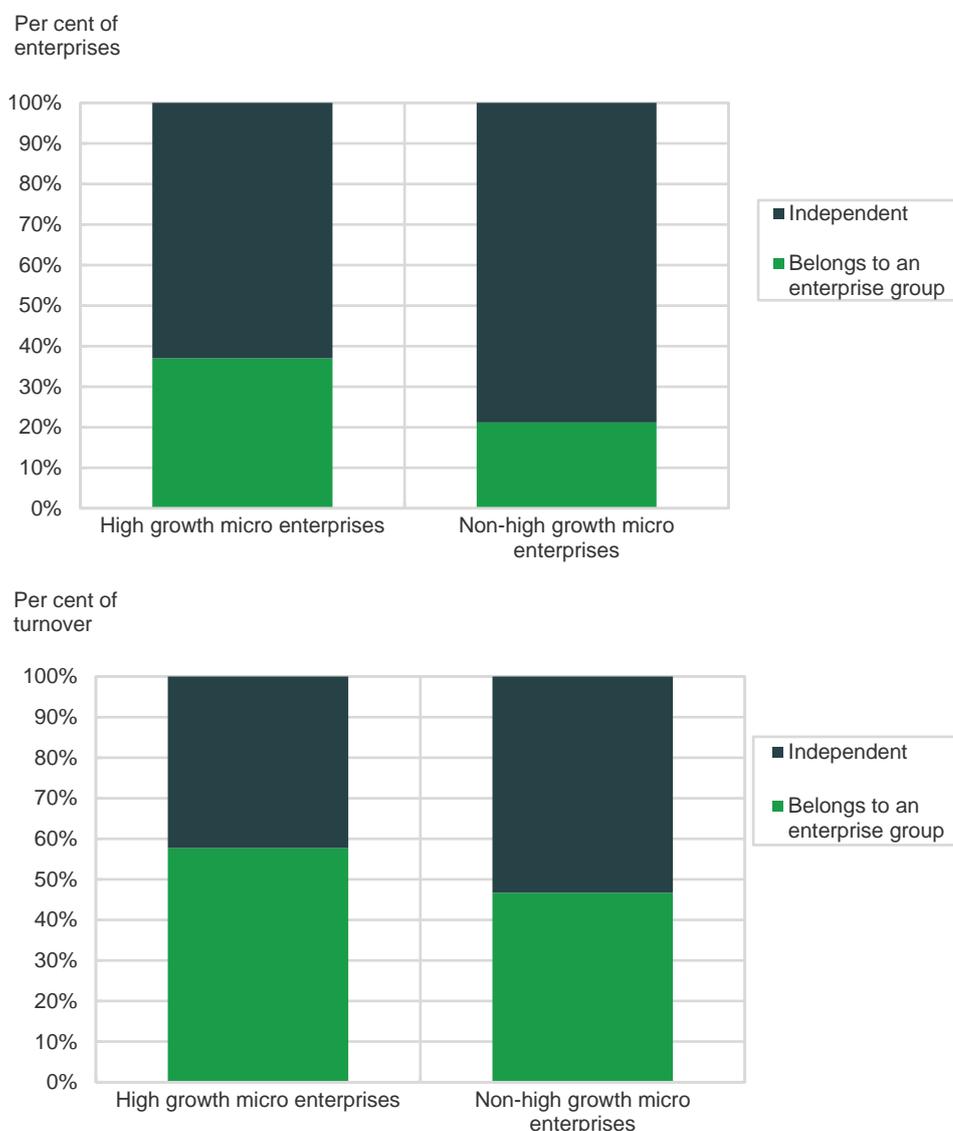
The high growth definition in this pilot was set out to require a far higher growth by per cent for the smaller micro enterprises to become a high-growther. Since sole proprietors are generally smaller than other micro enterprises, this could explain parts of the difference in high-growther share between the legal forms. However, estimations by enterprise size showed a similar pattern of high growth occurrence in the upper and lower size class. Accordingly, the lower high growth occurrence among sole proprietors was mainly due to differences between the legal forms in their facilitating of growth, and not an artefact of the high growth definition.

Enterprise group participation’s influence on high growth

Participation in an enterprise group may be beneficial to growth, amongst others because it increases the availability of capital and the organizational flexibility.

Among Norwegian micro enterprises 22 per cent belonged to a group in 2017. Being part of a group clearly made it easier to grow fast - 37 per cent of the high-growthers between 2014 and 2017 were group participants compared to 21 per cent of the non-high-growthers, the difference being 16 percentage points (figure 4.2).

Figure 4.2 High-growth and non-high growth micro enterprises¹, by group participation. Number of enterprises and turnover, by per cent. Growth period = 2014-2017



¹ Organic growth, only.
Source: Statistics Norway.

The biggest micros were more likely to be part of a group, as can be seen from the higher share of group participants in the population when measured in terms of turnover. As for the legal forms, estimations by enterprise size showed that the increased high growth occurrence among group participants was mainly due to differences in growth properties and not to the size discrimination inherent in the high growth definition.

When expressing enterprises in terms of turnover, the difference in growth ability was partly equalized. Turnover produced by group participants comprised 58 per cent of the HGmEs and 47 per cent of the non-HGmEs, a difference of only 11 percentage points. There might be several explanations behind this pattern (remember turnover was measured at the end of the growth period):

- 1) Growth in turnover and growth in employees occurred at different times, or just didn't coincide. Since high growth was defined in terms of employees, high growth in turnover might be found in some non-HGmEs, and vice versa. Figure 4.10 (below) indicates this.
- 2) It is more difficult to grow fast in turnover than in employees when the enterprise belongs to a group. This could be the case if parts of the economy in high growth group participants are transferred to other enterprises in the group.
- 3) Independent enterprises need more economical power in itself to grow fast, while dependent ones can lean on the group to grow.
- 4) As the independent enterprises were found to be smaller than the group participants, and since by definition a higher growth in employees by per cent was needed for smaller enterprises to become a high-growther, a higher growth by per cent - even in turnover - is more likely in independent high-growthers than in group participants.

The corresponding figures expressed in terms of employees shed light on the different explanations. The first two relate solely to turnover, in the sense that equalization of high growth occurrence was not expected to occur when measuring the population shares in terms of employees. The third is ruled out as independent enterprises were already found to be smaller (i.e. produce less turnover) than the group participants, while the fourth relates to both but stronger to number of employees.

There was some equalizing of high growth occurrence across enterprise group belonging even in number of employees, but far less than in terms of turnover. There were 41 per cent group participants among the high-growthers versus 27 per cent among non-high-growthers, a difference of 14.5 percentage points. This indicates that the first two explanations are dominating, one of them or both, while the fourth also contribute. In other words, growth in employees and turnover occurred at different times (as was also found for ordinary enterprises in WP 3) and/or turnover growth was inhibited in group participants due to economical transfers from the high-growthers to other enterprises in the group, while part of the pattern was an artefact of the definition of high growth which requires a higher relative growth for the smallest enterprises to become a high-growther.

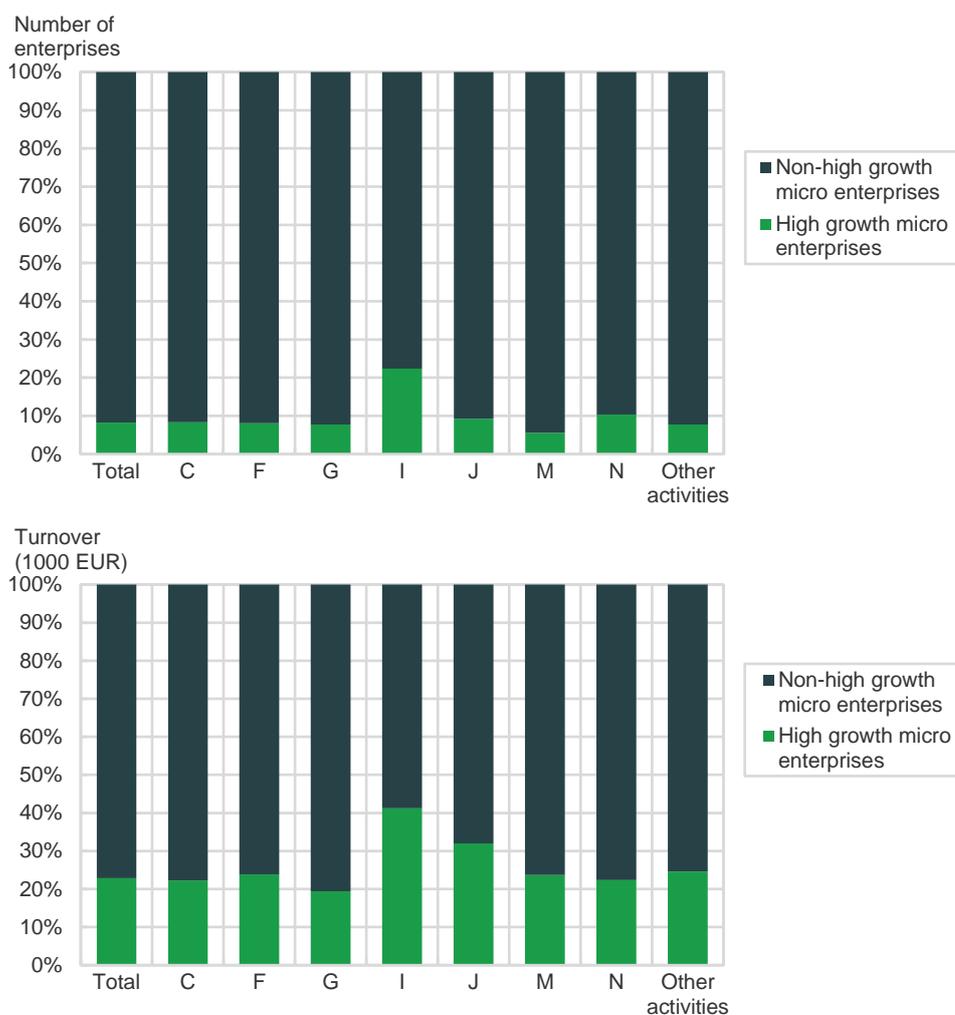
The last variable, gross value added (GVA), placed in-between turnover and employment when looking at group participants' contribution to the population. Group participants' GVA comprised 52 per cent of high-growthers vs. 39 per cent of non-high-growthers, a difference of 13.4 percentage points. This suggests that being part of a group is beneficial even for the value creation. It also suggests that some high growth in terms of GVA occurred among non-high-growthers, and that

somewhat more GVA have been transferred from high-growthers than from non-high-growthers within enterprise groups, but less so than turnover.

High growth by industry

The high-growthers were, with one exception, fairly evenly distributed among the industries, counting 8 ± 2 per cent of all micro enterprises within the industry (figure 4.3). Again, in terms of turnover the high-growthers took higher shares, and with a few exceptions they held around 23 per cent of their industry.

Figure 4.3 High-growth and non-high growth micro enterprises¹, by industry (NACE). Number of enterprises and turnover, by per cent. Growth period = 2014-2017



¹ Organic growth, only.
Source: Statistics Norway.

Industry I (Accommodation and food services) was the exception, having a significantly higher share of high-growthers in the period. This industry counted 22 per cent of the enterprises and 41 per cent of the turnover. Clearly, 2014 to 2017 was a good period for small businesses within Accommodation and food service in Norway.

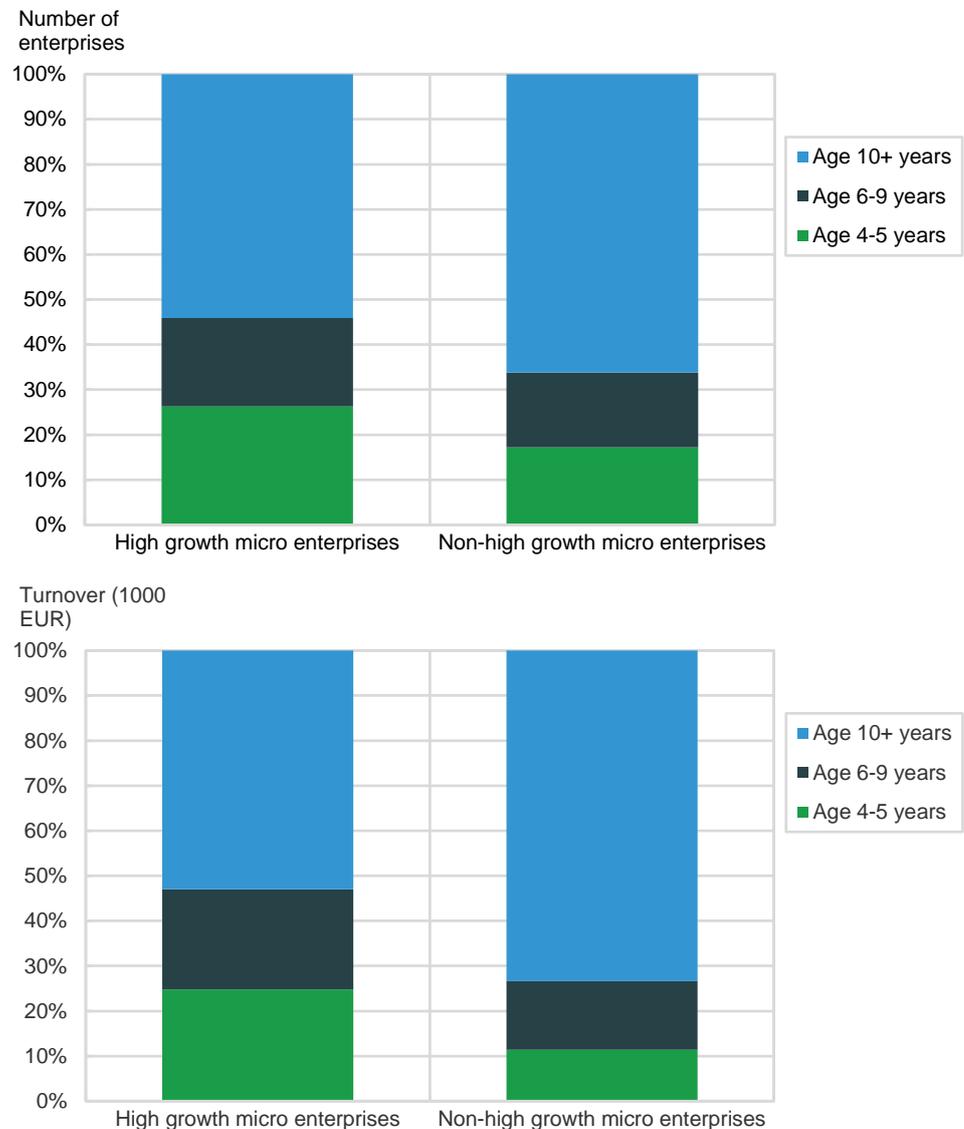
In industry J (Information and communication), while not standing out in number of enterprises, high-growthers produced 32 per cent of the turnover, which is significantly more than in other industries. The finding is consistent across age groups. They also made a higher share of the employees and the GVA, indicating that within Information and communication high-growther micros were bigger or grew more than in other industries.

