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Abstract

Using 30 years of data from all for-profit firms incorporated in Belgium, we show that business dynamism and entrepreneurship have been declining over recent decades. This decline set in around the year 2000 following a decade of declining start-up rates. We also observe a decreasing share of young firms that become high-growth firms and more importantly a declining propensity for small (not necessarily young) firms to experience fast growth. Interestingly, a similar decline in business dynamism occurred in the U.S., where firms face a far less rigid institutional environment than in Belgium. These remarkable similarities suggest that global trends rather than country specific changes are at the basis of this evolution. We show evidence that points to the role of ICT intensity and in explaining the secular decline in business dynamism.

Key words: business dynamism, firm dynamics, firm growth, entry, reallocation, high-growth firms, high-impact firms

JEL classification: D21, E24, J6, L25

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1. Introduction

The process of firm entry, exit, expansion and contraction is generally seen to play a key role for aggregate productivity growth. High business dynamism thus implies that resources can easily be reallocated from low productivity to high productivity activities in the economy, hence contributing to overall productivity growth. While it has been well documented that the level of business dynamism varies across countries,[1] usually due to different levels of labor and product market regulation, little is known about its evolution over a long period of time, stretching various business cycles. Yet, a better understanding of the long run evolution of business dynamism seems important to understand the long run evolution of aggregate productivity growth or its stagnation in a number of countries in recent years.

In this paper we fill this gap and study business dynamism stretching a period of 30 years. To this end we use a unique dataset from all for-profit firms incorporated in Belgium between 1985 and 2014. We analyze dynamism via the evolution of characteristics (dispersion and skewness) of the distribution of firm growth rates and show that business dynamism and entrepreneurship have been declining over recent decades. After rising in the pre-2000 period, the decline clearly sets in around 2000. We initially observe two underlying drivers of this decline: start-up rates and high-growth firms. Start-up rates rapidly decline from the nineties leading to a smaller employment share at younger, more dynamic firms. This explains about 1/3 of the post-2000 dynamism decline. From 2000 we also see a declining propensity for small (not necessarily young) firms to experience high-growth episodes. The question remains, however, what caused the decline of start-up and high-growth activity.

Interestingly, a similar decline in business dynamism occurred in the U.S. as shown by Decker et al. (2016). This is remarkable as firms in the U.S. face a far less rigid institutional environment than in Belgium. The U.S. are widely acknowledged as having a flexible, innovative and entrepreneurial economy and are consistently ranked amongst the top countries in competitiveness rankings. Business dynamism in the U.S. might be declining, but at least starting from a very high level.

The Belgian economy, on the contrary, is perceived to be significantly less dynamic and entrepreneurial than the U.S. Belgium scores mediocre at best at these same competitiveness rankings.[2] Furthermore, the OECD puts Belgium 3rd for protection of permanent workers against individual and collective dismissals behind Venezuela

[1] See for instance Haltiwanger et al. (2014) and Criscuolo et al. (2014).

[2] IMD's World Competitiveness Ranking (2015, 2016, 2017): U.S. (1st, 3rd, 4th) vs. Belgium (23rd, 22nd, 23rd); WEF's Global Competitiveness Report (2016-2017): U.S. (3rd) vs. Belgium (17th), World Bank's Ease of Doing Business (2017): U.S. (8th) vs. Belgium (42nd).

and China. The OECD puts the U.S. at place 69 out of 72 countries on this ranking. Zimmer (2012) shows Belgium has the highest mismatch between labor supply and labor demand in the EU-15. Belgium thus clearly has a more rigid labor market than the U.S. This hampers reallocation between firms. Belgium can be regarded as less dynamic in the business sense and one cannot state business dynamism started from a high level. As we observe the same overall pattern in two very different economies, we believe global trends rather than country specific changes are at the basis of the decline in dynamism.

This brings us to additional drivers of the dynamism decline, the ICT revolution and increased globalization of the past two decades. We explore the link between ICT intensity of an industry and dynamism and find preliminary evidence that the decline is driven by the most ICT intensive industries. We also study the link between dynamism and foreign direct investment (FDI) in the form of the presence of multinational corporations (MNCs). We find, however, mixed results. On the hand, industries with a low MNC presence show the highest dynamism decline. On the other hand, we find that especially services sectors with a high presence of MNCs show the largest dynamism trend change around 2000. Whether there is any connection between MNC presence and dynamism remains, however, unclear and needs further research.

The underlying drivers we discuss (start-up rates, high-growth firms, ICT intensity, presence of MNCs) can also not be seen independently from recent research that points to the rise of market power of the so called "superstar firms" where a limited number of firms in an industry become highly successful (Autor et al. 2017).

Table 1 summarizes the main findings for the evolution of the employment weighted firm growth rate distribution. We measure dynamism via the difference between the growth rate[3] of a firm at the 90th and at the 10th percentile (90-10 differential) of the growth rate distribution of Belgian firms. In 1988 a firm at the 90th percentile grew about 35% faster than a firm at the 10th percentile. This slightly increased in 2000 to come down to just 29% in 2014. The difference in growth rates between the 90th and the 50th percentile (90-50 differential) showed a similar evolution. This led, together with a small decrease of the 50-10 differential to an overall decline in skewness of the distribution. Skewness is highly influenced by what happens to the fastest growing firms.

We are to our knowledge the first to study business dynamism based on a multi-decade time series of all for-profit enterprises for a European country. It hence allows us to truly disentangle a long-term trend from the impact of the business cycle. Our analysis confirms that the decline in business dynamism is a secular trend spanning multiple business cycles also in Belgium. In addition, we contribute by linking ICT intensity of an industry with dynamism. This has more explanatory value for dynamism than traditional industry classifications based on high-

[3] Growth rates between periods *t* and *t-1* are measured as the increase in % of the employment at time *t* over the average employment at periods *t* and *t-1*. See section 3 for more detail.

tech vs. low-tech manufacturing and knowledge intensive vs. less-knowledge intensive services.

	Differential	1988	2000	2014
All firms	90-10	0.35	0.37	0.29
	90-50	0.19	0.23	0.16
	50-10	0.15	0.14	0.13
Manufacturing firms	90-10	0.28	0.26	0.19
	90-50	0.12	0.14	0.09
	50-10	0.15	0.12	0.10
Services firms	90-10	0.38	0.46	0.32
	90-50	0.25	0.29	0.18
	50-10	0.13	0.16	0.14

Table 1: Summary of Main Differentials of the Employment Weighted Growth Rate Distribution. Dispersion and skewness initially go up pre-2000 and come down post-2000

This paper continues as follows. The next section 2 reviews the literature on firm and business dynamics. Section 3 gives the background on the data and defines the main concepts used throughout the paper. Section 4 looks into the dispersion and skewness of the firm growth rate distribution and discusses the main empirical findings about the decline of dynamism. Section 5 investigates the underlying drivers of the decline: declining start-up rates, decrease in high-growth activity, the level of ICT intensity of and the presence of MNCs in an industry. Finally, section 6 concludes.

2. Literature review

The specific literature on firm and business dynamics started in the 1990s where the underlying granularity of aggregate net job creation was studied (e.g. Boeri & Cramer 1992, Davis & Haltiwanger 1992, Konings 1995). Although aggregate net job creation might well be modest, one realized there are large underlying flows of gross job creation and destruction between existing, newly established and exiting firms. These underlying dynamics are apparent even within narrowly defined segments of the economy. The past decade, taking a microeconomic firm level perspective to obtain a better understanding of aggregate movements has received renewed attention.[4] Firm dynamics was also studied again. There now seems to be a consensus that a small number of high-growth

[4] The role of firm heterogeneity has been exploited in recent work explaining fluctuations in GDP growth (Davis et al. 2007; Gabaix 2011; Acemoglu et al. 2012), unemployment (Moscarini & Postel-Vinay 2012, trade (Di Giovanni et al. 2014; Bernard et al. 2014) and aggregate (export) prices (Amiti et al. 2014).

firms contribute disproportionately to aggregate employment growth. Haltiwanger et al. (2016) found high-growth firms also make a disproportionate contribution to U.S. productivity growth as resources are rapidly shifted towards these successful firms. Andrews et al. (2015) find that some countries are more successful than others at channeling scarce resources to productive and innovative firms and show this partly reflects cross-country differences in the policy environment. Bravo-Biosca (2016) subsequently links a more dynamic firm growth distribution with faster productivity growth and also shows the U.S. performs better than most European countries for a wide set of metrics of business dynamism. Criscuolo et al. (2014) show that especially young firms play an outsized role in overall job creation in 18 studied OECD countries. Calvino et al. (2015) document cross country differences on start-up dynamics and find that most surviving start-ups do not grow. Recently, OECD (2017b) released its flagship report on business dynamics and productivity that discusses a wide set of topics based on a granular study of underlying business level data.

Decker et al. (2016) show that business dynamism is declining in the U.S. and the character of that decline changed around 2000. They base their findings on the study of firm growth rate distributions from a large dataset covering micro-data of U.S. firms between 1976 – 2011. The literature specifically on firm growth goes back to at least Gibrat (1931) who states that firm growth rates are independent of firm size. It has also been shown that the distribution of firm growth rates is fat-tailed resembling a tent-shaped Laplace distribution. E.g., Bottazzi & Secchi (2006) and more recently Bravo-Biosca (2016) confirm empirically that the distribution has indeed fat tails, but it is also roughly symmetric. Both studies, however, are biased towards larger firms as they only include listed companies or companies with more than 10 employees. They hence do not capture the enormous skewness observed by Decker et al. (2014) of the growth rate distribution of younger (and hence smaller) firms. Reichstein & Jensen (2005) also found clear evidence of skewness in the Danish firm growth distribution, especially for the right tail, containing the fastest growing firms. Decker et al. (2016) find substantial, though declining, skewness in the U.S. firm growth rate distribution. A fatter right tail, especially in the growth rate distribution of young firms, is consistent with theoretical models on firm growth. The up-or-out mechanism described by the passive learning model of Jovanovic (1982) implies that young firms either realize they are productive and rapidly expand or realize they are not and disappear. Another source of skewness stems from the fact the vast majority of firms is simply static and shows near zero growth. Most firms are not willing or not able to achieve growth as shown by Schoar (2010). She differentiates between subsistence and transformational entrepreneurs, with the latter a small minority of firms. Transformational entrepreneurs invest in R&D, innovate and if successful rapidly expand. Next to modelling an economy consisting of 2 types of firms roughly similar to the subsistence vs. transformational

firms, Acemoglu et al. (2017) find in U.S. data that small and young firms are both more R&D intensive and grow more. This is consistent with Hölzl (2009) who showed that for countries on the technological frontier (for which Belgium is used as an example) innovation becomes increasingly important for small and medium sized firm to grow rapidly. The skewness of the firm growth distribution is hence linked with the presence of young and/or innovative, transformational firms.

The underlying drivers affecting differences in and changes to firm growth distributions are only starting to be documented. Decker et al. (2016) link changes of the firm growth distribution to changes in young and high growth firm activity. This of course redirects the question to why there are changes in certain types of firm activity. Bravo-Biosca et al. (2016) look at drivers of the cross-country differences in firm growth dynamics and link them with labor market regulation, bankruptcy legislation, financial market development and R&D support policies. Goldschlag & Tabarrok (2018) find that rising regulation cannot explain secular trends in U.S. economic dynamism. Another recent angle is the increasing presence and dominance of larger firms that leaves less opportunities to younger and smaller firms. Andrews et al. (2016) show a growing divergence between firms that operate at the frontier and "the rest". De Loecker & Eeckhout (2017) take a firm level perspective on the evolution of U.S. markups from 1950 and find, amongst others, that a decline in job flows is driven by the rise of firm market power. Their analysis is limited, however, to publicly listed firms. Decker et al (2018) claim that, for the U.S, the changing pattern of reallocation (both economy-wide and within-sector) is not driven by the changing age structure of firms. They find a decreased responsiveness of firms to their idiosyncratic productivity shocks which leads to reduced pace of reallocation.

The contribution of this paper is that we now also study long term changes to European business dynamism. Contrary to other studies on European data, we cover a 30 year timeframe not only for older and larger firms but also for all for profit enterprises. Our analysis confirms that the decline in business dynamism is a secular trend spanning multiple business cycles also in Belgium. The decline in business dynamism is hence not limited to economies that already were highly dynamic such as the U.S. We also step aside from traditional Eurostat industry classifications of high-tech vs. low-tech manufacturing and high knowledge intensive vs. low knowledge intensive services and find early evidence that points to the role of the ICT intensity of an industry in explaining the secular decline in business dynamism.

3. Data and definitions

We have constructed a database from data made available by the National Bank of Belgium (NBB). The database contains the unconsolidated[5] annual accounts of all for-profit enterprises incorporated under Belgian law[6] that are legally required to file their annual accounts with the NBB.[7] These annual accounts typically include the main figures of the profit and loss statement, balance sheet as well as figures on the number of employees, sector, activity and location. Turnover is only reported for a subset of firms since "small firms"[8] report turnover on a voluntary basis. The dataset does not include data from self-employed workers that employ other people but do not operate via an incorporated legal entity. Data is on legal entity level and does not split figures over multiple establishments of the same legal entity. We are therefore not able to make a distinction between organic growth and growth from absorbing an acquired legal entity into an existing legal entity.[9] We observe these firms during the 30-year period 1985-2014. The period 1985-1994 of this database is gathered by Konings & Roothooft (1997) and we have extended it with additional data received from the NBB. From 1996 onwards the requirements for filing personnel information in Belgium were altered. For the period 1985-1995 we measure employment growth based on the reported variable average number of employees during the year, which includes own personnel, self-employed owners active in the business as well as interim labor. After 1996, this variable is not available anymore and for the period 1996-2014, we use the growth in the reported average full time equivalent employees (FTE) instead. FTE is arguably a better measure for the amount of labor within a firm as part-time work has become increasingly popular over the previous 2 decades.[10] To map the sector the firm is active in, we use the NACE Rev.

[5] Working based on unconsolidated accounts ensures that only Belgian activities and employment are taken into account. It does not allow, however, to distinguish between employment focused on the domestic market and employment linked with headquarter activity of MNCs or with export.

[6] This includes both locally and foreign owned firms incorporated in Belgium. Belgian annual accounts are not confidential and can be consulted at the NBB. Individual annual accounts of the past 10 years can be freely downloaded from the NBB website. Older annual accounts can be requested from the NBB at a fee. We have gathered the missing data while one of the authors was working as a research fellow at the NBB.

[7] Financial institutions are not included in the dataset as they do not file standard annual accounts.

[8] Small firms are defined as firms that do not exceed more than one of the following thresholds (1985 levels): average number of employees 50, turnover BEF 200M (approx. €5M), balance sheet total BEF 100M (approx. €2.5M). Over the years the monetary thresholds were gradually increased to €7.3M for turnover and €3.65M for balance sheet total (2014 levels).

[9] This makes the result of our study not fully comparable with studies using establishment level data. The impact is expected to be limited. In 2014 9,128 FTE were employed at legal entities that disappeared due to "merger after acquisition", this on a total job destruction rate of 147,450 FTE. In many cases, the acquiring company, in fact, keeps the legal entity of the target after changing the ownership.

[10] To solve the 1996 change in definition, we calculate the 1995-1996 growth by comparing the average number of employees (which includes interim labor) in 1995 with the total number of employees at the end of 1996 (a reported variable) summed with the amount of interim labor in 1996 (reported separately). We annualize the growth rate as we assume this growth is over 1,5 years as it compares an average variable with an end-of-year variable. We come to an

2, 2008 4-digit classification. We assume the latest available classification for the whole company lifespan. For companies not active after 2008 we map the older versions of the classification into the current version. If a 1-on-1 mapping is not possible, the biggest companies are mapped via a manual search and the remainder is mapped to the 4-digit code via a closest match algorithm. We do not clean the data as we believe what happens in the tails of the firm level distribution needs more scrutiny to better understand granular origins of aggregate movements.[11] The final database used for this study consists of 91,347 firms employing 1,501,988 people in 1985 and 407,374 firms employing 1,968,266 FTE in 2014. Detailed descriptive statistics of the data can be found in Appendix A.

We are the first study that covers almost the full private sector employment for a period of 3 decades for a European country. Other studies on European business dynamism are either based on OECD's DynEmp project or Bureau Van Dijk's Orbis database. Dynemp currently only covers the period 2001-2011 and hence cannot distinguish a secular trend from the impact of the business cycle. Orbis offers 10y times series for Belgium and longer time series for some other countries, but especially small firms are underrepresented in this database. Since younger firms are on average smaller than mature firms, young firms are underrepresented as well. Furthermore, as Orbis offers a snapshot of the firm landscape, exiting firms can only be fully traced by combining vintage versions of the database which easily leads to underrepresentation of firms that have exited during the studied time period.

We capture business dynamism by the statistical distribution of firm employment growth rates. The growth rate is defined as:

$$DHS_{it} = \frac{Emp_{it} - Emp_{it-1}}{\frac{Emp_{it} + Emp_{it-1}}{2}}$$

The growth rate DHS_{it} for firm i at time t compares the absolute growth between t and $t-1$ with the average employment of the two periods for firm i. This growth measure follows the definition of Davis, Haltiwanger & Schuh (1996) and is further referred to as the DHS growth rate.[12] It transforms the domain of growth rates from $[-1, +\infty]$ to the symmetric domain around 0 $[-2, +2]$. This allows to account for firm entry (+2) and exit (−2). As we capture the full firm landscape, we use the employment weighted growth rate distribution. A significant number of firms (especially smaller firms) shows no growth at all. As a consequence there is a very large weight on the

annualized growth rate of 0,64% for 1995-1996 aggregate employment in our dataset. This compares with a 0,69% growth rate for aggregate Belgian employment according to the Eurostat Labor Force Survey.

