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Capital structure of non-financial companies in EU countries – macroeconomic view

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Abstract

This article examines the macroeconomic aspects of capital structure of companies in EU countries in the international context during the period 2011–2020. It aims at evaluating the capital structure of European non-financial companies in general, followed by the application of market timing theory and convergence tendencies in the companies within the EU countries. Our results suggest that the equity ratio of examined companies has grown over the last decade at the expense of credit sources of financing. Although our research could not confirm the possibility of market timing theory application, this was due to the limitations of our analysis caused also by an inappropriate data structure. The general result of the examination of convergence suggests that the historical capital structure has a strong impact on the current structure. Analysis of the capital structure of companies in individual European countries also shows that there are still significant differences between these countries, which have been reduced only partially in the medium term, and thus convergence trends are insignificant.

Keywords: Capital structure, non-financial companies, convergence, market timing theory

1 Introduction

Capital structure decisions are an essential part of the management processes of all business entities. However, paradoxically, economists began to pay more attention to capital structure only because of the theory of its irrelevance by Modigliani and Miller (1958). Several variant theories have emerged, including market timing theory (Baker and Wurgler, 2002), which assumes that the current capital structure is the result of past efforts by companies to market timing.

A macroeconomic context can be found in several studies of capital structure. Korajczyk and Levy (2003) have pointed to equity issues corresponding with the economic cycle, countercyclical developments in debt issuance (for companies without restrictions on raising capital) and the use of macroeconomic determinants of capital structure in conjunction with microeconomic ones.

The main objective of this article is to examine the capital structure of non-financial companies in the EU countries from a macroeconomic point of view, with emphasis on market timing theory and the context of convergence of the countries. The structure of the article follows this objective. In the first part, we provide a brief review of relevant approaches to capital structure decisions. Furthermore, we examine the evolution of the capital structure over time from the perspective of the European Union as a whole. In subsequent parts, we analyse corporate debt developments in the EU countries with the utilisation of market timing theory and examine the

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current corporate capital structure of individual EU countries in the context of their convergence. The final part concludes this theory.

2 Literature review

2.1. Theoretical approaches summary

The seminal work of Modigliani and Miller (1958) about the irrelevance of capital structure can be considered as the beginning of research in the field of capital structure. The authors emphasized that there is no dependence between the capital structure and the value of the company under certain assumptions.

Modigliani and Miller (1963) later extended their original theory to the effect of taxes, as the original model was based on several unrealistic assumptions, e.g., the absence of taxes. According to the modified theory, the value of the company may already depend on the capital structure, thanks to the interest tax shield. If we only consider the effect of the shield, it would be best for the company to use debt almost exclusively as a source of financing. Thus, in the example of the original and modified MM model, we can observe a significant difference in the result after taking into account a single-added variable. The effect of the interest tax shield is greater in countries where the corporate tax burden is greater. On the contrary, the (personal) interest tax paid by third-party providers on their interest income may reduce the overall effect of the shield (Miller, 1977; Faccio and Xu, 2015). Unprofitable companies and companies that have already optimised the tax using other techniques are less motivated to use this shield than profitable companies (Faccio and Xu, 2015).

However, Kraus and Litzenberger (1973) compared the positive effects of the interest tax shield with the negative effects of possible financial distress, leading to an internal solution to the optimisation of the capital structure. The riskier the business, the higher the equity ratio should be. The target amount of indebtedness is determined by such a level at which the marginal advantages and marginal disadvantages from its further increase are the same (Sivák, Bastyr, 2017).

Jensen and Meckling (1976) examined the relationships between different interest groups of individual stakeholders, specifically between owners, creditors and management, in their agency costs theory. These costs naturally arise in a principal–agent relationship, as rational economic subjects act mainly in their own interests.

Pecking order theory (Myers and Majluf, 1984) assumes that a company uses resources to finance assets in the following order: internal funds, debt issue and equity issue. A company that has sufficient internal resources to finance (real) investments, therefore, does not use external resources at all; in the event of their shortage, it issues debt, while shares issue and owners' deposits, respectively, are a last resort. The company is therefore primarily funded by the path of least resistance.

Life cycle theory (Chittenden et al., 1996 following Weston and Brigham, 1981) assumes that the size of a company, its age, access to the capital market and asset structure influence the capital structure, as younger and smaller companies have difficulties not only with accessing capital market but also with the debt resources in general. However, they can motivate creditors with collateral.

