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## What's Banking Sector Concentration Got to Do with Private Equity Market?

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Working Paper D.3.4

## What's banking sector concentration got to do with Private Equity market?

Oleg Badunenko, Saloni Deva, Dorothea Schäfer and Michael Viertel

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# What's banking sector concentration got to do with Private Equity market?\*

Oleg Badunenko, Saloni Deva, Dorothea Schäfer and Michael Viertel<sup>†</sup>

## Abstract

The paper investigates the link between bank concentration and a country's buy-out market. We perform a macro level analysis for 15 European countries during 1997–2007. We estimate the elasticity of the country  $i$ 's buyout market to country  $i$ 's concentration in the banking sector. Our major finding suggests that the more concentrated the banking sector is, the better it is for the size of the buyout market. The elasticity ranges from 1 up to 3 percent depending on which bank concentration measure is employed and what segment of buyout market we look at. We also find that bank concentration is irrelevant for the average deal size. To the best of our knowledge, this is the first paper to analyze the link between banking sector developments and the market for leveraged buyouts.

**Keywords:** Private equity financing, corporate finance, banking concentration, market power, banking competition

**JEL Classification:** M14, G24, G34

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Relationship-driven transactions were very often based on direct contacts between the bank and the 'customer', the private equity fund manager, as well as on past transactions and history (European Central Bank 2007).

## 1 Introduction

Whether increased concentration in the banking sector should be welcomed or combated is far from clear. Many observers claim that a lowered competition may have positive impacts on both the solvency of individual banks and—as a consequence—the stability of the banking system as a whole. If the implications of lowered competition for direct bank lending to firms is a subject of controversial discussion, the potential virtues and vices of banking sector concentration on the Private Equity markets should be also open to dispute. After all, commercial banks have played a significant role in financing leveraged buyouts in the US and in Europe. As discussed by [Kaplan and Stein \(1993\)](#) for the US, above 70 percent of the total buyout debt was provided by banks between 1982 and 1984.

“Bank debt is debt provided to finance the buyout in the form of a senior term loan or revolving credit loan.”

Only in the highly mature phase of the take over wave in the US, the junk bond boom lowered the quantity of debt provided by US banks for LBOs to approximately 50 percent. In Europe, a significant buyout sector developed only recently. Banks have played a pivotal role in this development as the debt share of the LBO-financing came to a large extent from banks.

The current financial crisis has already proven that structural changes in the banking sector are quickly carried over the private equity markets. In particular, banks are no longer as readily willing to supply debt for LBOs as it has been the case in the previous years. Consequently the market of leveraged buyouts (LBOs) has suffered greatly during the turmoil. Throughout Europe, buyouts have declined in both number and volume in 2008. Our paper aims to shed new light on the as yet unsolved question of whether not only banking sector turmoil but also long-term structural developments affect the buyout activity. In particular, we ask whether and how changes in the concentration level in the banking sector affect the buyout market.

In principle there are two channels through which banking concentration could be transferred into the buyout market. Relationship lending is the first channel (Petersen and Rajan (1995)). For private equity investors, it is common that in order to receive low interest rates, the investors must have successful relationships with banks. Fund managers tend to use the same bank(s) frequently in order to receive efficient loans and thus with each taken loan that results in a successful investment, the relationship between the investor and bank has strengthened in previous years (European Central Bank 2007). The important role of relationship lending for buyout activities, combined with the observed link between banking sector concentration and relationship lending, immediately raises the question of whether the buyout market is affected by structural changes in the banking sector.

The second channel for transferring banking sector changes into the buyout market is the way how LBO-debt is arranged. In general banks syndicate the LBO financing, that is, a consortium of usually large banks share the debt. Until the 90s of the twentieth century, long-term business loans were considered as extremely illiquid investments (Diamond and Dybvig (1983)). Loans remained until the maturity date on the balance sheets of banks. The main cause of the illiquidity was the lack of secondary loan markets. However, the introduction of the Euro has given rise to a number of financial innovations and paved the way for securitization and selling off of long-term business loans. Securitized loans were transformed into fungible securities such as collateralized loan obligations and offered in tranches of varying risk levels to interested investors. In this way, Europe created a unified and highly liquid secondary market for securities derived from corporate loans. Banks need a certain size for being able to arrange the syndication and securitization of LBO loans. For this reason the level of concentration in the banking sector is expected to affect the availability of loans for LBOs and therefore influence the buyout market.

We analyze empirically how the degree of concentration/competition in the banking sector affects the structural achievements in the PE market. Specifically, structural macro-level data are used to evaluate the impact of increased bank market competition on LBO activity. Bank market concentration in a specific country is proxied by the Herfindahl-Hirschman Index (HHI). The lower the HHI, the less concentrated the domestic market is, implying that the higher the level of competition. A HHI equal to zero implies that the domestic market is perfectly competitive.

We employ data from two sources. Market-level data are taken from the database of the Centre for Management buyout and Private Equity Research (CMBOR). The data base includes ownership history beginning in 1997. From this base, we retrieve structural market variables for 15 European countries for the years 1997 to 2007. Some country-level data on the nature and evolution of the banking sector are adopted from the World Bank Financial Structure Database (Beck et al., 2000).<sup>1</sup>

To the best of our knowledge, this is the first paper to analyze the link between banking sector developments and the market for leveraged buyouts. Our analysis shows that bank concentration this year has an effect on the volume of the next year buyout market. The more concentrated the banking sector is, the better it is for the size of the buyout market. The elasticity ranges from 1 up to 3 percent depending on which bank concentration measure is employed and what segment of buyout market we look at. Additionally, we show that the average volume of the deal does not depend on the bank concentration.

