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Wiener Institut für Internationale Wirtschaftsvergleiche

The Vienna Institute for International Economic Studies

Working Papers | 84 | June 2012

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Labour Hoarding during the Crisis: Evidence for selected New Member States from the Financial Crisis Survey

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Sandra M. Leitner and
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Labour Hoarding during the Crisis: Evidence for selected New Member States from the Financial Crisis Survey

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Abstract

During economic downturns, labour hoarding becomes an attractive human resource strategy if sizeable search and training costs render hiring and training new workers too costly. The paper sheds light on the prevalence and extent of labour hoarding in five New EU Member States and Turkey during the global financial crisis, which spread quickly like wildfire after the bankruptcy of Lehman Brothers in September 2008. It applies a unique firm-level panel, constructed by merging the World Bank Financial Crisis Survey (FCS) with the Business Environment and Enterprise Performance survey (BEEPs) and demonstrates that labour hoarding was a widely used strategy among entrepreneurs during the crisis. Furthermore, labour hoarding was particularly frequent among innovators whose substantial R&D-related training costs and extensive search costs for knowledgeable and experienced R&D personnel rendered labour hoarding more cheaply.

Keywords: *global financial crisis, labour hoarding, New Member States, firm level analysis*

JEL classification: *G01, C23, D22, J23*

Sandra M. Leitner and Robert Stehrer

Labour Hoarding during the Crisis: Evidence for selected New Member States from the Financial Crisis Survey

1. Introduction

In the face of a (temporary) fall in demand and sales, entrepreneurs may decide to hoard labour instead of massively laying off workers, in spite of the additional costs they incur. In particular, hoarding labour becomes considerably cheaper than firing workers and hiring and training new workers if substantial search and training costs are involved in the process. Search costs are large if activities workers need to perform in a firm are very specific and demands on employees are high and very unique so that necessary skills are difficult to find among potentially new workers. Hence, due to repeated advertisement, interviewing and thorough screening, both advertising and screening costs become non-negligible. Training costs are high if newly hired workers require extensive training to acquire crucial firm-specific knowledge or if incumbent workers need continuous training to keep pace with rapidly changing requirements like galloping technological change, swiftly changing consumer preferences, changing markets or market conditions.

Following the bankruptcy of Lehman Brothers in September 2008, the global economy quickly entered a recession as credits froze and global demand collapsed. The group of EU-12 countries was particularly ill-equipped to stem the tide of economic and financial turmoil since their dependence on massive capital inflows from and exports to neighbouring Western Europe rendered them particularly vulnerable to the global credit and demand crisis which soon had a tight grip on the region. Consequently, the region's GDP shrank by around 4 percent in 2009 (wiiw 2011), surpassing the fall in GDP in the US of almost 3 percent or in Latin America of around 3 percent. However, the impact of the crisis was rather heterogeneous across new member states: while the slump in real GDP was most dramatic in Latvia, Lithuania and Estonia, Poland successfully weathered the crisis without any losses in GDP. Additionally, labour markets were not spared from the crisis and unemployment rates quickly rose to around 8.5 percent in 2009 (wiiw 2011) from 7.7 percent in 2007 (wiiw 2009) as demand and production plummeted (by comparison, in 2009, unemployment rates almost reached 10 percent in the US, amounted to almost 9.5 percent in the Euro Area and climbed to 8 percent in Latin America). To contain the degree of labour shedding, different labour market measures were devised and implemented like short-time working schemes, cuts in labour costs or retraining and skill-upgrading in rapidly declining sectors (see DG ECFIN, 2009 for an overview of policy responses in EU Member States).

Against that backdrop, the analysis seeks to throw light on the prevalence and extent of labour hoarding during the global financial crisis in five New EU Member States, compris-

ing Bulgaria, Hungary, Latvia, Lithuania and Romania as well as Turkey. It uses a unique firm-level panel, constructed by merging the World Bank Financial Crisis Survey (FCS) with the Business Environment and Enterprise Performance survey (BEEPs). As such, the ensuing analysis contributes greatly to the still scarce evidence on the role of very specific firm characteristics for the widely observable labour hoarding phenomenon. There are two major findings. First, labour hoarding was a massively used strategy during the financial crisis. Second, due to substantial R&D-related training costs and extensive search costs for knowledgeable and experienced R&D technicians, labour hoarding was particularly common among innovators.

The rest of the paper is structured as follows: Section 2 discusses previous empirical evidence on the presence and extent of labour hoarding while section 3 provides an empirical backdrop of transmission mechanisms and consequences of the financial crisis in the EU-12. Section 4 describes the underlying data and methodology while section 5 presents and discusses results of the analysis. Finally, section 6 concludes.

2. Previous evidence on labour hoarding – a literature review

In his seminal work on the quasi-fixity of labour, Oi (1962) offered a rationale for labour hoarding and emphasized that due to non-negligible fixed employment adjustment costs, firms abstain from laying off workers when faced with temporarily lower demand since hoarding workers may be substantially cheaper than firing them and hiring and training new workers once demand recovers. Instead, firms tend to adjust the utilization of their labour force to accommodate short-run fluctuations in demand and production, which renders employment relatively more stable than output. The literature differentiates between two types of (gross) labour adjustment costs: i) hiring costs such as search costs (i.e. expenditures on advertising and screening) as well as ii) training costs of newly hired workers intended to improve their productivity.

