Central European Review of Economics & Finance
Vol. 31, No. 3 (2019), pp. 35–49
DOI: 10.24136/ceref.2019.009
Received: 3 May 2019. Accepted: 24 June 2019.

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CORPORATE DELEVERAGING. LESSONS FROM THE POLISH EXPERIENCE (2006–2017)

Purpose *– How long do firms need to reduce their debt level? We know from literature that this process cannot be completed rapidly and could be justified by the need to ensure financial flexibility or by the will to maintain a target leverage ratio. The purpose of this paper is to observe the behaviour of Polish firms in this process and the time needed (if any) to get back to the lower level in terms of debt. Our focal point is determining whether there are differences between firms in terms of size and sectors which could influence capital structure theories.*

Design/methodology/approach *– The debt level defined is the net debt ratio, observed over 12 years (from 2006 to 2017) with a trough level estimated at the median of the ratio over that period for a sample of 50 496 firms per year (average). We also analyse the evolution of two other ratios, net debt/fixed assets and operational cash-flow/net debt, to obtain greater precision in our observations.*

Findings *– In line with previous studies, we find that the process of getting back to the trough does not proceed very rapidly. However, this article is original because we find significant differences between firms in terms of size (3.27 years for small firms compared to 5.13 years for medium-sized firms and 3.77 years for large firms) and in terms of sectors. The trade-off theory could explain some patterns for small firms, whereas a more flexible version of the trade-off theory should be applied to large firms. For medium-sized firms, we should look for another explanation.*

Originality/value *– Our findings are consistent with a capital structure theory which focuses on differences between firms in terms of size and sectors regarding the behaviour of some firms with respect to debt. Models which deal with capital structure should not stick to a stationary target leverage ratio for explaining capital structure choices, and should segment their observations and explanations to make them more efficient.*

Keywords: Debt, excessive leverage, capital structure theories.

JEL Classification Codes: O16.

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Introduction

The relationship between debt and equity is a fascinating subject which needs to be understood if we want to moderate the risk of excessive debt. Initially, according to literature, debt has no impact on the value of the firm (Modigliani, Miller, 1958). However, this conclusion changed quickly due to the external gift granted by the state in the form of tax deductibility of interest (Modigliani, Miller, 1963). That is why firms should theoretically look for an optimal debt ratio which will maximize their value. However, as shown by Graham (2000), firms are often far from the ratio predicted by models. Moreover, this ratio is not fixed, and changes significantly according to several parameters. One popular parameter for instance is the impact of growth. According to literature, the effect of growth on debt can be interpreted in two ways: Myers (1977) considers that the amount of a company's debt is inversely related to the growth opportunities, while Heshmati (2001), analysing Swedish micro and small firms, confirms that growth opportunity has a negative impact . On the other hand, Degryse and al. (2009) show, through an analysis of Dutch SMEs, that when firms are growing, they need more funds, so their debt increases: „when internal funds are depleted, long-term debt is next in the pecking order". For France, Kouki and Said (2012) also find a positive and significant effect explained by the need for new external funds for financing new investment opportunities.

This inconsistency in literature is not new. We find it also in the debate between the trade-off and pecking-order theories. The first theory defends the existence of an optimal debt ratio. Firms choose debt finance or equity finance by comparing the tax benefits of debt with the dead-weight costs of bankruptcy (Kraus, Litzenberger, 1973). The second theory does not support the same view: firms will try to avoid external financing as often as possible, which means that their priority is to rely on internal funds. When they need external financing, they will prefer new debt to new equity because this sends a better message to investors.

Experimental applications of both theories produce controversial results. For quoted companies in the USA, Shyam, Sunder and Myers (1999) observe that capital structure decisions are closer to conclusions from the pecking order theory. On the other hand, Hovakimian, Opler and Titman (2001) conclude that results on trade-off are statistically significant. For this reason, Fama and French (2005) state that we cannot stick to one theory as a stand-alone theory of capital structure. Dealing with analysis of capital structure means that we have to face „discontinuities in financing behaviour" (Denis, McKeon, 2011) and we must try to look for „a rational explanation" (Denis, McKeon, 2011) for such patterns.

We would like to contribute to this literature by focusing our analysis on the behaviour of companies towards debt, and especially the time needed to get back to the lowest level.