Micro high-growthers within industry N (Administrative and support services) comprised quite average shares of the enterprises and turnover in the industry. However, in terms of employees and to some extent GVA this industry stood out with 11 and 4 percentage points higher shares than the population total, respectively. The difference was bigger for younger enterprises (4-5 years) and smaller for older ones (+10 years). This indicates that high-growthers within administrative and support services grew particularly fast in number of employees, but gained no extra turnover compared to high-growthers in other industries and they created just a little more economical value.

High growth by enterprise age

Young micro enterprises were more likely to grow fast than older ones. In 2017, 12 per cent of the 4 to 5 years old enterprises were high-growthers, compared to 7 per cent of those being at least 10 years old. This trend can also be seen from the increased share of high-growthers among micro enterprises younger than 10 years in figure 4.4.

Figure 4.4 High-growth and non-high growth micro enterprises¹, by enterprise age. Number of enterprises and turnover, by per cent. Growth period = 2014-2017



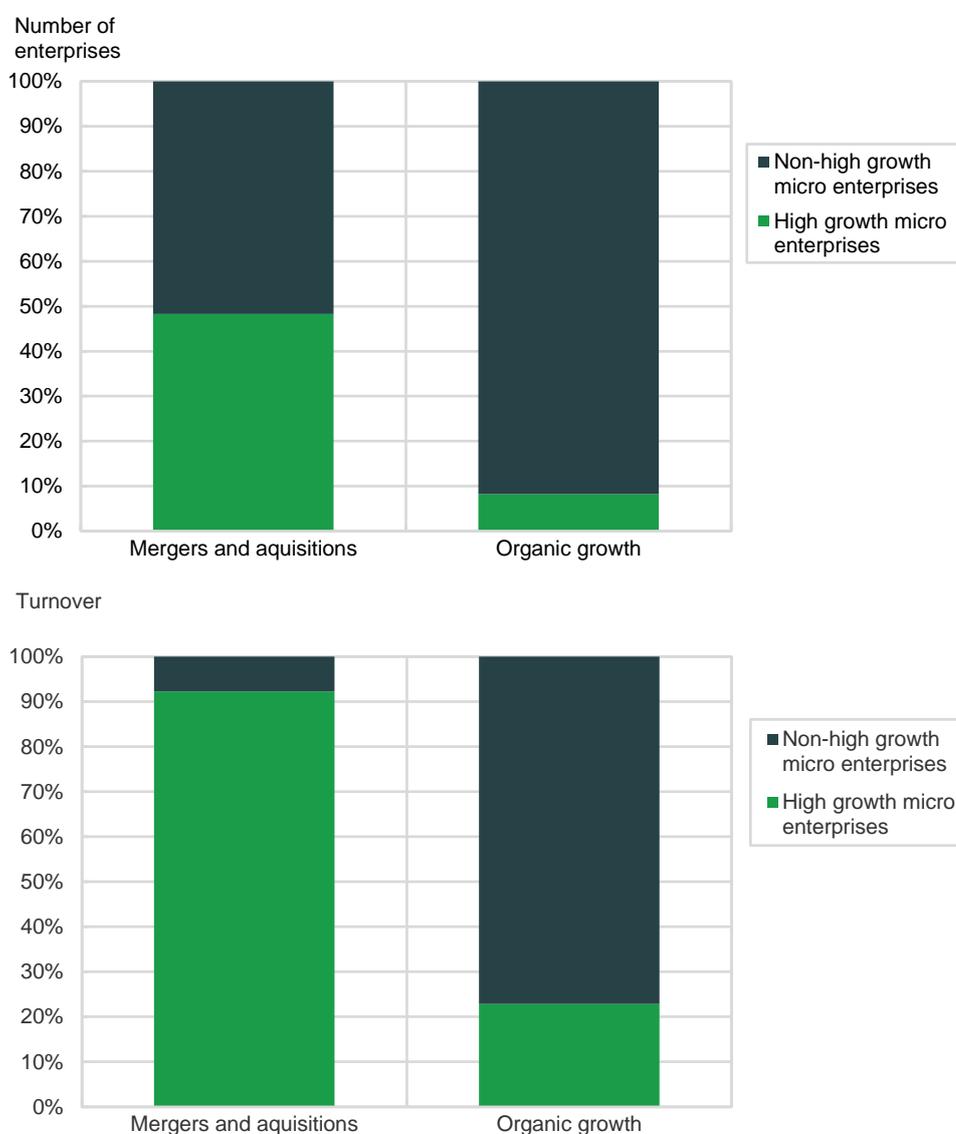
¹ Organic growth, only.
Source: Statistics Norway.

Among those not growing fast the older enterprises are bigger, indicated by their share of the turnover (73 per cent) being larger than their share of enterprises (66 per cent). However, for the high-growthers this difference was, in fact, slightly on the opposite side (53 vs. 54 per cent), indicating that the young high-growthers grew faster and reached at least the size of the older ones by the end of the growth period. This is supported by findings in WP 3, where young ordinary enterprises of maximum 5 years' age were found to have a 12 per cent likelihood of having a 20 per cent annual growth or more over a three years' period, compared to 5 per cent likelihood among older enterprises.

Organic growth versus mergers and acquisitions

Mergers and acquisitions, though few in number, are heavily overrepresented among the micro high-growthers. Nearly half of the micro mergers and acquisitions were high-growthers in 2014 to 2017, while less than 10 per cent among those with organic growth (figure 4.5).

Figure 4.5 High-growth and non-high growth micro enterprises, by type of growth. Number of enterprises and turnover, by per cent. Growth period = 2014-2017



Source: Statistics Norway.

This finding is even more pronounced when it comes to turnover, employees and GVA. Around 90 per cent of these indicators are attributed to high-growthers among mergers and acquisitions, while just above 20 per cent are attributed to high-growthers among enterprises that grew organically. Clearly (and not surprisingly), acquiring establishments contributes significantly to an enterprise's growth.

In some tables, where mergers and acquisitions are not kept apart, the number of high-growthers is clearly affected. However, merging and acquisition does not as such bring growth to the economy, since the values are simply transferred from other enterprises. This supports the decision to keep mergers and acquisitions outside the target population of most tables in this pilot.

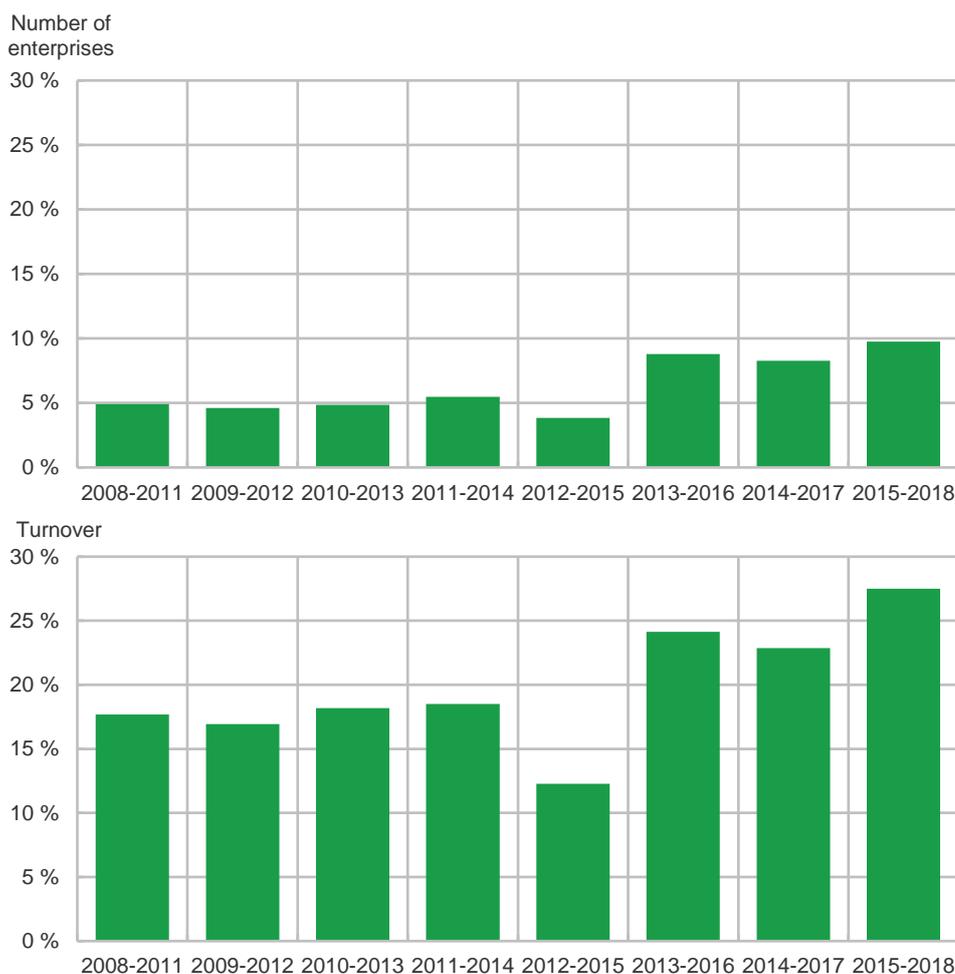
High growth over time and by enterprise size – pilot results and trial estimations

High growth over time

The overall share of micro high-growthers in 2017 was 8.3 per cent, slightly lower than in 2016 when the share was 8.8 per cent, but more than double the share in 2015 of 3.8 per cent. Apparently, the rise in micro high-growthers from 2015 to 2016 was quite steep.

In a former Nordic project, the development in scale-up (box 4.1) occurrence among ordinary enterprises between 2011 and 2016 was analysed (Bøegh Nielsen et al., 2019). A rise in scale-ups from 2015 to 2016 was found in that project, as well, but far from as steep as for the micro high-growthers in this pilot. Enhanced overlap and longer time series were considered necessary to make the comparison of the two studies more certain and increase the validity of the conclusions. The time series on an aggregate level in this pilot was extended to cover the end years from 2011 to 2018, and the results are shown in figure 4.6.

Figure 4.6 High growth enterprises' share of total target population, according to number of enterprises and turnover. By growth period. Growth periods from 2008-2011 to 2015-2018

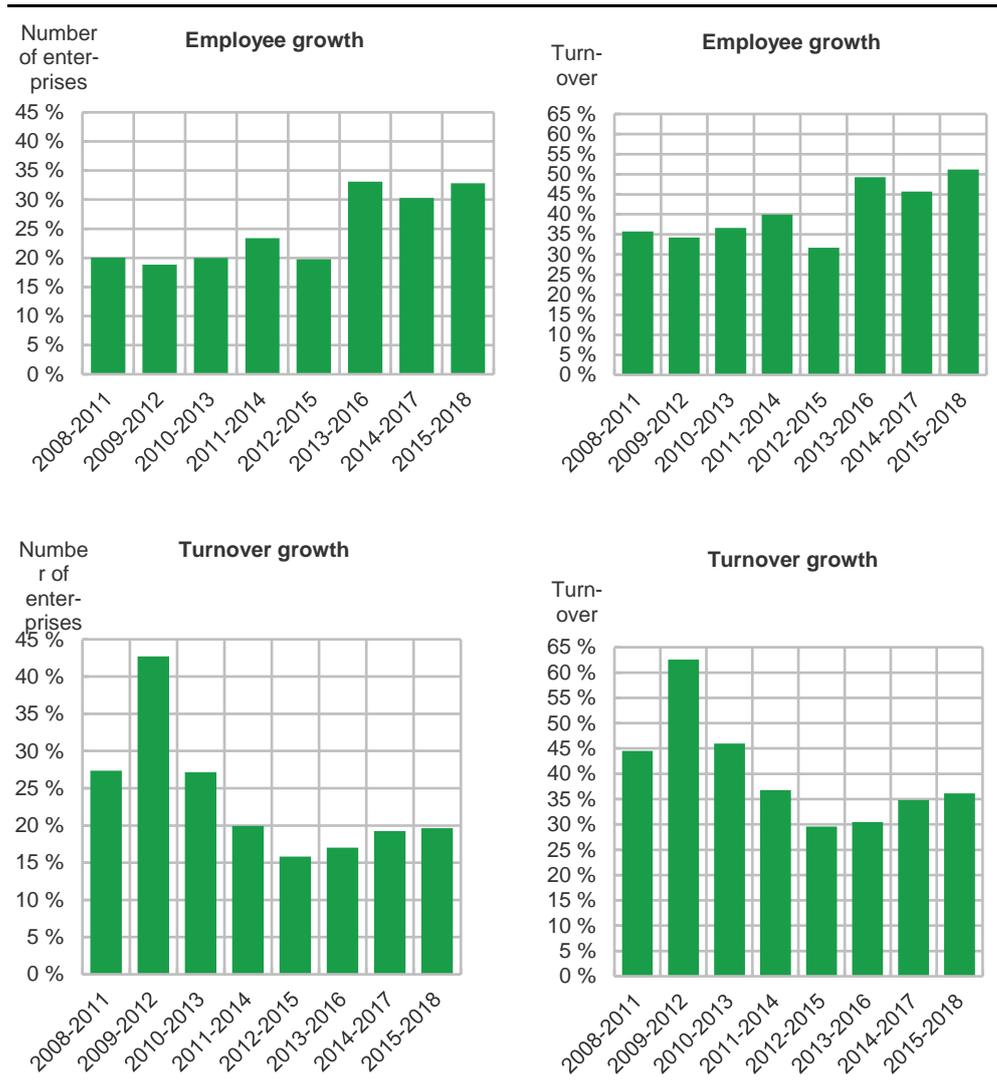


¹ Organic growth, only.
Source: Statistics Norway.

Boks 4.1: Definitions and coverage in the Nordic project on scale-ups.
In the Nordic project the population covered enterprises with a 10 or more full time equivalent number of employees (FTEs) and a 2 million EUR or higher turnover at the starting year of three years periods. Scale-ups comprised the sub-population of enterprises growing in FTEs by at least 20 per cent annually over three years, on average. It covered the periods with end years from 2011 to 2016.

The time series in this pilot did not correspond well with the time series in the Nordic project. Besides the steep rise in high-growthers from 2015 to 2016 found in this pilot, the pronounced peak in occurrence around 2013 found for scale-ups in the Nordic project was not at all found for micro high-growthers in this pilot. There could be several explanations for this discrepancy, and alternative estimates with other high growth definitions were tested (figure 4.7):

Figure 4.7 High growth¹ micro enterprises' share of total target population according to number of enterprises and turnover, by growth period. Growth periods from 2008-2011 to 2015-2018. High growth = 10% or higher annual growth in employees or turnover



¹ Organic growth, only.
Source: Statistics Norway.

The upper panels of figure 4.7 show the share of high-growers when defined as a 10 per cent annual increase in employees during a three years' period. In the left panel the enterprises were measured by their number, while in the right panel they were measured by turnover. In both upper panels a similar pattern as in figure 6 is observed. This indicates that the choice of variable in the high growth definition was more important for the development in high-growther occurrence than was the high growth limit according to that variable.

