2018
August

# News release: Profitability, Equity Capitalization and Net Worth at Risk (2015 data Update)

**FSA (Financial Statement Analysis) WG**

European Committee of Central Balance Sheet Data Offices (ECCBSO)

FSA Working Group
eccbso
European Committee of Central Balance Sheet Data Offices

**News release:**

## Profitability, Equity Capitalization and Net Worth at Risk (Updated with 2015 data)

Financial Statement Analysis Working Group (WG FSA) conducted a study in 2013 to analyze profitability and equity capitalization in six European countries for manufacturing, construction and trade sector focusing on the economic crisis in the years 2008-2009 and one year later. The group introduced the concept of "Net Worth at Risk" (NWaR) as a kind of stress test to evaluate if companies in sector, size and country classification are enough capitalize to afford a period of crisis with possibility of having heavy losses. NWaR is the share of cumulative losses (as a percentage of total assets) that companies may have to face with a certain level of confidence calculated over a given period. Two NWaR approaches are used: conditional and unconditional NWaR at three-confidence level: 95%, 90% and 80%. The first two represent rather worst-case scenarios and the last displays a rather moderate loss scenario.

This note is the extension of the former study within the time span from 1987 to 2015 with Spain, Italian and Turkish data. Likewise, the former one, this study aims to create a tool for the stress test to evaluate the financial performance of the companies in terms of profitability and equity capitalization.

## COUNTRY EXPERIENCES BETWEEN THE YEARS 1987-2015[1]

Before 2008, the conditional NWaR belonged to the years 1992/1993 in Spain and Italy. NWaR values showed that these countries had stronger deterioration in losses because of high inflation and interest rates in these years. In Turkey, the conditional NWaR has experienced in the years of financial crisis of 1994 and 2001. Following lower profitability figures before 2008, manufacturing generally has the highest conditional NWAR for all levels of confidence and independently of size. This could be explained by a higher performance of costs in times of crisis due to the rigidity of labor costs and the capital intensity in this sector. It is also noticeable that the last crisis did not generally match the high level of losses recorded in earlier 1990s or 2000s.

From 2008 to 2015, NWAR results have been more severe between the years 2010-2012 due to the subsequent European Crisis after the Great Financial Crisis of 2008. These are also the years of the credit enlarging, the figures show us the dispersion between the profitability of the lower and

[1] Please note that in this study, there are data for previous years but the table is restricted to the last 8 years

upper quartile has increased for micro, small and medium companies in these years. This implies that the companies particularly in the lower percentile should have a greater equity cushion to handle a possible recession.

In Spain, unconditional net worth at risk, the mean of the years 2007/2008 to 2014/2015, is lower than the conditional NWaR (represented by the bold numbers in the tables-the highest minimum losses after 2008) for all size classes of three sectors. In addition, the results are lower than the actual losses in 2008 for manufacturing sector. The differentiation of the conditional and unconditional NWaR is important to assess the impact of recessions on the income distribution. For the micro and small companies, these differences are still very close. Therefore, it can be inferred that manufacturing companies have recovered better after the crisis as size increases.