Empirically, supportive evidence of labour hoarding is found at different levels of aggregation. For example, in an attempt to understand the pro-cyclical nature of labour productivity, Bernanke and Parkinson (1991) identified and analysed the roles of three competing theories (i.e. technology shocks, increasing returns or labour hoarding) in a sample of US manufacturing industries in the interwar period (1923-1939). They conclude that technology shocks very unlikely gave rise to observable pro-cyclical labour productivity but that, instead, cyclical productivity patterns result from increasing returns and labour hoarding, to different degrees though. Specifically, they highlight that labour hoarding was unambiguously the dominant practice in three US industries only: steel, rubber as well as stone, clay and glass, while a combination of both appear to have driven the pro-cyclical labour productivity in the remaining industries. Moreover, Burnside et al. (1993) analysed the Solow residual and shed light on its sensitivity to labour hoarding. They demonstrate that a size-

able portion of movements in the Solow residual are due to labour hoarding so that standard real business cycle (RBC) models overestimate the variance effect of innovations to technology by around 50%.

Similar evidence is also found at the establishment and firm levels. Fay and Medoff (1985) studied labour adjustment patterns in a small sample of US manufacturing establishments during economic downturns and emphasize that around 4 percent of blue-collar labour paid for by the typical plant during economic downturns can be classified as hoarded. The extent of the effects of the 1997 Asian Financial Crisis on firms located in Indonesia, Korea, Malaysia, the Philippines and Thailand was subject of the analysis by Hallward-Driemeier et al. (2000) who point at evidence of non-negligible labour hoarding in Indonesia, Thailand and Malaysia, while, despite strong union movements, labour hoarding was lowest in Korea. In addition, labour hoarding was found to be more prevalent in the non-export than the export sector.

Moreover, a growing body of empirical literature seeks to identify specific firm characteristics that are associated with more intense labour hoarding. For example, Dietz et al. (2010) analysed the role of labour hoarding for stabilizing the German labour market during the 2002-2003 recession. They apply data from the IAB Establishment Panel covering the recession from 2002 to 2004 and find evidence that labour hoarding was comparatively more prominent in the service sector than the manufacturing sector and more dominant and common among small establishments. Bohachova et al. (2011) set out to shed light on the comparatively muted employment responses in Germany to the recent economic crisis. They use establishment-level panel data from the German IAB Establishment Panel from 2000 to 2009 and demonstrate that labour hoarding differed across economic sectors and crucially depended on the degree of product market competition firms faced and on firm-level labour market institutions. Specifically, labour hoarding was dominant among service sector firms, in firms that operated in less competitive environments, had institutionalized works councils or faced less stringent and binding collective agreements. In contrast, during the global financial crisis, labour hoarding appeared independent of firm size.

3. Effects of the global financial crisis in the New Member States

Before the financial crisis spread globally and hit the global economy with full force in 2009, the New Member States (EU-12 henceforth) and Turkey were steadily catching up with the EU-15 countries. Between 2001 and 2008, average real GDP growth in the EU-12 and Turkey amounted to around 5 percent and 4.5 percent, respectively. Within the region, the Baltic States emerged as growth champions with average growth rates of around 7 percent while Malta was at the bottom end of economic growth with an average growth rate of around 2 percent only.

However, after the collapse of Lehman Brothers in September 2008, the EU-12 countries and Turkey got sucked into the vortex of the global financial crisis and real GDP took a nosedive. The Baltic States, the former growth champions, were hit the hardest and in 2009 real GDP plummeted by almost 18 percent in Latvia, by around 15 percent in Lithuania and by around 14 percent in Estonia (Table 1). With between 8 to 7 percent, Slovenia, Hungary and Romania experienced similar grave contractions in real GDP. Turkey shared a similar fate and saw its real GDP fall by almost 5 percent in the face of the globally unfolding economic and financial turmoil. In contrast, thanks to sound macroeconomic and financial management, Poland escaped from the crisis relatively unscathed and even grew by around 1.6 percent at the height of the crisis in 2009.

Table 1

Annual real GDP growth rates

Country	2001	2002	2003	2004	2005	2006	2007	2008	**2009**	2010	2011
Bulgaria	4.15	4.65	5.51	6.75	6.36	6.51	6.45	6.19	**-5.48**	0.39	1.67
Cyprus	4.02	2.13	1.87	4.24	3.86	4.13	5.09	3.59	**-1.85**	1.14	0.48
Czech Republic	3.10	2.15	3.77	4.74	6.75	7.02	5.74	3.10	**-4.70**	2.74	1.65
Estonia	6.28	6.56	7.77	6.34	8.85	10.10	7.49	-3.67	**-14.26**	2.26	7.64
Hungary	3.71	4.51	3.85	4.80	3.96	3.90	0.11	0.89	**-6.80**	1.26	1.69
Lithuania	6.70	6.84	10.28	7.37	7.79	7.81	9.80	2.91	**-14.84**	1.44	5.87
Latvia	7.35	7.22	7.60	8.86	10.12	11.15	9.60	-3.28	**-17.73**	-0.34	5.47
Malta	-1.55	2.81	0.13	-0.50	3.67	2.87	4.33	4.12	**-2.71**	2.30	2.06
Poland	1.21	1.44	3.87	5.34	3.62	6.23	6.79	5.13	**1.61**	3.94	4.35
Romania	5.68	5.08	5.24	8.49	4.15	7.87	6.32	7.35	**-6.58**	-1.65	2.45
Slovakia	3.48	4.58	4.77	5.06	6.66	8.35	10.49	5.75	**-4.93**	4.18	3.35
Slovenia	2.94	3.83	2.93	4.40	4.01	5.85	6.87	3.59	**-8.01**	1.38	-0.17
Turkey	-5.70	6.16	5.27	9.36	8.40	6.89	4.67	0.66	**-4.83**	9.01	7.47