In the lower panels a similar high growth definition according to turnover growth was applied. The development in high-growther occurrence according to this turnover-based definition is quite different, and coincides much closer to the development in scale-up occurrence found in the Nordic project.

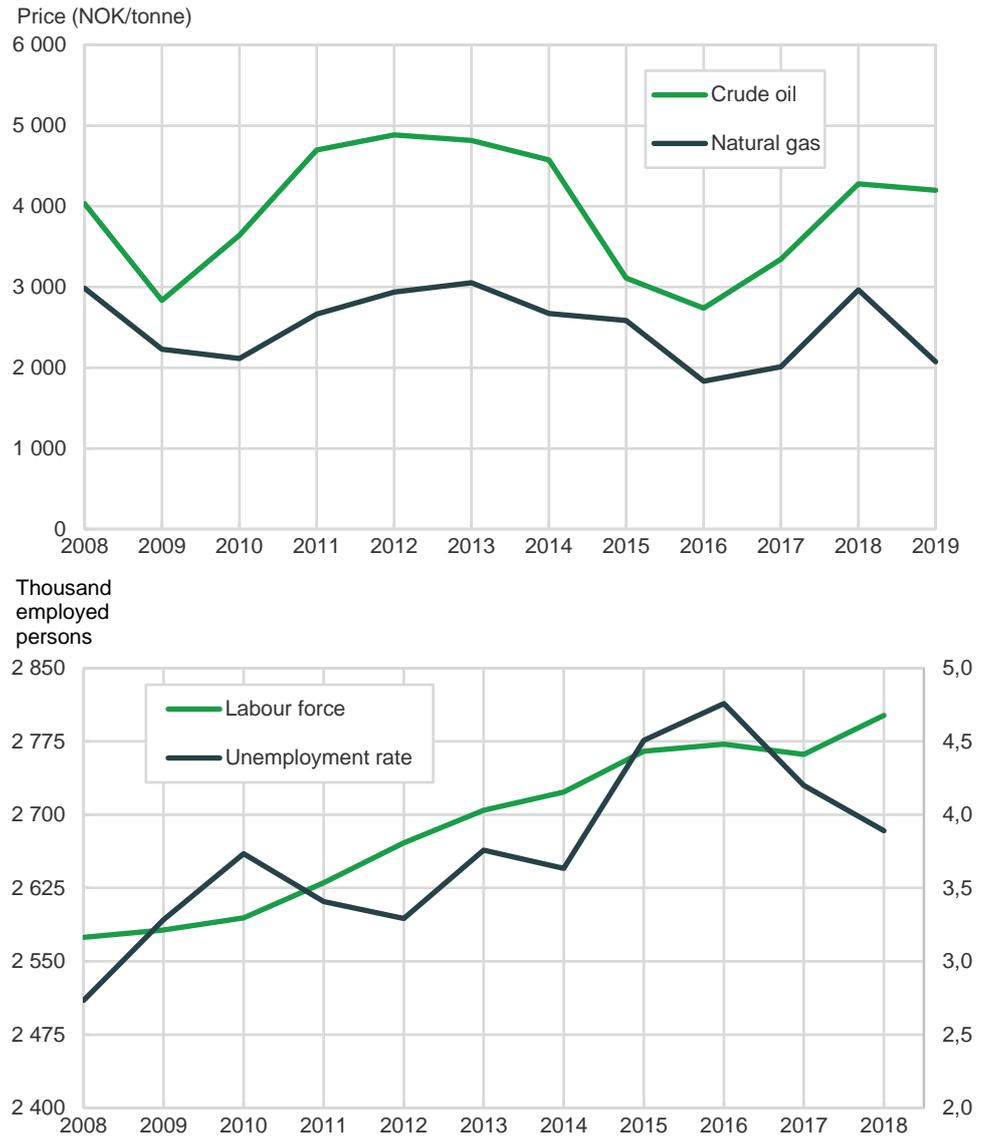
One major difference between the Nordic project and this pilot is that in the Nordic project high growth was defined in terms of full-time equivalents (FTE), while in this pilot number of employees was used. Since FTE more directly measures the activity in the enterprises, it resembles turnover closer than number of employees does. Moreover, from 2015 a new data source on employment, "A-ordningen", was

implemented, in which the coverage due to marginal positions was enhanced. As marginal positions are counted the same as full positions in the number of employees and employed persons, the change in data source affected these two variables significantly, but had insignificant effect on full-time equivalents. This suggests that defining high growth in terms of turnover and full-time equivalents are better choices than defining it in terms of employees or employed persons.

In the Nordic project the development in number of scale-ups corresponded well with the oil price (figure 4.8) during most of the period, as did the number of micro high-growthers defined by relative turnover growth in this pilot. However, the slight increase in scale-ups from 2015 to 2016 was not addressed in the Nordic project and broke with the falling trend in the oil price. The micro enterprises in this pilot continued this slight growth through 2017 and 2018, a period where the oil price recovered markedly. Clearly, the development of the oil price did not resonate well with the development in micro high-growther occurrence from 2015 to 2018 and calls for supplementary explanations.

The size of the labour force and the unemployment rate (figure 4.8) were seen as potential supplementary explanations. Labour force size and unemployment rate were expected to be negatively inter-correlated, and hence have opposite effects on enterprise growth. However, in 2015-2017 the labour force size and unemployment rate were positively correlated. Accordingly, they gave mixed signals regarding high growth rates in this period: The sharp fall in scale-ups in 2015 found in the Nordic study, did not correspond with the marked rise in the labour force in 2015, and the slight rise in micro high-growthers in 2016 and 2017 in this pilot did not resonate well with the slight rise in unemployment rate in 2016 nor with the slight fall in labour force in 2017.

Figure 4.8 Economical drivers in Norway, 2008 to 2018



Source: Statistics Norway (2020a, 2020b).

One plausible supplementary explanation that remained was the Norwegian fiscal policy, which was quite expansive during 2014 to 2016 and gradually became neutral towards 2018 (Statistics Norway, 2019). This expansionary coincides well with the 2013-2016 growth period, and might explain the increase in turnover high-growthers in 2016 in this pilot and in scale-ups in the Nordic study despite falling petroleum prices. It might even explain why the fall in scale-ups in 2015 in the Nordic study was lesser than could be expected from the deep fall in petroleum prices and why the rise in micro high-growthers according to turnover was lesser than expected from the steep recovery of petroleum prices in 2017 and 2018. As it seems, while the development in petroleum prices was the main driver behind the trend in high growth among enterprises between 2008 and 2018, the counter-cyclical expansionary in 2014 to 2016 and to some extent in 2017 had a subduing effect on the depression during these years.

High growth by enterprise size

High growth in relation to initial enterprise size was one of the perspectives in WP1, and several tables with split by enterprise size were made. However, since the number of micro high-growthers is directly determined by the high growth

definition, hence careful considerations must be made for the definition not to discriminate by enterprise size.

As stated above, high growth among micro enterprises was in this pilot defined in terms of absolute growth, to keep the number of micro high-growthers from getting overwhelmingly high. Accordingly, the share of micro enterprises reaching high growth – 8 per cent in 2017 – was a designed effect of the definition. Moreover, a higher growth by per cent was required for small micro enterprises to become a high-growther than for larger micros, and even higher than for ordinary enterprises. Hence, it would not be clear whether differences in high growth enterprise shares among size classes were a result of different abilities to grow fast or an artefact of the definition.

In this Norwegian pilot a trial estimation was performed, in which the uniform and relative (i.e. size indiscriminate) definition of high growth currently being used for ordinary enterprises in the national and the reported BDs (i.e. 10 per cent annual growth in employees), was applied across all enterprise sizes – both micro and ordinary enterprises. In addition, a similar definition of high growth in terms of turnover (i.e. 10 per cent annual growth in turnover) was tested. These were the definitions of high growth used in figure 7 (above). Furthermore, definitions of large decline being mirror images of the high growth definitions (i.e. 10 per cent annual decline) were tested.

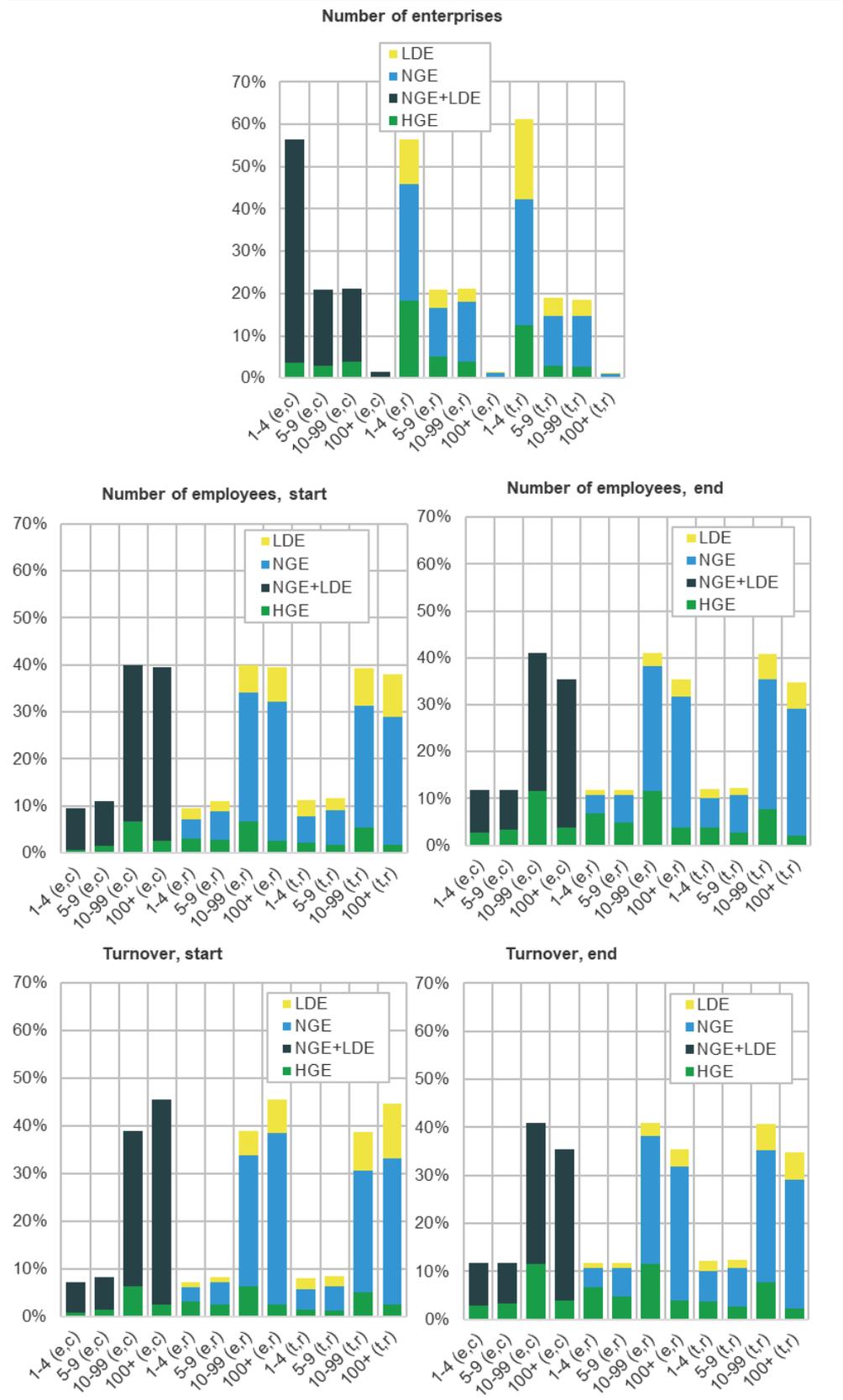
These estimations were compared against a combined definition based on the one applied for micro enterprises in this pilot (i.e. absolute growth by 4 or more employees) and the one used in the national and reported BDs for ordinary enterprises, with a kink point at 10 employees' enterprise size.

In the trial estimations using a high growth definition in terms of employees, enterprises with positive number of employees at period start and enterprises with non-missing employees at period end were included. In the trial estimation using a high growth definition in terms of turnover, enterprises with positive number of employees and turnover at period start and enterprises with non-missing turnover at period end were included. In all trial estimations industry B (Mining and quarrying) were excluded, due to change of accounting principle in the tax statement between 2014 and 2015 from gross to net accounting of operating income⁵.

The number of employees and turnover were measured at both start and end of the growth period, and the growth period measured was 2014-2017. The results are shown in figure 4.9.

⁵ This change in accounting principle resulted in an over-estimation of large decline enterprises in industry B, with a massive impact on the size group +100 employees when measured as turnover at period start.

Figure 4.9 Enterprise growth¹. By size group². (Growth type³ and high growth definition⁴ in parentheses.) Growth period = 2014-2017



¹ HGE = high growth enterprise, NGE = non-growth enterprise, LDE = large decline enterprise.

² Number of employees at start of growth period.

³ e = growth in number of employees, t = growth in turnover.

⁴ c = combination of absolute growth by 4 or more employees for micro enterprises and relative growth of 10 per cent per year for ordinary enterprises, r = relative growth of 10 per cent per year for all enterprises.

Source: Statistics Norway.

The trial estimations show higher dynamics among the smallest enterprises, with considerably bigger shares of both high growth enterprises (HGEs) and large decline enterprises (LDEs) when applying the uniform and relative high growth and large decline definitions. However, when measuring enterprise growth and enterprise size by period start in terms of employees, the ordinary enterprises make a bigger part of the total HGEs than do the micro enterprises. When measuring it in terms of turnover, the difference in favour of ordinary enterprises is even bigger. This shows that measuring high-growers in terms of employees or turnover is a realistic alternative to twisting the high growth definition in order to weight down the overwhelming number of micro HGEs.

When instead employees and turnover were measured by period end, a clear increase in high-growther occurrence was observed and the increase in relative terms was largest for the micros. This implies that the growth by per cent in employees and turnover was higher among the micro HGEs than among the ordinary HGEs.

The trial estimation of large decline shows that the dynamics were fairly balanced in most categories, in the sense that the share of high-growthers and large-decliners were fairly at the same level. When measuring the enterprises in terms of employees the high-growthers' share is somewhat bigger, while when measuring them in terms of turnover the large-decliners' share is a bit bigger. This applies to high growth and large decline both according to employees and according to turnover. However, for the biggest size group, i.e. 100 or more employees at period start, large-decliners held substantially bigger shares all over. Apparently, maintaining a large enterprise size is demanding in Norway.

The uniform and relative kind of definition has some obvious benefits. In addition to those already mentioned, they can be applied on turnover, while this is not possible for the combined definition due to an ambiguous kink-point at 10 employees. Moreover, they can be used to estimating the number of large decline enterprises by the mirror definition, i.e. 10 per cent annual decline. This would make no sense when using the combined definition as the starting point, as the mirror definition would require an absolute decline of 4 employees even for enterprises having 3 or less employees at the start of the growth period. The uniform and relative kind of definition is also easier to compute, and it is more readily used in numerical models making it more applicable to further analyses.