[11] We do, however, exclude Belgium's largest employer, the Belgian National Railway Company, from our data as, driven by EU regulation, it changes legal entity throughout the period. Since it represents approx. 4% of private sector employment, its observed entry and exit has a substantial impact on the employment weighted growth rate distribution.

[12] The DHS growth rate expresses the percentage growth vs. the average size over the period as opposed to the conventional growth rate that expresses the percentage growth vs. the initial size of the period.

zero value of the unweighted growth rate distribution. An additional characteristic of the Belgian firm landscape is that there are many small firms that show very small changes in FTEs.[13] This has a limited impact on overall reallocation but has the same impact on the unweighted growth rate distribution as a larger firm growing at the same rate. Unless otherwise stated, the growth rate distribution refers to the employment weighted distribution of firm DHS growth rates.[14]

Our analysis is predominantly based on studying percentiles of this growth distribution and the evolution thereof over time. We calculate the dispersion of the distribution as the difference in growth rate between the 90th and the 10th percentile, also referred to as the 90-10 differential. Similarly, the 90-50 differential and 50-10 differential refer to the difference in growth rate between the 90th and the 50th percentile and the 50th and the 10th percentile. The 90-50 differential and 50-10 differential are utilized to study the skewness of the distribution. The 90th percentile is used to study high-growth and referred to as P90. As we focus on the long term trend, the Hodrick-Prescott (HP) trend is included[15] as well as the 3-year moving average. We study the growth rate distribution for the universe of all firms as well as for relevant subgroups (e.g., young firms, certain sectors, etc.).

4. The Decline in Business Dynamism

We start our analysis with descriptive evidence of the decline in business dynamism. We study the evolution of the dispersion (90-10 differential) and the skewness (90-50 differential and 50-10 differential) of the employment weighted growth rate distribution. Dispersion is linked with the level of reallocation across firms. Skewness is linked with the activity of young, transformational entrepreneurs and creative destruction.

Fig. 1 shows this evolution of dispersion for all firms and continuing firms only.[16] The higher the difference, the more reallocation of human resources. We initially see an uptake in business dynamism in the eighties. In the early eighties Belgium was regarded as one of the worst performing economies in Europe: (very) high government deficits, spiraling public debt, high and increasing unemployment and ailing private firms. This led the then government to introduce a set of economic recovery policies. Next to a devaluation of the Belgian franc with 8.5%

[13] E.g., a firm growing from 1 to 1.1 FTE has a DHS growth of 9.5% although only 0.1 FTE is added.
[14] In Appendix B we also study dynamism based on the unweighted growth rate distribution and come to the same conclusions, i.e. a secular decline in dynamism.
[15] Given the use of annual data, the Hodrick-Prescott smoothing parameter used is 100.
[16] The universe of continuing firms excludes entering and exiting firms in a given year.

1982, the administrative burden to start-up a company was significantly reduced in the period 1985-1987. Potentially this led to the steep increase in growth rate dispersion during the 2nd half of the 80s. Depending on whether we include entry/exit activity, the decline in dispersion set in early 1990s (all firms, including exit/entry) or late 1990s (continuers only) and continues post-2000. We can clearly confirm a continuing decline in growth rate dispersion over the past 2 decades. Recessions[17] are also marked in Fig. 1. We see little to no correlation between a period of recession and a change in business dynamism. This confirms the decline in dynamism is a secular trend rather than a phenomenon linked with the business cycle.

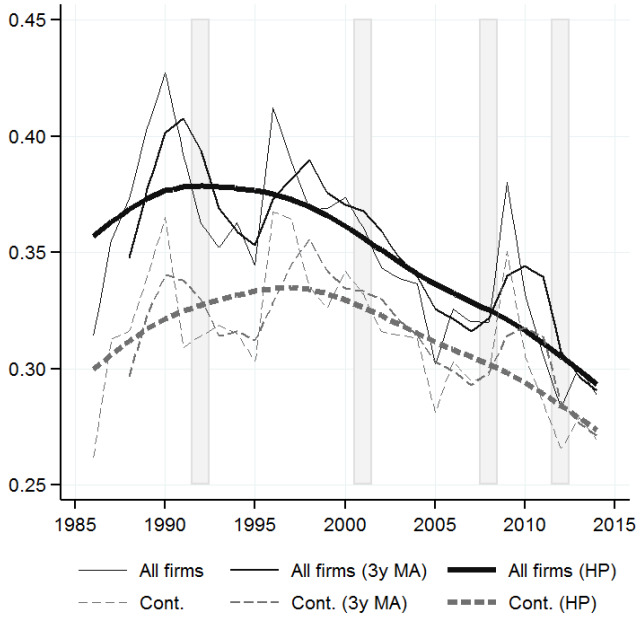


Fig. 1 90-10 differentials for all firms and continuing firms only. We see a continued decline post-2000. Note: grey shaded areas mark recessions, cont. abbreviates continuing firms. Source: authors' analysis based on NBB dataset.[18]

Fig. 2 shows the trend in dispersion for different industries. The services industry represents approximately half of Belgian employment in the beginning of the period and gradually increases its employment share to approximately 2/3 towards the end of period. Services predominantly take share from the manufacturing industry. Dispersion in the manufacturing industry gradually decreases. Dispersion in the services industry rises towards the end of the 90s, before declining as well. While the Belgian services industry continues to grow in terms of

[17] A recession is defined as 2 subsequent quarters of negative quarter-on-quarter real GDP growth. Real GDP growth figures from 1985 onwards taken from the OECD.
[18] Note and source comments are valid for figures throughout the document and not retaken.

value added and employment, Van Beveren & Vanormelingen (2014) find that it actually had a negative within firm productivity growth for the period 1998-2009 and that (very modest) productivity gains are purely driven by between firm reallocation. The decrease in service industry dynamism must hence be a source of concern. OECD (2017a) consistently urges Belgium to increase competition in the services industry to increase the potential for productivity growth. In Belgium, there still is regulation in place protecting existing firms in the retail trade and professional services.

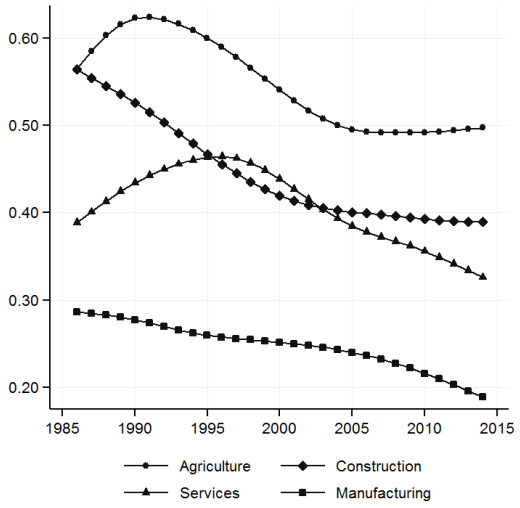


Fig. 2 90-10 differentials split between main sectors. Dispersion in the manufacturing sector steadily declines, dispersion in the services sector declines since the mid-nineties.

Fig. 3 shows the dispersion of the growth rate distribution for young firms.[19] We also correct young firm activity for so called spurious entrants. A spurious entrant is a newly established legal entity receiving a new business number,[20] but which is not truly a new firm. A spurious entrant is the result of a relocation of existing production factors from an incumbent, either in total or partially, to a new business number. Geurts & Van Biesebroeck (2016) find, based on detailed Belgian data of employee movements from the Belgian National Social Security Office (NSSO), that more than one third of administrative start-ups with 5 to 9 employees and two thirds with 10 or more employees are in fact spurious entrants. True entrants with more than 50 employees are extremely rare. Unfortunately, detailed employee movements are not available for the long time-period we study. To correct for spurious entrants and as a close approximation of the underlying dynamics, we therefore remove all entrants with

[19] Young firms are defined as max. 5y old.

20 In Belgium a new business number is only given to a newly incorporated legal entity, with new shareholder capital. A new business number is not given when there is a change of shareholder nor location.

more than 10 employees.[21] The dispersion or dynamism at young firms is significantly higher compared to that of older firms. A remarkable finding is that dynamism at young firms has actually been rising. The 90-10 differential for young firms excluding spurious entrants strongly increases leading to 2000 after which it stabilizes.

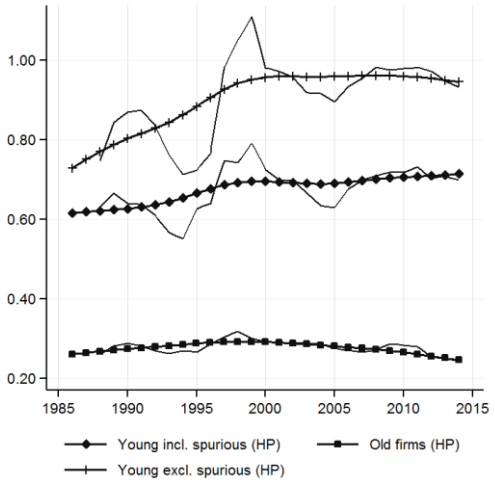


Fig. 3 90-10 differentials for old and young firms. The differential is significantly higher for young firms and it increases until 2000 after which it stabilizes. Dispersion for older firms declines post 2000.

We now turn to the skewness of the employment weighted growth rate distribution. Over the years a consensus has emerged on cross sectional patterns of firm growth.[22] Young firms disproportionately contribute to gross job creation and, conditional on survival, show much higher growth rates than older firms. Probability of exiting decreases linearly with age and the vast majority of start-ups do not grow at all. The positive job growth contribution of young firms is driven by a small number of high-growth firms. These patterns come together in the fact that young continuing firms show significantly higher skewness in firm growth rates. The skewness and a change in skewness of the overall growth distribution is hence closely linked with the activity of young, transformational entrepreneurs and creative destruction.

Fig. 4 shows 90-50 and 50-10 differentials as well as the difference between the two. We expect the growth rate distribution to be skewed to the right-hand side. This implies the 90-50 differential should be bigger than the 50-10 differential and the difference between the two hence positive. Fig. 4a shows these differences for all firms.

21 Geurts & Van Biesebroeck (2016) come to their findings based on entrants in the 2004-2012 period and we assume the proportion of spurious entrants they find also holds for our time period 1985-2014.

22 See Haltiwanger et al. (2013) and Decker et al. (2016) for the U.S., Criscuolo et al. (2014) and Calvino et al. (2015) for a broader set of OECD countries and Geurts & Van Biesebroeck (2016) specifically for Belgium.

The 90-50 differential is indeed larger than the 50-10 differential though the difference clearly is declining. The 50-10 differential is, since it is linked with job destruction, counter-cyclical. The 90-50 differential is pro-cyclical implying job creation in Belgium is highly linked with the business cycle as well. These 2 findings combined lead to the fact that the difference between the differentials is highly pro-cyclical. A striking finding is that the volatility of the difference clearly is reducing with each recession, including the great recession. The impact of a recession on the shape and skewness of the growth rate distribution declines. Firms seem to adjust their labor force less during recessions now compared to several decades ago.

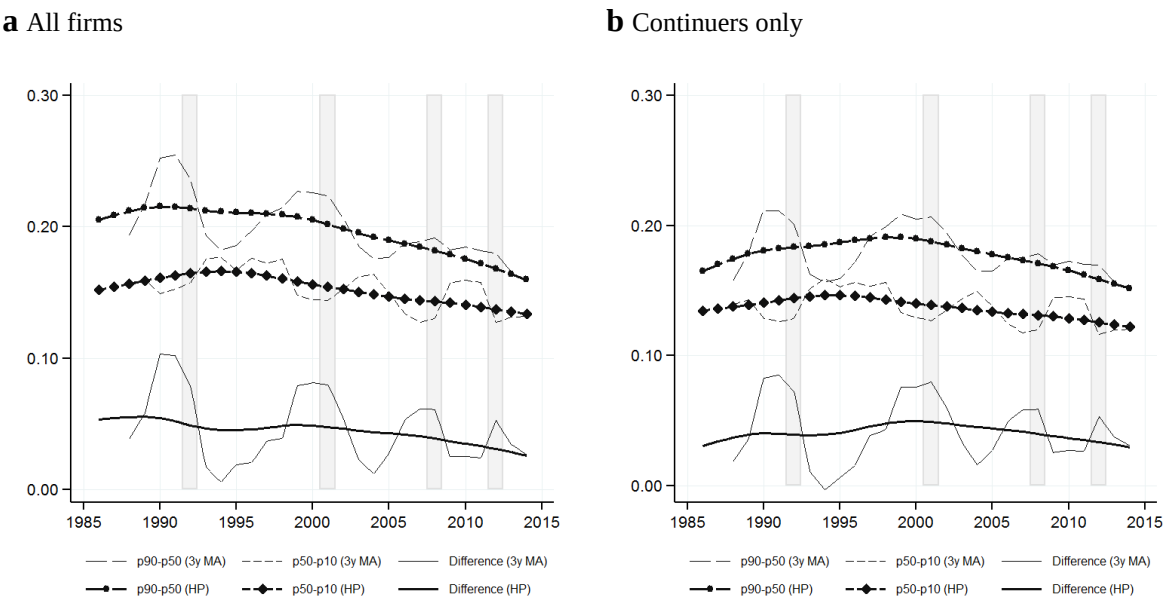


Fig. 4 90-50 and 50-10 differentials and the difference between the two for all firms (a) and continuing firms only (b). For all firms, the skewness declines throughout the studied period. For continuers only, the decline sets in around 2000.

Together with a declining dispersion, we can conclude Belgian firms are becoming more homogenous with respect to employment growth rates. There is less reallocation and less creative destruction and the impact of a recession is softening. Whether or not this phenomenon is linked with the fact that there is a growing diversion between "superstar firms" or "frontier firms" and the "rest" as described by Autor et al. (2017) for sales and Andrews et al. (2016) for productivity remains to be investigated.

Fig. 4b shows the same differentials, but for continuing firms only (i.e. excluding entry and exit). Skewness increases initially and declines post-2000. This implies the overall decline in skewness is not purely driven by an asymmetrical decline in entry and exit rates. Furthermore, the overall decline in skewness is to a large extend driven by the 90-50 differential. As the median firm shows little to no growth, what happens to the 90-50 differential is closely linked with what happens to the 90th percentile of firm growth rates, i.e. the activity of the fast growing firms which is further explored in section 5.

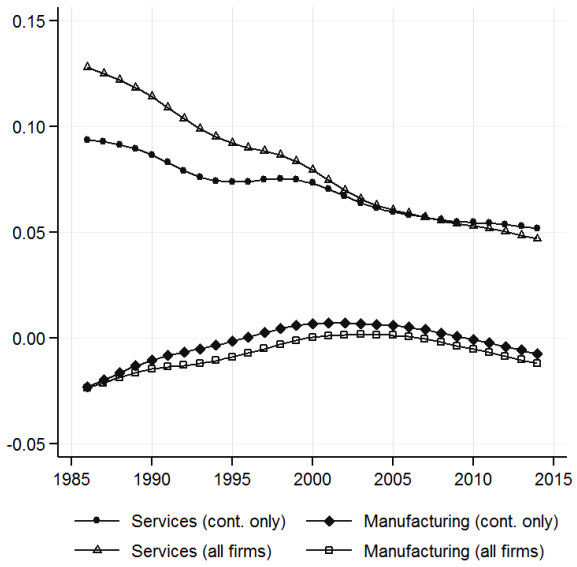


Fig. 5 Skewness or difference between 90-50 and 50-10 differentials for the services and manufacturing sectors. We The skewness of the services sector significantly decreases. For manufacturing it initially increases and comes down post-2000.

Fig. 5 shows the evolution of skewness for the manufacturing and the services sector, both for all firms and continuers only. The skewness of the services sector shows a continuous decline. For continuers only in the services sector we see a drop in the 80s, a stable skewness during the 90s and a drop again post-2000. The manufacturing sector shows an initial increase but shows a declining skewness post-2000.

So far, our findings for Belgium are similar to Decker et al.'s (2016) findings for the U.S. A striking difference, however, is that skewness for young firms as shown in Fig. 6 does not come down and both the 90-50 and the 50-10 differentials increase which is in line with the increased dispersion for young firms. Young Belgian firms are becoming less homogeneous from a growth point of view. Older firms (figure not shown) show little to no skewness. Skewness of mature firms remains fairly constant throughout the studied time period. The 90-50 differential is significantly lower for older firms than for young firms. A young firm is more likely to experience high growth than an older firm.

In summary, we see an overall declining pattern for dynamism measured via the dispersion and skewness of the employment weighted firm growth rate distribution.[23] Underlying, we find an increasing pattern for young firms

[23] This finding is robust to using alternative measures of dynamism, including dynamism based on the unweighted employment growth rate distribution as well as the (unweighted) turnover growth rate distribution as shown in Appendix B.

and the slightly decreasing pattern for older firms. Furthermore, we see a strong decrease of dispersion (post-2000) and skewness in the services industry. Dispersion and skewness is significantly higher for younger firms compared to older firms and for the services industry compared to the manufacturing industry. These findings indicate that there is potentially a strong role for compositional shifts of the firm landscape as the driver of changes in aggregate dynamism. This is further discussed in section 5.