Source: wiiw database

In its global drive, the crisis found different channels of transmission and eventually gained a foothold in the group of EU-12 countries through two major channels, namely trade and capital flows. Firstly, given the region's rapidly advancing economic integration and its emergence as an important link in the globally increasing fragmentation of production value and supply chains, trade channels have been particularly strong and the quickly spreading crisis severely hurt local producers due to the plunge in global, but particularly in EU-15-wide, demand for goods and tradable services. Specifically, in 2009, when the crisis unfolded in the EU-15 and consequently the region's major export market collapsed, exports in the group of EU-12 countries dropped by between around 12 percent and 25 percent (see Table 4 in the Appendix). Across the group of EU-12 countries, exports collapsed most dramatically in Lithuania (by -25 percent), Estonia (by -22 percent) and Bulgaria (by -20 percent) but least in smaller economies like Malta (by -11 percent), Cyprus (by -12 percent) or in Turkey (by -14 percent), an EU candidate country.

Secondly, before the crisis unfolded, the EU-12 had been a major recipient of massive capital inflows (in particular inward FDI), predominantly from the EU-15, leading to partly substantial capital account deficits, rapidly expanding volumes of short-term credits and an alarming accumulation of foreign-currency denominated private debt. However, in the wake of the financial crisis, net foreign capital inflows came to a halt and even reversed in all EU-12 countries but Bulgaria, Poland and Slovakia (Jevcak et al, 2010). These capital outflows were of the most liquid type of investment like portfolio investment and financial derivatives, while inward FDI flows staggered and faltered but remained an important source of capital for the region. In 2009, inward FDI flows dropped in all but three economies (Cyprus, Estonia and Malta). The plunge in inward FDI flows was most dramatic in Slovenia (by -135 percent), Slovakia (by -100 percent) and Lithuania (by -97 percent) but fairly moderate in Poland (see Table 5 in the Appendix).

Table 2

Annual unemployment rates (2000-2011)

Country	2000	2001	2002	2003	2004	2005	2006	2007	2008	**2009**	2010	2011
Bulgaria	16.4	19.5	18.2	13.7	12.1	10.1	9.0	6.9	5.6	**6.8**	10.2	11.1
Cyprus	4.8	3.9	3.5	4.1	4.6	5.3	4.6	3.9	3.7	**5.3**	6.2	7.8
Czech Republic	8.7	8.0	7.3	7.8	8.3	7.9	7.2	5.3	4.4	**6.7**	7.3	6.8
Estonia	13.6	12.6	10.3	10.0	9.7	7.9	5.9	4.7	5.5	**13.8**	16.9	12.5
Hungary	6.4	5.7	5.8	5.9	6.1	7.2	7.5	7.4	7.8	**10.0**	11.2	10.9
Latvia	13.7	12.9	12.2	10.5	10.4	8.9	6.8	6.0	7.5	**17.1**	18.7	--
Lithuania	16.4	16.5	13.5	12.5	11.4	8.3	5.6	4.3	5.8	**13.7**	17.8	15.4
Malta	6.7	7.6	7.4	7.7	7.2	7.3	6.9	6.5	6.0	**6.9**	6.9	6.4
Poland	16.1	18.3	20.0	19.7	19.0	17.8	13.9	9.6	7.1	**8.2**	9.6	9.7
Romania	6.8	6.6	7.5	6.8	8.0	7.2	7.3	6.4	5.8	**6.9**	7.3	7.4
Slovakia	18.8	19.3	18.7	17.6	18.2	16.3	13.4	11.1	9.5	**12.0**	14.4	13.4
Slovenia	6.7	6.2	6.3	6.7	6.3	6.5	6.0	4.9	4.4	**5.9**	7.3	8.1
Turkey	--	--	--	--	--	9.2	8.7	8.8	9.7	**12.5**	10.7	--

Source: Eurostat

Until the onset of the global financial crisis, labour markets in the EU had performed and developed fairly well. In 2007, the average employment rate in the group of EU-12 countries approached 65 percent while the unemployment rate was 7.7 percent (wiiw 2009). Across EU-12 countries, unemployment rates differed greatly and were highest in Slovakia with around 11 percent, followed by Poland with around 10 percent and Hungary just below the 8 percent threshold. In contrast, with around 4 percent, unemployment rates were lowest in Cyprus and Lithuania (Table 2). And with almost 9 percent, the unemployment rate was relatively high in Turkey.

