

Unhinging heaven's door. New evidence on the effect of Gender Quota Laws on firm performance in Europe

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May 2014

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Abstract

We study the effect of the introduction of the legislation on gender quotas in private corporate boards in the EU, focusing on several measures of firm performance and the existence of heterogeneous effects across countries. The empirical analysis is based on detailed accounting data for a large sample of private and publicly limited companies in seven EU countries for the 2004-2013 period. Our estimates point out that the introduction of gender quotas by law has positive effects on employment and subsequently increase total labor cost, but it has negative effects on labor productivity and short-term profitability. These results are robust to different definitions of the control group and sample selection. Estimates by region reveal the existence of heterogeneous effects, with gender quotas associated to more positive and larger effects in countries characterized by lower initial levels of firm performance and greater gender imbalances.

Keywords: Gender quota, firm performance, productivity, discrimination

JEL Codes: J1, J3

1. Introduction

In the last decades most industrialized countries have registered a significant increase in female educational attainment, labor market participation and employment opportunities. Such improvements have been however uneven along the hierarchical ladder within companies, and it has been very limited in leadership positions, even in countries, such as the Scandinavian ones, which have already achieved good results in terms of overall gender equality in the labor market.

In April 2014, the average share of women on the boards of the largest publicly listed companies registered in the current 28 Member States of the European Union (EU) reached 18.6%. Only in five EU Member States (Latvia, France, Finland, Sweden and the Netherlands) women account for at least a quarter of board members. Figures are even more dismal when looking at top executive positions: only 3.3% of the largest listed companies in Europe have a woman CEO (Chief Executive Officer). Despite some progress in boardrooms, the level of female representation in the top executive position has hardly changed over the past years (EC., 2014).

The reasons behind the under-representation of women in power and decision-making are multifaceted and complex, but a crucial role is played by cultural factors and gender-related stereotypes.

In order to speed up the cultural change needed to favor women access to top jobs, some international organizations and national governments have considered the possibility to introduce mandated gender quotas for corporate boards. The first country that actually moved in this direction was Norway, which in December 2003 passed a law stating that each gender should represent at least 40 percent of the members of the board of publicly limited companies. Following the example of Norway, a lively debate vamped both in the EU and within many of its Member States on the usefulness of this type of legislation to break the glass ceiling which prevent highly qualified women to reach the highest job positions, within both private and state owned firms, without harming firm performance.

There is no general consensus on the potential benefits of these laws for companies, particularly among business (male) leaders and shareholders.

The supporters of gender quotas believe that they will help to crack the glass ceiling that prevents productive high skilled women from reaching leadership positions, with beneficial effects on firm performance (EC., 2013). Furthermore, such laws may produce significant spillover effects also on other gender disparities in the labor market: more women on the board could in fact push for hiring or promoting new women also for other managerial positions within firms or could create a more favorable environment for women employment (for example, through more flexible working time schedules, policies to reconcile work and family life, etc.). Finally, there could be also more

incentives for young women to graduate in fields (such as management, finance, economics and law) which are more valuable for business careers (Bertrand et al. 2014).

The opponents of gender quotas claim that, if boards are already set to maximize firm value – or any other measure of firm performance – the introduction of a binding constraint in terms of number of women among board members should necessarily lead to a sub-optimal output. Evidence on Norway actually shows that, after the introduction of the 2003 law on gender quotas, the stock price of the affected firms significantly dropped in the following years, consistently with the idea that firms choose boards to maximize value (Ahern and Dittmar, 2012). Furthermore, the “old” board members may not welcome the newly hired women, mainly if they believe that they got their jobs only because of the law and not for their skills; this may cause conflicts within the board, with subsequent negative effects on firm strategy and management. Finally, some firms may try to avoid the law – or minimize its impact – by changing their legal status, reducing the size of the board or hiring women only for non-executive positions. Again, evidence on Norway confirms that a large number of public limited liability companies changed their status to private after 2003 (Bertrand et al., 2014) and, among companies listed on the stock exchange prior to the reform, the likelihood of delisting anytime between 2003 and 2009 was larger among those with a smaller initial share of women on their board, which were those finding more demanding to comply with the law (Ahern and Dittmar, 2012).