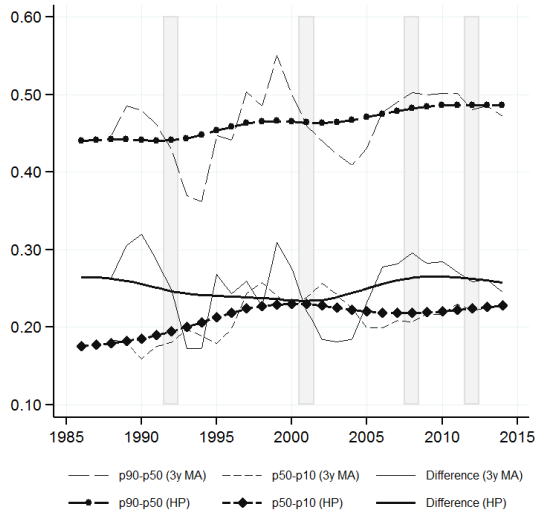


Fig. 6 90-50 and 50-10 differentials and the difference between the two for young firms only

5. Underlying drivers of business dynamism

The decline of start-ups and the changing composition of the firm landscape

A decline in start-up and exit rates will ultimately lead to an aging firm landscape where the average firm becomes older. The impact of this change in age composition on the dispersion and skewness of the firm growth distribution is well documented. Fizaine (1968) already discovered that age has a negative impact on both the growth and the variance of growth rates of French establishments. This has recently been confirmed by Bravo-Biosca (2016) who estimates that young firms grow about 3.5 times faster than older firms based on data for several countries. Earlier, Haltiwanger et al. (2013) came to a similar conclusion for the U.S. Specifically for Belgium, Geurts & Van Biesebroeck (2016) find that conditional on size, the growth rate of start-up firms reduces with age. This evidence indeed suggests that a decline in start-up rates and the rise of incumbent, "superstar firms" shifts the age distribution towards older firms. This has a negative impact on dispersion and skewness of the growth rate

distribution.

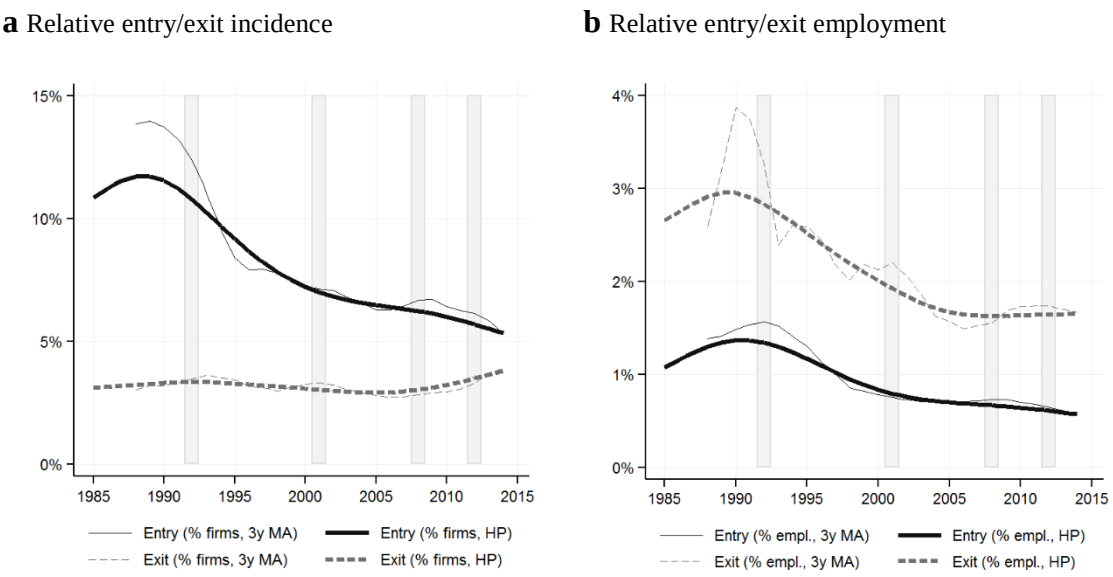


Fig. 7 Relative firm entry and exit rates in # of firms entering/exiting as % of all firms (a) and in employment at firms entering/exiting as % of all firms (b). Entry is corrected for spurious entrants. After an initial uptake, there is a strong decline in entry. Exit rates experience a gradual decline as well.

Fig. 7 shows the relative firm entry and exit rate both for the number of firms (Fig. 7a) as well as the relative employment[24] they represent (Fig. 7b). Table 3 and Table 4 in Appendix A give further detail on relative entry and exit rates at NACE 1-digit level.

Exit rates show regular spikes driven by the failing and/or restructuring of individual large firms (e.g., GIB, Belgium's largest retail group and Sabena, the national flag carrier). Nevertheless, the overall trend clearly is declining.

Looking at entry rates, we see a strong uptake late eighties and a subsequent decline from the early nineties. Although firm entry is widely studied in the literature of the 80s and the 90s, this period is unfortunately not very well documented for Belgium.[25] We therefore scrutinize the detailed data and we see the largest decline in start-up employment over the period 1995-1996. This coincides with the changed calculation method on how to report firm employment. From 1996 onwards a self-employed small business owner that actively works in the business

[24] To maximize comparability we use the variables average employment (# heads) before 1996 and end of year employment (# heads) from 1996 onwards. The dynamism and skewness calculations of the previous chapter use FTE from 1996 onwards. As a robustness check, we also study dynamism based on employment (# heads) after 1996 in Appendix B and come to the same conclusion, i.e. a decline in dynamism.

[25] See e.g., Geroski (1995) for an extensive overview of the empirical literature on firm entry. Specifically for Belgium, to our knowledge there is only to Sleuwaegen & Dehandschutter (1991) and De Backer and Sleuwaegen, (2003) who study Belgian start-up rates during the '80s and '90s but limit themselves to the manufacturing industry.

is not included anymore in the reported number of employees. Most probably, this changed definition led to the steep drop in 1996 of the average firm size at start-up (Fig. 8a) and the number of employees at starting firms (Fig. 8b). The average firm size drops with approx. 0.4 employees over the period 1995-1996. Increasing the number of employees with 0.4 (dotted lines in Fig. 8) makes the fall in start-up employment less dramatic than Fig. 7b suggests. Since headcount is an overestimation of employment when part-time work is on the rise and absolute employment at start-ups does not take into account the overall increase of the workforce, we can safely conclude that start-up activity is gradually declining after the strong increase of the late 80s, albeit at a less steep pace than the crude numbers suggest. This explains why the changing age composition only counts for approx. 1/3 of the overall dynamism decline as show in Appendix C.

a Average firm size at start-up

b Absolute employment at start-up firms.

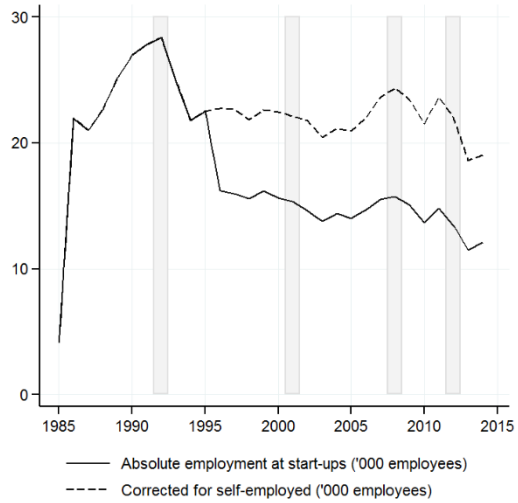


Fig. 8 Average firm size at year of entry (a) and absolute employment at entering firms (b). Dotted line corrects for changed definition of employment in 1996. Entry is corrected for spurious entrants. The average firm size significantly reduces in 1996 (the year the definition changed) and the drop in start-up employment is less outspoken if we correct for this changed definition.

The strong increase in start-up number late 80s is linked with regulatory changes. During the period 1985-1987 Belgian corporate law was drastically changed. The administrative burden to start-up a company was reduced and it became possible to incorporate a legal entity with a single shareholder.[26] These changes led to a strong increase in start-up rates from 1986 for both the number of starting firms and the employment at starting firms. As a result

[26] Before 1987 a single person business could only be run by a self-employed person operating without a legal entity. Profits of a single person business were taxed according to the (in most cases less favorable) personal income tax brackets. Furthermore, entrepreneurs without a legal entity remain personally liable for the business' debts in case of bankruptcy.

many self-employed small business owners, operating without a legal entity, switched to operating within a legal entity. Table 5 in Appendix A ranks NACE 2-digit sectors based on the employment they represent in the period of the start-up boom (1986-1992). We indeed find most start-up employment at retail and wholesale shops, restaurants and bars and construction companies (tradesmen).

a Relative entry/exit employment (after removal of top 5 start-up sectors)

b 90-10 differential (after removal of top 5 start-up sectors)

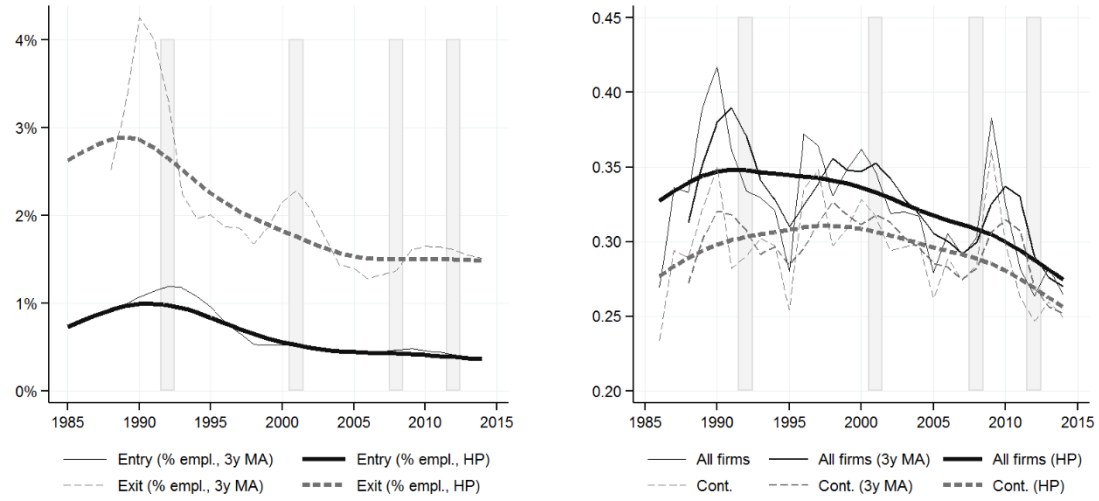


Fig. 9 Relative employment at firms entering/exiting as % of all firms (a) and dynamism (90-10 differentials) for all firms and continuing firms only (b). Entry is corrected for spurious entrants. Top-5 1986-1992 sectors with highest start-up employment are removed from the data. The decline in start-up and dynamism is less outspoken, but still present.

We do not know to what extend these newly started legal entities are truly new businesses or a change of legal status of existing businesses. At least a part of the start-up boom of 1986-1992 will be driven by already existing self-employed small businessmen. In our calculations they show up as start-ups and hence increase business dynamism although strictly speaking this is not the case.[27] It hence might be that the initial increase and subsequent decline of business dynamism might be caused by the temporary increase of incorporation of already existing businesses driven by regulatory changes. Fig. 9 now removes the top-5 1986-1992 start-up sectors[28] from the data and show start-up and exit rates (Fig. 9a) as well as dynamism (Fig. 9b). The evolution of the long term trend is smoothened, but stays comparable.

The decline in start-up rates of the past 2 decades is well documented and not limited to Belgium. Calvino et al.

[27] A benefit remains that, since incorporation offers far higher protection in case of bankruptcy, incorporation should encourage risk taking which is positive for subsequent dynamism.

[28] See Table 5 in Appendix A. The top 5 sectors are retail trade (excl. motor vehicles) (NACE 47), wholesale trade (excl. motor vehicles) (NACE 46), specialised construction (NACE 43), food and beverage service (NACE 56), wholesale and retail of motor vehicles (NACE 45). They represent 46% of start-up employment during 1986-1992.

(2015) find this a common trend for most OECD countries. For Belgium they find that the start-up rate is very low, but the post-entry growth rate of survivors is the highest in the studied sample. They also find this is a common characteristic for nearly all NACE 2-digit industries. Dumont & Kegels (2016) dig deeper into Belgian start-up rates and find that of the factors impacting start-ups (such as bankruptcy regulation, contract enforcement, access to finance and product market regulation) it seems that access to finance is the major barrier for entrants and young firms in Belgium. The combination of these insights might also explain why dynamism at young firms actually increases as potentially only the best business ideas are able to find the required financing and materialize into a start-up business.

The decline in entry rates leads to a subsequent decline of employment at young firms (figure not shown) and a shift towards older, less dynamic firms. Next to changes of the age composition, there are also changes of the sectoral composition of the firm landscape. Bijnens & Konings (2017) show that over the past decades, Belgium has moved a large amount of jobs from the capital intensive, goods producing manufacturing industry to more volatile distribution and support services. In Appendix C we analyze the effect on compositional shifts on the decline of the 90-10 differential as well as on the decline of alternative measures of business dynamism. We find that this only partially explains the aggregate decline. The changing age composition explains approx. 1/3 of the decline. The effect of sectoral changes is not fully clear as depending on the measure it can either cause a decline or rise in dynamism. In any case, taking the changing firm landscape into account, the majority of the decline in dynamism remains unexplained. This is confirmed by the fact that dynamism at continuing firms shows a trend change from increasing to declining end 90s whereas the start-up rate showed the largest decline during the 90s and stabilizes post 2000.

The decline of high-growth firms

We now turn to the evolution of high-growth firms (HGF) as they have a strong impact on the 90-50 differential and hence overall skewness of the firm growth rate distribution. While it is often claimed that small, young firms account for the majority of job creation, this is rebuked by Henrekson & Johansson (2010). They analyze 20 empirical studies and find that a large share of net employment growth is generated by a few rapidly growing firms, so-called high-growth firms (HGFs). These HGFs are not necessarily small and young, but it is predominantly young age more than small size that seems to be linked with rapid growth and job creation. Geurts & Van Biesebroeck (2016) find that firm size at start-up seems to have some predictive power for subsequent high

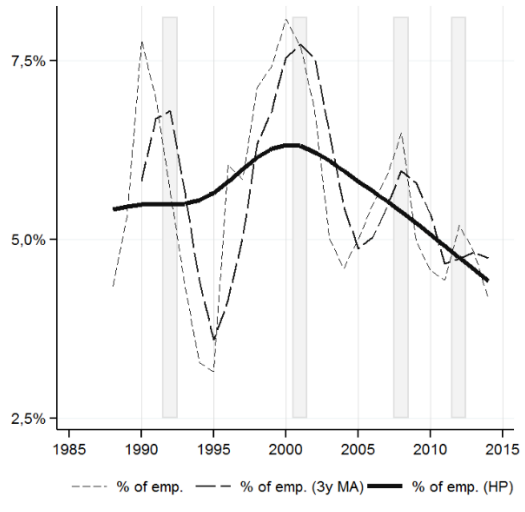
job creation.

HGFs thus play an important role in a dynamic economy as they represent a disproportionate share of job creation. The Eurostat-OECD definition of high-growth requires an annualized growth rate of 20% over a three-year period and ten or more employees at the beginning of the observation period. We also use an alternative definition of high-growth that defines all companies with a growth rate above the 90th percentile as HGFs.

Fig. 10a first looks at high growth based on the Eurostat-OECD definition. The employment share at HGFs initially goes up pre-2000 and comes down post-2000. The volatility stemming from the business cycle has significantly come down too, with the latest downturn having only a small impact on HGF activity. Looking at the growth rate of the 90th percentile (Fig. 10b, bottom curve), we observe a similar trend. We now know that the decline in skewness and dispersion of the firm growth rate distribution is driven to a large extend by what happens to these fastest growing firms. P90 firms increased their growth rates in the pre-2000 period which drove the overall 90-50 differential upwards. This was accompanied by a smaller increase of the 50-10 differential leading to an increase in dispersion and a small increase in skewness. Post-2000, we see a drop in the 90-50 differential which brought down skewness and dispersion.

The overall trend masks the fact that the growth rate of the fastest growing young firms (P90) is significantly higher and actually steadily going up (Fig. 10b, top curve). High growth clearly is associated with younger firms. The best young firms are actually doing well, but their impact on the overall trend completely fades away since there is simply less activity from young firms.

a EUROSTAT-OECD definition



b P90 definition

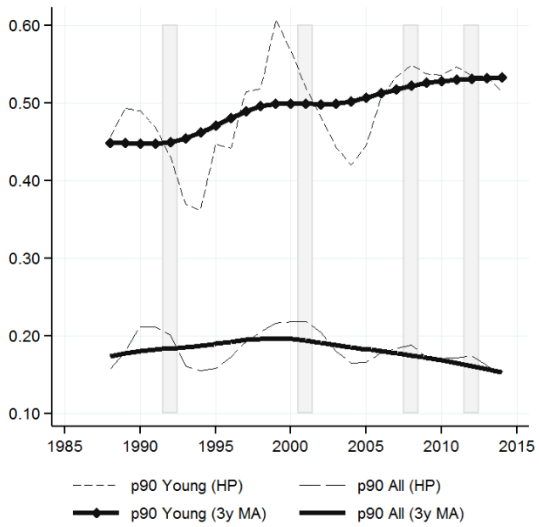


Fig. 10 Relative employment at high-growth firms (a) and growth rate of P90 for all and young firms only (b). HGF activity goes up pre-2000 and comes down post-2000. P90 growth rate for young firms increases.