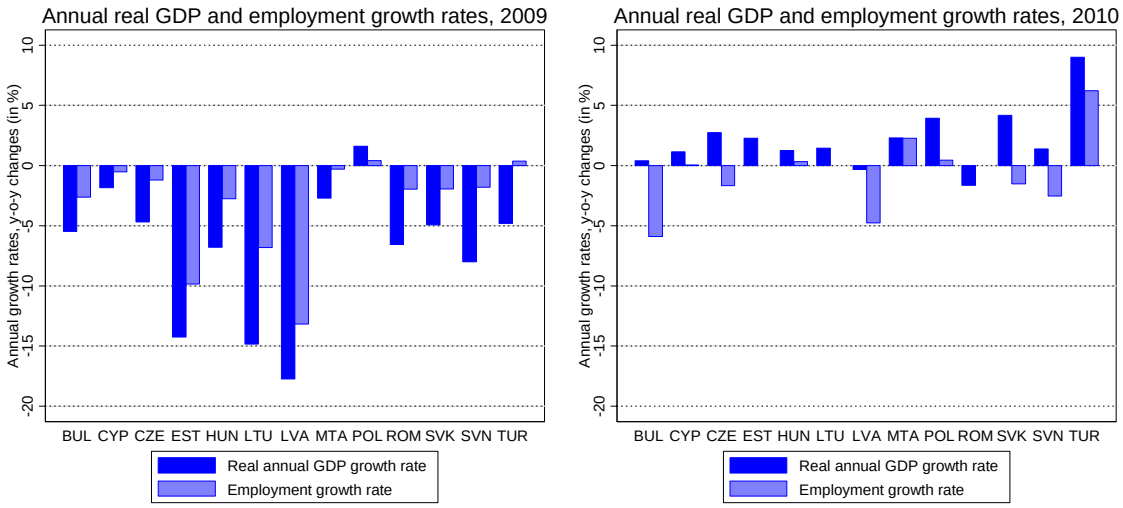
However, labour markets started to deteriorate from mid-2008 onwards and in 2009, when real GDP hit rock bottom, unemployment rates soared. The Baltic States, which suffered

the most pronounced plunge in real GDP growth, also experienced the strongest increases in unemployment of around 10 percentage points between 2007 and 2009.

Partly dramatic plunges in real GDP notwithstanding, the rise in unemployment was comparatively moderate however, a phenomenon attributable to widespread labour hoarding during the recession. Figure 1 approaches the issue differently and compares changes in real GDP to changes in employment for 2009 and 2010 for all EU-12 member countries plus Turkey. It highlights that in the crisis year of 2009, in the majority of countries considered, the contraction in real GDP far exceeded the drop in employment – a clear indication of labour hoarding. Specifically, real GDP dropped by between 2 to almost 18 percent while employment fell by between 0.3 and 13 percent only. Turkey enjoyed an exceptional position as employment expanded (slightly) despite deteriorating GDP growth. In 2010, when recovery was on the way already and the majority of economies (except for Latvia and Romania) returned to positive growth, employment only slowly recovered in Cyprus, Hungary, Malta and Poland while in Turkey employment kept its impetus and rose even further. The former pattern points at the presence of labour hoarding during the 2010-recovery year. In contrast, despite growing GDP, employment contracted even further in Bulgaria, the Czech Republic, Latvia, Slovakia and Slovenia.

Figure 1

Comparison of real GDP and employment growth rates in 2009 and 2010



Source: wiiw database.

Moreover, as the crisis unfolded, numerous economies implemented flexibility-enhancing labour market policies like short-time working schemes to cushion negative effects on labour markets, particularly to contain the extent of job losses. Consequently, between 2008 and 2009, average hours worked dropped by 1.7 percent in the EU-12 (relative to a drop of 1.5 percent in the EU-15) (Stehrer and Ward, 2012). But crisis-related reductions in average hours worked differed across sectors and were most pronounced in industry and con-

struction, where average hours worked contracted by 3.4 percent and 2.8 percent, respectively. In contrast, agriculture and public administration, education and health experienced a minor drop in average hours worked of 0.3 percent only.

4. Data and methodology

In this paper the phenomenon of labour hoarding is considered from a firm-level perspective. The analysis applies a unique firm-level panel, constructed by merging the World Bank Financial Crisis Survey (FCS) with the Business Environment and Enterprise Performance survey (BEEPs), a joint initiative of the World Bank (WB) and the European Bank for Reconstruction and Development (EBRD).

The FCS was designed and developed to capture the effects of the global financial crisis on sales and supplies, employment, finance and R&D expenditure of private firms in six countries, comprising Bulgaria, Hungary, Latvia, Lithuania, Romania and Turkey. It was conducted in three consecutive waves between 2009 and 2010: the first wave was carried out in June/July 2009, the second wave in February/March 2010 and the third wave in May/June 2010. The FCS firm sample represents a subsample of firms interviewed in the 2009 round of the BEEPs and is representative of the private non-agricultural formal economy.[1]

The BEEPs collects information on the quality of individual firms' business environment, how it is perceived by them, how it changed over time, identifies various constraints or obstacles to firm performance and growth, and captures the effects a country's business environment has on firms' international competitiveness. So far, the survey was conducted in four consecutive waves in 1999-2000, 2002, 2005 and 2009 and collected comparative firm panel data for a broad group of transition economies. Country-samples are representative of the overall non-agricultural economy[2] and were selected using random sampling with replacement, stratified by firm size, business sector and geographic region.