The paper unfolds as follows. In Section 2, we briefly review the literature and develop our hypothesis. Section 3 describes the data. The empirical results and their discussion are provided in Section 4, while Section 5 concludes.

## 2 The connection between bank concentration and the buyout market

### 2.1 The link via relationship lending

The information-based hypothesis implies that in a concentrated banking market, banks have an incentive to focus on their relationships with borrowers, thus affecting the information advantage positively. This in turn increases the volume of loans given to firms and results in an increased level of corporate leverage in the market. Further, it is argued that banks tend to screen imperfectly, thus as bank market competition increases, the imperfect screening process causes the credit-worthiness of borrowers to fall. Essentially, as bank market concentration falls, loan rates increase, thus implying that fewer loans are granted. Studies using micro-level data tends to support the information-based hypothesis (e.g. Petersen and Rajan (1995), Zarutskie (2003)).

<sup>1</sup>The financial structure data were accessed at <http://siteresources.worldbank.org/INTRES/Resources/>

This notion is further emphasized by [Cetorelli and Gambera \(2001\)](#), who focus on empirical evidence regarding the impact of the banking market structure on economic growth. First and foremost, they find that bank market concentration tends to cause a deadweight loss that in fact depresses growth. This is because high concentration in the banking industry results in a lower total amount of credit available in the economy. However, there is also a counter effect as concentration tends to leave more room for improved lending relationships. Better relationships seem to benefit the growth industries by facilitating credit access of firms in these industries, especially of younger firms that are in most need of external financing. [Petersen and Rajan \(1995\)](#) argue that competitive markets are obstacles to relationship banking. In a competitive market, a bank is aware that it may not be able to establish a long-lasting lending relationships with young firms that are regarded as risky investments. Thus, if these young firms do turn out to be successful, the bank will not be able to enjoy the benefits and high returns from bearing certain informational costs initially. This is because once the young firms establish themselves in the market, they will seek lower loan rates than initially offered by the incumbent bank while the bank is attempting to recoup its original costs. Thus, it is likely that young firms are not at all financed in competitive markets due to the free-riding problem between banks. In contrast, monopoly power in the loan market provides strong incentives for banks to establish successful lending relationships with their clients. Banks give their clients better access to credit because of their market positions and the fact that they can enjoy the future surpluses generated by the relationships.

Overall the information-based hypothesis suggests that increased bank market concentration results in more relationship lending. In the case of private equity investors, it is common that fund managers tend to use the same bank(s) frequently and thus with each taken loan that results in a successful investment, the relationship between the investor and bank strengthens. In terms of relationships between banks and LBO firms, [Ivashina and Kovner \(2008\)](#) find that repeated interactions between the LBO firms and banks decrease the costs associated with information asymmetries. LBO firms are more inclined to use banks that they have a positive relationship with because these banks can better understand complex deals and the firms believe that they have a competitive advantage over other firms in receiving efficient loans. LBO firms virtually improve upon their own value by interacting repeatedly with the same banks. However, the authors also find that LBO firms often use banks that they do not have a relationship with to lead deals. Practitioners suggest that this may be because

the LBO firms must maintain competition in loan pricing and this is best done by forming relationships with numerous banks. Further, the LBO firms tend to use banks that function as financial advisors during the auction sale process. By taking into account that financing of buyouts in Europe is relationship-driven, the information-based hypothesis suggests a positive impact of banking market concentration on buyout activity.

## 2.2 The market power link

The market power hypothesis states that higher competition in the loan market increases credit availability. In contrast, monopolies tend to increase prices and constrain loan amounts so that the availability of credit retreats. Firms are more likely to diminish their use of bank debt and thus exhibit lower leverage.

[Baert and van der Vennet \(2009\)](#) perform an empirical study based on the capital structure of publicly quoted non-financial firms between 1997 and 2005 in the EU15.

“We find a negative and significant relationship between the degree of concentration of European bank markets and the market leverage of non-financial firms.”

According to the market power hypothesis the effect is driven by lower amounts of credit available. [Carbó-Valverde et al. \(2006\)](#) perform an empirical study using the Lerner index as a measure of concentration instead of the more common Herfindahl Hirshman Index (HHI). Their results show that an increase in bank market power causes higher financing constraints for firms. Similarly, [Giannetti \(2000\)](#) finds that firms are less indebted in highly concentrated banking markets, and suggests that this may be because the firms want to avoid the banks' market power.

Buyouts are affected by the availability of credit. Thus, the evidence in favor of the market power hypothesis suggests that the buyout market flourishes less if the banking market is more concentrated.



## 2.3 The securitization link

A high percent of private equity activity is financed using bank debt (Axelson et al. (2008)). Banks tend to transfer such debt to capital markets via securitization. It is commonly suggested that larger banks have a greater capacity to syndicate and securitize loans. Hakenes and Schnabel (2008) show theoretically that a low bank market competition increases credit risk transfer. The conjecture implies that the structure of the banking market affects the banks' capacity to syndicate and securitize loans. Increased securitization is expected to affect the buyout activity positively. Ahn and Breton (2009) also discuss the connection between bank market concentration and securitization. However, they suggest that the recent surge in securitization is the results of the bank's struggle to soften the effects of more competition in the loan market. On the basis of this conjecture bank market concentration and buyout activity would be linked negatively.

