

**The Impact of CSR Certification on  
Firm Profitability, Wages and Sales**

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WIFO Working Papers, No. 535

May 2017

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2017/131/W/0

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# **The Impact of CSR certification on firm profitability, wages and sales**

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## ***Abstract***

We use synthetic control group methods to analyze the causal impact of CSR certification on the economic performance of a small set of Italian manufacturing firms that underwent SA8000 certification in 2009 or 2010. We find no evidence of a positive or negative impact of SA8000 certification on firm profitability and wages. The only outcome variable for which effects are positive and weakly significant in many instances are firms' turnover to assets ratios. From this we conclude that SA8000 certification has no strong impact on firm profitability and wage costs, but that it may be a viable marketing tool that increases company sales.

**JEL-codes:** M14, L31, L21

**Keywords:** Corporate Social Responsibility, Synthetic Control Groups, Company Performance, SA8000 certification

## 1. Introduction

The number of firms resorting to voluntary but costly external certification for social and environmental standards has rapidly increased in the last decades. For instance according to a survey by Kitzmueller and Shimshak (2012) more than one third of the large firms in the US resort to such certifications. As a consequence also research on the impact of these certification activities and of corporate social responsibility (CSR) in general on the economic performance of firms has boomed in recent years (Margolis and Walsh 2003, Margolis *et al.* 2009, Hiscox *et al.* 2009, Bernabou and Tirole 2010, Kitzmueller and Shimshack 2012 for surveys). Much of this research finds a positive (but often small) correlation of the implementation of CSR policies with sales (Waddock and Graves 1997), innovation (LeBas and Poussing 2014, Bocquet *et al.* 2013), labor productivity and financial performance (Margolis *et al.* 2009, Wu and Shen 2013) and the ease of recruiting and motivating employees (Flammer and Luo 2017, Tamm *et al.* 2010) and a negative one with the costs of capital (Ghoul *et al.* 2011).

This is, however, only imperfect evidence of a positive causal impact of CSR adoption as two competing explanations exist for the positive correlation of financial performance with CSR adoption and/or certification. The first, often referred to as the “resource slack hypothesis” (e.g. Margolis *et al.* 2009), holds that managers, shareholders and owners of financially more successful firms have greater resources to finance otherwise profit reducing CSR activities, which they undertake for ideological reasons or to increase their social prestige. According to this hypothesis therefore good financial performance causes CSR adoption. The second, referred to as the “good management hypotheses”, by contrast, holds that CSR improves a firm’s relationships to key stakeholders and as a consequence also company performance. In this view CSR causes good financial performance.

Differentiating between these two hypotheses requires establishing a causal effect of CSR adoption on the firms’ financial performance. Ideally to do this, one would like to run an experiment. In

this CSR practices or certifications should be randomly assigned to one group of firms, while another randomly selected group of firms continues business as usual. A comparison of the change in financial performance between these two groups would then yield the causal impact of CSR on financial performance. Such an experiment is unlikely to ever be conducted on account of its high costs and the many practical issues involved. Researchers interested in identifying the causal impact of CSR therefore must look for “close substitutes” to such an experiment (i.e. quasi-experimental evidence). For instance, in a recent study, Flammer (2015) uses a regression discontinuity approach to identify the impact of CSR on company performance. She compares listed US companies, whose board decided to implement CSR practices by a narrow margin, to companies, whose board decided not to implement such practices by an equally narrow margin and argues that these two groups are “a close call” to a random assignment. She finds that the first group of firms has substantially better financial performance after CSR implementation than the latter. She also finds that this causal effect is weaker in companies with higher CSR levels, thus pointing to decreasing marginal returns of CSR investments.

This paper extends on these findings. It uses data on the certification of a widely used international standard on social accountability (the SA8000 standard) for a small group of Italian firms and synthetic control group methods (Abadie and Gardeazabal, 2003 and Abadie *et al.* 2010) to assess the causal impact of CSR practices on financial performance. It therefore contributes to two strands of literature. One relates to the impacts of SA8000 certification on firm performance (Hiscox *et al.* 2009 for a survey and Dönmez Mac and Calis 2012 Gilbert and Rasche, 2007, Dimitru *et al.* 2010 and Rasche 2010 for recent contributions). This has so far mostly concentrated on ethical, political and philosophical considerations and on the effects of this certification on the employees of certifying firms. The current paper, to the best of our knowledge, is the first analysis of the causal impact of SA8000 certification on financial performance. The other is the wider literature on the impact of CSR policies on company

performance. In this literature, too only few studies (Flammer 2015 and Flammer and Luo 2017 for exceptions) have used quasi-experimental methods. This paper adds to this literature, which has so far mostly concentrated on publicly listed companies in the US, by evaluating the causal impacts of one of the most used social accountability certifications on the financial performance of a small sample of Italian manufacturing firms not listed on the stock exchange. This may be interesting in the light of the substantial differences in for instance transparency and disclosure rules applying to listed and unlisted companies, as well the substantially more regulated product and labor markets in Europe. In particular, the latter suggests that companies in Europe may already be operating at rather high CSR levels and that therefore, in the light of the results of Flammer (2015), returns to implementing such strategies may be lower than in the US.

## **2. Theory and previous literature**

Previous literature has followed two rather different lines of reasoning to explain the impact of CSR on financial performance. The first of these is based on the assumption that consumers, investors and workers are indifferent as to how a good or service is produced, but that managers or owners prefer socially responsible production.<sup>12</sup> Proponents of this line of argument (e.g. Reinhardt *et al.* 2008, Melo 2012) suggest that CSR reduces profits, but is undertaken to satisfy the preferences of managers or owners. Since, more profitable firms are (all else equal) better prepared to cover the additional costs of CSR, this line of reasoning predicts a positive correlation between firm profitability and CSR adoption, because higher profits allow managers and owners to implement CSR.

The second line of reasoning, assumes that investors, consumers or workers prefer socially of environmentally responsible production. As a consequence CSR can impact on firms' financial performance through a sales, credit and labor market channel. The sales channel arises if customers hold a preference for socially responsibly produced goods. This implies that CSR adoption increases the demand

(or the willingness to pay) for a firm's produce. This will result in increased sales and higher profits if the increase in sales exceeds the costs of CSR implementation. The credit channel, by contrast, stresses that investors have a preference for CSR and will thus be willing to accept a lower returns (interests) on funds provided to firms applying CSR. If the savings from lower interest payments exceed the costs of adopting CSR, this will once more improve a company's financial performance. Finally, the labor channel argues that if workers (all else equal) prefer to work at socially responsible firms, this will increase their productivity.<sup>3</sup> If this increase in productivity exceeds the cost of CSR adoption, this will also increase firm profitability. This line of reasoning therefore also predicts a positive correlation between CSR adoption and profits, but holds that this is because CSR implementation increases profits. Furthermore, this line of reasoning also identifies three separate channels through which this causal impact can occur.

A rather large literature aims to measure the correlation between CSR adoption and firm level financial performance or to identify the different channels through which CSR adoption impacts on this. For example, with respect to the impact of CSR on the financial performance of firms Margolis *et al.* (2008) provide an encompassing meta-study. This surveys 251 estimates of the correlation between CSR and financial performance. They show that in average these studies find a weak positive correlation (of 0.13) between financial performance and CSR-adoption, with more recent studies in tendency finding even smaller correlations. Similarly, in the recent literature on the separate channels through which CSR adoption may affect firm performance El Ghoul *et al.* (2011) use a sample of over 12,000 US firms to show that investments into CSR, are significantly negatively correlated to a firms' cost of equity. Tamm *et al.* (2010) focusing on the labor channel and using survey data from Estonia, Lithuania and Latvia show that employees in firms that are deemed more socially responsible also have higher job satisfaction and work ethics. Korschun *et al.* (2014) find that employees in Fortune 500 firms that implement CSR policies

are more customer-oriented. Furthermore Saedi (2015), in line with the sales channel, finds higher customer satisfaction among Iranian firms following CSR policies.