**Table 1-Spain**
**Unconditional Net Worth at Risk and Cumulative two year losses at 10th percentile**

**Manufacturing, Trade and Construction Companies**
**( NACE Rev.2 C,G,F sectors)**

| | 07/08 | 08/09 | 09/10 | 10/11 | 11/12 | 12/13 | 13/14 | 14/15 | Unconditional |
|---|---|---|---|---|---|---|---|---|---|
| C-micro | -26.9 | -39.7 | -43.3 | -43.0 | **-45.7** | -43.2 | -33.7 | -25.6 | -37.6 |
| G-micro | -34.7 | -43.7 | -44.1 | -45.4 | -50.2 | **-51.1** | -47.3 | -39.6 | -44.5 |
| F-micro | -33.6 | -42.7 | -45.2 | -46.8 | **-48.4** | -42.9 | -34.2 | -26.5 | -40.0 |
| C-small | -2.7 | -7.2 | -7.1 | **-8.2** | -7.0 | -6.3 | -3.9 | -0.8 | -5.4 |
| G-small | -1.1 | -4.6 | -5.0 | -5.5 | **-6.9** | -5.6 | -3.4 | -0.8 | -4.1 |
| F-small | -0.7 | -3.3 | -6.5 | -11.9 | **-12.2** | -9.5 | -7.5 | -2.7 | -6.8 |
| C-medium | -5.5 | -11.7 | **-12.0** | -8.9 | -9.2 | -8.2 | -5.5 | -2.7 | -7.9 |
| G-medium | -1.9 | -6.2 | -5.5 | -5.5 | **-7.4** | -5.5 | -3.6 | -1.6 | -4.7 |
| F-medium | 0.0 | -3.2 | -10.8 | -12.4 | **-19.9** | -18.6 | -12.4 | -5.9 | -10.4 |
| C-large | -8.6 | **-12.7** | -11.2 | -7.0 | -9.0 | -9.9 | -6.2 | -3.4 | -8.5 |
| G-large | -4.2 | -7.0 | -9.2 | -6.1 | **-10.6** | -7.0 | -4.6 | -3.3 | -6.5 |
| F-large | -0.2 | -6.6 | -4.3 | -10.1 | -14.3 | **-21.4** | -14.0 | -10.6 | -10.2 |

In Italy, unconditional NWaR is lower than the conditional NWaR after 2008 for all size classes of three sectors. The difference has increased as the size decreased for manufacturing companies. Therefore, likewise the Spanish companies, Italian manufacturing companies have recovered better after the crisis as size level increases. For both countries, the recovery has seen after 2013 in the profitability figures.

**Table 2-Italy**
**Unconditional Net Worth at Risk and Cumulative two year losses at 10th percentile**

**Manufacturing, Trade and Construction Companies ( NACE Rev.2 C,G,F sectors)**

| | 07/08 | 08/09 | 09/10 | 10/11 | 11/12 | 12/13 | 13/14 | 14/15 | Unconditional |
|---|---|---|---|---|---|---|---|---|---|
| **C-micro** | -20.4 | -23.1 | -24.0 | -20.1 | **-21.1** | -21.1 | -19.1 | -15.2 | -20.5 |
| **G-micro** | -24.1 | -25.7 | -24.7 | -23.5 | -25.5 | **-26.6** | -24.1 | -20.3 | -24.3 |
| **F-micro** | -9.4 | -10.2 | -10.2 | -10.1 | **-11.9** | -13.2 | -13.2 | -10.9 | -11.1 |
| **C-small** | -6.3 | -8.5 | -8.3 | **-6.6** | -6.9 | -6.5 | -4.9 | -3.1 | -6.4 |
| **G-small** | -5.1 | -6.2 | -5.6 | -5.3 | **-6.6** | -6.9 | -5.4 | -2.9 | -5.5 |
| **F-small** | -2.1 | -2.5 | -2.6 | -3.0 | **-4.2** | -5.2 | -4.6 | -2.6 | -3.3 |
| **C-medium** | -6.2 | -8.0 | **-8.4** | -6.0 | -7.2 | -6.5 | -4.6 | -3.1 | -6.3 |
| **G-medium** | -4.5 | -5.6 | -4.9 | -4.9 | **-5.8** | -6.2 | -4.4 | -2.0 | -4.8 |
| **F-medium** | -1.5 | -2.2 | -2.0 | -2.8 | **-5.8** | -5.1 | -5.3 | -2.7 | -3.4 |
| **C-large** | -7.9 | **-10.5** | -10.6 | -8.4 | -9.3 | -9.2 | -8.1 | -5.1 | -8.6 |
| **G-large** | -4.6 | -5.5 | -4.3 | -3.6 | **-4.9** | -6.5 | -5.2 | -3.3 | -4.7 |
| **F-large** | 0.0 | -0.8 | -0.3 | -3.6 | -3.7 | **-5.8** | -4.6 | -0.4 | -2.4 |

In Turkey, it is noticeable that manufacturing and trade companies of same size has experienced the worst NWaR in the same years after 2008. Medium and large construction companies have lower profitability figures in the years 2014/2015 due to the some geopolitics unrest in the regions working and the exchange rate effect.

