Working Papers 2018 21

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OCTOBER 2018

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Lisbon, 2018 • www.bportugal.pt

Working Papers | Lisbon 2018 • Banco de Portugal Av. Almirante Reis, 71 | 1150-012 Lisboa • www.bportugal.pt •
Edition Economics and Research Department • ISBN (online) 978-989-678-618-2 • ISSN (online) 2182-0422

CEO Performance in Severe Crises: The Role of Newcomers

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October 2018

Abstract
A firm's optimal choice of a CEO involves a trade-off between hiring newcomers – who take time to profit from learning by doing – and avoiding CEO turnover or opting for internal successions – risking that the old guard fall prey to an experience trap, repeating the same old business practices. When firms are hit by an aggregate economic shock, exogenous, unexpected, and unprecedented in nature, reach, magnitude and persistence, conducting 'business as usual' no longer applies and having in office a newcomer – a CEO hired recently from another firm – may turn out to be particularly valuable to efficiently abandon old management practices. We use a unique matched firm-employee dataset for Portuguese firms in the wake of the last economic crisis, to estimate the value of a newcomer CEO, who is by nature prone to avoid the experience trap. During the crisis, firms run by newcomer CEOs outperform those run by high tenured and/or internally promoted CEOs in terms of both value added (GVA) and sales. We estimate a performance gap of approximately 18%, and confirm that no such gap exists prior to the crisis. Firms managed by newcomers are also less likely to fail during the crisis. Propensity Score matching confirms our difference-in-differences results. Our findings are robust to different measures of firm performance, across different samples and specifications, and to the inclusion of several CEO and firm controls, including fixed effects. Finally, we show that newcomer CEOs make different decisions in terms of personnel, expenditure, investment and international trade, attaining higher productivity levels.

JEL: G34, L25, J24

Keywords: Firm performance, CEO tenure, Great Recession.

Acknowledgements: The authors thank Cláudia Custódio, Tiago Cavalcanti, Enlinson Mattos, Susana Peralta, Fernando Anjos and Miguel Ferreira for helpful comments. The authors also thank the participants of the seminars in Fundação Getúlio Vargas' São Paulo School of Economics and Nova SBE; and the 2018 International Research Meeting in Business and Management held in Nice, France. The opinions expressed in the paper are those of the authors and do not necessarily coincide with those of Banco de Portugal or the Eurosystem. Any errors and omissions are the sole responsibility of the authors.

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1. Introduction

Top executives impact strategic choices and firm performance in significant ways, maybe especially so during major crises. A significant body of work has investigated which CEO attributes are associated with the highest levels of firm performance, but very few papers analyze the existing trade-offs. A key trade-off is that of selecting a CEO new to the firm and the function – who may require a period of 'learning by doing', versus an experienced insider – who masters 'business as usual' but may fall prey to an 'experience trap', becoming incapable of performing in new and challenging circumstances. Firms choose their CEO along the tenure-origin locus as to maximize the net value of the CEO inter-temporal performance, for given expectations about the future. However, if unexpected circumstances materialize, such as a major crisis, the optimal mix of CEO characteristics will likely change. A severe economic crisis implies a strong disruption in demand or financing conditions, and may require newcomer CEOs – that is, recent external hires, able to respond more creatively and effectively to the unexpected circumstances.

This paper estimates the impact on firm performance of newcomer CEOs – those recently recruited outside the firm – during the European sovereign debt crisis. We use a comprehensive firm-employee matched dataset covering the universe of top managers and business firms in Portugal, one of the countries most affected by the crisis. The sovereign debt crisis and the subsequent economic and financial adjustment program were exogenous to the firms, unexpected and unprecedented in nature, reach, and magnitude, making this event the basis of our identifying strategy.[1]

When firms are hit by a shock, conducting 'business as usual' becomes a less attractive option, raising the risk of getting caught in an experience trap. The two characteristics that make CEOs more likely to avoid the experience trap are being a recent promotion to an executive position, and being hired in the market, i.e. not being and internal promotion. We label CEOs combining these two characteristics as newcomer CEOs. Since newcomers are recent hires, when compared to high-tenured CEOs they are less committed to the status-quo as far as managerial options, willing to take more risk, and drive change by tackling problems from new and promising angles. While the position of a newcomer is not yet secured at the current firm, and their incentives to perform well are at the highest, their nature as external hires makes them also

1. Other strategies using exogenous shocks which affect CEO turnover – hires, firings, or separations, were used in the past to identify the causal connection between CEO characteristics and firm performance. This avenue is pursued in Murphy and Zimmerman (1993), Chang *et al.* (2010) and Fee *et al.* (2010), for hires, and Bennedsen *et al.* (2007), who uses CEO deaths.

more aware of their value in the labor market[2], turning them less risk averse and reinforcing their willingness to innovate in their management strategies. Conversely, higher-tenured CEOs, aside from being more imbued in the firms old ways, might feel less the urge to innovate, due to a lower risk of losing their job (Buhai *et al.* (2014) argue that higher seniority is associated with a lower probability of lay-offs).

It is widely accepted in the literature that CEOs begin their career with a knowledge deficit, but learn rapidly their function. Some papers have estimated the ideal length of time for a CEO to hold office (Luo *et al.* 2013). Wu *et al.* (2005) show that, with time, low-tenured CEOs take more risk and undertake bolder initiatives, expand their knowledge and widen their repertory of skills, improving firm performance but, after some point, become myopic, risk-averse, and slow to adapt to changing circumstances, overly wedded to early formulas. Henderson *et al.* (2006) also show that, after some time, tenure starts to hurt performance. In line with these views, Hambrick and Fukutomi (1991) suggested that the relationship between CEO tenure and firm performance can be described as an inverted U. In this vein, longer-tenured CEOs have been shown to favor the avoidance of losses over the pursuit of new gains, as suggested in Luo *et al.* (2013). As outsiders, newcomers are also less likely to commit blindly to obsolete strategies in face of new challenges, bringing richer, diversified experiences from other organizations. Indeed, the common perception is that CEOs recruited in the market are more likely to make bolder changes than those internally promoted.[3] However, research is inconclusive on whether these bolder changes actually lead to better performance, after controlling for the operating conditions prior to the hire. On the one hand, Bidwell (2011) and Zajac (1990) argue that external hires perform worse than internal movers, even if they are paid substantially more. On the other hand, Huson *et al.* (2004) find evidence that operating performance improves when an outsider, as opposed to an insider, is appointed.

Our paper contributes to the existing literature in three ways. First, we use a new and powerful identification strategy, by collecting data on observed firm behavior during the sovereign debt crisis of 2011-2013, in which Portugal experienced a severe economic downturn, unequaled in the OECD except for Greece.[4] The depth and unexpected nature of the crisis precluded

2. Custódio *et al.* (2013), who compute the CEO pay increase associated to generalists, find that this pay gap increases when the CEO is hired from outside the firm.

3. Conventional wisdom suggests that an external solution for leadership is a common option for those firms that have stagnated or are in deep financial distress. Notice, however, that in our case, since we will consider a systemic crisis, it may not be as immediate to make the current CEO responsible for low performance.

4. Immediately before the crisis, credit to non-financial corporations was growing at a faster pace in Portugal than in the Eurozone as a whole, but the economy accumulated important macroeconomic imbalances that would make it highly vulnerable to the crisis. A sudden stop occurred in 2011, resulting in a severe decrease in employment and a sharp

preemptive actions on the part of firms, including anticipatory CEO hires. Therefore, the CEO in place when the economic crisis started had been, in most cases, previously appointed and was expected to operate under different circumstances. This allows us to identify the association between CEO type and firm performance. We do not suggest that newcomers always outperform other CEOs. Instead, we present robust evidence that they become more valuable in the event of a major crisis. In other words, the mix of characteristics of the CEO in place when the crisis occurs becomes central to the firm, the more so as the crisis makes it difficult for companies to re-optimize and change CEO. Second, we use data for the period before and during the crisis, allowing us to detect, evaluate and assess how the CEO characteristics change their contribution to firm performance from normal to crisis times. Third, the availability of uniquely detailed CEO and firm-level data is a necessary condition to pursue this type of research, and we put together a unique set of information by merging two large micro-level databases covering the universe of firms and CEOs in Portugal: Quadros de Pessoal, which collects extensive information on both firms and workers; Informação Empresarial Simplificada (IES), which collects detailed information on balance sheet and income statements for the universe of Portuguese firms.