These contributions have, however, differed in the definition of CSR and financial performance. Furthermore as pointed out in the survey by Hiscox *et al.* (2009) they have also faced severe methodological problems in differentiating between the good management and resource slack hypothesis as only few of them account for the potential endogeneity of CSR. With respect to the definition of the CSR-status of a firm some authors (e.g. Flammer 2015) have used corporate disclosures, while others (e.g. Lin *et al.* 2009) focus on charitable donations and quite a few recent papers (Wu 2013, Cavaco and Crifo 2014, Becchetti and Ciceritti 2009) have resorted to various indices measuring the reputation of firms in implementing CSR. One drawback of these measures is that they provide only limited information on compliance with CSR practices. As a consequence a number authors (e.g. Hiscox *et al.* 2009) advocate the use of industry standards or certifications to measure CSR implementation, as compliance to these is controlled by external auditors and because recent experimental evidence suggests that such standards are also considered more credible signals of CSR by customers (Eile and Teyssier 2015).

With respect to the measure of financial performance, by contrast, authors focusing on firms listed on the stock exchange have used measures of a firm's value such as Tobins Q or the market value of a firm as these are likely to better reflect the long run profitability of a firm than bookkeeping measures (Becchetti and Ciceritti 2009, Becchetti *et al.* 2013). By contrast, the few contributions focusing on smaller enterprises or enterprises not listed on stock exchanges (Lin *et al.* 2009, Tsoutsura 2004, Wu and Shen 2013, Belu and Manescu 2013) have mostly focused on accounting measures of profitability such as returns on assets and returns on equity.



### **3. Method and Institutional Background**

In the current paper, CSR adoption is measured by the implementation of SA8000 certification. This is one of the internationally most widely used social accountability standard for retailers, brand companies, suppliers and other organizations.<sup>4</sup> It is based on international agreements<sup>5</sup> and requires certified firms to adhere to a set of norms related to working hours, health and safety, prevention of discrimination, work of children and adolescents and forced labor. It also requires certified firms to respect the freedom of association, to follow a specific code of conduct with respect to disciplinary practices, to provide sufficient remuneration to meet the basic needs of workers and to implement continuous control systems for improving working conditions. In addition SA8000 certified firms are required to employ neither child nor forced or compulsory labor, to provide a safe and healthy workplace environment and to take effective steps to prevent potential health and safety incidents and occupational injury or illness associated with, or occurring in the course of work. They are also required to abide to existing laws with respect to working hours and remuneration (Social Accountability International, 2015).

SA8000 certification is also costly for the firm and is based on a highly standardized certification process. In terms of costs, the out-of-pocket costs associated with certification consist of the costs associated of taking corrective and preventive action in order to comply with the standard, of preparing and conducting the audit by an SAAS-accredited certifying body as well as the costs associated with taking corrective actions to resolve problems if nonconformities have been identified. In particular with respect to the costs of certification individual certification bodies base their auditing activities on market prices depending on the size, scope, and location of the facility, at prices that typically range between \$500 and \$1,500 per day (<http://www.saasaccreditation.org/certification-costs> and Gilbert 2001).

The certification process, by contrast, ensures a continued compliance of the certified companies to SA800 norms. Any organization seeking certification to SA8000 must apply to an SAAS-accredited

auditing firm, which acts as a certification body for the standard. It consists of a preliminary assessment at the very beginning of the procedures. In this, any necessary improvements to meet the requirements in the standard are identified. This is followed by a certification audit, where the auditing firm examines whether the necessary improvements have been implemented and provides the certification if this is justified. After this the firm is subject to regular (annual or semi-annual) surveillance audits for three years, after which the certificate expires and needs to be renewed under slightly simplified procedures. These surveillance audits ensure the continued compliance to the standard as well as continued improvements in meeting the standard, and may result in a list of suggested improvements or even withdrawal of the standard in cases of severe abuse (Gilbert 2001 and <http://www.saasaccreditation.org/certification> for details). As a consequence issues of compliance with the standard are likely to be of lesser importance in the current analysis, given that this is monitored by independent auditors at regular intervals (Social Accountability International, 2015).<sup>6</sup>

Issues of identification of the impact of CSR on financial performance, however, remain to be relevant. These arise both because of the potential reverse causality emphasized in the theoretical section above, but also because firms choose to adopt SA8000. Profit maximizing firms will therefore only do this if they expect this to increase their profits. Comparing firms implementing SA8000 to firms not implementing it therefore implies comparing firms that expect to profit from SA8000 to firms that do not. As a consequence, such a comparison will overstate the true effect of SA8000 adoption, if firm expectations of profitability of SA8000 adoption are met.

To assess the impact of CSR certification on a firm's sales, profitability and productivity, therefore a comparison group of non-adopting firms that can be expected to have developed in a similar way as SA8000 adopting firms would have in the absence of adoption must be sought for. Previous contributions often use industry averages or firms of similar sizes to define such a control group (e.g.

Basovnikova *et al.* 2013). In the current paper, we use synthetic control methods. This method (introduced by Abadie and Gardeazabal 2003 and Abadie *et al.* 2010), has recently been used in many studies relating to various fields of economic analysis (e.g. Peri and Yassenov, 2015, Kreif *et al.* 2016). It provides a systematic way to avoid the arbitrariness necessarily involved in defining ad-hoc control groups (e.g. industry averages) and to analyze the impact of an event (such as SA8000 certification) on a treated unit (i.e. a SA8000 certified firm) relative to a control group of untreated units (i.e. firms that did not certify SA8000) at the hands of a control group that is derived by statistical methods.

It consists of in a first step using data on a multitude of firms that did not adopt SA8000 (referred to as the donor pool) to define a fictitious untreated firm that has developed as similarly as possible to the firm adopting the treatment prior to treatment. In a second step then the post adoption development of the firm adopting SA8000 is compared to this fictitious firm. The method therefore allows for the identification of a reasonable control group and to conduct a difference in difference analysis on the outcome for the certifying firm relative to the endogenously defined synthetic group. Formally in the context of the current analysis the method consists of considering  $N+1$  firms (indexed by  $n$ ) over a time period (indexed by  $t \in [1 \dots T]$ ). Assuming that, without loss of generality, the first of these firms has certified for SA8000 for the first time in period  $\tau$ , the vector of observed firm characteristics ( $X_n$ ) can be defined, such that  $X_1$  denotes the treated firm's characteristics and  $X = (X_2, \dots, X_{N+1})$  the characteristics for firms in the donor group in the pre-treatment period. The synthetic control method then consists of first estimating weights that produce a convex combination of firm characteristics among the donor pool so as to as closely as possible approximate the behavior of the variable vector ( $X_1$ ) of the treated firm in the pre-treatment period (i.e. up to  $\tau$ ). This is done by choosing a vector of firm specific weights  $W = (w_2, \dots, w_{N+1})$ , with  $\sum_{n=2}^{N+1} w_n = 1$  and  $w_n < 1$ , to solve the minimization

$$W^* = \operatorname{argmin}_W (X_1 - XW)'V(X_1 - XW) \quad (1)$$

subject to

$$\sum_2^{N+1} w_n = 1$$

with  $V$  a  $K \times K$  positive definitive diagonal matrix, which determines the weight for the contribution of each characteristic in the objective function and which is chosen so as to minimize the standard error of the estimate. In a second step then the weights ( $W^*$ ) calculated from this optimization are used to calculate hypothetical post treatment variables for the “synthetic control”. These can then be compared to the development of the variables of interest in the post treatment period in SA8000 adopting firms.

One issue related to the synthetic control group method is that it does not directly allow for hypotheses tests as it is not clear what the standard deviation of the estimated effect is. Abadie *et al.* (2010) therefore suggest applying procedures of classical permutation tests for inference in the synthetic control group analysis. These consist of applying the synthetic control method to a number of untreated observations in the sample and to simulate the distribution of deviations between the treated and synthetic control group from a series of such placebo treatments. Through this the size of the difference between the synthetic control and the treated firm relative to the effects estimated for randomly chosen placebo firms can be assessed by standard difference in difference methods. To implement this approach, we therefore conducted a synthetic control group analysis as above for a set of 250 randomly selected placebo firms from the donor pool of firms and imposed a fictitious adoption in the same year as the treated firm.