According to market timing theory (Baker and Wurgler, 2002), the current capital structure is the result of a company's past market timing efforts. The company is motivated to issue new shares when their market value is high compared to historical market prices (alternatively, when the market value of the share is high compared to its book price), while repurchases occur when share prices are low. An important finding is that this effect can be long lasting. The authors have also shown that companies with low debt are the ones that have obtained financing from sources with a high market-to-book ratio for their shares. If we wanted to modify the theory of market timing for debt issues, the company would issue debt at a time when its price (interest rate) is low. However, it is not possible to fully modify the idea of share redemptions for bond repurchases or early repayments of loans in a clear manner, given the fact that a company may have both fixed and variable interest rates on its debts and due to early repayment fees; although the repurchase of own bonds on the secondary market at the time of their undervaluation could be an interesting opportunity for a company with high free cash.

2.2. Capital structure – macroeconomic perspectives

Empirical studies in the field of capital structure focus on the research of a certain set of enterprises and, most often, on microeconomic variables. However, we find the intersection with a macroeconomic perspective mainly on two levels – by including macroeconomic variables in capital structure models or in research that is focused on a wide range of companies in several countries, including the possibility of international comparison.

Korajczyk and Levy (2003) followed market timing theory and, at the same time, incorporated macroeconomic variables into their research. They argue that for publicly traded companies, equity issues fluctuate in line with the

economic cycle and debt issues are, on the contrary, countercyclical. According to their research, the target level of indebtedness is countercyclical. However, this is especially true for companies that have been included in the group without financial restrictions. Companies with financial constraints are defined as those with insufficient cash flow for their investments and at the same time with significant agency costs associated with the issue of securities on the financial markets. In addition, in line with market timing theory, a company issues shares as their price rises. The capital structure of the company will ultimately be the result of both macroeconomic and specific microeconomic impacts. The authors also showed that macroeconomic aspects will have less of an impact on companies with financial constraints. They chose aggregate profitability growth of non-financial corporations and market yield expressed through a combination of market indices as appropriate macroeconomic variables.

Bandyopadhyay and Barua (2016) examined the link between capital structure and macroeconomic effects, respectively, and the profitability of Indian companies. They confirmed the agency costs theory and the trade-off theory, as well as the assumption that the macroeconomic context affects capital structure and profitability. Using a two-step dynamic panel generalised method of moments, they have shown that leverage has a positive effect on profitability.

Publicly traded non-financial corporations in Malaysia, Singapore and Thailand were investigated by M'ng et al. (2017). The capital structure determinants in this research can be divided into micro- and macroeconomics. The microeconomic variables considered are profitability, business size, asset tangibility and the non-interest tax shield. They chose inflation as a macroeconomic variable. They confirmed trade-off theory and pecking order theory. In particular, they identified a negative relationship between leverage and profitability and a positive relationship between leverage and asset tangibility of Malaysian and Singaporean companies. Depreciation scaled by total assets has a negative impact, while the size of the company has a positive impact on leverage in all countries surveyed. They consider the fact that the harmonisation of accounting standards did not occur in all countries studied until 2012, as well as the fact that they did not examine the impact of the financial crisis during the period 2008–2009 on their own, to be limitations of their research.

Jermias and Yigit (2019) examined the context of financial crises and capital structure in a set of Turkish-listed companies during the period 1989–2012. The authors confirmed the different levels of leverage before, during and after the crisis, with leverage peaking during the crisis.

Pour and Khansalar (2015), examining OECD countries' enterprises during the years 1990–2011, have shown that leverage and debt maturity have different effects on underinvestment depending on a company's debt capacity. Companies without limited debt capacity can solve the problem of underinvestment by increasing debt with shorter maturities and extending the maturity with lower debt. These companies also use the interest tax shield better. If companies have debt capacity constraints, they tend to have lower debt with shorter maturities, and they cannot adequately solve the problem of underinvestment. This problem is outweighed by a potential liquidity risk.

Faccio and Xu (2015), also examining OECD countries in the long term, focused on the use of an interest tax shield. The scope of the research confirmed the long-term relationship between taxes and capital structure, which cannot be confused with random correlation or one-off effects. It was confirmed that the impact of the income tax on indebtedness, which also represents the incentive to take advantage of the shield, is more pronounced for profitable companies.