Our results show that firms run by newcomer CEOs significantly outperform those run by other CEOs during the crisis, both in terms of value added (GVA) and sales. Notably, this difference in performance is observed during the crisis, but not before. Our results are broadly consistent with Henderson *et al.* (2006), who shows that industry uncertainty magnifies the negative impact of longer-tenured CEOs. Moreover, it is associated with newcomers, whether transitioning from executive or non-executive positions in the origin firm. The performance gap, in terms of GVA, is of approximately 17.8 per cent during the crisis years, and not statistically significant during non-crisis years. In addition, firms managed by newcomers reach higher values of productivity – in terms of sales and value added per worker, and generate more value per unit sold. Firms run by newcomer CEOs are also less likely to fail and go out of business during the crisis. Moreover, these firms are also associated with a higher accumulation of capital during the crisis, stemming from higher investment, and have easier access to short and, especially, long-term debt, suggesting a 'signaling' value of hiring a newcomer CEO. Newcomer CEOs are able to keep a higher number of workers during the crisis, pay higher wages and incur higher total costs, while becoming more efficient, as they reduce costs per unit sold. Finally, firms managed by newcomers become more open to trade during this period and, more specifically, export a higher share of their total sales. Overall, our results suggest that newcomer CEOs are able to amass resources and make decisions

drop in sales for most firms. We consider the crisis as an unexpected exogenous large shock, transversal to the economy, which left virtually no firm unharmed.

that lead not only to better performance, but also higher productivity. Our findings are robust to the inclusion of CEO and firm controls, including firm fixed effects, and are present irrespective of whether the firms are managed by one or more CEOs, and whether or not those are also owners.

Taken together, our results strongly support our hypothesis that newcomers deliver better firm performance during crises, when compared to high tenured and/or insider peers. This is in line with the idea that, in times of distress, the existing management paradigm is no longer suitable, and it is important to challenge 'business as usual' and adapt to new circumstances, escaping the 'experience trap'.

2. Sample and data description

Our data combines information drawn from two different panel datasets: Quadros de Pessoal (QP) and Informação Empresarial Simplificada (IES). QP is a micro longitudinal dataset, collected by the Portuguese authorities, with matched employer-employee data that include all private firms and workers operating in Portugal. Reported data cover the firm, the establishment and each of its workers. The survey is mandatory for all establishments with wage-earners and contains information regarding the firm (including size, sales, capital) and the workers (including gender, age, schooling, hours worked and monthly earnings). QP includes a personal identification number that enables tracing individuals across time, which allows us to use information from the past (since 1986) to observe a workers promotion within or from outside a firm to the CEO post. In addition, we draw on yearly data from IES for information regarding the firm's balance sheet and income statements. IES is the system through which corporations report mandatory information to the tax administration and the statistical authorities. Data is available from 2005 onwards, covering virtually the universe of Portuguese non-financial corporations. Our final sample covers the period from 2008 to 2013.

The sample is restricted to firms for which we can identify a CEO. There is no direct way to do so in the database, however each worker is classified according to the National Classification of Occupations and assigned a professional grade level in QP. Professional grade levels are defined by law, and each firm is obliged to classify each job accordingly. We define CEOs as workers classified simultaneously as chief executives in the National Classification of Occupations and in the highest hierarchical grade level, which corresponds to top managers (following Lima and Centeno (2003)). The sample is restricted to firms reporting no CEO turnover between 2008 and 2013.[5] It is important

5. In the sample of firms managed by a non-owner CEO, approximately 16 per cent of the firms observe CEO turnover sometime between 2008 and 2013. This figure drops to approximately half, if we consider only CEO hires during the crisis period.

to stress that results only change marginally without this restriction.[6] Finally, the sample is limited to firms already operating in at least one of the pre-crisis years (2008-2010), a requisite to be able to measure the impact of the crisis on the firm's performance. Our final sample consists of 225629 CEO-firm-years, representing around 50718 firms and 63683 CEOs.

2.1. Data harmonization issues

In QP, in the period between 1986 and 2013 the national classification of occupations was revised several times and the last change occurred in 2010. From this year onwards, we use the latest classification of occupations and are able to identify accordingly the workers classified as CEOs. However, in order to identify which firms maintained their CEO before and through the crises, it is necessary to compare the classifications prevailing before and after 2010. We proceeded by using the official table of harmonization published by Statistics Portugal, taking also into consideration that there was a lag in the adoption of the new classifications by some firms.

We also encounter a problem in IES, since in 2010 there was a change in the official firm accounting system from Plano Oficial de Contas (Official Accounting Plan) to Sistema de Normalização Contabilística (Normalized Accounting System), which was driven by the need to comply with EU regulations. This leads to small differences in the definition of some of the variables which, however, have a negligible influence on the series under consideration.

2.2. Newcomers and CEO and firm characteristics

Table 1 presents summary statistics for the two main measures of firm performance used in this paper, GVA and sales, as well as CEO and firm characteristics that are used as covariates in the analysis. Appendix A provides variable definitions and data sources.

Table 2 shows the average characteristics for firms with newcomer and 'non-newcomer' CEOs – those who have been internally promoted or/and have a higher than median executive tenure, and tests for the difference.

As expected, newcomers have a significantly lower tenure at a management position, tend to be younger and hold higher degrees of education. In addition, the share of female CEOs is higher amongst newcomer CEOs. As to firm's

6. In the body of the paper we restrict ourselves to firms not undertaking CEO changes, such that we can consider having a newcomer in office at the time of the crisis as exogenous to the firm. A simple regression analysis, available upon request, shows that there is no significant difference in performance during the crisis period, between firms that did and didn't change their CEO. Morevorer, the results regarding newcomers presented in the paper, hold across both groups.

	Mean	Median	Stand. Deviation	Minimum	Maximum
CEO characteristics:					
Outside CEOs	0.868	1	0.328	0	1
CEO tenure	7.257	7	4.277	1	25.5
CEO age	44.839	44.5	9.106	18	76
CEO gender	0.277	0	0.411	0	1
Education	5.011	5	1.834	1	10
Firm characteristics:					
GVA (log)	11.018	10.961	1.466	-4.605	20.447
Total sales (log)	12.290	12.131	1.464	-4.605	21.304
Firm age	11.976	9	10.883	0	224
No. of workers	9.061	4	46.048	1	6252
No. of establishments	1.207	1	1.268	1	158

TABLE 1. Summary statistics
This table presents the mean, median, standard deviation, minimum and maximum fo each variable used in the baseline regressions presented in the next section, for the full sample during the period 2008-2013. The sample consists of all firms (with no CEO turnover during or immediately before the crisis) and for which CEO data are available. Variable definitions are provided in Appendix A.

	Newcomer	Non-newcomer	Difference	
CEO characteristics:				
CEO tenure	3.710	10.102	-6.392	***
CEO age	41.596	47.439	-5.844	***
CEO gender	0.294	0.264	0.030	***
Education	5.220	4.842	0.378	***
Firm characteristics:				
GVA	10.719	11.257	-0.539	***
Total sales	11.984	12.536	-0.552	***
Firm age	6.283	16.542	-10.259	***
No. of workers	6.528	11.092	-4.564	***
No. of establishments	1.157	1.247	-0.090	***

TABLE 2. Newcomer statistics: CEO and firm characteristics
This table presents the mean of CEO and firm characteristics for the sample of newcomer CEOs and non-newcomer CEOs and the associated difference. Variable definitions are provided in Appendix A. *, ** and *** indicates significance at the 10%, 5% and 1% level, respectively

characteristics, those with newcomer CEOs tend to be smaller (both in terms of number of workers and production scale) and younger.

2.3. CEOs and firm owners

Throughout our analysis, we will split our sample along two dimensions: the number of CEOs at the firm, and whether at least one of those CEOs is, simultaneously, the employer/firm owner. This distinction is important, because a higher number of CEOs may 'dilute' the connection between CEO

characteristics and firm performance, while ownership may also affect incentives in an important way. In Table 3 we present the average CEO and firm characteristics for those with a single non-owner CEO or a single owner CEO.

	1 CEO: not the owner	1 CEO: the owner	Difference	
CEO characteristics:				
CEO tenure	7.185	7.031	0.153	***
CEO age	45.863	44.246	1.617	***
CEO gender	0.253	0.267	-0.015	***
Education	5.406	5.061	0.345	***
Firm characteristics:				
GVA	11.537	10.763	0.774	***
Total sales	12.916	10.381	2.535	***
Firm age	12.916	10.381	2.535	***
No. of workers	20.517	5.978	14.539	***
No. of establishments	1.347	1.155	0.191	***

TABLE 3. CEOs and firm owner statistics
This table presents the mean of CEO and firm characteristics for the sample of owner CEOs and non-owner CEOs and the associated difference. Variable definitions are provided in Appendix A. *, ** and *** indicates significance at the 10%, 5% and 1% level, respectively

Owners tend to be slightly younger, are more often females and hold lower levels of education. Average tenure of CEOs at a management position is around 7 years, irrespective of being the owner or not. Firms run by owners tend to be considerably smaller, both in terms of number of workers and establishments as well as in terms of GVA and sales.

3. Do newcomers deliver better firm performance in times of crisis?

Uncovering the causal association between CEO characteristics and firm performance is not an easy task. As the assignment of CEOs to firms is not random, separating the impact of CEO attributes from firm's characteristics is a challenging endeavor, so that a statistically significant coefficient associated to a CEO type may be due to unobserved firm characteristics which may be, in turn, correlated with the CEO. We propose an innovative route to overcome this endogeneity problem. Our identification strategy is based on the argument that the context in which firms operated changed drastically and unexpectedly during the sovereign debt economic crisis. Moreover, given that the crisis affected virtually all firms, each firm was constrained and possibly unable to re-optimize their choice of CEO in wake of the economic shock. Therefore, in great part, firms were stuck with a CEO hired before the crisis, and suitable for a context that was no longer valid. In sum, the unexpected and severe nature of the crisis created a laboratory to conduct our analysis and investigate causality.