**Table 3-Turkey**
**Unconditional Net Worth at Risk and Cumulative two year losses at 10th percentile**

**Manufacturing, Trade and Construction Companies ( NACE Rev.2 C,G,F sectors)**

| | 07/08 | 08/09 | 09/10 | 10/11 | 11/12 | 12/13 | 13/14 | 14/15 | Unconditional |
|---|---|---|---|---|---|---|---|---|---|
| C-micro | -13.3 | -17.8 | -17.7 | -27.6 | **-30.0** | -24.6 | -25.1 | -27.8 | -23.0 |
| G-micro | -11.3 | -16.9 | -19.2 | -21.6 | -32.7 | **-9.8** | -13.2 | -22.3 | -18.4 |
| F-micro | -8.1 | -10.6 | -12.8 | -21.7 | **-19.9** | -14.3 | -16.9 | -14.0 | -14.8 |
| C-small | -9.9 | -14.7 | -12.1 | **-19.3** | -16.1 | -7.7 | -12.0 | -10.2 | -12.7 |
| G-small | -6.5 | -9.1 | -5.9 | -15.0 | **-15.4** | -5.3 | -7.6 | -7.8 | -9.1 |
| F-small | -3.2 | -5.0 | -4.8 | -17.9 | **-11.3** | -11.4 | -9.4 | -8.7 | -9.0 |
| C-medium | -10.5 | -14.7 | **-6.2** | -9.9 | -8.6 | -4.4 | -5.6 | -5.4 | -8.2 |
| G-medium | -9.1 | -12.9 | -4.8 | -10.2 | **-7.9** | -1.6 | -3.8 | -3.8 | -6.7 |
| F-medium | -1.5 | -7.5 | -6.2 | -11.3 | -12.3 | -6.0 | -7.1 | **-17.0** | -8.6 |
| C-large | -9.4 | **-11.2** | -4.4 | -6.8 | -5.7 | -6.0 | -6.2 | -6.9 | -7.1 |
| G-large | -3.2 | -8.7 | -4.7 | -5.3 | **-4.5** | -3.0 | -3.0 | -3.4 | -4.5 |
| F-large | -2.3 | -5.1 | -2.2 | -4.6 | -5.5 | 1.2 | -2.9 | **-5.5** | -3.4 |

Given NWaR figures, the proportion of firms having a net worth ratio below NWaR is computed. While NWaR figures give an indication of how a sector or size is susceptible to losses, these resulting ratios “Percentage of Companies with Net Worth below NWaR” can display how a sector is generally endowed with equity to cope with these loss scenarios. These ratios may be seen as an indicator of sector-size risk with regard to the function of equity to absorb losses.

In Spain, for micro and small companies, this percentage has been in a declining trend after 2008. After this year, percentage of these companies with equity over total assets ratio higher than 50% has also increased. The increase in the equity ratio can be caused either from the contraction of the total assets or an increase in equity. For the large manufacturing, trade and construction companies, 2014 and 2015 are the good years in terms of profitability and net worth. In these years, the percentage of companies with capital below NWaR is lower than the previous year for large companies. However, for the large construction companies, different from large companies in other sectors, the percentage of the companies with net worth to total assets ratio over 50% is lower. The percentage of the companies is concentrated between the ratios of 10% and 25% in this sector-size level. Therefore, the capability of large construction companies to cope with the NWaR loss scenario is worse than the other large companies in the manufacturing and trade sector.

