Employment, Output and Productivity Adjustment During the Great Recession: The Role of Managerial Quality

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Abstract

This study investigates empirically how differences in managerial practices shaped the macroeconomic recovery from the 2008 Great Recession. We build a country-industry panel over the 2007-2015 period for eighteen industries in nine OECD countries, using an indicator of management quality at the country level based on the categorical scores of managerial practices collected at the firm level by Bloom *et al.* (2012) and an indicator measuring the industry level shocks caused by the 2008 economic crisis. We then rely on the local projection method pioneered by Jordà (2005) to estimate the impact of the shocks on post-2009 macro developments at different levels of managerial quality. We find that both production and employment were more resilient in countries where management quality is higher, resulting in no significant cumulative impact of management quality on productivity over the recovery. The effects of management on production and employment resilience are stronger for industries deeply affected by the 2008 crisis and go along with wage moderation and a slight increase in the labour share.

Past research has amply documented the effects of differences in managerial practices on firm-level and sectoral productivity outcomes in the medium to long-run (Syverson, 2011; Bloom *et al.*, 2014, 2016; Giorcelli, 2019). In this study, we instead analyze how differences in managerial practices shaped the macroeconomic recovery from the 2008 Great Recession. [2] We focus on five interrelated key economic variables: value-added, employment, the average real wage per employee, labour productivity and the labour share, relying on a country-industry panel that covers 18 industries in 10 OECD countries over the 2007-2015 period. We measure managerial quality drawing on firm-level data from the World Management Survey (WMS) (Bloom and Van Reenen 2007; and Bloom *et al.* 2009, 2012, 2016), which display a wide dispersion in managerial practices across countries and across firms within countries.[3]

Using the local projection approach developed by Jordà (2005) and Teulings and Zubanov (2014), we investigate how the co-variation of average (country-level) managerial quality with five important economic variables was affected by the 2008 crisis. We find that, in countries with better managed firms, employment losses and declines in production have been moderated partly through wage restraints, which preserved pre-crisis productivity levels and labour shares. The positive effects of managerial quality on employment resilience increase with the depth of the shock suffered at sectoral level. Thus, our study suggests that better managed firms are more able to cope with changes and thus perform better in times of crisis. This is consistent with findings by Schivardi *et al.* (2022) of a significant positive effect of management practices on firm performance during the spread of COVID-19 in Italy.

In the following four sections, we successively present our empirical approach, data construction, estimation results and conclusion.

Empirical Approach: The Local Projection Method

The local projection approach (Jordà, 2005) is a flexible time-series (and panel data) statistical method to estimate the dynamic effects of the "impulse responses to shocks", defined as the differences between outcomes of a shock and counterfactual outcomes without the shock. We apply this method to analyze how the recovery following the industry-level shocks induced by the Great Recession (GR) has been affected by managerial practices. Over the seven post-crisis years (2009-2015) covered by our sample, we focus on movements in five interrelated economic variables: value-added (VA), employment (L), the average real wage per employee (W), labour productivity (LP) and the labour share (LS). Our conjecture is that firms' ability to deal with shocks depends on management quality (MQ): precisely that movements in these variables have been influenced by MQ

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2 A longer version of this study is available in Cette *et al.*, 2020.

3 Several government agencies (e.g. in the United States, Canada, Australia, Ireland and New Zealand) have used the WMS approach to collect management information for benchmarking purposes. Survey data gathered by the OECD (2019) also found a wide dispersion of those practices across and within countries.

and increasingly so with the size of the shocks.

We thus estimate a system of 35 (5 variables x 7 years) stacked regressions, where the five dependent variables are the log-changes of our variables of interest (VA, L, W, LP, LS) between 2007 and each of the seven years of our study period (2009, 2010, ..., 2015), and the regressors are simply measures of the industry-level shocks (SH), the country indicators of MQ before 2008, as well as the interaction between industry-level shocks and country-level MQ (SH*MQ).