Regardless of the lack of conclusive evidence on the effect of mandated gender quotas on firm performance, it is undoubted that gender quota laws are the most effective tool to rapidly increase the number of women on boards (Walby, 2013). In the EU the issue of women on boards is high in the political agenda since 2010, when the European Commission stated in its Strategy for Equality between Women and Men that one of its key actions in the field of gender balance in decision making was “*to monitor progress towards the aim of 40% of members of one sex in committees and expert groups established by the Commission*” (EC., 2011). A concrete step forward was taken in November 2012, when the European Commission put forward the proposal for a Directive establishing a “procedural quota”, which establishes an objective for a minimum of 40% of each sex among non-executive directors by 2020. If a company does not reach this threshold, it will have to apply clear and gender-neutral selection criteria in the selection process: in case of equal qualification, priority will be given to the candidate of the under-represented sex. On 20 November 2013, the European Parliament voted with a strong majority to back the proposed Directive, confirming the broad consensus to increase gender balance on corporate boards in the EU. The Directive is currently being discussed by the Council of the EU.

Following the Norwegian example and the EU recommendations, a number of EU countries (Spain in 2007; Belgium, France, Italy and Netherlands in 2011) have recently passed national laws with mandated gender quotas for private companies, albeit with different rules in terms of target firms, size of the gender quota and severity of sanctions for non-compliers.

This provides a fertile ground to test the effect of this type of legislation on firm performance and beyond, looking also at its effects on other gender-related labor market outcomes. We strongly believe that it is necessary to extend evaluation studies beyond the Norwegian borders to ensure the external validity of the results found so far: although the evidence on Norway is rich and useful for its policy implications, the cultural and institutional features of this country cast some doubts on the possibility to automatically extend these results to other EU countries, characterized by quite different cultural and institutional characteristics. For example, the fact that the legislation on gender quota did not have strong impact on women in the Norwegian labor market beyond its direct effects on the newly appointed female board members (Bertrand et al., 2014) may be due to the fact that, being Norway already a best performer in terms of gender equality, it may be difficult to gain further significant improvements, at least in the short run. From this viewpoint, it is interesting to see whether the effects of mandated gender quotas are more pervasive in countries, such the Southern EU ones, starting from much worse initial conditions in terms of women employment and equal opportunities.

In light of these considerations, the aim of this paper is to study the effect of mandated gender quotas in the EU, focusing on the existence of heterogeneous effects across countries.

The paper is structured as follows: in Section 2 we discuss the related literature, while in Section 3 we present the institutional setting related to the introduction of mandated gender quotas in the EU. In Section 4 we present the data and our empirical strategy, in Section 5 we discuss our main results and in Section 6 we extend our analysis with further estimates and robustness checks. The last Section concludes.

2. Literature review

There is a growing body of economic literature analyzing the economic implications of diversity at top management positions and, in particular, among board members. Within this literature, a number of papers seek to explore the relationship between women in leadership and company performance. The exploration of this relationship, however, is complicated by the endogenous nature of board composition. Endogeneity may arise from selection bias caused by unobserved heterogeneity across firms, because the pool of firms with more gender-balanced boards are

probably different from firms with less diverse boards. Moreover, reverse causality is also an issue given that board composition may depend on firm performance.

Overall, the empirical findings from this literature are mixed. Some studies, especially those made using cross-section data, find that diverse boardrooms achieve better results than more uniform ones, while more recent papers tend to show little or negative effect of the share of women on boards on company outcomes.

Carter et al. (2003) provides the first empirical evidence on the relationship between board diversity, defined as the percentage of women and minorities, and financial firm value (measured by Tobin's Q) of Fortune 1000 firms. After controlling for size, industry, and other corporate governance measures, they find a significant and positive relationship between the fraction of women or minorities on the board and firm value. Carter et al. (2010) partially revise these findings in a subsequent paper investigating the relationship between the number of women and ethnic minority directors on the board and important board committees and financial performance measured as return on assets (ROA) and Tobin's Q. In this paper, they do not find a significant relationship between the gender or ethnic diversity of the board or important board committees, and financial performance for a sample of major US corporations. Moreover, their evidence also suggests that the diversity of the board appear to be endogenous to firm financial performance. Erhardt et al. (2003) examines the relationship between the percentage of women and minorities on boards of directors for 127 large US companies and financial performance data (return on asset, ROA, and return on investment, ROI) for the years 1993 and 1998, and they find a positive association. Smith et al. (2006) study the relationship between management diversity and firm performance in the case of women in top executive jobs and on boards of directors. They use data for the 2,500 largest Danish firms observed during the period 1993-2001. Their findings show that the proportion of women in top management jobs tends to have positive effects on firm performance, even after controlling for numerous characteristics of the firm and direction of causality. However, the results show that the positive effects of women in top management strongly depend on the qualifications of female top managers.