A further issue with the synthetic control group method is that it is not entirely clear how to deal with multiple treated units. Abadie *et al.* (2010) suggest that in such a case, the treated units should be collapsed into a single unit by taking averages across the individual observations (Kreif *et al.* 2016 for an application). We follow this suggestion below by taking averages for all firms treated in 2009 and 2010 respectively and performing the synthetic control group analysis for these two aggregated firms. An advantage of this approach is that reduces any issues resulting from measurement errors in the data. A

disadvantage is that by definition it also masks heterogeneity in treatment effect across firms. As a consequence in a further step of the analysis, we also conduct a firm by firm level analysis.

#### **4. Data**

We implement these procedures by merging data taken from two sources. The first is a list of Italian manufacturing companies that received CSR certification in the years from 2009 to 2010. This was acquired from the SAAS accreditation homepage<sup>7</sup> and provides the name of all establishments that received SA8000 certification and the year in which this certification was first granted. It also provides information on the address of the establishment and its industry affiliation. The second is the Amadeus data base of Bureau van Dijk. This was used to extract bookkeeping data on firm profitability, sales and total wage costs as well as total assets for all Italian manufacturing establishments for the years 2007 to 2012. Using an exact matching algorithm on names and address to merge these data sets we were able to identify 10 establishments that received an SA8000 certification in the years 2009 or 2010, retained the standard until 2012<sup>8</sup> and have a full panel of observations from 2007 to 2012 (i.e. one observation for each year) for all indicators used in the analysis.

This data was then used to calculate values of firm level return on assets (ROA), turnover to assets ratios and total wage costs relative to total assets.<sup>9</sup> These are used as outcome variables in the current analysis. Returns on assets are used as a measure for the firm's overall financial performance, while turnover to assets ratio and wage costs relative to assets account for the importance of the sales and labor channel, respectively. Under the "good management" hypothesis we therefore expect SA8000 certification to increase ROA and either to reduce wage costs or to increase the turnover to assets ratio (or both) depending on whether the sales or labor channel (or both) are relevant. By contrast, under the "resource slack hypothesis" we would expect a negative impact of SA8000 adoption on ROA and a neutral one on

the turnover to assets ratio, but potentially a negative or neutral one on wage costs relative to assets (depending on whether compliance to SA8000 increases wage costs or not).

The left-hand side panel of Table 1 provides descriptive statistics for these indicators for the 10 firms adopting SA8000 for the first time in the years 2009 or 2010 by reporting the average ROA, turnover to assets ratio and wage costs as a percentage of assets in the period before and after SA8000 adoption. Of the 10 establishments two operate in manufacturing of leather and related products (i.e. NACE 2 digit industry 15), other non-metallic mineral products (NACE 2 digit industry 28) and in manufacturing of fabricated metal products (excluding machinery and equipment - 25) and one each in the manufacture of beverages (11), chemicals and chemical products (20), basic metals (24) and other non-metallic mineral products (23). Six received SA8000 certification in 2009 and four in 2010. Furthermore, only one firm is a public limited liability company listed on the stock exchange. All others are private limited liability companies. This may be of relevance in the light of the previous literature on CSR adoption, as this has mostly focused on listed companies, while the current sample is strongly selected from among non-listed companies.

{Table 1: Around here}

The right-hand side panel of Table 1 presents descriptive statistics for the donor pool of the synthetic control group analysis for the pre- and post-treatment period. This is the group of all firms with a full set of observations on their total ROA, turnover to assets ratio and wage costs to assets for the years 2007 to 2012 that never adopted SA8000. While we use firm level data to define the synthetic control, the right-hand side panel of Table 2 presents descriptive statistics for this donor group by NACE 2-digit industry. Comparing the development of the various indicators of the treated firms and the donor pool

between the pre- and post-adoption period, provides rather mixed evidence on the potential impact of SA8000 adoption on ROA, turnover to assets ratio and wage costs relative to assets. Thus for instance considering the averages for the firms receiving SA8000 certification in 2009 their ROA and turnover to assets ratio reduced after SA8000 adoption, while their wage costs as a share of total assets increased. This development of ROA and turnover to assets ratios contrasts to the development in the donor group. The development of wages as a share of assets, however, is in line with the developments in the donor group. By contrast, among firms receiving SA8000 certification in 2010 all three indicators increased in line with the development of the respective donor groups.

Focusing on firm level developments indicates equally mixed results. For four firms ROA and turnover to assets ratios reduced in the post treatment period (mostly in contrast to developments of the donor group), while for another six they increased. Similarly wage costs as a share of assets reduced among three firms but increased among the others. Furthermore standard difference-in-difference tests for difference of developments among the treated firms relative to the developments in the donor group remain statistically insignificant throughout. The only exceptions are three firms (number 7, 8 and 9) when focusing on the developments of the turnover to assets ratio, and two firms (number 7 and 8) in the case of wage costs as a percentage of assets. In all these cases, however, the results of this test indicate a significantly stronger increase in the respective indicator among the treated firms relative to the donor group. In sum, therefore a simple comparison of firm level performance to industry averages does not lead to clear cut results with respect to the impact of SA8000 certification on firm level financial performance.

## **5. Results**

### ***5.1. Results for aggregates***

This may, however, be because this naïve comparison does not consider the potential self-selection of firms into SA8000 certification. Figure 1 therefore presents the key results of the synthetic control group

analysis. It compares the evolution of the respective outcome indicators (ROA, turnover to assets ratio and the wage costs as a share of assets) of the average firm applying the SA8000 standard in 2009 (in the left-hand panel) and 2010 (in the right-hand panel) to the respective synthetic control in the period from 2007 to 2012. In this figure, bold lines represent the average development of the treated firms, while thin lines show the developments of the synthetic control. Furthermore, the top panel of this figure presents results with respect to ROA, the middle panel for the turnover to assets ratios and the lowest panel for wage costs relative to assets. The horizontal line in these figures marks the year of SA8000 certification. In all of these diagrams the lines for the treated firms and their respective synthetic control are very close to each other in the period before SA8000 adoption for all of the outcome variables. This provides (ex-post) validation of the identification strategy, as it indicates that the treated and the synthetic control group assigned by the method follow very similar trends before treatment.

In the post-treatment period, however, the developments of the treated firm and its synthetic control start to diverge. In particular, the evidence on ROA suggests a positive impact of SA8000 adoption on firm profitability for the firms that adopted this standard in 2009, as their average ROA is by around six percentage points higher at the end of the observation period than among the synthetic control group. For firms that adopted the SA8000 standard in 2010, by contrast, results indicate a decline in profitability after the introduction of the standard relative to the synthetic control, as the ROA of firms adopting SA8000 certification in 2010 is by around three percentage points lower throughout the post-treatment observation period than that of their synthetic control group.

{Figure 1: Around here}



Evidence with respect to the turnover to assets ratio (in the middle panel of Figure 1) is more compelling, as both firms adopting the SA8000 standard in 2009 and 2010 experienced a noticeable increase in their turnover to assets ratio relative to their synthetic control after SA8000 adoption. This difference amounts to over 20 percentage points (i.e. around one third of a standard deviation of this indicator among non-adopting firms) throughout the post-treatment period for firms adopting SA8000 in 2009 and to five to ten percentage points for firms adopting SA8000 in 2010. Finally, the results with respect to the total wage costs of the firm suggest a sizable negative impact of SA8000 adoption on total wage costs for firms adopting the SA8000 standard in 2009 but a sizeable positive one for firms adopting SA8000 in 2010.

In sum, therefore these results provide a rather differentiated picture on both the “good management” and the “resource slack” hypothesis. On the one hand the results with respect to the turnover to assets ratio are broadly in line with the “good management hypothesis” as they suggest that, consistent with the sales channel, SA8000 adoption has a positive impact on the turnover to assets ratio. On the other hand the results on ROA and wage costs as a share of assets provide no clear evidence on either of the two hypotheses, but rather highlight the potential heterogeneity of treatment effects, as they depend on the year of SA8000 certification. Firms certifying in 2009 experienced higher profitability and lower wage costs after SA8000 adoption as would be expected under the good management hypothesis. Firms certifying in 2010, by contrast, experienced higher wage costs but lower profitability as could be expected under the resource slack hypothesis.