**Table 4- Spain**
**Percentage of the Companies with capital below**
**Unconditional NWAR**

**Manufacturing, Trade and Construction Companies**
**( NACE Rev.2 C,G,F sectors)**

| | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|---|
| C-micro | **63.8** | 61.9 | 60.6 | 60.1 | 58.7 | 56.5 | 56.3 | 55.2 | 52.8 |
| G-micro | **74.0** | 72.3 | 70.7 | 69.7 | 68.6 | 66.6 | 66.4 | 65.9 | 64.2 |
| F-micro | **66.0** | 65.6 | 64.2 | 62.7 | 61.1 | 58.7 | 57.6 | 56.3 | 54.8 |
| C-small | **6.9** | 5.7 | 5.8 | 5.5 | 5.8 | 5.1 | 4.8 | 4.8 | 3.9 |
| G-small | **9.1** | 8.1 | 8.1 | 7.7 | 7.7 | 8.0 | 7.3 | 6.7 | 5.6 |
| F-small | **17.0** | 12.9 | 11.9 | 11.8 | 12.3 | 9.9 | 6.7 | 6.9 | 4.5 |
| C-medium | 6.6 | 6.5 | 8.8 | **9.5** | 8.4 | 8.2 | 6.1 | 6.7 | 6.2 |
| G-medium | 6.6 | 6.8 | 6.7 | 7.5 | 7.7 | **7.9** | 7.4 | 7.7 | 7.2 |
| F-medium | 19.9 | 17.9 | 18.1 | **24.7** | 20.5 | 16.8 | 20.1 | 16.2 | 7.1 |
| C-large | 7.0 | 9.0 | 10.1 | 10.2 | 9.5 | **10.4** | 10.1 | 9.3 | 7.9 |
| G-large | 13.3 | 13.7 | 13.4 | 13.4 | 12.8 | **14.9** | 13.3 | 12.1 | 10.1 |
| F-large | 4.6 | 6.2 | 6.5 | 7.1 | **12.6** | 10.3 | 11.2 | 10.3 | 10.8 |

**Table 5 -Italy**
**Percentage of the Companies with capital below Unconditional NWaR 90%**

**Manufacturing, Trade and Construction Companies ( NACE Rev.2 C,G,F sectors)**

| | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|---|
| C-micro | **63.9** | 60.6 | 59.9 | 60.2 | 59.7 | 58.8 | 58.1 | 57.6 | 55.6 |
| G-micro | **69.8** | 67.6 | 66.6 | 65.9 | 65.6 | 64.5 | 63.9 | 63.2 | 61.5 |
| F-micro | **53.7** | 52.4 | 51.7 | 50.1 | 48.8 | 47.2 | 45.7 | 43.8 | 40.4 |
| C-small | **29.7** | 25.7 | 23.8 | 24.3 | 25.2 | 23.7 | 22.7 | 21.7 | 20.0 |
| G-small | **35.1** | 32.5 | 31.5 | 30.6 | 31.1 | 29.8 | 28.5 | 26.8 | 24.5 |
| F-small | **30.5** | 29.6 | 28.1 | 27.4 | 26.9 | 26.4 | 24.7 | 22.8 | 19.6 |
| C-medium | **17.0** | 13.8 | 12.5 | 13.5 | 13.5 | 13.5 | 11.9 | 11.0 | 9.3 |
| G-medium | **25.7** | 22.6 | 21.7 | 21.3 | 22.1 | 21.0 | 20.0 | 18.7 | 15.4 |
| F-medium | **25.5** | 24.3 | 22.9 | 23.6 | 24.0 | 24.5 | 25.1 | 23.1 | 22.8 |
| C-large | **15.5** | 13.6 | 12.9 | 13.7 | 13.2 | 14.0 | 13.0 | 11.8 | 9.9 |
| G-large | **24.2** | 22.5 | 21.1 | 19.6 | 20.1 | 18.6 | 17.2 | 15.5 | 14.5 |
| F-large | 18.6 | 13.2 | 20.0 | 19.7 | 26.5 | **27.2** | 23.7 | 20.7 | 19.5 |

In Italy, after 2011, firms' capitalization improved: for almost all sector and size combinations, the percentage of companies with capital below NWaR is in a declining trend. Micro firms appear relatively undercapitalized, especially in the trade sector where there is the highest percentage of the companies with net worth below NWaR. Among the large firms, construction companies are the least capitalized; even in 2012, the percentage is the highest after 2008.