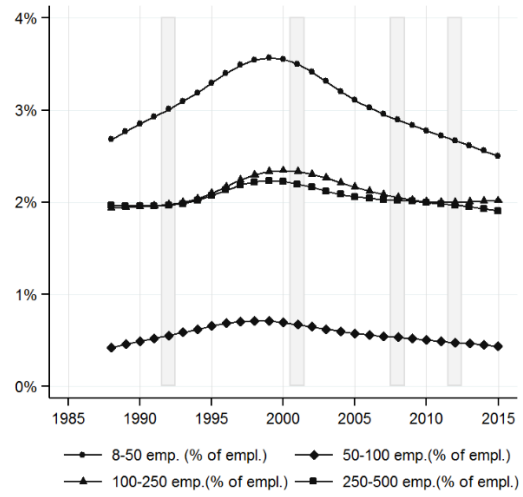
Although HGFs play an important role in overall employment growth and the skewness of the growth distribution, the impact of the decline in HGFs remains yet unknown. HGFs remain to some extend a mystery as they tend to come and go as "black swans" (Moreno & Coad 2015). Although there is a clear decline in HGF (and start-up) activity, we do not see a direct link with overall employment. Unemployment in Belgium has remained fairly stable over the past decades and only experience mild fluctuations in line with the business cycle. Possibly, HGF activity can be linked with the quality of employment. Bachmann et al. (2017) provide some intuition on this. They find in German data that fast growing firms fuel their growth by poaching workers from other firms (rather than hiring from unemployment). Most likely they need to offer better contract terms to do so. This fuels overall salary growth. The decline of fast growing firms could hence offer a part of the explanation that Belgian job creation at the higher paying levels is coming down as shown in Bijnens & Konings (2017).

Based on the Eurostat-OECD definition, only approx.. 1,000 companies p.a. are categorized as high-growth firms as only a small part of the firms landscape (~5%) meets the 10 employee threshold. As young firms are predominantly small, a Eurostat-OECD HGF analysis excludes most of the employment dynamics of young firms. Hölzl (2013) therefore uses a broader definition for high-impact firms[29] (HIF) that combines relative and absolute growth and puts the threshold at 8 employees. We focus on high-impact firms with less than 500 employees as we are predominantly interested in younger firms. For larger firms, the absolute rather than the relative growth predominantly drives the definition of high-impact.

Fig. 11a shows the employment at HIFs split over different size classes. The size class is defined at time t-3 to avoid a bias towards larger firms since per definition HIFs have experienced strong growth over the past 3 years. The overall trend of an increase pre-2000 and decrease post-2000 is also valid for HIFs. Underlying we see, however, that the smallest HIFs experience the fastest increase pre-2000 and also the fastest decrease post-2000. The segment of small HIFs (8-50 employees) is also likely to be the youngest sub-segment. Fig. 11b splits the sample between young firms (5 years or less at time t-3) and old HIF. We find that not only young HIFs experience a decline post-2000, but also and more importantly the older HIFs. The decline in high-impact activity is hence not limited to younger firms for which the activity is highly linked with the (declining) start-up rate.

[29] High-impact firm definition: $(Emp_t - Emp_{t-3})\left(\frac{Emp_t}{Emp_{t-3}}\right) \geq 25.15968$ if $Emp_{t-3} > 8$

a Split over different firm sizes



b Split over different firm age

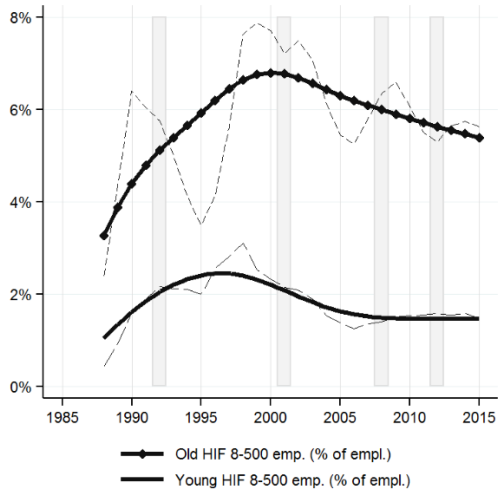


Fig. 11 Relative employment at high-impacts firms split over different firm sizes (a) and firm age (b). Small and young HIFs see the sharpest increase pre-2000 and decrease post-2000. Younger and older HIFs experience a decline. Firm size and age is defined at t-3

The role of ICT Intensity

So far, we have shown that there is a clear decline in dynamism and this decline set in around the year 2000. A substantial part (approx.. 1/3) is driven by lower start-up rates that shifted employment towards older, less dynamic firms. An additional driver is the decline of employment at high-growth and high-impact firms. This decline is not limited to young firms (which is linked with the decline in start-up rates) and also apparent for older firms. What exactly caused the decline in start-up and high-growth activity remains, however, yet unknown.

Decker et al. (2016) see a U.S. dynamism trend change that set in around the year 2000. Since Belgium and the U.S., two very different economies,[30] exhibit similar trends with respect to dynamism, global changes affecting all countries rather than country specific changes are likely to have played a role.[31] Possible global changes are the increasing use of ICT or increased globalization. In this paragraph we explore the impact of ICT. In the next paragraph we briefly study globalization.

Several authors already confirmed that a substantial part of the U.S. growth acceleration from 1995 to 2000 is

[30] Also note that Belgium, contrary to the U.S., did not experience a significant Internet boom and bust around 2000.
[31] Note that this is in line with Goldschlag, N., & Tabarrok, A. (2018) who show that increased regulation (which is country specific) is not to blame for the decline of U.S. business dynamism.

driven by the adoption of ICT (Jorgenson et al., 2003; Daveri, 2003). Van Ark (2015) states this was also the case for Europe, though less outspoken compared to the U.S. Van Reenen et al. (2010) link ICT with reallocation of employment and find firms with higher levels of ICT are more likely to grow and less likely to exit.

Several classifications for industries exist based on their level of innovation or high-tech content. We find that these definitions do not capture very well the impact of the ICT revolution.[32] For instance, wholesale and retail activities are generally not classified as highly innovative, nevertheless the use of ICT dramatically increased and has become a key success driver of this industry. To capture the impact of ICT, we use the EU KLEMS Productivity and Growth Accounts on industry level for Belgium.[33] The dataset provides us with the change in contribution of ICT capital services to value added growth on an aggregation level between NACE 1-digit and 2-digit.[34] We assume the industries with the highest contribution between 2000 and 2014 are the ones that were most affected by the ICT revolution that set in during the second half of the '90s.[35] Companies in these sectors who did not successfully invest in ICT, saw (compared to other industries) a disproportionate impact on their value added growth and were hence more likely to stagnate or disappear. As acquiring ICT knowledge and infrastructure is, to a certain extent, a fixed cost, smaller companies are more likely to miss out on the ICT revolution which could ultimately result in a loss in business dynamism as a limited number of successful companies become more dominant in an industry.

Fig. 12a shows the evolution of dynamism (captured by the 90-10 differential) for ICT intensive vs. non-intensive industries. Both see an initial uptake in dynamism linked with the increased start-up rate of the 2nd half of the 80s. Subsequently the non-ICT intensive industries experience a slow, continuous decline throughout the studied period. ICT intensive industries, however, show a strong increase in dynamism until the second half of the '90s followed by an even stronger decrease. The overall pattern of a change in dynamism in the late 90s is clearly driven by the ICT intensive industries. This is not contradictory to Van Reenen et al. (2010) who have shown that

[32] We have analyzed the different measures of dynamism for different industries based on Eurostat's classification of high-tech vs. low-tech manufacturing industries and knowledge intensive vs. less knowledge intensive services. This yielded little additional insight.

[33] See Jäger (2017) for an explanation of the EU KLEMS project and its data sources.

[34] Several 2-digit industries are taken together resulting in 29 different industries instead of the 88 NACE 2-digit industries.

[35] Via this methodology we categorize the following NACE sections or industries as ICT intensive (all other industries, we regard as non-ICT intensive): IT and other information services (62-63), Telecommunications (61), Publishing, audiovisual and broadcasting activities (58-60), Professional, scientific, technical administrative and support service activities (M-N), Financial and insurance activities (K), Wholesale and retail trade (G), Arts, entertainment and recreation (R), Machinery and equipment n.e.c. (28), Chemicals and chemical products (20-21), Coke and refined petroleum products (19), Electricity, gas and water supply (D-E).

firms investing more in ICT grow more in employment. The initial uptake of ICT will cause increased reallocation from firms not investing in ICT to firms investing in ICT which initially leads to an increase of business dynamism. The ICT investing firms will become larger and more productive and push the smaller, less productive firms out of the market. The surviving firms become the "superstar firms" of their industries potentially causing a subsequent decline in business dynamism. Dhyne et al. (2018) show that actually only a small number of larger firms benefit from productivity increasing ICT investments, especially within the services industry.

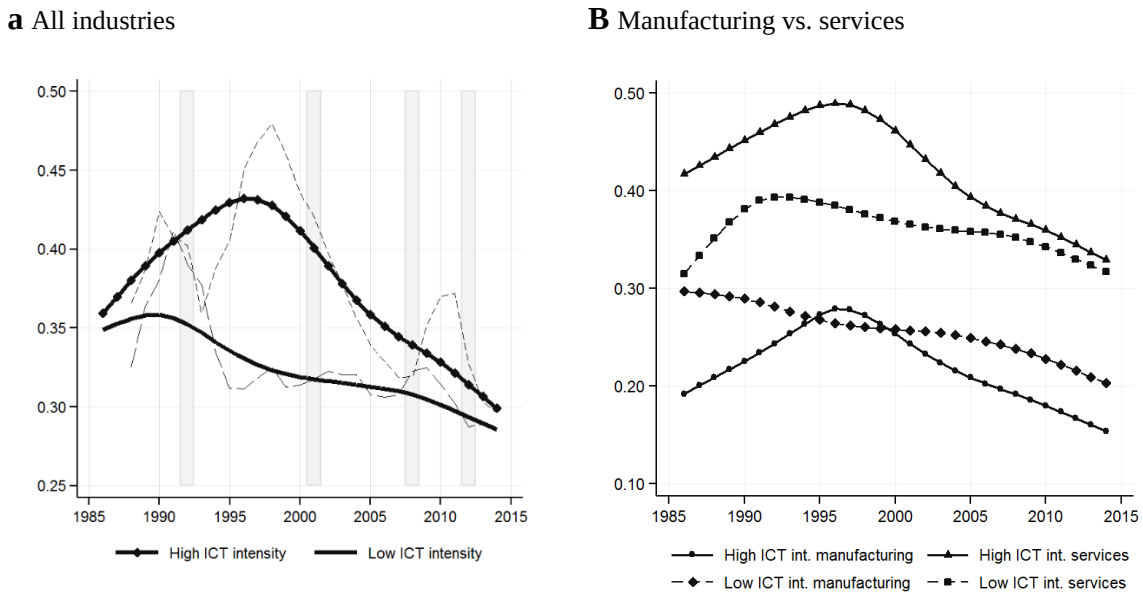


Fig. 12 90-10 differential split by level of ICT intensity. The dynamism increase pre-2000 and decline post-2000 is predominantly driven by high ICT intensive industries.

One could argue that in Fig. 12a, we do not observe the difference in ICT intensity, but rather a difference services vs. manufacturing as services are over represented in the ICT intensive industries. Therefore, in Figure Fig. 12b we explicitly make the ICT intensity split for manufacturing and services. Even within the services and the manufacturing industries, there is a clear difference of the ICT intensive industries vis-a-vis the non-ICT intensive ones. For both services and manufacturing, the ICT intensive industries exhibit the overall pattern of a change in dynamism towards the end of the 90s, whilst the non-ICT intensive industries show a slower decline and do not experience a trend change in the years leading to 2000.

Fig. 13 looks at the combination of firm age and ICT intensity and its effect on the fastest growing companies (P90). Apart from the initial strong decline at low ICT intensive services (linked with the decline in firm entry), the growth rate of the 90th percentile for young firms (Fig. 13a) shows a rather flat evolution. Fig. 13b also shows

the P90 growth rate for old firms. The decline in dynamism for older firms, especially older services firms, is very outspoken. We find the steepest decline with high ICT intensive services. This shows again that the decline in dynamism is not purely linked to a decline of activity at younger firms.

We cannot claim (yet) the causes of the decline in business dynamism are linked with the increased use of complex ICT systems during the second half of the ’90s. Nevertheless, we find some preliminary indications that whether or not an industry has a high ICT intensity is somehow linked with the decline in business dynamism. This topic needs further, more detailed research.

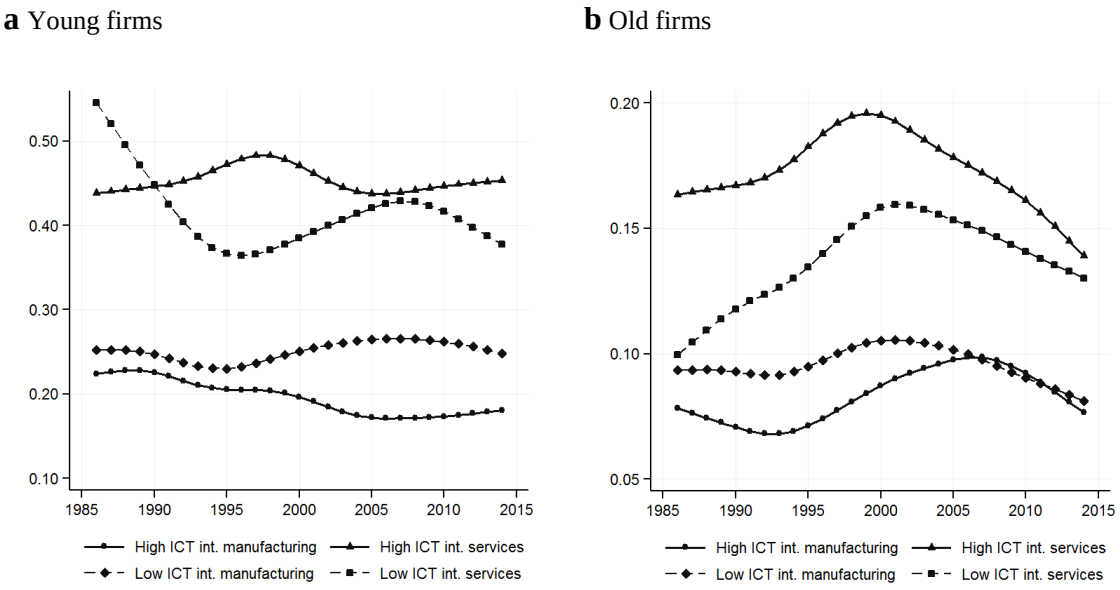


Fig. 13 P90 split by level of ICT intensity, young firms (a) and old firms (b). The especially the decline at older services firms is very outspoken

The role of foreign direct investment

The steep increase in globalization of the past decades had indeed substantial effects on the firm landscape. The Melitz (2003) model already implied only the best firms will participate in the export market and will become better an push out weaker firms. Bernard et al. (2007) document how increased international trade and investment affects the strategy and structure of incumbent firms across industries. Globalization comes in many forms and we therefore study one specific part of globalization highly relevant for Belgium, a small and very open economy: the increased importance of inward foreign direct investment (FDI) and the presence of foreign multinational

corporations (MNC).[36]

According to UNCTAD data, the inward FDI stock of developed economies increased more than tenfold over the period 1990-2014. Belgium too, receives substantial foreign direct investment. OECD (2014) puts the 2011 stock of inward Belgian FDI at 200% of GDP. This ratio ranks Belgium 2nd of all OECD countries, behind Luxembourg. It is therefore fair to say, inward foreign investment plays a very important role for Belgium's firm landscape and hence for its business dynamism.

Aitken and Harrison (1999) already drew attention to the fact that, although inward FDI leads to technology spillovers (benefiting domestic entrepreneurship), more efficient foreign firms may "steal" the market of domestic firms. This leads over time to a less competitive firm landscape. The fear that foreign MNCs monopolize domestic markets has certainly not ebbed way since their research. De Backer and Sleuwaegen (2003)[37] studied this topic specifically for Belgium. They analyze entry and exit across Belgian manufacturing industries and find that FDI indeed discourages entry and stimulates exit of domestic entrepreneurs. However, their empirical results also show that this crowding out effect is moderated or even reversed in the long-run due to the long term positive effects of FDI on domestic entrepreneurship as a result of learning and linkage effects between foreign and domestic firms. In addition Duprez and Van Nieuwenhuyze (2016) point out that, at least for the case of Belgium, an economic crisis affects employment at subsidiaries of foreign MNCs to a much greater extent than employment at domestic firms.

To study the impact of MNC activity on dynamism we have obtained confidential data from the NBB's survey on foreign direct investment. This data list all firms that are directly or indirectly foreign owned.[38] We have linked this information with employment information to come to a "MNC presence" per NACE 2-digit sector. A sector with high MNC presence has a high share of employment at firms with foreign ownership. Table 5 in Appendix A shows the details and ranks the sectors based on MNC presence. We split our data between sectors with high MNC presence (representing 50% of employment) and the sectors with a low MNC presence (representing 50%

[36] We do not study the possible increased Belgian employment at Belgian MNCs driven by headquarter services delivered to non-Belgian affiliates. This increased employment does show up in the employment figures we use, but we have no information on whether these employees work specifically for the Belgian market of for the foreign market.

[37] More recent research on linkages between FDI and entry/exit rates unfortunately focusses on developing and transitional economies.

[38] This survey is conducted since 1997. Based on, amongst others, annual account data, the NBB selects the firms who must obligatorily respond to the FDI survey if 10% of the firm's equity is directly or indirectly held by a foreign entity or individual.

of employment).