These results, however, must be interpreted in the context of the variability of the variable of interest among untreated firms. To allow for such an interpretation Figure 2 (in its top panel) shows the estimated gaps for the first 50 of a total of 250 placebo treatments which we estimated for firms not adopting SA8000 and compares them to the estimated gap for the average firms treated in 2009 and 2010.

Again in this figure in the pre-treatment period most series are located very close to zero, thus also indicating a good fit of the placebo treatments. Furthermore, in the post-treatment period the placebo treatment effects – although varying more than in the pre-treatment period - are well centered on zero. This provides further ex-post validation to the method used, as in average no effects are found in the post-treatment period for firms where no treatment occurred. The bars of the bottom panel of Figure 2 show the empirical distribution of the placebo treatment effects for all 250 placebo treatments. These are defined as the differences-in-differences between the treated firms and the control group over the pre- and post-treatment period in the outcome variable generated. The horizontal line in these figures shows the estimated treatment effect for the average of the firms that adopted SA8000 in 2009 and 2010, respectively. Thus a vertical line that is far to the right of the placebo distribution suggests that the estimated treatment effect for the respective group of firms is positive and large relative to the placebo treatments, while a vertical line to the left of this distribution indicates a large negative effect of SA8000 adoption.

{Figure 2: Around here}

Finally, Table 2 summarizes the results reported in Figure 2 by comparing the estimated pre- to post treatment differences in pre-tax profits, sales and wage costs (reported in the top panel of this table) to the average pre- to post treatment differences in the placebo treatments (middle panel) in a difference in difference estimate of the treatment effects (bottom panel). Furthermore, the bottom panel of this table reports the share of the placebo distribution to the right of the estimated treatment effect. This last panel can thus be interpreted as a test of the null hypothesis that SA8000 had no effect on firm level returns on assets, turnover to sales ratios and wage costs relative to assets. A number smaller than 0.1 in this table

suggests a statistically significant positive impact of SA8000 certification on the respective indicator at the 10% level, while a value larger than 0.9 indicates statistically significant negative impact of SA8000 certification on the respective indicator at the 10% level.

{Table 2: Around here}

Taken together the evidence presented in Figure 2 and Table 2 thus indicates that in the average firm adopting the SA8000 standard in 2009 ROA increased by 2.8 percentage points, while the turnover to assets ratio increased by 21.7 percentage points and total wage costs as a share of assets reduced by 4.7 percentage points. By contrast, in the average firm adopting the SA8000 standard in 2010 returns on assets reduced by 1.3 percentage points while the turnover to assets ratio and wage costs as a share of assets increased by 8.4 and 1.4 percentage points, respectively. Comparing these figures to the effects found for placebo treatments suggests an average treatment effect on the treated (ATT) for firms adopting in SA8000 in 2009 of 3.2 percentage points for ROA, 24.4 percentage points for the turnover to assets ratio and 5.1 percentage point for wage costs as a percentage of assets, with all these effects except for the one on turnover to assets ratios statistically insignificant at conventional significance levels. For the firms adopting SA8000 in 2010, by contrast, the estimated ATT is -0.9 percentage points for ROA, 10.1 percentage points for the turnover to assets ratio and 1.0 percentage points for wage costs as a percentage of assets, with all effects statistically insignificant at conventional levels of significance.

In sum considering the average firms certifying for SA8000 in 2009 and 2010 we find no evidence of either a statistically significant positive or negative impact of SA8000 certification on firm profitability and wages and only weak evidence for a statically positive effect firms turnover to assets

ratio's that is also limited to firm certifying in 2009. Furthermore, the differences between results for different years also suggest substantial heterogeneity in treatment effects.

## **5.2 *Heterogeneity in treatment effects and results for individual firms***

To assess this potential heterogeneity of treatment effects, we also conducted a similar analysis as above for each firm in the sample<sup>10</sup>. The results of this analysis are reported in Figures A1 to A3 in the Appendix, which presents similar graphs as Figures 1 and 2. Furthermore these results are summarized in Table 3. This repeats the information displayed in Table 2 on a firm by firm level. As can be seen results are almost always statistically insignificant at conventional significance levels for the development of ROA and wages as a share of assets after SA8000 certification, and often also disagree in sign for these outcome indicators. Thus firm profitability as measured by returns on assets increased statistically significantly only in firm number 3 with an increase of 17.8 percentage points relative to the reference, while wages as a share of assets reduced statistically significantly in firm number 2, but increased statistically significantly in firm number 7. This thus also suggests an insignificant or at least highly heterogeneous impact of SA8000 on wage costs. The only outcome indicator where results are statistically significant more often is the turnover to assets ratio. This increased statistically significantly in 3 of the 10 firms considered. In addition for these firms this increase is also of economic significance as it amounts to an increase between 19.0 to 30.3 percentage points (i.e. around one third of a standard deviation of this measure in the industries to which the firms were affiliated).

{Table 3: Around Here}

Furthermore, correlating the average treatment effects on a firm level with indicators of firm size such as the number of employees and total assets before SA8000 adoption, suggests that larger firms are

more likely to profit from SA8000 adoption than small ones in terms of turnover ratios. The correlation coefficient of the treatment effect for the turnover ratio with the number of employees at a treated firm is 0.46 and with total assets 0.60. By contrast for ROA and the wage sum as a share of total assets the correlation of the firm level treatment effects with firm size are much smaller. They amount to 0.13 respectively -0.14 with the number of employees, and to 0.09 respectively 0.29 with total assets.

### 5.3 *Regression results*

Finally in a last step of the analysis we also followed Peri and Yassenov (2010), who use a difference in difference analyses to assess the significance of the estimated effect from the synthetic control group. This consists of a regression analysis in which the pre- to post-treatment difference in the outcome variable under consideration between the treated firm and its synthetic control group as well as the same difference for the 250 placebo treatments are entered as observations. Thus dividing the output from the synthetic control group method into a subset of observations (R) that refer to the differences of the treated firms to their synthetic control group and another subset of observations that refer to the differences-in-differences for the placebo treatments, the significance of the SA8000 adoption can be assessed by the significance of the parameter  $\delta$  in a regression of the form:

$$y_{it} = \beta_i D_i + \lambda D_t + \delta D_{t \geq \tau} D_{i \in R} + \xi_{jit} \quad (2)$$

where  $\xi_{jit}$  is a disturbance term and  $y_{it}$  is the respective outcome variable of the firm adopting the SA8000 standard or of its respective synthetic control group and  $D_i$  is a dummy variable for each firm and  $D_t$  for each year, while  $D_{t \geq \tau}$  and  $D_{j \in R}$  are indicators for the post treatment period and the set of SA8000 adopting firms. Furthermore, we conducted a similar regression analysis for the differences between the treated firms and their respective synthetic control

{Table 4: Around here}

The results of these analyses are reported in in Table 4. In this table the right-hand side presents results for the regression in which differences between the treated firm and the synthetic control and placebos are analyzed while the left-hand side focuses on the comparison of treated firms to their respective synthetic control group. In addition, the top panel reports the regression results for the analysis on the level of averages across firms, while the bottom panel present the same analysis for the analysis at the firm level. Once more these results do not suggest a significant impact of SA8000 certification on either firm level profitability or wages, as the coefficient on the interaction term on the treated firms and the post treatment period are insignificant in all specifications. Also the sign of these coefficients differs between the specifications. By contrast, SA8000 certification has a weakly significantly positive impact on sales as a share of assets in three of the four specifications and the coefficient on the treated firms and post treatment period interaction is also positive in the fourth of these specifications. This thus once more suggests that, if anything, SA8000 certification may have a positive effect on the sales of companies, with the size of the estimates suggesting an increase of the turnover to assets ratio in these firms of between ten to as much as 20 percentage points.