The empirical literature abounds in papers finding no effect of board diversity on firm's performance. Among the others, Francoeur et al. (2008) find that having more women on corporate boards or on both corporate boards and top management does not seem to generate significant excess returns. Rose (2007), using a cross section of listed Danish firms during the period of 1998–2001, does not find any significant link between firm performance as measured by Tobin's Q and female board representation. According to the author, a plausible reason is that female board members may have decided to adopt the behavior and norms of the conventional (male) board

members. As a consequence, the gains from board diversity are not realized. Marinova et al. (2010), using 2007 data on 186 Dutch and Danish listed firms, apply a two-stage least-squares estimation strategy and consider Tobin's Q as a measure of performance. Their findings indicate that there is no effect of board gender diversity on firm performance. Gregory-Smith et al. (2014), using UK data, find no empirical evidence that gender diverse boards improve corporate performance. In view of this, the authors suggest that proposals towards greater board diversity may be best designed around the moral value of diversity, rather than with reference to a prospect of improved company performance. More recent study provide evidence of a negative relationship between board diversity and firm performance. Adams and Ferreira (2009), using a sample of US firms, show that female directors have a significant impact on board inputs such as director attendance and committee assignments. However, the average effect of gender diversity on firm outcomes is negative. This negative effect is driven by companies with fewer takeover defenses, suggesting that gender quotas can reduce firm value for well-governed firms. In Europe, Minguez-Vera and Martin (2011) analyzed the relationship between gender diversity and firms' outcomes for a sample of Spanish small and medium firms. They find that women's presence on boards generates a negative impact on firm performance, and this result may be due to less risky strategies implemented by women directors.

The introduction in Norway of mandatory quotas for female directors through a law requiring that 40% of firms' directors be women, provided researchers an extraordinary quasi-natural experiment to study the causal effect of gender quotas on company performance. Ahern and Dittmar (2012) present evidence on the relationship between firm value and board characteristics exploiting the exogenous change to board composition created by the Norwegian law. In a panel of 248 publicly listed Norwegian firms from 2001 to 2009, they find a large negative impact of the mandated board changes on firm value and on Tobin's Q. Matsa and Miller (2013) use the same natural experiment as Ahern and Dittmar (2012) for studying the impact of gender quotas for corporate board seats on corporate decisions in Norway. They find that treated firms reduce workforce less than control firms, rising relative labor costs and employment levels and reducing short-term profits. The effects are strongest among firms without female board members before the reform and are present even for boards with older and more experienced members after the reform.

Overall, the empirical findings are mixed. However, it should be emphasized that papers exploring the effect of gender quotas taking into account endogeneity arising from selection bias caused by unobserved heterogeneity across firms and by reverse causality generally find a negative effect of female board representation and firms' outcomes, at least in the short run.

Finally, if these laws are (temporarily) adopted to favor a cultural change and to fight gender stereotypes, we may also expect that they can generate spillover effects on other gender differences in the labor market. In this perspective, Bertrand et al. (2014) exploit the Norwegian law to investigate the effects of the board gender quotas on the labor market opportunities of women, focusing on those more likely affected by the reform (i.e., women on boards and, more in general, highly qualified women) and on education and family choices of young women. They find that the female board members appointed after the reform are observably more qualified than their female predecessors and that the gender gap in earnings within boards drop substantially after the reform. However, there is no evidence that these effects at the very top spread at lower positions. Furthermore, while young women pursuing a college degree are well aware of this reform and expect that it should positively influence their future job career and earnings profile, the reform did not affect their fertility and marital plans. Overall, these findings suggest that in the short run the reform had very little impact on women in firms beyond its direct effect on the newly appointed female board members.

3. Institutional setting

The reduction of the gender gap in corporate boards can be pursued in a number of ways, ranging from legislative measures to voluntary initiatives and the diffusion of good practices by both governments and businesses. Recent studies point out that the latter are usually perceived by firms as a more flexible and less invasive mechanism than national laws, but their effects in terms of increasing share of women on the boards have been so far uneven and slow; by contrast, legal quotas seem to be the most effective and fastest mechanism to increase gender diversity in corporate boards (Walby and Armstrong, 2012).

To further emphasize the role of legislative measures, after a long debate on the necessity of fixed and binding gender quotas across the EU Member States, in November 2012 the European Commission proposed a law to ensure that women get a fair chance in the recruitment processes of potential board members through the adoption of a transparent and fair selection procedure (a so-called "procedural quota") rather than introducing a fixed quantitative quota¹. One year later the

¹ If a publicly listed company in Europe does not have 40% of women among its non-executive board members, the new law will require it to introduce a new selection procedure for board members which gives priority to qualified female candidates. However, the law only applies to the supervisory boards or non-executive directors of publicly listed companies, with the exception of small and medium firms (i.e., with less than 250 employees). Furthermore, individual EU Member States will have to put in place appropriate sanctions for non-compliers. The law will automatically expire in 2028.