Denoting respectively the different countries, industries and years by the indices c, i and t, we can write as follows these 35 stacked regressions for the generic dependent variable X for t = 2009,..., 2015:

$$\ln\left(X_{cit}\right) - \ln\left(X_{ci07}\right) =$$
$$\alpha_t^X SH_i + \theta_t^X MQ_c + \beta_t^X \left(SH_i * MQ_c\right) +$$
$$\sum_k \gamma_t^{X,k} Z_c^k + \phi_t^X + \varepsilon_{cit}^X$$

(1)

where α is the direct effect of the shock, θ and β are the parameters of interest measuring the influence of MQ on outcomes, γ^k are the parameters of country-specific control variables Z_w^k and ϕ and ε stand respectively for year fixed effects and idiosyncratic random effects. We also introduce country and industry fixed effects in our sensitivity analysis. Our results are very robust to these sensitivity tests.[4]

Data construction

We use the OECD STructural ANalysis (STAN) database to measure the 2008 shock as well as the subsequent economic adjustment in our variables of interest, and data from Bloom *et al.* (2012) to build our MQ indicator. Merging these sources, we obtain a balanced panel over the period 2007-2015 for nine countries (France, Germany, Ireland, Italy, Japan, Poland, Spain, Sweden, United Kingdom and United States) and eighteen industries.

To avoid a potential source of endogeneity, instead of using country-specific industry-level production losses, we proxy such shocks in all countries with the industry production losses between 2007 and 2009 in the United States, where the economic crisis started. We therefore exclude the United States from our estimation sample. Our choice is corroborated by the fact that, while industry-specific 2007-2009 production losses differ widely *within* countries, industry production losses *between* countries are strongly correlated.

Our empirical investigation hinges largely on our MQ measures, which are based on the firm-level surveys of Bloom *et al.* (2012). Their surveys focus on some managerial firm practices that can be deemed 'good' or 'bad' irrespective of their environment.[5]

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4 Detailed results of these econometric estimates are available upon request from the authors.

5 To assess the soundness of such a claim, Bloom and Van Reenen (2007) show that their MQ indicators are significantly associated with higher firm productivity, sales growth rates, profitability, Tobin's Q, and survival rates. Managerial quality, however, is particularly difficult to measure. For example, the use of incentives is scored as high managerial quality in the survey we use, but a standard result in dynamic incentive models is that high-powered incentives can lead to unproductive outcomes.

Chart 1: Distribution of Managerial Quality at Firm Level by Country during the Pre-crisis Period (2003-2008)
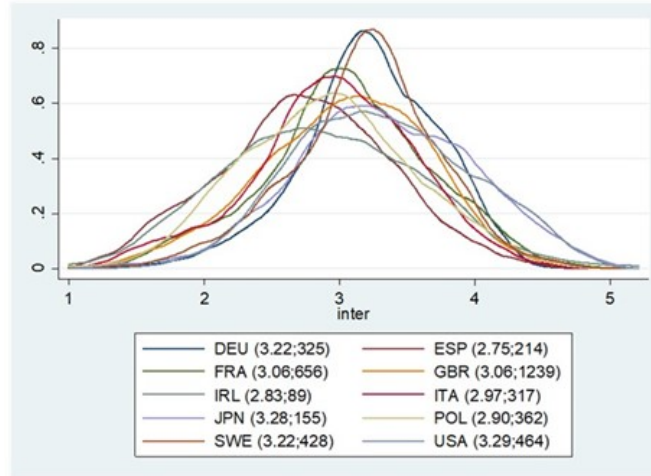
Note: The first number in the parenthesis after the name of each country corresponds to the median value of the MQ indicator and the second number corresponds to the number of firms covered by the survey in the country. Source: Authors calculations using Bloom *et al.* (2012) data.

Their survey includes eighteen questions asked to medium- to large-sized manufacturing firms, with 50 to 10.000 workers.[6] They cover four areas:

- *Monitoring*: How well do organizations monitor developments inside the firm, and use this information for continuous improvement?

- *Targets*: Do organizations set the right targets, track the right outcomes, and take appropriate action if the two are inconsistent?

- *Incentives*: Are organizations promoting and rewarding employees based on performance, prioritizing careful hiring, and trying to keep their best employees?

- *Operations*: Introduction and utilization of lean production methods.

All the survey replies are scored on a scale from 1 to 5, increasing in the quality of practices. The unweighted average of these scores is our MQ measure at the firm level, which we turn into a country-level variable (MQc) by taking the median of the firm level measures in each of our nine countries. We rely on MQ data before the 2008 Great Recession to avoid a potential source of endogeneity. The countries with the highest MQc are Japan and the United States and the ones with the smallest MQc are Poland, Ireland and Spain.

Chart 1 shows the distribution of the firms' values of our composite management quality indicator at firm level during pre-crisis period (2003-2008). It indicates also in the legend the median values of the MQ indicator for each of our nine countries, as well as the number of individual firm observations underlying the country distri-

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6 Our main study sample is a country-industry panel covering both manufacturing and non-manufacturing industries, while all the firms surveyed in Bloom, Genakos, Sadun and Van Reenen (2012) are manufacturing firms. Therefore, one of our sensitivity analyses restricts the estimation sample to the manufacturing industries (see the section "Estimation results"), leaving results broadly unchanged.