## **6. Conclusion**

In sum, using a synthetic control group analysis to identify the causal effects of SA8000 certification as one of the internationally most often applied standards for CSR certification, we find little evidence of either a positive or negative impact of SA8000 certification on firm profitability and wages. This implies that we also find no clear evidence to support either the resource slack or the good management hypothesis. Rather our results indicate a potential impact of such certifications on sales in some cases, as the only outcome variable for which positive significant effects of SA8000 certification are found in a number of instances are firms' turnover to assets ratios. This suggests that SA8000 certification has no

strong impact on firm profitability and wage costs, but that it may be a viable marketing tool that increases company sales. In particular, given that most of our firms do not operate in consumer industries we would argue that firms may use such a certification to strengthen their position in world-wide delivery networks.

Our results, apply to a small set of Italian firms that are not listed on the stock exchange, and differ somewhat from recent quasi-experimental evidence on the impact of CSR on large listed US companies provided by Flammer (2015). Although we have no means to tests these hypotheses, there may be two explanations for these differences in results. The first of these may be that smaller firms not listed on the stock exchange face rather different transparency and disclosure rules with respect to their CSR activities (as well as their costs). This implies that they may be affected differently through CSR certification. This would be consistent with the substantial heterogeneity in the effects of SA8000 certification found in the current paper. The second of these may be that the substantially more regulated product and labor markets in Europe imply that firms in these markets are already operating at rather high CSR levels and therefore profit less from CSR certification. This would be consistent with Flammer's (2015) result of decreasing returns to CSR-activities. Irrespective of the causes for the differences in results found, analyzing the potentially differential impact of CSR adoption in different (firm level or national level) institutional contexts could be an interesting topic for further research.

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#### NOTES

<sup>1</sup> This may be either due to an ideological conviction of these actors or because CSR offers them the possibility to increase their social prestige (Bernabou and Tirole, 2010).

<sup>2</sup> This may be either due to an ideological conviction of these actors or because CSR offers them the possibility to increase their social prestige (Bernabou and Tirole, 2010).

<sup>3</sup> This is either because working at such firms increases motivation or because socially responsible firms have more applicants for vacancies and can thus choose to employ more productive workers.

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<sup>4</sup> According to Social Accounting Accreditation Services (SAAS) in 2016 a total of 3888 facilities in 68 countries and 55 industries were certified through SA8000 in 2016 (<http://www.saasaccreditation.org/certifacilitieslist>)

<sup>5</sup> These include the International Labor Organization convention, the Universal Declaration of Human Rights and the Convention of the Rights of the Child.

<sup>6</sup> Despite its prevalence and emphasis on compliance the impact of SA8000 certification on the financial performance of the certified organization has so far rarely been analyzed. For instance Hiscox, *et al.* (2008) in a survey report that there have been no studies evaluating the impact of SA8000 adoption on business outcomes so far.

<sup>7</sup> [http://www.saasaccreditation.org/sites/default/files/u5/SA8000\\_Q4.2016\\_Public\\_list.pdf](http://www.saasaccreditation.org/sites/default/files/u5/SA8000_Q4.2016_Public_list.pdf)

<sup>8</sup> Firms which adopted the SA8000 before 2009 or adopted the standard in the period from 2009 to 2010 but stopped applying it before 2012 were omitted from the analysis to avoid confounding the synthetic control group with treated firms and to avoid issues related to non-compliance to this standard.

<sup>9</sup> The return on assets were calculated as the ratio of before tax profits to total assets, the turnover to assets ratio as the ratio of sales to assets and the wage costs as the firm's wage bill relative to assets. Therefore to ensure all variables are on a comparable scale, they are all measured as a percentage of total assets.

<sup>10</sup> Methodologically these analyses are based on an identical procedure as those for firm averages above. The only difference is that we limit the donor pool for the analysis to firms from the same industry.



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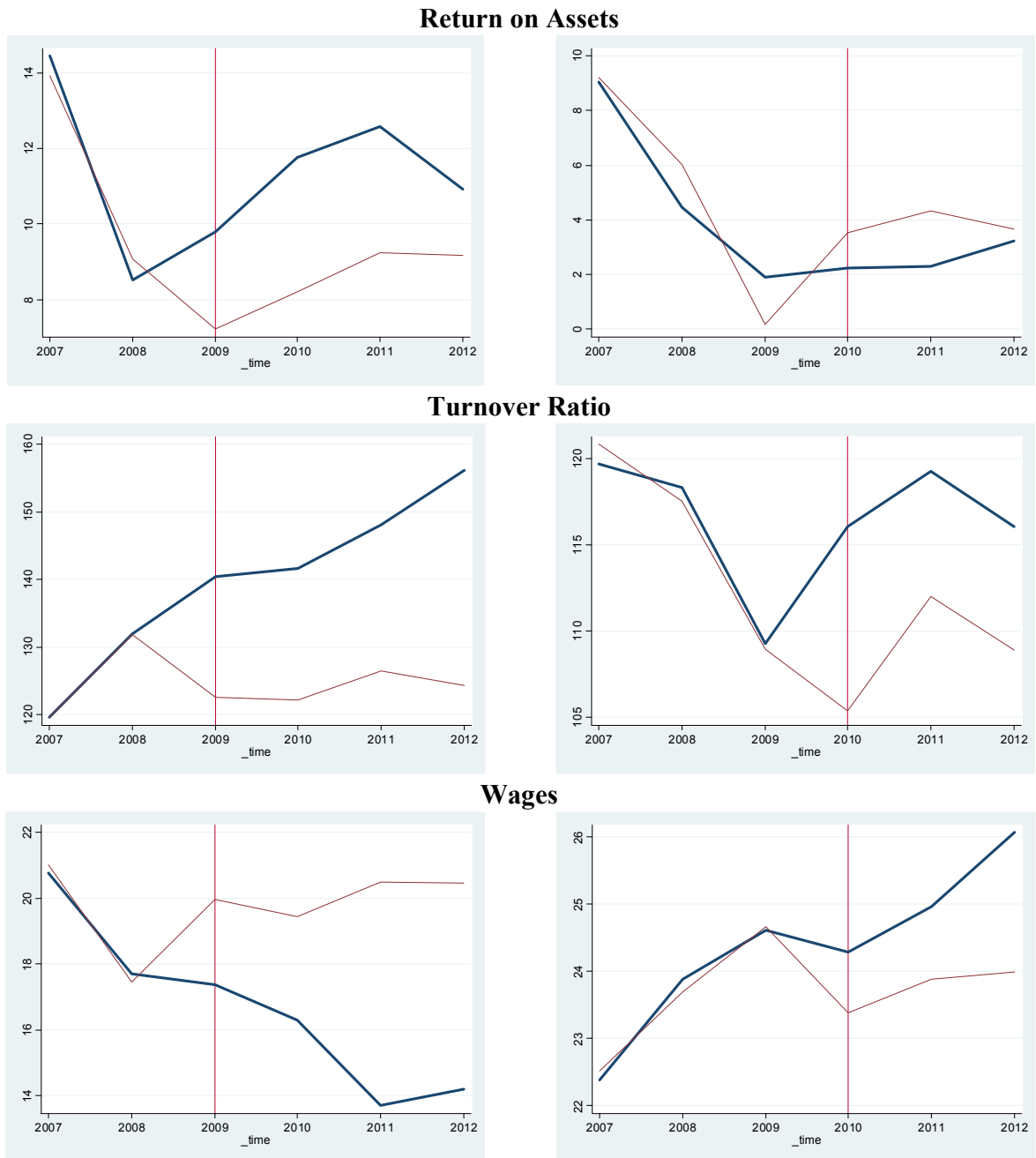
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**Table 1: Descriptive statistics for SA8000 firms and industry averages**