The link between the use of macroeconomic variables in capital structure research and the wider coverage of EU-28 countries is provided by Savvakis et al. (2021). They consider GDP growth, the level of total factor productivity (TFP) in the country, interest rates, the development of the stock market – in terms of the share of total capitalisation on GDP – and the human capital index as capital structure determinants. It was the TFP indicator that they confirmed as the important determinant. Some of the results of their research depend on the fact whether the surveyed companies are in EMU countries or not, other results depend on the size of the surveyed companies.

3 Data and methodology

The focus of our research is non-financial corporations from a macroeconomic point of view, i.e., from the perspective of the European Union as a whole and individual countries. The material includes aggregated data from the balance sheets of non-financial corporations in the EU 27. We used the Eurostat database (2022). The period of the previous decade i.e., 2011–2020, was examined. With regard to research aimed also at market timing theory, we also used the interannual logarithmic returns of the STOXX 600 index (Investing, 2022), using prices as of 31/12 of each year. The index selection corresponds to the EU analysis as a whole. We applied basic research methods, including exploratory, descriptive and correlation analyses.

4 Result and discussion

In order to meet the objective of the article specified in the introductory part, we will present the results of our research in three areas: (1) assessment of the capital structure of non-financial corporations in the European Union as a whole; (2) analysis of companies' indebtedness within the market timing context; and (3) analysis of convergence of the capital structure of non-financial companies in individual EU countries.

4.1. Assessment of capital structure of non-financial companies in the EU

The evolution of the capital structure in non-financial corporations in the EU is relatively consistent, without dramatic shocks, including 2020, which is surprisingly comparable to 2019 in all items examined, despite the COVID pandemic crisis (see Fig. 1). Equity predominates over debt and other liabilities. There is a gradual growth trend in equity, disrupted only in 2018. The most important debt sources are loans, especially long-term ones. In the past, they accounted for 24% of total liabilities, but during the examined period, they decreased by 5 pp. We also see a slight decline in short-term loans, which account for 8% of total liabilities. The share of other capital components is stable. Debt securities issued represent 4%, and the remaining items make up approximately one-tenth of the total capital.