The combined high growth definition gave an impression that the dynamics of the micro enterprises was lower or about the level of the larger ones, depending of the measure used, while this was actually a designed effect of the definition. As described above, the dynamics of the micro enterprises were, in fact, larger. This, as well, speaks against using a high growth definition based on absolute growth for the micro enterprises.

One possible advantage of the combined definition is its ability to elucidate the highest growth among the smallest micro enterprises. This might yield more precise signals to politicians on the effects of political measures to stimulate growth among micro enterprises.

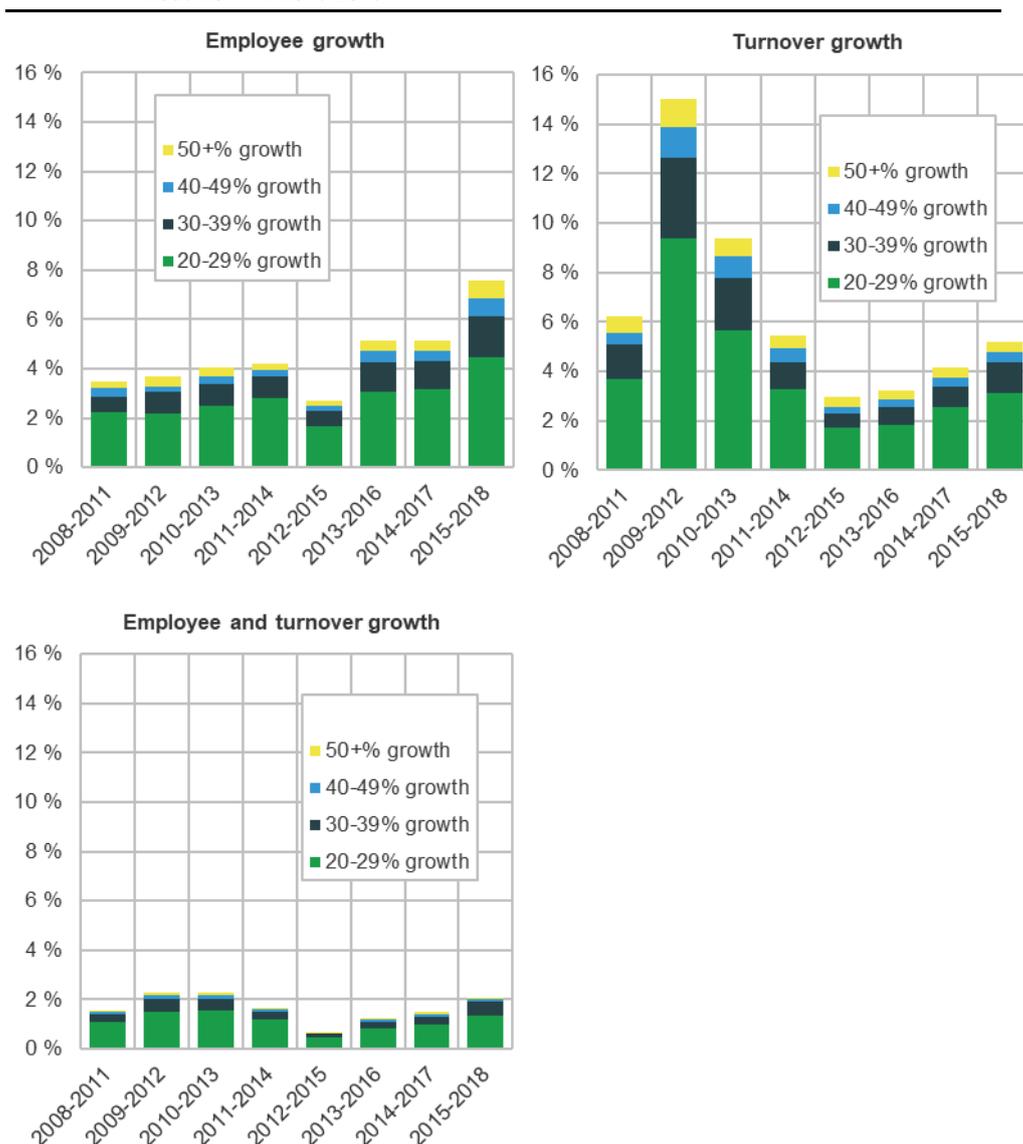
However, the uniform and relative kind of definition is more versatile and allows a broader, more representative and more transparent picture of the business dynamics to be analysed. To analyse how and to what degree enterprise dynamics are affected by enterprise size is a natural topic within business dynamics, and seems as a more reasonable choice than making steps to level out such differences by twisting the definition of high growth.

4.2. Scale-ups, young high-growthers and prominent enterprises

Scale-ups

The share of employee scale-ups in 2017 was 5.1 per cent, which is within the range of the Nordic countries and slightly more than the Norwegian share in 2016, according to the Nordic study. The share was almost doubled from 2.7 per cent since 2015. The share of turnover scale-ups rose more gently, from 3.0 per cent in 2015 to 4.2 per cent 2017. To increase the validity of the assessment, the time series was extended on an aggregate level to cover all growth periods from 2008-2011 to 2015-2018 (figure 4.10).

Figure 4.10 Employee and turnover scale-ups, by annual growth rates¹. Per cent of population. 2008-2011 to 2015-2018.



¹ Organic growth, only.
Source: Statistics Norway.

The same patterns as for the micro enterprises now appeared for the scale-ups. Scale-ups according to employee growth showed a gentle growth through most of the time series, with a distinct depression in the 2012-2015 period. Scale-ups according to turnover growth, on the other hand, showed a large peak in the 2009-2012 period, followed by a depression around the 2012-2015 period and a gentle

increase from there. This suggests that the same drivers and sources of error, which was found to explain the trend of micro high-growthers, apply for scale-ups, as well. The distinct dip in employee scale-ups and micro high-growthers in the 2012-2015 period calls for a closer scrutiny to reveal how the levels are affected by the implementation of “A-ordningen” as a new data source on employment.

Growing in both employees and turnover was evidently much harder than growing in just one of these variables, at least when looking at simultaneous growth. Typically, between one half and one fourth of the scale-ups according to one of these variables – the one with the lowest scale-up occurrence – were scale-ups according to both.

Boks 4.2: Scale-up definition

Scale-ups were defined as enterprises with at least 20 per cent annual growth in employees and/or turnover over a 3-year period, having at least 10 employees and 2000 EUR turnover in the starting year of the period, and non-missing employees in the ending year. Mergers and acquisitions were excluded⁶.

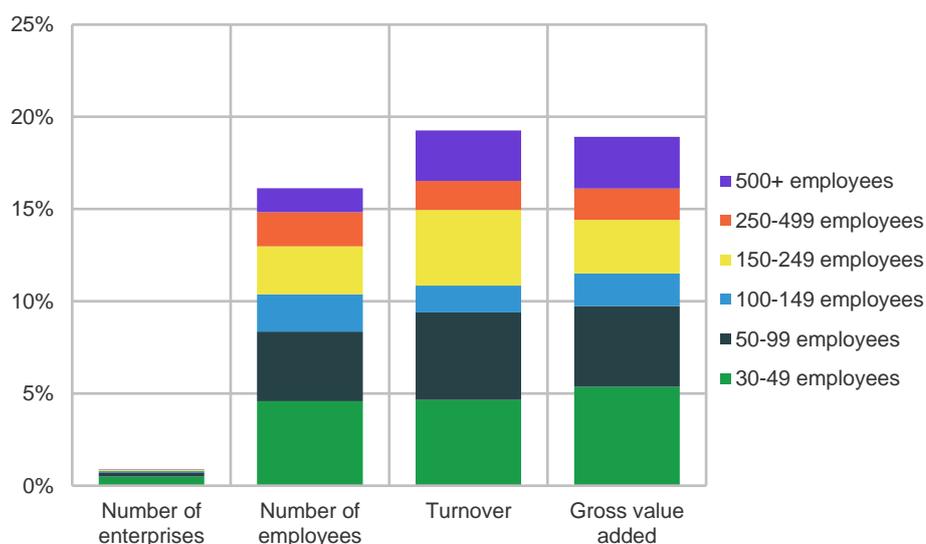
Employee scale-ups were most frequent in industry I (Accommodation and food services) in 2017, while for turnover scale-ups the picture was mixed with several prominent industries. Scale-ups according to both employees and turnover were most frequent in industry J (Information and communication), but when measured in terms of employees, turnover and GVA scale-ups in industry I comprised the biggest contribution to their industry.

Young enterprises were more likely to become a scale-up than older ones. Enterprises being 4 or 5 years old had a 10-12 per cent likelihood of becoming a scale-up according to either employees or turnover in 2017, and 6 per cent likelihood according to both variables. For older enterprises, the respective likelihoods were 4-5 per cent according to one variable and 1 per cent according to both.

Young high-growthers

Another way of measuring high growth is to place young enterprises in size categories. The bigger size at the end of the analysed period, the faster was the growth during the period.

Figure 4.11 Maximum 10 years old enterprises, by size. Per cent of all size groups. 2017.



All growth types are included.
Source: Statistics Norway.

⁶ This differs from the definition set out by the Eurostat project leaders.

The population in figure 4.11 includes enterprises created no earlier than 2008. They started with 1 to 9 employees and had a non-missing number of employees in 2017. Mergers and acquisitions were included.

An overwhelming share of these young enterprises in 2017 - 99 per cent - had not reached 30 employees. Of those reaching 30 employees, mergers and acquisitions are assumed to comprise significant fractions. This shows that growing big in short time was very difficult for enterprises in Norway.

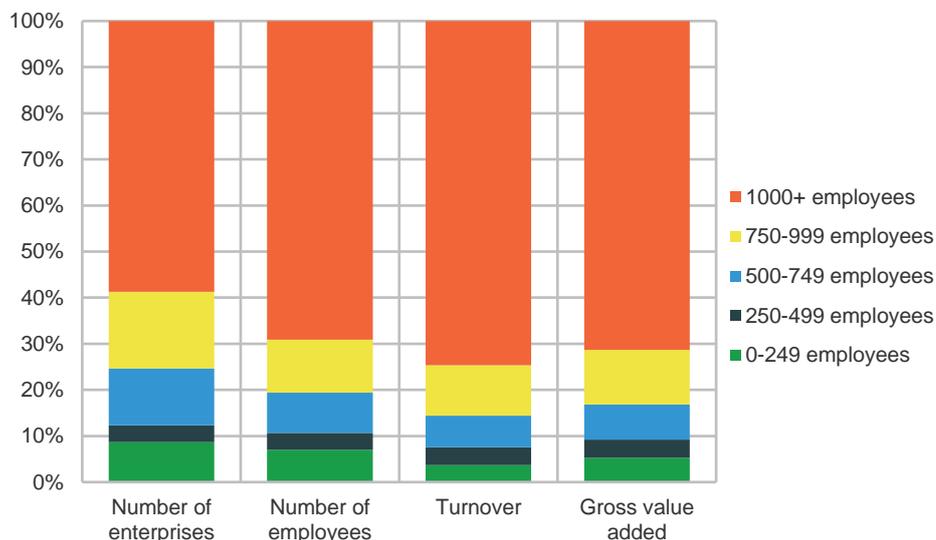
Again, being part of a group proved beneficial for enterprise growth, increasing the likelihood of reaching 30 employees within 9 years by nine-fold from 0.35 to 3.1 per cent, compared to independent enterprises. Being part of a group applied to 20 per cent of the young enterprises, but 69 per cent of those reaching 30 employees. Group participation increased employment, turnover and GVA in the enterprises, regardless of size category.

Among the economic activities, industry N (Administrative and support services) stood out with many young enterprises growing fast. This industry had a four-time higher share of enterprises reaching 30 employees than the population average, and 46 per cent of the employment in young enterprises was in enterprises with at least 30 employees, compared to the average of 16 per cent for all industries. The shares of turnover and GVA in industry N being produced by +30 employee enterprises were 32 and 47 per cent, respectively, compared to 19 per cent for all industries, indicating that growth in employment was not necessarily followed by an equally large growth in turnover and value creation.

Prominent enterprises

Yet another way of exploring growth in this pilot was to assess the growth pattern among the most prominent enterprises, i.e. those having at least 1000 employees, by estimating the size distribution nine years before (figure 4.12).

Figure 4.12 Prominent enterprises in 2017, by size group in 2008



All growth types are included.
Source: Statistics Norway.

Norway had 150 enterprises with at least 1000 employees in 2017. These prominent enterprises comprised 0.9 per cent of the enterprises with reported employment in the population, but 16 to 20 per cent in terms of employment, turnover and GVA. Of these, 138 were found in the 2008 population, while the

remaining 12 were either not yet established or restructured in ways that rendered them unidentified in the 2008 population.

Almost 60 per cent of the prominent enterprises in 2017 had at least 1000 employees in 2008 as well. On the other hand, 8.7 per cent had less than 250 employees, implying an annual average growth by at least 16.7 per cent in 9 years. For comparison, the share of ordinary enterprises growing in employees by at least 20 per cent annually over 3 years towards 2017 was 4.8 per cent. Mergers and acquisitions are included in the figures in this pilot and parts of the fastest growing enterprises are assumed to be due to this. Moreover, growth levels and period lengths differ. Accordingly, the figures are not entirely comparable. Still, and with support in what was found in the longest after-growth perspective of WP 2 (section 4.3), it is reasonable to conclude that high and sustained growth was a more common feature for prominent than for other enterprises.