Firm No.	Nace digit ind.	Year of cert.	listed	Treated firms			Untreated firms (Industry Averages)			Obs.	
				ROA	Turnover to assets Pre-treatment	Wages to Assets Post-treatment	ROA	Turnover to assets Pre-treatment	Wages to Assets Post-treatment		
1	11	2009	No	9.52 (1.91)	110.12 (2.48)	18.06 (0.56)	15.13 (1.37)	108.12 (6.19)	8.95 (7.65)	8.91 (7.51)	268
2	15	2009	No	9.52 (2.50)	180.17 (27.59)	15.74 (2.79)	23.31 (4.12)	170.50 (15.41)	27.91 (22.69)	28.08 (22.47)	905
3	15	2009	Yes	37.81 (5.70)	212.69 (12.20)	25.79 (2.96)	20.10 (5.40)	175.48 (6.19)	27.91 (22.69)	28.08 (22.47)	905
4	23	2010	No	2.67 (0.04)	105.02 (0.72)	23.42 (0.97)	20.77 (0.54)	104.97 (5.27)	19.86 (16.26)	20.92 (16.49)	1047
5	24	2009	No	13.06 (5.55)	118.34 (1.67)	6.27 (0.03)	6.85 (0.62)	134.60 (21.82)	19.37 (15.89)	20.02 (16.26)	515
6	25	2009	No	1.96 (1.74)	152.23 (14.95)	66.77 (9.14)	80.01 (5.18)	193.07* (26.50)	29.42 (22.18)	30.14 (22.74)	3852
7	25	2010	No	4.74 (0.76)	146.00 (11.20)	69.50 (15.36)	87.83*** (33.29)	275.66*** (78.87)	29.73 (22.47)	29.81 (22.46)	3852
8	25	2010	No	10.04 (16.80)	164.24 (31.10)	44.21 (14.40)	54.74 (11.82)	183.52* (38.70)	29.73 (22.47)	29.81 (22.46)	3852
9	28	2009	No	4.50 (3.81)	80.64 (30.48)	9.24 (0.18)	13.36 (1.45)	81.30 (9.62)	24.55 (16.75)	24.89 (17.70)	3068
10	28	2010	No	1.15 (0.15)	122.87 (14.30)	31.54 (2.41)	33.99 (3.63)	152.81 (20.24)	24.70 (16.50)	24.73 (17.59)	3068
Average		2009		11.75 (0.83)	155.31 (18.37)	14.74 (1.39)	18.62 (1.87)	150.61 (10.77)	24.96 (19.56)	25.49 (20.11)	10426
Average		2010		2.76 (0.66)	109.67 (2.25)	25.52 (0.78)	23.79 (0.99)	113.84 (6.03)	25.15 (19.69)	25.26 (19.91)	10426

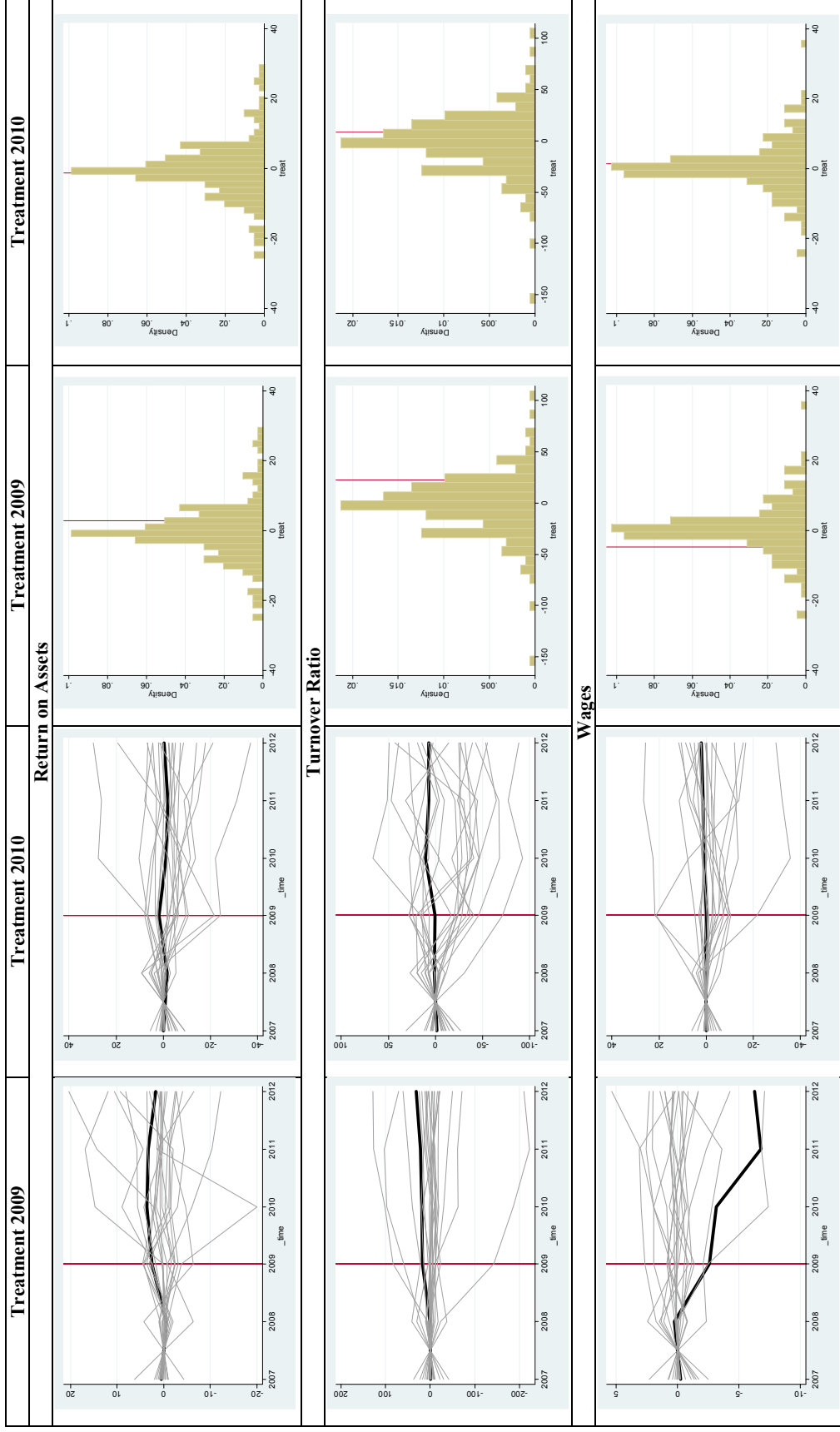
S: Amadeus, own calculations. Notes. Firm level statistics are means and standard deviations (in brackets) over the respective time period. Industry level means and standard deviations (in brackets) refer to means across firms with a full set of observation for the respective time period. Obs.=number of firms, ROA= Return on assets. \*\*\* (\*\*\*) (\*) signify significance of the coefficient a difference in difference test at the 1% (5%) (10%) level

**Figure 1: Results of synthetic control group analysis (aggregated firm data)**  
**Treatment 2009** **Treatment 2010**



Notes: Bold lines represent development of the indicators for the average firm adopting SA8000 in 2009 (left hand side) and 2010 (right hand side). Thin lines represent the development of the respective synthetic control group. The horizontal line indicates the year of adoption of the SA8000 standard. Top panel presents results for ROA, middle panel for turnover to assets ratio and bottom line for wage costs as a share of assets. All variables are measured as percentages of assets.

**Figure 2: Results of placebo treatments for synthetic control group analysis (aggregated firm data)**



Notes: Left hand side panel: bold lines are differences in development of the indicators for the average firm adopting SA8000 in 2009 (left hand side) and 2010 (right hand side) and synthetic control group. Thin lines represent the differences in development of the first 50 placebo treatments. Right hand side panel: Bars show the simulated distribution of placebo ATTs, line represents ATT of the treated unit. Top panel presents results for ROA, middle panel for total turnover to assets ratio and bottom line for wage costs as a percentage of assets. All variables are measured as percentages of assets.

**Table 2: Estimated Average Treatment Effect on Treated (ATT) at Aggregate Level**

	ROA	Turnover to assets	Wage costs in percent of assets
		Difference to pre-treatment period	
treated 2009	2.8	22.7	-4.7
treated 2010	-1.3	8.4	1.4
		Difference in difference to average placebo treatments	
treated 2009	3.17	24.41	-5.07
treated 2010	-0.88	10.07	0.98
		P-value	
treated 2009	0.26	0.09	0.83
treated 2010	0.58	0.25	0.36

Notes: Top panel reports pre- to post-treatment differences in outcomes. Middle panel reports the difference in difference estimate of the treatment effect. Bottom panel reports the share of the placebo distribution to the right or the left of the estimated treatment effect.