## 3 Data

We analyze empirically how the degree of concentration/competition in the banking sector affects the structural achievements in the PE market. Specifically, structural macro-level data are used to evaluate the impact of increased bank market competition on LBO activity. Therefore we created a panel data set consisting of 15 European countries.<sup>2</sup> It covers the development of the Europeans private equity market from 1997 until 2008.

On a regular basis the Center for Management Buyout Research (CMBOR) publishes the European Management Buyout Review. Data from CMBOR includes only the buyout stage of the private equity market and is therefore perfectly suited to examine the question. CMBOR lists a transaction as a buyout if over 50 per cent of the issued share capital changes ownership with either management or private equity firm or both jointly have a controlling stake. To measure the activity of the European private equity market we collected information about the number and the value of the buyout transactions, i.e. we define the size of the private equity market in the respective country as the aggregate transaction value of leveraged buyouts in the observed

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<sup>2</sup>Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, UK

year. Since CMBOR also lists the number of deals in one year, we have information on average deal sizes. The transaction value includes both equity and debt. We are also able to distinguish between different value ranges, which allows us to examine whether the effect of bank market concentration on mid cap and large cap transactions is different. The observed period from 1997 to 2008 captures most of the two major European buyout waves.

Buyout markets in countries that are included in the panel differ extensively.<sup>3</sup> The same variation in market size may be significant in a country with a poorly developed buyout sector but may be negligible in a country with a very mature private equity sector like the one in Great Britain. To ensure comparability of the magnitudes of market sizes between countries, we scale the total value of buyouts. More specifically, we first calculate the mean of total value of buyouts in a country over available eleven years and then we divide the total value of buyout by these country specific means. The scaling makes sure that buyout activity is comparable between countries which are, for instance, as different as Great Britain and Portugal in terms of private equity market.

The bank market concentration in a specific country is measured by the Herfindahl-Hirschman Index (HHI). The HHI is a commonly accepted measure of market concentration. Data are taken from the ECB's annual report on EU banking structures.<sup>4</sup> It is calculated by squaring the market share of each firm competing in the market and then summing the resulting numbers.

$$HHI_i = \sum_{j=1}^N s_j^2. \quad (1)$$

In our case  $s_j$  is the share of bank  $j$ 's total assets to the aggregate of the banking sector's total assets in the respective country  $i$  measured in percent. For instance, if two banks own 50 percent each of the total assets of the sector:  $HHI = 2,500 + 2,500 = 5,000$ . HHI ranges from 0 and 10,000. The lower the HHI, the less concentrated the domestic market is, implying a higher level of competition. A HHI equal to zero indicates perfect competition, a HHI equal to 10,000 means that the complete banking sector consists of one bank and thus the domestic market is a perfect monopoly. We also employ a

<sup>3</sup>Summary statistics for the size of the buyout markets in each country are reported in the Appendix.

<sup>4</sup>[http://www.ecb.int/press/pr/date/2008/html/pr081013\\_1.en.html](http://www.ecb.int/press/pr/date/2008/html/pr081013_1.en.html). Norway and Switzerland are not included in the ECB-report. Data for this countries was provided by Norwegian and Swiss central banks.

second concentration measure called CR5. CR5 measures concentration by dividing the sum of the total assets of the 5 largest banks by the sum of the banking sector's total assets.

The summary statistics of the key variables of this assessment are displayed in Tables 1-4. Tables 1-3 demonstrate the cross-country variation of the buyout activity in the observed time frame. These tables indicate that buyout sectors in United Kingdom, France, and Germany are comparatively huge. The country specific properties of bank market concentration are exhibited in Table 4. The bank market concentration in Switzerland, Finland, and the Netherlands is relatively high, whereas United Kingdom and Germany are characterized by relatively low concentration. In fact, Germany has the lowest HHI-figure of all 15 countries. The large differences indicate that just considering the levels of the concentration measures for each year may not be appropriate. Their evolution over time may not be captured properly by such an approach. Figure 1 provides a graphical representation of the interaction of the buyout sector and bank market concentration.

We also control for structural changes in the financial sector. Structural market variables are taken from the World Bank Financial Structure Database. Beck et al. (2000) explain the methodology and the structure of the database.<sup>5</sup>

## 4 Empirical results

### 4.1 Econometric model

Our base model is

$$\ln(\text{Total value}_{it}) = \alpha_1 + \beta_1 \ln(\text{Bank Concentration}_{it}) + \gamma_j \text{Control variables}_{it}^j + \mu_i + \nu_{it}, \quad (2)$$

where  $\ln(\text{Total value}_{it})$  is a logarithm of one year forwarded value of total buyouts in country  $i$  in year  $t$ .<sup>6</sup> Figure 1 shows that if the relationship between value of the buyout market and bank market concentration exists, bank concentration in year  $t$  has an influence on the value of the buyout market in the next year,  $(t + 1)$ . We have also plot-

<sup>5</sup>The Database can be retrieved from: <http://siteresources.worldbank.org/INTRES/Resources/469232>

<sup>6</sup>It is basically a logarithm of value of total buyouts in country  $i$  in year  $(t + 1)$ .

ted the current values of both total value of buyout market and bank concentration. There is a clear lag in the relationship. It is easy to imagine that the decision to commit to a buyout this year depends on the level of bank concentration that is observed in previous years.