When firms reduce debt, this can be a consequence of profitable years and the possibility for them to fund their activity and their investment using their internal funds only. On the other hand, this can be seen as a request from the market and from their lenders to reduce debt when it gets too high or a sovereign decision to get back to their target leverage ratios. Thus the observation of the time needed to get back to the lowest level of debt should be a good indicator in our quest to find a rational explanation for discontinuities in financing behaviour.

We know that empirically „debt reductions are neither rapid, nor the result of proactive attempts to rebalance the firm's capital structure toward a long-run target" (Denis, McKeon ,2011). For them, based on US companies, since 1971, the reduction has been quite low. Seven years are needed to reduce debt by 15% at least after the peak is reached. More recently, DeAngelo, Gonçalves and Stulz (2016) estimate that „the findings are consistent with proactive deleveraging to avoid distress and to restore financial flexibility and are hard to reconcile with materially positive target leverage ratios". Based also on US companies but non-financial ones, from 1950 to 2012, they show that there is a „six-year median time from peak to trough". In both cases, authors reject the strict existence of a target leverage ratio as a first-order priority, and

the reduction of the debt level is not so rapid. This means that models which deal with capital structure should not stick to a stationary target leverage ratio for explaining capital structure choices.

We would like to compare this observation with the evolution of debt for Polish firms between 2006 and 2017. Our sample consists of an average of 50 496 firms per year, of which 84.2% are small (turnover < 10 million €). If the debt reduction proceeds quite fast, this should indicate that Polish firms do follow a defined path in debt reduction and they would like to stick to a target leverage ratio. If this is not the case, it means that we will be far from some trade-off considerations and such behaviour can rather be explained by the need for financial flexibility and the possibility to grasp opportunities in the near future. Our article is original due to the sample and also method. We use a different method and different scales (by sector and by size). To estimate how many years are needed to get back to the trough debt level, we define the trough as the median of the debt level for a period of 12 years. in this paper, we discuss the lessons from literature in the first section, in the second section we present our sample and methodology, and in the third and last section, we observe the period needed to get back to the trough on different scales: country, sector and size.

Our findings show that even if at country level we observe a net debt ratio which is increasing and which tends to reach a new target, this observation is confirmed only for small firms when we narrow the analysis with regard to firm size. This is also true when we look at the indicator of time needed to get back to the trough. For large firms, we find also a target leverage ratio, but at a higher level. For medium-sized firms, data do not support the existence of this target, which means we confirm the position that

models which deal with capital structure should not stick to a stationary target leverage ratio to explain capital structure choices, and should segment their observations and explanations to make them more efficient. The analysis at sector level confirms this observation. The target leverage ratio should not be stationary and should fluctuate according to firms' size and sectors.

Corporate deleveraging behavior, lessons from literature

Citing Newton's first law of motion, „every body persists in its state of being at rest or of moving uniformly straight forward, except insofar as it is compelled to change its state by force impressed", and applying it to trade-off models, the management of capital structure should be quite stable, with a targeted stationary leverage ratio which enables corporates to maximize their value (Almeida, Philippon, 2007). Of course, some changes are possible, but they should explain a deliberate movement to be closer to the target stationary leverage ratio or a necessary movement to reach a new target stationary leverage ratio (Flannery, Rangan, 2006). That is why, if authors support a dynamic approach towards capital structure decisions, the prerequisite is to support the view that companies adjust their level of debt to achieve a target debt ratio (Frank, Goyal, 2003). The level of target leverage could be more or less strict. For instance, Leary and Roberts (2005) suggest that firms target an optimal leverage „range" with low and high levels which act as boundaries. Interestingly, Hovakimian, Opler, and Titman (2001) show that the deviation from the target concerns principally firms that raise outside financing, and even more when corporates decide to repurchase some of their outstanding securities. Hovakimian (2004) shows that „only debt reductions offset the deviation from target leverage accumulated prior to the transaction…debt issues do not serve to reduce the deviation from the target debt ratio. The pre-debt-issue deviation from the target is essentially zero. The issuance of debt increases rather than reduces the deviation from the target". Denis and Mckeon (2011) show also that „our sample leverage increases represent deliberate decisions to move the firm away from estimates of its long-run target leverage ratio". The proof they give for this is that many firms decide deliberately to increase pay-out to equity holders and do not use such funds to reduce the level of debt and get back to their long-term target. Based on such studies, we cannot conclude that all movements toward the target are a first-order consideration. Even if managers and/or shareholders have a defined targeted level, the rebalancing process will be necessarily slow because several parameters are always in force (Harford, Klasa, Walcott, 2009). For instance, Leary and Roberts (2005) show that „while firms appear to follow a dynamic rebalancing strategy, information asymmetry costs may be an important determinant in their financing decision" and can explain some delays in the dynamic. Denis and McKeon (2011) observe in that way that seven years are needed

to note a determinant reduction in debt. DeAngelo, Gonçalves and Stulz (2016) reach the conclusion that it takes six years (median).