Chart 2: Average Impact of a One Standard Error Increase of Pre-crisis Country-level Management Quality
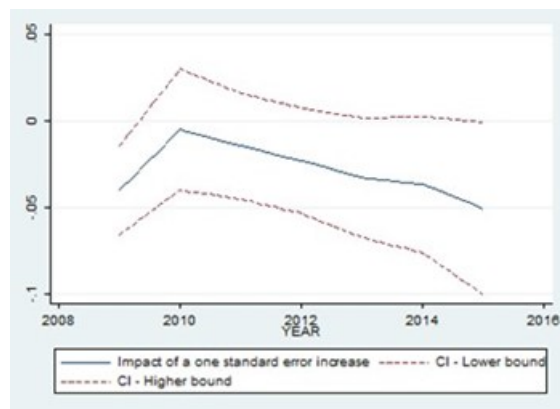
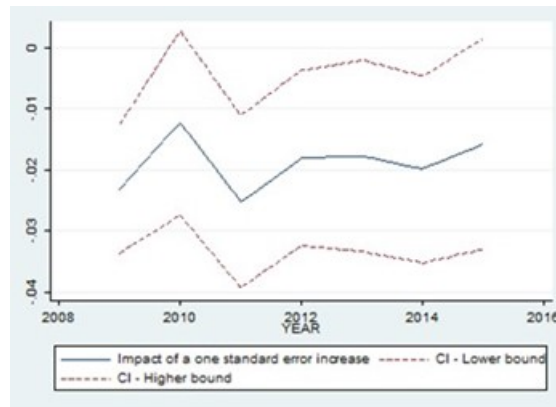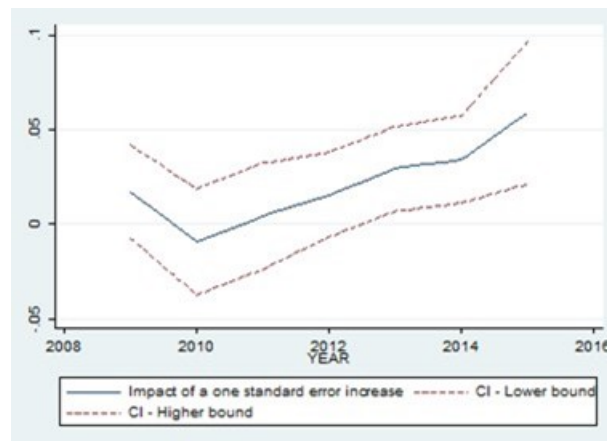Panel A: Value-added
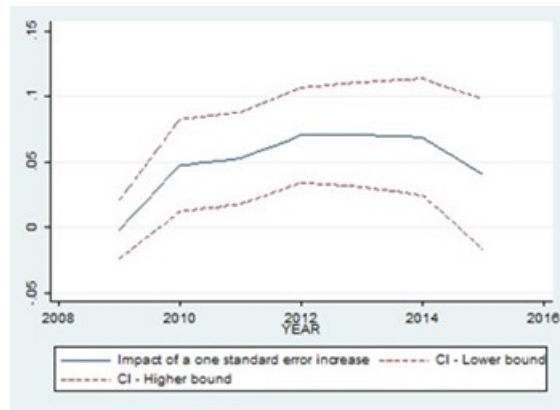
Panel B: Employment
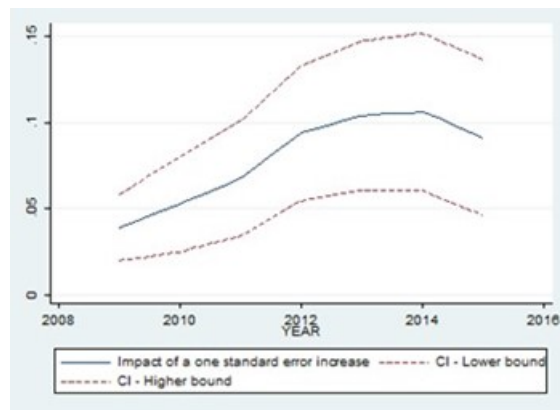
Panel C: Labour productivity

Panel D: Wage per worker

Panel E: Labour share

Note: For each variable of interest, dashed lines correspond to the confidence intervals. Higher and lower bounds correspond to the estimated value of the coefficient plus and minus two estimated robust standard errors.

butions.[7] The countries with the highest MQ median value are Japan (3.28) and the United States (3.29), and the ones with the smallest are Poland (2.90), Ireland (2.83) and Spain (2.75). As can be seen on the Chart 1, Ireland and Japan are also the two countries with the most spread-out distributions.