3.1. Baseline regressions

We start with a difference-in-differences analysis, where the treatment is defined as a firm being 'hit' by the crisis while being led by a newcomer CEO, hired a few years before in the market. Our control group consists of firms with CEOs with either high tenure and/or internally promoted. The fact that a firm enters the crisis with or without a newcomer CEO is considered exogenous to the firm's characteristics. Being in the treatment or control group is considered unrelated to other unobserved characteristics affecting the dependent variable. In the difference-in-differences procedure we consider the treatment period as the crisis years (2011 to 2013), and the baseline period 2008 to 2010, the years just before the crisis. Our benchmark specification is:

$$Ln(GVA)_{it} = c + \beta_1 Crisis_t + \beta_2 Newcomer_{it} + \beta_3 Crisis_t * Newcomer_{it} + \beta_4 X_{it} + \gamma_i + e_{it} \quad (1)$$

where the outcome variable is GVA (or total sales) in firm i at year t. The constant term captures the mean outcome for the control group – before the crisis. The treatment dummy takes the value of 1 for firms with newcomer CEO, capturing any ex-ante differences between the treatment and control groups. The coefficient on the crisis dummy captures the common impact of the economic downturn on all firms. Finally, and most relevant to our exercise, the interaction term between the crisis and newcomer dummies – a dummy variable taking the value one for firms with newcomer CEOs during the crisis period – tests whether these firms display a significant difference in performance during the crisis. X_{it} is a vector of CEO and firm controls, γ_i are the dummies for each firm and e_{it} is the error term.

In our specifications, all available observable covariates are added as controls, minimizing omitted variable bias and the possibility that the results are driven by firm or CEO characteristics. By adding firm fixed effects, we also address the issue of time-invariant unobservables, which may lie behind the CEO-firm match so that no time-invariant firm-specific omitted variables drive our results. In this identification procedure, we also control for innate CEO attributes. This is important as most of the firms in the database have a single CEO and display no CEO turnover in the period of the crisis, making firm and CEO dummies equivalent. In other words, we are in fact controlling for any time invariant firm or CEO characteristics, while not able to disentangle the two.

Difference-in-differences models require the fulfillment of a parallel trend assumption.[7] This assumption requires that the average change in the control

7. Another pre-condition for the validity of this type of analysis is that the 'program' is not implemented based on pre-existing differences in outcome. In our case, this is not a

group is the counterfactual of the treatment group, in the absence of treatment. In the current case, we need to assess whether average changes in GVA across firms were the same during the crisis after controlling for all observable factors and time-invariant unobservables, assuming no difference in CEO type. There is no direct way of testing the identifying assumption. Instead, we follow a method proposed by Baltrunaite *et al.* (2012) and examine the residuals from the regression of the GVA on the vector of controls X_{it} and the vector of firm fixed effects for the treatment and control groups before the crisis. Comparing the averages of the residuals for the two groups, before the crisis, we find that they are not statistically different. In sum, the unpredicted part of the GVA before the crisis is essentially the same in treated and control firms, which further supports our identification strategy.

Table 4 presents the results of the difference-in-differences estimation. Columns 1 and 2 report estimates considering GVA as the dependent variable, first those from a simple OLS regression, and then firm fixed effects are added. In columns 3 and 4 we present the same set of results for total sales. Throughout, we control for CEO attributes – gender, age and education, and firm characteristics – number of workers, establishments, and firm age. Standard errors are clustered at the firm level, to adjust for within firm correlation.

The crisis dummy has, as expected, a consistent negative and significant coefficient, capturing the common downturn in performance for all firms. Our variable of interest, the interaction term between the crisis and treatment dummies, has a consistently positive and significant coefficient across all specifications. Relative to similar firms, firms under the direction of newcomers during the crisis, deliver better performance that corresponds to a 17.8 per cent (16.4 log points) GVA gap and 17.4 per cent (16 log points) in terms of sales. It is important to notice that the coefficient of the newcomer dummy *per se* is not consistently significant, indicating there is no evidence of a performance gap prior to the crisis. This result is consistent with our hypothesis that newcomers become valuable in times of crisis, but do not necessarily foster better firm performance in normal times, when the gains from learning by doing may outweigh the risk of getting caught in an experience trap.

So far we have defined a newcomer CEO as an external hire with tenure lower than the sample median (years employed at the current firm at a management post). We re-estimate specifications 2 and 4 from Table 4 using different upper thresholds for the tenure of a newcomer CEO, maintaining the condition that they are external hires. Figure 1 plots both the coefficients of interest, *crisis*treatment*, for the GVA and Sales specifications for different

problem since the sample is restricted to firms with no CEO turnover during the crisis, nor immediately before. Adding this feature to the unpredictability of the crisis, it is possible to conclude that having a newcomer in office when the crisis set in is an exogenous event, not the result of a voluntary choice.

	Firm Performance			
	Gross Value Added		Sales	
	OLS (1)	Firm fixed effects (2)	OLS (3)	Firm fixed effects (4)
Crisis	-0.154***	-0.140***	-0.104***	-0.099***
	(0.011)	(0.016)	(0.013)	(0.013)
Newcomers	0.000	-0.033	0.046**	0.027
	(0.013)	(0.021)	(0.023)	(0.019)
Newcomers*crisis	0.161***	0.164***	0.135***	0.160***
	(0.017)	(0.022)	(0.022)	(0.020)
CEO age	0.001**	0.006	0.001	-0.008
	(0.001)	(0.006)	(0.001)	(0.006)
CEO gender	-0.005		-0.099***	
	(0.011)		(0.023)	
Education	0.020***	0.011	0.032***	0.005
	(0.003)	(0.010)	(0.006)	(0.006)
Firm age	-0.002***	-0.008**	-0.001	0.002
	(0.000)	(0.004)	(0.001)	(0.004)
No. of workers	0.266***	0.674***	0.356***	0.626***
	(0.017)	(0.026)	(0.026)	(0.025)
No. of establishments	-0.005***	0.002	-0.007*	0.002
	(0.001)	(0.003)	(0.004)	(0.002)
Average performance	0.799***		0.681***	
	(0.017)		(0.024)	
Observations	22,324	22,534	23,194	23,783

TABLE 4. Newcomers and firm performance: difference-in-differences
This table presents difference-in-differences estimates of ordinary least squares (OLS) and firm fixed effects panel regressions of the logarithm of gross value added (GVA) and total sales on newcomer chief executive officers (CEOs). The treatment variable is defined as being a newcomer in a top management position at the firm. Newcomers are defined as having CEO tenure below the sample median and as having been hired externally (outsiders). The treatment period is the period of crisis, namely 2011-2013. The OLS regressions also include district and industry dummies. The sample consists of all firms, managed by 1 CEO (with no CEO turnover during or immediately before the crisis) and for which CEO data are available. Robust standard errors adjusted for firm-level clustering are reported in brackets. *, ** and *** indicates significance at the 10%, 5% and 1% level, respectively.

tenure thresholds, and the corresponding interval of confidence. We find evidence that as the threshold is less stringent, that is, a low-tenured CEO is defined in a less demanding way, the result weakens, and the performance gap (irrespective of considering GVA or total sales) continuously approaches zero. This is a very important result. The fact that the coefficient of the interaction term is positive throughout and the size of the coefficient monotonously decreases as higher tenured CEOs are considered, suggests a clear relationship between tenure at a management position and firm performance during the crisis.

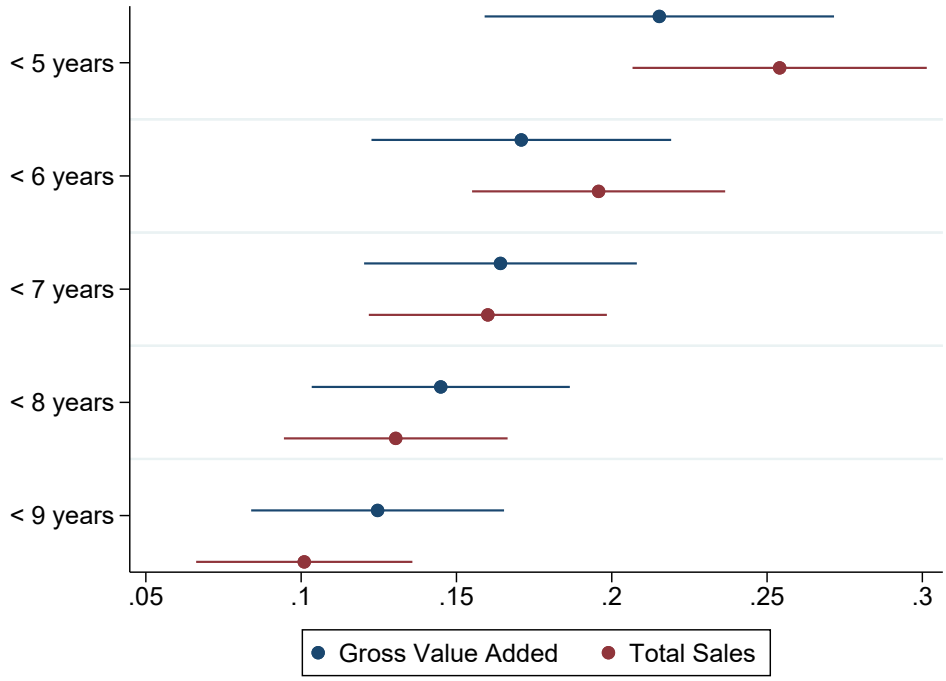

FIGURE 1: Newcomer's tenure at top management position and the performance premium

Note: The dots stand for the estimated coefficients and the lines represent the 95 per cent confidence interval.