We have modeled the relationship in logarithms for the sake of easy interpretation of coefficient  $\beta$ . Indeed,  $\beta$  from Eq. (2) will be an elasticity of the total value of the buyout market with respect to bank concentration. This lucrative advantage comes at a price since we need to make an assumption that this elasticity is *equal* for all countries. We have run four models with different combination of control variables. First, the majority of deals (and large part of each of them) is co-financed by debt, but debt traded in stock exchanges and private debt in the form of bank loans may affect the buyout market differently. Thus, it is important to control for the availability of distinct forms of debt. We construct a control variable that proxies the availability of private credit relative to the availability of publicly traded debt by dividing the “Private Bond Market Capitalization” and the “Private Credit by Deposit Money Banks” both normalized by GDP. Both variables are taken from the World Bank Financial Structure Database. The resulting ratio is called “expensiveness of the private credit”. Since GDP is generically wiped out from this ratio, we also include the Growth of GDP as a control variable. Finally, we include the “Stock Market Capitalization” as a control for the development of the financial system of a country in a given year.

Additionally, we wish to check whether bank concentration has an influence on the average deal. We thus run the following econometric model:

$$\ln(\text{Average value}_{it}) = \alpha_2 + \beta_2 \ln(\text{Bank Concentration}_{it}) + \delta_j \text{Control variables}_{it}^j + \mu_i + \nu_{it}, \quad (3)$$

where  $\ln(\text{Average value}_{it})$  is a logarithm of one year forwarded value of an average buyout in country  $i$  in year  $t$ . We define “average buyout $_{it}$ ” as a ratio of the value to the number of all buyouts in country  $i$  in year  $t$ .

## 4.2 Results

We have run four regressions for each of the equations, Eq. (2) and Eq. (3). All four include the “Expensiveness” control variable. The first specification does not include further control variables. The second and the third include “GDP Growth” and “Stock

Market Capitalization”, respectively. The fourth specification includes all three control variables. The results appear in Table 5.

Irrespective of the specification (the control variables we include in the regression), our  $\beta_1$  coefficient is positive and significant. The elasticity of buyout market volume with respect to bank concentration is around 1 percent, implying that 1 percent increase in bank concentration leads to 1 percent increase in volume of buyout market.<sup>7</sup>

The one percent increase has different implication for different countries. For example, in France, 1 percent increase in bank concentration leads to an *average* increase in total buyout market of 136 million Euro. In Sweden the increase is only a quarter of that, 37 million Euro. And even smaller is the increase in Austria: 6.5 million Euro. It should be kept in mind that although the magnitude of the effect is different across countries, it is a legacy of scaling. The effect itself, that is, the elasticity, is restricted to be the same in *all* countries.

The magnitude of  $\beta_1$  changes a little across the specifications. However, the coefficient is consistently positive and significant. The same cannot be said about the effect of bank concentration on an average deal size. The four rightmost columns of Table 5 suggest that the  $\beta_2$  coefficient is only marginally significant in two out of four specifications, and not statistically significant in other two.

Since the debt required to finance deals is especially essential for huge deals, the sensitivity of buyout market of huge deals to bank concentration is expected to be particularly large. Tables 6 and 7 present the results of this modification to test this conjecture. The regressions in the former (latter) table restricts market to deals worth more than 25 (50) million Euro. The elasticity of the buyout market to bank concentration has slightly increased from roughly 1 percent<sup>8</sup> to about 1.05 percent we consider only deals worth more than 25 million Euro, and to about 1.3 percent for deals worth more than 50 million Euro.

Therefore, the bigger the deal the more dependent is the buyout market on bank concentration. This especially concerns huge deals worth more than 50 million Euro.

<sup>7</sup>Strictly speaking, this elasticity means that a 1 percent increase in bank concentration leads to a 1 percent increase in volume of buyout market *scaled* by the country specific mean. The latter can however be omitted because of the elasticity scaling property. Denote  $Y$  be the total value while  $y$  be the total value scaled by mean. Let  $x$  be the concentration. Then  $\beta_1 = \varepsilon = (\partial y / \partial x)(x/y)$ , which is also equal to  $(\partial Y / \partial x)(x/Y)$ . The latter is the elasticity of the *unscaled* buyout market volume with respect to bank concentration.

<sup>8</sup>Here we report only the coefficients from specification IV, which has all three control variables.

The average deal is however unaffected irrespective of which deals we take into consideration. We thus conclude that bank concentration affects the entire buyout market but not the average deal.

The sign of the coefficient at the “Expensiveness” control variable is negative and the coefficient is significant. This indicates the relative importance of private credit for the buyout markets in Europe. The lower the size of the loan market relative to the size of the market for publicly traded debt is the smaller is the total buyout market. This variable is also significant in regression of “Average Value” (Eq. (3)), meaning that the “expensiveness” exerts its power on an average deal as well. Two other control variables proved statistically insignificant in nearly *all* specifications. Market capitalization matters for average deal, when we consider deals worth more than either 25 or 50 million Euro.

### 4.3 Robustness check

Bank concentration can be measured differently. The Herfindahl-Hirschman Index is one way to do so. Researchers also use the share of total assets of the five largest banks in the total assets of the entire banking industry as a bank concentration measure. We have used this measure, conventionally called CR5, to check whether our results are robust. We therefore repeat the exercise for the entire buyout market, for deals worth more than 25 and 50 million Euro and present results in Tables 8, 9 and 10 (similar to Tables 5, 6 and 7 with results with HHI as a measure of bank concentration).