European Parliament voted in favor of this proposal with an overwhelmed majority, but further steps are needed to make it an official Directive enforceable by the EU Member States.

In the meantime, following the leading example of Norway, which was the first country in the world introducing gender quotas in corporate boards by law in December 2003, in the last decade a growing number of EU Member States have adopted legislation with similar prescriptions, albeit with different nuances in terms of target firms, gender quotas and severity of sanctions for non-compliers.

Table 1 reports the EU Member States which have already passed a law prescribing gender quotas in private firms and summarizes the main features of these laws. As a benchmark, in the last row of the table we also report the same information for Norway.

The first EU country that introduced gender quotas for private companies was Spain in 2007, followed by Belgium, France, Italy and the Netherlands in 2011. Similar legislation is currently under debate in Germany.

All the countries considered imposed a target gender quota to be reached, ranging from 30%-33% (in the Netherlands, Belgium and Italy) to 40% (in France, Spain and Norway). In most cases the compliance date is set a few years ahead from the introduction date, in order to give to the target firms enough time to adjust to the new requirements in terms of gender composition of their board. In the case of Italy, the law defines also an interim quota (20%) that firms should reach the first time they have to renew the members of their board. With the exception of the Netherlands and Spain, in all countries sanctions are applied to non-compliant firms. In this perspective, the experience of Norway provided useful indications: Norway introduced gender quotas for public limited companies at the end of 2003 without sanctions for non-compliers, but since after two years the fraction of women on boards of directors of these companies has hardly changed (it was around 17% at the end of 2005), the Norwegian government introduced severe sanctions for firms not reaching the target quota by 2008. Statistics shows that at the end of that year the share of women on boards of public limited companies in Norway actually reached the target of 40%. In Spain the lack of sanctions is probably due to the fact that the gender quota was proposed more as a recommendation than as a binding rule; however, the Spanish law states that gender diversity in the boardroom will be positively evaluated by the Public administration when awarding public contracts.

Some heterogeneity emerges in terms of the target (private) firms: while in Norway gender quotas apply to all the public limited companies, in Belgium and Italy it is limited to firms that are publicly listed on the stock exchange. In the remaining countries (namely France, the Netherlands and Spain), small and medium sized firms, defined on the basis of different criteria, are exempted from

the legislation.² We shall take into account the country-specific definition of the target firms in the following empirical analysis.

INSERT TAB 1

Official data provided by the European Commission actually confirm that most of the EU countries that adopted a specific legislation for gender quotas are among those that have been actually experiencing the largest increase in the share of women on boards between 2007 and 2014 (see fig. 1).

INSERT FIG 1

4. Data and empirical strategy

The aim of the empirical analysis is to assess the effect of the introduction of the legislation on gender quotas in private corporate boards, defined above, on several measures of firm performance. To this end, we use accounting data taken from Bureau Van Dijk's Amadeus for the 2004-2013 period, a database of comparable financial information for public and private companies. Amadeus contains comprehensive information on around 21 million companies across Europe. For our analysis, we selected all the EU countries which have recently passed a law with mandated corporate gender boards (i.e., Belgium, France, Italy, the Netherlands and Spain). In order to enlarge the set of the potential control group, we also selected a couple of countries, namely Germany and Portugal, which have not adopted such type of legislation yet, but that share with the so called "treated" countries common features in terms of socio-economic and institutional characteristics.³ For each country, we extracted all the public and private companies with sales of at least ten millions of Euro in one of the years between 2010 and 2013. We then excluded from the analysis state owned companies, partnerships, non-profit organizations and companies with unknown status. Despite of this, our sample amounts to around 94% of all firms in the Amadeus dataset for these countries.

Overall, our sample comprises 146,005 companies for seven countries (see Table 1). Around half on them are public limited companies. The number of treated companies varies by country because

² Our analysis is limited to private companies. However, note that in most of the countries considered the legislation apply also to state owned companies. The latter are the only type of companies subject to gender quotas also in a number of other EU countries (Austria, Denmark, Finland and Ireland). In some cases, as it happened in Norway, the legislation is applied first to state owned companies, and later to private companies.