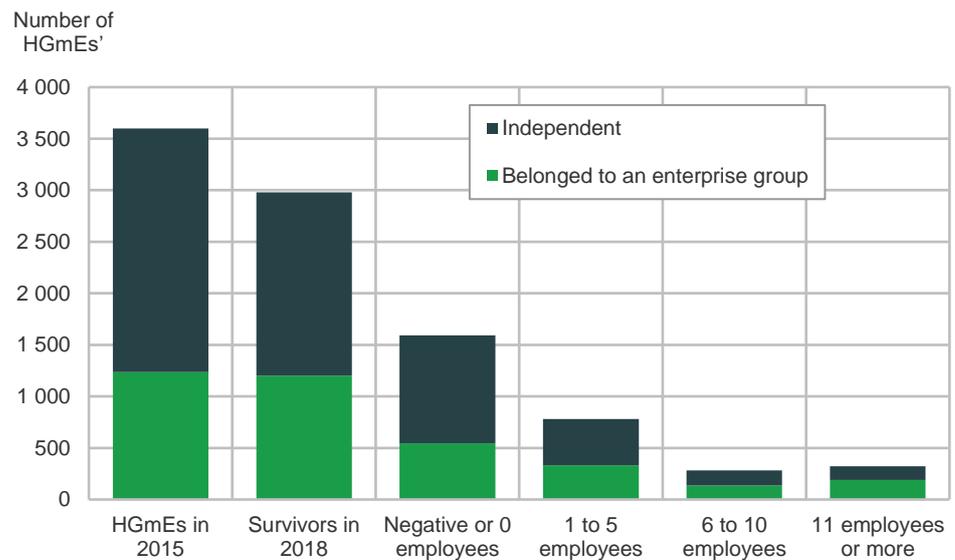
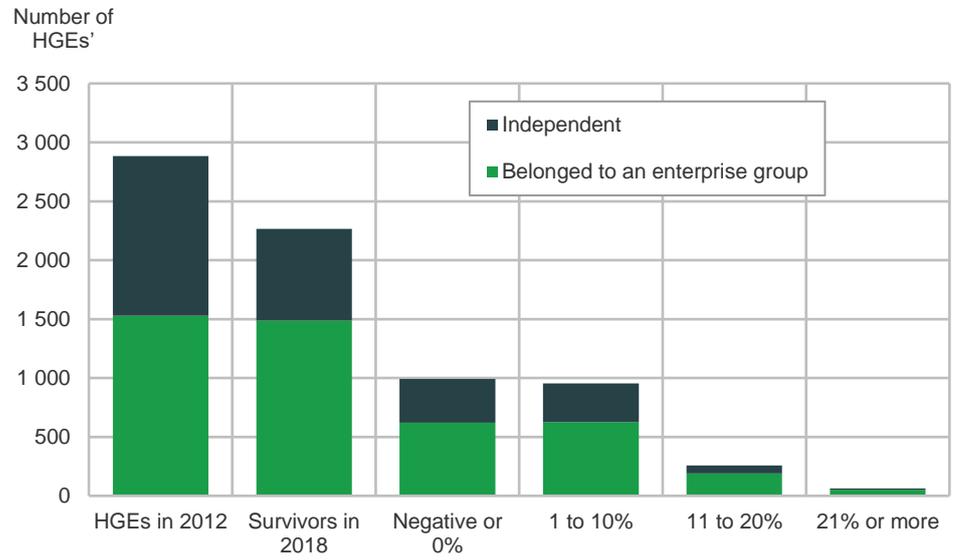
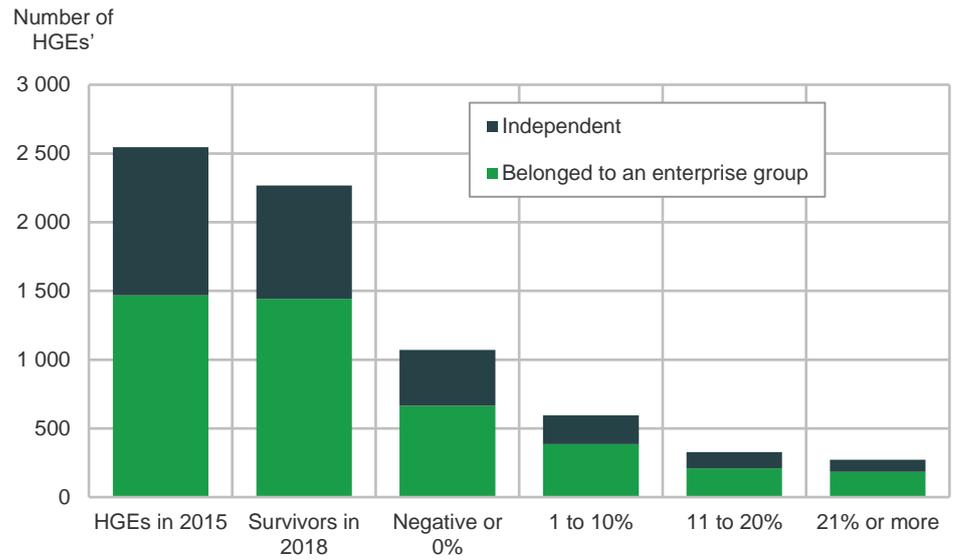
4.3. The after high growth perspective

Three different categories of enterprise sizes and growth periods after high growth were assessed in this pilot:

- 1) *Ordinary* high growth enterprises (HGEs) during a *three* years' after-growth period.
- 2) *Ordinary* high growth enterprises (HGEs) during a *six* years' after-growth period.
- 3) *Micro* high growth enterprises (HGmEs) during a *three* years' after-growth period.

In all three categories more than half of the survived high growth enterprises – 53, 56 and 61 per cent, respectively – had zero or negative after-growth (figure 4.13). The share of enterprises maintaining high growth through the after-growth period was 27, 14 and around 25-30 per cent in the three categories. The share of the micro enterprises is given as an interval, as the growth groups in WP 2 did not coincide entirely with the high growth limit for micro enterprises.

Figure 4.13 After-growth in HGEs of 2015 and 2012 and in HGmEs of 2015, by group participation. 2018



All growth types are included.
Source: Statistics Norway.

Mergers and acquisitions were included in the after-growth period, and contributed to the share of high-growthers. Despite this bias, it seems reasonable to conclude that high-growthers were more likely to grow fast in the next three years' period than non-high-growthers. This hold particularly true for micro enterprises, where high growth in the total population was found in 10 per cent of the enterprises in 2018, but also for ordinary enterprises, which had an overall high-growther share of 16 per cent the same year. The lower share of enterprises meeting the high-growth criterion in category 2 relates to the obvious fact that it is harder to maintain a high growth rate over six years than over three.

In the after-growth perspective it again shows that being part of an enterprise group promotes growth. The higher growth rate, the larger share of the enterprises was part of a group. It also promotes surviving (table 4.1).

Table 4.1 Group participation of high growth enterprises (per cent). By enterprise size, after-growth period, and survival and after-growth rates in per cent (employees). 2018.

Enterprise size and after-growth period	All	Survivors	Negative or 0	1 to 10 (1 to 5)	11 to 20 (6 to 10)	21 or more (11 or more)
Ordinary, 3 years after-growth	57.7	63.7	62.0	64.8	63.8	67.3
Ordinary, 6 years after-growth	53.0	65.7	62.7	65.8	73.5	79.7
Micro, 3 years after-growth	34.4	40.4	34.2	42.6	48.4	58.4

Source: Statistics Norway.

More than half of the ordinary enterprises with high growth prior to the base year (2015 or 2012) were group participants in 2018, while just above one third of the micro enterprises. Group participation was clearly more common among the larger (ordinary) high-growthers. Survivors had a 6-9 percentage points higher share of group participants than the total group of previous high-growthers, while very few of the terminated ones were group participants.

The share of group participants increased with growth rate in the after-growth period. The most pronounced trend was found among the previous micro high-growthers with 34 per cent group participants among those having negative or 0 after-growth between 2015 and 2018 and nearly 58 per cent group participants among those with 11 or more employees' after-growth – an increase by 24 percentage points. Micro enterprises clearly benefitted a lot from participating in groups, but the figures are also somewhat biased by mergers and acquisitions.

For ordinary high growth enterprises of 2012 the share of group participants increased from 63 per cent among those having negative or 0 after-growth to nearly 80 per cent among those having 21 per cent or more annual growth – an increase by 17 percentage points. To maintain a persistent high growth in ordinary enterprises, group participation is also clearly beneficial. For ordinary high growth enterprises of 2015 the share of group participants increased by only 5 percentage points with increased after-growth, possibly because maintaining high growth over a shorter period is not as demanding.

Industry J (Information and communication) had the highest share of sustained high growth among industries. Industry F (Construction) had a large share of ordinary high-growthers with sustained high growth in the three years prior to 2018, while industry N (Administrative and support services) had a large share of ordinary enterprises with sustained high growth in the three years prior to 2015. There were small differences between old and young enterprises in the ability to maintain high growth.

4.4. International participation

All countries participating in the pilot are presented in table 4.2. Results from these countries will be presented in a joint written report by Eurostat, as well as a written

report by each participating country. Those results may be used for international benchmarking of results from the Norwegian part of the pilot.

Table 4.2 Countries participating in the pilot, by working program

Country	WP 1	WP 2	WP 3
Austria	x	x	
Bulgaria	x	x	
Croatia	x	x	
Denmark	x	x	x
Estonia	x	x	
Finland	x	x	x
Lithuania	x	x	
Netherlands	x	x	x
Poland		x	
Portugal	x	x	
Sweden	x	x	x
Iceland	x	x	x
Norway	x	x	x

Source: Eurostat

5. Recommendations

5.1. Recommendations

Size independent definition of high growth – and large decline

In this pilot, high growth among micro enterprises was defined in terms of absolute growth, and not relative growth as for the ordinary enterprises, to avoid an overwhelming number of high-growthers. This introduces a shift in high growth definition between ordinary and micro enterprises, and impairs the comparability across size. If instead the relative and size independent definition of high growth had been chosen, which is currently used for ordinary enterprises in the national and the reported BDs, the share of enterprises experiencing high growth could be compared across enterprise size.

Moreover, by introducing definitions of large decline as mirror images of the high growth definitions, a more comprehensive and balanced picture of the enterprise dynamics could be given.

In fact, to analyse if and eventually to what degree enterprise dynamics are affected by enterprise size is a natural topic within business dynamics, which seems a more reasonable choice than making steps to level out differences by twisting the high growth definition. This would, in turn, provide a basis for meaningful comparisons of high growth enterprises between micro and ordinary enterprises, including their number of employees, full-time equivalents and turnover, in order to assess their respective contributions to the economy.

High growth definitions better reflecting the activity level and reducing uncertainty

The activity level is better reflected by turnover and FTE than by number of employees. This applies to all enterprise sizes, but is particularly evident for the smallest ones, because all positions, including marginal ones, are counted by head employee. Moreover, implementation of “A-ordningen” data on employment in 2015 caused a positive shift in the coverage of very minor positions in the Norwegian data. This illustrates that the uncertainty, or even bias, might be higher in the number of employees than in turnover and FTE. Both speak for defining high growth in relative terms by turnover and FTE instead of employees.

Consistence between high growth definition and after-growth groups

The high growth definition and growth groups in the after-growth period for micro enterprises were inconsistent. In future updates of these tables, it should be

considered lowering the limit from 5 to 3.31, or 4 due to rounding, between growth group 2 and 3. This would allow the share of micro high-growthers that maintained high growth during the after-growth period to be precisely determined.

Consistent founding years

In this Norwegian pilot, where new enterprises acquired establishments, the founding year of the enterprise was defined as the founding year of the oldest unit in the enterprise, either the enterprise itself or the oldest establishment. This follows the idea behind the treatment of merging and takeover in BD on survival. However, the founding year of an enterprise in the national BD on survival is never adjusted, and consequently the founding year of the youngest enterprise is kept. It should be considered making the definition of founding year in cases of merging and acquisitions consistent between these two statistics.

Moreover, the treatment of time lag in registrations and late backdatings in the national BD on survival leads to differences between cohort year and founding year for a number of enterprises (i.e. a given cohort contains older enterprises). It might be worth to consider altering the cohort definition in the national BD on survival, into defining cohorts by the enterprises' founding year.

There are differences in methodology and definitions between the national and reported BDs. Reconciling these two statistics within the requirements in the reporting should be considered.

5.2. Further work

The relation between employee growth and turnover growth

High turnover makes it possible to have more employees in the next run, while increasing the number of employees might increase the turnover in the longer run. In order to bring deeper insight into what comes first of turnover growth and employment growth, two different types of alternative WP 2 tables could be considered:

- High growth in terms of *turnover* and after growth in terms of *employees*.
- High growth in terms of *employees* and after growth in terms of *turnover*.

Moreover, comparing these two tables would give a measure of which is the more common way of growing, and could lead to valuable information on obstacles to growth.

The relation between high growth and export

Being an exporter might be positively or negatively related to high growth, as it indicates a dependence on international markets. Exploring export in relation to high growth, including a comparison of export characteristics between high-growthers and non-high-growthers, could provide deeper insight to the impact of entering global markets on enterprises' growth.

The significance of foreign ownership

Another aspect of globalization, which could also influence on enterprise growth, is the nationality of the owner of the enterprise. The nationality of the global group head (GGH), i.e. the group leading company, and the global decision centre (GDC), i.e. the head quarter of the group, are found in the business register. The ultimate controlling institutional unit (UCI), which could be a private person, a public institution or an enterprise inside or outside the group, is found in the IFATS statistics. All represent relevant and different aspects of ownership, which could provide valuable insight to the drivers behind enterprise growth.

Alternative splits by economic activity

Alternative splits by economic activity, e.g. high, moderate and low technology intensity, as in the Nordic study, emission intensity or energy intensity, could provide valuable insight to segments of the industries characterised by alternative aggregates of NACE or going all across the NACE standard.

References

- Bøegh Nielsen et al., 2019: Peter Bøegh Nielsen, Kalle Emil Holst Hansen and Kamilla Elkjær (Statistics Denmark), Henri Luomaranta, Pontus Lindroos and Olli-Jussi Sonni (Statistics Finland), Alina Kerul and Gísli Már Gíslason (Statistics Iceland), Øyvind Hagen and Jan Olav Rørhus (Statistics Norway) and Andreas Poldahl (Statistics Sweden). Published 14 May 2019. Scale-ups in the Nordics. Statistical Portrait 2008-2016. ISBN 978-82-8277-091-0. Nordic Innovation.
- EU, 2008: Published 11 March 2008. REGULATION (EC) No 295/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL. Amended with COMMISSION REGULATION (EU) No 446/2014, published 2 May 2014. Official Journal of the European Union.
- EU, 2014: Published 29 April 2014. COMMISSION IMPLEMENTING REGULATION (EU) No 439/2014. Official Journal of the European Union.
- EU, 2020: Last modified 26 November 2014. Statistics explained (http://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:High-growth_enterprise). Eurostat.
- Statistics Norway, 2019: Published 7 March 2019. Upturn in Norwegian economy continues, but with clouds on the horizon. Link to detailed report in Norwegian (Internasjonal og norsk økonomi med Økonomisk utsyn over året 2018) in the Norwegian version of the article. Statistics Norway.
- Statistics Norway, 2020a: Published 16 November 2020. External trade in goods. Statistics Norway.
- Statistics Norway, 2020b: Published 22 October 2020. Labour force survey, seasonally-adjusted figures. Statistics Norway.
- Statistics Norway, 2020c: Published 30 September 2020. Newly established enterprises, survival and growth. Statistics Norway.

Appendix A: Abbreviations

BD = business demography

BD on survival

= business demography on newly established enterprises' survival and growth

BR = business register

GVA = gross value added

HGE = high growth enterprise

HGmE = high growth micro enterprise

SBS = structural business statistics

Survival and growth statistics

= business demography on newly established enterprises' survival and growth

WP = working program

Appendix B: Templates for methodological reporting

Responding country: Norway

WP I on Micro HGEs

Methodological questions on High Growth Enterprises development project

As generally in pilot projects, the idea of this brief note is to collect some of the experiences and problems related to the current pilot data collection in participating countries. We collect these experiences already now right after data compilation, since it is probably still well in your memory! Please attach this methodological part also to your final report when the project ends.