**Table 3: Estimated Treatment Effect on Treated (ATT) at Firm Level**

Firm No.	Pre-post Difference			Difference in difference			P-value		
	ROA	Sales	Wages	ROA	Sales	Wages	ROA	Sales	Wages
1	6.2	4.3	7.7	6.6	6.0	7.3	0.129	0.394	0.119
2	2.9	19.0	-10.2	3.3	20.7	-10.6	0.268	0.093	0.057
3	17.4	30.3	2.9	17.8	34.0	2.5	0.027	0.044	0.278
4	0.8	12.5	0.2	1.1	14.2	-0.2	0.607	0.261	0.511
5	3.4	28.6	-4.2	3.7	30.3	-4.6	0.750	0.071	0.185
6	-0.4	-7.4	228.9	0.0	-5.7	228.5	0.509	0.642	0.960
7	-9.6	-25.7	13.8	-9.2	-24.0	13.4	0.857	0.894	0.101
8	5.8	-0.2	-5.9	6.2	1.5	-6.2	0.165	0.513	0.141
9	1.0	-9.0	-5.1	1.4	-7.3	-5.5	0.375	0.686	0.159
10	-3.0	-7.3	5.5	-2.7	-5.6	5.1	0.286	0.633	0.172

Notes: The right-hand panel of the table reports pre- to post-treatment differences in outcomes, the second panel reports the difference in difference estimate of the treatment effect. The right-hand side panel reports the share of the placebo distribution to the right of the estimated treatment effect. ROA= Return on assets. All variables are measured as percentages of assets.

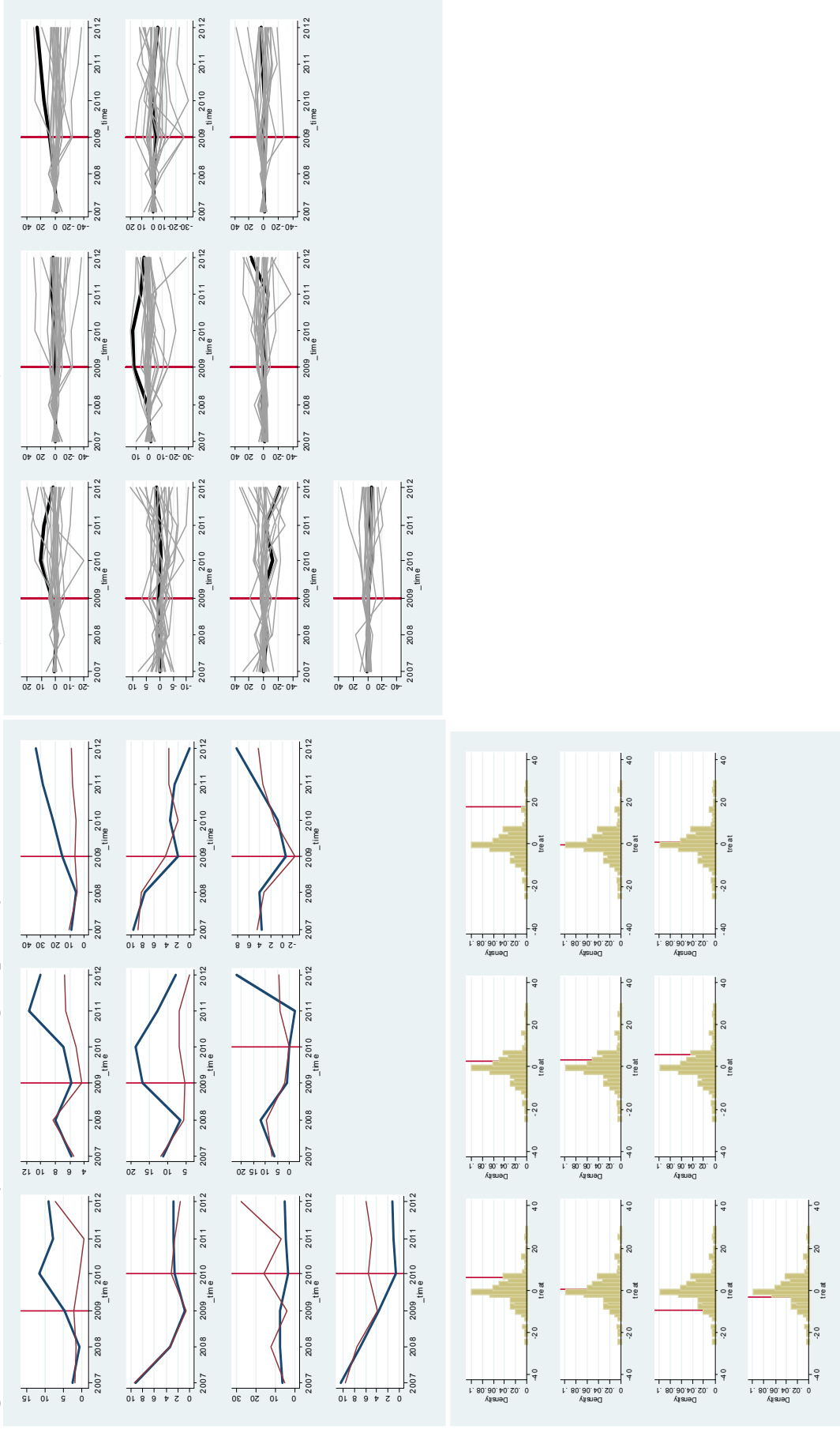


**Table 4: Difference in Difference Regression Results**

	ROA	Sales	Wages	Profits	Sales	Wages
	DiD Synthetic versus treated			DiD treated with placebos		
	Average of firms					
Treatment dummy	2.0 (1.6)	17.8 * (8.1)	-1.4 (1.9)	-2.0 (3.4)	21.4 * (12.5)	-2.0 (3.4)
Observations	24	24	24	2480	2480	2480
R squared	0.42	0.4	0.13	0.01	0.02	0.01
	Firm level analysis					
Treatment dummy	3.6 (2.7)	5.4 (3.0)	4.5 (3.7)	3.3 (3.2)	9.5 * (4.7)	5.2 (4.2)
Observations	120	120	120	1536	1536	1536
R squared	0.09	0.12	0.02	0.03	0.11	0.02

