

4 BUSINESS DYNAMICS IN SPAIN: CHARACTERISTICS, DETERMINANTS AND IMPLICATIONS

Business dynamics, i.e. business start-up, failure and growth processes, affect price levels, output and employment and determine efficiency in the allocation of productive resources among sectors and firms. A low business start-up rate usually denotes there are idle productive resources which do not find a suitable use in the productive process. Further, an excessively low business failure rate may also indicate that resources are employed inefficiently in low-growth-potential sectors and firms. The fact that corporations encounter limits to their size is also a symptom of an inefficient allocation of factors of production insofar as they are not geared towards those sectors and companies with a greater value-generation capacity.

This chapter documents firstly certain basic features of business demography in Spain. In particular, the evidence available shows that business start-ups and failures are not abnormally low compared with other European countries. Nevertheless, the poorer outlook for business profitability and the tightening of financial conditions as a result of the crisis have seemingly caused business start-ups to remain at relatively low levels in recent years. Moreover, there are differences in the characteristics of newly created Spanish firms in respect of their size, initial productivity levels and survival rate which seem to be lower than those of other developed economies.

This chapter presents evidence suggesting that companies which obtain productivity gains usually increase their size levels despite distortions of varying kinds (regulatory, economic, financial, etc.) which limit the growth of their employment levels. As a consequence, Spain's business sector is characterised by a relatively high number of small companies with low productivity, irrespective of size.

Secondly, the chapter examines in depth the different financial and regulatory conditioning factors which affect the characterisation of Spanish business demography. From the different pieces of information analysed, it can be concluded that the possible removal of barriers and friction in these areas would generate positive macroeconomic effects, but this in itself does not ensure that there will be sustained economic growth. The latter requires, furthermore, the application of various levers with the potential to directly increase business productivity through improvements in the quality and use of production factors as well as in the functioning of markets and institutions.

1 Introduction

The functioning of product markets is a determining factor of an economy's macroeconomic performance...

...both in the short and long term

In recent years much of the debate about economic policy has focused on whether it was appropriate to undertake structural reforms. Notwithstanding considerable discussion about policies conducive to greater labour market flexibility, the proper functioning of the product markets is also key to facilitating macroeconomic adjustment in the face of economic shocks, to increasing efficiency and, in short, to encouraging higher growth. In fact, there are sound reasons to think that as part of an optimum strategy to improve the economy's structural fundamentals, the regulatory reform of the product market should go hand in hand with and even – in certain circumstances – precede labour market flexibility¹.

In the short term, the behaviour of prices and wages due to changing economic conditions determines the speed and scale of the macroeconomic adjustment. For example, the

¹ O.Blanchard and F. Giavazzi (2003), «Macroeconomic Effects of Regulation and Deregulation in Goods and Labor Markets», *Quarterly Journal of Economics*, Vol. 118.

higher the nominal inertia, the greater the decreases in an economy's production and employment following a negative economic shock. The duration and costs of internal devaluation, such as that undertaken by the Spanish economy during the crisis in order to restore competitiveness, also hinges crucially on the nominal rigidity of prices and wages. Greater competition in product markets boosts price and wage flexibility, heightens the impact of the adjustment of the latter on the real exchange rate and, consequently, improves competitiveness (see Chapter 2 of this Report).²

The structure of the market in which companies operate is even more significant in the long term. Competition in product markets is directly linked to the incentives for corporations to generate and adopt technological innovation, and it also conditions the allocation of productive resources among the different sectors and firms with varying productivity levels. The channel for incentives for innovation and that for promoting factor reallocation both have implications for productivity growth. This consideration is especially important in the case of the Spanish economy, since certain shortcomings in the functioning of the product and labour markets have been detected recurrently. These shortcomings delay innovation and the adoption of new technologies by hindering the efficient allocation of productive resources and, in short, by reducing productivity growth.

Business dynamics, influenced by the functioning of the product market, are an essential mechanism for improving efficiency and productivity

The limitations on the proper functioning of the product market and their implications for the efficient allocation of resources are usually reflected in the dynamics of the business sector. Consequently, the diagnosis and analysis of the determinants of business start-up, failure and growth rates provide useful information when designing and applying structural reforms aimed at improving the economy's growth potential.

The costs of starting and winding up a business activity determine not only the pace of business start-ups and failures, but the type of firms being created and failing...

Business start-up and failure rates depend not only on the outlook for and expectations about demand but on aspects such as the start-up costs of the business activity or those costs arising from the so-called «second-chance» asset liquidation, business restructuring and reorganisation arrangements. Both types of costs may, moreover, bias business investment towards those assets and sectors where the guarantees offered in contracts and the liquidation of assets in the event of insolvency are less costly to enforce, leading on occasions to an inefficient allocation of resources.³

...and different regulatory distortions may limit the growth of the most productive firms

Likewise, there are frictions that affect the adjustment of firm size and condition their growth. Some regulatory «thresholds» operate by discouraging the growth of the most productive firms beyond a certain size. For instance certain fiscal regulations, relating to administrative controls derived from audit requirements, or labour regulations, linked to the firm's staff representation requirements and employee rights, which under Spanish legislation are subject to stricter regulations once employment numbers have reached certain levels, give rise to these types of thresholds. Other frictions add distortions to the relative prices of the factors of production, entailing certain competitive advantages for some firms that are not necessarily the most productive ones. Of note here are certain labour market, financial, sectoral and government procurement accessibility regulations.

Financial conditions fundamentally influence business dynamics

Business start-ups and their entry to new markets also call for the availability of financing providing for the launch of new investment projects and the maintenance thereof until they prove profitable. In this respect, the availability of personal wealth, the functioning of the

² See J. Andrés, Ó. Arce and C. Thomas (2014), *Structural reforms in a debt overhang*, Working Paper No. 1421, Banco de España.

³ See Ó. Arce, J. M. Campa and A. Gavilán (2013), «Macroeconomic adjustment under loose financing conditions in the construction sector», *European Economic Review*, Vol. 59, pp. 19-34.

credit market and, also, the development of new financing instruments and channels determine, in part, the flow of new business start-ups and the inter-sectoral reallocation of productive resources, along with the movement of such resources towards the highest-productivity firms. In this connection, the recent changes observed in financial markets – some the outcome of the crisis, others the result of intense regulatory reform in this field – should be borne in mind when analysing the factors promoting or restricting the efficient allocation of productive resources across firms.

Improving the quality of the resources available in the economy is essential for raising growth capacity in a sustained fashion

Irrespective of credit accessibility and of the presence of different regulations that distort business start-ups, failures and growth, the strengthening of the business sector will necessarily be boosted by productivity gains. In this connection, improving the population's vocational skills, promoting innovation and the adoption of technology, and eliminating the obstacles to the efficient allocation of resources towards the most productive ends should be an economic policy priority.

On that basis, this chapter offers an in-depth analysis of business dynamics in Spain from three standpoints. Firstly, a series of analytical and quantitative elements are presented that highlight the macroeconomic effects of business dynamics, with regard both to adjustment processes in the short term and to potential growth in the long term. Secondly, business dynamics in Spain are characterised, in comparison with peer countries, and the significance of productivity as a determinant of such dynamics is emphasised. Finally, there is discussion as to what extent Spanish business start-ups, failures and growth are linked to different product and labour market regulations, their financing conditions and the level of employer and employee professional skills.

2 The macroeconomic consequences of business start-ups, failures and growth

There are several channels through which business dynamics have macroeconomic implications

An increase in the flows of business start-ups and in the rate of failure of the least productive firms, and a better adaptation of the size of those that remain in the face of changing market conditions, tend to increase the degree of competition in markets and may provide a boost to innovation and the adoption of technology. Likewise, greater business dynamics, in the terms described, provide for the reallocation of resources towards the highest-productivity firms, which translates into higher growth potential for the economy as a whole.

First, greater business dynamics are conducive to competition,...

In the short term, the greater the competition in markets is, the lower the level of prices and, concurrently, the higher output and employment will be. Furthermore, greater competition also promotes and accelerates the reallocation of production factors towards their most efficient uses. The cost of production may also increase owing to the presence of barriers to entry in the markets for intermediate goods and to excessive regulation or administrative burdens associated with the pursuit of an activity, and to the expenses arising from the lawsuits a firm must face in order to ensure contractual performance.

... facilitate the adjustment of the economy in the face of shocks...

Business dynamics also determine the adjustment of the response to economic shocks. For instance, given an increase in business opportunities, the flow of business start-ups will tend to reduce the average price mark-up relative to unit labour costs, leading to an increase in production, thereby amplifying the impact of the positive shocks. For example, Box 4.1 shows, using a macroeconomic model developed and estimated to capture these effects, that the response of the economy to a temporary increase in productivity is all the greater the lower the costs of business start-ups. Conversely, recovery after an adverse shock entailing the failure of a significant number of firms will be all the slower the greater

the duration and cost associated with the winding-up of less productive firms and the lower the start-up rate of new competitors.⁴

... and promote the development and adoption of new technologies, fomenting productivity growth

In the long term, the rates at which technological innovations originate and are adopted also depend on the level of market competition and on the degree of business dynamism. R+D investment requires a return which, on occasions, can only come about through the exercise of a degree of market power, at least over some period of time. However, in other instances, protecting new ideas need not be incompatible with the presence of incentives to innovate in a competitive environment. Many technological innovations have arisen and been disseminated outside the protection of patents. Indeed, in competitive environments, firms can also make technological innovations profitable; and these, moreover, will be disseminated more rapidly the fewer the obstacles to business start-ups.

Indeed, regarding the generation and dissemination of innovation, the role of new entrepreneurs should not be underestimated, even when new productive units with a small number of employees are involved. Market structures and institutions that facilitate the entry and exit of firms can promote the accumulation of knowledge, investment in intangible assets, through experience, and the mobility of entrepreneurs and innovators, all of these factors being necessary for raising productivity.⁵

Business dynamics also determine the degree of heterogeneity within each sector...

There is abundant empirical evidence confirming that, within each sector of activity, firms of very different sizes and productivity exist alongside one another. This heterogeneity is the outcome of entrenched patterns that are common to many countries: new firms entering a specific market are, on average, of a smaller size and therefore have greater growth potential than those already established. In particular, there is a negative association between productivity growth and employment, on one hand, and a positive one between the size and age of firms, on the other. Likewise, older firms that have a greater number of workers have a higher survival rate than newly created firms.⁶

That means that the distribution by firm size both at the aggregate level and within each sector is asymmetrical, insofar as this distribution contains a greater density of small-sized firms. In Spain, this asymmetry is very marked. As is set out in greater detail in the following section, almost 90% of Spanish firms have fewer than 10 employees, while those with over 50 workers account for a very small percentage compared with that of peer countries.

... which has a bearing on the source and transmission of shocks, affecting the scale of economic fluctuations

Aggregate shocks, which affect all firms jointly, are less frequent and less extensive than idiosyncratic shocks, i.e. those that affect companies individually. The aggregate consequences of these idiosyncratic shocks depend on the composition of the productive system, in terms of firm size, and on price and wage rigidities. For example, in an economy with flexible prices, if the large firms account for a high portion of the employment in a country, the business cycle may be strongly influenced by its idiosyncratic shocks,⁷

4 For a theoretical analysis of these types of transmission channel in customary macroeconomic models, see, for example, F. Bilbiie, F. Ghironi and M. Melitz (2012), "Endogenous Entry, Product Variety, and Business Cycles", *Journal of Political Economy*, vol. 120(2), pp. 304-345; N. Jaimovich and M. Floetotto (2008), "Firm dynamics, markup variations, and the business cycle", *Journal of Monetary Economics*, vol. 55, pp. 1238-1252, and G. L. Clementi and B. Palazzo (2015), "Entry, Exit, Firm Dynamics, and Aggregate Fluctuations", *American Economic Journal Macroeconomics*, forthcoming.

5 See X. Vives (2008), "Innovation and competitive pressure", *The Journal of Industrial Economics*, vol. 56, pp. 419-469.

6 See CompNet Task Force (2014), *Micro-Based Evidence of EU Competitiveness. The CompNet Database*, ECB working paper 1634.

7 This possibility is given the name of «granular hypothesis». See X. Gabaix (2011), "The granular origins of aggregate fluctuations", *Econometrica*, vol. 79(3), mayo, pp. 733-772, and V. Carvalho and B. Grassi (2015), *Firm Dynamics and the Granular Hypothesis*, manuscript.

although this correlation diminishes when the degree of nominal inertia of prices is greater.⁸ Conversely, in economies where small and medium-sized firms have a greater weight, aggregate economic fluctuations tend to be associated to a greater extent with global demand- or supply-side shocks.

Another factor that influences the aggregate consequences of idiosyncratic shocks is the growth potential of newly created companies. This effect is particularly significant in relation to the duration of expansions and of recessions. Hence, if after a positive shock the flow of business start-ups increases and new firms harness their growth potential, the expansion generated by the shock will be much more durable and sustained over time than if the new start-ups face restrictions constraining their growth capacity.

Business dynamics are influenced by labour market regulations and affect the functioning of the labour market

Business start-ups and their growth are influenced not only by product market regulations, but also by labour market-related regulations. For instance, labour regulations affect individual's incentive to work as an entrepreneur, a private-sector wage-earner or a public-sector employee, or to remain idle. Also, the fact that national or regional-level collective bargaining prevails over that at the firm level, imposing working conditions on new start-ups in the related sector, may prevent the entry of firms initially with low productivity but high growth potential. Discrimination in the application of certain labour rules on the basis of firm size may also generate obstacles to the growth of younger firms.