**Table 6-Turkey**
**Percentage of the Companies with capital Below Unconditional NWAR**

**Manufacturing, Trade and Construction Companies ( NACE Rev.2 C,G,F sectors)**

| | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|---|
| C-micro | 15.6 | 19.7 | 19.1 | 21.4 | 31.7 | 28.9 | 34.7 | 39.2 | **38.8** |
| G-micro | 18.1 | 19.1 | 26.3 | 24.3 | 33.7 | 33.9 | 41.5 | 53.1 | **49.0** |
| F-micro | 26.4 | 32.0 | 29.0 | 37.0 | 43.4 | 42.0 | 52.4 | **59.3** | 57.3 |
| C-small | 5.6 | 9.4 | 8.0 | 9.7 | 19.0 | 12.1 | 16.9 | **23.5** | 22.8 |
| G-small | 6.0 | 10.6 | 11.9 | 10.0 | 20.6 | 16.6 | 22.1 | **25.3** | 24.0 |
| F-small | 21.6 | 24.5 | 24.5 | 21.7 | 38.1 | 28.2 | 30.7 | 36.7 | **39.1** |
| C-medium | 1.8 | 6.2 | 3.5 | 3.9 | 7.2 | 4.4 | 6.2 | 7.5 | **10.5** |
| G-medium | 4.3 | 10.5 | 6.2 | 6.2 | 12.2 | 8.5 | 11.0 | **13.0** | 11.9 |
| F-medium | 18.8 | 26.5 | 22.5 | 19.0 | 29.5 | 20.3 | 27.2 | 33.3 | **36.2** |
| C-large | 0.2 | **5.9** | 1.0 | 1.3 | 5.6 | 2.4 | 4.4 | 2.5 | 4.6 |
| G-large | 3.3 | **8.1** | 5.8 | 4.6 | **8.1** | 4.3 | 4.6 | 6.1 | 4.5 |
| F-large | 0.0 | 0.0 | 5.3 | 2.2 | 8.2 | 8.6 | 5.0 | **13.5** | 7.1 |

In Turkey, percentage of the companies with capital below unconditional NWaR reveals that after 2012, for all sizes and sector combinations the percentages have increased, the capability to cope with the loss have decreased. After 2001, net worth to total assets ratio has decreased for the large trade companies. This is either because of the percentage of bank credit increase in the total assets and the decrease in equity; or just decrease in equity due to the decrease in the profitability at that class. The percentage of the companies in the low-level class, the ratio of the class level of profitability between 0% and 1%, has increased in these years. In terms of the large companies' profitability, the average of the high-upper percentile of the profitability is the highest in large construction companies among the others.

**Percentage of the companies with capital below unconditional NWaR (90%)**
**Comparison for the years 2010 and 2015**

The charts below represent the percentage of the companies with capital below unconditional NWaR at 90% confidence level in the years 2010 and 2015. Although the percentages are still high, for micro companies the ratios declined in 2015 in Spain and Italy. For these countries, the highest percentage belongs to micro trade companies. In Turkey, the lowest ratios belong to the micro construction companies. For all three countries, the capitalization is better for large manufacturing companies than the other sector-size combinations.