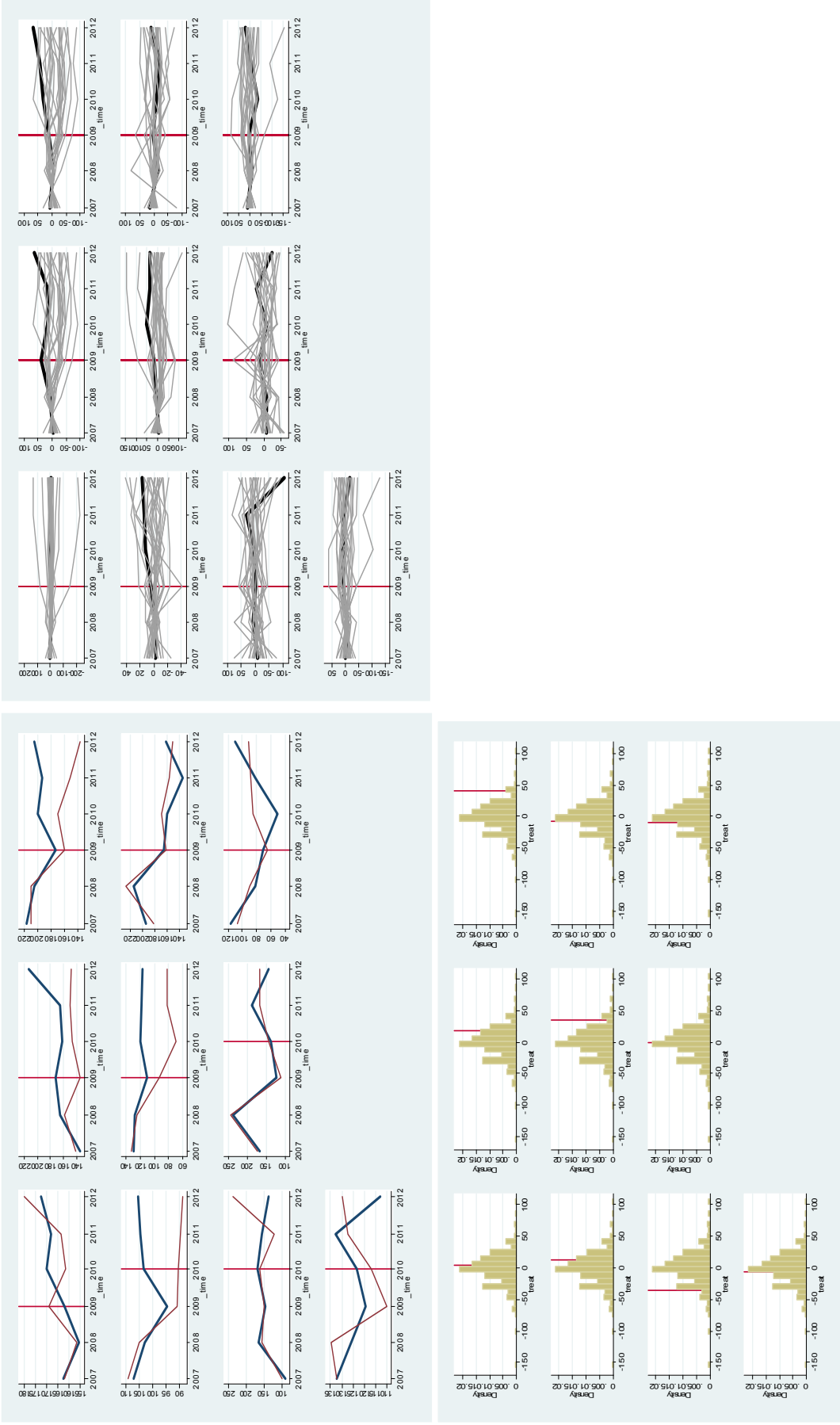
Notes: Table report result of the estimated treatment effect in a regression as in equation (2) in the text. Values in brackets are standard errors of the estimate, \*\*, \*(\*\*), (\*) signify significance of the coefficient at the 1%, (5%), (10%) level. ROA= Return on assets. All variables are measured as percentages of assets. Treatment dummy is interaction of post treatment period with indicator for treated firms (i.e.  $D_{t \geq \tau} D_{i \in R}$  in Equation 2)

**Figure A1: Results of synthetic control group analysis for return on assets (individual firm level data)**



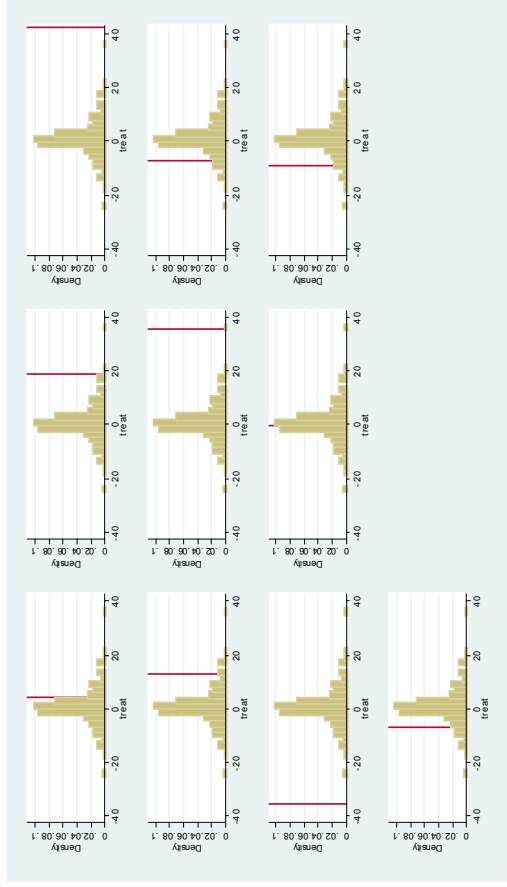
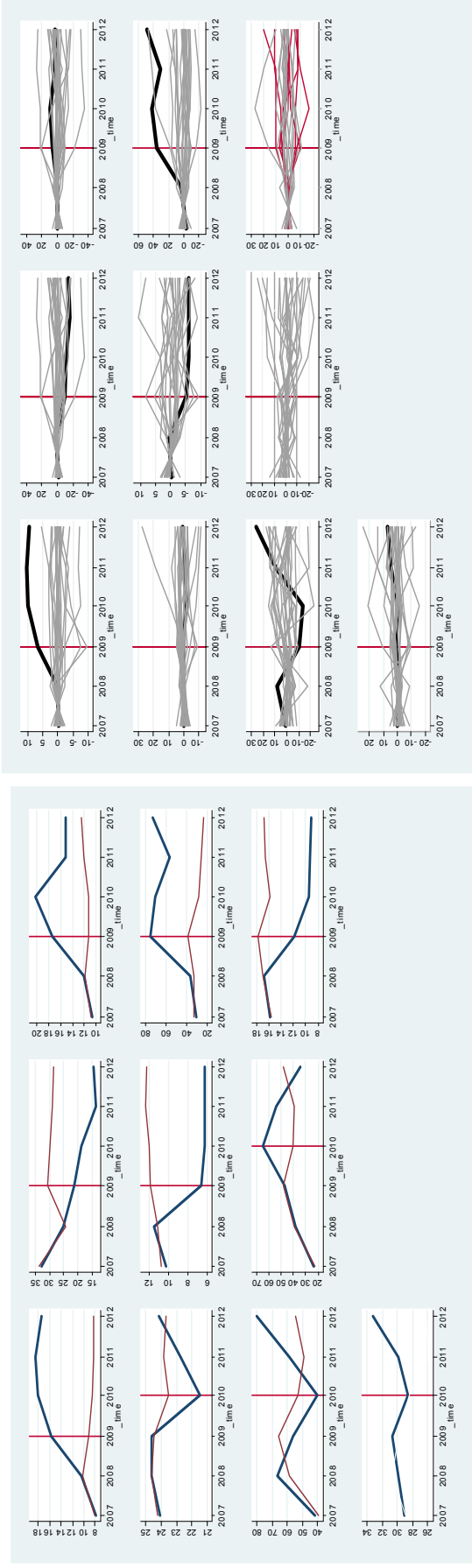
Notes: Top left panel: presents the results of a synthetic control group analysis for returns on assets for each of the firms. The bold line shows the development of sales in the treated firm, the thin line the predicted sales for the synthetic control group before and after adoption of the SA8000 standard. The horizontal line indicates the year of adoption of the SA8000 standard. Top right panel: Bold lines represent differences in development for the average firm adopting SA8000 and synthetic control groups. Thin lines represent the differences in development of the first 50 placebo treatments. Bottom panel: bars show the simulated distribution of 250 placebo ATTs, line represents ATT of the treated unit.

**Figure Aë: Results of synthetic control group analysis for turnover to assets ratio (individual firm level data)**



Notes: Top left panel: presents the results of a synthetic control group analysis for returns on assets for each of the firms. The bold line shows the development of sales in the treated firm, the thin line the predicted sales for the synthetic control group before and after adoption of the SA8000 standard. The horizontal line indicates the year of adoption of the SA8000 standard. Top right panel: Bold lines represent differences in development for the average firm adopting SA8000 and synthetic control groups. Thin lines represent the differences in development of the first 50 placebo treatments. Bottom panel: bars show the simulated distribution of 250 placebo ATTs, line represents ATT of the treated unit.

**Figure A3: Results of synthetic control group analysis for wage cost as a percentage of assets (individual firm level data)**



Notes: Top left panel: presents the results of a synthetic control group analysis for returns on assets for each of the firms. The bold line shows the development of sales in the treated firm, the thin line the predicted sales for the synthetic control group before and after adoption of the SA8000 standard. The horizontal line indicates the year of adoption of the SA8000 standard. Top right panel: Bold lines represent differences in development for the average firm adopting SA8000 and synthetic control groups. Thin lines represent the differences in development of the first 50 placebo treatments. Bottom panel: bars show the simulated distribution of 250 placebo ATTs, line represents ATT of the treated unit.