Business start-up and failure rates are mirrored by worker flows. The higher these rates are, the higher the respective entry rates into employment and unemployment will be. Further, a high business failure rate and a low growth of small firms will tend, in general, to bring about greater labour instability and a lesser accumulation of work experience on the part of employees. Finally, in light of firm entry and exit rates, labour instability is greater if the legislation on employment protection involves incentives for staff turnover through the continuing use of temporary contracts.

There are various economic policy instruments linked to business demography with which to boost competition, productivity and well-being

Box 4.1 shows, for illustrative purposes, the results of an exercise assessing different economic policy measures related to business dynamics. In particular, the effect of a reform that increases competition in the product markets through a reduction in entry costs and that provides for the growth of those small firms with sufficient productivity is compared with those effects arising from a reform that generates a genuine improvement in small firms' productivity. The main conclusion of the exercise is that although a reduction in entry costs increases the range of potentially profitable business opportunities, many of which ultimately translate into new firms in a limited period of time, a measure of this type may reduce aggregate productivity if growth is not assisted via the reduction of firms' adjustment costs. The exercise further shows that the measures that appear to have the biggest positive impact on the economy as a whole are those aimed directly at raising average productivity and, in particular, that of small firms.

3 A characterisation of business dynamics in Spain in the international context

There follows a characterisation of business dynamics in Spain from the time and international perspective, in relation both to the level and composition of firm entries and exits and to the growth of firms that are already established. It should be borne in mind that this type of analysis faces difficulties derived from a lack of data that are homogeneous

⁸ J. Andrés and P. Burriel (2014), *Inflation dynamics in a model with firm entry and (some) heterogeneity*, Banco de España Working Paper No. 1427.

and sufficiently representative in all countries. To resolve these difficulties, several statistical sources⁹ have been combined in the evidence presented below.

During the expansion prior to the crisis, Spain had a similar business start-up rate to, and a business failure rate somewhat lower than, the average for the EU countries

Start-up and failure rates can usually be measured by the ratio of the flow of firm start-ups and failures over the course of one year to the number of firms existing in the previous period. These rates have a marked cyclical component, as business start-ups are substantially greater in expansions than in recessions, while the opposite occurs with failure rates.

On Eurostat data (see panel 1 of Chart 4.1), in the years immediately prior to the crisis (2005-2007), Spain posted a business start-up rate close to the EU average, i.e. 9%, a similar figure to that observed in France (10%) and somewhat higher than that for Germany and Italy (5% and 8%, respectively). In this period, within the EU, the highest business start-up rates were observed in the United Kingdom (15%) and in certain Eastern European countries, such as Bulgaria, Estonia and Slovakia (17 %, 14 % and 14 %, respectively). Regarding the failure rate, Spain's rate was lower than the average, at 4%, a similar figure to that of Germany, Italy and France (6%, 5% and 5%, respectively). In the international context, there is a positive association between start-ups and failures, whereby those countries that had high failure rates – the United Kingdom (10%) and Eastern European countries such as Bulgaria, Estonia and Slovakia (7%, 7% and 8%) – are also those that posted the highest start-up rates. In Spain, the business start-up rate observed over the course of these years far exceeded the failure rate (see panel 3 of Chart 4.1).

The crisis substantially reduced the business start-up rate and raised the failure rate

As from 2007 there was a significant increase in the firm failure rate while the start-up rate decreased, to the extent that, according to DIRCE (the National Statistics Institute Central Companies Directory), net declines were observed in the number of firms up to 2012. In 2013, a net positive change was discerned, owing to a decline in the number of failures and a rise in start-ups. The following year, however, the number of firms stabilised. In any event, the differences by sector of activity are appreciable. Hence, although the recession had an adverse impact on business dynamics in all sectors (see panel 4 of Chart 4.1), the construction sector was that most affected by the crisis, both in the reduction in firm entries and in the increase in firm exits, with sizeable net declines being evidenced from 2008. These effects were on a much lesser scale in the services and, especially, industrial sectors.

Even taking into account the effect of the business cycle, Spain has posted relatively low business start-up rates since 2008

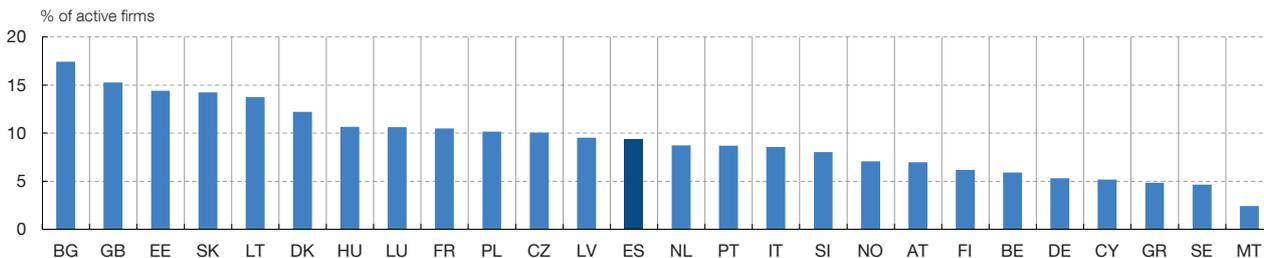
The effect of the business cycle on firm start-up and failure rates can be proxied drawing on the estimated relationship between these rates and GDP growth for a set of countries. According to the results of estimates of this type, it may be concluded that, although in Spain the pre-2008 pattern of business start-ups was similar to that in other countries, since then it has been considerably lower, even given the economic recession (panel 5 of Chart 4.1). Moreover, although firm failures throughout the recession were in step with expectations given the scale of the decline in GDP, prior to 2007 in Spain a greater number of firms survived relative to what corresponded to the average behaviour in other countries (see panel 6 of Chart 4.1).

Start-up and failed firms are less productive than established firms...

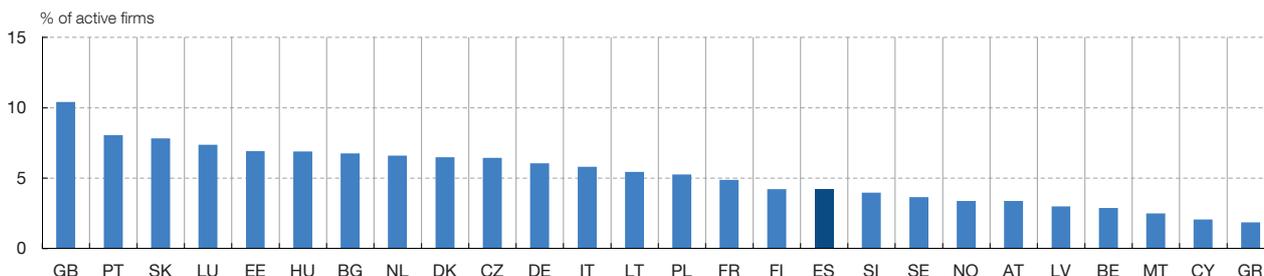
It can be seen in Spain's case that both newly created firms and those discontinuing their activity show lower productivity levels than the average productivity of their sector. Firm entries during the 1998-2007 period, in particular, evidenced a level of productivity that is almost 20% below the sector average, suggesting the existence of a necessary learning-

⁹ The information for Spain has been drawn from the Banco de España Central Balance Sheet Data Office (CBSO), the Balance of Payments (BP), the Banco de España Central Credit Register (CIRBE) and the INE Central Companies Directory (DIRCE); the sources for the remaining countries are AMADEUS, *CompNet* [a research network on the competitiveness of the European System of Central Banks (ESCB)], Eurostat (Structural indicators) and OECD (*Entrepreneurship at a Glance*). However, for the correct interpretation of the statistics discussed below, it should be borne in mind that not all the databases used are internationally harmonised.

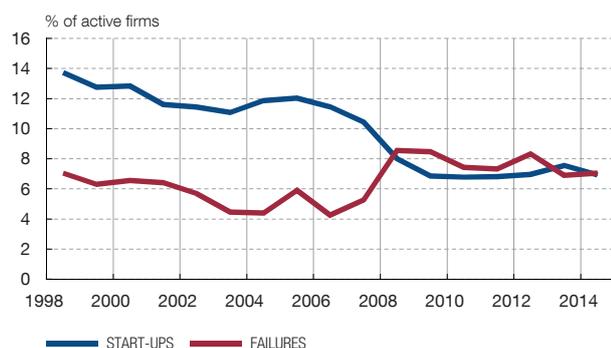
1 BUSINESS START-UP RATE BEFORE THE CRISIS (2005-2007) (a)



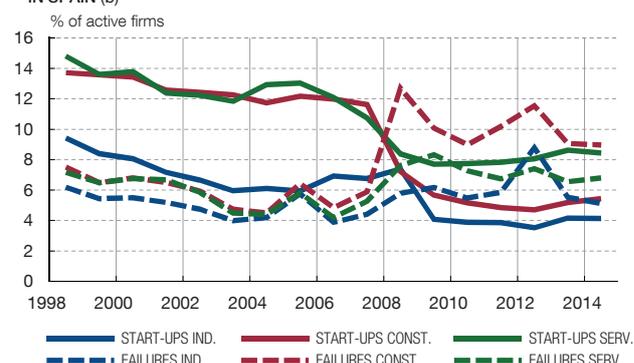
2 BUSINESS FAILURE RATE BEFORE THE CRISIS (2005-2007) (a)



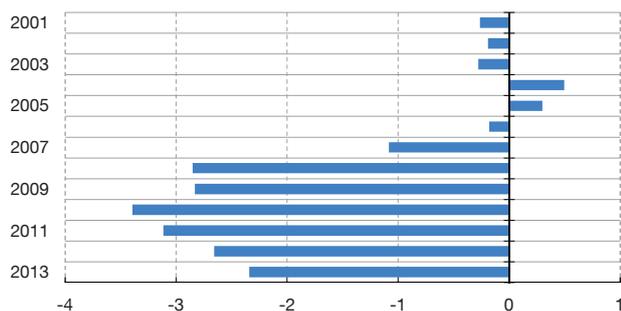
3 BUSINESS START-UP AND FAILURE RATES IN SPAIN (b)



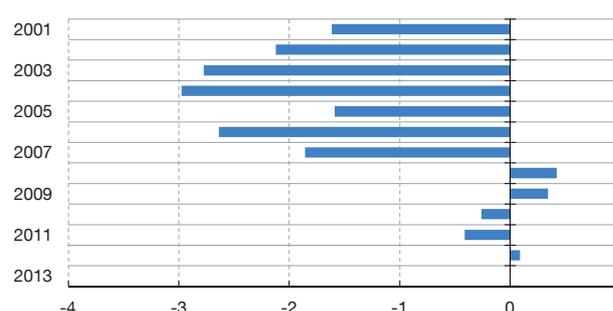
4 START-UP AND FAILURE RATES IN THE MAIN SECTORS OF ACTIVITY IN SPAIN (b)



5 RESIDUALS OF THE START-UP MODEL (c)



6 RESIDUALS OF THE FAILURE MODEL (c)



SOURCES: European Commission, OECD, INE and Banco de España.

- a Eurostat distinguishes three legal forms of businesses: public or private limited liability commercial-law companies, workers' limited or unlimited liability companies and unlimited liability sole proprietorships. The information is limited to public or private limited liability commercial-law companies to increase the comparability of the statistics, since data on sole proprietorships are prone to greater measurement errors. Limited liability commercial-law companies account for 40%, since sole proprietorships account for somewhat more than 50%. In terms of employment, however, their contribution is much larger. Sectorally, the information is limited to industry and services excluding the management activities of holding companies, general government, defence and compulsory social security, education and healthcare, other welfare and services activities provided to the community, personal services, household activities and extraterritorial organisations and bodies.
- b Units started up are defined as businesses started up in the current or previous two periods and failures are defined as those which cease to exist in the current or previous two periods. The sectoral classification is that of the two-digit NACE. Weighted by the sector average to prevent different sectoral compositions in business additions or reductions from affecting the results.
- c Residuals relate to two regressions of business start-up and failure rates and GDP growth. Sample consisting of OECD countries between 2002 and 2012. A residual of -1 denotes a start-up or, where applicable, failure, rate which is 1 percentage point less than that estimated by means of historical and inter-country correlation of the business cycle and the relevant rate.



BUSINESS DEMOGRAPHY AND PRODUCTIVITY (a)
TABLE 4.1

Percentage

1 By sector	Total		Industry		Construction		Services		
	1998-2007	2008-2012	1998-2007	2008-2012	1998-2007	2008-2012	1998-2007	2008-2012	
Average of the relative levels of apparent labour productivity for the period									
Total corporations	100	100	100	100	100	100	100	100	
New corporations in the current year and two previous years	83.4	88.5	84.8	90.1	86.1	94.6	82.6	87.2	
Remaining corporations	111.9	111.8	107.7	109.3	110.2	115.8	113.6	111.3	
Corporations closed in the current year and two subsequent years	73.1	57.2	70.2	52.8	81.8	56.6	71.5	58.4	
Average of the contributions to apparent labour productivity growth for the period									
Total corporations	100	100	100	100	100	100	100	100	
New corporations in the current year and two previous years (b)	-6.2	-2.2	-3.4	-1.1	-5.8	-1.2	-7.0	-2.7	
Corporations closed in the current year and two subsequent years (c)	3.2	7.4	3.0	7.1	2.2	11.6	3.5	6.5	
					Total				
					1999-2007		1998-2012		
2 According to sector growth					Growing	Not growing	Growing	Not growing	
Average of the relative levels of apparent labour productivity for the period									
Total corporations			100	100	100	100			
New corporations in the current year and two previous years			83.4	82.7	88.4	88.9			
Remaining corporations			112	110	110	113			
Corporations closed in the current year and two subsequent years			73.3	69.6	67.3	53.9			
Average of the contributions to apparent labour productivity growth for the period									
Total corporations			100	100	100	100			
New corporations in the current year and two previous years (b)			-6.3	-4.8	-2.7	-2.0			
Corporations closed in the current year and two subsequent years (c)			3	4	5	8			
Memorandum item									
Percentage of sectors			62	38	30	70			
Percentage of companies in the sector			64.7	35.3	36.5	63.5			

SOURCES: INE and Banco de España.