Database and methodology

We use the BACH database (www.bach.banque-france.fr) for our empirical observations. The period analysed is 12 years, from 2006 until 2017. As stated on the website, „the data are based on the annual statistical financial statements collected by Central Statistical Office. The survey comprises enterprises of more than 9 employees".

We make a comparison between sectors according to the NACE classification of economic activities based on Regulation (EC) No 1893/2006 of the European Parliament and of the Council, 20 December 2006. NACE is the „statistical classification of economic activities in the European Community" and it is the acronym for „nomenclature statistique des activités économiques dans la Communauté européenne". We use the 16 sectors presented in Table 1.

Table 1. Summary of sectors used in the analysis

1	Accommodation and food service activities
2	Administrative and support service activities
3	Agriculture, forestry and fishing
4	Arts, entertainment and recreation
5	Construction
6	Education
7	Electricity, gas, steam and air conditioning supply
8	Human health and social work services
9	Information and communication
10	Manufacturing
11	Mining and quarrying
12	Other service activities
13	Real estate activities
14	Transportation and storage
15	Water supply, sewerage, waste management and remediation act.
16	Wholesale and retail trade; repair of motor vehicles and motorcycles

Source: prepared by the author

We also narrow down the analysis according to firm size. We make a distinction between small firms (turnover < 10 million €), medium-sized firms (10 million € ≤ turnover < 50 million €) and large firms (turnover ≥ 50 million €).

In our sample, small firms are dominant (Table 2).

Table 2. Firms per size in our sample

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Average	Share
Large	1.197	1.459	1.702	1.338	1.558	1.701	1.755	1.804	1.870	1.963	1.936	2.156	1.703	3,4%
Medium	4.733	5.554	6.342	5.294	5.941	6.330	6.395	6.438	6.771	6.988	6.865	7.396	6.254	12,4%
Small	38.972	38.899	42.356	44.337	42.741	43.046	43.275	44.799	44.658	42.865	44.208	40.309	42.539	84,2%
Sum	**44.902**	**45.912**	**50.400**	**50.969**	**50.240**	**51.077**	**51.425**	**53.041**	**53.299**	**51.816**	**53.009**	**49.861**	**50.496**	**100,0%**

Source: prepared by the author.

To assess corporate deleveraging, we use the net-debt ratio (ND/TA), which is net debt (ND) divided by total assets (TA) in book terms. To avoid the effect of change in the number of firms per year, we divide the ratio by the number of firms. For debt (D), we add together bonds and similar obligations („bonds and similar securities issued by the entity") + amounts owed to credit institutions („debt of the entity vis-à-vis credit institutions (includes financial leasing)) + other creditors + trade payables („debts to suppliers of goods and services, net of advances made (except for payments on account")). We reduce the debt by the „cash and bank" to get the net debt (ND). Total assets (TA) in book terms are immediately given in the data base („Total assets (€ thousands)"). We also observe two other ratios: the first is ND/FA between net debt (ND) and fixed assets (FA), calculated as the sum of „Intangible fixed assets" + „Tangible fixed assets" + „Financial fixed assets" - „details of financial fixed assets relating to investments in (holdings of shares in the capital of) associates, subsidiaries and jointly controlled entities". The second is CF/ND with operational cash-flow (CF) calculated as the sum of „net profit or loss for the period" + „Provisions (net of reversals)" + „Extraordinary expenses and impairments (net of reversals), except on inventories and receivables" + „Impairments (net of reversals) on inventories and receivables" + „Depreciation and amortization on intangible and tangible fixed assets" and net debt (ND). For FA and CF, to avoid also the effect of change in the number of firms per year, we divide the amount by the number of firms.

Empirical observations from the Polish experience (2006–2017)

We start our analysis by observing data gathered on a country scale taking into account the effect of changes in the number of firms. Our first observation is that our debt net ratio (ND/TA) does not change significantly over the period. Our median absolute deviation (MAD) is low: 0.9% for a median at 25.3%. The trend looks like a quest to reach a higher target leverage ratio.