The results clearly show that the conclusions we made in previous section for HHI hold for CR5 as a measure of bank concentration. Indeed, the elasticity of the volume of the buyout market with respect to bank concentration is positive and statistically significant. Bank concentration now has an influence even on average deal whenever we consider all deals or deals that are bigger than 25 million Euro. When we take only deals worth more than 50 million Euro, bank concentration does not have an effect on the average deal.

The magnitude of the elasticities are somewhat changed. Now, on average, 1 percent increase in the bank concentration measure leads to 1.7 percent<sup>9</sup> increase in total buyout market, to 2.1 percent increase in market of buyouts worth more than 25 mil-

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<sup>9</sup>Here we again report only the coefficients from specification IV, which has all three control variables.

lion Euro, and to 2.8 percent increase in market of buyouts worth more than 50 million Euro. Even though the magnitudes of the elasticities have changed, the tendency has not. Bigger deals are affected a little bit more by changes in bank concentration.

## 5 Concluding remarks

The current crisis has intensified the discussion about contagion effects spreading across financial segments and institutions. However empirical evidence about the interconnectedness of financial market segments is still scarce. This paper investigates the channel through which structural developments in the banking sectors are transferred into the private equity sector. Specifically it checks whether or not bank concentration exerts power on the buyout market.

Our empirical work based on country level data reveals a close link between the domestic banking sector and the domestic buyout market. It shows that the volume of the next year buyout market is clearly affected by the bank concentration this year. Depending on the measure of the bank concentration, we quantify the elasticity of the entire buyout market to be from 1 to 2 percent. When we, however, consider only large and huge deals, that is those exceeding 25 and 50 million Euro respectively, the elasticity gets even bigger. It ranges from 1.07 up to 3 percent for huge deals. We also find that while bank concentration has an effect on the volume of the buyout market, it does not influence the volume of the average deal.

The inter-linkages of the banking market and the private equity market have implications for the bank behaviour and for the regulation of both sectors. The close interconnectedness is also stated in the new EU regulatory proposal related to Alternative Investment Fund Managers (AIFM).<sup>10</sup> Therefore more empirical work on this issue is required. Additional beneficial evidence can be expected if, complementary to the the aggregate analysis done in this paper, firm level micro-data could be used.

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<sup>10</sup>[http://ec.europa.eu/internal\\_market/investment/alternative\\_investments\\_en.htm](http://ec.europa.eu/internal_market/investment/alternative_investments_en.htm).

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## A Summary Statistics

Table 1: Summary Statistics for Total Value of Buyouts

<b>Name</b>	<b>Mean</b>	<b>Median</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
Austria	647.82	172.90	1295.87	47.90	4701.50
Belgium	1657.77	1521.05	1205.86	342.20	4304.00
Denmark	2890.20	1351.15	4153.97	262.90	14418.10
Finland	993.57	1061.05	502.58	440.20	2228.90
France	13596.77	9030.20	9636.00	5287.70	34231.30
Germany	12726.48	12185.85	7479.64	3543.90	26487.50
Ireland	1433.12	861.85	1728.68	68.80	5021.10
Italy	5497.85	3451.65	4633.67	669.80	17380.10
Netherlands	7087.37	4893.35	7118.05	1059.00	26713.60
Norway	795.37	481.95	779.46	22.40	2464.90
Portugal	205.44	78.25	424.19	1.60	1534.80
Spain	2878.75	1933.05	2819.97	374.10	9391.00
Sweden	3754.78	2842.75	3185.17	964.80	10611.10
Switzerland	1583.08	1481.30	689.05	709.20	2766.10
UK	32417.17	29090.90	13196.40	17113.70	68133.70
<b>Total</b>	<b>5877.70</b>	<b>1798.10</b>	<b>9693.56</b>	<b>1.60</b>	<b>68133.70</b>

Table 2: Summary Statistics for Total Value of Buyouts worth more than €25m

<b>Name</b>	<b>Mean</b>	<b>Median</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
Austria	659.81	134.60	1349.00	58.00	4668.50
Belgium	1569.02	1402.05	1185.15	280.20	4224.00
Denmark	2846.62	1323.65	4138.27	215.90	14358.10
Finland	917.15	999.55	503.03	336.20	2133.90
France	12812.44	8180.70	9585.04	4422.70	33422.30
Germany	12304.40	11780.85	7494.76	3001.90	26144.50
Ireland	1493.78	958.60	1740.07	143.10	4939.10
Italy	5299.18	3233.65	4621.00	445.80	17186.10
Netherlands	6802.37	4674.35	7118.53	711.00	26413.60
Norway	813.37	481.40	765.44	124.60	2389.90
Portugal	241.02	65.50	457.58	40.00	1449.80
Spain	2694.58	1758.55	2816.69	243.10	9148.00
Sweden	3619.37	2710.25	3150.95	883.80	10477.10
Switzerland	1460.33	1395.05	702.16	568.20	2694.10
UK	29903.08	26352.90	13385.35	14206.70	65999.70
<b>Total</b>	<b>5733.04</b>	<b>1791.55</b>	<b>9308.57</b>	<b>40.00</b>	<b>65999.70</b>