- a Based on data from the microdata files of the Central Companies Directory (DIRCE), together with microdata from the Central Balance Sheet Data Office.
- b Calculated as the change in the productivity level in a given period, by including corporations created in the current year and two previous years in the calculation of average productivity.
- c Calculated as the change in the productivity level in a given period, by excluding the corporations closed in the current year and two subsequent years in the calculation of average productivity.

curve period so that new firms converge on average productivity levels in their sector of activity. Likewise, failing companies posted, on average, a level of productivity that was 27% below that of their sectoral average, whereby their disappearance gave rise to a positive composition effect on productivity growth at the aggregate level (panel 1 of Table 4.1).

...although, during the crisis, start-up firms' productivity improved slightly in relative terms, while the less productive firms disappeared

Since 2008 the selection of firms, among both entries and exits, has produced a greater positive effect on the economy's aggregate productivity. Specifically, start-ups since then have shown a level of productivity closer to the sectoral average, while those firms exiting had a significantly lower level. These results are common to a broad set of sectors of the Spanish economy. In all cases, both start-ups and failures show of activity levels below the

average for the related sector. At the same time, the selection of firms has become more intensely geared to the most productive ones (see panel 1 of Table 4.1).

The improvement in the relative productivity of newly created firms has come about in most sectors

The increase in newly created firms' productivity relative to those already in place can be seen both in the sectors most affected by the recession, proxied by those in which there were declines in employment, and in those that recorded growth in employment. However, firms exiting sectors with declines in employment have had lower productivity than those remaining in place in sectors with employment growth, which indicates a relationship between firm exits and the cyclical position of the sector in question (panel 2 of Table 4.1). The new business start-up patterns and the fact they are across the board suggests that some improvement is taking place in the selection of new firms on the basis of their productivity, which might be symptomatic of a favourable structural change in Spanish business demography.

Nonetheless, the size and survival rate of newly created firms are lower in Spain than in peer countries

On Eurostat data, newly created Spanish firms are atypical regarding their initial size and survival rates. Indeed, the initial size of Spanish start-ups is generally small, standing on average at 4.6 employees in the industry, exceeding only Japanese and Luxembourg companies (4.0 and 4.3 employees, respectively). At the other extreme are France, Finland and the Netherlands, with an average size of 23.7, 17.9 and 16 employees, respectively. In the services sector, Spain has the smallest initial size of EU countries as a whole, with 2.4 employees. According to DIRCE figures, it is estimated that this characteristic became more accentuated during the crisis, given that the average size of start-ups in Spain fell as from 2008. If, between 2000 and 2007, 78% of start-ups with more than one employee had between one and five workers, this percentage rose to 82% in the subsequent period (see panel 1 of Chart 4.2). Moreover, the probability of survival of Spanish firms after five years is also low in comparative terms (see panel 2 of Chart 4.2). In this case, during the crisis, the probability of Spanish start-ups rather than established firms disappearing increased further.

Increased productivity is a determinant of business growth and development

A widely documented fact in studies on business dynamics is the positive association between size and productivity. The fundamentals of this association are, however, less evident. First, it may be the outcome of the presence of economies of scale that generates productivity gains when firm size increases. Further, it may be the case that firms are intrinsically more or less productive and only grow insofar as the factors of their environment (economic, regulatory, institutional and financial factors, *inter alia*) allow it, once their true productive potential has been disclosed. In the first instance, size would cause productivity; in the second, causality would be the other way around, from productivity to size.

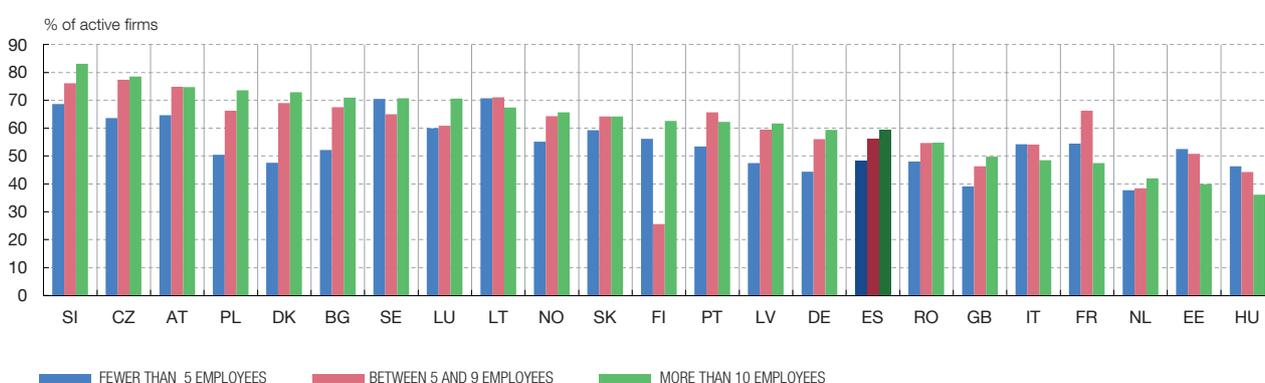
Although in practice there will foreseeably be numerous causality relationships between these two variables, in both directions, one way of attempting to discern their relative weight is to compare employment growth in two identical firms up to a specific time at which there can be seen to be a significant exogenous increase in productivity or size at only one of them. The results of such an analysis are shown in Table 4.2.¹⁰ The top section in this table shows that in the year following a 10% increase in productivity, the related firm begins to grow more than its counterpart, such that after five years employment in the first firm has grown 8 pp more than that in the second firm. The lower section in Table 4.2 plots the changes in productivity for the two identical firms up to a specific time at which there can be seen to be an increase in size at only one of them (also normalised at 10%). In the second instance, no significant differences are found between the growth in productivity of both firms even after five years. Accordingly, these results suggest that productivity growth will give rise to an increase in firms size, while in the short term business growth would not of itself give rise to evident gains in productivity.

¹⁰ See E. MoralBenito (2016), *Growing by learning*, Banco de España Working Paper, forthcoming.

1 AVERAGE SIZE OF NEW COMPANIES (0 TO 2 YEARS) BETWEEN 2001 AND 2010 (a)



2 FIVE-YEAR SURVIVAL RATE IN 2010



SOURCES: OECD and European Commission.

a According to C. Criscuolo, P. N. Gal and C. Menon (2014) in *The Dynamics of Employment Growth: New Evidence from 18 Countries*, OECD Science, Technology and Industry Policy Papers no. 14, OECD Publishing.



ESTIMATED EFFECTS ON EMPLOYMENT AND PRODUCTIVITY (a)

TABLE 4.2

	After the number of periods indicated				
	1	2	3	4	5
Of a productivity shock on					
Employment growth	0.017*** (0.004)	0.012*** (0.004)	0.010** (0.005)	0.004 (0.007)	0.003 (0.006)
Cumulative employment growth	0.017*** (0.004)	0.037*** (0.005)	0.045*** (0.006)	0.075*** (0.007)	0.084*** (0.009)
Of a size shock on					
Productivity growth	0.017* (0.009)	-0.005 (0.005)	-0.014 (0.020)	-0.008 (0.009)	-0.010 (0.014)
Cumulative productivity growth	0.017* (0.009)	0.012 (0.012)	0.006 (0.017)	0.012 (0.008)	0.007 (0.031)

SOURCE: Banco de España.

NOTE: *, ** and *** denote significance coefficients at 10%, 5% and 1%, respectively. Standard errors are in brackets.

a See E. Moral-Benito (2016), *Growing by learning*, Documentos de Trabajo, Banco de España, forthcoming. This exercise is based on propensity score matching which identifies a group of firms that are equal in terms of their observable characteristics (size, age, productivity, sector of activity, export status, etc.) in an initial period. This group is divided into two: a treatment group consisting of firms which have shown productivity (or employment) growth of more than 10% in the initial period, and a control group consisting of firms which have not shown such growth. Next, the average employment (or productivity) growth of each group in the following five periods (years) is compared and the differences between the two groups are checked to determine whether they are statistically different from zero.

	Probability of high employment growth		Probability of high productivity growth	
	2002-2007	2008-2012	2002-2007	2008-2012
High productivity growth in the previous period	0.012*** (0.001)	0.019*** (0.001)	-0.244*** (0.001)	-0.268*** (0.001)
High employment growth in the previous period	0.163*** (0.001)	0.177*** (0.001)	-0.006*** (0.001)	-0.007*** (0.001)
Percentage of permanent jobs at the firm	-0.001 (0.002)	-0.001 (0.002)	0.032*** (0.002)	0.058*** (0.002)
Financing conditions (b)				
At least one credit application granted	0.015*** (0.001)	0.014*** (0.001)	0.015*** (0.001)	0.009*** (0.001)
All applications rejected	0.009*** (0.001)	0.008*** (0.001)	0.008*** (0.001)	0.002** (0.001)
No applications made, but no restrictions on credit	0.014*** (0.001)	0.015*** (0.001)	0.011*** (0.001)	0.006*** (0.001)
Firm age (c)				
3 - 5 years	-0.028*** (0.001)	-0.046*** (0.002)	-0.059*** (0.001)	-0.065*** (0.002)
6 - 10 years	-0.039*** (0.002)	-0.066*** (0.002)	-0.072*** (0.002)	-0.087*** (0.002)
11 - 15 years	-0.045*** (0.002)	-0.080*** (0.002)	-0.072*** (0.002)	-0.098*** (0.003)
16 -20 years	-0.050*** (0.002)	-0.093*** (0.003)	-0.072*** (0.003)	-0.111*** (0.003)
> 21 years	-0.054*** (0.004)	-0.011*** (0.003)	-0.068*** (0.003)	-0.012*** (0.004)

SOURCES: INE and Banco de España.

NOTE: *, ** and *** denote significance coefficients at 10%, 5% and 1%, respectively. Standard errors are in brackets.

a Results of a linear probability model estimated using firm data in the Central Balance Sheet Data Office. The coefficients represent the marginal effects of each variable on the probability that a firm has high growth. All the results include fixed effects as the control group. High employment growth firms are defined as the 10% of firms with the highest value which results from multiplying the absolute change in employment by the ratio of employment in the subsequent period (t+1) to employment in t. High productivity growth firms are defined as the 10% of firms that have the highest productivity growth rate and have not undergone falls in their employment level. Both definitions are calculated at the level of sector (NACE two digit categories) and year.

b The first two categories refer to firms which have applied for credit to a bank from which they do not have outstanding loans. The third refers to firms which, although they have not applied for credit to a new bank, have increased the number or amount of loans from their customary banks or have lines of credit which are mostly unused. Finally, the reference group consists of firms which neither request credit from new banks nor increase their positions with their customary banks.

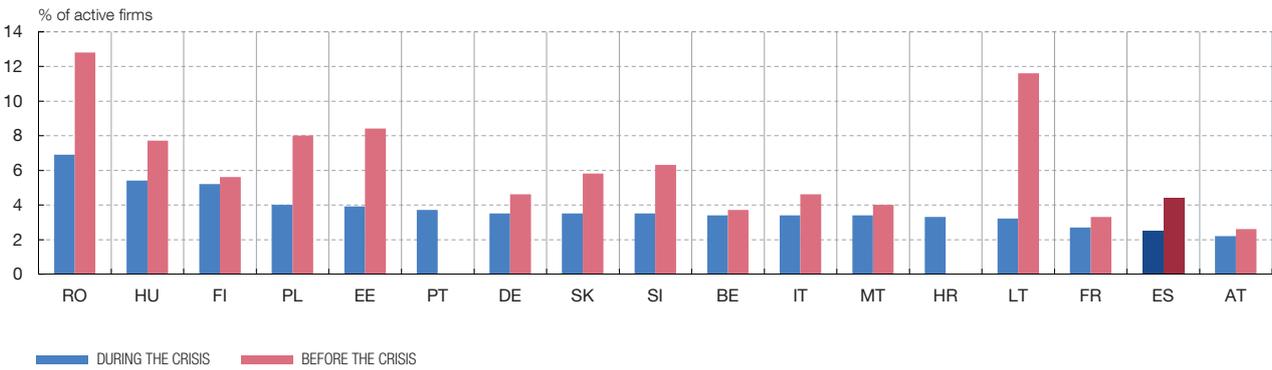
c The reference category consists of firms of age below 2 years.