³ Socio-economic classifications usually cluster Belgium, France, Germany and the Netherlands in the group of the so called Continental countries, while Italy, Portugal and Spain in the group of the Southern countries. The two clusters are characterized by quite different welfare regimes. For more details, see Esping-Andersen (1990).

of some heterogeneity in the timing and application of the law. For Germany and Portugal there are no treated firms because, as mentioned above, in the time span covered by the data they did not have a law imposing gender quotas.

INSERT TAB 2

To estimate the causal effect of the legislation on gender quotas on firm performance we use a reduced form approach and estimate the following model:

$$Y_{ijts} = \alpha + \beta TREATED_{jt} + \tau_t + \delta_s + \gamma_j + \sum_j t * \gamma_j + \sum_s t * \delta_s + \theta X_{ijst} + \varepsilon_{ijst} \quad (1)$$

where “ijts” denotes the i-th firm in country j at time t and in sector s. Y is one of our dependent variables measuring firm performance., TREATED is a dummy equal to one if the firm is subject to the gender quota reform, δ_s and γ_j are fixed effects for the sector of activity and the country, τ_t are time fixed effects, $\sum_j t * \gamma_j$ and $\sum_s t * \delta_s$ are, respectively, country and sector-specific time trends, X is a vector of time variant firms’ characteristics and ε is an error term. The inclusion of fixed effects and both country-specific and sector-specific time trends should ensure that our comparisons across treatment groups over time is not influenced by group-specific characteristics. Furthermore, with this specification identification comes from the sharp discontinuity around the time when the legislation was passed.

To capture all possible sources of time invariant unobserved heterogeneity at the firm level, given the availability of a panel dataset we first estimate the baseline specification described above using a firm fixed effect estimator, that allows us to implicitly control for all the fixed effects specified in equation (1). This would be our preferred estimator. As a benchmark, we use also an approach that is similar to a Difference-in-Differences method and estimate a linear OLS model without firm fixed effects.

In light of the legislation discussed in Section 2, we define the TREATED firms on a country basis. More specifically, we consider as treated all the publicly listed firms in Belgium and Italy, all the publicly listed firms and the unlisted ones with at least 500 employees and revenues over 50 million

Euros over the three previous consecutive years in France, all large private and public limited companies the Netherlands⁴, all the public limited companies with at least 250 employees in Spain. As mentioned above, the use of Amadeus data provides a number of possible indicators of firm performance. Among the outcomes considered, other than the number of employees, we use productivity measures (namely value added per employee, and Total Factor Productivity, TFP), labor cost measures (total labor cost and labor cost per employee) and profitability indicators (ROE and ROA). Except for the latter, we take the logarithm of all the dependent variables. Note that the use of a relatively large set of outcomes should offer a rather complete picture on the potential effects of these reforms on firm performance.

Given the well-known problem of the potential endogeneity issue of the traditional estimation of TFP as a residual in the estimation of firm production function, we estimated the TFP following the estimation procedure suggested by Levinsohn and Petrin (2003). In particular, we estimated the TFP by two-digit industries, using value added as output and number of employees and fixed tangible assets as inputs.

From a policy point of view, it may also be interesting to estimate the effect of a one-percentage change in the share of women on boards on firm performance as follows:

$$Y_{ijts} = \alpha + \beta SHARE_{jt} + \tau_t + \delta_s + \gamma_j + \sum_j t * \gamma_j + \sum_s t * \delta_s + \theta X_{ijst} + \varepsilon_{ijst} \quad (2)$$

where SHARE is the number of women on the total number of board members and the other variables have the same meaning as above. In order to take into account the potential endogeneity of the SHARE variable,⁵ we estimate equation (2) by IV, using the legislation on gender quotas (and hence the TREATED dummy) as an instrument for the share of women on boards.

⁴ Small and medium-sized companies (SMEs) are not subject to the law. A certain company is considered a SME if it meets at least two of the following three criteria: total assets < 17,5 millions of Euros; net annual turnover < 35 millions of Euros; annual average number of employees < 250.

⁵ Note that the fixed effects estimator does not allow to control for all possible sources of endogeneity. More specifically, fixed effects estimates are biased if there is reverse causality (Imbens and Wooldridge, 2009). Since in our case it is likely that changes in firm performance affect firm governance, including board composition, we exploit the previously discussed quasi-natural experiment provided by the introduction of gender quotas by law and perform an IV estimator.