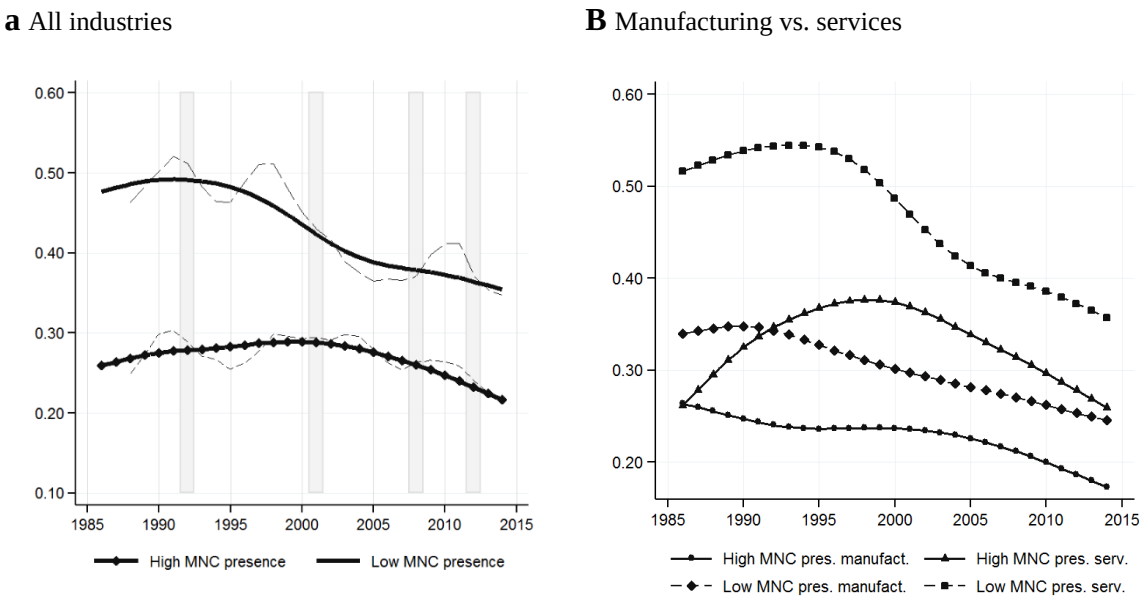


Fig. 14 90-10 differential split by level of MNC presence (high vs. low, see Table 5 in Appendix A). Overall the dynamism drop is predominantly driven by sectors with low MNC presence. Comparing manufacturing with services, we see that the initial rise in dynamism is driven by services with high MNC presence. These high MNC presence services show a remarkable trend changes second half of the 90s. Source: authors' analysis based on NBB FDI survey data.

Fig. 14 shows the evolution of dynamism (captured by the 90-10 differential). Fig. 14a shows that sectors with low MNC presence show higher dynamism, but also show a steeper decline that sets in the 2nd half of the 90s. As most manufacturing sectors have a high MNC presence, Fig. 14b makes the split between manufacturing and services. Both services and manufacturing, independent of high or low MNC presence, show a decline in dynamism. The most remarkable finding is that services with high MNC presence show the most outspoken trend change around 2000. Services with low MNC presence, show a steep decline around 2000. A possible linkage between MNC presence and dynamism seems only to be present in services sector. Bearing in mind, however, we only take into account MNC activity from 1997, the question whether an increased MNC presence had an impact on dynamism in services sectors needs further study.

6. Concluding Remarks

We find clear evidence that the secular decline in business dynamism is not limited to the U.S., a highly entrepreneurial economy where dynamism started from a high base. Business dynamism is declining in Belgium

as well, an economy with a rigid labor market and where the levels of entrepreneurship are significantly lower than in the U.S. We do not see a "revert to the mean" or convergence with respect to business dynamism where highly dynamic economies are hampered by increasing legislation and rigid economies become more entrepreneurial driven by structural reforms.

We find that the decline of Belgium business dynamism set in around the year 2000. This follows a decade of declining start-up rates that shifted the composition of the firm landscape to older, less volatile firms. We estimate this age effect to explain up to 1/3 of the aggregate dynamism decline. The dynamism decline is predominantly driven by a sustained decrease of the 90-50 differential of the firm growth rate distribution. The declining 90-50 differential is closely linked with the activity of the so called high-growth firms. We find a declining propensity for small (not necessarily young) firms to experience fast growth.

Although the causes of the above changes remain yet unknown, they are likely to be found in global trends affecting (developed) economies in a similar way. Potential candidates could be the increased use of ICT and its impact on productivity gains or increased globalization.

With respect to ICT as a cause for the decline in dynamism, we offer preliminary evidence that the ICT intensity of an industry is linked with the gravity of the decline in business dynamism. As our findings are based on a rather crude split of industries based on ICT intensity, this remains an area to further research.

With respect to globalization, we briefly study the impact on dynamism from the increased presence of multinational companies (MNCs) and find mixed results. While industries with the highest presence of MNCs show low dynamism, the drop in dynamism is actually significantly higher for industries with a low MNC presence. Nevertheless, services industries with a high MNC presence show the strongest dynamism trend change. The reasons for this, however, remain a topic for further research as well.

We also see that the volatility of the 90-50 and 50-10 differentials is declining with each business cycle. Firms are becoming less and less diverse from a growth rate perspective. Firms increasingly resemble each other. Whether or not this goes hand in hand with decreasing diversity in productivity in Belgium remains to be investigated. Andrews et al. (2016) already showed dispersion in productivity within NACE 2-digit sectors is actually increasing.

Reallocation of (human) resources towards the most efficient and productive firms is an important driver for overall productivity growth. The fact that there is less activity at (small) high-growth firms might be due to the simple fact that resources are already allocated to the most productive (larger) firms. If this is the case, the

dynamism decline is not necessarily negative for overall productivity growth.

Other research indicates that younger firms on average invest more in innovation. If high growth is more and more associated with larger firms this might also mean that they are more and more able to shield themselves from creative destruction driven by younger, smaller and potentially more innovative firms. This implies a negative effect on aggregate productivity. An alternative and less worrying explanation could be that smaller, disruptive firms are more likely to be acquired by incumbent firms and they continue their innovation supported by the resources and the management knowledge of the incumbent. In any case, the research on the decline in business dynamism should not be seen independently from the recent studies on the increased performance and power of the so called “superstar firms”. Understanding what caused the Belgian decline in business dynamism and high-growth firm activity is a topic for future research.

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Appendix A: Descriptive statistics of data

Table 2: Overview of number of firms (with and without turnover) per year in the dataset split over different NACE Rev. 2 1-digit sections.

Table 3: Relative firm entry and exit rates per NACE Rev. 2 1-digit section in # of firms entering/exiting as ‰ of all firms.

Table 4: Relative firm entry and exit rates per NACE Rev. 2 1-digit section in # of employees entering/exiting as ‰ of all firms.

Table 5: Share of employment (FTE) at firms with partial or whole foreign ownership (direct and indirect) per year and split over NACE 2-digit sector.

Table 6: Employment at start-up firms during 1986 – 1992 (# employees in year of start-up) split over NACE Rev.2 2-digit sectors and ranked based on employment (largest to smallest).

Year	TOTAL		Agriculture, mining (A+B)		Manufacturing (C)		Utilities (D+E)		Construction (F)		Wholesale, retail (G)		Transportation (H)		Food and accommodation (I)		ICT (J)		Finance, insurance (K)		Real estate (L)		Professional services (M)		Admin and support services (N)		Other services (O-U)	
	All	With turn.	All	With turn.	All	With turn.	All	With turn.	All	With turn.	All	With turn.	All	With turn.	All	With turn.	All	With turn.	All	With turn.	All	With turn.	All	With turn.	All	With turn.	All	With turn.
1985	91.3	54.4	2.4	1.4	13.2	8.5	0.3	0.3	9.4	5.6	33.0	19.9	4.5	2.9	2.9	1.7	1.7	1.1	3.9	1.7	3.0	1.7	6.5	3.7	4.6	2.6	5.8	3.2
1986	104.6	56.1	2.8	1.5	14.6	8.6	0.4	0.3	10.5	5.6	37.5	20.4	5.0	2.9	3.5	1.8	2.1	1.1	4.4	1.8	3.8	1.9	7.6	3.9	5.2	2.7	7.3	3.6
1987	116.8	63.5	3.3	1.8	15.6	9.2	0.4	0.3	11.6	6.4	41.1	22.5	5.3	3.2	4.1	2.2	2.4	1.4	4.8	2.1	4.4	2.2	9.1	4.8	5.7	3.0	9.0	4.6
1988	130.7	69.4	3.9	2.1	16.7	9.6	0.4	0.3	12.9	6.9	44.7	23.9	5.7	3.4	4.7	2.4	2.8	1.5	5.4	2.3	5.2	2.5	10.9	5.6	6.1	3.2	11.2	5.6
1989	146.2	75.8	4.8	2.5	17.9	10.1	0.5	0.3	14.3	7.7	48.5	25.3	6.1	3.6	5.3	2.6	3.2	1.7	6.0	2.6	6.1	2.8	12.9	6.6	6.8	3.4	13.9	6.7
1990	162.3	83.7	5.9	3.0	19.0	10.6	0.5	0.3	15.8	8.4	52.3	27.4	6.6	3.8	5.9	3.0	3.7	1.9	6.5	2.9	7.3	3.4	15.1	7.6	7.6	3.9	16.0	7.5
1991	178.5	83.8	7.1	3.4	20.0	10.3	0.5	0.3	17.3	8.3	55.9	26.7	7.1	3.7	6.6	3.1	4.2	2.0	7.2	3.0	8.9	3.7	17.4	8.0	8.5	3.9	17.6	7.5
1992	193.3	90.0	8.0	3.7	20.7	10.7	0.6	0.3	18.6	9.1	58.9	27.9	7.4	3.9	7.3	3.4	4.6	2.2	7.7	3.2	10.5	4.2	19.3	8.6	9.1	4.1	20.8	8.8
1993	204.1	90.2	7.8	3.4	21.0	10.3	0.6	0.3	19.7	9.1	61.5	27.9	7.6	3.8	8.0	3.5	4.6	2.0	9.3	3.6	14.6	5.6	20.7	8.7	9.9	4.3	18.8	7.7
1994	212.4	90.9	3.9	1.5	23.3	11.2	1.2	0.7	21.1	9.3	68.1	30.0	6.5	3.2	10.1	4.4	4.8	2.1	9.5	3.7	19.5	7.5	20.7	8.3	8.9	3.7	14.8	5.3
1995	221.2	92.2	3.6	1.4	23.7	11.1	1.3	0.7	22.2	9.5	70.7	30.1	6.6	3.2	11.0	4.7	5.1	2.2	9.8	3.8	20.5	7.6	22.0	8.6	9.7	4.0	14.7	5.4
1996	231.4	93.6	3.3	1.3	23.9	10.9	1.4	0.7	23.2	9.7	72.9	30.2	6.9	3.2	11.9	4.9	5.6	2.4	10.6	3.9	21.4	7.7	23.8	9.1	10.7	4.1	15.7	5.6
1997	241.0	98.6	3.3	1.3	23.9	11.0	1.5	0.8	24.4	10.3	74.7	31.2	7.2	3.4	12.6	5.3	6.1	2.7	11.2	4.1	22.0	7.9	25.8	9.9	11.2	4.4	16.8	6.2
1998	250.6	101.1	3.4	1.4	24.2	11.0	1.4	0.7	25.5	10.6	76.8	31.7	7.6	3.5	13.6	5.8	6.8	3.0	11.6	4.1	22.6	7.9	27.9	10.5	11.5	4.6	17.8	6.5
1999	260.5	104.4	3.5	1.4	24.5	11.1	1.5	0.7	26.6	11.1	78.5	32.3	8.0	3.7	14.3	6.0	7.6	3.3	12.4	4.2	23.2	8.0	29.9	11.1	11.8	4.7	18.7	6.8
2000	270.9	103.4	3.6	1.3	24.5	10.7	1.5	0.7	27.8	10.9	79.7	31.4	8.3	3.6	14.9	6.0	8.6	3.5	13.3	4.3	24.2	8.0	32.4	11.4	12.2	4.8	19.9	6.8
2001	280.1	100.8	3.7	1.4	24.4	10.2	1.5	0.7	29.0	10.9	80.0	30.0	8.6	3.7	15.4	5.8	9.7	3.8	14.4	4.2	25.1	7.6	34.6	11.2	12.5	4.6	21.1	6.9
2002	290.5	101.5	3.8	1.4	24.3	10.0	1.6	0.7	30.2	10.9	80.1	29.4	9.0	3.7	16.2	5.9	10.6	4.0	15.5	4.3	26.2	7.6	37.0	11.6	13.3	4.8	22.8	7.3
2003	299.8	99.3	3.9	1.3	24.1	9.5	1.5	0.7	31.2	10.6	80.8	28.3	9.3	3.7	16.9	6.0	11.1	4.0	16.3	4.2	27.2	7.3	39.4	11.6	13.6	4.7	24.3	7.3
2004	309.5	98.3	4.2	1.4	23.7	9.0	1.4	0.6	32.6	10.5	81.6	27.6	9.9	3.9	18.0	6.1	11.9	4.1	16.9	4.2	28.0	7.3	41.7	11.7	13.6	4.4	25.9	7.5
2005	319.4	90.1	4.4	1.3	23.3	8.0	1.3	0.5	34.5	9.9	82.0	24.9	10.5	3.7	19.1	5.7	12.5	3.8	17.8	4.0	28.7	6.5	43.9	10.6	13.9	4.1	27.5	7.1
2006	331.0	83.3	4.6	1.2	23.3	7.3	1.1	0.5	36.5	9.3	82.8	22.7	10.9	3.5	19.8	5.3	13.1	3.6	18.9	3.8	29.8	5.9	46.6	9.9	14.2	3.7	29.3	6.6
2007	344.8	81.2	4.8	1.2	23.6	7.1	1.1	0.5	39.2	9.5	84.6	21.6	11.5	3.5	20.7	5.1	14.1	3.6	19.7	3.8	30.3	5.7	50.0	9.8	14.8	3.6	30.4	6.4
2008	359.2	77.2	5.0	1.0	23.8	6.8	1.2	0.5	41.7	9.1	85.3	20.2	11.8	3.4	21.3	4.8	15.1	3.5	20.9	3.6	31.3	5.4	53.7	9.4	15.6	3.5	32.4	6.1
2009	371.8	73.0	5.4	1.0	23.8	6.3	1.3	0.5	43.9	8.7	86.0	18.8	12.0	3.3	21.8	4.5	15.9	3.4	21.8	3.3	32.4	5.1	57.3	9.0	16.1	3.4	34.2	5.7
2010	382.5	70.5	5.5	0.9	23.7	6.0	1.4	0.5	45.3	8.3	86.3	17.9	11.9	3.2	22.1	4.3	16.5	3.3	22.6	3.2	33.4	5.1	60.2	8.7	16.5	3.3	37.2	5.6
2011	395.5	80.2	5.6	1.0	23.7	6.4	1.5	0.5	47.3	9.7	87.1	19.7	12.0	3.4	22.7	5.0	17.4	3.9	23.6	3.8	34.2	5.6	63.6	10.5	17.3	3.9	39.5	6.8
2012	406.2	83.0	5.8	1.0	23.7	6.4	1.6	0.6	49.2	10.3	87.6	19.9	12.1	3.5	23.1	5.3	18.2	4.1	24.4	4.0	34.9	5.7	66.9	11.3	17.9	4.0	40.9	7.0
2013	410.1	63.1	5.8	0.7	23.6	5.3	1.6	0.5	50.0	7.5	87.0	15.9	12.0	3.0	23.4	3.9	18.6	3.0	24.7	3.0	34.9	4.5	68.1	7.8	18.1	3.1	42.2	5.0
2014	407.4	57.4	6.0	0.7	23.1	5.0	1.6	0.5	50.4	6.7	85.5	14.6	11.9	2.8	23.5	3.4	18.7	2.7	24.5	2.7	35.2	4.1	68.5	6.9	18.3	2.9	40.1	4.4

Table 2: Overview of number of firms per year in the dataset split over different NACE Rev. 2 1-digit sections. Table includes both the total number of firms ("All") and the number of firms reporting turnover ("With turn."). The number of firms gradually increases over the time period. The number of firms reporting turnover declines from the early 2000s.