The number of high-growth firms is fairly low when compared with peer countries

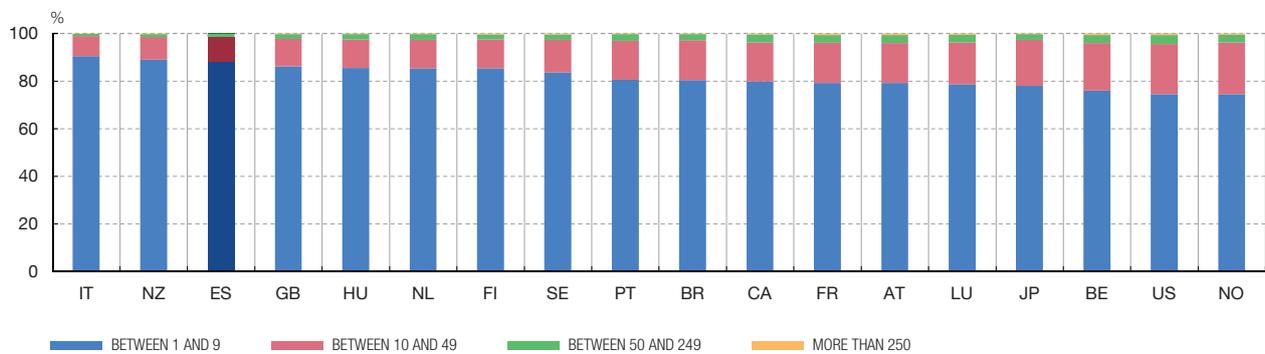
The analysis of high-growth firms, which are defined as those at which there is a significant increase in size, measured by employment, over a short period, also stresses the significance of productivity (see Table 4.3).¹¹ Specifically, it is found that these firms' productivity growth is a determinant of the increase in their size, while size, at least among firms notable for rapid development, does not increase productivity growth. Insofar as productivity growth in Spain is low, from an international standpoint, it is not surprising that the percentage of high-growth firms, according to the OECD definition (see panel 1 of Chart 4.3), is also low in relative terms.

¹¹ See C. Guillamón, E. MoralBenito and S. Puente (2016), *High growth in employment and productivity: Dynamic interactions, and the role of financial constraints*, Banco de España Working Paper, forthcoming.

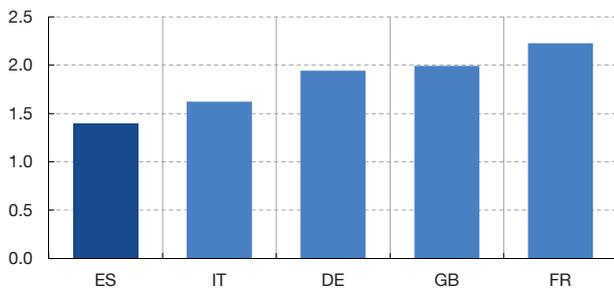
1 PERCENTAGE OF HIGH-GROWTH FIRMS (a)



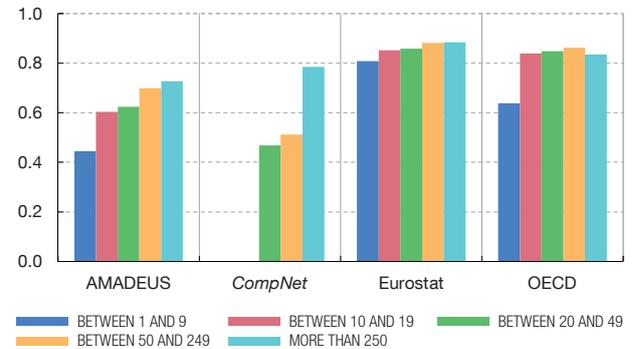
2 DISTRIBUTION OF FIRMS BY NUMBER OF EMPLOYEES



3 AVERAGE EFFICIENCY IN THE ALLOCATION OF RESOURCES TO FIRMS BASED ON TFP BETWEEN 2004 AND 2012 (b)



4 RELATIVE PRODUCTIVITY OF SPANISH FIRMS (c)



SOURCES: OECD, AMADEUS, European Commission, ECB's *Competitiveness Research Network (CompNet)*, INE and the Banco de España's Central de Información de Riesgos and Central de Balances.

- a Per the *CompNet* definition, which encompasses those firms that raise their levels of employment by more than 20% per year over a three-year period.
- b Annual average in each of the periods of covariance between the market share of the firms in each sector, measured by value added, and their total factor productivity relative to the sector average. Greater covariance indicates better allocation of productive resources among the firms of a given sector.
- c Productivity ratio between Spanish firms and the average in France, Germany and Italy (average = 1). The AMADEUS and *CompNet* data refer to total factor productivity and the Eurostat and OECD data to apparent labour productivity.



In Spain, moreover, the correlation between business growth and productivity is relatively low

As a result, the distribution of firms in Spain is relatively skewed towards smaller and low-productivity companies

4 Some determinants of business dynamics in Spain

Access to financing, regulation, the availability of human capital and innovative capacity are fundamental factors of business dynamics

4.1 BUSINESS FINANCING

Bank loans are the main source of Spanish firms' external financing

Financial conditions worsened substantially during the crisis

In the current phase of recovery, a pick-up in financing can be seen which, moreover, is targeted on more productive firms...

Not only does there appear to be a small number of high-growth firms in Spain, but also the positive correlation between productivity and growth is less than that observed in other countries (panel 3 of Chart 4.3). In short, other factors unrelated to productivity appear to play a more relevant role in the accumulation of resources at certain firms.

The aforementioned business start-up, growth and failure patterns help justify the fact that Spain's distribution of firms evidences a greater weight for smaller size than that observed in other countries (see panel 2 of Chart 4.3). It is also seen that Spanish firms' productivity is at least 15% lower than that of their German, French and Italian counterparts, even when comparing size ranges, although this difference is significantly greater in the group of firms with 1 to 9 employees, where the weight of start-ups is greater (see panel 4 of Chart 4.3).

Among the key factors for start-ups are access to financing, regulations (whether fiscal, administrative or labour), the availability of human capital and innovation-related possibilities and incentives (see Chart 4.4). The same factors are likewise crucial regarding firms' growth potential, in addition to other factors that may be specific to each sector.

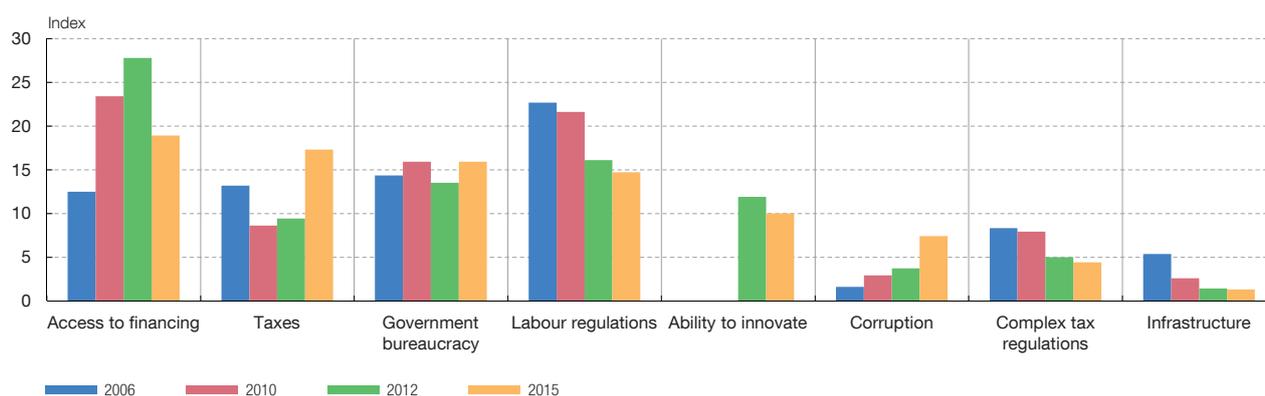
The creation and growth in the size of firms are influenced by the availability of external financing to undertake new investment projects, which in Spain's case and, especially, for small firms occurs in the main through bank loans. In the immediate run-up to the crisis, bank lending standards in respect of firms were relatively lax, which translated into abundant bank financing that was especially conducive to the creation and survival of small firms. However, the firms resorting to lending did not necessarily have high productivity. Indeed, before 2007 no positive association can be found between the likelihood of obtaining financing and business productivity (see panel 1 of Chart 4.5).

During the crisis financial conditions tightened notably. Contributing to this were various factors such as the deterioration in credit institutions' financing conditions, partly as a result of financial fragmentation problems in the euro area, and the effects of the crisis on borrowers' creditworthiness. Small firms, especially start-ups, saw the biggest deterioration in their bank lending access conditions, partly as a result of their higher credit risk but also because of the diminished amount and quality of information that banks have on them. With a view to mitigating these frictions, public financial support programmes for this type of firm were extended (see Box 4.2). Notwithstanding, the lesser availability of financing contributed to a notable decline in start-ups and, consequently, to the reduction in private business investment.

Following the crisis, firms' access to bank financing has improved, especially in the case of SMEs. This, combined with the increase in the demand for credit, has been mirrored by an increase in the volume of funds granted. These developments have been accompanied by a certain degree of credit supply selection among lenders, whereby access to financing has improved more markedly in the case of those firms in a more favourable economic and financial position.¹² A reflection of this has been an increase in the positive association between the obtaining of loans by firms and their productivity (see panel 1 of Chart 4.5). Accordingly, the course of recent credit flows points to a degree of reallocation of resources

¹² For further information see Box 5.2 of the Banco de España 2014 *Annual Report* del Banco de España de 2014.

MOST PROBLEMATIC FACTORS FOR DOING BUSINESS (a)



IMPORTANCE OF THE FOLLOWING FACTORS IN FIRM GROWTH IN 2015 (b)

Percentage	Total	Industry	Construction	Trade	Transport	Other services
Product demand	44.4	54.3	43.8	43.7	35.9	43.4
Macroeconomic environment	24.4	31.1	22.5	17.3	16.8	28.5
Economic regulation	19.7	18.3	20.1	14.9	11.1	26.0
Taxes	17.9	17.4	20.8	17.0	9.2	20.8
Bad debts	13.9	13.4	22.8	5.3	-6.3	23.2
Availability of financing	13.5	14.7	29.5	7.0	6.9	14.0
Labour market efficiency	7.6	7.0	7.6	3.5	3.4	11.6
Suitable human capital	1.1	5.1	-4.4	-4.0	-5.0	5.6
Factor costs	-5.2	13.1	-8.3	-6.0	-6.2	-11.9
Infrastructure	-11.6	-4.8	-7.7	-12.5	-6.6	-17.1
Insufficient equipment	-17.1	-4.0	-18.9	-21.8	-15.8	-20.6
Legal costs	-33.3	-38.8	-31.5	-38.0	-41.9	-25.8

SOURCE: *Global Competitiveness Report* of the World Economic Forum, and INE.

- a Data drawn from the module on the most problematic factors for doing business, in the *Global Competitiveness Report*. Respondents have to select, from a list of factors, the five most problematic ones for doing business in the country and assign them a score ranging from 1, for the least problematic, to 5, for the most problematic. The index is a weighted average of the responses.
- b Data drawn from the module devoted to opinion on the business environment, of the INE business confidence index. It represents the difference between the percentage of firms giving a high importance to those factors and the percentage of firms giving them a low importance.



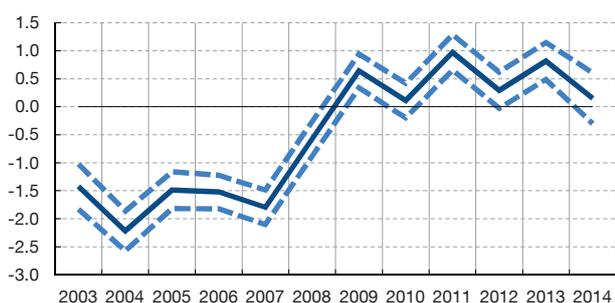
across firms, meaning they would be directed to a greater extent towards more productive companies.

...while the various reforms undertaken have lessened the distortions that were encouraging investment in real estate assets at the expense of other activities

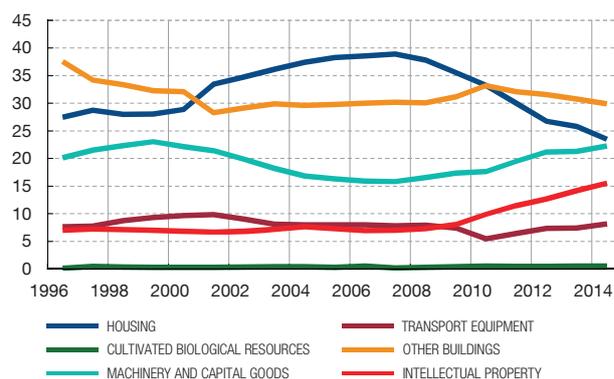
Some of the structural reforms undertaken in recent years should contribute to lessening the distortions that encouraged investment in real estate assets at the expense of alternative investment in projects with potentially higher expected returns but with less collateral. Specifically, both the recent changes in financial regulation and the range of fiscal and regulatory measures in the area of housing and the rental market should have contributed to curbing an excessive concentration of credit in real estate assets.¹³ A preliminary assessment of recent reforms in the area of insolvency proceedings suggests that such reforms would have resulted in the greater efficiency of these proceedings (see Box 4.3). That should be conducive to a greater use of insolvency proceedings by firms

¹³ J. S. MoraSanguinetti y M. Rubio (2014), "Recent Reforms in Spanish Housing Markets: An Evaluation using a DSGE Model", *Economic Modelling*, vol. 44.