5. Main results

Table 3 presents the main fixed effects estimates of our preferred specification of equation (1) for the seven measures of firm performance considered: the logarithm of value added per employee (*logvadip*, col 1), the logarithm of TFP (*logvadip*, col 2), the logarithm of the number of employees (*logemployees*, col 3), the logarithm of total labour costs (*logcostlav*, col 4), the logarithm of the labor cost per employee (*logcostlavdipcol5*), the ROE and ROA (col 6 and 7 respectively). All columns include, other than firm fixed effects, year fixed effects and both country and sector-specific time trends, the latter computed at the 2-digit level of the NACE classification. In the case of the value added per employee, we also control for the logarithm of capital per employee. Standard errors reported in squared brackets are clustered at the firm level. Given the aim of our analysis, we focus our attention on estimates of the coefficient of the TREATED dummy. Our estimates point out that the introduction of gender quotas by law has positive effects on employment, with subsequent negative effects on firm productivity and profitability (but estimates are statistically significant only in the case of ROA). According to our estimates, firms subject to legislation on gender quotas registered a positive effect on employment by around 8 percentage points, facing a reduction of value added per employee of around 2.5 percentage points. It is interesting to note that such firms have not experienced any significant change in TFP. This may be due, on one hand, to the greater attention posed by the new boards on either product or organizational innovation; on the other hand, if the constraint imposed by the law on the gender composition of boards had a large negative effect on firm value (Ahern and Dittmar, 2012), firm could have reacted by seeking other ways to increase efficiency and possibly future firm value. Our estimates also show that the growth in employment caused total labor costs to grow by about the same size, hence leaving the labor cost per employee roughly unchanged. Finally, the introduction of gender quota seems to have a negative effect on both indicators of profitability, but our estimates are statistically significant only in the case of ROA. Our results are coherent with those found by Matsa and Miller (2013) in the case of Norway: firms affected by the legislation imposing gender quotas in corporate boards undertook less substantial workforce reductions, increasing relative labor costs and employment levels and reducing short-term profits. Differently from previous studies, we also show that, if there is any negative effect on productivity, this is circumscribed to labor productivity.

INSERT TAB 3

In Table 4 we report the estimates of equation (1) for the same dependent variables using a linear OLS estimator. All the columns include controls for year, country and sector (2-digits of NACE classification) fixed effects, country and sector-specific time trends and a set of time varying firm-level controls (classes for firm size in terms of turnover, assets and employees, logarithm of capital per employee, legal status, whether the firm is publicly quoted). Clustered standard errors (with clusters defined on the basis of the country and the treatment status) are reported in brackets. With the exception of labor productivity, these estimates confirm our main findings discussed above, but the estimate of the TREATED dummy is statistically significant only in the case of total labor cost.

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6. Robustness checks and further estimates

In this Section we verify the robustness of our main results to alternative definitions of the control group and of the overall sample. Furthermore, we test the existence of heterogeneous effects by European regions.

First, we modify the selection criteria used to define the estimation sample, in order to enlarge it and compare treated firms with a larger sample of untreated firms. We then extend the dataset to private limited companies, to whom the reform does not apply in any of the countries considered. The results reported in Tables 5 (fixed effects estimates) are qualitative similar to those presented in the previous section. They confirm the negative and significant impact of the reform on labor productivity and the positive and significant impact on employees and total labor costs.

INSERT TAB 5

Second, since small and medium-sized firms are less likely to be affected by the gender quota law, we restrict our sample and estimate the baseline equation (1) selecting only companies with sales greater than 80000 million of Euros (our definition of large firms), considering both private and publicly limited companies (panel a of Table 6) and only publicly limited companies (panel b of Table 6). Estimates reported in Table 6 confirm all the results found above, but the size of the estimated coefficients is in some cases smaller (see, for example, the estimated effect on log employees) and/or not statistically significant. In both panels results seem particularly robust – and in line with our preferred estimates on the whole sample of publicly limited companies – in the case of total labor costs and profitability (measured by the ROA). We still find a positive and statistically

significant effect on the (log) number of employees when we restrict the sample of large firms to publicly limited companies (column 3 of panel b).

INSERT TAB 6

Finally, we examine whether the effect of the law changes by area, dividing the sample between Northern EU countries and Southern EU countries. We include Belgium, France, Germany and Netherlands in the Northern sample; Italy, Portugal and Spain in the Southern one. Since these two groups of countries are characterized by quite different cultural and institutional features, we may expect a different impact of legislation on gender quota, with potentially more positive results in countries starting from relatively worse conditions in terms of gender equality. Indeed, official international rankings on this issue point out that Northern EU countries rank much higher than Southern ones, especially in terms of gender equality in economic conditions and number of women on boards (see Table 7).