Figure 1. Debt net ratio of all firms in Poland (2006–2017)

Source: prepared by the author.

When we look at each variable in the debt net ratio, we have more volatility for TA (MAD at 608 894) than for ND (MAD at 206 649). Interestingly, we have a correlation between TA and ND.

Table 3. Correlation matrix (Pearson) between ND and TA for all firms in Poland (2006–2017)

Variables	NET DEBT	FIXED ASSETS
NET DEBT	1	0.959
FIXED ASSETS	0.959	1

Source: prepared by the author.

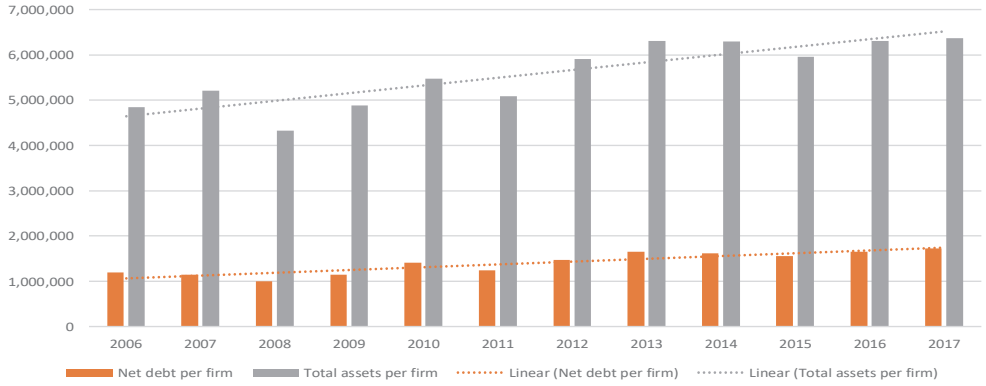

Figure 2. ND and TA for all firms in Poland (2006-2017)

Source: prepared by the author

On a country scale, we observe that from 2006 until 2017, we have a correlation between TA and ND, as both significantly increased over the period (+44% for net debt and +31% for total assets). We have more volatility for TA than ND. Our debt net ratio increased over this period, which means we can confirm existence of an optimal leverage „range" on a country scale and the quest to reach a higher level. However, our results must be made more precise by an analysis at sector level. Now we will look at evolution of ND and FA. Interestingly, we also find a correlation between ND and FA.

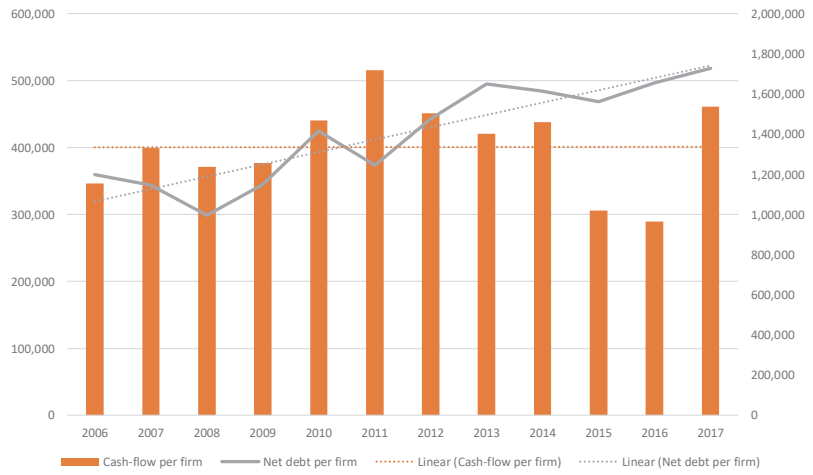

Figure 3. ND and FA for all firms in Poland (2006-2017)

Source: prepared by the author.

Table 4. Correlation matrix (Pearson) between ND and FA for all firms in Poland (2006–2017)

Variables	NET DEBT	FIXED ASSETS
NET DEBT	1	0.959
FIXED ASSETS	0.959	1

Source: prepared by the author.

On a country scale, we observe that from 2006 until 2017, we have a correlation between ND and FA, as both significantly increased over that period (+44% for ND and +51% for FA). This means that firms fund their acquisition of fixed assets using additional debt. They seem to do this even when we note a positive variation of cash-flow, because we have no correlation between ND and CF.