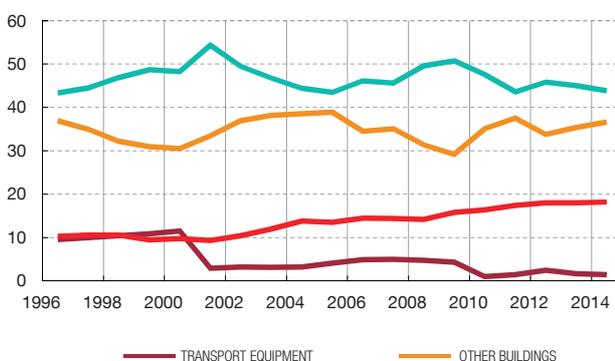
1 RELATIONSHIP BETWEEN PRODUCTIVITY AND ACCEPTANCE OF LOAN APPLICATIONS BY FIRMS (a)



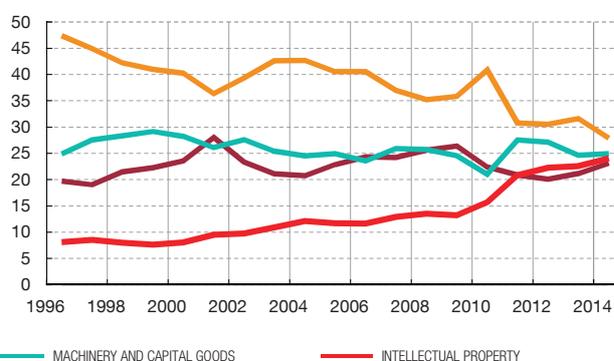
2 BREAKDOWN OF GROSS CAPITAL FORMATION. TOTAL ECONOMY



3 BREAKDOWN OF GROSS CAPITAL FORMATION. INDUSTRY



4 BREAKDOWN OF GROSS CAPITAL FORMATION. SERVICES



SOURCES: INE and Banco de España.

a Credit approval and business TFP regression coefficient based on size, age, financial costs, asset volume and sector of activity of the firm. A negative (positive) coefficient denotes a negative (positive) correlation between productivity and credit approval. The broken lines show the confidence interval of the estimate.

and, therefore, it should promote an increase in the weight of project financing with a high potential return and a higher level of risk. There is in fact evidence that the inefficiencies evidenced by business insolvency proceedings as a mechanism to restructure debt – in comparison with mortgage foreclosures – skewed the granting of credit in the past towards projects collateralised by real estate.

In this respect, developments in recent years reveal major changes in the composition of firms’ investment flows, which were no doubt also in response to cyclical factors, making it difficult to assess the role the recent reforms may have played to date. Hence, the weight of housing in overall gross capital formation has fallen by around 15 pp since 2008, while that of gross formation in capital goods and the acquisition of intellectual property has increased (see panel 2 of Chart 4.5).

The increase in gross formation in capital goods appears to be the result of a sectoral reallocation following the fall in the weight of construction and real estate services in aggregate value added, since there is no evidence of an increase in the former within the industrial and services sectors. However, there is indeed a continuous increase in gross formation in intellectual property, which quickened after 2009, especially in the services sector (panels 3 and 4 of Chart 4.5).

SPANISH POSITION AND INTERNATIONAL COMPARISON

Ease of doing business indicators (a)	Spain		United Kingdom		United States		Germany		France		Italy	
	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016
Overall indicator	34	33	6	6	7	7	15	15	27	27	44	45
Starting a business	78	82	43	17	44	49	10	107	27	32	48	50
Dealing with construction permits	97	101	23	23	33	33	13	13	39	40	79	86
Getting electricity	78	74	16	15	42	44	3	3	22	20	58	59
Registering property	48	49	44	45	33	34	62	62	82	85	22	24
Getting credit	52	59	17	19	2	2	24	28	71	79	90	97
Protecting minority investors	44	29	4	4	32	35	46	49	27	29	33	36
Paying taxes	79	60	16	15	48	53	68	72	105	87	37	137
Trading across borders	1	1	36	38	33	34	34	35	1	1	1	1
Enforcing contracts	39	39	26	33	21	21	11	12	12	14	24	111
Resolving insolvency	23	25	12	13	4	5	3	3	22	24	21	23
Memorandum item												
Number of countries surveyed	189											

SOURCE: The World Bank (<http://espanol.doingbusiness.org/>).

a With these indicators, the country with the best practices has position number 1, countries with successively poorer practices occupy increasingly higher positions.

4.2 THE IMPACT OF REGULATIONS

Although the obstacles to competition have progressively diminished, there is room for improvement in entry regulations, especially at the regional and local government levels

As regards the formalities for creating a new firm, Spain is ranked in a relatively unfavourable position at the international level. For example, according to the World Bank's *Doing Business* indicator, Spain ranks 82nd, at some distance from the United Kingdom, France and Italy, albeit better than Germany. However, there have recently been considerable improvements in this area, essentially owing to the creation of single windows and the possibility of using responsible statements as opposed to the previous requirement entailing the approval of a licence. At present seven procedural steps, 14 days and 5.2% of income are necessary for a business start-up, compared with 10, 61 and 15%, respectively, in 2010 (see upper panel of Table 4.4).

Nonetheless, it should be borne in mind here that business start-ups are still subject to a plethora of regional and local government regulations, an aspect which is not reflected in the aforementioned indicator. The information available in this connection for 19 Spanish cities confirms that there is significant regional heterogeneity, which, for the sake of facilitating start-ups, would warrant rigorous assessment of the different instruments used that help identify good practices in this regulatory policy area.¹⁴

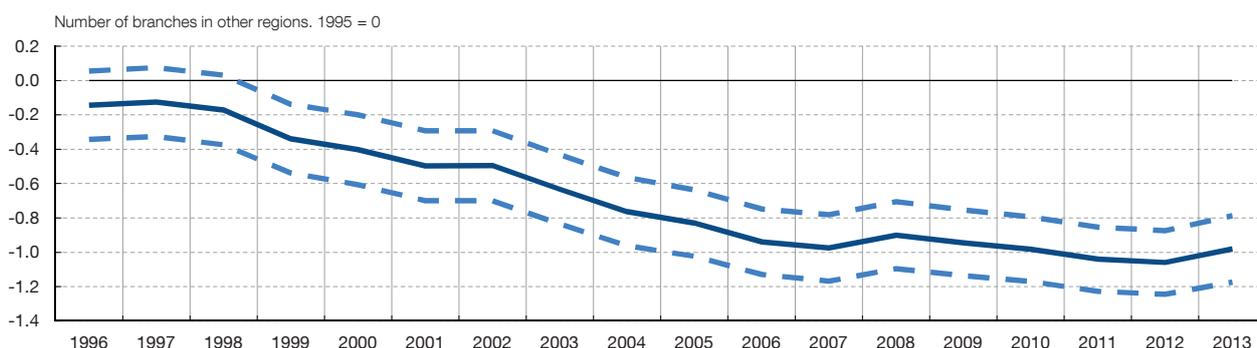
To promote the growth of firms, it is also necessary to reduce size-contingent regulations and those that restrict activity in other geographical markets...

At the state level, there is a broad range of business size-contingent regulations, which may act as a deterrent to business growth.¹⁵ Likewise, the regional governments have increased their regulatory capacity, whereby the heterogeneity in the regional steps needed to undertake investment projects might not only be curtailing start-ups, but also their

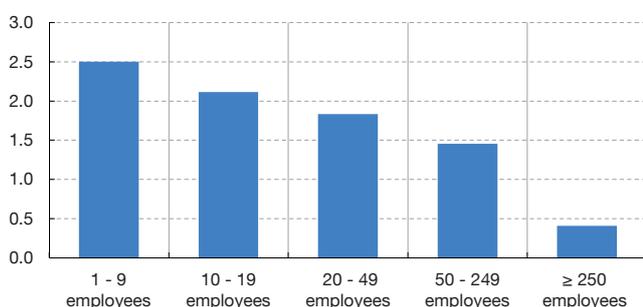
¹⁴ See *Doing Business* en España, 2015 (<http://espanol.doingbusiness.org/reports/subnational-reports/spain>).

¹⁵ See the evidence on the impact of specific regulatory thresholds in the distribution of firms by size in Chapter 3 of the Banco de España 2014 *Annual Report* and in the European Commission's *Report on Spain 2016, with an exhaustive examination of the prevention and correction of macroeconomic imbalances*. In this respect, fiscal and labour regulatory arbitrage affects the difference between the number of firms and the number of entrepreneurs, meaning that the average size of firms measured in legal terms need not match the average size of resources managed under a single management unit.

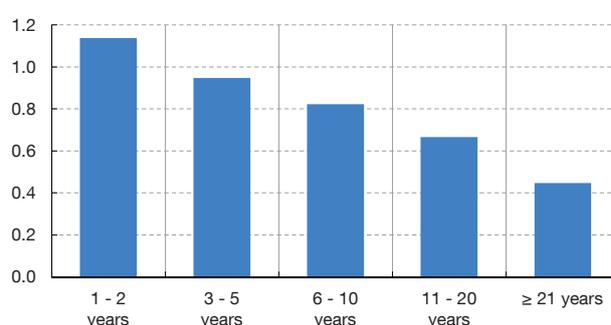
1 SPANISH FIRMS ESTABLISHING A PRESENCE IN OTHER REGIONS WITH RESPECT TO 1995 (a)



2 AVERAGE DISTORTION BY FIRM SIZE (b)



3 AVERAGE DISTORTION BY FIRM AGE (b)



SOURCES: INE and Banco de España.

- a Measured by the effect of time dummies in a regression of the number of branches in other regions, controlling additionally for size, home region GDP and twodigit firm sector. A coefficient of -1 (+1) in a given year indicates that, on average, Spanish firms operated in one less (more) region with respect to 1995. The broken lines give the confidence intervals of the estimate.
- b Marginal productivity of capital by firm size (age) relative to an American firm of the same size (age). Marginal productivity is calculated using the *Hsieh and Klenow* model. In this respect, it is implicitly assumed that in an economy without distortions, the marginal cost is the same for all firms in the same (four-digit) sector. Since all firms maximise profits by making their marginal revenue equal to marginal cost, in a frictionless economy all firms should have the same marginal revenue in equilibrium. Thus the difference between a firm's marginal revenue and the average marginal revenue of the sector is interpreted as a distortion faced by the firm in its operations which prevents it from achieving its optimum scale. More specifically, the marginal revenue of each sector in the United States is taken as reference, since this economy is assumed to have fewer distortions.

subsequent capacity to grow. In this respect, it appears that firms have progressively reduced their presence in regions other than that of the parent, despite the fact that for many firms, especially in the services sector, direct investment is the sole means of harnessing economies of scale (see panel 1 of Chart 4.6). To correct these distortions, it is vital to implement the Market Unity Guarantee Law, in particular the legislation on the so-called “sectoral committees”, whose aim is to reduce and homogenise the regulations applicable to the different areas.

...and to reduce distortions in the prices of productive factors that prevent the appropriate growth of the most productive firms

Finally, economic regulations may favour certain firms which, irrespective of their productivity, may obtain operating cost advantages that enable them to gain a greater market share. Generally, small and young firms face greater distortions than large corporations, which hampers their growth until they reach an optimum size (see panel 2 of Chart 4.6). This, in turn, may give rise to an inappropriate allocation of resources, owing to excess investment by the least productive firms and a reduction in aggregate production.

The specific nature of these distortions is very varied. For instance, in the labour market area, firm-level collective bargaining agreements, substantial changes to

working conditions or opt-outs are usually used almost exclusively by firms of a certain size and age, which leads young and small firms to have lower adjustment flexibility. Further, the legislation on public procurement contracts requires accreditation by the firm of a degree of solvency that is usually related to its level of business or its net worth, and to the works it has performed in recent years; accordingly, newly created firms have greater difficulties in bidding successfully, irrespective of their productivity. Likewise, there are distortions in other areas, such as the financial area or those relating to energy costs.¹⁶ In this respect, it must be ensured that the objectives pursued by these types of regulations, which introduce a degree of business discrimination, are compatible with competition between established companies and newly created firms, and that they do not pose added difficulties to business growth potential.

Spain has a high loan recovery rate, even though the intensity and efficiency of business insolvency proceedings are insufficient

Finally, business restructuring processes are a significant factor in the allocation of productive resources. In this connection, one variable that is given priority attention is the proportion of debt recovered by creditors, either through the winding-up of the firm or through its restructuring. According to *Doing Business*, this recovery rate in Spain is 71.2%, which ranks our country in a relatively favourable position (25th) and very close to that of France and Italy, although on average 18 months are needed to complete this operation.

The Spanish system's relatively high rate of recovery is due to the fact that many bank loans are secured, and the guarantee is enforced when the loan is unpaid, whereas the use of insolvency proceedings for companies that need their debt to be restructured is much lower.¹⁷ This characteristic, as discussed in the previous section, affects – more than the rate of destruction – the collateral requirements made by financial institutions and, in short, the type of investment projects that receive most financing (see Box 4.3). Accordingly, it is necessary to continue assessing to what extent the changes made to insolvency regulations increase the use and efficiency of liquidation mechanisms.

4.3 PROFESSIONAL SKILLS, ACCESS TO INNOVATION AND PRODUCTIVITY

An improvement in workers' cognitive skills and the use of best business practices would increase business productivity...