**Chart-1 SPAIN**

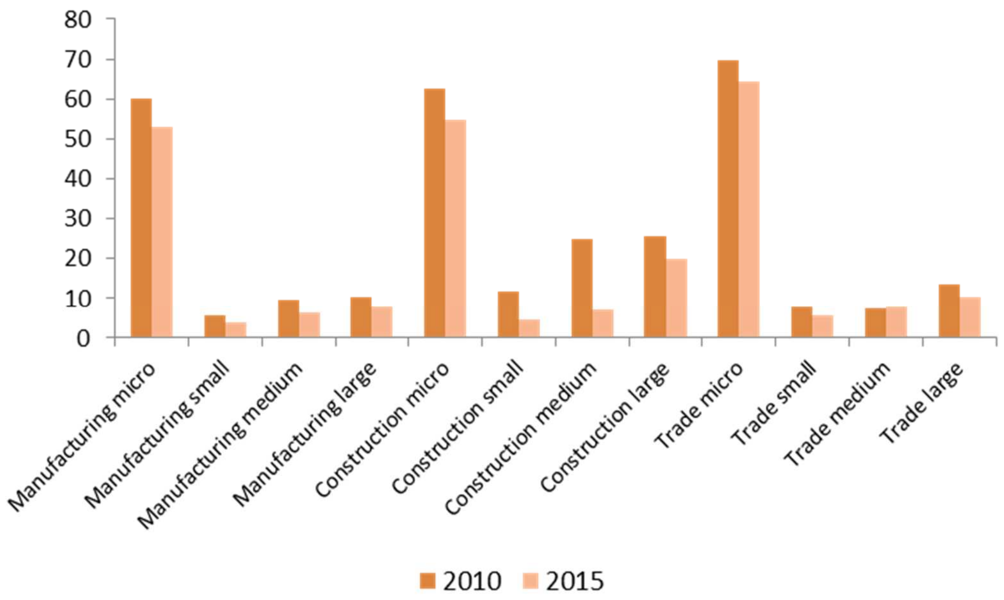


**Chart 2-ITALY**

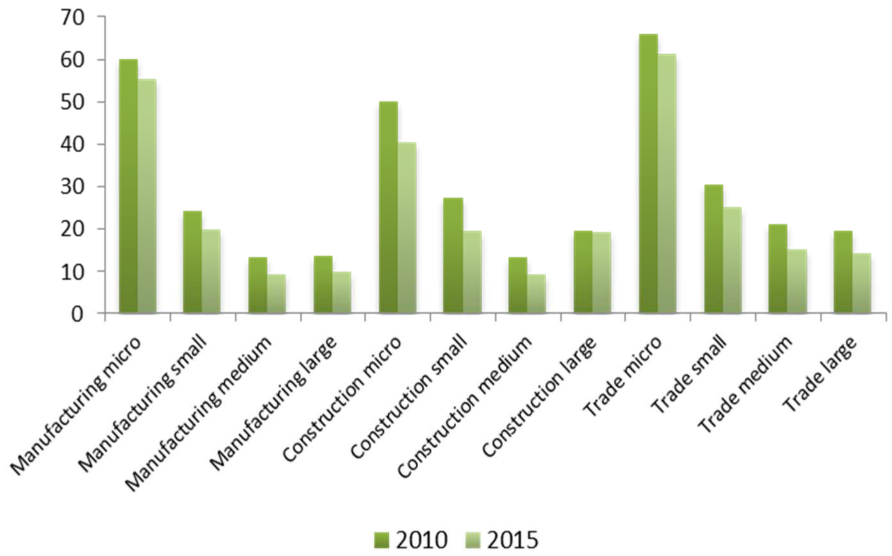
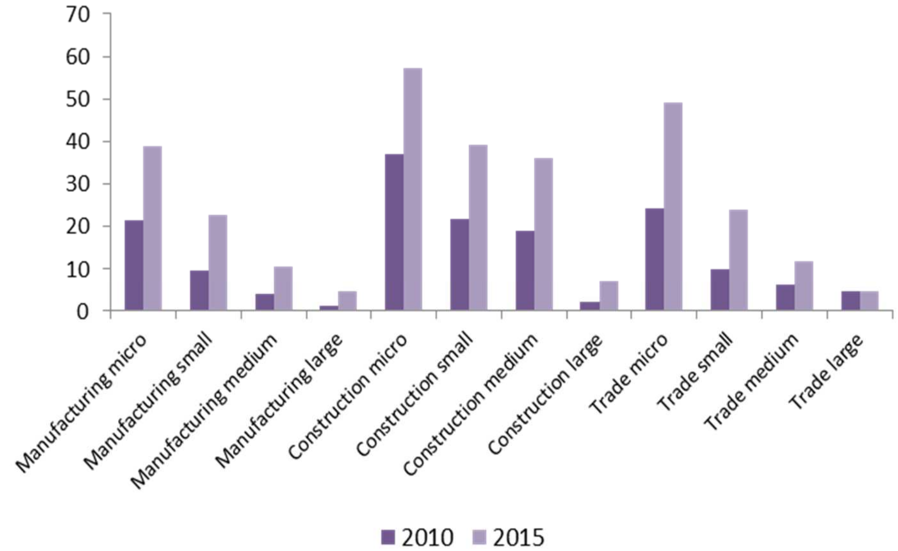