We have also received separately questions which we have responded by further explaining and sometimes by launching a quick e-mail consultation to you. Please report below any concerns and comments you may have on the project WP I. **Please also report below under relevant heading if you were not able to submit all tables / variables / breakdowns fully in line with what was defined in the project.**

Finally, there are open questions where we hope you could elaborate your views and ideas what could be done better, what could be the most successful way to expand the project into Micro Data Linking i.e. which statistics / variables would be the most feasible to be linked in your view. Please also assess the feasibility and relevance of collecting this data on regular basis in the future.

Please note, that your proper answers are critical in order to at the end make an overall / summary assessment and future work proposals of WP I on Micro HGEs.

Data extraction

Please report your experiences of this project as regards to providing the requested data. If there were specific challenges, etc.:

Your comments: No specific problems of getting data. Microdata are readily available back to 2007, except gross value added, which is available back to 2008. With some extra effort microdata are available back to 1980.

It should be noted, however, that there is a slight inconsistency between the tables delivered in this grant, compared to the Norwegian statistics on new enterprises and their survival and growth. In this grant, the enterprises' birth year is defined by the birth date as registered by ($t+21$ mths). In the Norwegian statistics, on the other hand, new enterprises are defined as all enterprises added to the business register in the reference year, as measured at ($t+4$ mths). Accordingly, backdatings of enterprise births performed between ($t+4$ mths) and ($t+21$ mths) are covered by grant, but not by the statistics on new enterprises and their survival and growth. Around 4 per cent of the enterprises counted as new at ($t+4$ mths) were, in fact, born the year before, according to the population in this grant. The population used in this grant is derived from the Norwegian final statistics on business demography.

Breakdowns used

BD size classes:

02 = 1-4 employees

03 = 5-9 employees

Employee size classes are determined in the beginning of growth ($t-3$), it is annual average.

Your comments: In the Norwegian tables, the number of employees in a given year is the reported number of employees in the mid week of December. The employee size classes are determined in the beginning of growth ($t-3$), and accordingly the number of employees is the reported number in the mid week of December in $t-3$.

Legal form

SP - Sole proprietorship

LL - Limited liability company

PA - Partnership and other legal forms

Your comments: Legal form is defined in the reference year t . The legal form is a variable in the business register, and the dating of the legal form corresponds to the enterprise birth date. The legal form does not change during the enterprises' life time.

The legal forms covered coincide with the business demography (BD) population, in which several legal forms are excluded. These are legal forms not meant for business, for instance bankrupt estates, office communities, voluntarily registered rental buildings, and joint properties according to property law.

A change in the legislation from 1/1-2012 reduced the share capital required to establish a limited liability company (LL) from 100 000 NOK (appr. 10,000 €) to 30 000 NOK (appr. 3,000 €) and simplifying the audit for the smallest LLs. This change leads to an increased number of LLs from this year onwards.

NACE total (B to N and S95)

TOTAL (B to N and S95) Current total used for HGEs

Manufacturing (Section C)

Construction (Section F)

Wholesale and retail trade (Section G)

Accommodation and food services (Section I)

Information and communication (Section J)

Professional, scientific and techn. Act. (Section M)

Administrative and support services (Section N)

Other activities (B to N and S95, excluding C, F, G, I, J, M and N)

As in HGE the NACE of growing enterprises is defined in the reference year t .

Your comments: The activity codes (NACE) are (of course) on the population file, and hence readily available. The activities covered coincide with the business demography (BD) population, in which Section A (Primary industries) and Section O (Public administration and defence) are excluded.

Age of enterprise

- 5 years old or less
- more than 5 years to 10 years
- 10 years or older

Your comments: The enterprise age is defined by the establishing date, as reported by the entrepreneur. In exceptional cases, the age is defined according to other sources from which the enterprises' existence was first known. The enterprise age is considered to be of fairly good quality back to 1996. For older enterprises, there is a congestion of registered enterprise births in 1995, which was the establishing year of the national business register in Brønnøysund (Statistics Norway had its own business register long before that).

In cases where a newborn enterprise takes over older establishments, the enterprise is defined as being survived by takeover. In such cases, the enterprise age was counted as the age of the oldest establishment.

Group status

- Independent
- belongs to a group

Your comments: The group status was derived from the group number in the business register. All enterprises being part of a group have a group number, and accordingly all enterprises having a group number were classified as dependent. The remaining enterprises were classified as independent.

Organic vs 'gross growth'

- organic
- 'gross growth' including organic growth as well as mergers and takeovers etc.

Your comments: Mergers and takeovers were identified as establishments where the enterprise number changed within the reference period. Enterprises with this kind of establishments were included in 'Gross growth', but excluded from 'Organic'.

Variables

Variables included were the number of enterprises, employees, persons employed, turnover and gross value added. The values for variables turnover and value added should be reported in 1000 euros.

Your comments:

The number of enterprises is simple to compute and a natural choice of variable, since this variable is also reported in the statistics on high-growth enterprises (HGEs).

Number of employees is based on the reported number in the mid week of December, as described above in the section on BD size classes. The number has been controlled against a.o. hours worked and payment.

The variable contains some erroneous missing and zero values. When missing values occur in the starting year or end year of the reference period, the enterprise is excluded from the tables. When erroneous zeros occur in the end year, the enterprise is included in the 'Other' category

showing no high-growth. The number of erroneous zeros is not estimated, but based on inspection it is assessed to be low compared to the rest of the 'Other' category.

Employed persons is counted as the annual average, and derived from the structural business statistics (SBS). It builds on the same sources as the number of employees, but there are some differences. It is defined as number of employees plus the owner(s). However, the number of employees in SBS is the average of midweeks of all months of the year. This average is controlled against part-time workers and full-time equivalents, and added owner(s) to yield the number of persons employed. Accordingly, the relation between employed persons and employees + owner(s) is approximate in our tables.

Employed persons is on the population file, and hence no micro data linking (MDL) is necessary. It might be a good alternative to employees, as it covers the average for the entire year. On the contrary, the final numbers are not available until ($t+21$ mths) while the number of employees is available at ($t+3$ mths).

Turnover is on the population file, and hence no MDL is necessary. It is derived from SBS, and the final numbers are available on the population file at ($t+21$ mths).

Gross value added (GVA) is not on the population file, and hence the micro data must be linked. It is derived from SBS, and the final numbers are available approximately at ($t+16$ mths). Data are available back to 2008.

Missing GVA values for enterprises within categories in the tables are counted as 0, in order to have the number of enterprises consistent for all variables. In table 1-3 missing GVA values were found in 19 per cent of the enterprises in 2017, of which 7 per cent had a positive turnover. Practically all were in the activity group 'Other', and they were proportionately distributed between high-growth and non-high-growth enterprises.

Growth periods

Applied:

2012 - 2015

2013 - 2016

2014 - 2017

Your comments: All three periods has been estimated without problems. The data program developed for the project was designed so that only the reference year at the start of the session needed to be changed when running it for another reference period. Hence, delivering tables for other reference periods (i.e. from 2008-2011 onwards, or 2007-2010 without GVA) is quite easy. The reference period 2015-2018 is available from approximately 1. October 2020.

Comments by table

Table 1:

Your comments: Employee size and legal form are readily derived from the BD population, which bases on the business register.

Table 2:

Your comments: Employee size is readily derived from the BD population, while group status needs micro data linking to a dataset in the business register system containing the group number.

Table 3:

Your comments: Age and activity are readily derived from the BD population.

Table 4:

Your comments: Employee size is readily derived from the BD population, while growth type needs micro data linking to the annual enterprise and establishment file in the business register system to identify establishments changing owner enterprise during the reference period, and marking of the enterprises being the new owner of these establishments.

Most challenging issues with the project from your perspective

Your comments: The compilation of the tables was a relatively straightforward task. There were no confidential figures.

However, the comparison with the survival data in BD that was suggested as quality control in the guidelines had one weakness, at least for Norway. In the grant the cohorts were defined by the establishing year. In BD the cohorts are defined as all new enterprises being added to the register in that particular year, as measured at ($t+4$ mths). The difference between these two methods on the total level amounts to several hundred to above one thousand enterprises per year. This led to some fruitless searching for errors in the compilation program.

Proposals for future improvements (contents, tables etc.)

Your comments:

Proposal 1: The criteria used for defining high growth among micro enterprises, i.e. enterprises with less than 10 employees, could have been explored a bit further in the project.

It was a natural choice to make the definition of high growth micro enterprises (HGmEs) consistent with the definition of high growth enterprises (HGE), i.e. high growth enterprises with at least 10 employees, in the sense that the two definitions would give the same result if applied on enterprises with exactly 10 employees. This was the case with both HGmE definitions in question, the Dutch and the Danish. Furthermore, both were fairly easy to compute.

To select between the two suggested definitions, a third criterion was applied, saying that the definition giving the lowest number of HGmEs should be preferred. There were two arguments raised to support this criterion. 1) The number of micro enterprises is overwhelming compared to the number of bigger enterprises. Hence, the number of HGEs would seem insignificant compared to the number of HGmEs if applying the same definition, i.e. based on the same per cent growth limit, for both types of enterprises. 2) It would be too easy for a micro enterprise to become an HGmE. For instance, an enterprise with 1-3 employees in the starting year would need only 1 additional employee at the end year to become an HGmE. This breaks the common idea of what high growth is. Both suggested definitions were tested in the project, and they yielded a considerably higher number of HGmEs, compared to the number of HGEs. Hence, the definition giving the lowest number of HGmEs, i.e. the Dutch, was chosen.

However, it is still not obvious that a 1-3 employee enterprise should be defined as an HGmE when increasing by 3.31 (in practise 4) employees over three years, as in the Dutch definition, but not when increasing with 1.655 (in practise 2) employees, as in the Danish definition, or even 1. The general reason for including micro enterprises in the estimation of high growth firms is their significant contribution to the economy. This contribution is measured in terms of variables like employed persons, turnover, gross value added, etc., and not simply the number of enterprises. In Norway, micro enterprises (including zero employed persons) count 93 per cent of all enterprises in the population, but only 27 per cent of the employed persons and 21 per cent of the turnover. These numbers are reduced to 60 per cent, 27 per cent and 14 per cent, respectively, when excluding enterprises with zero employed persons, and even further when excluding enterprises with zero employees.

Hence, if measuring high growth firms in terms of employed persons or turnover, there seems to be no need for reducing the dominance of HGmEs over the HGEs. Furthermore, it could be argued that when measuring growth according to employed persons or turnover, applying the same limits for both HGEs and HGmEs in terms of percentage growth, the micro enterprises would have a more representative part of the high growth firms, while using a stricter limit would make the HGmEs underrepresented and, hence, underestimate their contribution to the economical growth.

A key argument that was raised against using the same definition for HGmEs as for HGEs was the fact that for enterprises with zero employees a such definition would make no sense, as they would not need to grow to meet the criterion for becoming an HGmE. However, enterprises with zero employees were excluded from the population at a later stage in the project, due to availability and quality issues (i.e. missing values recorded as zero, and zero values recorded as missing). Consequently, this argument is no longer valid.

Another advantage of using the same definition for HGmEs as for HGEs was raised in the project, but not discussed. The HGE and HGmE numbers could be useful as input data to further analyses. Such analyses become complicated by introducing a kink-point, caused by a shift in definition between the upper and lower part of the population, as in both the Dutch and the Danish definition. The choice of definition should be based on the policy need for indicators and analyses. Somewhat more exploration and clarification at this point seems warranted from the Norwegian perspective.

Proposal 2: Part-time workers are measured by headcount, as are full-time workers. Consequently, industries and countries with a high share of part-time workers might have a different pattern of high growth firms, compared to other industries or countries. The effect could also be unevenly distributed among the size groups, and might be worthwhile to explore in the future.

Micro data linking (MDL)

In order to provide gross value added (or any other variable within the data requirements) did you use MDL? What could be the most successful way to expand the project into Micro Data Linking i.e. which statistics / variables would be the most feasible to be linked in your view?

Your comments: Yes, MDL was used to provide GVA. Other variables from the SBS could easily be linked together with GVA. Gross operating surplus and investments could be of particular interest.

It could be interesting to see if growth in the gross operating surplus coincides with growth in the number of employees, or if the opposite is the fact. An increase in the number of employees could be viewed as a kind of investment, which could drain the enterprise for resources in the shorter run, while in the longer run bringing growth in the gross operating surplus.

For investments, it could be relevant looking at different types of investment and different reference periods. Data equipment and other ICT investments, as well as investments in intangible assets such as concessions, patents, licences, trade marks and similar rights, are examples of investments that might result in growth in a relatively short time span, while other investments could more likely reduce the economical performance in the short run while bringing growth in the longer run. It should be considered to measure investments in the starting year instead of the end year, as investments are expected to occur prior to a growth period.

Equity (i.e. total of capital and reserves) is a common constraint to growth, and could be yet another interesting variable to look at. However, this would need additional MDL against the accounts statistics.

The after-growth perspective in WP2 could give even further insight into this.

Your assessment of the overall feasibility and relevance of the project and the outputs, also as regards to collecting this data on regular basis in the future

Your comments: For Norway's part there is no problem delivering these tables on a regular basis. A compilation program is developed, which can be run for a new reference period by simply changing the end reference year at the start of the program. However, the tables can be delivered at ($t+22$ mths), at earliest, because the final population file containing final figures on employed persons and turnover is not ready before ($t+21$ mths).

Finally we have attached a table below including a few questions of more generic nature of BD domain, please fill in

Questions	Yes or No	Comments
Statistical unit		
Is enterprise = legal unit?		
Enterprise	No	
Legal unit	Yes	
other	No	
Thresholds		
From definition: a statistical unit is considered to have been active during the reference period, if in said period it either realized positive net turnover or produced outputs or had employees or (in FRIBS) performed investments. Do you have any thresholds? For example, if turnover is less than 1200 Euros per year, then enterprise is excluded		
Threshold as no data source is available	Yes	Section O (Public administration and defence) is excluded from the population. In addition, practically all enterprises in section A (Primary industries) are excluded from the SBS, which provides the GVA figures.
Threshold set by statistical office as these enterprises are	Yes	Enterprises with both zero employed persons and zero turnover are excluded.

considered economically not important		Enterprises in Section K (Financial and insurance activities) with a positive operating result and securities' funds are still included.
Other	Yes	When missing values occur in the starting year or end year of the reference period for the variable defining the growth, the enterprise is excluded from the tables. In line with the guidelines to the grant, enterprises with zero employees in the starting year are also excluded.
Number of persons employed (self-employed + employees) and employees		
Is headcount used for number of employees and persons employed or something else? For example, if one employee works part time, is it counted as 1 or differently? If owner works 20% from his time in his enterprises, is he counted as 1 person employed? Sometimes countries calculate employment in full time equivalent, in this case please explain, how it is done.		
Headcount	Yes	Part-time workers are included in the headcount.
other	No	
Are you estimating self-employed persons as proposed in Eurostat-OECD manual: sole proprietorship: 1; partnership: 2; limited liability company: 0?		
No estimation – sources are complete, each enterprise has at least 1 self-employed person, except for LL.	No	
No estimation – there might be enterprises with 0 self-employed persons for SP and PA	No	
Yes, if self-employed person are missing in register, they are estimated according Eurostat-OECD manual	Yes	
Other	No	
How are you rounding number of persons employed and employees? Please describe. How many decimals are used for employees of population in t-3 at enterprise level? To select HGmEs are you using increase by 3.31 employees or by 4 employees in t? How rounding is done after? Are enterprises with 0.1 employees in t-3 taken in population of HGmEs in the beginning of growth (as well as in size class 1-4) or you round to 0 and enterprise is considered to be out of population in the beginning of growth? Is the same rounding method used for all BD?		
Employees are based on headcount, also for part-time workers. Accordingly, there was no need for rounding of employees. Employed persons are an annual average of employees and owners, and are rounded to the nearest integer. That means 0.1 employed persons are rounded down to 0. Turnover and GVA are rounded to the nearest 1,000 €.		