The ensuing analysis uses a merged firm panel comprising BEEPs data from the 2009 round, referring to 2007 and (partly) to 2004, and FCS data from the 1st and the 3rd waves, referring to mid-2009 and mid-2010, respectively. As such, BEEPs data refer to the pre-crisis period while FCS data refer to the post-crisis recovery period and capture effects of and responses to the global financial crisis.

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1 In Turkey, the first FCS wave (2009) covers the manufacturing sector only, while the following two waves refer to the overall private sector.

2 The non-agricultural economy comprises all manufacturing sectors (ISIC rev.3.1: group D), the construction sector (ISIC rev.3.1: group F), the service sector (ISIC rev.3.1: groups G and H) as well as the transport, storage and communications sector (ISIC rev.3.1: group I).

The focus of the analysis rests on labour productivity responses to the crisis as captured by the difference between the annual sales growth rate and the annual employment growth rate. Specifically, the 2009-BEEPs asked respondents to provide information on the total number of permanent, full-time employees at the end of 2007 as well as of 2004, from which annualized average employment growth rates were calculated for the pre-crisis period. Similarly, the 1st (and 3rd) wave of the FCS collected data on the total number of permanent, full-time employees at the end of the last completed month (i.e. mid-2009 and mid-2010) which were used to calculate the annual employment growth rate for the post-crisis period. Furthermore, the 2009 round of the BEEPs also collects data on total annual sales for fiscal years 2004 and 2007 which were transformed into annualized average sales growth rates for the pre-crisis period. For the sake of comparability and compatibility, information on sales were taken from the 3rd wave of the FCS which asked respondents to indicate how sales for the last completed month in 2010 have changed compared to the same month in 2009 (i.e. from mid-2009 to mid-2010): whether sales have increased (by how much in %), decreased (by how much in %) or remained the same. All in all, labour productivity growth rates vary widely. Outliers were eliminated according to the three-sigma rule so that extreme values in excess of 380 or smaller -100 were eliminated and excluded from the analysis.

Methodologically, a random-effects feasible generalized least squares estimator (FGLS) is applied which assumes that none of the explanatory variables is correlated with the unobserved effect.

Specifically, the following model is estimated:

$$grLP_{it} = \alpha_0 + \beta_1 t + \gamma_A X_{Ait} + \delta_B (t * X_{Ait}) + \upsilon Y_{it} + \omega Z_{it} + u_{it} \quad (1)$$

where $grLP_{it}$ is the annual labour productivity growth rate of firm i at time t. More specifically, for the 2004-2007 pre-crisis period, $grLP_{it}$ is the annualized average labour productivity growth rate, while for the post-crisis period, $grLP_{it}$ refers to the annual labour productivity growth rate between 06/07 2009 and 06/07 2010. t is a dummy variable which is equal to 1 for the crisis-period and 0 otherwise and captures the effects of the global financial crisis on labour productivity. X_{Ait} is a matrix of A firm characteristics, Y_{it} is a vector of 17 ISIC rev. 3.1 sector dummies while Z_{it} is a vector of 5 country dummies that are assumed to capture, among other things, the roles of product market conditions or labour market institutions and regulations on sales and employment fluctuations. Finally, u_{it} represents the error term. Generally, there is evidence of labour hoarding if labour productivity growth is significantly lower during the crisis than before when entrepreneurs hang on to their workers so that any decline in sales far exceeds cuts in employment.

As for firm characteristics, a dummy for exporter status is included for firms whose sales from exporting domestically produced goods and tradable services exceed a minimum

threshold of 10% of total sales. Given their exposure to fierce international competition, the obstacles and difficulties they encounter with opening up and penetrating new foreign markets or their need to comply with and adapt to international quality and technical standards, exporters make high operational and technical demands on their employees. Therefore, strong emphasis may be put on training and human resource development, resulting in high training costs as well as substantial firing costs due to the considerable loss of firm-specific knowledge and human capital of dismissal. Hence, faced with temporarily lower demand, exporters may pursue a strategy of massive labour hoarding.

Moreover, as emphasized by Sharpe (1994), labour hoarding is less pronounced in smaller firms which, during economic downturns, face relatively high opportunity costs of capital and therefore see a strong need to conserve their working capital. He applies annual manufacturing firm data taken from the R&D Master File constructed from the Standard & Poor's Compustat files for the period from 1959 to 1985 and shows that employment of smaller firms is more sensitive and more strongly reacts to changing macroeconomic conditions.