INSERT TAB 7

Our estimates by region reported in Table 8 seem very interesting. More specifically, regarding the Northern countries the analysis confirms the negative effect of the law on the productivity measures of the firms. The coefficients of the dummy TREATED are negative and statistically significant for labor productivity as well as for TFP. Moreover, the reform has a positive and significant effect on the number of employees. Differently from the North, estimates for the Southern countries show a positive effect of the reform on TFP. Furthermore, the positive impact on both the number of employees and total labor costs is confirmed. On the other hand, we find a negative and statistically significant effect on ROA only for the sub-sample of Southern countries. The main interesting result refers to the positive relationship between the reform and the TFP for the Southern countries; in addition, we observe for this sub-sample more sizeable effects than in the North also on the other performance variables.

INSERT TAB 8

There is clearly a different effect of gender quota in the two sets of countries. Why this should be the case? We put forward three possible explanations. First of all, the observed differences among countries may be related to the fact the firms in the Southern countries have initial poorer

performance than the firms in the Northern countries. Thus, their performance may react more substantially to any performance-enhancing event, such as the introduction of gender quotas in the board of directors. In fact, not only board diversity can improve the quality of the decision-making process, but women directors might also add new perspectives to the way boards develop decisions. Secondly, differences in gender equalities discussed above suggest the existence of a rather strong cultural prejudice against women in the labor market, which is stronger against women in key labor market positions. Therefore, whenever men are considered as the only potential candidates for the board, even when more qualified women are available, boards will be of lower quality than if the best men and women were selected. The introduction of gender quota in this setting can only increase the quality of the board and positively affect the organization's efficiency and productivity. Finally, whenever the proportion of women suitable for a top executive position is low, there exists a limited pool of female candidates. Hence, companies subject to gender quotas will either overburden the small number of qualified women or accept less experienced and less qualified candidates. This argument seems more relevant in the Northern sample because, before the reform, the share of women in boards was higher in the North than in the South (See Table 7, column three). It then could be that firms in Northern countries had to recruit women with a much broader and potentially less qualified background.

In line with all the above explanations, we find the gender quota reform has a positive and broad effect on the firms located in countries less profitable and virtuous.

7. Conclusions

In this paper we investigated the effect of the introduction of the legislation on gender quotas on firm performance in the EU, focusing on several measures of firm performance and the existence of heterogeneous effects across countries.

Following the Norwegian example and the EU recommendations, a number of EU countries (Spain in 2007; Belgium, France, Italy and Netherlands in 2011) have recently passed national laws with mandated gender quotas for private companies, albeit with different rules in terms of target firms, size of the gender quota and severity of sanctions for non-compliers. We exploit this set of quasi-natural experiments to complement existing evidence on Norway.

The empirical analysis, based on accounting data taken from Bureau Van Dijk's Amadeus for the 2004-2013 period, shows that the introduction of gender quotas by law has positive effects on employment, with subsequent negative effects on firm productivity and profitability. According to our estimates, firms subject to legislation on gender quotas registered a positive effect on employment by around 8 percentage points, facing a reduction of value added per employee of

around 2.5 percentage points, but no significant change in TFP. Our estimates also show that the growth in employment caused total labor costs to grow by about the same size, hence leaving the labor cost per employee roughly unchanged. Finally, the introduction of gender quota seem to have a negative effect on both indicators of profitability, but our estimates are statistically significant only in the case of ROA.

These results are robust to changes in sample selection and to alternative definitions of the control group.

Furthermore, estimates by region show the existence of heterogeneous effects across countries, with more positive effects on employment and productivity (at least in terms of TFP) in Southern European countries than in Northern ones. Given the initial levels of firm performance and gender imbalances in the two regions considered, we conclude that the gender quota reform has a more positive and larger effect in less virtuous and profitable countries.