Year	TOTAL		Agriculture, mining (A+B)		Manufacturing (C)		Utilities (D+E)		Construction (F)		Wholesale, retail (G)		Transportation (H)		Food and accommodation (I)		ICT (J)		Finance, insurance (K)		Real estate (L)		Professional services (M)		Admin and support services (N)		Other services (O-U)	
	Entry	Exit.	Entry	Exit	Entry	Exit	Entry	Exit	Entry	Exit	Entry	Exit	Entry	Exit	Entry	Exit.	Entry	Exit	Entry	Exit	Entry	Exit	Entry	Exit	Entry	Exit	Entry	Exit
1985	30.6	50.2	1.6	1.5	2.7	5.6	0.1	0.2	3.0	4.4	9.6	17.0	1.1	1.5	1.3	2.4	0.8	1.2	0.9	5.0	0.8	0.5	2.5	3.4	1.6	3.2	4.7	4.4
1986	135.3	37.0	5.8	1.3	11.4	4.6	0.3	0.1	10.6	3.1	45.3	12.6	4.5	1.8	6.4	1.9	3.8	1.1	6.3	2.3	5.6	0.3	11.2	2.4	6.9	2.3	17.1	3.3
1987	140.1	41.7	6.2	1.3	11.6	4.7	0.3	0.1	12.6	3.3	43.3	14.7	4.5	1.9	6.6	2.3	4.3	1.3	6.0	2.2	4.1	0.4	14.0	2.9	6.5	2.3	20.1	4.3
1988	139.2	42.3	7.3	1.6	11.0	5.0	0.2	0.1	12.0	3.2	38.7	14.0	4.4	2.2	6.4	2.1	4.0	1.3	4.8	2.1	3.9	0.4	14.7	3.5	6.0	2.4	25.7	4.5
1989	138.9	41.4	9.3	1.7	10.5	4.9	0.3	0.1	11.9	3.5	36.3	13.8	4.3	1.9	6.3	1.8	3.7	1.2	4.3	2.0	3.0	0.3	15.4	3.3	6.0	2.4	27.6	4.4
1990	134.0	38.6	10.3	1.7	9.2	4.4	0.2	0.1	11.3	3.3	33.6	12.1	4.6	2.0	5.8	1.7	3.7	1.3	3.8	1.3	3.7	0.4	16.3	3.6	6.8	2.4	24.6	4.2
1991	123.4	43.9	10.3	2.4	8.3	4.7	0.2	0.1	10.8	3.7	30.1	13.8	4.1	1.9	5.4	2.1	4.0	1.5	3.3	1.7	3.5	0.5	14.9	4.3	5.7	2.5	22.9	4.6
1992	113.4	44.8	8.6	2.5	6.8	4.6	0.2	0.1	9.5	4.0	25.6	13.0	3.2	2.0	4.9	2.1	3.0	1.7	3.2	1.6	3.9	0.5	13.0	4.4	4.8	2.6	26.7	5.8
1993	94.9	40.8	5.0	2.0	5.6	3.7	0.2	0.1	7.7	3.5	22.8	12.0	2.7	1.6	4.6	2.2	2.3	1.1	4.1	2.5	8.6	0.7	10.5	3.9	5.2	2.5	15.5	5.0
1994	79.8	37.4	1.2	0.9	5.4	4.0	0.7	0.2	8.3	3.2	22.6	13.6	1.9	0.9	5.7	3.1	2.1	1.0	3.1	1.1	6.4	1.6	9.3	2.6	6.6	2.2	6.5	3.0
1995	76.6	38.6	1.3	0.9	4.8	4.3	0.5	0.3	8.0	3.3	22.3	13.8	2.1	0.9	6.2	3.1	2.2	0.8	3.1	1.3	4.6	1.5	9.3	2.9	6.7	2.8	5.6	2.6
1996	80.6	32.7	1.1	0.7	4.9	3.2	0.6	0.3	7.4	2.7	22.5	11.9	2.0	0.7	6.4	2.4	2.8	0.8	4.3	1.3	4.4	1.4	10.5	2.5	7.5	3.1	6.3	1.8
1997	80.0	36.4	1.0	0.7	4.5	3.2	0.5	0.2	7.8	3.3	22.5	12.6	2.1	0.8	6.3	2.9	3.0	1.0	3.7	1.6	4.0	1.6	11.5	3.0	5.7	3.4	7.2	2.1
1998	71.2	35.6	0.9	0.6	4.1	3.2	0.4	0.3	7.3	3.0	20.3	12.4	1.9	0.8	6.0	3.0	3.2	1.2	3.0	1.7	3.3	1.5	10.8	3.4	4.2	2.7	5.7	2.0
1999	71.1	36.7	0.9	0.6	4.1	3.3	0.4	0.3	7.3	3.0	19.5	13.0	2.0	0.8	6.0	3.0	4.0	1.2	3.7	1.6	3.2	1.5	11.2	3.5	3.7	2.7	4.9	2.1
2000	72.2	38.5	0.9	0.5	3.6	3.4	0.4	0.3	7.3	3.5	17.8	13.5	1.8	0.9	5.5	3.0	4.9	1.6	4.4	1.7	4.1	1.6	12.3	3.8	3.9	2.4	5.4	2.1
2001	68.7	34.9	0.8	0.4	3.3	3.1	0.4	0.3	7.2	3.2	15.8	11.6	1.8	1.0	5.1	2.9	5.3	1.8	4.6	1.5	3.7	1.5	11.9	3.5	3.4	2.3	5.5	1.8
2002	69.6	32.5	0.7	0.3	2.9	2.8	0.6	0.3	7.1	3.0	15.1	11.0	1.8	0.7	5.6	3.0	4.9	1.5	4.5	1.4	4.4	1.3	11.7	3.2	3.5	2.3	6.7	1.6
2003	63.1	31.1	0.6	0.3	2.5	2.7	0.4	0.4	6.4	2.8	13.8	9.7	1.9	0.6	5.5	2.8	3.5	1.5	4.0	1.9	4.1	1.3	11.0	3.2	3.2	2.1	6.1	1.7
2004	61.9	32.4	0.8	0.3	2.7	2.7	0.2	0.3	6.6	2.9	13.8	10.3	1.6	0.7	5.6	3.3	3.6	1.5	3.2	1.7	3.9	1.6	10.7	3.4	2.7	1.9	6.5	1.7
2005	62.0	29.2	0.9	0.3	2.6	2.1	0.2	0.3	7.6	2.9	13.2	9.3	1.8	0.8	5.6	3.1	3.4	1.4	3.5	1.4	3.8	1.4	10.6	2.9	2.6	1.8	6.4	1.5
2006	63.7	29.7	0.7	0.3	2.7	2.2	0.2	0.3	8.3	3.1	12.7	9.2	1.6	0.8	5.4	3.2	3.2	1.3	4.3	1.5	4.2	1.5	10.9	3.0	2.8	1.7	6.7	1.6
2007	67.8	30.0	1.0	0.3	2.9	2.1	0.3	0.1	10.4	3.6	13.9	8.8	2.1	1.3	5.7	3.3	4.1	1.2	3.9	1.4	2.9	1.5	12.7	3.2	3.4	1.4	4.5	1.9
2008	68.8	30.2	0.8	0.3	2.7	2.2	0.3	0.1	10.9	3.5	13.1	8.1	2.1	1.4	5.4	3.3	4.6	1.3	3.9	1.7	2.9	1.5	13.7	3.4	3.8	1.5	4.7	1.9
2009	64.4	30.2	0.9	0.3	2.4	2.0	0.3	0.1	9.8	3.8	11.6	8.1	1.9	1.4	5.1	3.2	3.9	1.3	3.6	1.7	3.1	1.6	13.6	3.6	3.6	1.6	4.8	1.7
2010	59.0	30.7	0.6	0.2	2.1	1.9	0.3	0.1	8.1	3.9	10.7	8.1	1.4	1.3	4.6	3.1	3.3	1.2	3.4	1.7	3.0	1.8	11.9	3.8	3.2	1.5	6.3	2.1
2011	64.4	33.3	0.6	0.2	2.2	2.0	0.4	0.1	9.0	4.4	11.3	8.3	1.6	1.3	4.7	3.2	3.7	1.4	4.1	1.9	3.5	1.9	12.9	4.3	3.5	1.7	7.0	2.5
2012	60.5	36.3	0.6	0.3	2.1	2.2	0.3	0.2	9.0	4.7	10.2	8.7	1.5	1.3	4.6	3.2	3.7	1.6	3.9	2.0	3.4	2.2	12.7	5.4	3.3	1.8	5.2	2.7
2013	49.3	45.7	0.5	0.4	1.9	2.5	0.3	0.1	7.2	5.5	8.7	9.7	1.3	1.3	4.3	3.1	3.1	2.3	2.7	3.0	2.3	2.6	9.5	8.6	2.6	2.1	4.9	4.6
2014	45.7	39.2	0.5	0.4	1.7	2.0	0.2	0.2	6.6	4.6	8.3	9.1	1.2	1.3	4.1	2.9	3.1	1.9	2.4	2.7	1.9	3.0	9.8	6.5	2.4	1.8	3.6	2.7

Table 3: Relative firm entry and exit rates per NACE Rev. 2 1-digit section in # of firms entering/exiting as ‰ of all firms. Entry is corrected for spurious entrants. Initially there is a strong uptake in entry late eighties followed by a continuous decline from the early nineties.

Year	TOTAL		Agriculture, mining (A+B)		Manufacturing (C)		Utilities (D+E)		Construction (F)		Wholesale, retail (G)		Transportation (H)		Food and accommodation (I)		ICT (J)		Finance, insurance (K)		Real estate (L)		Professional services (M)		Admin and support services (N)		Other services (O-U)	
	Entry	Exit.	Entry	Exit	Entry	Exit	Entry	Exit	Entry	Exit	Entry	Exit	Entry	Exit	Entry	Exit	Entry	Exit	Entry	Exit	Entry	Exit	Entry	Exit	Entry	Exit	Entry	Exit
1985	2.7	21.7	0.1	0.5	0.4	8.6	0.0	0.1	0.4	2.5	0.9	5.1	0.1	0.6	0.2	0.4	0.0	0.2	0.0	0.3	0.0	0.0	0.2	1.3	0.1	0.7	0.3	1.5
1986	14.2	20.5	0.5	0.2	1.9	9.2	0.1	1.9	1.6	1.8	5.2	3.1	0.5	0.9	0.8	0.5	0.4	0.4	0.3	0.1	0.1	0.1	0.9	0.8	0.5	0.4	1.3	1.2
1987	13.4	26.7	0.4	0.6	1.6	10.2	0.0	0.0	1.9	2.1	4.5	8.2	0.6	0.6	0.9	0.6	0.3	0.6	0.3	0.3	0.1	0.0	1.0	1.0	0.4	0.7	1.3	1.5
1988	14.1	30.5	0.4	0.8	1.8	16.0	0.0	0.0	2.1	1.9	4.3	4.7	0.7	1.2	0.9	0.4	0.3	0.5	0.3	0.4	0.1	0.0	1.1	1.3	0.4	0.9	1.5	2.3
1989	14.9	38.7	0.7	0.3	1.8	17.6	0.0	5.2	2.2	2.2	4.6	5.1	0.7	1.5	0.9	0.5	0.3	0.4	0.3	1.1	0.1	0.0	1.3	1.4	0.5	0.6	1.5	2.8
1990	15.5	46.9	0.7	0.5	1.8	20.4	0.1	0.4	2.2	3.0	4.6	5.5	0.8	11.4	1.0	0.8	0.4	0.5	0.4	0.5	0.1	0.0	1.5	1.4	0.6	0.8	1.6	1.7
1991	15.6	26.6	0.8	0.6	1.7	9.8	0.0	0.0	2.4	3.2	4.3	5.4	0.7	1.8	1.1	0.6	0.4	0.8	0.4	0.3	0.1	0.1	1.5	1.6	0.6	0.9	1.7	1.5
1992	15.9	24.2	0.7	0.4	1.5	7.3	0.0	0.1	2.2	3.4	4.4	5.6	0.7	1.8	1.0	0.8	0.4	0.6	0.4	0.2	0.1	0.0	1.5	1.6	0.5	1.1	2.4	1.2
1993	14.2	20.9	0.5	0.5	1.3	7.1	0.0	0.1	1.9	3.2	3.9	4.3	0.6	1.0	1.1	0.8	0.3	0.4	0.4	0.4	0.2	0.0	1.3	1.2	0.6	0.9	2.0	1.1
1994	12.3	33.1	0.1	0.5	1.2	5.7	0.1	0.2	1.8	3.3	3.9	17.9	0.4	0.6	1.3	1.2	0.3	0.3	0.3	0.3	0.2	0.2	1.1	0.6	0.8	1.7	0.7	0.6
1995	12.7	23.8	0.2	0.2	1.1	8.0	0.0	0.2	1.9	2.2	3.9	5.4	0.5	3.8	1.5	1.0	0.3	0.2	0.4	0.4	0.2	0.2	1.2	1.0	0.7	0.7	0.8	0.6
1996	9.0	16.7	0.1	0.3	0.9	5.9	0.1	0.1	1.2	2.0	2.7	4.2	0.3	0.3	1.2	0.7	0.3	0.4	0.3	0.4	0.1	0.2	0.8	0.7	0.5	1.0	0.5	0.5
1997	8.6	25.0	0.1	0.2	0.8	5.1	0.0	0.1	1.2	1.7	2.5	12.2	0.4	0.4	1.3	1.4	0.3	0.7	0.2	0.3	0.1	0.1	0.7	0.5	0.4	1.3	0.5	0.9
1998	8.1	18.8	0.1	0.2	0.8	4.8	0.0	0.2	1.1	1.8	2.5	5.0	0.3	0.4	1.2	1.0	0.3	0.7	0.2	0.4	0.1	0.1	0.7	1.2	0.4	2.8	0.4	0.3
1999	8.0	21.8	0.1	0.3	0.7	5.0	0.0	0.1	1.2	1.9	2.3	4.6	0.4	0.9	1.1	1.5	0.3	1.0	0.2	0.5	0.1	0.1	0.8	2.1	0.4	3.2	0.5	0.6
2000	7.4	23.0	0.1	0.2	0.6	4.8	0.0	0.2	1.0	2.0	2.1	4.4	0.3	4.6	0.9	0.9	0.4	2.2	0.2	0.3	0.1	0.1	0.7	1.0	0.4	1.7	0.5	0.7
2001	7.1	21.2	0.1	0.2	0.6	4.4	0.0	0.2	1.0	2.2	1.9	4.2	0.3	0.8	0.9	0.9	0.4	1.2	0.2	0.4	0.1	0.2	0.7	2.2	0.3	3.7	0.5	0.6
2002	7.3	17.4	0.1	0.0	0.5	4.1	0.0	0.4	0.9	2.2	2.0	5.3	0.3	0.4	1.0	0.8	0.3	0.9	0.3	0.3	0.1	0.1	0.8	0.8	0.4	1.4	0.5	0.5
2003	6.8	17.1	0.1	0.1	0.5	3.8	0.0	0.5	0.8	3.1	1.9	3.3	0.3	0.3	1.1	1.1	0.2	0.6	0.3	0.9	0.1	0.1	0.7	0.9	0.4	1.0	0.5	1.1
2004	7.2	14.1	0.1	0.2	0.6	3.2	0.0	0.1	0.9	1.6	2.0	3.1	0.2	0.5	1.2	1.0	0.3	1.0	0.2	0.2	0.1	0.1	0.7	0.8	0.3	1.5	0.5	0.9
2005	6.9	16.0	0.1	0.1	0.5	3.3	0.0	0.3	1.0	1.5	1.8	3.5	0.3	0.3	1.3	0.8	0.2	2.2	0.2	0.2	0.1	0.1	0.6	1.2	0.3	1.8	0.5	0.6
2006	7.2	14.7	0.1	0.1	0.5	3.3	0.0	0.3	1.1	1.7	1.8	3.4	0.3	0.9	1.2	1.0	0.2	0.4	0.3	0.2	0.1	0.1	0.7	0.6	0.3	1.6	0.6	1.1
2007	7.4	15.2	0.1	0.2	0.5	3.2	0.0	0.1	1.3	2.1	1.7	2.9	0.3	1.6	1.1	1.5	0.2	0.5	0.3	0.2	0.1	0.2	0.7	0.7	0.4	1.5	0.6	0.5
2008	7.4	16.6	0.1	0.2	0.4	3.1	0.0	0.1	1.3	2.1	1.8	2.7	0.3	1.0	1.1	1.0	0.3	1.1	0.3	0.5	0.1	0.1	0.8	1.1	0.4	2.8	0.5	0.9
2009	7.2	18.7	0.1	0.1	0.5	3.2	0.0	0.2	1.3	2.0	1.7	3.2	0.2	1.3	1.2	1.0	0.2	2.8	0.2	0.8	0.1	0.1	0.7	1.6	0.3	1.9	0.6	0.7
2010	6.4	16.6	0.1	0.1	0.4	3.6	0.0	0.1	1.0	2.0	1.5	3.3	0.2	1.1	1.1	1.2	0.2	0.6	0.2	0.3	0.1	0.1	0.6	0.9	0.4	2.3	0.6	0.9
2011	6.9	16.9	0.1	0.1	0.4	3.1	0.0	0.2	1.2	2.4	1.7	2.9	0.2	1.0	1.1	1.2	0.2	0.7	0.2	0.2	0.1	0.1	0.7	1.3	0.4	2.5	0.6	1.2
2012	6.2	18.7	0.1	0.2	0.3	2.3	0.0	0.2	1.1	2.4	1.5	3.4	0.2	1.3	1.1	1.2	0.2	0.5	0.2	0.3	0.1	0.2	0.7	3.9	0.4	1.8	0.4	1.1
2013	5.3	15.4	0.1	0.1	0.3	2.7	0.0	0.0	0.8	1.9	1.2	3.3	0.2	0.7	1.0	1.2	0.2	0.4	0.2	0.3	0.1	0.1	0.6	1.1	0.3	2.8	0.4	0.9
2014	5.5	16.1	0.0	0.2	0.3	2.5	0.0	0.1	0.8	1.8	1.3	4.1	0.2	0.9	1.2	1.5	0.2	1.2	0.2	0.3	0.1	0.1	0.6	1.1	0.3	1.4	0.4	0.9

Table 4: Relative firm entry and exit rates per NACE Rev. 2 1-digit section in # of employees entering/exiting as ‰ of all firms. Entry is corrected for spurious entrants. Initially there is a strong uptake in entry late eighties followed by a continuous decline from the early nineties. There is a strong drop in 1995 – 1996 linked with the changed definition of number of employees.