Similarly, substantial labour hoarding may be more common and widespread among innovators which face sizeable training and search costs. Given their uncertain and novel nature, innovative activities are highly resource and knowledge intensive. Hence, to satisfy the very specific R&D needs of their employers, R&D staff has to (continuously) undergo specific training to acquire particular crucial state-of-the-art technological knowledge. Moreover, due to the innovator's specialized R&D needs, it may be more difficult and time and cost-intensive to find the proper match so that search costs may also be very large. The firm's innovator status is captured by means of a dummy variable which is equal to 1 if, prior to the crisis, the establishment has spent on R&D activities (either in-house or outsourced). As for the period after the crisis, the FCS does not directly gather information on establishments' expenditure on R&D but instead surveys whether, over the last 3 to 12 months (i.e. between 2009q1 and 2010q1 or between 2008 and 2009), R&D spending has either increased, remained unchanged or decreased. Hence, for the post-crisis period, the innovator dummy is equal to 1 only if establishments reported a decrease in R&D spending, as only in this case, R&D expenditure were positive before and innovators were identifiable without a doubt. In contrast, the dummy was set equal to 0 if R&D spending either increased or remained the same, as R&D expenditure may have been zero before so that non-innovators would erroneously have been classified as innovators.

Traditionally, labour hoarding is considered to be a dominant strategy among state-owned firms which face 'softer budget constraints'[3] and can therefore afford to over-employ or hoard labour, despite falling demand. Specifically, in the light of non-negligible budgetary

[3] The term was coined by Kornai (1982) to describe situations in which losses of firms are cross-subsidized while profits are taxed heavily.

support of loss-making state-owned firms in terms of substantial cross-subsidies or easy credits, the maintenance of idle surplus labour becomes a viable employment strategy. To capture the idea that labour hoarding may be more pronounced among (majority) state-owned firms, a dummy variable is included which is set equal to 1 if the state or government owns more than 50% of a firm. And since ownership is not captured in the FCS, it is determined by the pre-crisis status and assumed to have remained unchanged over time.

In addition, a dummy variable is included for majority foreign-owned firms (with more than 50% owned by private foreign individuals, companies or organizations) to capture that the strong pressure that weighs heavily on foreign-owned firms to more flexibly and cost-efficiently adjust to changing competitive forces emerging in the international arena give rise to lower labour hoarding but to stronger and quicker labour adjustments. However, supportive empirical evidence is scarce. Jungnickel and Keller (2003) use a West-German sub-sample of the IAB establishment panel to test whether employment strategies differ among West German firms and foreign-owned firms. They, however, do not find strong support of more flexible employment strategies pursued in foreign-owned firms.

Finally, the degree of labour hoarding may also crucially depend on firm age. Younger, more recently established firms that are still in their infancy and therefore at the beginning of their learning and growth trajectories are more vulnerable to external macroeconomic shocks. Hence, firm sales are expected to drop more substantially in response to contracting demand. Moreover, younger firms may have invested substantially in training activities of their workforce to meet their administrative and technical needs, to raise overall firm productivity and profitability and to guarantee survival and sustainable and continuous growth. However, since training activities take time to take noticeable effect, productivity improvements may not have materialized yet so that in the face of high (sunk) training costs, younger firms tend to hoard labour once sales drop to also benefit from their training investments. This is corroborated by findings of Brown and Earle (2002) who study the reallocation of workers and jobs in Russian industry between 1990 and 1999 and emphasize that labour destruction rates are significantly lower in de novo firms. A dummy variable is included in the analysis to account for the role of firm age on labour hoarding. It is set equal to 1 if the firm was younger than 5 years of age before the crisis set in and 0 otherwise.

5. Results

Results of the analysis are presented in Table 3 below, for three different samples separately. Column (1) looks at the overall firm sample and highlights that during the financial crisis labour productivity growth was significantly lower by around 19 percentage points. Hence, overall, during the crisis labour hoarding was a massively used strategy as employers abstained from drastically cutting their labour forces despite the dramatic slump.

Moreover, during the financial crisis, labour hoarding was significantly more common among innovators only which suffered on average almost 13 percentage points lower labour productivity growth. This finding is supportive of the idea that due to substantial training and search costs they incur, innovators avoid massive lay-offs but instead turn to labour hoarding to cope with temporary losses in demand and sales, experiencing a temporary drop in labour productivity along the way.

Table 3

Estimation results for different samples

Dep.Var.: labour productivity growth rates

	Whole sample	Manufacturing	Services	Other
Variables	(1)	(2)	(3)	(4)
Constant	10.644***	9.637*	18.713***	9.314
	(2.73)	(1.79)	(3.31)	(1.58)
Time	-18.774***	-21.133***	-21.160***	-14.803**
	(5.52)	(3.84)	(3.46)	(2.32)
Exporter	3.031	1.919	-10.347	2.356
	(1.14)	(0.58)	(-1.00)	(0.41)
Time*exporter	1.378	4.596	26.472	-1.070
	(0.31)	(0.79)	(1.36)	(0.12)
Medium-sized	0.262	3.961	-4.655	0.064
	(0.11)	(1.06)	(0.93)	(0.01)
Time*medium-sized	0.381	-0.376	6.534	-3.036
	(0.09)	(0.06)	(0.80)	(-0.38)
Large	-1.123	4.184	-7.747	-3.105
	(0.41)	(1.02)	(1.39)	(0.62)
Time*large	6.573	0.038	13.108	13.085
	(1.44)	(0.01)	(1.40)	(1.54)
Innovator	4.149**	2.623	2.985	7.856**
	(1.99)	(0.86)	(0.69)	(1.98)
Time*innovator	-13.362***	-8.031	-23.321***	-15.437**
	(3.31)	(1.35)	(2.67)	(2.11)
Majority state-owned	-5.071	-3.614		-3.934
	(0.36)	(0.15)		(0.23)
Time*majority state-owned	43.829**	4.262		52.412**
	(2.10)	(0.11)		(2.09)
Majority foreign-owned	-0.228	3.444	1.706	-5.605
	(0.06)	(0.60)	(0.20)	(0.83)
Time*majority foreign-owned	4.817	-0.346	-8.298	21.194**
	(0.80)	(0.04)	(0.63)	(2.02)
Young	4.513	4.567	0.228	7.288
	(1.34)	(0.91)	(0.04)	(1.11)
Time*young	-8.472	-5.441	-11.343	-11.748
	(1.55)	(0.69)	(1.10)	(1.02)
Country dummies	YES	YES	YES	YES
Industry dummies	YES	YES	NO	YES
No. of observations	2,529	1,216	623	690
Adj. R^2	0.135	0.156	0.202	0.116