Estimation Results

For heuristic purposes, we first report findings concerning the average impact of MQ on our variables of interest and then report its industry-specific impact, which depends on the industry-specific size of the shock. Detailed estimates are available in
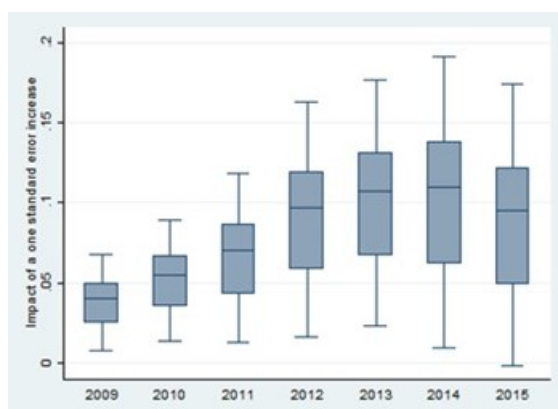
7 Unfortunately, the number of firms observed per country does not allow to build reliable indicators at the industry level.

Chart 3: The Industry-specific Impact of Management Quality
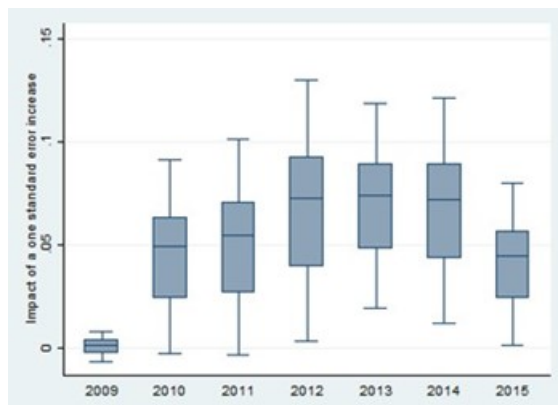
Panel A: Value-added

Panel B: Employment

Note: The impact of a (pre-crisis) one standard error increase of MQ on the change in value-added (employment) in 2015 compared to 2007 would be 0.1 per cent (-0.1 per cent) in industries where the shock was nil, 2.6 per cent (5,0 per cent) for the first quartile of shock, 4.3 per cent (9.3 per cent) for the median shock, 5.7 per cent (12.3 per cent) for the third quartile of shock and 8.2 per cent (17.9 per cent) for the most important shock.

Cette *et al.* (2020).

Chart 2 shows the yearly evolution (i.e. cumulative effect at year t as measured by the coefficient $\widehat{\theta_t^X}$) of the estimated average impacts of a pre-crisis one standard error increase of MQ on each of our variables of interest. Overall, good managerial practices may have helped counteract the detrimental direct impacts of the Great Recession on employment with a moderating effect on wage resulting in an upward push on the labour share after a few years. As

MQ has a positive and significant impact on both value-added and employment for most of the post-crisis period, there is no significant impact on productivity, except in the first year.

Chart 3 presents our main result: the estimated impact of a one standard error increase of the pre-crisis MQ, as in Chart 1, but in terms of box plots showing the effects across industries that experienced

shocks of different sizes.[8] As conjectured, the positive influence of MQ on these two variables is related to the size of the shocks: the bigger are the shocks the larger are both their direct detrimental impacts and the countervailing influence of good managerial practices on employment and value added.

These results are robust to changes in the estimation sample, in the set of fixed effects and in the estimation method of standard errors (bootstrap s.e. as well as clustered s.e. at the country level) as well as to including control variables (such as OECD measures of labour and product market regulations, and human capital) and using instrumental variables (Cette *et al.*, 2020).

Conclusion

Countries where management quality was higher than average at the outset of the Great Recession weathered the crisis better than other countries in terms of employment and production outcomes. This was partly due to the ability to moderate real wage growth and resulted in stronger resistance of labour shares. Our results, which are robust to several sensitivity tests, point to the potential gains to be obtained from raising the level of managerial abilities not only in terms of growth but also in terms of better resilience to cyclical downturns.

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8 We present only the effects on value-added and employment for which the MQ impact (i.e. the (β_t^X) coefficients) depends significantly on the size of the shock.