3.2. Newcomers: is CEO tenure or external origin what matters?

In this paper we define newcomers as recent external hires. This raises the question of whether our results are driven by just one, or both these attributes: whether it is just being an outsider – externally hired, or being new at the job – a low tenure in a management position at the firm, that drives our findings. Table 5 re-estimates the regressions specified in Table 4, defining the treatment variable as being an outsider (panel A) or new at the job – having a lower than sample median tenure in a top management position (panel B). As expected, we find that the coefficients are not statistically significant for outsiders. Remember outsiders are external hires, but not necessarily recent ones.

In sum, these results show that, whatever advantages or disadvantages there may be to outsiders as CEOs, these are not more salient in times of crisis, which suggests high-tenured external hires become as imbued in the firm's business practices as internally promoted CEOs. In conclusion, there is no evidence that externally recruited CEOs perform better than those internally promoted

	Firm Performance			
	Gross Value Added		Sales	
Panel A	OLS (1)	Firm fixed effects (2)	OLS (3)	Firm fixed effects (4)
Crisis	-0.116***	-0.071***	-0.085***	-0.040*
	(0.018)	(0.023)	(0.023)	(0.021)
Outsider	-0.019		0.015	
	(0.014)		(0.032)	
Outsider*Crisis	0.025	0.007	0.029	0.019
	(0.021)	(0.024)	(0.026)	(0.022)
Observations	22,324	22,534	23,194	23,783
Panel B	(5)	(6)	(7)	(8)
Crisis	-0.154***	-0.132***	-0.111***	-0.090***
	(0.010)	(0.016)	(0.012)	(0.014)
Low tenured CEO	0.004	-0.043**	0.028	0.011
	(0.012)	(0.019)	(0.021)	(0.017)
Low tenured CEO*Crisis	0.146***	0.144***	0.133***	0.143***
	(0.016)	(0.020)	(0.021)	(0.018)
Observations	24,610	24,835	25,526	26,155

TABLE 5. Outsides and low-tenured CEOs and firm performance
This table presents difference-in-differences estimates of ordinary least squares (OLS) and firm fixed effects panel regressions of the logarithm of gross value added (GVA) and total sales on low-tenured and outsider CEOs. In Panel A the treatment variable is a dummy that takes the value of 1 for CEOs with low tenure (below the sample median). In Panel B the treatment variable is a dummy that takes the value of 1 for externally recruited CEOs (outsiders), instead of internally promoted. The treatment period is the period of crisis, namely 2011-2013. The regressions include CEO and firm controls (gender, age, education, firm age, firm size, average performance). The OLS regressions also include district and industry dummies. The sample consists of all firms, managed by 1 CEO (with no CEO turnover during or immediately before the crisis) and for which CEO data are available. Robust standard error adjusted for firm-level clustering are reported in brackets. *, ** and *** indicates significance at the 10%, 5% and 1% level, respectively.

in times of crises. The results in panel B suggest that low-tenured CEOs help firms perform better in crises times, irrespectively of being insiders or outsiders.

Table 6 further deepens the analysis, investigating whether the results for low-tenure CEOs are present for the insider and outsider CEO sample. We find that, for insiders, there is no significant performance difference between low and high-tenured insiders. As CEO tenure is defined as the number of years at firm with a top management position, not accounting for the periods spent at other positions in the firm, low-tenure as a CEO may not be sufficient to avoid being caught in the experience trap, as familiarity with business practices may come from earlier on. These results corroborate our main hypothesis and results presented in Table 4: the performance gap is associated to newcomers, those CEOs who were simultaneously externally hired and low tenure.

Panel A	Inside CEOs			
	Gross Value Added		Sales	
	OLS	Firm fixed effects	OLS	Firm fixed effects
	(1)	(2)	(3)	(4)
Crisis	-0.135***	-0.034	-0.127***	-0.058**
	(0.020)	(0.029)	(0.026)	(0.027)
Low tenured CEO	0.036	0.008	0.037	0.008
	(0.026)	(0.042)	(0.051)	(0.043)
Low tenured CEO*crisis	0.039	-0.030	0.051	0.018
	(0.042)	(0.050)	(0.054)	(0.041)
Observations	3,707	3,722	3,808	3,844
Panel B	**Outside CEOs**			
	Gross Value Added		Sales	
	OLS	Firm fixed effects	OLS	Firm fixed effects
	(1)	(2)	(3)	(4)
Crisis	-0.165***	-0.173***	-0.109***	-0.117***
	(0.013)	(0.020)	(0.015)	(0.016)
Low tenured CEO	-0.002	-0.052**	0.033	0.014
	(0.014)	(0.023)	(0.024)	(0.020)
Low tenured CEO*crisis	0.170***	0.190***	0.140***	0.176***
	(0.019)	(0.024)	(0.023)	(0.021)
Observations	18,617	18,812	19,386	19,939

TABLE 6. Low-tenured CEOs and firm performance: insiders and outsiders
This table presents difference-in-differences estimates of ordinary least squares (OLS) and firm fixed effects panel regressions of the logarithm of gross value added (GVA) and total sales on low-tenured CEOs. The treatment variable is defined as having low tenure in a top management position at the firm. The treatment period is the period of crisis, namely 2011-2013. In Panel A and B the sample is divided into inside and outside CEOs, respectively. The regressions include CEO and firm controls (gender, age, education, firm age, firm size, average performance). The OLS regressions also include district and industry dummies. The sample consists of all firms, managed by 1 CEO (with no CEO turnover during or immediately before the crisis) and for which CEO data are available. Robust standard error adjusted for firm-level clustering are reported in brackets. *, ** and *** indicates significance at the 10%, 5% and 1% level, respectively.

Finally, in Table 7, we examine how a CEOs experience in the firm they transited from affects their impact on business performance during the crisis. We split the sample of outside CEOs between those that transited from an executive and from non-executive positions, to find that low-tenured outside CEOs deliver better firm performance during crises irrespective of the position they transit from. This is an important result, as it sheds some light on whether previous experience as a manager of another firm may also act as a trap in times of crisis. We find that previous experience doesn't alter our results, meaning that being new to the current firm is still beneficial, despite the position held at the previous job.

Panel A	Outisde CEOs: transitting from non-executive position			
	Gross Value Added		Sales	
	OLS	Firm fixed effects	OLS	Firm fixed effects
	(1)	(2)	(3)	(4)
Crisis	-0.163***	-0.182***	-0.104***	-0.113***
	(0.014)	(0.022)	(0.016)	(0.017)
Low tenured CEO	-0.000	-0.051**	0.046*	0.026
	(0.016)	(0.025)	(0.027)	(0.022)
Low tenured CEO*crisis	0.165***	0.188***	0.134***	0.167***
	(0.020)	(0.026)	(0.025)	(0.022)
Observations	15,642	15,816	16,322	16,823
Panel B	**Outside CEOs: transitting from executive position**			
	Gross Value Added		Sales	
	OLS	Firm fixed effects	OLS	Firm fixed effects
	(1)	(2)	(3)	(4)
Crisis	-0.180***	-0.141***	-0.127***	-0.146***
	(0.035)	(0.050)	(0.042)	(0.039)
Low tenured CEO	-0.022	-0.071	-0.003	-0.046
	(0.035)	(0.051)	(0.065)	(0.049)
Low tenured CEO*crisis	0.197***	0.221***	0.158**	0.229***
	(0.057)	(0.070)	(0.075)	(0.064)
Observations	2,692	2,713	2,769	2,817

TABLE 7. Low-tenured CEOs and firm performance: outside executive and non-executives This table presents difference-in-differences estimates of ordinary least squares (OLS) and firm fixed effects panel regressions of the logarithm of gross value added (GVA) and total sales on low-tenured CEOs. The treatment variable is defined as having low tenure in a top management position at the firm. The treatment period is the period of crisis, namely 2011-2013. In Panel A and B the sample of outsiders is further decomposed into outside executives (CEOs who were already top-managers at ananother firm when they were recruited to the current firm) and non-executives (CEOs who didn't hold an executive job at the previous firm).The regressions include CEO and firm controls (gender, age, education, firm age, firm size, average performance). The OLS regressions also include district and industry dummies. The sample consists of all firms, managed by 1 CEO (with no CEO turnover during or immediately before the crisis) and for which CEO data are available. Robust standard errors adjusted for firm-level clustering are reported in brackets. *, ** and *** indicates significance at the 10%, 5% and 1% level, respectively.