Note: Robust z-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.1. Country and industry dummies are included but coefficients are not reported here to conserve space but are available upon request. The manufacturing sector comprises section D (ISIC rev. 3.1), the service sector refers to retail only while so-called other sector covers wholesale, IT, hotel and restaurants, services of motor vehicles, construction and transport.

In addition, in order to throw light on potentially diverging patterns and strategies of labour hoarding among firms that operate in different sectors, columns (2) to (4) look at three sectors separately, namely the manufacturing sector (ISIC rev. 3.1: section D), the service sector (comprising retail only) as well as the so-called other sector (comprising wholesale, IT, hotel and restaurants, services of motor vehicles, construction and transport). Generally, the results reveal that during the financial crisis, labour hoarding was strongest in the manufacturing sector, followed by the service sector and the other sector. Moreover, there is evidence that massive labour hoarding among innovators was a phenomenon of the other sector only where due to labour hoarding, labour productivity growth among innovators was on average almost 15 percentage points lower during the crisis.

In contrast, no evidence is found that either exporter status, firm size or ownership status affected the degree of labour hoarding among selected emerging economies during the global financial crisis.

6. Conclusion

Though costly, entrepreneurs may turn to labour hoarding instead of massively laying off workers when faced with a temporary fall in demand for their products or services, particularly if, due to non-negligible search and training costs, hoarding is substantially cheaper than firing and hiring and training new workers once demand recovers.

The analysis applies a unique merged firm-level panel for 5 New EU Member Countries (Bulgaria, Hungary, Latvia, Lithuania and Romania) as well as the Candidate Country Turkey and analyses the prevalence and extent of labour hoarding during the global financial crisis. Specifically, it seeks to identify very specific firm characteristics that are associated with massive labour hoarding. Generally, the New Member States, whose pre-crisis growth engine was predominantly fuelled by substantial capital inflows from and exports to neighbouring Western European countries, got quickly drawn into the undertow of the globally unfolding financial crisis and real GDP nose-dived, exports collapsed and capital inflows reversed. Unemployment picked up quickly but remained manageable as entrepreneurs hoarded labour and turned to and implemented short-term work agreements to conceal massive labour shedding.

It confirms that overall, labour hoarding was a massively used strategy among employers who hung on to their workers despite dramatic losses in demand and sales. As for specific firm characteristics, the analysis reveals that only one type of firm practices labour hoarding to a significant extent: due to substantial training costs aimed at endowing R&D personnel with vital state-of-the-art technological knowledge as well as extensive search costs for knowledgeable and experienced R&D technicians, innovators only resorted to hoarding labour once demand for their products and services collapsed.

Furthermore, the analysis also looked at the degree of labour hoarding in different sectors and demonstrates that, across sectors, labour hoarding was most prevalent in the manufacturing and service sectors but least customary in the so-called other sector comprising wholesale, IT, hotel and restaurants, services of motor vehicles, construction and transport. Finally, evidence is found that labour hoarding among innovators was sector-specific and widely practiced among innovators in the other sector only.

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Appendix

Table 4

Annual export growth rates

Country	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Bulgaria	6.99	6.61	10.38	18.74	-10.96	71.91	12.92	12.72	-19.54	24.72	23.67
Cyprus	8.39	-6.23	-2.34	9.90	8.57	6.76	8.63	2.55	-12.46	6.11	5.42
Czech Republic	15.84	6.75	3.81	15.98	16.54	17.51	13.58	10.49	-15.04	19.95	14.47
Estonia	6.79	-0.88	9.37	17.32	22.79	12.02	10.71	7.14	-22.40	26.78	30.32
Hungary	12.84	5.18	1.80	14.65	12.54	18.99	16.06	6.61	-17.72	18.49	10.65
Lithuania	22.03	17.36	6.39	12.04	27.09	17.98	9.09	24.93	-25.10	29.78	27.06
Latvia	9.53	4.55	3.62	17.04	26.73	15.68	24.12	10.33	-17.51	18.86	22.98
Malta	-9.42	7.59	-5.65	-0.26	3.69	25.07	12.09	5.64	-11.05	19.85	7.36
Poland	14.02	4.50	6.36	19.94	18.37	21.14	15.44	14.31	-15.43	22.24	7.01
Romania	12.36	14.65	6.34	19.68	20.65	19.51	15.83	16.38	-14.96	21.77	18.82
Slovakia	10.36	7.76	21.09	13.30	15.81	28.11	26.62	12.94	-17.22	20.01	15.17
Slovenia	8.94	7.55	2.53	13.32	13.50	15.66	16.36	4.12	-17.63	12.38	11.20
Turkey	2.62	2.67	0.51	20.08	14.14	12.38	10.86	13.14	-13.86	13.70	6.76