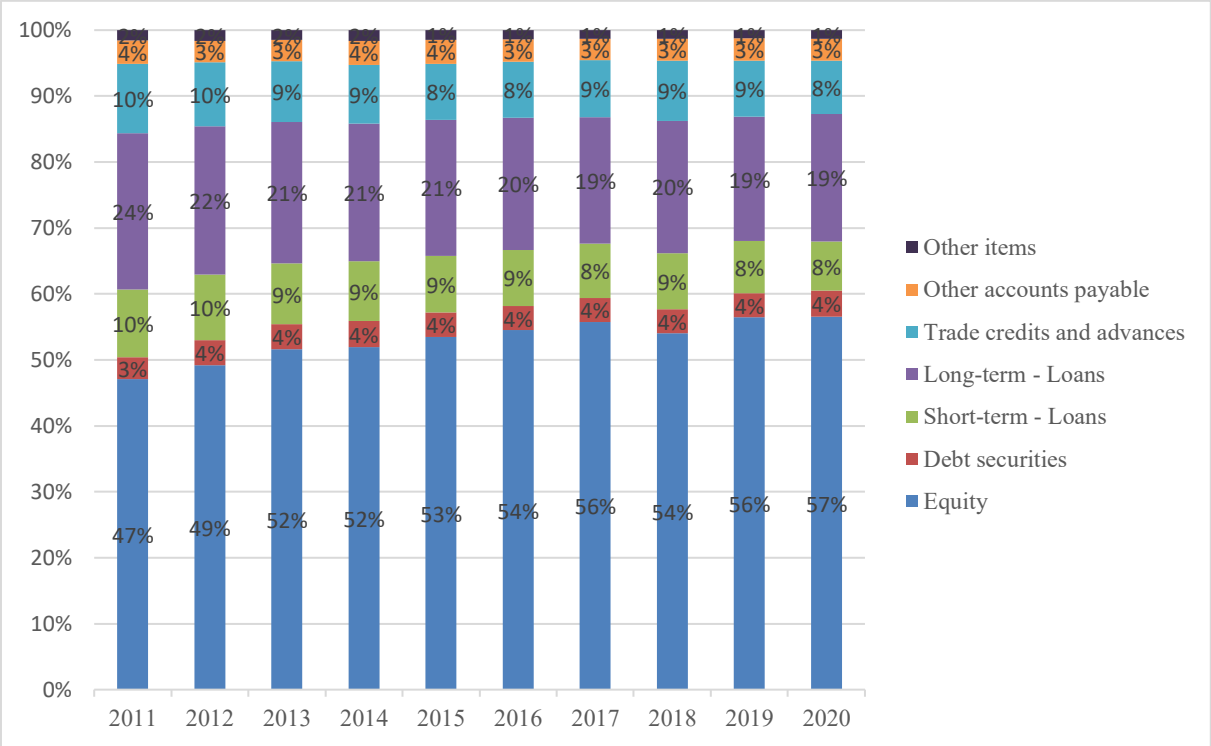


Figure 1. Capital structure of EU non-financial companies and its development
Source: Own processing from Eurostat

As a result, we can confirm the dominance of credit instruments over corporate bonds, which is a typical feature of continental financing that is disappearing very slowly. On the other hand, the equity ratio has been growing in recent years at the expense of loans. The reduction in the share of loans is also quite surprising in the context of an expansionary monetary policy leading to a reduction in interest rates. Leverage is declining in terms of several indicators – short-term leverage, total leverage and credit indebtedness.

4.2. Indebtedness and market timing

In determining the cause of fluctuations in debt and equity ratios, we follow mainly the market timing theory and partly the research by Korajczyk and Levy (2003), who proposed a combination of market indices as a macroeconomic variable. It should be the case that the equity ratio increases during a period of favourable

macroeconomic development and at the same time in a period when shares have a relatively higher price. Therefore, we will compare the development of capital structure in terms of capital ownership with the development of the selected index, STOXX Europe 600 (see Fig. 2).

The expected positive correlation is mainly confirmed by the development during the years 2011–2013 and 2018–2019. In 2011, we observed a low value of both indicators and, in 2012–2013, we observed a significant increase. Similarly, the decline in both values in 2018 (equity ratio, – 2 pp., index yield, –15%) alternated with a more significant increase in 2019. Spearman's correlation coefficient of interannual changes in the equity ratio and STOXX index annual returns reached 0.97 (Pearson's coefficient reached 0.95), i.e., it is a very strong direct linear dependence.

A significant limitation of this approach is the fact that equity also includes the item of retained earnings and losses. Thus, an increase in equity together with an increase in the return on a stock index may be related to an increase in corporate profitability. Therefore, it may not directly confirm the validity of the market timing theory. This limitation is also in line with the findings by Frank and Goyal (2015), who point to the analogous fact that the indirect relationship between profitability and leverage attributed to the theoretical interpretation is more a matter of leverage calculation, which is influenced by profitability (i.e., retained earnings). Leverage declines as profitability increases, even without deeper causality. In addition, according to the ESA 2010 methodology, shares in the share capital (mainly for publicly traded companies but also for other companies using the estimate) are valued at the market price, i.e., it is not possible to use data from Eurostat (2022) in the analysis of individual equity items for a deeper study of the validity of market timing theory. We state that, despite the confirmation of the expected positive correlation of the selected indicators, we cannot confirm or refute the market timing theory due to the limitations of our analysis.