Table 3: Summary Statistics for Total Value of Buyouts worth more than €50m

<b>Name</b>	<b>Mean</b>	<b>Median</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
Austria	692.54	149.40	1416.93	50.00	4668.50
Belgium	1506.69	1352.05	1154.25	208.20	4089.00
Denmark	2809.37	1305.80	4126.45	162.20	14291.10
Finland	848.32	930.55	503.49	259.20	2036.90
France	12273.69	7754.20	9424.10	4124.70	32657.30
Germany	12109.07	11573.35	7502.80	2680.90	25940.50
Ireland	1441.15	923.60	1728.55	111.10	4828.00
Italy	5070.02	3048.65	4562.27	336.80	16828.10
Netherlands	6598.12	4424.85	7146.06	497.00	26252.60
Norway	772.65	339.40	767.82	84.60	2331.90
Portugal	368.66	113.90	605.83	50.20	1449.80
Spain	2494.67	1589.55	2737.12	112.10	8787.00
Sweden	3521.45	2652.25	3150.86	778.80	10386.10
Switzerland	1412.58	1384.80	684.59	487.20	2618.10
UK	27789.42	24428.65	13009.63	12435.70	62956.70
<b>Total</b>	<b>5623.20</b>	<b>1848.20</b>	<b>8944.16</b>	<b>50.00</b>	<b>62956.70</b>

Table 4: Summary Statistics for Herfindahl Index

<b>Name</b>	<b>Mean</b>	<b>Median</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
Austria	545.27	548.00	30.68	511.00	618.00
Belgium	1683.73	1905.00	497.33	699.00	2112.00
Denmark	1187.73	1120.00	190.63	863.00	1499.00
Finland	2318.18	2240.00	276.47	1960.00	2730.00
France	597.27	597.00	97.19	449.00	758.00
Germany	158.64	163.00	22.05	114.00	183.00
Ireland	527.64	500.00	50.87	473.00	600.00
Italy	235.55	230.00	39.50	190.00	330.00
Netherlands	1765.09	1762.00	74.99	1654.00	1928.00
Norway	1246.55	1089.00	307.98	847.00	1677.00
Portugal	925.36	991.00	234.49	566.00	1154.00
Spain	459.73	482.00	86.28	285.00	581.00
Sweden	819.91	800.00	50.96	760.00	934.00
Switzerland	2413.87	2459.51	448.69	1251.93	2900.60
UK	317.91	307.00	80.11	208.00	449.00
<b>Total</b>	<b>1013.49</b>	<b>760.00</b>	<b>743.54</b>	<b>114.00</b>	<b>2900.60</b>

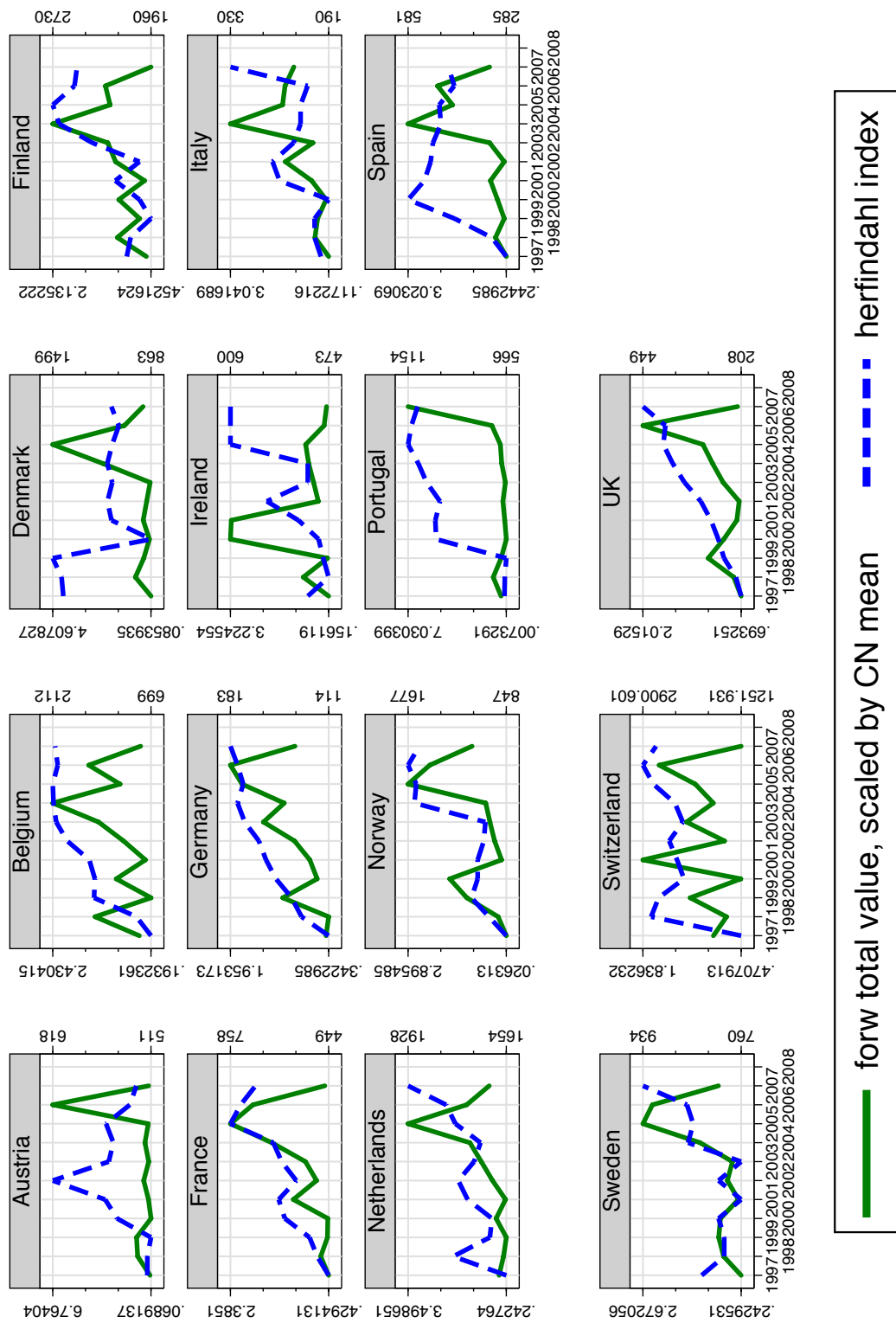


Figure 1: Development of one year forwarded value of total value of buyouts (scaled by country specific mean) and Herfindahl-Hirschman Index (HHI)