3.3. Newcomers: CEOs and firm owners

So far we have restricted our analysis to the sample of firms managed by a unique CEO, who is not simultaneously owner of the firm. In this sub-section, we examine the impact of newcomers along two dimensions: the number of CEOs, unique or multiple CEOs, and whether all of the CEOs are firm owners. For firms with multiple CEOs, the newcomer dummy takes the value 1 if at least one of the CEOs in charge is a newcomer.

In Table 8, the first two columns consider the entire sample of firms in the database – including multiple CEOs and CEO-owner firms, which increases

substantially the number of observations. We confirm previous results from our baseline regressions. Firms run by newcomers obtained, during the crisis approximately, a 21 per cent (19.4 log points) higher GVA relative to similar firms.

Graph 2 compares the coefficients for the variable of interest – the interaction term between the crisis and treatment dummies — from the fixed effect regressions in Table 8 for the whole sample, and those for firms run by more than one CEO (Table B.1 in the appendix). We find a consistently positive and significant interaction coefficient for all sub-samples, confirming that newcomers outperform higher-tenured and/or inside CEOs, irrespective of whether these CEOs manage the firm alone, and whether or not they are also firm owners. Moreover, coefficients aren't significantly different across samples.

Table B.2 in the appendix presents results for the baseline specification (3) and (4) from Table 4, where the performance measure used is the firm's total sales, for the different samples specified above. Results are consistent across all samples and the magnitude of the impact of newcomers on sales is quantitatively similar to the impact on GVA. The exception is the impact of newcomers on sales in firms run by owners, which is significantly higher than amongst firms under the control of non-owners.

			Firm's managed by one CEO			
	All firms		1 CEO: not the owner		1 CEO: the owner	
	OLS	Firm fixed effects	OLS	Firm fixed effects	OLS	Firm fixed effects
	(1)	(2)	(3)	(4)	(5)	(6)
Crisis	-0.183***	-0.160***	-0.154***	-0.140***	-0.186***	-0.182***
	(0.003)	(0.005)	(0.011)	(0.016)	(0.005)	(0.008)
Newcomers	-0.007*	-0.018***	0.000	-0.033	-0.005	-0.015
	(0.004)	(0.007)	(0.013)	(0.021)	(0.006)	(0.010)
Newcomers*crisis	0.177***	0.194***	0.161***	0.164***	0.180***	0.219***
	(0.006)	(0.007)	(0.017)	(0.022)	(0.008)	(0.010)
Observations	223,797	225,629	22,324	22,534	115,743	116,890

TABLE 8. Newcomers and firm performance (GVA): CEOs and firm owners
This table presents difference-in-differences estimates of ordinary least squares (OLS) and firm fixed effects panel regressions of the logarithm of gross value added (GVA) on newcomer CEOs. In these regressions the treatment variable is defined as being a newcomer (low tenure and externally recruited). The treatment period is the period of crisis, namely 2011-2013. Regressions (1) and (2) from table 1 were estimated for different samples, depending on whether CEOs own the firm or not. The regressions include CEO and firm controls (gender, age, education, firm age, firm size, average performance). The OLS regressions also include district and industry dummies. The sample includes all firms for which exists available data for at least one CEO (with no CEO turnover during or immediately before the crisis). Robust standard error adjusted for firm-level clustering are reported in brackets. *, ** and *** indicates significance at the 10%, 5% and 1% level, respectively.

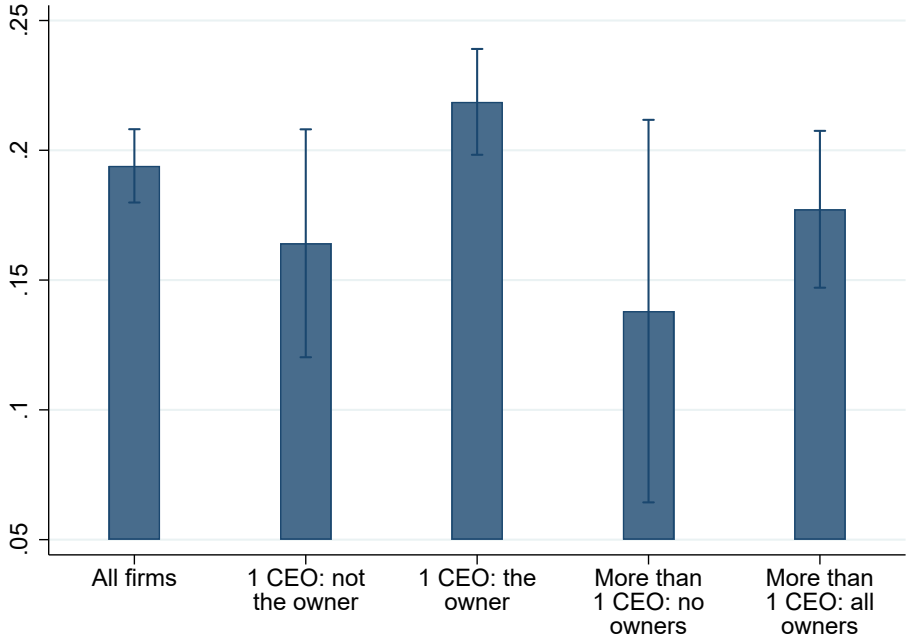

FIGURE 2: Newcomer's across different types of samples and the performance premium

Note: The columns stand for the estimated coefficients and the lines represent the 95 per cent confidence interval.

3.4. Additional robustness tests

We now use a nearest-neighbor matching estimator (Abadie and Imbens 2011) to address sample selection bias concerns. Ideally, we would compare performance of a firm run by a newcomer during the crisis period with the same firm's performance under the alternative that it had not appointed a newcomer CEO. The counter-factual is not observable, though, and we thus construct a hypothetical counter-factual by estimating a first-stage probit regression of the likelihood that a firm appoints a newcomer using observable pre-crisis firm and CEO characteristics. We then obtain a propensity score based on the predicted probabilities. Finally, we use the outcome of the nearest neighbor to compute the unobserved counter-factual.

In addition, we carry out balancing tests for our estimates, to confirm whether the necessary assumptions for the validity of the matching method hold. These are, first, the overlap assumption requiring that the conditional probability of receiving treatment, also known as the propensity score (Rosenbaum and Rubin 1983), is bounded away from zero and one. Figure B.1 in the Appendix shows the estimated propensity score for all treated and control

units used in the matches, showing how our estimated propensity score is indeed bounded away from zero and one. To determine the region of common support more precisely, we follow the strategy in the literature that consists in excluding all observations for which the propensity score is smaller than the minimum and larger than the maximum in the opposite group. This approach eliminates a very low number of observations, and has only a marginal impact on our results. We then assess the quality of the matching by checking for significant differences in covariate means for both groups, computing the standardized bias measure and the pseudo-R^2 suggested by Rosenbaum and Rubin (1985) and Sianesi (2004), respectively.

Table B.3 in the Appendix, shows that the clear ex-ante differences between the control and treatment groups are reduced to statistical insignificance after the matching procedure. This is confirmed by the decrease in the standardized bias and, finally, the joint statistical significance of the covariates, and the pseudo-R^2 of the propensity score in the unmatched and matched samples estimation procedures.[8] Overall, we conclude that the matched sample increases the similarity between the observables of the treatment and the control groups.

		Firm's managed by 1 CEO		Firm's managed by more than 1 CEO	
	All firms	1 CEO: not the owner	1 CEO: the owner	More than 1 CEO: no owners	More than 1 CEO: all owners
	(1)	(2)	(3)	(4)	(5)
Newcomers	0.158***	0.094***	0.190***	0.182**	0.150***
	(0.010)	(0.032)	(0.013)	(0.074)	(0.028)
Observations	107,294	10,843	56,113	3,406	22,535

TABLE 9. Newcomers and firm performance: propensity score match
This table presents estimates of the average difference between a firm's average GVA during the crisis period run by a newcomer CEO. These estimates were obtained using a propensity score match method, matching firm's based on the firm's and CEO's pre-crisis characteristics (gender, age, education, firm age, firm size, average performance). Regressions were estimated for different samples, depending on the number of CEOs and owners of the firm. The sample includes all firms for which exists available data for at least one CEO (with no CEO turnover during or immediately before the crisis). *, ** and *** indicates significance at the 10%, 5% and 1% level, respectively.

Table 9 presents the impact of newcomers on firm performance, measured by GVA, following a matching procedure. The average performance gap between matched newcomer CEOs and the control group is around 17 per cent (15.8 log points, column 1), and is statistically significant. Notably, the estimated size of the effect is remarkably close to the results above, using DiD estimates. Results are pretty stable across samples, for firms managed by owner and non-owners,

8. More specifically, the very low pseudo-R^2 suggests that, after matching, there are no systematic differences in the distribution of covariates between the two groups.

and unique or multiple CEO firms. This evidence suggests that the endogeneity of CEO selection is unlikely to drive our primary finding.

Table B.4 in the Appendix repeats this procedure to compute the average difference in sales. Results are similar, though of a lower magnitude, suggesting that, during crises, newcomers have a more notable role generating value rather than sales.