**Chart 3-TURKEY**



# DATA AND DEFINITION OF RATIOS

## Data

The financial statements used in this study are restricted to corporations and cooperatives. Partnerships and sole proprietorships are excluded. This study covers the period from 1987 to 2015. Depending on the availability of the data source, the starting year is later for some sectors. Individual financial statements that are reported in the form of generally accepted accounting principles (GAAP) are used. For the sectoral coverage, manufacturing, trade and construction are selected due to their importance in contribution to a national economy. Sectors have been differentiated according to the NACE Rev.2 classification. Demolition and site preparation is excluded from the construction sector. For analyzing the data according to size classes, micro, small, medium and large enterprises are defined by applying the thresholds for turnover. The corresponding thresholds for separating micro, small, medium and large corporations are £2 million, £10 million and £50 million.

## Definition of Ratios

### *Profitability*

In this study, profitability is measured as the ratio of “net income” in the income statement to the total assets in the balance sheet of non-financial corporations. For the total asset used in the denominator of the ratios, adjustments are made for equity. Subscribed capital uncalled (or unpaid), bond redemption premium, intangible fixed assets and investment grands are subtracted from total assets and discounted trade bills are added.

### *Equity Capitalization*

Equity capitalization is the ratio of net worth to total assets. Net worth is simply the amount by which assets exceed liabilities. It is calculated by adding share issues, revaluation reserves, retained earnings, net profit or loss for the financial year and special tax based reserves. Subscribed capital uncalled (or unpaid) and intangible fixed assets are subtracted from the calculation. Net worth is divided by total assets for assessing equity capitalization as a percentage of total capital provision to a company.

### *Net Worth at Risk (NWaR)*

NWaR is the share of cumulative losses (as a percentage of total assets) that companies may have to face with a certain level of confidence calculated over a given period. This ratio also serves as a benchmark of minimum capital required in a given sector-size class enabling companies to absorb losses that might potentially arise.

Two NWaR approaches are used: conditional and unconditional NWaR at three confidence levels: 95%, 90% and 80%. The first two levels of confidence represent rather worst-case scenarios and the last displays a rather moderate loss scenario. For practical issues, we use 90% confidence level for the comparison of figures at sector and size levels.

At 90% confidence level, conditional NWaR is calculated as follows: for each company cumulative two-year net income figures in terms of total assets are calculated[2]. From the resulting two-year net income distributions in each sector-size combination, the 10th percentile is chosen; resulting in a time series of overlapping two-year values. From the time series, the minimum level of the time span 1987-2015 is chosen for conditional NWaR 90%. For the unconditional NWaR 90%, the mean of the last eight conditional NWaR 90% is used. The differentiation of conditional and unconditional NWaR is important to assess the impact of recessions on the income distribution.

[2] The sum of net income in period t and t+1 is divided by total assets in period t.