NACE 2-digit sector		Employment		Share of employment (FTE) at firms with foreign ownership																			
		Share	Cumul.	Average	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
19	Coke and refined petroleum products	0.2%	0.2%	94%	61%	65%	96%	95%	98%	99%	99%	98%	100%	100%	100%	100%	96%	100%	100%	94%	93%	92%
21	Pharmaceutical products	1.0%	1.2%	79%	66%	69%	71%	71%	71%	71%	72%	74%	77%	80%	89%	89%	89%	89%	89%	87%	87%	87%
29	Motor vehicles	1.8%	3.1%	72%	70%	71%	69%	69%	78%	78%	78%	78%	75%	73%	74%	72%	70%	70%	70%	70%	71%	68%
20	Chemicals and chemical products	2.6%	5.7%	69%	58%	64%	71%	71%	73%	74%	75%	72%	64%	66%	69%	70%	74%	70%	69%	68%	66%	66%
24	Basic metals	1.9%	7.6%	67%	41%	40%	65%	67%	71%	75%	77%	66%	73%	73%	77%	76%	74%	67%	66%	67%	65%	64%
12	Tobacco products	0.1%	7.7%	63%	61%	71%	72%	68%	66%	64%	69%	66%	62%	60%	58%	50%	52%	71%	71%	55%	54%	67%
35	Electricity Gas steam supply	1.1%	8.8%	63%	84%	83%	80%	78%	75%	74%	79%	79%	81%	60%	59%	48%	46%	40%	43%	41%	40%	41%
26	Computer electronic and optical products	1.0%	9.8%	61%	71%	69%	64%	64%	72%	71%	67%	44%	58%	66%	56%	56%	57%	54%	59%	59%	60%	59%
51	Air transport	0.4%	10.1%	59%	89%	90%	86%	88%	65%	52%	50%	60%	49%	51%	55%	52%	50%	45%	45%	46%	47%	46%
80	Security and investigation	0.6%	10.8%	59%	47%	37%	35%	38%	65%	65%	66%	66%	33%	34%	71%	68%	67%	68%	69%	75%	76%	76%
15	Leather products	0.1%	10.9%	55%	43%	45%	47%	52%	54%	53%	54%	56%	58%	60%	62%	63%	62%	55%	55%	56%	57%	60%
27	Electrical equipment	1.1%	11.9%	55%	48%	57%	56%	56%	64%	60%	67%	61%	52%	57%	56%	54%	52%	54%	54%	50%	48%	45%
17	Paper products	0.8%	12.7%	51%	46%	47%	45%	47%	51%	50%	56%	57%	56%	54%	54%	53%	49%	52%	52%	50%	50%	51%
28	Machinery and equipment	1.9%	14.6%	51%	44%	47%	47%	48%	52%	53%	52%	49%	48%	51%	52%	53%	52%	53%	52%	52%	52%	53%
30	Other transport equipment	0.4%	15.0%	50%	56%	55%	40%	38%	40%	43%	43%	43%	57%	58%	58%	56%	56%	55%	53%	51%	51%	46%
78	Employment activities	6.2%	21.2%	46%	24%	22%	37%	45%	46%	46%	45%	47%	46%	52%	52%	55%	53%	57%	53%	52%	50%	41%
39	Remediation activities	0.0%	21.2%	45%	0%	0%	0%	0%	76%	74%	76%	71%	69%	65%	63%	55%	51%	50%	43%	38%	40%	40%
61	Telecommunications	1.6%	22.8%	44%	77%	73%	69%	67%	70%	74%	78%	25%	25%	25%	30%	26%	28%	22%	24%	25%	24%	24%
72	Scientific research and development	0.2%	23.0%	41%	52%	50%	27%	22%	37%	37%	51%	53%	34%	45%	46%	43%	34%	50%	41%	40%	41%	42%
11	Beverages	0.5%	23.5%	41%	9%	9%	26%	26%	33%	34%	33%	38%	39%	38%	35%	65%	38%	65%	64%	63%	63%	62%
23	Other non-metallic mineral products	1.6%	25.1%	41%	39%	42%	39%	40%	44%	47%	44%	45%	38%	37%	33%	41%	42%	43%	44%	40%	41%	39%
22	Rubber and plastic products	1.3%	26.4%	40%	35%	41%	37%	42%	43%	43%	45%	41%	42%	43%	41%	39%	39%	38%	38%	36%	37%	36%
70	Management consultancy	1.3%	27.7%	40%	45%	52%	48%	48%	56%	53%	53%	52%	41%	42%	36%	31%	30%	29%	27%	25%	24%	24%
63	Information service	0.2%	27.9%	40%	15%	16%	19%	17%	23%	24%	34%	65%	54%	52%	51%	48%	49%	53%	52%	48%	47%	45%
53	Postal and courier activities	2.1%	30.0%	39%	6%	8%	5%	5%	5%	5%	5%	5%	5%	92%	91%	92%	92%	93%	92%	92%	7%	7%
94	Membership organizations	0.0%	30.1%	38%	0%	0%	0%	57%	58%	56%	55%	52%	44%	42%	41%	41%	41%	41%	42%	41%	42%	33%
33	Repair and installation of machinery	0.5%	30.6%	34%	17%	9%	8%	28%	34%	35%	28%	29%	39%	44%	43%	47%	44%	30%	43%	44%	45%	41%
64	Finance	1.2%	31.7%	33%	31%	28%	29%	29%	33%	31%	28%	30%	28%	29%	27%	36%	39%	37%	40%	38%	37%	38%
55	Accommodation	0.9%	32.6%	31%	30%	28%	28%	29%	46%	44%	40%	37%	36%	33%	32%	31%	29%	25%	24%	23%	21%	19%
58	Publishing activities	0.5%	33.1%	27%	26%	26%	23%	26%	34%	31%	31%	25%	32%	35%	34%	35%	36%	19%	20%	21%	20%	18%
37	Sewerage	0.1%	33.2%	26%	36%	38%	42%	47%	65%	62%	58%	59%	54%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8	Other mining	0.2%	33.4%	26%	21%	25%	25%	16%	31%	35%	31%	32%	35%	34%	33%	33%	19%	20%	20%	20%	15%	15%
10	Food products	3.6%	36.9%	25%	23%	25%	24%	26%	30%	30%	30%	28%	27%	26%	24%	21%	23%	24%	25%	23%	21%	20%
52	Warehousing and transportation	2.0%	38.9%	25%	9%	9%	16%	17%	23%	23%	32%	33%	32%	30%	30%	29%	28%	29%	28%	28%	25%	26%
38	Waste collection	0.7%	39.6%	24%	14%	11%	13%	13%	25%	26%	28%	29%	25%	30%	31%	28%	31%	33%	26%	24%	24%	23%
77	Rental and leasing	0.4%	40.0%	23%	13%	19%	23%	24%	26%	24%	25%	25%	25%	22%	22%	23%	22%	26%	24%	24%	25%	25%
46	Wholesale trade (excl. motor vehicles)	9.6%	49.6%	23%	19%	20%	20%	21%	24%	24%	26%	24%	23%	24%	24%	23%	23%	24%	24%	24%	23%	23%
79	Travel agency	0.3%	50.0%	23%	20%	21%	19%	20%	32%	29%	31%	21%	25%	25%	28%	27%	13%	21%	21%	21%	20%	20%
95	Repair of computers and goods	0.2%	50.1%	22%	12%	20%	20%	25%	36%	40%	37%	34%	33%	18%	15%	16%	16%	15%	15%	15%	15%	15%
13	Textiles	1.5%	51.7%	21%	12%	12%	13%	17%	14%	16%	16%	24%	22%	22%	25%	24%	24%	26%	27%	28%	28%	30%
66	Financial support	0.8%	52.5%	21%	12%	16%	14%	14%	24%	24%	25%	27%	24%	22%	22%	17%	16%	24%	24%	24%	24%	25%
25	Fabricated metal products	3.0%	55.5%	21%	12%	12%	20%	19%	23%	23%	23%	25%	14%	21%	21%	20%	21%	24%	23%	23%	23%	21%
47	Retail trade (excl. motor vehicles)	8.9%	64.3%	20%	5%	5%	8%	15%	21%	23%	26%	24%	22%	22%	21%	20%	27%	27%	25%	24%	24%	23%
62	Computer programming and consultancy	1.8%	66.2%	17%	3%	6%	5%	11%	23%	26%	28%	24%	21%	22%	22%	21%	16%	17%	17%	16%	14%	14%
92	Gambling	0.1%	66.2%	17%	0%	19%	16%	16%	17%	20%	19%	20%	18%	17%	20%	18%	17%	17%	19%	21%	16%	16%
42	Civil engineering	1.4%	67.7%	16%	6%	7%	9%	12%	20%	22%	22%	21%	20%	20%	16%	17%	17%	17%	17%	18%	18%	17%
50	Water transport	0.1%	67.8%	16%	14%	18%	24%	30%	36%	31%	33%	26%	24%	6%	6%	6%	5%	4%	4%	5%	4%	20%
81	Buildings and landscape	2.4%	70.1%	16%	7%	4%	9%	9%	27%	25%	25%	25%	25%	25%	24%	18%	16%	15%	13%	10%	9%	8%

32	Other manufacturing	0.3%	70.5%	15%	9%	15%	15%	14%	16%	17%	15%	14%	14%	15%	14%	13%	15%	16%	15%	16%	15%	14%
45	Wholesale and retail of motor vehicles	2.8%	73.3%	14%	13%	14%	14%	14%	15%	15%	17%	16%	16%	14%	13%	13%	13%	14%	14%	14%	14%	14%
71	Architectural and engineering	1.3%	74.6%	13%	8%	10%	9%	8%	10%	11%	17%	18%	15%	15%	13%	11%	13%	14%	14%	14%	14%	13%
60	Broadcasting	0.3%	74.8%	12%	28%	14%	14%	13%	14%	8%	8%	6%	6%	12%	13%	12%	12%	13%	13%	11%	11%	11%
73	Advertising and market research	0.6%	75.4%	12%	13%	12%	10%	10%	14%	15%	13%	15%	14%	14%	12%	11%	11%	11%	10%	10%	11%	10%
16	Wood products except furniture	0.6%	76.0%	11%	3%	3%	3%	3%	4%	3%	3%	3%	18%	18%	14%	17%	17%	17%	18%	18%	19%	25%
82	Office support	0.7%	76.8%	11%	9%	12%	15%	15%	14%	7%	17%	12%	10%	11%	9%	10%	11%	11%	11%	10%	10%	10%
56	Food and beverage service	2.4%	79.1%	11%	5%	11%	10%	15%	13%	14%	16%	14%	12%	11%	10%	11%	11%	10%	10%	9%	9%	9%
96	Personal services	0.7%	79.9%	10%	5%	5%	12%	11%	15%	14%	14%	12%	12%	11%	11%	10%	9%	10%	10%	10%	8%	8%
14	Wearing apparel	0.4%	80.3%	10%	11%	11%	6%	7%	7%	9%	11%	10%	11%	11%	12%	13%	10%	10%	11%	11%	11%	10%
2	Forestry	0.1%	80.4%	9%	8%	18%	18%	13%	15%	16%	15%	24%	15%	5%	6%	6%	6%	0%	0%	0%	0%	0%
93	Sports	0.3%	80.7%	9%	4%	3%	8%	10%	12%	11%	11%	11%	11%	11%	10%	10%	9%	8%	8%	8%	8%	7%
18	Printing and reproduction	0.9%	81.7%	8%	4%	5%	7%	8%	8%	8%	10%	10%	10%	10%	9%	8%	7%	6%	7%	6%	6%	7%
41	Construction of buildings	3.0%	84.7%	7%	2%	4%	5%	4%	11%	9%	9%	9%	8%	6%	5%	8%	8%	8%	8%	8%	9%	10%
59	Motion and television production	0.2%	84.9%	7%	5%	4%	5%	4%	5%	12%	7%	8%	2%	9%	7%	8%	8%	8%	8%	8%	8%	9%
1	Crop and animal	0.4%	85.2%	5%	6%	5%	12%	6%	8%	8%	7%	6%	4%	3%	3%	3%	3%	2%	2%	2%	3%	3%
43	Specialised construction	5.1%	90.4%	4%	3%	5%	5%	5%	6%	6%	4%	3%	1%	4%	4%	4%	5%	5%	5%	4%	5%	4%
31	Furniture	0.7%	91.1%	4%	1%	1%	1%	2%	7%	8%	7%	7%	6%	1%	1%	3%	3%	3%	4%	4%	4%	4%
49	Land transport	3.7%	94.8%	4%	2%	3%	4%	4%	5%	5%	5%	4%	3%	4%	3%	2%	3%	3%	4%	4%	4%	3%
68	Real estate activities	0.7%	95.5%	3%	0%	4%	6%	2%	5%	5%	8%	4%	3%	3%	2%	3%	3%	2%	3%	3%	2%	2%
90	Arts and entertainment	0.1%	95.6%	3%	0%	0%	3%	3%	3%	2%	3%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
5	Mining of coal and lignite	0.1%	95.7%	3%	0%	0%	0%	0%	11%	22%	22%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
74	Other scientific and technical services	0.3%	96.0%	3%	7%	6%	5%	4%	6%	6%	8%	1%	1%	1%	0%	0%	0%	1%	0%	2%	2%	2%
99	Extraterritorial organizations	0.0%	96.0%	2%	0%	0%	12%	9%	5%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
69	Legal and accounting	1.1%	97.1%	1%	2%	2%	2%	2%	2%	2%	2%	2%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
86	Health activities	0.9%	97.9%	1%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	0%	0%	0%	0%
85	Education	0.1%	98.1%	0%	0%	0%	0%	0%	0%	2%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
91	Library and musea	0.0%	98.1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
65	Insurance	0.0%	98.1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%
36	Water collection	0.4%	98.5%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
87	Residential care	0.9%	99.4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
88	Social work and assistance	0.3%	99.7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
84	Public administration	0.2%	100.0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
9	Mining support service	0.0%	100.0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3	Fishing	0.0%	100.0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
75	Veterinary	0.0%	100.0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
97	Domestic personnel	0.0%	100.0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7	Mining of metal ores	0.0%	100.0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Table 5: Share of employment (FTE) at firms with partial or whole foreign ownership (direct and indirect) per year and split over NACE 2-digit sector. “Average” gives the average share over the period 1997-2014. Sectors ranked from highest to lowest average share. The column “employment” marks the share and the cumulative share the sector represents in total employment over the period 1997-2014. All sectors ranked higher than Travel Agency (NACE 79) are categorized as highly FDI intensive (shaded in grey) and the other sectors as low FDI intensive. Information on foreign ownership obtained from the NBB’s FDI survey.

NACE code	NACE Description	# employees	Cumulative share	NACE industry
47	Retail trade (excl. motor vehicles)	24079	14%	Services
46	Wholesale trade (excl. motor vehicles)	21014	26%	Services
43	Specialised construction	16447	35%	Construction
56	Food and beverage service	9743	41%	Services
45	Wholesale and retail of motor vehicles	8214	46%	Services
99	Extraterritorial organizations	7380	50%	Services
41	Construction of buildings	7050	54%	Construction
49	Land transport	5784	57%	Services
69	Legal and accounting	5143	60%	Services
10	Food products	3753	63%	Manufacturing
25	Fabricated metal products	3591	65%	Manufacturing
71	Architectural and engineering	3346	66%	Services
90	Arts and entertainment	3162	68%	Services
96	Personal services	2739	70%	Services
1	Crop and animal	2688	71%	Agriculture
66	Financial support	2678	73%	Services
9	Mining support service	2623	74%	Agriculture
74	Other scientific and technical services	2570	76%	Services
73	Advertising and market research	2534	77%	Services
81	Buildings and landscape	2467	79%	Services
62	Computer programming and consultancy	2260	80%	Services
86	Health activities	2236	81%	Services
18	Printing and reproduction	1596	82%	Manufacturing
64	Finance	1560	83%	Services
52	Warehousing and transportation support services	1539	84%	Services
91	Library and musea	1402	85%	Services
82	Office support	1355	86%	Services
59	Motion and television production	1344	86%	Services
55	Accommodation	1250	87%	Services
77	Rental and leasing	1231	88%	Services
70	Management consultancy	1180	89%	Services
31	Furniture	1164	89%	Manufacturing
23	Other non-metallic mineral products	1152	90%	Manufacturing
68	Real estate activities	1119	91%	Services
16	Wood products except furniture	1012	91%	Manufacturing
28	Machinery and equipment	948	92%	Manufacturing
42	Civil engineering	947	92%	Construction
14	Wearing apparel	875	93%	Manufacturing
32	Other manufacturing	822	93%	Manufacturing
13	Textiles	816	94%	Manufacturing
93	Sports	800	94%	Services
5	Mining of coal and lignite	799	95%	Agriculture
27	Electrical equipment	759	95%	Manufacturing
79	Travel agency	755	95%	Services
2	Forestry	636	96%	Agriculture
29	Motor vehicles	632	96%	Manufacturing
22	Rubber and plastic products	584	97%	Manufacturing
33	Repair and installation of machinery	552	97%	Manufacturing
87	Residential care	531	97%	Services
58	Publishing activities	528	97%	Services
38	Waste collection	444	98%	Utilities
20	Chemicals and chemical products	410	98%	Manufacturing
30	Other transport equipment	383	98%	Manufacturing
26	Computer electronic and optical products	372	98%	Manufacturing
85	Education	358	99%	Services
8	Other mining	358	99%	Agriculture
95	Repair of computers and goods	325	99%	Services
24	Basic metals	303	99%	Manufacturing
17	Paper products	186	99%	Manufacturing
78	Employment activities	151	99%	Services
50	Water transport	141	99%	Services
15	Leather products	139	100%	Manufacturing
51	Air transport	105	100%	Services
53	Postal and courier activities	90	100%	Services
11	Beverages	89	100%	Manufacturing
75	Veterinary	68	100%	Services

63	Information service	64	100%	Services
60	Broadcasting	62	100%	Services
94	Membership organizations	57	100%	Services
65	Insurance	46	100%	Services
3	Fishing	27	100%	Agriculture
35	Electricity Gas steam supply	22	100%	Utilities
21	Pharmaceutical products	21	100%	Manufacturing
61	Telecommunications	21	100%	Services
92	Gambling	17	100%	Services
72	Scientific research and development	17	100%	Services
12	Tobacco products	16	100%	Manufacturing
36	Water collection	14	100%	Utilities
84	Public administration	14	100%	Services
80	Security and investigation	12	100%	Services
7	Mining of metal ores	11	100%	Agriculture
19	Coke and refined petroleum products	8	100%	Manufacturing
37	Sewerage	6	100%	Utilities
97	Domestic personnel	5	100%	Services
88	Social work and assistance	4	100%	Services
39	Remediation activities	1	100%	Utilities

Table 6: Employment at start-up firms during 1986 – 1992 (# employees in year of start-up) split over NACE Rev.2 2-digit sectors and ranked based on employment (largest to smallest). “Cumulative share” refers to the cumulative share of start-up employment represented by the sector and its preceding sectors. Entry is corrected for spurious entrants. Most start-ups are wholesale and retail shops, construction tradesmen and restaurants and bars.