## B HHI Regressions

Table 5: One year forwarded Log-Values: log(Total Value), log(Average Value)

	log(Total Value)				log(Average Value)			
	(I)	(II)	(III)	(IV)	(I)	(II)	(III)	(IV)
natural logarithm of herfindahl index	1.0982** (0.0387)	1.0327* (0.0522)	1.0790** (0.0421)	0.9840* (0.0637)	0.5725* (0.0859)	0.5312 (0.1184)	0.5551* (0.0993)	0.4921 (0.1584)
expensiveness of the private credit	-0.4264*** (0.0009)	-0.4093*** (0.0022)	-0.4237*** (0.0009)	-0.4007*** (0.0023)	-0.2365** (0.0119)	-0.2258** (0.0216)	-0.2341** (0.0115)	-0.2188** (0.0234)
GDP Growth		-4.2411 (0.4596)		-5.2690 (0.3661)		-2.6708 (0.6294)		-3.4967 (0.5467)
Stock Market Capitalization/GDP		0.1038		0.1769		0.0937		0.1422
Constant	-7.4849** (0.0331)	-6.9359** (0.0482)	-7.4512** (0.0337)	-6.7455* (0.0543)	-3.9867* (0.0708)	-3.6410 (0.1084)	-3.9563* (0.0727)	-3.4880 (0.1290)
R-squared	0.053	0.050	0.048	0.046	0.014	0.010	0.009	0.005
N	165	165	165	165	165	165	165	165

Notes: \*, \*\*, and \*\*\* indicate statistical significance at the 5%, 1%, and 0.1% test levels, respectively; *p-values* in parentheses are based on robust standard errors that are corrected for clustering at the country level.

Table 6: One year forwarded Log-Values (Buyouts &gt; €25m): log(Total Value25), log(Average Value25)

	log(Total Value25)				log(Average Value25)			
	(I)	(II)	(III)	(IV)	(I)	(II)	(III)	(IV)
natural logarithm of herfindahl index	1.0921*** (0.0075)	1.0815** (0.0124)	1.0724*** (0.0091)	1.0476** (0.0175)	0.2803 (0.1933)	0.2746 (0.2545)	0.2015 (0.3773)	0.1498 (0.5562)
expensiveness of the private credit	-0.4181*** (0.0021)	-0.4150*** (0.0056)	-0.4154*** (0.0020)	-0.4088*** (0.0059)	-0.2393** (0.0162)	-0.2377** (0.0258)	-0.2285*** (0.0094)	-0.2148** (0.0185)
GDP Growth		-0.7887 (0.9222)		-1.5519 (0.8502)		-0.4239 (0.9401)		-3.2470 (0.5810)
Stock Market Capitalization/GDP			0.1057	0.1266			0.4244**	0.4681**
Constant	-7.4373*** (0.0060)	-7.3454** (0.0123)	-7.4040*** (0.0063)	-7.2166** (0.0150)	-1.9875 (0.1652)	-1.9383 (0.2476)	-1.8565 (0.2240)	-1.4656 (0.4001)
R-squared	0.046	0.040	0.040	0.035	0.004	-0.002	0.024	0.021
N	161	161	161	161	160	160	160	160

Notes: \*, \*\*, and \*\*\* indicate statistical significance at the 5%, 1%, and 0.1% test levels, respectively; *p-values* in parentheses are based on robust standard errors that are corrected for clustering at the country level.

Table 7: One year forwarded Log-Values (Buyouts &gt; €50m): log(Total Value50), log(Average Value50)

	log(Total Value50)				log(Average Value50)			
	(I)	(II)	(III)	(IV)	(I)	(II)	(III)	(IV)
natural logarithm of herfindahl index	1.4568*** (0.0043)	1.3959*** (0.0080)	1.4282*** (0.0046)	1.3344** (0.0111)	0.0108 (0.9557)	0.0530 (0.8043)	-0.1244 (0.5796)	-0.1274 (0.6085)
expensiveness of the private credit	-0.4807*** (0.0019)	-0.4623*** (0.0047)	-0.4769*** (0.0017)	-0.4514*** (0.0047)	-0.2123*** (0.0088)	-0.2265** (0.0141)	-0.1946*** (0.0024)	-0.1937*** (0.0078)
GDP Growth		-4.8397 (0.5335)		-6.1505 (0.4388)		3.8160 (0.3793)		-0.2187 (0.9621)
Stock Market Capitalization/GDP			0.1400	0.2206			0.6671***	0.6700***
Constant	-9.9098*** (0.0034)	-9.3743*** (0.0085)	-9.8500*** (0.0036)	-9.1351** (0.0103)	-0.2242 (0.8614)	-0.6079 (0.6785)	0.0471 (0.9734)	0.0703 (0.9654)
R-squared	0.057	0.054	0.052	0.050	-0.004	-0.006	0.057	0.051
N	159	159	159	159	156	156	156	156

Notes: \*, \*\*, and \*\*\* indicate statistical significance at the 5%, 1%, and 0.1% test levels, respectively; *p-values* in parentheses are based on robust standard errors that are corrected for clustering at the country level.