Responding country: Norway

WP II on What happens after growth period

Methodological questions on High Growth Enterprises development project

As generally in pilot projects, the idea of this brief note is to collect some of the experiences and problems related to the current pilot data collection in participating countries. We collect these experiences already now right in the context of data compilation. **Please attach this methodological report of WP II also to your final report when the project ends.**

Please note that several of the questions overlap with your previous responses to WP I and WP III but for consistency reasons we are collecting methodological experiences from each WP separately. Therefore your already given replies to WP I or WP III will make your response to WP II much easier due to some overlap in the contents.

Please report below any concerns and comments you may have on the project WP II. **Please also report below under relevant heading if you were not able to submit all tables / variables / breakdowns fully in line with what was agreed in the project.**

Finally, there are open questions at the end where we hope you could elaborate your views and ideas on

- what could be done better
- what could be the most successful way to expand the project into Micro Data Linking i.e. which statistics / variables would be the most feasible to be linked in your view.
- please also assess the feasibility and relevance of collecting this data on regular basis in the future.

Please note, that your proper answers are critical in order to make an overall / summary assessment after the project ends and outline future work proposals of WP II on What happens after growth period.

Data extraction

Please report your experiences of this WP II of the project as regards to providing the requested data. If there were specific challenges, etc.:

Your comments: The population used in this grant is derived from the Norwegian final statistics on business demography. Additional data are linked from the business register and the structural business statistics. The micro data used in WP II is the same as in WP I and III. There were no specific problems of getting data. Microdata are readily available back to 2008, which means tables could be produced with reference years back to 2017 (table 4-6) and 2014 (table 1-3 and 7-9) according to the selected method in the pilot.

The slight inconsistency between the tables delivered in this grant, compared to the Norwegian national statistics on new enterprises and their survival and growth (BD), which was described in the WP I and III

templates, is reiterated. Moreover, the Norwegian national BD statistics is slightly inconsistent with the BD reported to Eurostat:

- National BD defines enterprise birth from the creation date of the organization number, and does not have positive employment or turnover as a criterion. This causes differences in the number of new enterprises due to slow start-ups (i.e. taking a year or more from creation to getting employment or turnover). However, positive employment or turnover is still a criterion for survival in both BDs.
- National BD does, as the reported BD, identify takeovers by the transfer of the local kind-of-activity unit (LKAU) organization numbers to a new enterprise. However, it does not identify takeovers by match in two or more of the following criteria: ownership (represented by enterprise name), economic activity (4 digit NACE code) and location (postal code and street address). This causes a small number of survivals by takeover to remain unidentified in the national BD.
- The national BD builds on more final data on employment and turnover, as the most updated versions of employment and turnover data are not ready before the reporting deadline.

Reported microdata on HGEs (series 9M) is available back to 2012, which means tables consistent with the reported BD figures could be produced with reference years no further back than 2018 (table 4-6) and 2015 (table 1-3 and 7-9).

Breakdowns used

NACE total (B to N and S95)

TOTAL (B to N and S95) Current total used for HGEs
 Manufacturing (Section C)
 Construction (Section F)
 Wholesale and retail trade (Section G)
 Accommodation and food services (Section I)
 Information and communication (Section J)
 Professional, scientific and techn. Act. (Section M)
 Administrative and support services (Section N)
 Other activities (B to N and S95, excluding C, F, G, I, J, M and N)

NACE of growth enterprises is defined in the reference year t-3 and t-6. There were questions raised on how to define NACE and finally it was decided to adopt the above mentioned approach.

Did you encounter any difficulties when identifying and defining NACE code? Any proposals?

Your comments: The categories are readily computed, and the grouping yielded a reasonable number of enterprises in the category of other activities. However, due to possible differences in coverage within other activities between the countries a further breakdown of other activities could be warranted to allocate this possible inconsistency to an even narrower category of economical activity.

The combination of breakdowns caused a manageable number of categories to be confidential on the national level. The confidentiality is

caused by very low numbers of enterprises in the non-reported categories of other survivors (i.e. the difference between all survivors and the specified categories of survivors), which is due to missing employee data. These low numbers make it necessary to put a secondary confidentiality flag to the categories containing all survivors in these cases. However, it is difficult to see how this could be avoided without compromising the transparency.

Age of enterprise

For this WP II we simplified the used age size class into the following two, since for analytical purposes the young enterprises are in focus.

5 years or less
more than 5 years

Your comments: The categories were readily computed, using the method described in the WP I template.

The age was computed from the birth year according to the national BD, which is in fact the creation year, i.e. the year when the organization number was established. This method yields a higher average enterprise age in this pilot, compared to the method recommended in the BD manual. This applies to WP I and III as well.

Group status

Independent
belongs to a group

When tables were out a question was raised when should we define the group status (in t, t-3, t-6). In our understanding and for simplicity we should define this only once when we compile the HGE population to be followed. Do you agree on this? Any other views, the same approach as for NACE?

Your comments: Group status was readily computed based on the group number linked from the business register, as described in the WP I and III templates. The pragmatic approach of defining group status only once is supported. Group status is, after all, a fairly stable variable, and introducing a second measuring point would either lead to 1) inconsistent figures between start and end of measuring period or 2) marginal categories of enterprises changing group status, triggering a need for both primary and secondary confidentiality flagging, which in turn could actually reduce the available information in the tables, despite that the detailing is increased.

Defining group status by the end of the after growth period makes the measuring point consistent with the other breakdown variables.

Variables

Variables included were the number of enterprises, employees, persons employed, turnover and gross value added. The values for variables turnover and value added were to be reported in 1000 euros.

Your comments: The description of number of enterprises, employees and turnover in the WP I and III templates is valid for WP II as well. Missing turnover was found in 2.2 per cent of the enterprises identified as survived in table 1-3, and enterprises in other activities were over-represented in this respect.

Both fulltime and part-time workers are counted by head (i.e. not fulltime equivalents). Number of employees and persons employed are derived from 'a-ordningen' dating back to 2015. Before 2015 it was taken from the 'aa-register'. The coverage in 'a-ordningen' is somewhat higher than in the 'aa-register' with respect to persons in very small positions. Hence, the number of high growth enterprises for the period 2012-2015 is likely to be slightly overestimated.

Note that persons employed and gross value added were not among the variables specified in the transmission format, and hence they were not reported in WP II.

Growth periods

Population of growth period 2009 – 2012 to be followed in 2015 and 2018

Population of growth period 2012 – 2015 to be followed in 2018 (used also for micro HGEs in tables 7-9)

What is your opinion of following HGE population 3 and 6 years after the growth period? Would any other interval be better?

Your comments: The agreed growth periods work well, and micro data were readily available. The long time span from start of high growth period to end of after growth period makes the tables vulnerable to changes in methods, definitions, etc. in input data.

Growth rates

Average annualised growth in the number of employees over a three / six year period we used the following growth rates in order to classify enterprises:

- 0 % or less
- 0 % >= 10 %
- 10 % >= 20 %
- more than 20 %

Please report how successful in your view were the chosen classes? Any other views or proposals?

Your comments: The growth classes also work well. The +20 % growth class allows for comparison with non-European OECD countries. The decision not to further split the highest growth class seems warranted, as it keeps the number of confidential categories low.

Micro HGEs

In WP I we have developed an approach to measure micro HGEs. When dealing with micro enterprises defining growth only by using certain

percentage growth is not feasible (as also was the result from WP I on micro HGEs).

As it was largely supported by the group to include also the micro HGEs, we compiled tables 7-9 to cover only micro HGEs and defined growth classes by using increase in absolute a number of employees instead of percentages as in tables 1-6. The employee numbers used were

- by 0 or decrease
- from 1 to 5 employees
- from 6 to 10 employees
- from 11 + employees

Please report your experiences of the employee classes above? Any other proposals to be used?

Your comments: The growth classes were readily computed and caused no specific problems. Secondary confidentiality flags were put on some categories covering all survivors due to missing number of employees in the reference year, as described above.

The definition of high growth in micro enterprises raises concern, as described below.

Comments by table

Table 1

Your comments: Group status was added to the population by micro data linking of a dataset in the business register system containing the group number. Growth groups work well. No specific problems.

Table 2

Your comments: Activity is readily derived from the BD population. Growth groups work well. In case of a future NACE revision, the possibility of making a consistent table will be affected for a long period of time (i.e. 6 years).

Table 3

Your comments: Age is readily derived from the BD population. The national definition of enterprise birth is applied, which yields a positive bias on age compared to the Eurostat definition. Growth groups work well.

Table 4

Your comments: Group status was added to the population by micro data linking of a dataset in the business register system containing the group number. Growth groups work well. No specific problems.

Table 5

Your comments: Activity is readily derived from the BD population. Growth groups work well. In case of a future NACE revision, the possibility of making a consistent table will be affected for a very long period of time (i.e. 9 years).

Table 6

Your comments: Age is readily derived from the BD population. The national definition of enterprise birth is applied, which yields a positive bias on age compared to the Eurostat definition. Growth groups work well.

Table 7

Your comments: Group status was added to the population by micro data linking of a dataset in the business register system containing the group number. Growth groups work well. No specific problems.

Table 8

Your comments: Activity is readily derived from the BD population. Growth groups work well. In case of a future NACE revision, the possibility of making a consistent table will be affected for a long period of time (i.e. 6 years).

Table 9

Your comments: Age is readily derived from the BD population. The national definition of enterprise birth is applied, which yields a positive bias on age compared to the Eurostat definition. Growth groups work well.

Most challenging issues with the project from your perspective

Your comments: The computation of tables was rather straightforward. The quality check was somewhat tedious, as different methods were used in this pilot compared to the national and the reported BDs on survival. This is described in more detail in the WP I template and the forthcoming final report.

Different definitions of high growth impair the possibility of making meaningful analyses of micro vs. ordinary high growth enterprises (see below).

Proposals for future improvements (contents, tables etc.)

Your comments: None regarding the project table framing, given the HGmE definition set out in WP I. With consistent HGE definitions for micro and ordinary enterprises table 7-9 could be replaced by a further breakdown of table 1-3 (and possibly table 4-6).

It should be considered, for Norway's part, to compile the tables basing on the reported BD populations in any future updates of the project to improve comparability across countries. This proposal applies to all WPs.

Micro data linking (MDL)

In order to provide gross value added (or any other variable within the data requirements) did you use MDL?

Your comments: Yes, MDL was used to retrieve GVA from the structural business statistics.

What could be the most successful way to expand the project into Micro Data Linking i.e. which statistics / variables would be the most feasible to be linked in your view?

Your comments: As described in the WP I template, several variables are interesting for future analyses, including gross operating surplus, equity and investments in tangible and intangible goods. In the after growth perspective in WP II these variables could give additional insights, as well, as different kinds of expenses and investments are expected to yield growth at different periods of times.

Your assessment of the overall feasibility and relevance of the project?

Your comments: The after growth perspective is highly relevant, as it reveals the sustainability and duration of the growth, as well as the different aspects of growth related to different economic variables.

Your opinion about methodology developed and the output tables compiled?

Your comments: The method developed for WP II is supported, given the definition of high growth in micro enterprises as set out in WP I. It is simple to compute and follows naturally from the methods in the BD reporting (10+ employees) and WP I (1-9 employees).

As described in the WP I template we have concern about the definition of high growth in micro enterprises. By introducing the new definition of high growth for micro enterprises, with a kink point at 10 employees as a consequence, the number of high growth micro enterprises (HGMEs) is kept low as a designed effect. Consequently, the economical relevance of HGMEs is significantly underestimated compared to using the ordinary definition of high growth (i.e. the one used in the BD reporting). The rationales for doing so are to keep the number of HGMEs from dominating the overall number of HGEs and to avoid unintuitive results on an individual level.

However, it was not addressed in the project how to prioritize between a reasonable number of HGMEs and intuitive results at an individual level on one hand and consistency between the HGMEs' and HGEs' estimated contributions to the economy at the population level on the other, and on which basis this priority should rely. By signalling a low contribution of HGMEs to the economy, the political instruments available for promoting high growth among micro enterprises might be undervalued. Moreover, the shift in definition and the resulting kink point distorts analyses covering the total size span of high growth enterprises, including comparisons of micro vs. ordinary enterprises' ability to grow fast, and the definition impairs the possibility to establish a mirror definition comprising large decline enterprises that would supplement the picture of the business dynamics. Trial estimations applying relative and uniform definitions of high growth and large decline will be presented in the Norwegian final report.

Please also reflect your view / feasibility on collecting this data on regular basis in the future?

Your comments: For Norway's part there is no problem delivering these tables on a regular basis. A compilation program is developed, which can be run for a new reference period by simply changing the end reference year at the start of the program. Currently, the tables can be delivered at approximately ($t+20$ mths), at earliest, because the final population file containing final figures on employed persons and turnover is not ready before approximately ($t+19$ mths).

The tables, and in particular tables 4-6, are covering long time spans. Accordingly, they are vulnerable to changes in methods, definitions and classifications in the micro data. Whenever such changes occur, it might take long before consistent tables could be produced again. A revision of the NACE standard would be such a case. The long time spans in WP II are considered valuable, but a regular reporting might be demanding as definitions and methods tend to change at occasion.

In case of a regular reporting, it should be considered compiling the tables based on the BD populations reported to Eurostat, instead of the national BD populations used in this pilot.

Responding country: Norway

WP III on Scale ups

Methodological questions on High Growth Enterprises development project

As generally in pilot projects, the idea of this brief note is to collect your experiences and problems related to the current pilot data collection in participating countries. We collect these experiences already now right after data compilation, since they are probably still well in your memory! Please attach this methodological sheet also to your final report when the project ends.

Please report below any concerns and comments you may have on the project WP III. **Please also report below under relevant heading if you were not able to submit all tables / variables / breakdowns fully in line with what was defined in the project.** As there were three different approaches used in this project WP III we will also kindly ask you to individually assess and prioritise each of these ones in terms of feasibility and relevance, if possible. This question is an open one, so please elaborate your thoughts there!