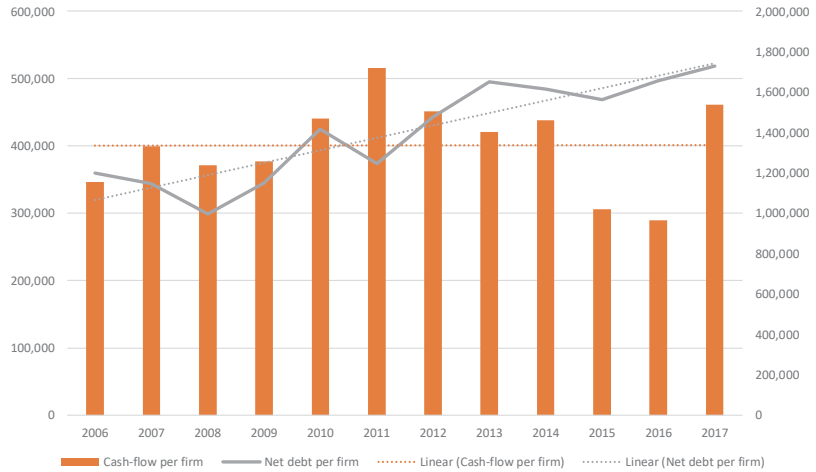

Figure 4. ND and CF for all firms in Poland (2006–2017)

Source: prepared by the author.

Table 5. Correlation matrix (Pearson) between ND and CF for all firms in Poland (2006–2017)

Variables	NET DEBT	FIXED ASSETS
NET DEBT	1	0.030
FIXED ASSETS	0.030	1

Source: prepared by the author.

To summarise, we observe quite a stable ND over the period with a correlation and major increase of ND and FA, and a more stable evolution of CF, but no correlation with ND. By keeping a range of net debt towards total assets, firms have invested in fixed assets mainly with debt in comparison with the use of internal funds (CF).

On a country scale, a trade-off view of firms' behaviour can be observed only if we agree on a flexible range of target leverage ratio and an objective to reach a higher level. Moreover, debt is used even if internal funds were available.

Small firms are dominant in our sample, as they represent 84.2% of all firms (in total from 2006 until 2017). Medium-sized firms (12.4%) are therefore more important than large firms (3.4%). When we look at the MAD for the net debt ratio, we have greater variation for large firms (MAD at 1.0%) than for small firms (MAD at 0.7%) and for medium-sized firms (MAD at 0.5%). If we look at the distribution of the net debt ratio, for small firms we have a picture of an established range. For medium-sized firms, we have a more stabilised period of six years with two major changes in the opposite direction. For large firms, the trend looks like a quest to obtain a new range.

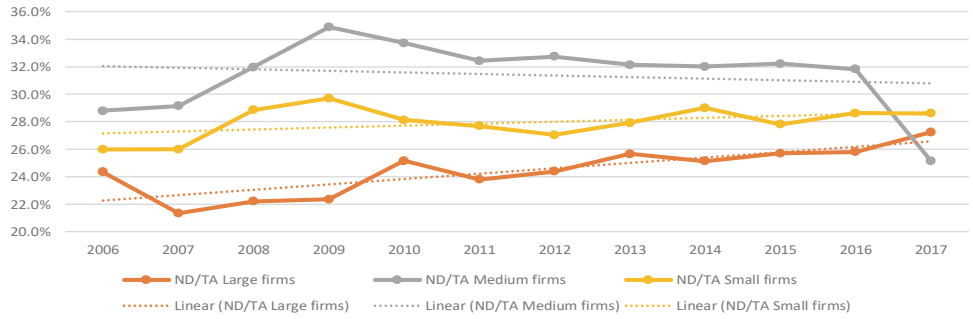

Figure 5. Debt net ratio according to size of firms in Poland (2006–2017)

Source: Prepared by the author

Looking at size, the observation of existence of a target net debt ratio is true only for small firms, which are dominant in our sample.

When we look at the ND/FA ratio, we get a picture of a target ratio for small and large firms. For medium-sized firms, the variations are significant.