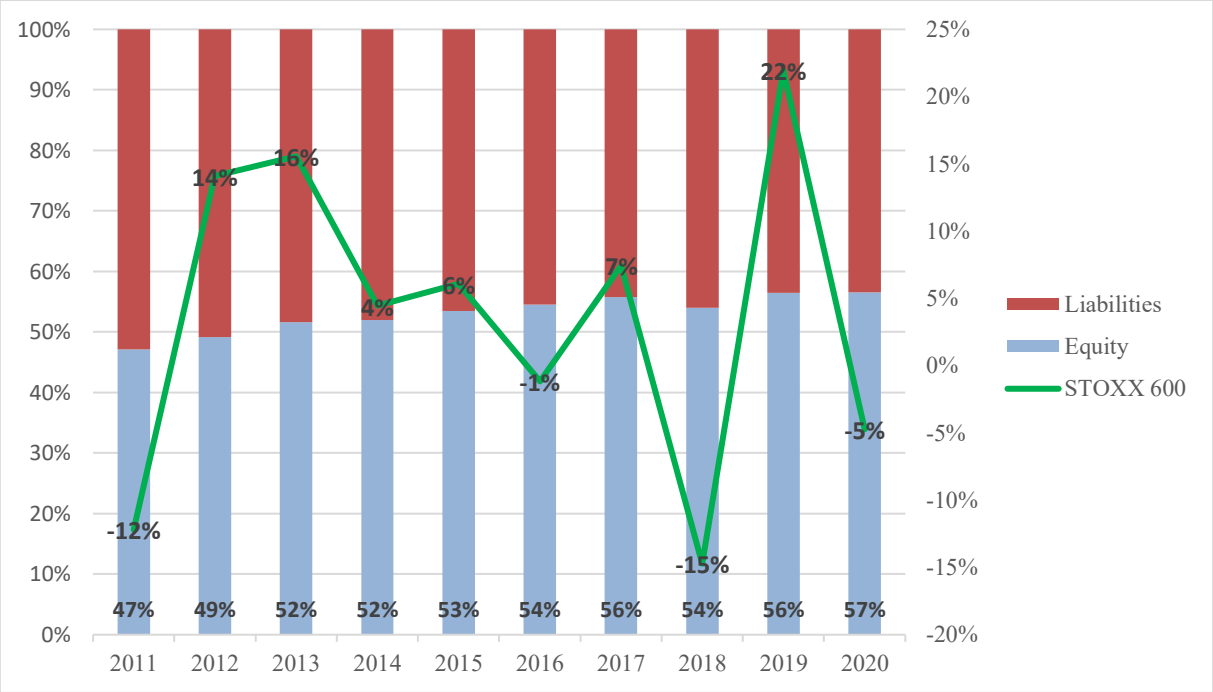


Figure 2. Leverage and equity ratio compared to stock index development
Source: Own processing from Eurostat and Investing.

4.3. Capital structure of non-financial corporations in individual EU countries and their mutual convergence

In the case of countries forming a certain unit, it makes sense to examine the degree of their mutual convergence and divergence, respectively. In the case of the EU countries, we can expect not only certain similarities but also elimination of differences over time resulting from harmonisation of legislation, interconnections in trade relations and convergence in the broadest sense. Therefore, we will focus on the evaluation of the capital structure in 2020, which we will then compare with 2015, i.e., we analyse developments in the medium term, including the effects of the COVID-19 pandemic. The limitation is the absence of the latest data for 2021, which are not currently available. In addition to the standard indicators of descriptive statistics, which we will use to evaluate the

differences according to individual indicators, we will also measure the degree of overall differences for each country by the following formula:

$$\sum (xij/xia - 1)2 *(xia / \sum xia) \quad (1)$$

where xij is the value of the indicator i for country j,
xia is the average value of the indicator i for all countries,
∑xia is the sum of all averages of individual indicators
and the total result is the sum for all indicators for the jth country.

For evaluating the differences between the countries as such, not the difference from the aggregate value for the European Union as a whole, we will consider the same weight for each country.

Table 1. Capital structure of non-financial companies from EU countries in 2020

Country	Equity	Debt securities	Loans	Trade credits	Other items	Difference measure (Eq. 1)
Belgium	52	3	33	9	3	4
Bulgaria	45	1	24	19	11	12
Czechia	52	3	23	15	7	3
Denmark	64	2	28	4	4	9
Germany	44	3	30	12	11	4
Estonia	60	1	23	13	3	5
Ireland	59	2	23	9	7	3
Greece	51	1	43	1	5	17
Spain	60	3	27	8	2	5
France	63	6	23	6	1	13
Croatia	42	1	30	12	14	12
Italy	48	4	29	13	6	2
Cyprus	48	0	36	15	1	10
Latvia	54	1	29	12	4	2
Lithuania	56	2	19	16	8	7
Luxembourg	48	5	38	7	2	11
Hungary	55	1	26	12	5	2
Malta	33	2	43	16	7	17
Netherlands	61	4	30	3	3	10
Austria	48	5	37	5	4	9
Poland	46	2	26	12	14	10
Portugal	48	5	27	9	11	6
Romania	37	0	21	23	19	49
Slovenia	55	1	24	14	6	3
Slovakia	42	3	31	16	8	6
Finland	56	4	31	5	4	5
Sweden	68	4	22	3	3	15
Average of EU 27	**52**	**3**	**29**	**11**	**6**	**9**
Standard deviation	8	2	6	5	4	-
Coefficient of variation	16	65	22	50	71	-