4. Newcomers and firm survival

In this section we examine the impact of newcomer CEOs on the probability of firm survival. The relevance of this analysis is twofold. On the one hand we use the probability of firm survival for robustness, as an additional measure of performance. If newcomer CEOs increase the probability of a firm staying in business, this validates our argument that they cope best with unstable and demanding economic contexts, such as severe crises. On the other hand, this analysis may help confirm that our primary results are not driven by firm selection, whereby firms run by talented newcomers survive and remain in the sample, whereas firms run by less talented newcomers don't survive and drop out.

Table 10 presents the results of probit regressions where the dependent variable equals 1 in time t if the firm doesn't fail that year. We control for the same set of firm and CEO characteristics as in Table 4, including industry fixed effects, but coefficients are not shown for reasons of parsimony. The coefficient on the interaction term now captures the percentage increase in the probability that firm run by a newcomer survives during the crisis, as opposed to other firms.

We find that, during the crisis, the probability of survival decreased for all firms. As for firms run by newcomers, while they have an 8.1 per cent (8,5 log points) lower probability of survival in the normal period, this reverts during the crisis, so that the probability of survival increases by 1 percentage points for firms run by newcomer CEOs. In columns 2-5 we also estimate the probability of firm survival for the samples run by one or more CEOs, owners and not owners. Our results are confirmed for the one CEO subsamples, owner or not owner. Results are not there for the sample of firms run by multiple CEOs.[9]

9. Note that, in this case, for the firm to be classified in the treatment group it is sufficient that only one of the CEOs in office is a newcomer. Moreover, given that decision power is rarely equally shared and we can't control for who is actually in charge, it is harder to draw clear conclusions, as the existence of a single newcomer CEO may not be enough to impact the firm's survival during the crisis.

		Firm's managed by 1 CEO		Firm's managed by more than 1 CEO	
	All firms	1 CEO: not the owner	1 CEO: the owner	More than 1 CEO: no owners	More than 1 CEO: all owners
	(1)	(2)	(3)	(4)	(5)
Crisis	-0.260***	-0.357***	-0.363***	0.048	-0.188***
	(0.016)	(0.050)	(0.023)	(0.082)	(0.038)
Newcomers	-0.085***	-0.078**	-0.086***	-0.332***	-0.180***
	(0.014)	(0.038)	(0.020)	(0.058)	(0.034)
Newcomers*crisis	0.103***	0.143**	0.126***	-0.093	0.088
	(0.021)	(0.065)	(0.028)	(0.124)	(0.056)
Observations	337,314	50,162	174,819	15,575	65,689

TABLE 10. Newcomers and firm survival
This table presents difference-in-differences estimates of probit panel regressions of firm survival on newcomer CEOs. In these regressions the treatment variable is defined as being a newcomer (low tenure and externally recruited). The treatment period is the period of crisis, namely 2011-2013. The regressions were estimated for different samples, depending on the number of CEOs and owners of the firm. The regressions include CEO and firm controls (gender, age, education, firm age, firm size, average performance). The regressions also include industry dummies. The sample includes all firms for which exists available data for at least one CEO (with no CEO turnover during or immediately before the crisis). Robust standard error adjusted for firm-level clustering are reported in brackets. *, ** and *** indicates significance at the 10%, 5% and 1% level, respectively.

5. Newcomers: what do they do differently?

In this section, we examine whether the presence of newcomer CEOs translates into different management practices. We want to identify the extent to which newcomer CEOs act differently. We follow a nearest-neighbor matching procedure, as described in subsection 3.4, based on the firm and CEO characteristics prior to the crisis. Table 11 presents results for the two subsamples of firms run by one CEO, owners and not owners.[10]

Panel A summarizes the results on cost policies. Newcomer CEOs spend more during the crisis period, but do so more efficiently, decreasing the cost per unit sold and the share of employee costs in total costs.

In Panel B we examine employee decisions and find that, during the crisis, the number of workers and employee related expenditure increases in firms run by newcomer CEOs. In addition, costs per worker also increase. While the direction of causality is not straightforward, it is plausible that under newcomer CEOs, workers were better managed and faced incentives to perform better.

In Panel C, we analyze financing and investment decisions. Newcomer CEOs are associated to more leveraged firms during the crisis, both in terms of short and long term debt. This suggests newcomers are better able to access credit during the crisis, particularly long-term debt, which requires higher trust on the part of lenders, and credibility on the part of firms. The difference is quantitatively very significant, and possibly enough to foster performance

10. Table B.5 in the Appendix presents the results for multiple CEO firms.

Panel A	**Costs**								
	Total costs (log)			Costs/Sales			Employee costs/ Total costs		
	All firms	1CEO	1Owner	All firms	1CEO	1Owner	All firms	1CEO	1Owner
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Newcomers	0.167***	0.144***	0.200***	-0.040***	-0.044***	-0.049***	-0.009***	-0.012***	-0.005***
	(0.008)	(0.028)	(0.010)	(0.003)	(0.010)	(0.004)	(0.002)	(0.004)	(0.002)
Observations	113,433	11,370	59,985	111,411	11,069	58,926	113,444	11,375	59,988

Panel B	**Workers**								
	Number of workers (log)			Employee costs (log)			Costs per worker (log)		
	All firms	1CEO	1Owner	All firms	1CEO	1Owner	All firms	1CEO	1Owner
	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Newcomers	0.072***	0.127***	0.083***	0.121***	0.136***	0.150***	0.061***	0.060***	0.078***
	(0.006)	(0.022)	(0.007)	(0.007)	(0.025)	(0.010)	(0.004)	(0.012)	(0.005)
Observations	117,939	11,905	62,206	113,349	11,367	59,950	113,263	11,312	59,950

Panel C	**Investment and Financing**								
	Change in capital stock			Short term debt (log)			Long term debt (log)		
	All firms	1CEO	1Owner	All firms	1CEO	1Owner	All firms	1CEO	1Owner
	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)
Newcomers	0.302***	0.232***	0.320***	0.180***	0.266**	0.323***	0.274***	0.502***	0.333***
	(0.014)	(0.045)	(0.019)	(0.037)	(0.118)	(0.049)	(0.040)	(0.129)	(0.053)
Observations	98,442	9,958	51,529	118,044	11,977	62,206	118,044	11,977	62,206

Panel D	**Trade**					
	Openness			Exports/Sales		
	All firms	1CEO	1Owner	All firms	1CEO	1Owner
	(28)	(29)	(30)	(31)	(32)	(33)
Newcomers	0.007***	0.017**	0.012***	0.015***	0.021***	0.018***
	(0.002)	(0.008)	(0.002)	(0.001)	(0.006)	(0.002)
Observations	113,139	11,201	59,715	113,626	11,261	59,942

TABLE 11. Newcomers and key policy instruments
This table presents estimates of the average difference between the treated (firms run by a newcomer CEO) and the control group, during the crisis period. These estimates were obtained using a propensity score match method, matching firm's based on the firm's and CEO's pre-crisis characteristics. Regressions were estimated for different samples, depending on whether the CEO in office is also the owner or not. The sample consists of all firms (with no CEO turnover during or immediately before the crisis) and for which CEO data are available. *, ** and *** indicates significance at the 10%, 5% and 1% level, respectively.

and survivability of firms. This is also consistent with newcomer CEOs being less risk-averse and more motivated to take risks and make changes, even in times of crisis. Consistently, newcomer CEOs display a higher rate of capital accumulation.

Finally, panel D presents results on firm's engagement in foreign markets. The evidence suggests that, eliminating any ex-ante differences, during the crisis, firms managed by newcomer CEOs are more open to international trade, measured as total export and import flows on sales. In addition, it is revealing that newcomers were able to increase the share of exports in firm's total sales during this period.

It should be noted that this preliminary analysis is suggestive, and not intended to uncover exactly what lies behind newcomers' success in times of severe crisis. In particular, the direction of causality between management decisions and firm performance is not established. Nonetheless, our results strongly suggest that differences in performance and survival map into different management in terms of costs, employment, openness, investment and financing decisions, worth investigating.

6. Newcomers and firm productivity

So far we have uncovered the impact of newcomer CEOs on a firm's performance during a crisis in terms of scale – firm's run by newcomers register higher total sales and in terms of value added – newcomers generate more value for the firm during the crisis. We now examine another economically meaningful perspective, namely whether better performance as far as sales and value added are associated with an increase in productivity levels.

Management practices are relevant for productivity, particularly so in times of uncertainty and crisis. Several authors, including (Bloom and Van Reenen 2010; Bloom *et al.* 2016), found a robust link between management practices and firm productivity.

In this section, we study three straightforward measures of productivity, namely: apparent labor productivity, measured as GVA or Sales per worker, and GVA per unit sold.