## C CR5 Regressions

Table 8: One year forwarded Log-Values: log(Total Value), log(Average Value)

	log(Total Value)				log(Average Value)			
	(I)	(II)	(III)	(IV)	(I)	(II)	(III)	(IV)
natural logarithm of cr5	1.7658** (0.0129)	1.7204** (0.0201)	1.7420** (0.0147)	1.6624** (0.0265)	0.9560** (0.0229)	0.9505** (0.0464)	0.9328** (0.0324)	0.8985* (0.0812)
expensiveness of the private credit	-0.3860*** (0.0010)	-0.3817*** (0.0033)	-0.3846*** (0.0011)	-0.3772*** (0.0037)	-0.2100** (0.0165)	-0.2095** (0.0357)	-0.2086** (0.0166)	-0.2055** (0.0380)
GDP Growth		-1.0767 (0.8691)		-1.7925 (0.7812)		-0.1304 (0.9843)		-0.7724 (0.9098)
Stock Market Capitalization/GDP			0.1249	0.1463		0.1220		0.1312
Constant	-7.0607** (0.0105)	-6.8551** (0.0190)	-7.0695*** (0.6633)	-6.7288** (0.6112)	-3.8992** (0.0173)	-3.8743** (0.0462)	-3.9079** (0.0171)	-3.7611* (0.0625)
R-squared	0.036	0.029	0.030	0.023	0.007	-0.000	0.001	-0.006
N	143	143	143	143	143	143	143	143

Notes: \*, \*\*, and \*\*\* indicate statistical significance at the 5%, 1%, and 0.1% test levels, respectively; *p-values* in parentheses are based on robust standard errors that are corrected for clustering at the country level.



Table 9: One year forwarded Log-Values (Buyouts &gt; €25m): log(Total Value25), log(Average Value25)

	log(Total Value25)				log(Average Value25)			
	(I)	(II)	(III)	(IV)	(I)	(II)	(III)	(IV)
natural logarithm of cr5	2.1188*** (0.0041)	2.1283*** (0.0067)	2.0892*** (0.0050)	2.0659*** (0.0095)	1.0306** (0.0255)	1.1387* (0.0563)	0.9351** (0.0422)	0.9456 (0.1107)
expensiveness of the private credit	-0.3857*** (0.0021)	-0.3867*** (0.0067)	-0.3840*** (0.0023)	-0.3818*** (0.0074)	-0.2427** (0.0130)	-0.2532** (0.0237)	-0.2371*** (0.0062)	-0.2381** (0.0163)
GDP Growth		0.2351 (0.9791)		-0.5443 (0.9517)		2.6682 (0.6935)		0.2457 (0.9710)
Stock Market Capitalization/GDP			0.1522	0.1584			0.4945**	0.4917**
Constant	-8.4307*** (0.0033)	-8.4742*** (0.0070)	-8.4407*** (0.0030)	-8.3405*** (0.0078)	-4.1245** (0.0217)	-4.6170* (0.0579)	-4.1606** (0.0205)	-4.2058* (0.0786)
R-squared	0.041	0.034	0.035	0.028	0.018	0.013	0.043	0.036
N	140	140	140	140	139	139	139	139

Notes: \*, \*\*, and \*\*\* indicate statistical significance at the 5%, 1%, and 0.1% test levels, respectively; *p-values* in parentheses are based on robust standard errors that are corrected for clustering at the country level.

Table 10: One year forwarded Log-Values (Buyouts &gt; €50m): log(Total Value50), log(Average Value25)

	log(Total Value50)				log(Average Value50)			
	(I)	(II)	(III)	(IV)	(I)	(II)	(III)	(IV)
natural logarithm of cr5	3.0708*** (0.0041)	2.9362*** (0.0088)	3.0188*** (0.0044)	2.8203** (0.0106)	0.4738 (0.2249)	0.7230 (0.1283)	0.3062 (0.4984)	0.4402 (0.4131)
expensiveness of the private credit	-0.4438*** (0.0012)	-0.4304*** (0.0042)	-0.4411*** (0.0012)	-0.4220*** (0.0046)	-0.2206** (0.0101)	-0.2470** (0.0158)	-0.2117*** (0.0023)	-0.2255*** (0.0081)
GDP Growth		-3.4336 (0.6865)		-4.7404 (0.5758)		6.8393 (0.1994)		3.4359 (0.5156)
Stock Market Capitalization/GDP			0.2170	0.2698			0.7317***	0.6931***
Constant	-12.1755*** (0.0034)	-11.5586*** (0.0092)	-12.1531*** (0.0032)	-11.2960*** (0.0093)	-1.9936 (0.1891)	-3.1489 (0.1062)	-1.9564 (0.2481)	-2.5388 (0.2309)
R-squared	0.059	0.053	0.054	0.049	-0.001	0.006	0.063	0.059
N	138	138	138	138	135	135	135	135

Notes: \*, \*\*, and \*\*\* indicate statistical significance at the 5%, 1%, and 0.1% test levels, respectively; *p-values* in parentheses are based on robust standard errors that are corrected for clustering at the country level.