Finally, there are open questions where we hope you could elaborate your views and ideas what could be done better, what could be the most successful way to expand the project into Micro Data Linking i.e. which statistics / variables would be the most feasible to be linked in your view. Please also assess the feasibility and relevance of collecting this data on regular basis in the future.

Please note, that your proper answers are critical in order to make an overall / summary assessment and future work proposals of WP III on Scale-ups.

Data extraction

Please report your experiences of this project as regards to providing the requested data. If there were specific challenges, etc.:

Your comments: No specific problems of getting data. Microdata are readily available back to 2007, except gross value added, which is available back to 2008. Accordingly, table 6b, which uses employee data from $t-9$, can be readily reported back to $t = 2016$, only. With some extra effort microdata are available back to 1980.

It should be noted, however, that there is a slight inconsistency between the tables delivered in this grant, compared to the Norwegian statistics on new enterprises and their survival and growth. In this grant, the enterprises' birth year is defined by the birth date as registered by ($t+21$ mths). In the Norwegian statistics, on the other hand, new enterprises are defined as all enterprises added to the business register in the reference year, as measured at ($t+4$ mths). Accordingly, backdatings of enterprise births performed between ($t+4$ mths) and ($t+21$ mths) are covered by grant, but not by the statistics on new enterprises and their survival and growth. Around 4 per

cent of the enterprises counted as new at ($t+4$ mths) were, in fact, born the year before, according to the population in this grant. The population used in this grant is derived from the Norwegian final statistics on business demography.

Breakdowns used

Growth rates used in Tables 1-3 (extension of Nordic approach)

20-29%
30-39%
40-49%
50+%

Your comments: The categories are readily computed. However, the combination of detailed breakdowns caused quite many categories to be confidential or even missing on the national level.

Enterprises with missing growth rates (i.e. missing number of employees or turnover in either starting or end year) has been excluded.

Employment size classes used in tables 4 and 5:

0-29
30-49
50-99
100-149
150-249
250-499
500+

Your comments: The categories are readily computed. However, the combination of detailed breakdowns caused quite many categories to be confidential or even missing on the national level.

Enterprises with missing numbers of employees have been excluded.

NACE total in tables 1-3 (B to N and S95)

TOTAL (B to N and S95) Current total used for HGEs
Manufacturing (Section C)
Construction (Section F)
Wholesale and retail trade (Section G)
Accommodation and food services (Section I)
Information and communication (Section J)
Professional, scientific and techn. Act. (Section M)
Administrative and support services (Section N)
Other activities (B to N and S95, excluding C, F, G, I, J, M and N)

Your comments: The categories are readily computed. However, the combination of detailed breakdowns caused quite many categories to be confidential or even missing on the national level.

Age of enterprise in tables 1-3:

5 years old or less
more than 5 years

In tables 4 and 5:

5 years old or less
more than 5 to 10 years

Your comments: The categories are readily computed. It should be noted that age group 2 in tables 4 and 5 covers ages ranging from 6 to 10 years, while age group 2 in WP 1 covers ages ranging from 6 to 9 years. This difference in definitions is preferred by the Eurostat project managers, as confirmed by email.

Group status in Table 5

Independent
belongs to a group

Your comments: The group status was derived from the group number in the business register. All enterprises being part of a group have a group number, and accordingly all enterprises having a group number were classified as dependent. The remaining enterprises were classified as independent.

Variables

Variables included were the number of enterprises, employees, persons employed, turnover and gross value added. The values for variables turnover and value added should be reported in 1000 euros.

Your comments:

The number of enterprises is simple to compute and a natural choice of variable, since this variable is also reported in the statistics on high-growth enterprises (HGEs). Moreover, the number of enterprises is not sensitive, and hence not subject to confidentiality flagging.

Number of employees is based on the reported number in the mid week of December, as described above in the section on BD size classes. The number has been controlled against a.o. hours worked and payment.

The variable contains some erroneous missing and zero values. When missing values occur in the starting year or end year of the reference period, the enterprise is excluded from the tables. When erroneous zeros occur in the end year, the enterprise is included in the 'Other' category showing no high-growth. The number of erroneous zeros is not estimated, but based on inspection it is assessed to be low compared to the rest of the 'Other' category.

Turnover is on the population file, and hence no MDL is necessary. It is derived from SBS, and the final numbers are available on the population file at (*t+21 mths*).

Gross value added (GVA) is not on the population file, and hence the micro data must be linked. It is derived from SBS, and the final numbers are available approximately at (*t+16 mths*). Data are available back to 2008. Missing GVA values for enterprises in the table populations are counted as 0, in order to have the number of enterprises consistent for all variables. In tables 1-3, missing GVA values were found in 2.6 per cent of the enterprises in 2017. Practically all where in the activity group 'Other'.

They were overrepresented in the high-growth categories according to employees (table 1), proportionately distributed between high-growth and other enterprises according to turnover (table 2), and underrepresented in the high-growth categories according to both criteria (table 3).

Comments by table

Tables 1-3:

Your comments: Age, activity and growth rates are readily derived from the BD population. A high proportion of the categories are either missing or confidential at the national level.

Tables 4-5:

Your comments: Age, activity and employee groups are readily derived from the BD population. A high proportion of the categories are either missing or confidential at the national level.

Table 6:

Your comments: Employee groups are readily derived from the BD population. However, table 6b can be delivered for reference years no earlier than 2007. Accordingly, table 6 can be delivered for reference years no earlier than 2016.

Assessment of three different approaches

The Nordic approach, Tables 1-3

The most relevant outcome of Scale-up workshop organized in October for our project was the statistical analysis of Scale-ups carried out and published by five Nordic statistical offices. The approach takes its starting point from HGE methodology but with some amendments. Instead of 10 per cent of average annualised growth requirement, it operates with 20 per cent (and turnover threshold of 2 million EUR) which is in fact the old pre economic crisis used criteria for HGEs. In addition, the definition operates with turnover growth for identifying scale-ups. The scale-ups are accordingly classified into employment scale-ups, turnover scale-ups and the ones fulfilling both criteria.

Our project tables 1-3 follow the methodology adopted in Nordic approach described above. The contents for all the three tables are basically the same, only criteria for scaling up varies (employment in T1, turnover in T2 and both in T3).

Please provide your assessment of Nordic approach: The WP3 tables 1-3 bases on the same micro data as WP1, more or less. Hence, tables 1-3 from WP3 were easily made in a joint compilation program with the WP1 tables. The manual part of the confidentiality flagging came in addition in WP3, while there were no confidential figures in WP1.

This methodological report is kept strictly methodological, while the assessment of relevance will be presented in the final report.

The original approach, Tables 4-5

The original Eurostat intension was to look at enterprises which are young and having shown their capacity to scaling up business. As the Nordic Approach only covers the three years scaling up periods, we decided to

also test longer term measures included in line with what has originally been thought as part of the exercise.

The approach takes its starting point looking at the current situation (i.e. the reference year 2017) how these maximum 10 years old enterprises have been able to scale up their business in terms of employees in 2017. These are classified in mutually exclusive size classes from the lowest up to 29 employees, 30 - 49 employees etc. The same employment size classes are used in both tables 4 and 5.

Please note that in order to tables 4 and 5 make the best sense we have agreed to include an additional condition that when starting the activity enterprises employ less than 10 employees. This is in order to include the real start-ups and exclude the ones which start with e.g. hundreds of employees due to e.g. spin offs from a larger company.

Please provide your assessment of the Original approach: The assessment of tables 1-3 applies to tables 4-5, as well.

Scaling up of the largest enterprises, Table 6

Finally, one additional table was added to focus on the largest enterprises in the participating countries. This was inspired by a recent Danish study where the largest 1000 employee enterprises were followed ten years back in time, i.e. in which size classes they were that time. We compiled a simple table 6 for this purpose.

As also correctly mentioned in e-mail consultation that for the largest enterprises many demographic events may have happened during the past 10 years i.e. mergers, acquisitions and takeovers. We need to accept this as it is and more consider our outcome as indicative in this respect. The other issues is the statistical unit discussion, enterprise is referred here even though enterprise group might have been more relevant observation unit.

It is worth mentioning that tables 4+5 and 6 has much in common i.e. both are focusing on recent 10 years as looking at the scaling up taking place. On contrary, tables 1-3 focus on three year high growth/scaling up period so these different time spans covered are expected to bring interesting data to be analysed and further assessed the best way forward.

Please provide your assessment of the Large enterprise approach: The WP3 tables bases on the same micro data as WP1, more or less. Hence, tables from WP3 were easily made in a joint compilation program with the WP1 tables. Even though there are relatively few enterprises with at least 1000 employees in Norway (147 in 2017), no categories were confidential in Table 6 due to a quite aggregated breakdown.

This methodological report is kept strictly methodological, while the assessment of relevance will be presented in the final report.

Most challenging issues with the project from your perspective

Your comments: The compilation of the tables was a relatively straightforward task.

As mentioned above, there were quite many confidential figures. Hence, secondary flagging was a bit time consuming.

Proposals for future improvements (contents, tables etc.)

Your comments:

Proposal 1: A less detailed breakdown in Tables 1-5 could be warranted, to reduce the abundance of confidential and missing categories.

In Tables 1-3 confidentiality would have been avoided by merging all enterprises with at least 30 per cent growth per year (i.e. groups 2-4) into one category and avoiding breakdown by age. By merging all enterprises with at least 20 per cent growth per year (i.e. groups 1-4) into one category and keeping the breakdown by age, confidentiality would have been significantly reduced.

In Tables 4-5 confidentiality would have been avoided by merging all enterprises with at least 50 employees (i.e. groups 3-7) into one category and avoiding breakdown by age. By merging all enterprises with at least 100 employees (i.e. groups 4-7) into one category and avoiding breakdown by age, or merging all enterprises with at least 50 employees into one category and keeping the breakdown by age, confidentiality would have been significantly reduced.

Proposal 2: Part-time workers are measured by headcount, as are full-time workers. Consequently, industries and countries with a high share of part-time workers might have a different pattern of high growth firms, compared to other industries or countries. The effect could also be unevenly distributed among the size groups, and might be worthwhile to explore in the future.

Micro data linking (MDL)

In order to provide gross value added (or any other variable within the data requirements) did you use MDL? What could be the most successful way to expand the project into Micro Data Linking i.e. which statistics / variables would be the most feasible to be linked in your view?

Your comments: Yes, MDL was used to provide GVA. Other variables from the SBS could easily be linked together with GVA. Gross operating surplus and investments could be of particular interest.

It could be interesting to see if growth in the gross operating surplus coincides with growth in the number of employees, or if the opposite is the fact. An increase in the number of employees could be viewed as a kind of investment, which could drain the enterprise for resources in the shorter run, while in the longer run bringing growth in the gross operating surplus.

For investments, it could be relevant looking at different types of investment and different reference periods. Data equipment and other ICT investments, as well as investments in intangible assets such as concessions, patents, licences, trade marks and similar rights, are examples of investments that might result in growth in a relatively short time span, while other investments could more likely reduce the economical performance in the short run while bringing growth in the longer run. It should be considered to measure investments in the starting year instead of the end year, as investments are expected to occur prior to a growth period.

Equity (i.e. total of capital and reserves) is a common constraint to growth, and could be yet another interesting variable to look at. However, this would need additional MDL against the accounts statistics.

The after-growth perspective in WP2 could give even further insight into this.

Your assessment of the overall feasibility and relevance of the project and the outputs, also as regards to collecting this data on regular basis in the future

Your comments: For Norway's part these tables can be delivered on a regular basis. A compilation program is developed, which can be run for a new reference period by simply changing the end reference year at the start of the program. Confidentiality flagging is partly done manually, and is a bit time consuming. Hence, a bit more aggregated breakdowns could be considered. The tables can be delivered at ($t+22$ *mths*), at earliest, because the final population file containing final figures on employed persons and turnover is not ready before ($t+21$ *mths*).

List of figures

Figure 4.1	High-growth and non-high growth micro enterprises ¹ , by legal form. Number of enterprises and number of employees. Growth period = 2014-2017.....	19
Figure 4.2	High-growth and non-high growth micro enterprises ¹ , by group participation. Number of enterprises and turnover, by per cent. Growth period = 2014-2017.....	20
Figure 4.3	High-growth and non-high growth micro enterprises ¹ , by industry (NACE). Number of enterprises and turnover, by per cent. Growth period = 2014-2017.....	22
Figure 4.4	High-growth and non-high growth micro enterprises ¹ , by enterprise age. Number of enterprises and turnover, by per cent. Growth period = 2014-2017.....	23
Figure 4.5	High-growth and non-high growth micro enterprises, by type of growth. Number of enterprises and turnover, by per cent. Growth period = 2014-2017.....	24
Figure 4.6	High growth enterprises' share of total target population, according to number of enterprises and turnover. By growth period. Growth periods from 2008-2011 to 2015-2018.....	26
Figure 4.7	High growth ¹ micro enterprises' share of total target population according to number of enterprises and turnover, by growth period. Growth periods from 2008-2011 to 2015-2018. High growth = 10% or higher annual growth in employees or turnover.....	27
Figure 4.8	Economical drivers in Norway, 2008 to 2018.....	29
Figure 4.9	Enterprise growth ¹ . By size group ² . (Growth type ³ and high growth definition ⁴ in parentheses.) Growth period = 2014-2017.....	31
Figure 4.10	Employee and turnover scale-ups, by annual growth rates ¹ . Per cent of population. 2008-2011 to 2015-2018.....	33
Figure 4.11	Maximum 10 years old enterprises, by size. Per cent of all size groups. 2017.....	34
Figure 4.12	Prominent enterprises in 2017, by size group in 2008.....	35
Figure 4.13	After-growth in HGEs of 2015 and 2012 and in HGmEs of 2015, by group participation. 2018.....	37

List of tables

Table 2.1	Coverage with respect to turnover or GVA in industries with reduced coverage, per industry	9
Table 2.2	Sub-populations, table breakdowns and growth types	9
Table 3.1	Number of enterprises ¹ in national and reported business demography (BD) on survival	14
Table 3.2	Difference in number of enterprises ¹ between cohorts in WP 1 and WP 3 in this pilot and cohorts in BD on survival due to time lag and backdatings, by cohort ($t = 2017$) ²	15
Table 3.3	Number of enterprises ¹ with different founding year between the main population and BD on survival due to transfer of establishments, by cohort ($t = 2017$)	16
Table 3.4	Number of survived enterprises ¹ in the main population and BD survival population, by cohort ($t = 2017$)	16
Table 3.5	Micro enterprises within other activities, by industrial sections ($t = 2017$)	17
Table 3.6	Micro enterprises within other activities, by institutional sector ¹ ($t = 2017$)	18
Table 4.1	Group participation of high growth enterprises (per cent). By enterprise size, after-growth period, and survival and after-growth rates in per cent (employees). 2018.	38
Table 4.2	Countries participating in the pilot, by working program.....	39

© **Statistics Norway, 2020**

When using material from this publication,
Statistics Norway must be listed as the source.

ISBN 978-82-587-1254-8 (printed)

ISBN 978-82-587-1255-5 (electronic)

ISSN 0806-2056