Equity is the predominant source of funding in several countries (see Table 1), notably Sweden, Denmark, France and the Netherlands. On the contrary, greater use of financial leverage can be found in companies in Malta, Romania and Slovakia. In V4 countries, we identified the similarity between the pairs of countries – Poland and Slovakia, the Czech Republic and Hungary, respectively. Regarding both equity and loans, we note the similarity between Slovakia and Croatia. Corporate bonds are used mainly in France, Luxembourg, Austria and Portugal,

while in Romania and Cyprus they are practically never used at all. Greek and Maltese companies have the highest share of loans. Trade credits have a relatively high share – about one-fifth of the total capital in Romania and Bulgaria. However, it would be appropriate to deepen the analysis of the capital structure of Polish, Romanian and Croatian companies with additional indicators, as a significant result is represented by the item 'other'. The greatest variability between countries is in the use of corporate bonds. On the contrary, considering equity ratios, the countries are the most similar. From the point of view of individual countries, Romania has the highest degree of diversity.

Compared to 2015 (Annex 1), we can state that several of the above facts apply at least in the medium term. It has been confirmed that the historical capital structure follows on from the current capital structure. However, despite considerable stability, some degree of EU convergence has also emerged. The average value of the difference indicator decreased. In Romania and Greece, the degree of divergence is relatively high in both periods, but with a significant reduction to date. Divergence, i.e., a significant increase in diversity is achieved only in Croatia, which, however, is a 'victim of its own success' in this respect, as it already achieved a low level of diversity in 2015. Convergence can also be confirmed by decreasing coefficients of variation of individual indicators in 2020, although a sharp decline is observable only for the variation coefficient of debt securities.

5 Conclusion

The capital structure of non-financial companies in EU countries has a relatively stable development, meaning that there is quite a strong relationship between the past and current capital structure. Surprisingly, such development includes results for 2020 that are exemplary and comparable to the results for 2019 despite the crisis related to the pandemic situation. The next unexpected result is represented by a decrease in the loans to total assets ratio despite an expansionary monetary policy. The equity ratio has been rising over the examined period of the last decade, and thus equity predominates over liabilities. Focusing on reasons for such development and applying market timing theory, we found a strong linear correlation between equity ratio and stock index development, which, however, cannot be interpreted unequivocally. Looking at the expected results, we confirmed loans' dominance over debt securities. Moreover, some evidence for partial convergence of the EU countries was discovered, particularly in terms of a decrease in an average value of the difference measure, although stronger convergence should be expected because of the effects of the EU harmonisation.

There are several important limitations of our analysis, such as the relation between profitability and leverage caused by leverage calculation, not necessarily deeper relations, that can also affect the noted correlation of equity ratio and stock index; the limitations of the examined data; a lack of advanced mathematical analysis, etc.

Further research is needed from several points of view. The lack of a significant impact of the pandemic on our results does not lead to definite conclusions, however, supports a need for continuous research on capital structure in the context of the pandemic. The next important area is represented by the EU countries' convergence research, as convergence can partially be considered as a measure of success of any union, especially for its new or 'weaker' members, and can justify harmonisation efforts, as well.

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Annex

Annex 1. Capital structure of EU countries' non-financial companies in 2015

Country	Equity	Debt securities	Loans	Trade credits	Other items	Difference measure (Eq. 1)
Belgium	57	3	31	8	2	6
Bulgaria	42	1	27	19	11	11
Czechia	51	3	21	16	8	7
Denmark	60	2	24	4	9	10
Germany	45	3	30	12	11	4
Estonia	55	2	25	9	8	3
Ireland	51	1	36	8	5	4
Greece	41	0	53	1	5	28
Spain	58	2	29	9	2	5
France	59	6	25	7	3	12
Croatia	39	2	33	16	10	7
Italy	47	4	30	14	5	2
Cyprus	42	0	41	16	1	13
Latvia	49	0	33	14	4	4
Lithuania	56	0	22	15	7	8
Luxembourg	57	5	31	5	1	11
Hungary	55	0	29	11	5	3
Malta	33	2	45	16	4	15
Netherlands	56	3	35	3	2	10
Austria	47	6	38	5	4	10
Poland	46	4	25	12	12	7
Portugal	43	4	32	9	11	6
Romania	29	0	25	22	24	72
Slovenia	48	1	32	13	5	1
Slovakia	42	5	29	17	7	7
Finland	49	5	36	5	4	7
Sweden	64	4	26	3	3	13
Average of EU 27	**49**	**3**	**31**	**11**	**6**	**11**

Standard deviation	8	2	7	5	5	–
Coefficient of variation	17	75	23	50	75	–