Section 3 highlighted the importance of the low level of productivity in explaining business dynamics in Spain. In this respect, the professional skills of employees and employers and investment in innovation is key to explaining productivity differences at the firm level.¹⁸ Various indicators show that the Spanish population has lower professional skills than those of our peer countries. These indicators are usually constructed on the basis of the population's level of educational attainment drawing on various sources (official education system, and vocational, occupational and other unofficial training courses) and the attendant years and type of professional experience. Also informative are the results of standardised exams for the entire working age population on cognitive, numerical and reading comprehension abilities. In the case of the latter¹⁹, Spain stands out as a country

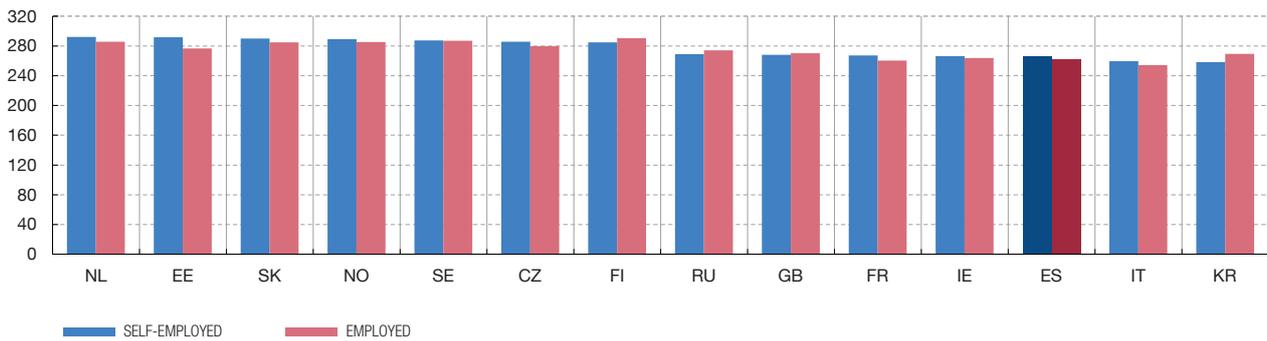
¹⁶ For example, in the financial area, different sized companies may adopt different corporate structures that affect access to financing and liability according to the share capital disbursed. Likewise in the energy area, there are permits for the sale of self-generated electricity as from a certain plant capacity and the possibility of charging for the right to interrupt supply at large corporations.

¹⁷ See M. Celentani, M. GarcíaPosada and F. Gómez (2010), *The Spanish Business Bankruptcy Puzzle and the Crisis*, FEDEA Working Paper 201011, and M. GarcíaPosada and J. S. MoraSanguinetti (2014), "Entrepreneurship and Enforcement Institutions: Disaggregated Evidence for Spain", *European Journal of Law and Economics*, vol. 40 (1), pp. 49-74.

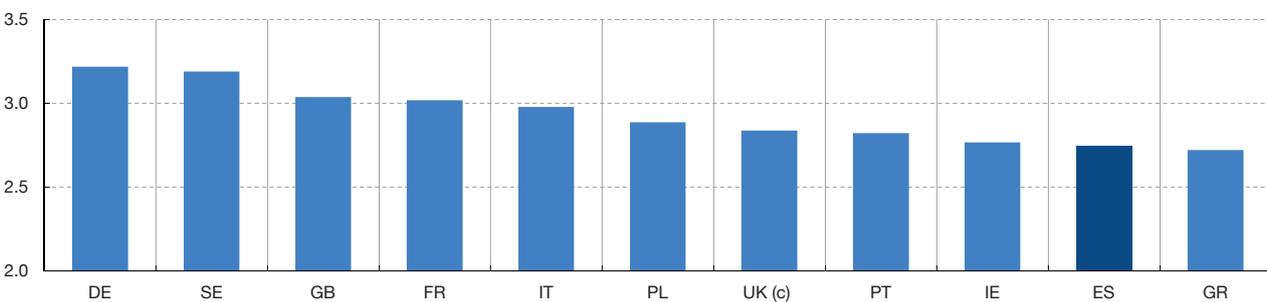
¹⁸ C. Syverson (2011), «What Determines Productivity?», *Journal of Economic Literature*, vol. 49 (2), pp. 326365, highlights three essential factors for explaining the different levels of business productivity: worker skills, business management and innovative capacity.

¹⁹ The PIAAC database offers a uniform quantification for the OECD countries of cognitive, numerical and reading comprehension skills. The survey's target population are individuals, not households, and sampling was undertaken with the help of INE.

1 WORKERS' MATHEMATICAL KNOWLEDGE SCORE, BY COUNTRY (a)



2 AVERAGE SCORE OF COMPANY MANAGERS BY COUNTRY (b)



SOURCES: OECD and Banco de España.

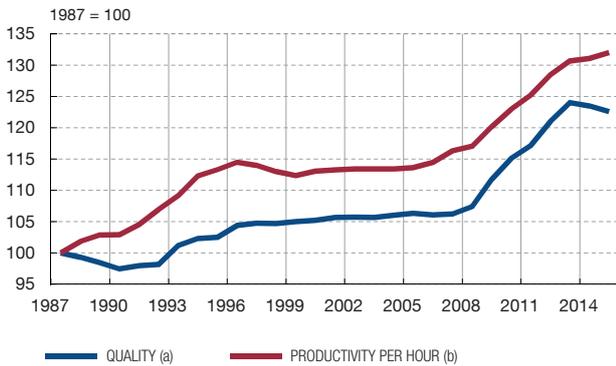
- a Result of mathematical test of the OECD's Programme for the International Assessment of Adult Competencies (PIAAC) .
- b The World Management Survey constructs an indicator from surveys of business management practices and makes a subjective assessment of the situation. Specifically, it assesses operating capacity (e.g. it analyses the introduction of modern techniques or the adoption of best practices, appraisal capacity (including most notably information processing and continuous appraisal), ability to establish targets (clear objectives and time horizons) and the ability to incentivise (how incentives have consequences). The full questionnaire can be found at <http://worldmanagementsurvey.org/wp-content/images/2010/09/Overview-of-Management-Questions-Across-Sectors.pdf>.
- c Data of Northern Ireland.

with one of the worst average scores (252), above only Italy (250), and far below the EU (271) and OECD (273) averages.

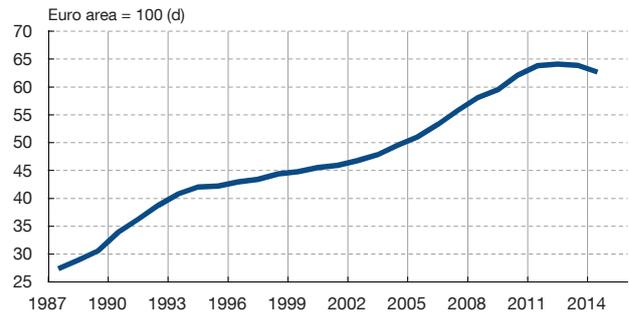
As can be seen in panel 1 of Chart 4.7, in most countries sampled the self-employed show high levels of cognitive skills, in relation to the population as a whole. In Spain, however, this group brings up the rear in terms of average cognitive skills relative to the other OECD countries, standing above only Italy and Korea.

To manage a firm, not only cognitive skills but also interactive, strategic, operational and control skills are needed. The indicators available on business management, which are positively correlated with measures of business productivity, profitability and survival, place Spain in a position below Germany, the United Kingdom, France and Italy (see panel 2 of Chart 4.7). Among the different facets measured by the foregoing indicators, Spain is in a more unfavourable position regarding the policy of business incentives, including those relating to the identification of goals, appraisal and remuneration following their attainment. These results may be due to lower skills on the part of the managerial classes or to a lower degree of professionalisation of business management, in relation to the reference countries, especially in small and medium-sized enterprises, and/or to an institutional framework that constrains organisational capacity and efficient management of firms' productive resources to a greater extent than in other countries.

1 HUMAN CAPITAL QUALITY AND LABOUR PRODUCTIVITY INDICES



2 COMPARISON OF TECHNOLOGICAL CAPITAL STOCK/GDP RATIO OF THE SPANISH ECONOMY WITH THAT OF EURO AREA (c)



SOURCES: European Commission and Banco de España.

- a See P. Cuadrado, A. Lacuesta and S. Puente (2008). The quality index approximates the productivity differences between workers with different observable characteristics (education, age, etc.).
- b Productivity is calculated as the ratio between value added and employment. Until 1994 employment is expressed in terms of full-time equivalent employees and thereafter in terms of hours worked.
- c Stock of technological capital calculated by the perpetual inventory method from the cumulative R&D expenditure expressed in current currency terms.
- d The euro area aggregate relates to the 18 euro area countries in 2014. It therefore includes Spain, although Slovenia only since 1990, and Cyprus, Malta, Slovakia, Estonia and Latvia since 1995.



...whereby it is necessary to continue increasing human capital,...

The indices of quality of the labour factor, which show changes in the composition of employment in terms of level of educational attainment and working experience, reveal that since the late 1980s Spain has witnessed a considerable increase in the quality of its labour force thanks mainly to the replacement of workers reaching retirement age with a low level of educational attainment by younger, better trained generations (see Chart 4.8). There is a certain cyclical pattern to this improvement, which is more pronounced at times of larger job destruction, owing to such destruction being concentrated in temporary workers with lower levels of educational attainment and working experience. Conversely, during upturns, a large number of unemployed re-join the workforce. Given that, on average, the latter workers have lower productivity levels, partly owing to the loss of professional skills incurred during long periods of unemployment, their positive contribution in terms of the formation of the generational change in the workforce is lower, meaning that the aggregate index of quality of the labour factor grows to a lesser extent.

Thus, to bring about a speedier improvement in the population's cognitive and business skills, it would not suffice to act only on the educational system; it is also necessary to increase unemployed workers' cognitive skills, to implement an effective continuous training system and to reduce the costs of professional business-support services. In this respect, it would be desirable in terms of business development to bring about a situation in which managers of the most productive new businesses may benefit from the knowledge imparted by business management professionals. As indicated in Chapter 1 of this Report, competition in the broad area of professional services is low in comparison with the OECD reference countries, which might be an indicator of difficulties of access by small firms to strategic consultancy services.

...to promote investment in technological capital...

The crisis has delayed the slow ongoing convergence of the Spanish economy's stock of technological capital/GDP ratio relative to the euro area, which in 2014 was still 37%

below the euro area average (see Chart 4.8). Throughout this chapter various factors, such as financing or insufficient managerial and employee skills, have been suggested as relevant factors for explaining this worse performance. However, there are many other reasons relating to the very structure of Spain's public-private innovation system that should be reviewed in order to promote this type of investment (see the European Commission's 2014 assessment report of the innovation system).

...and to harness synergies encompassing business management, availability of financing and employment stability of workers

It should be borne in mind that the generation and dissemination of innovation require a setting where the synergies between the main factors of production – namely physical and human capital, and business management capacity – are boosted.²⁰ As the results offered in Table 4.3 suggest, access to financing and workers' employment stability are associated with higher growth in productivity and unemployment. In this respect, positive effects of the existence of firm-level collective bargaining agreements have also been observed, insofar as they facilitate business management flexibility.²¹

Consequently, in order to promote business innovation, increase productivity growth and strengthen the Spanish economy's productive structure, it is necessary to continue undertaking a series of complementary measures on several fronts. These include most notably, in view of the priority nature of the need to improve them, the regulation of competition in the market for goods and services, the availability and efficiency of business financing, and more extensive business flexibility that is compatible with an increase in workers' employment stability.

5 Conclusions

Business dynamics in Spain share some common features with our peer countries, although they also show some particularities...

The evidence available shows that both business start-up-ups and failures in Spain appear to come about in a similar fashion to that observed in other countries, once the effects of the business cycle are taken into account. However, the worsening outlook for business profitability and the tightening of financing conditions further to the crisis are expected to have led, in recent years, to a situation in which the creation of new firms has held at relatively low levels.

The characteristics of newly created Spanish firms are, in some respects, different from those of other countries, especially regarding size, initial level of productivity and survival rate, which appear to be lower than those of our peers. Nonetheless, in recent years the productivity of newly created firms relative to established companies has improved. It is further observed that productivity gains are a significant determinant of business growth, while greater size, in itself, need not result in improved productivity.

The foregoing features give rise to a distribution of firms in Spain that is relatively skewed towards smaller-sized companies and to a negative productivity differential relative to European competitors with similar characteristics. This differential is across the board in terms of company size, although it is greater for smaller firms, in which segment newly created companies are concentrated.

20 L. Garicano and P. Heaton (2010), "Information Technology, Organization, and Productivity in the Public Sector: Evidence from Police Departments", *Journal of Labor Economics*, University of Chicago Press, vol. 28(1), pp. 167-201.

21 In this respect see L. Hospido and E. MorenoGalbis (2015), *The Spanish Productivity Puzzle: in the Great Recession*, Working Paper 1501, Banco de España; C. Guillamón, E. MoralBenito and S. Puente (2016), *High growth in employment and productivity: Dynamic interactions, and the role of financial constraints*, Working Paper, Banco de España, forthcoming, and A. Cabrales, J. J. Dolado and R. Mora (2013), "Dualidad laboral y déficit de formación ocupacional: evidencia sobre España con datos de PIAAC", en *PIAAC*, volumen 2: Análisis secundario, Ministerio de Educación, Cultura y Deporte.

...that highlight the need to alleviate frictions and inefficiencies in various areas and to foment real improvements in average business productivity levels

The limited correlation between productivity and business growth in Spain may be caused by various different factors (economic, financial, institutional, regulatory, etc.). In any event, the various simulations and empirical analyses presented in this chapter show that a potential future elimination of the barriers restricting the efficient allocation of resources is not sufficient to ensure sustained increases in growth capacity. The latter will further require real business productivity boosts through improvements in the quality of production factors (workers' human capital, business management and technological capital).