Table 12 presents the results, obtained through a propensity score match procedure, as described in previous sections. We here examine the sample of

	GVA per worker			Sales per worker			GVA per unit sold		
	All firms	1 CEO	1 Owner	All firms	1 CEO	1 Owner	All firms	1 CEO	1 Owner
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Newcomers	0.074***	0.057**	0.102***	0.089***	0.076***	0.127***	0.073***	0.039*	0.069***
	(0.007)	(0.024)	(0.010)	(0.007)	(0.024)	(0.009)	(0.007)	(0.023)	(0.010)
Observations	107,220	10,788	56,113	116,502	11,645	55,902	106,932	10,787	55,934

TABLE 12. Newcomers and firm productivity
This table presents estimates of the average difference between a firm's productivity during the crisis period run by a newcomer CEO. These estimates were obtained using a propensity score match method, matching firm's based on the firm's and CEO's pre-crisis characteristics (gender, age, education, firm age, firm size, average performance).Regressions were estimated for different samples, depending on whether the CEO in office is also the owner or not. The sample consists of all firms, managed by at least 1 CEO (with no CEO turnover during or immediately before the crisis) and for which CEO data are available. *, ** and *** indicates significance at the 10%, 5% and 1% level, respectively.

firms managed by 1 CEO.[11] Overall, we document higher productivity levels in firms managed by newcomer CEOs, during the crisis. Specifically, firms which are apparently equal ex-ante experience 5.9 per cent (5.7 log points) higher GVA per worker during the crisis if directed by a newcomer CEO, who doesn't own the firm. This figure rises to 7.9 per cent (7.6 log points) when productivity is measured in term of sales per worker. Finally, we also conclude that firms managed by newcomers generated more value per unit sold during the crisis, than otherwise similar firms in the control group, thus pointing towards significant efficiency gains.

7. Concluding remarks

This paper examines how the presence of newcomer CEOs favors firm performance and increases its survivability during a major exogenous crisis, where newcomers are CEOs hired externally and new to the top management position. By focusing on a period of unprecedented and unexpected downturn, the economic crisis of 2011 to 2013, and examining the behavior of firms in Portugal, we mitigate endogeneity issues related to firm-CEO matching. We find clear and robust evidence that newcomer CEOs deliver better firm performance, and increase firm survivability. We test different specifications, notably the inclusion of CEO and firm controls, firm fixed effects, and alternative measures of performance. Our results are robust to subsamples of one and multiple CEOs, owners or not. Firms led by newcomers don't necessarily perform better under normal times; it is during crisis that such CEO characteristics become an asset.

Firms which enter the crisis managed by newcomer CEOs (non-owners) deliver 17.8 per cent higher value added than equivalent firms with higher tenured CEOs and/or internally promoted CEOs. Firm survivability is also higher for firms with newcomer CEOs. This result questions traditional definitions of human capital based on seniority and tenure, especially its value in crisis times. At the very least it suggests that accumulated experience in the firm is not key in periods of economic distress. Flexibility and adaptability, characteristics that are more likely to be present among newcomers, become more valuable than experience. Indeed, we find that newcomer CEOs make significantly different management choices as far as costs, employment, openness to foreign markets, financing and investment, and their firms are substantially more productive than other firms.

Different mechanisms may explain this result. First, the characteristics of newcomers, less familiar with current business practices and are more likely to draw on its experience in other firms, and quickly adjust to challenging

11. Table B.6 in the Appendix presents results for multiple CEO firms.

circumstances, when business as usual and past practices are ineffective. The incentives that a newcomer CEO faces are also different. A better performance by a newcomer CEO may associate with a higher net benefit in case of a good performance in his initial years, when uncertainty over ability and suitability for the job are higher. The incentives line up for a recently-hired CEO to risk more in face of new circumstances. In addition, good performance delivers benefits for a longer period, as a new manager in a given firm faces a longer expected horizon on the job

In sum, using a wide novel dataset on CEO and firm characteristics and performance in a country severely hit by the latest economic crisis, we find that newcomer CEOs, which in normal times perform at lower levels, become valuable firm assets in crisis times, delivering higher sales and value added, furthering firm survivability and raising productivity levels. There is evidence this different performance threshold stems from significantly different business practices, and is robust to number of CEOs, ownership status, and different tests and methodologies. Our results suggest that firm performance during normal and crisis times relates to different CEO characteristics, with CEOs hired externally and new at the job more able to withstand periods of economic distress. Future research should focus on deepening our analysis of the different management practices of newcomer CEOs, and the possible facilitation of transitions in top management positions when aggregate economic crises arise.

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Appendix A: Variables

Firm Characteristics

- Sales – Log of annual sales (IES)
- GVA – Gross value added is defined as log of sales minus intermediary consumption (IES)
- Number of establishments - Number of establishments that the firms lists each year (QP)
- Number of workers – Log of number of workers registered as working at the firm at October each year (QP)
- Firm age – Current year minus year of construction (QP)
- Total expenses - Log of total expenses including: costs of goods sold and material consumed, supplies and external services, employee expenses, impairment losses, changes in fair value and other expenses and losses in financial investments and financial instruments (IES)
- Employee expenses - Log of total employee expenses, including remunerations and pensions (IES)
- Capital stock - Log of fixed tangible assets and intangible assets (IES)
- Short-term debt - Log of current liabilities (IES)
- Long-term debt - Log of non-current liabilities (IES)
- Trade openness - Sum of total exports and imports divided by total sales (IES)

CEO Characteristics

- Newcomer - Dummy variable that takes the value of 1 for CEOs with a lower than sample median tenure, who are simultaneously outsiders and 0 otherwise (QP)
- Outsider - Dummy variable that takes the value of 1 if a CEO was hired from another firm directly to a top management position - not necessarily to a CEO position - and 0 if he was internally promoted (QP)
- Crisis - Dummy variable that takes the value of 1 during the years 2011, 2012 and 2013 and 0 otherwise
- Gender – Dummy variable that takes the value of 1 for females and 0 otherwise (QP)
- Age – Current year minus birth year (QP)
- Tenure – Defined as number of observations (one per year) at the current firm in a top management position according to the national Classification of Occupations (QP)
- Education – Categorical variable where: 1 - less than primary education; 2 - first cycle of primary education; 3 - 2nd cycle of primary education; 4 - lower secondary education; 5 - upper secondary education; 6 - post-secondary non-tertiary education; 7 - bachelors degree; 8 - undergraduate degree; 9 - masters degree; 10 - PhD (QP)

Appendix B: Additional results

	Firm's managed by more than one CEO			
	More than 1 CEO: no owners		More than 1 CEO: all owners	
	OLS	Firm fixed effects	OLS	Firm fixed effects
	(1)	(2)	(3)	(4)
Crisis	-0.155***	-0.082***	-0.171***	-0.132***
	(0.015)	(0.019)	(0.006)	(0.009)
Newcomers	-0.017	-0.047	-0.025***	-0.024*
	(0.018)	(0.029)	(0.008)	(0.012)
Newcomers*crisis	0.146***	0.138***	0.176***	0.177***
	(0.030)	(0.038)	(0.012)	(0.015)
Observations	6,685	6,712	44,554	44,712

TABLE B.1. Newcomers and firm performance: CEOs and firm owners
This table presents difference-in-differences estimates of ordinary least squares (OLS) and firm fixed effects panel regressions of the logarithm of gross value added (GVA) on newcomer CEOs. In these regressions the treatment variable is defined as being a newcomer (low tenure and externally recruited). The treatment period is the period of crisis, namely 2011-2013. Regressions (1) and (2) from table 1 were estimated for different samples, depending on whether CEOs own the firm or not. The regressions include CEO and firm controls (gender, age, education, firm age, firm size, average performance). The OLS regressions also include district and industry dummies. The sample includes all firms for which exists available data for more than one CEO (with no CEO turnover during or immediately before the crisis). Robust standard error adjusted for firm-level clustering are reported in brackets. *, ** and *** indicates significance at the 10%, 5% and 1% level, respectively.

	All firms		Firm's managed by one CEO				Firm's managed by more than one CEO			
			Not the owner		The owner		No owners		All owners	
	OLS	Firm FE	OLS	Firm FE	OLS	Firm FE	OLS	Firm FE	OLS	Firm FE
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Crisis	-0.135***	-0.125***	-0.104***	-0.099***	-0.137***	-0.144***	-0.104***	-0.069***	-0.126***	-0.103***
	(0.004)	(0.004)	(0.013)	(0.013)	(0.005)	(0.006)	(0.017)	(0.015)	(0.007)	(0.007)
Newcomers	-0.009	-0.006	0.046**	0.027	-0.031***	-0.005	-0.035	0.004	-0.016	-0.025**
	(0.006)	(0.005)	(0.023)	(0.019)	(0.009)	(0.008)	(0.038)	(0.023)	(0.013)	(0.010)
Newcomers*crisis	0.173***	0.203***	0.135***	0.160***	0.182***	0.233***	0.130***	0.132***	0.169***	0.203***
	(0.006)	(0.006)	(0.022)	(0.020)	(0.009)	(0.008)	(0.040)	(0.030)	(0.014)	(0.013)
Observations	233,352	238,878	23,194	23,783	121,362	124,890	6,844	6,929	45,745	46,206

TABLE B.2. Newcomers and firm performance: sales

This table presents difference-in-differences estimates of ordinary least squares (OLS) and firm fixed effects panel regressions of the logarithm of total sales on newcomer CEOs. In these regressions the treatment variable is defined as being a newcomer. The treatment period is the period of crisis, namely 2011-2013. Regressions (3) and (4) from Table 4 were estimated for different samples, depending on the number of CEOs and owners of the firm. The regressions include CEO and firm controls (gender, age, education, firm age, firm size, average performance). The OLS regressions also include district and industry dummies. The sample includes all firms for which exists available data for at least one CEO (with no CEO turnover during or immediately before the crisis). Robust standard error adjusted for firm-level clustering are reported in brackets. *, ** and *** indicates significance at the 10%, 5% and 1% level, respectively.