Source: wiiw database

Table 5

Annual growth rates of inward FDI flows

Country	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Bulgaria	-18.1	8.5	88.8	47.8	15.2	97.4	45.5	-25.7	-63.8	-27.0	-40.2
Cyprus		518.1	-29.5	11.2	8.5	52.7	11.3	-40.6	158.7	-76.9	
Czech Republic	16.7	44.2	-79.4	113.8	133.3	-53.4	75.7	-41.7	-53.4	145.1	-27.8
Estonia	41.9	-49.1	168.0	-6.3	199.3	-37.9	38.7	-40.5	12.0	-12.2	-78.6
Hungary	46.4	-27.5	-40.7	82.2	79.5	-11.4	-47.7	47.7	-73.0	19.6	-173.4
Lithuania	21.0	54.7	-79.3	289.7	32.6	75.3	1.7	-9.0	-96.5	1108.5	78.2
Latvia	-66.9	81.8	0.7	89.1	10.8	135.8	27.3	-49.0	-92.2	317.6	304.9
Malta	-57.6	-264.9	-279.4	-62.8	71.3	170.0	-49.9	-22.0	10.6	24.4	
Poland	-38.3	-31.4	-7.0	151.7	-18.6	88.9	9.6	-41.2	-7.9	-28.3	48.2
Romania	12.8	-6.3	60.6	166.3	0.6	73.8	-19.6	30.5	-63.3	-36.4	-13.6
Slovakia	-15.3	148.6	-56.5	27.5	-20.0	91.0	-29.3	26.1	-100.1	-8475.0	49.3
Slovenia	176.6	317.5	-84.3	145.9	-29.0	8.8	115.2	20.3	-135.3	-158.3	186.9
Turkey	250.3	-69.2	31.6	50.5	268.6	92.0	2.0	-18.6	-54.0	14.8	

Source: wiiw database

Table 6

Annual growth rates of inward FDI flows

Variable	Obs	Mean	Std. Dev.	Min	Max
Labour productivity growth rate	2529	10.22	42.14	-100	333.62
Time	2529	0.33	0.47	0	1
Exporter	2529	0.22	0.41	0	1
Medium-sized	2529	0.35	0.48	0	1
Large	2529	0.31	0.46	0	1
Innovator	2529	0.45	0.50	0	1
Majority state-owned	2529	0.01	0.08	0	1
Majority foreign-owned	2529	0.09	0.29	0	1
Young	2529	0.11	0.31	0	1

Table 7

Correlation matrix – overall sample

	Time	Exporter	Medium-sized	Large	Innovator	State-owned	Foreign-owned	Young
Time	1							
Exporter	-0.014	1						
Medium-sized	-0.012	0.003	1					
Large	-0.018	0.237	-0.491	1				
Innovator	-0.319	0.067	-0.024	0.098	1			
State-owned	0.019	0.006	0.025	0.033	-0.002	1		
Foreign-owned	0.052	0.142	-0.077	0.181	0.007	-0.025	1	
Young	0.042	-0.009	-0.012	-0.087	-0.040	-0.028	0.014	1

Table 8

Correlation matrix – manufacturing sector

	Time	Exporter	Medium-sized	Large	Innovator	State-owned	Foreign-owned	Young
Time	1							
Exporter	-0.013	1						
Medium-sized	-0.031	-0.013	1					
Large	-0.015	0.293	-0.562	1				
Innovator	-0.323	0.049	-0.056	0.096	1			
State-owned	0.012	0.060	0.058	-0.021	0.017	1		
Foreign-owned	0.052	0.191	-0.075	0.194	-0.024	-0.020	1	
Young	0.080	-0.011	0.028	-0.108	-0.072	-0.023	0.013	1

Table 9

Correlation matrix – service sector

	Time	Exporter	Medium-sized	Large	Innovator	Foreign-owned	Young
Time	1						
Exporter	-0.034	1					
Medium-sized	0.008	-0.036	1				
Large	-0.060	0.185	-0.396	1			
Innovator	-0.386	0.044	0.036	0.127	1		
Foreign-owned	0.047	0.125	-0.108	0.265	0.050	1	
Young	0.022	-0.005	-0.079	-0.043	0.009	0.033	1

Table 10

Correlation matrix – other sector

	Time	Exporter	Medium-sized	Large	Innovator	State-owned	Foreign-owned	Young
Time	1							
Exporter	0.039	1						
Medium-sized	0.009	0.015	1					
Large	0.026	0.069	-0.461	1				
Innovator	-0.248	0.087	-0.024	0.062	1			
State-owned	0.034	-0.053	0.002	0.102	-0.021	1		
Foreign-owned	0.060	0.096	-0.058	0.102	0.024	-0.044	1	
Young	-0.011	0.008	-0.018	-0.087	-0.025	-0.041	0.004	1

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P.b.b. Verlagspostamt 1060 Wien