This box illustrates the channels through which business demography affects the dynamics of the main macroeconomic variables. To this end, various simulation exercises are performed using a general equilibrium model in which agents optimally decide to create a business, increase or decrease its size or liquidate its assets and discontinue production. In particular, in this model both starting a business and adjusting the scale of production are decisions taken by the entrepreneur requiring the outlay of a certain amount of non-recoverable funds. These entry and adjustment costs mean that new businesses start operations with below-average size and productivity, and only with time do they decide to increase both of these factors. The model intends, in turn, to realistically quantify the aggregate impact of changes in economic policy parameters that affect business decisions, as it is calibrated to reproduce both the aggregate ratios of the Spanish economy and the most relevant stylised facts of its business demography.

First, from a cyclical perspective, an economy's response to different shocks is largely determined by business dynamics. These, in turn, depend on multiple factors, such as business start-up and growth costs, the frictions that affect the liquidation of assets, and the costs (fixed and variable) necessary to maintain different scales of production and levels of technology. To demonstrate their importance, the accompanying chart shows the impact of the most commonly analysed factor in the literature, namely business start-up costs. Specifically, it is shown that the lower the costs of starting a business, the greater the economy's response to a temporary increase in the level of technology. In this case (the blue line in the chart), technological improvements make a larger number of business opportunities profitable and, as a result, more businesses are created. In turn, this increases the level of competition in the market, reduces business profits and enables greater increases in output.

Chart 1
TEMPORARY INCREASE IN PRODUCTIVITY IN ECONOMIES WITH DIFFERENT BUSINESS START-UP COSTS (a)

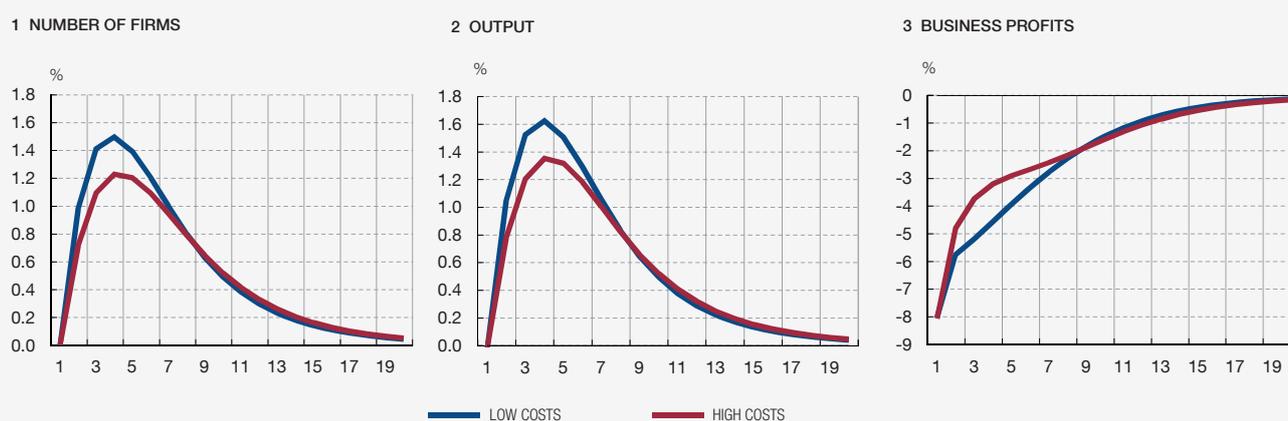


Table 1
IMPACT OF CHANGES IN ECONOMIC POLICY PARAMETERS (b)

	↓ 6% Entry costs	↓ 27% Cost of business size adjustment	↑ 0.3% Level of technology in small business
GDP	1.00	1.00	1.00
Number of firms	1.29	0.35	0.53
Small	1.43	0.08	0.53
Large	0.11	2.71	0.51
TFP	-0.12	0.31	0.23
Small	0.01	-0.09	0.29
Large	0.01	0.60	0.00

SOURCE: Banco de España.

- a Responses of the model to a temporary increase in productivity with two different calibrations for business start-up costs. In the "low costs" scenario shown by the blue lines, business start-up costs are 50% lower than in the "high costs" scenario, which is shown by the red lines.
- b Long-term changes or stationary state of the model in response to a permanent increase in the parameters listed in each column that is of a sufficient magnitude (also shown) to increase GDP by 1%. Thus, the first column shows the long-term effect of reducing business start-up costs by 6%; the second column shows the long-term effect of decreasing adjustment costs by 27%; and the third column shows the long-term effect of increasing the productivity of small business by 0.3%.

Second, the accompanying table shows the reaction of the main macroeconomic variables over the long term to changes in both entry and adjustment costs. The accompanying table compares the effect of changes to both parameters with the impact of technological improvements in small businesses. To provide for a comparison of the three scenarios, the exercises are calibrated so that the impact on GDP should be of the same magnitude (an increase of 1%). Thus, in the case of a reduction in entry costs (see the first column of the table), the fact that less investment is required to commence business operations increases the range of potentially profitable business opportunities, many of which ultimately result in new businesses being created in a shorter period of time. In turn, the larger number of businesses leads to an increase in employment and output, which enables workers to negotiate higher wages. The increase in disposable income enables agents to set aside more resources for consumption and investment and, therefore, to enjoy a higher level of well-being. However, it should be borne in mind that these aggregate effects are usually accompanied by relevant composition effects. More specifically, given that new businesses are mainly small, the increase in the number of businesses is concentrated in this group, which leads to a reduction in average productivity in the economy.¹

A reduction in costs related to an increase in the scale of production (see the second column of the table) also leads to an increase in GDP over the long term. It is worth noting that achieving an increase in GDP of 1% would require a much larger reduction in adjustment costs (-27%) than in entry costs (-6%). Further, and unlike with the entry costs, when the reduction in costs is centred

on those costs related to increasing the scale of production, the GDP increase is accompanied by a direct increase in aggregate productivity. Specifically, lower adjustment costs enable the growth of those small businesses pursuing projects with greater expected productivity, as it is now beneficial for them to invest in increasing their size and overall level of technology. In this way, the number of large businesses increases, as does their average productivity. The opposite occurs among small businesses, since their composition in terms of productivity is impaired. In turn, the higher probability of increasing in size boosts the expected profitability of setting up a new business, leading to an improvement in the flow of new businesses, although not as much as in the first scenario. Ultimately, it generates an increase in output, employment and consumption, which translates into substantial improvements in well-being over the long term.

Finally, these effects can be compared with those that would result from an increase in the average productivity of small businesses (see the final column of the table). As a result of this change, some small businesses will decide to invest and increase their size. Likewise, technological improvements boost business prospects for new entrants, leading to an increase in the number of businesses in the economy. In sum, these channels mean that a small increase of 0.3% in the TFP of small businesses (and 0.2% in the aggregate) generates a multiplier effect that leads to a 1% increase in GDP. In relative terms, even though it is difficult to compare the scales of the different economic policy tools, especially in terms of costs that do not have a real, quantifiable counterpart, this last measure seems to be particularly effective. Among the other measures considered, reducing entry costs gives rise to more appreciable effects on GDP and the level of competition, while reducing adjustment costs also leads to increased productivity.

¹ The model is not designed in such a way that, given an increase in competition, the incentives increase for other businesses to differentiate themselves and thus invest in technology.

In general, SMEs have greater difficulty accessing funding than larger companies, given the lower quality and quantity of the information available on their financial position (“information asymmetries”). These difficulties are even more severe for newly created businesses, since they have no credit history, and for those pursuing their activity in innovative fields with a more uncertain future. Moreover, as the recent economic and financial crisis has highlighted, these frictions are heightened during periods of uncertainty, when the assessment of risk profiles is more complicated.

In order to lessen the impact of these market failures, various schemes have been developed to provide public support for the funding of SMEs. As seen in Chart 1, there are various financial institutions in Spain, mostly public in nature, that support the financing of SMEs, whether through loans, capital contributions or guarantees.

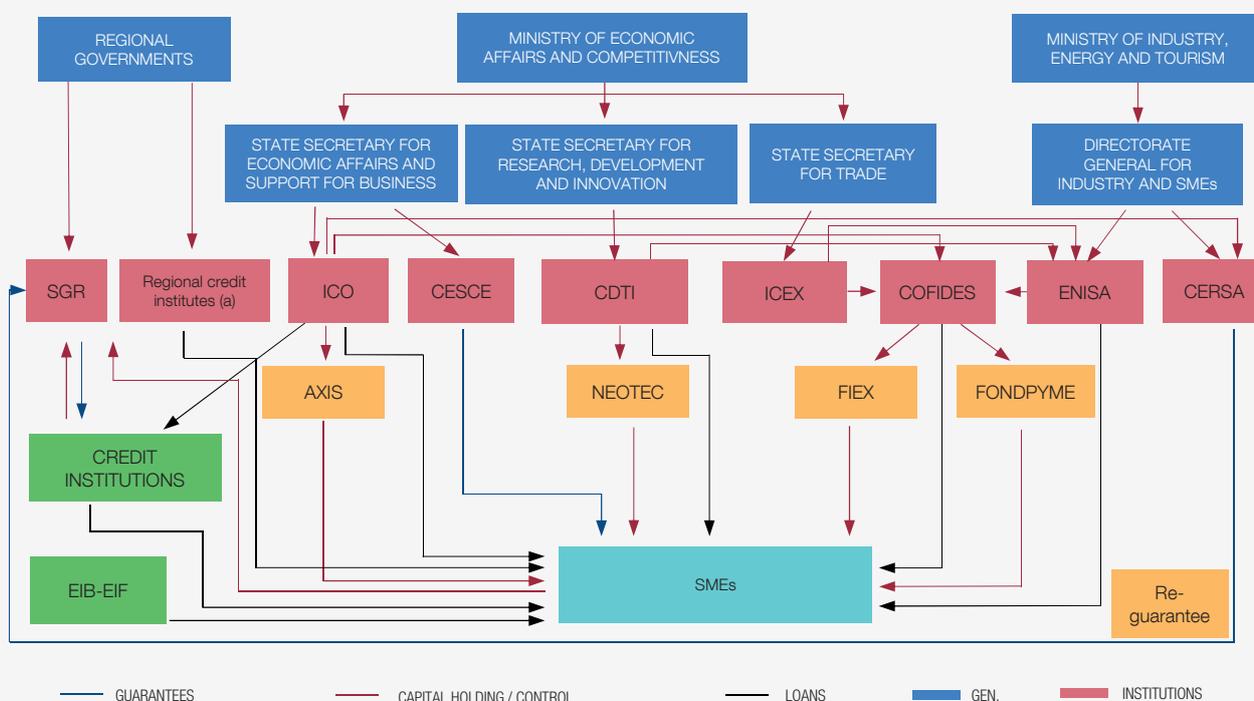
In quantitative terms, the main support for SMEs is provided by the Official Credit Institute (ICO), which has financing programmes such as its so-called “líneas de mediación” (credit intermediation facilities), which are loans that are studied and granted by credit

institutions, the role of the ICO being to provide liquidity.¹ As seen in Table 1, during the last crisis these ICO facilities provided significant support for the financing of SMEs, although in 2015 the amount of new transactions fell considerably (to €9.7 billion), against a background of improvement in the financing conditions of credit institutions, following the launch of the Eurosystem’s targeted longer-term refinancing operations. In addition, the ICO also offers financial support through the purchasing of shares and equity loans by its venture capital funds, although in much smaller amounts than under the aforementioned facilities. Various regions (such as Catalonia, Valencia, Murcia and the Basque Country) have public, financial or business institutions with objects and activities similar to those of the ICO, but the amounts of financing granted are more modest.

The Centre for Industrial Technological Development (CDTI) is a public enterprise, whose main activity consists in evaluating and

¹ The insolvency risk of the operation is assumed by the private credit institution. Exceptionally, in 2010 and 2011 the ICO granted direct financing to SMEs and self-employed persons through the so-called ICO-Direct Programme, in this case assuming the whole of the credit risk.

Chart 1
FINANCIAL SUPPORT SCHEMES FOR FIRMS IN SPAIN



SOURCE: Banco de España.

NOTE: The arrows denote the direction of financing, whether in the form of a loan, an acquisition of shares or a guarantee.

a Various regions have credit institutes to finance firms preferably located in their region [Institut Català de Finances (ICF), Institut Valencià de Finances (IVF), and Instituto de Crédito y Finanzas de la Región de Murcia (ICREF)].

financing research projects, usually of SMEs, with a high technological content. The financial instruments normally used are loans,² although it also provides capital to firms through various venture capital funds. As seen in Table 1, the CDTI agreed a total of €1 billion of direct new financing in 2015.

Compañía Española de Financiación del Desarrollo (COFIDES) and Empresa Nacional de Innovación, SA (ENISA), are two commercial companies, majority owned by the Spanish State (the former reporting to the Ministry of Economic Affairs and Competitiveness

and the latter to the Ministry of Industry, Energy and Tourism), whose objects are medium and long-term financing. In the case of COFIDES, the financing is targeted at investment projects executed abroad by Spanish firms (preferably through venture capital), while in that of ENISA, the financing is for projects of SMEs in which innovation is a strategic factor, and is mostly in the form of equity loans. The overall amount of financing provided through their various instruments is very moderate.