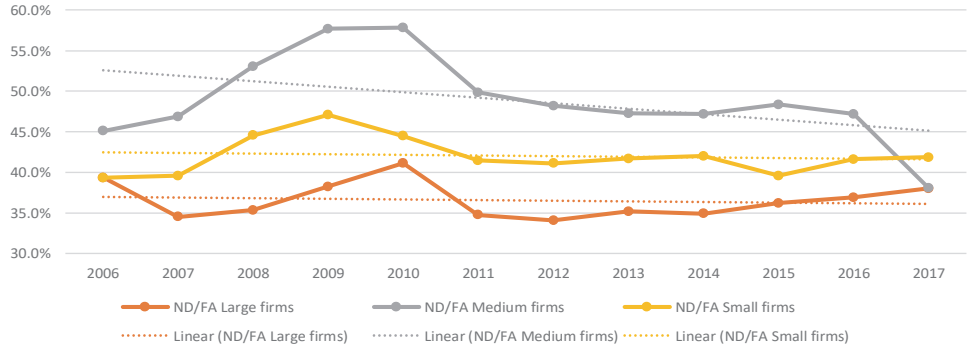

Figure 6. ND/FA according to size of firms in Poland (2006-2017)

Source: Prepared by the author

Finally, between CF and ND, we observe a decrease for all kinds of firms. Large firms show major variations between years, whereas small and medium-sized firms tend to show a more stable decreasing ratio.

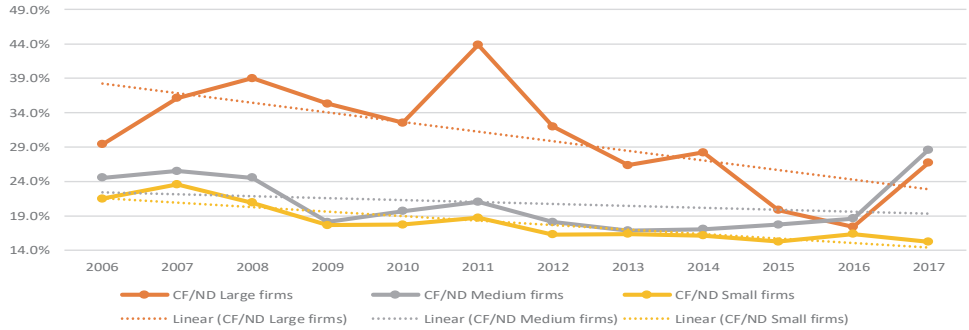

Figure 7. CF/ND according to size of firms in Poland (2006-2017)

Source: Prepared by the author

To summarise, we observe, with respect to size, existence of a target leverage ratio mainly for small firms, confirmed by its ND and FA ratio. Large firms show an objective to reach a higher level. For medium-sized firms, we have a more nuanced situation which is different than the previous ones.

For the analysis per sector, we use the method of calculating the difference between the debt net ratio of the year and the median of the period (our trough). If the difference is less than 1% or more than -1%, we consider the trough to be reached. If the difference is not in that range, we consider it at an upper or a lower limit and we calculate the number of years needed to get back to the trough. We then take the average number of years needed to get back to the target per sector. For instance, for small firms in the sector of accommodation and food service activities, we need three years, then 1 year, then four years, and finally 1 year. On average, from 2006 until 2017, small firms in the accommodation and food service activities sector need 2.25 years to get back to their trough.

Table 6. Distance between the debt net ratio and the median per year for small firms in the accommodation and food service activities sector from 2006 until 2017

2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
-11.4%	-13.5%	-6.3%	**-0.8%**	-1.7%	**0.8%**	3.0%	1.9%	3.0%	4.5%	**0.8%**	-4.8%

Source: prepared by the author.

If we apply the same method for all firms, we observe a longer period for larger firms. Small firms need in total 1.25 years to get back to their trough, whereas medium-sized firms need 1.67 years, and large firms 2.00 years.

If we take the average for all sectors, we also get the shortest period for small firms. For small firms, the average is 3.27 years, compared to 5.13 years for medium-sized firms and 3.77 years for large firms.

We now analyse this more thoroughly, at sector level. We define the upper limit as a period of five years or more to get back to the trough and the lower limit as a period of less than two years to get back to the trough.

When we look at the upper limit with sectors with the longest period (> of five years), four sectors are common to at least two categories of firms. Interestingly, we have sectors with period of 12 years, which means that during the period analysed, firms in that sector (on average) do not get back to their trough. Five of those 10 sectors are sectors which are capital intensive. Therefore we can easily imagine that the level of debt is strongly evaluative according to the volatility of the projects' needs, which require generally a high level of funds.