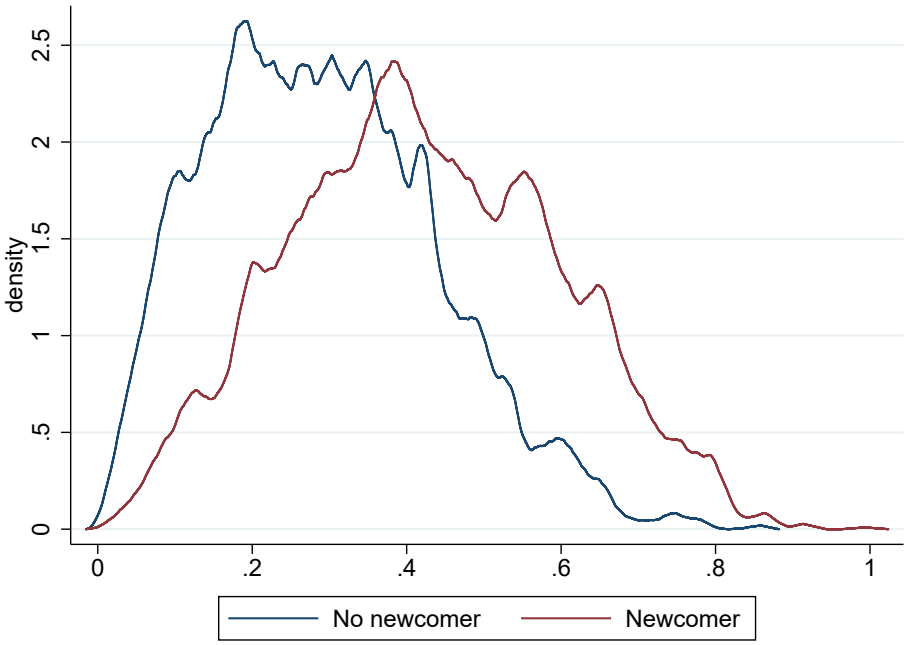

FIGURE B.1: Estimated propensity scores from probit regressions

Variable	Sample	Mean Treated	Mean Control	T-test	%bias	Bias reduction
CEO characteristics:						
CEO age	Unmatched	41.091	46.119	***		
	Matched	41.130	41.287		-1.7	96.9
CEO gender	Unmatched	0.280	0.234	***		
	Matched	0.280	0.263		4.0	62.4
Education	Unmatched	5.502	5.405	**		
	Matched	5.501	5.551		-2.3	48.3
Firm characteristics:						
Average performance (GVA)	Unmatched	10.932	11.962	***		
	Matched	10.950	10.939		0.7	98.9
No. of workers	Unmatched	1.312	1.983	***		
	Matched	1.316	1.326		-0.8	98.5
No. of establishments	Unmatched	1.194	1.375	***		
	Matched	1.195	1.175		1.0	89.0

TABLE B.3. Balancing properties of the propensity score matching
Note: *, ** and *** indicates significance at the 10%, 5% and 1% level, respectively.

		Firm's managed by one CEO		Firm's managed by more than one CEO	
	All firms	1 CEO: not the owner	1 CEO: the owner	More than 1 CEO: no owners	More than 1 CEO: all owners
	(1)	(2)	(3)	(4)	(5)
Newcomers	0.090***	0.061*	0.121***	0.051	0.121***
	(0.010)	(0.033)	(0.012)	(0.074)	(0.022)
Observations	113,923	11,488	60,032	3,526	23,402

TABLE B.4. Newcomers and firm performance: propensity score match
This table presents estimates of the average difference between a firm's average sales during the crisis period run by a newcomer CEO. These estimates were obtained using a propensity score match method, matching firm's based on the firm's and CEO's pre-crisis characteristics (gender, age, education, firm age, firm size, average performance). Regressions were estimated for different samples, depending on the number of CEOs and owners of the firm. The sample includes all firms for which exists available data for at least one CEO (with no CEO turnover during or immediately before the crisis). *, ** and *** indicates significance at the 10%, 5% and 1% level, respectively.

Panel A	**Costs**					
	Total costs (log)		Costs/Sales		Employee costs/ Total costs	
	>1 CEO	>1 owner	>1 CEO	>1 owner	>1 CEO	>1 owner
	(1)	(2)	(3)	(4)	(5)	(6)
Newcomers	0.112	0.157***	-0.016	-0.041***	0.002	-0.009**
	(0.080)	(0.028)	(0.011)	(0.008)	(0.009)	(0.004)
Observations	3,462	23,348	3,431	23,137	3,462	23,349

Panel B	**Workers**					
	Number of workers (log)		Employee costs (log)		Costs per worker (log)	
	>1 CEO	>1 owner	>1 CEO	>1 owner	>1 CEO	>1 owner
	(7)	(8)	(9)	(10)	(11)	(12)
Newcomers	0.067	0.065***	0.048	0.100***	0.003	0.049***
	(0.055)	(0.014)	(0.086)	(0.023)	(0.029)	(0.011)
Observations	3,556	23,886	3,460	23,338	3,453	23,338

Panel C	**Investment and Financing**					
	Change in capital stock		Short term debt (log)		Long term debt (log)	
	>1 CEO	>1 owner	>1 CEO	>1 owner	>1 CEO	>1 owner
	(13)	(14)	(15)	(16)	(17)	(18)
Newcomers	0.217**	0.281***	-0.526	0.231**	0.408	0.377***
	(0.094)	(0.037)	(0.367)	(0.106)	(0.359)	(0.110)
Observations	3,073	20,992	3,564	23,886	3,564	23,886

Panel D	**Trade**			
	Openness		Exports/Sales	
	>1 CEO	>1 owner	>1 CEO	>1 owner
	(19)	(20)	(21)	(22)
Newcomers	-0.055***	0.002	-0.035***	0.010**
	(0.010)	(0.005)	(0.007)	(0.004)
Observations	3,446	23,317	3,457	23,392

TABLE B.5. Newcomers and key policy instruments
This table presents estimates of the average difference between the treated (firms run by a newcomer CEO) and the control group, during the crisis period. These estimates were obtained using a propensity score match method, matching firm's based on the firm's and CEO's pre-crisis characteristics. Regressions were estimated for different samples, depending on whether the CEOs in office were also the owners or not. The sample consists of all firms, managed by more than 1 CEO (with no CEO turnover during or immediately before the crisis) and for which CEO data are available. *, ** and *** indicates significance at the 10%, 5% and 1% level, respectively.

	Firm's managed by more than one CEO					
	More than 1 CEO: no owners			More than 1 CEO: all owners		
	GVA per worker (1)	Sales per worker (2)	GVA per unit sold (3)	GVA per worker (4)	Sales per worker (5)	GVA per unit sold (6)
Newcomers	0.086*	0.016	0.247***	0.093***	0.164***	0.012
	(0.044)	(0.059)	(0.051)	(0.020)	(0.030)	(0.018)
Observations	3,402	3,545	3,400	22,535	23,673	22,485

TABLE B.6. This table presents estimates of the average difference between a firm's productivity during the crisis period run by a newcomer CEO. These estimates were obtained using a propensity score match method, matching firm's based on the firm's and CEO's pre-crisis characteristics (gender, age, education, firm age, firm size, average performance).Regressions were estimated for different samples, depending on whether the CEOs in office are also the owners or not. The sample consists of all firms, managed by more than 1 CEO (with no CEO turnover during or immediately before the crisis) and for which CEO data are available. *, ** and *** indicates significance at the 10%, 5% and 1% level, respectively.

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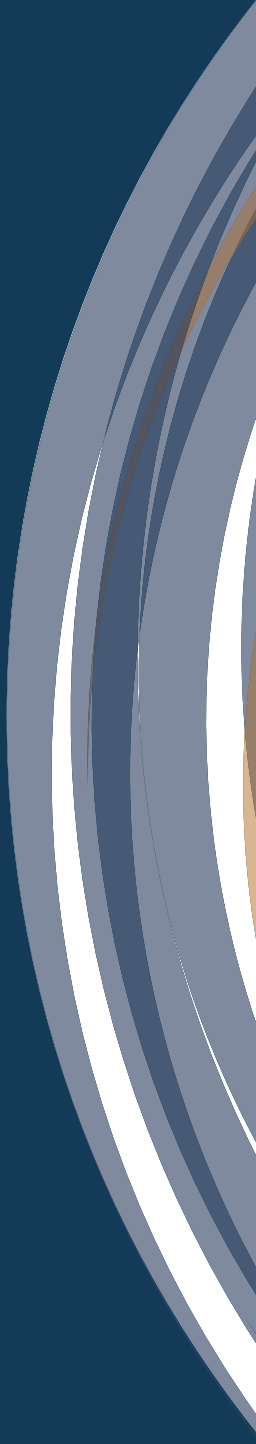

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