Mutual guarantee schemes (MGSs), which are financial institutions with mixed capital (provided by regional governments, credit

2 Through so-called "research and development projects".

Table 1
PROGRAMMES OF FINANCIAL SUPPORT FOR SMES. NEW TRANSACTIONS

	2012		2013		2014		2015	
	Amount (€m)	No. of transactions	Amount (€m)	No. of transactions	Amount (€m)	No. of transactions	Amount (€m)	No. of transactions
Loans and shares								
ICO	11,555.1	162,090	13,940.8	190,175	21,485.3	298,814	9,876.5	166,010
Loan	11,510.9	162,075	13,884.3	190,168	21,468.9	298,799	9,671.0	165,998
Venture capital	44.2	15	56.5	7	16.4	15	205.5	12
CDTI	1,082.1	689	837.1	1,303	858.1	1,400	1,020.5	1,402
Loan	1,077.0	687	833.2	1,299	843.0	1,391	1,020.5	1,402
Venture capital	5.1	2	3.9	4	15.1	9	n. d.	n. d.
COFIDES	227.4	44	221.6	57	244.9	56	n. d.	n. d.
Loan	31.0	27	36.6	31	29.1	27	n. d.	n. d.
Venture capital	196.4	17	185.0	26	215.8	29	n. d.	n. d.
ENISA	100.5	643	84.1	638	66.2	558	90.5	704
Loan	98.4	637	83.3	636	65.9	556	90.3	700
Venture capital	2.2	6	0.8	2	0.3	2	0.2	4
Guarantees and insurance								
SGR (a)	753.4	7,726	664.6	7,382	739.6	8,770	819.7	9,752
CERSA (b)	298.7	n. a.	322.4	n. a.	353.5	n. a.	n. a.	n. a.
CESCE (c)	164.9	n. a.	169.2	n. a.	151.3	n. a.	n. a.	n. a.
TOTAL	14,182.2		16,239.8		23,898.9			
	Amount (€m)	No. firms / No. issues	Amount (€m)	No. firms / No. issues	Amount (€m)	No. firms / No. issues	Amount (€m)	No. firms / No. issues
Alternative markets								
Placements	42.9		97.8		698.4		569.0	
MAB	42.9	13	47.8	15	129.0	17	78.5	11
MARF	–	–	50.0	1	569.4	12	490.5	10
Crowdfunding platforms							0.5	2

SOURCES: ICO, CDTI, COFIDES, CESCE, ENISA, CERSA, BME and Banco de España.

NOTE: "n. a." means data not available.

- a Bank guarantees for "loans and other deferred payments".
b Amount reguaranteed.
c Credit risk insurance policies.

institutions and SMEs themselves), grant guarantees that cover, at least partially, the risks implicit in lending transactions.³ They have a marked regional and sectoral scope, and their activity is usually linked to a region. In 2015, they granted guarantees totalling €820 million, a larger amount than in 2014 (€740 million). A significant part of the risk assumed by MGSs is usually transferred to Compañía Española de Reafianzamiento, SA (CERSA).

In insurance, Compañía Española de Seguros de Crédito a la Exportación (CESCE) also plays a role. The majority of the capital of this company is publicly owned and the main Spanish credit institutions and insurance companies also have holdings in it. Traditionally, its main activity as an insurance company has included managing export credit risk on behalf of the State. The volume of export credit insurance policies (premiums) has fluctuated between €150 million and €170 million in recent years.

In the European sphere, in January 2015, the European Investment Bank (EIB) and the European Investment Fund (EIF) launched a lending facility specifically aimed at SMEs and the self-employed for investment projects in Spain ("Iniciativa pyme-garantía FEI"), in which they assume 50% of the borrower's credit risk (the rest being retained by the credit institution lender). The public contribution budgeted for this initiative was €800 million.

Finally, there are also mechanisms of public support for investment in newly created firms or those listed on an alternative market (such as the alternative stock market (MAB) or the alternative

fixed-income market (MARF)) or, more recently, crowdfunding platforms,⁴ through personal income tax incentives and other measures.⁵ As seen in the lower part of Table 1, the financing obtained by firms through these channels has to date been limited (less than €600 million in 2015).

In short, there is a wide variety of – mainly public – institutions in Spain, offering support mechanisms for the financing of SMEs. Against a background of the need for fiscal consolidation, the amount of funds allocated to these programmes is necessarily limited. In this respect, it is especially relevant to carry out cost-benefit analyses and to use the results obtained to optimise the use of the various instruments available, limiting their application to situations in which appreciable failures in the operation of the financial market do indeed occur. Also, a simplification of the current framework, characterised, as seen above, by a large number of institutions with similar objects, may be appropriate.

³ From an operational standpoint, guarantees may be provided for different purposes. Thus, a guarantee may be provided for a bank loan or credit, but also to secure payment for domestic or foreign sales. A traditional operation consists in offering a guarantee to financial institutions which grant advances on the collection of export invoices.

⁴ Crowdfunding platforms were regulated in April 2015. They are a mechanism for channelling savings directly to productive investment, supplementing stock markets and banking systems. In particular, in October 2015, the CNMV (National Securities Market Commission) authorised the first (and so far only) equity crowdfunding, which is called *Bolsa Social*.

⁵ In the fiscal sphere, some regional governments and the State have introduced various incentives for the purchase of shares in newly created firms or in firms listed on alternative equity markets, provided that certain requirements are met regarding retention of the investment and the size of the firm. In the commercial sphere, in order to boost the MARF, regulatory changes have been made that affect both issuers of and investors in fixed-income securities. For the former, the limit on bond leveraging for public limited companies has been eliminated and, for investors, the regulations on private insurance and pension funds have been modified so that the acquisition of securities listed on this type of fixed-income market is apt for the coverage of technical provisions in the case of insurance.

Insolvency proceedings, when well designed, can be an efficient mechanism for restructuring the debts of firms in financial difficulty. However, the insolvency system in Spain has traditionally been characterised by long and costly procedures,¹ which result in the winding up of the firm in around 95% of cases.² These weaknesses were highlighted by the sharp increase in insolvency proceedings during the crisis, which led to congestion in the mercantile courts.

In order to resolve these and other problems, the Insolvency Law was reformed on numerous occasions between 2009 and 2015.³ As regards the insolvency of non-financial firms, among other changes, the scope of application of the faster and cheaper “shortened insolvency proceedings” has been extended, “early agreement proposals” have been promoted, the role of insolvency trustees has been reformed, refinancing agreements have been promoted as an alternative to insolvency proceedings, the legal regime for reorganisation agreements has been improved and the sale of the firm as a going concern has been facilitated. In relation to individuals (consumers and self-employed persons), the “out-of-court payment agreement”, a pre-insolvency mediation procedure, has been introduced, and a second chance mechanism has been created through which debtors may be discharged, under certain circumstances, from part of their outstanding debts.

This box presents an initial assessment of the effects of the four reforms to the legal framework for the insolvency of non-financial firms.⁴ The reforms that affect the bankruptcy of individuals are not assessed as the information needed to do this is not available. The analysis presented below is based on insolvency data from the Mercantile Registers that is received by the Banco de España’s Central Balance Sheet Data Office, and information on the balance sheets of insolvent firms obtained from the same source. The methodology used is the estimation of duration models and linear probability models,⁵ using daily information on dates of approval of reorganisation agreements, commencement of liquidation and termination of insolvency proceedings to estimate the impact of the reforms over short time frames (three months) before and after the entry into force of the reforms. At the same time, in order to taken into account the effect of other factors on the probability of approval of a reorganisation agreement and the duration of insolvency proceedings, a number of characteristics of insolvent firms are included (size, age, profitability, indebtedness, sector, etc.), as well as some for the province in which their registered office is situated (unemployment rate and insolvency rate).

The results, summarised in Table 1, show that some of the reforms analysed may have had a notable impact on the probability of reaching a reorganisation agreement and on the duration of insolvency proceedings. In particular, the 2012 reform⁶ appears to have increased the probability of a reorganisation agreement by at least five percentage points (see column 1), a significant impact

- 1 E. Van Hemmen (2007/2014), *Estadística concursal. Anuario 2006. Colegio de Registradores de la Propiedad y Mercantiles de España*, Madrid (and subsequent editions), and Consejo General del Poder Judicial (2007-2015), *La justicia dato a dato: año 2014* (and subsequent editions).
- 2 M. Celentani, M. GarcíaPosada and F. Gómez (2010), *The Spanish Business Bankruptcy Puzzle and the Crisis*, FEDEA Working Paper 2010-11. Banco de España (2014), 2013 Annual Report.
- 3 The Insolvency Law passed in 2003 has been amended on numerous occasions as a result of the crisis. Specifically, amendments have been made by Royal Decree-Law 3/2009, Law 38/2011, Law 14/2013, Royal Decree-Law 4/2014, Royal Decree-Law 11/2014, Law 9/2015 and Law 25/2015.

- 4 See M. García Posada and R. Vegas (2016), *Las reformas de la Ley Concursal durante la Gran Recesión*, Documentos de Trabajo, Banco de España, forthcoming.
- 5 Very similar results were obtained when probit models were used to analyse robustness.
- 6 Law 38/2011 of 10 October 2011 reforming Insolvency Law 22/2003 of 9 July 2003. Most of the reforms entered into force on 1 January 2012, while those that did not entered into force on the day following publication of the Law in the Official State Gazette (BOE) on 11 October 2011.

Table 1
MARGINAL IMPACT (%) ON THE PROBABILITY OF REACHING A REORGANISATION AGREEMENT AND ON THE DURATION OF INSOLVENCY

Dependent variable	1 Prob. agreement (a)	2 Prob. agreement (a)	3 Duration (b)
2012 reform	5,109**	12,305***	
2012 reform * Tangible fixed assets		-0,216***	
March 2014 reform			-17,4**

SOURCE: Banco de España.

NOTE: *, **, *** denote a correlation coefficient significantly different from zero at the 10%, 5% and 1% significance levels, respectively.

- a Results based on a linear probability model using 678 insolvencies declared between 1 October 2011 and 1 April 2012. The estimates include, as control variables, the age of the firm and the number of employees (both in logarithms), the ROA, tangible fixed assets as a percentage of total assets, the debt ratio (relative to assets), the liquidity ratio (current liabilities to current assets), the interest coverage ratio, the unemployment rate and the insolvency rate (number of insolvencies as a percentage of the total number of firms) of the province of the firm’s registered office, 17 sectoral dummy variables and 17 provincial dummy variables.
- b Results based on a log-logistic duration model estimated by maximum likelihood using 519 insolvencies declared between 8 December 2013 and 8 June 2014. The estimates include the control variables mentioned in note a) and a dummy variable for “express insolvencies” (insolvency proceedings that are dismissed as the assets are not sufficient to cover the costs of the process).

considering that only 9% of the firms in the sample obtained reorganisation agreements.⁷ This suggests that, thanks to the reform, a larger proportion of firms benefited from a restructuring of their debt, without being wound up and having their assets sold off, which may in many cases be a sub-optimal option. Moreover, this impact on the probability of a reorganisation agreement appears to have been greater for firms with a lower liquidation value (approximated by the proportion of their total assets that are tangible fixed assets; see column 2), which suggests an increase in ex-post efficiency; i.e. in the probability of restructuring firms whose value as a going concern is greater than their liquidation value and of liquidating those for which the opposite is the case.

These effects may be a result of the changes to the appointment and composition of insolvency trustees effected by the 2012 reform. Previously, the general rule was that there were three trustees (a lawyer; an auditor, economist or commercial graduate, and an unsecured creditor), all of whom were appointed by the judge hearing the insolvency proceedings. Following the reform, there is generally only one single trustee (except in very complex insolvencies, when a large unsecured creditor is appointed as a second trustee). This may have reduced problems of coordination (e.g. conflicts between trustees) and has probably involved cost savings, factors that would be conducive to the reaching of a reorganisation agreement. In addition, the reform sought to increase the

professionalism of insolvency trustees, which may have increased the capacity to distinguish between viable and non-viable firms. Thus, the requirements to become a trustee, relating to experience and specific training, were tightened and legal persons that have at least one practising lawyer and one auditor, economist or commercial graduate on their staff (e.g. consultancies) can be appointed as insolvency trustees.

The results obtained also indicate that the March 2014 reform has substantially reduced the duration of insolvency proceedings.⁸ Specifically, their average duration was reduced by at least 17% (see column 3). This may be due to the fact that the reform improved certain aspects of the legal framework for refinancing agreements (the so-called "*preconcurso de acreedores*"). Although the number of firms that reach refinancing agreements with their creditors is very small (between 100 and 200 per annum), they are much larger than the majority of those entering insolvency proceedings; for example, in 2013, the average assets of those that obtained a refinancing agreement were €117 million, while the average assets of firms subject to insolvency proceedings were €6 million.⁹ This suggests that, by increasing refinancing agreements as an alternative to insolvency, the March 2014 reform may have freed up mercantile court resources, reducing their congestion and, therefore, the duration of insolvency proceedings.

7 This percentage is in line with the literature. For example, E. Van Hemmen (2014), "La sociología de la liquidación concursal en la realidad española", in *La liquidación de la masa activa*, edited by Á. J. Rojo FernándezRío, J. Quijano González and A. B. Campuzano, Aranzadi-Thomson Reuters, finds that 5-10% of the firms in the sample reached a reorganisation agreement during the period 2006-2012.

8 Royal Decree-Law (RDL) 4/2014 of 7 March 2014 adopting urgent measures on corporate debt refinancing and restructuring, which entered into force on 8 March 2014.

9 E. Van Hemmen (2014), "La sociología de la liquidación concursal en la realidad Española", in *La liquidación de la masa activa*, edited by Á. J. Rojo FernándezRío, J. Quijano González and A. B. Campuzano, Aranzadi-Thomson Reuters.