Appendix B: Alternative measures for business dynamism

We conduct robustness analysis and calculate different measures of business dynamism. A first measure is the total job reallocation rate, i.e. the sum of job creation and destruction expressed as a percentage of overall employment. This can be seen as an indication of the level of job reallocation between firms. A second measure is the cross sectional standard deviation of the DHS growth rates as an indicator for the dispersion of the distribution. A third measure is the within-firm volatility of employment weighted growth rates within a 10 year horizon as developed in Davis et al. (2007).

We also include extra robustness checks on the calculation method of the growth rate differentials. We calculate the dispersion (90-10 differential) of the unweighted firm growth rate distribution and also study the dispersion (90-10 differential) of the turnover growth rate distribution. Finally we also investigate using the end of year number of employees post 1996 instead of the average number of FTE.

Fig. 15 shows the first four measures. We clearly observe that also these too point to a clear decline of business dynamism over the past decades. The job reallocation rate (Fig. 15a) initially goes up and clearly comes down after the mid '90s. The standard deviation of the employment growth rate distribution (Fig. 15b) continuously declines for both the unweighted and the employment weighted distribution. The within-firm volatility shown in Fig. 15c remarkable declines as well.[39] Finally, Fig. 15d gives the 90-10 differential for the unweighted distribution of firm growth rates for both all firms and continuing firms only. Here too we see a decline.

Fig. 16 shows the evolution of business dynamism measured via turnover. It shows the 90-10 differential of both the turnover weighted and the unweighted distribution of turnover DHS growth rates. We calculate dynamism based on the nominal value of turnover and based on the real value of the turnover. To come to the real value of turnover, we deflate turnover with industry specific deflators from EUKLEMS. The deflator for gross value add is used. This deflator offers NACE Rev. 2 2-digit specific estimates[40] that cover the full-length of the studied period (1985-2014). Firms categorized as "small firms" can report turnover on a voluntary basis, all other firms are required to report turnover. As show in Appendix A, in 1985 approx. 54,000 out of 91,000 firms reported

[39] The within-firm volatility for the balanced panel of firms that are continuously active in the studied period is not shown, but declines as well. This measure is filtered of all entry and exit activity.

[40] Smaller NACE Rev. 2 2 digit industries are grouped together by EUKLEMS. EUKLEMS reclassifies older versions of industry classifications to NACE Rev. 2.

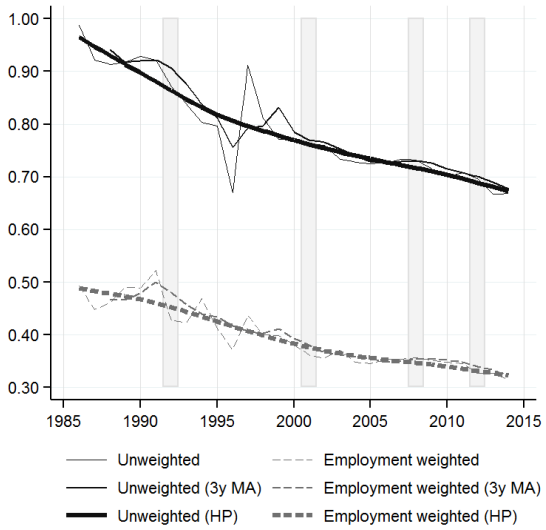
turnover, in 2014 57,000 out of 407,000 firms reported turnover. In 1985 firms reporting turnover represented 1.35M employees and firms not reporting turnover represented 150,000 employees. In 2014 firms reporting turnover represented 1.51M FTEs vs. 675,000 FTEs for firms not reporting turnover. The steep growth in the number of firms and overall employment growth in the period 1985-2014 is predominantly driven by small firms that do not report turnover. Furthermore, the manufacturing sector, with on average larger firms, is overrepresented in the subsample of firm reporting turnover. Turnover dynamism can therefore not be regarded as a complete proxy for overall business dynamism.[41] Nevertheless, all measures for turnover dynamism also indicate a dynamism decline that sets in around 2nd half of the 1990s and early 2000s . This is a strong robustness check on the fact that there is also a clear decline in dynamism for larger and (since size is correlated with age) more established firms.

Fig. 17 finally shows the evolution of dynamism (90-10 differential) for 2 alternative calculation method for employment. Throughout the paper employment post 1996 is calculated based on the average number of FTEs whereas pre-1996 the average number of employees (headcount) is used. FTE is a better measure than headcount when part-time work is rising. As explained in the paragraph on entry and exit, post 1996, a self-employed business owner active in the business is not reported anymore in a firm's employment statistics. This leads to a drop of 0.4 employees at start-up firms leading us to believe that on average an active self-employed business owner counted as 0.4 employees. Fig. 17a used average employment, not correct for the self-employed and Fig. 17b corrects for the self-employed by adding 0.4 employees to each firm. We see a decline in dynamism that sets in around 2000.

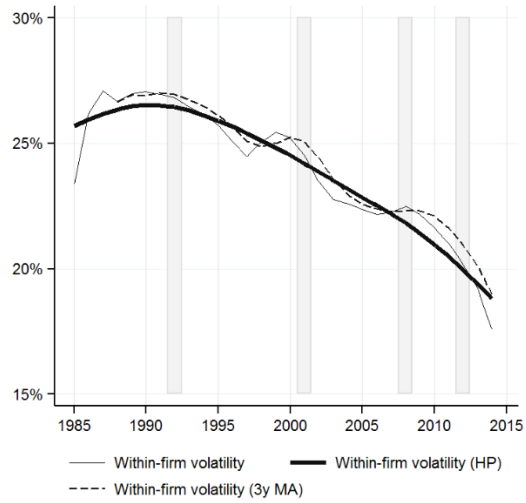
[41] We also work based on unconsolidated accounts that reports turnover that includes intercompany turnover. This potentially leads to double counting of the same final turnover.

a Job reallocation rate

b Employment growth standard deviation



c Within-firm volatility



d 90-10 differential (unweighted distribution)

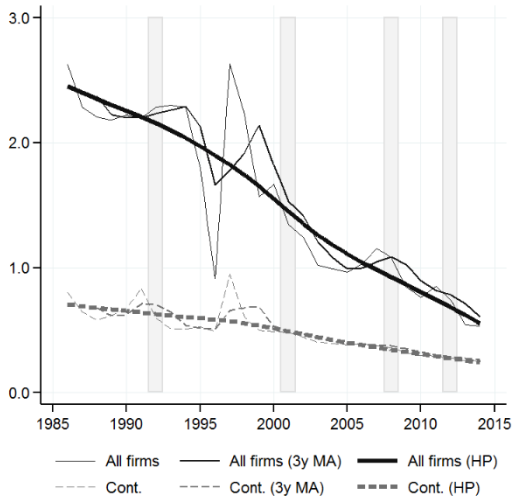
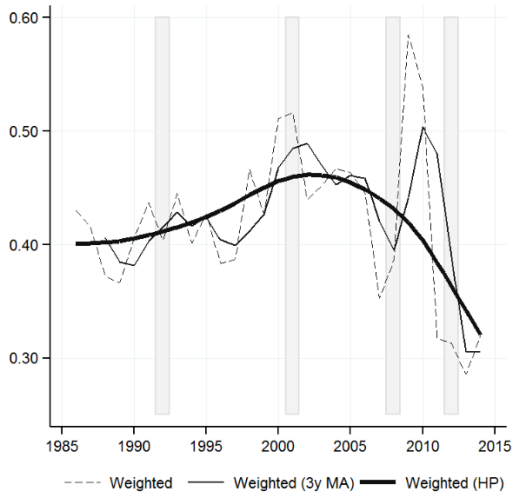
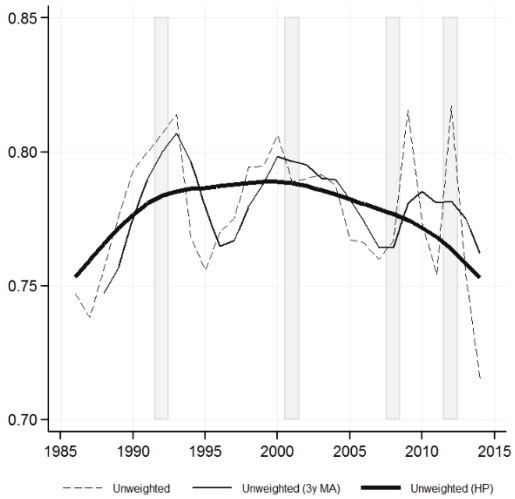


Fig. 15 The evolution of different measures for business dynamism. We see a decline for all of them.

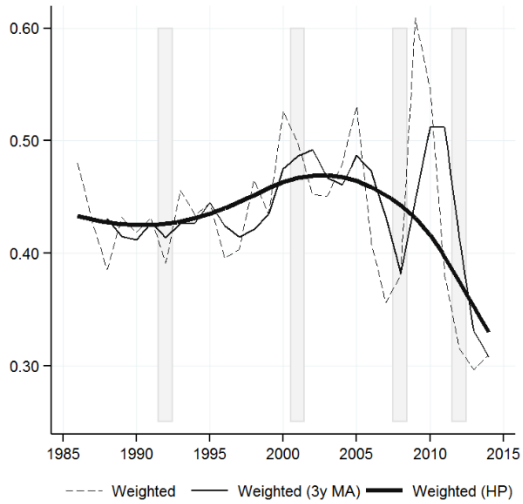
a Nominal turnover, weighted



b Nominal turnover, unweighted



c Real turnover, weighted



d Real turnover, unweighted

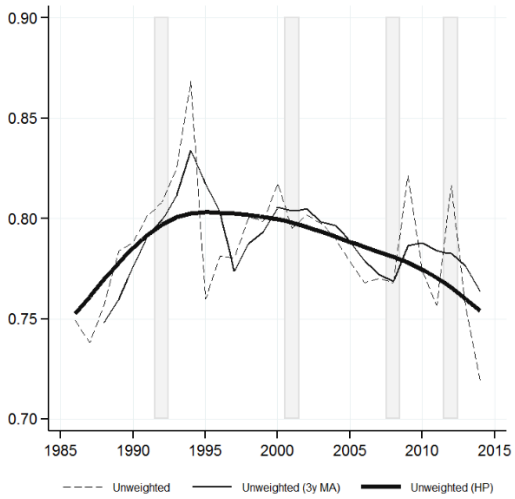


Fig. 16 90-10 differentials for both the turnover weighted (a and c) and unweighted distribution (b and d) of DHS turnover growth rates. Both nominal (a and b) and real values (c and d) for turnover are used. Real values are obtained by using the NACE 2-digit specific deflators for gross value add from EUKLEMS. All four measures show a decline in business dynamism that starts late ’90s or early 2000 depending on the measure.

a Not corrected with 0.4 employees

B Corrected with 0.4 employees

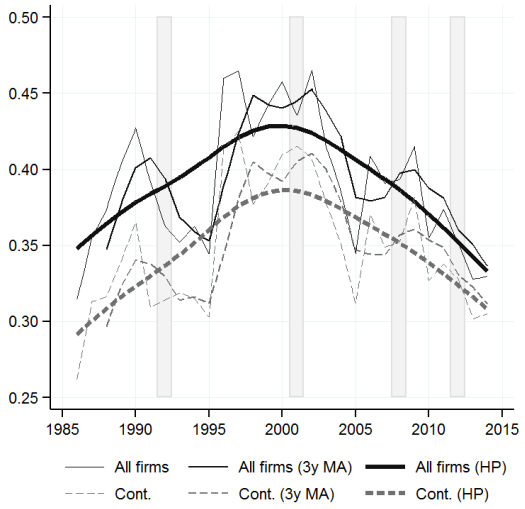


Fig. 17 90-10 differentials for weighted employment growth rates distribution. The end of year number of employees is used to calculate employment post 1996. Figure b corrects for the fact the self-employed business owner is not counted as an employee post 1996 by 0.4 employees to each firm. We see a dynamism trend change around the year 2000.

Appendix C The Role of Compositional Shifts

In this section we quantify the contribution of compositional shifts to the change in business dynamism. Bijnens & Konings (2017) described the significant shift in the structure of the Belgian firm landscape throughout the previous decades: jobs flow from the manufacturing to the services industry, from smaller to larger and from younger to older firms. It could well be that the change in overall dynamism is not driven by an intrinsic change in dynamism of a certain type of firms, but driven by the fact that jobs are shifted towards less dynamics parts of the economy without these parts becoming less dynamic per se.

Reallocation rate in the services industry is significantly higher than the one for the manufacturing industry. A shift of jobs to the more dynamic services industry would hence increase the overall dynamism of the economy. This shift works in the opposite direction compared to the overall decline in dynamism. Younger firms experience reallocation rates that lie substantially above the rate of older firms. As discussed in the main body of this paper, firm age is also linked with firm size. Overall a shift of jobs away from smaller, younger firms towards bigger and older firms will have a negative impact on dynamism. The questions remains, however, how big this impact is.

We conduct a simple shift share decomposition analysis. We allocate all firms to different cells defined by 88 NACE 2-digit industries, 8 firm age groups (0y to 5y, 6y-10y, and 10+y) and 8 firm size groups based on number of employees (1-9, 10-19, 20-49, 50-99, 100-249, 250-499, 500-999 and 1000+). We focus on the change in job flows, more specifically the overall change and the within cell component of the decomposition. The within cell component yields the change in the overall flow rate if every cell would have kept the same level of employment. The difference between these 2 indicate to what extend compositional changes drive the overall change as opposed to the within cell changes. We do this for the change in job reallocation, creation and destruction rates between the extreme values before the technology crisis of 2000 and the financial crisis of 2008. We use a 3 year moving average to minimize the impact of short term variations.

The 90-10 differential is also decomposed. It is, however, not possible to have an exact decomposition of a non-parametrical measure. We follow a simplified approach similar to the shift cell decomposition and calculate the dispersion of each cell in both time periods and take the employment weighted average over the cells. We also calculate the cell value for the second time period and weight these based on the employment shares of the first period and calculate the within cell change. The remainder yields the impact of the compositional change.

	Job Reallocation		Job Creation		Job Destruction		90-10 differential	
Overall Δ 1998-2007	-2.66 pp		-1.25 pp		-1.14 pp		-0.074	
Impact of changing composition of businesses:								
Only Sector	0.48 pp	-18%	0.69 pp	-56%	-0.21 pp	15%		17%*
Only Age	-0.52 pp	19%	-0.41 pp	33%	-0.10 pp	7%		30%*
Only Size	0.23 pp	-9%	0.07 pp	-6%	0.16 pp	-11%		-4%*
Sector, Age & Size Combined	0.05 pp	-2%	0.11 pp	-9%	-0.06 pp	4%		

Table 2: Role of Compositional Shifts on Change in Job Reallocation, Creation & Destruction Rate

Note: Δ1998-2007 represents the change in percentage points of the 3y moving average of the studied flow between 1998 and 2007. The impact of the changing composition is calculated as the difference between de actual change of the flow rate and the within cell component of this change. The cells are defined based on sector, age and size individually and sector, age and size combined. *The decomposition for the 90-10 differential is an approximation.

Table 2 summarizes the result. We see that the job reallocation rate dropped with 2.66 percentage points between its peak in 1998 and the bottom in 2007. The impact of the shift between sectors (i.e. mainly the shift from manufacturing to services industries) is 0.48 percentage points positive. This means that the drop in reallocation rate would have actually been 18% higher if jobs weren't shifted between sectors. For the job destruction rate and the 90-10 differential, shifts between sectors actually strengthens the decrease of the dynamism measure. Shifts between firm sizes have a positive, though smaller impact on the flow rates. Firm age is an important factor and actually the only factor that has a consistent negative impact on the studied flow rates. 19% of the drop in job reallocation, 30% of the drop of the 90-10 differential and even 33% of the drop in job creation rate can be attributed to a shift of jobs towards older, less dynamic firms. This is consistent with the findings in the main body of this paper, that the loss in business dynamism in linked with the decreased activity of younger firms.

For the job reallocation rate, the structural shifts in the economy actually work in opposite directions. Whilst shifts between sectors and firms sizes lower the drop in reallocation rate, shifts between firms with different ages increase the drop in reallocation rate. This leads to the fact that the combined effects cancel out and actually are very modest. Only a small part of the job reallocation rate can be attributed to the changing composition of the Belgian firm landscape. For the 90-10 differential the impact is higher as both sector and age changes strengthen the

decrease. Nevertheless, we can in any case conclude changing firm composition only partially explains the drop in dynamism and a significant part of the decrease remains unexplained.