Table 7. Sectors with the highest period needed to get back to their targets from 2006 until 2017 according to size of firms

Sectors with highest period (>5 years)	Small	Medium	Large
Arts, entertainment and recreation	12.00	12.00	
Electricity, gas, steam and air conditioning supply	5.00		5.50
Agriculture, forestry and fishing	5.00		
Mining and quarrying		5.00	5.00
Other service activities		10.00	
Wholesale and retail trade; repair of motor vehicles and motorcycles		5.00	
Human health and social work services		12.00	8.00
Transportation and storage		12.00	
Administrative and support service activities			12.00

Source: prepared by the author.

When we look at the lower limit with sectors with the shortest period (less than two years), we have less sectors, 7 sectors compared to nine sectors in the previous case. However, just two sectors are common to at least two categories of firms. The period needed to get back to the trough is less than two years, which advocates the existence of quite a strict target and the will to stick to it. For some sectors like real estate, this observation can be justified by the existence of bank loans. When companies take out a loan with a bank, they have the obligation to respect a defined level for some ratios, like the debt-service coverage ratio:

$$\frac{\text{EBITDA} - \text{IS}}{\text{Capital} + \text{interest}}$$

and that could explain why they must keep a stricter level of debt.

Table 8. Sectors with the shortest period to get back to their targets from 2006 to 2017 according to size of firms

Sectors with lowest period (< 2 years)	Small	Medium	Large
Administrative and support service activities	1.75	1.20	
Transportation and storage	1.20		
Wholesale and retail trade; repair of motor vehicles and motorcycles	1.75		
Information and communication		1.75	1.00
Accommodation and food service activities			1.75
Real estate activities			1.50
Water supply, sewerage, waste management and remediation act.			1.25

Source: prepared by the author.

Between those two limits, we have in total 15 sectors, which means that on average firms need between two and five years to get back to their target. This illustrates the fact that firms could have a fluctuating target. The second important observation is that all firms have only one sector in common. This means that corporate deleveraging fluctuates strongly according to sectors and firm size.

Table 9. Sectors with a mid-length period to get back to their targets from 2006 until 2017 according to size of firms

Sectors with mid-length period (> 2 years and < 5 years)	Small	Medium	Large
Accommodation and food service activities	2.25	2.33	
Construction	3.00		4.50
Education	2.25	3.33	
Human health and social work services	3.00		
Information and communication	2.25		
Manufacturing	3.33	2.67	2.67
Mining and quarrying	3.00		
Other service activities	2.00		3.00
Real estate activities	2.33	3.00	
Water supply, sewerage, waste management and remediation act.	2.33	3.33	
Agriculture, forestry and fishing		2.33	2.25
Electricity, gas, steam and air conditioning supply		3.33	
Arts, entertainment and recreation			2.25
Transportation and storage			4.00
Wholesale and retail trade; repair of motor vehicles and motorcycles			2.00

Source: prepared by the author.

Conclusion

We studied corporate deleveraging in Poland in the period from 2006 until 2017 according to size and sectors of Polish firms. We based our empirical tests on the premise that we have „deliberate movements away from estimates of the target leverage ratio…and that movement toward the estimated target leverage ratio is not a first-order consideration for the sample firms" (Denis and McKeon, 2011). This explains why we estimate as a trough the median of the net debt ratio. We also observe in our sample „discontinuities in financing behaviour" (Denis, McKeon, 2011) and we try to look for „a rational explanation" (Denis, McKeon, 2011) for such patterns.

Our explanations and observations are limited to a flexible version of a trade-off with a fluctuating range of target debt ratio. Interestingly, however, this is true mainly for small firms. For large firms, we reach the conclusion that they look for a new target leverage ratio. For medium-sized firms, it is very hard to estimate a pattern.

Regarding the time needed to get back to the trough, Denis and McKeon (2011) estimate 7 years, whereas DeAngelo, Gonçalves and Stulz (2016) find six years as a median. Using a different method, we find a shorter period for getting back to the trough, between 3.27 years for small firms, 5.13 years for medium-sized firms, and 3.77 years for large firms. With respect to sector, we observe that a majority of firms per sector have a period of between two and five years. However, we observe also significant volatility between sectors, with some sectors with periods of more than five years. Such versatility makes comparison between firms trickier and should be taken into account in the analysis of corporate structure behaviour. We share the observation that models which deal with capital structure should not stick to a stationary target leverage ratio for explaining capital structure choices, and should segment their observations and explanations to make them more efficient. Future research may focus on such differences between size and sectors between countries to deepen the analysis of corporate financials' behaviour.

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