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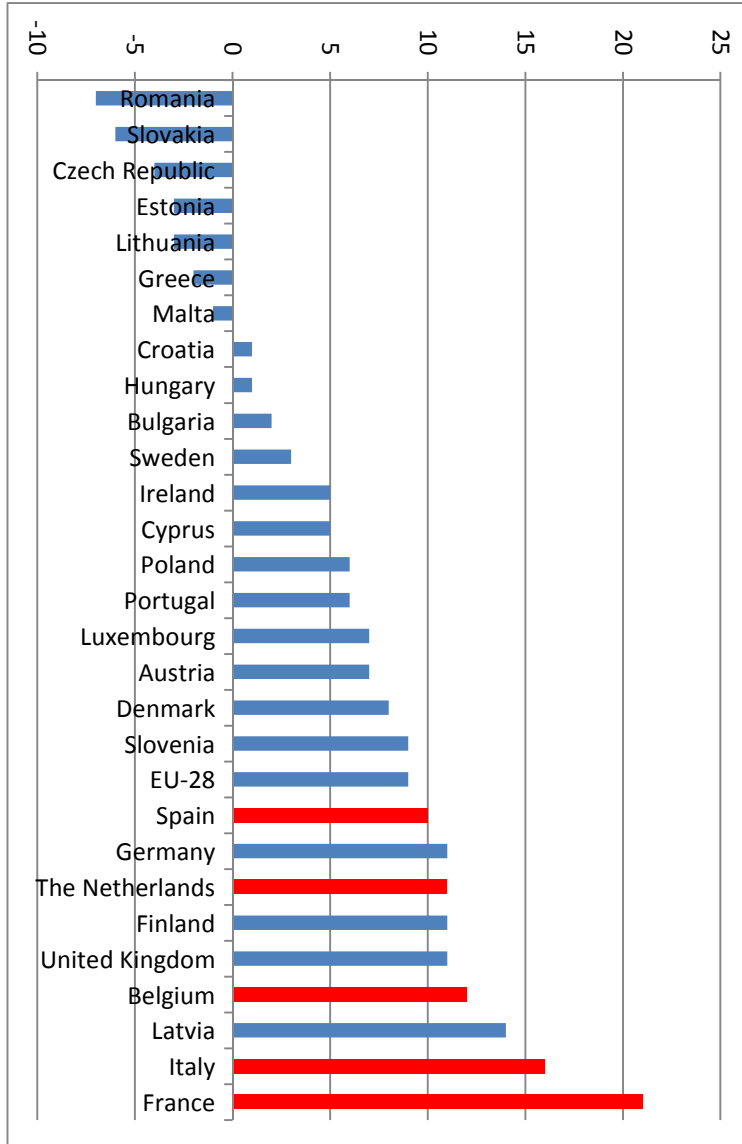
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Table 1 - Legislation on gender quotas in the EU countries and Norway

Country	Target firms	Gender quota	Introduction date	Compliance date	Sanctions for non compliers	Notes
Belgium	Publicly listed and state owned companies	33%	2011, September	2017-2018 for publicly listed companies	YES	Different compliance dates for other firms: 2011-2012 for state owned companies; 2018-2019 for small listed firms
France	Publicly listed companies + unlisted with at least 500 employees and revenues over 50 million Euros over the three previous consecutive years	40%	2011, January	2017	YES	
Italy	Publicly listed and state owned companies	33% (interim quota of 20% until 2015)	2011, June	2015	YES	It will expire in 2022
Netherlands	Large private and public limited companies (SMES=companies not meeting two of the following criteria: total assets<17,5 million; net annual turnover<35 million; annual avg n employees<250)	30%	2011, June	2013	NO	It will expire on Jan. 2016
Spain	Public limited companies with 250+ employees	40%	2007., March	2015	NO	Gender diversity taken into account for state contracts
Norway	Public limited and state owned companies	40%	2003	2006	YES	
Source: our elaboration on EC (2012), EC (2013) and www.catalyst.org/legislative-board-diversity (as of August 2014)						
Note: gender quota laws only for state owned companies in Austria, Denmark, Finland and Ireland						

Figure 1 – Changes in the share of women on board, 2007-2014
 28 Member States of the European Union (EU-28)



Red bars: countries that have passed legislation on gender quotas

Table 2 – Sample of firms by country and status

	N firms		
	All	Public limited companies	Treated
Belgium	8959	7499	112
France	39591	34624	5220
Germany	32145	2028	0
Italy	32885	15059	251
Netherlands	7815	394	334
Portugal	4704	3282	0
Spain	19906	10281	8214
Total	146005	73167	1912

Table 3 - The effect of gender quotas on firm performance
Public limited companies. Fixed effects estimates

VARIABLES	(1) logvadip	(2) logtfp	(3) logemployees	(4) logcostlav	(5) logcostdip	(6) ROE	(7) ROA
Treated firms	-0.025*** [0.008]	0.007 [0.008]	0.082*** [0.008]	0.078*** [0.007]	-0.003 [0.005]	-1.514 [0.990]	-0.482*** [0.158]
Constant	3.789*** [0.017]	5.185*** [0.002]	4.318*** [0.002]	7.941*** [0.002]	3.628*** [0.001]	26.146*** [0.344]	7.109*** [0.052]
Year fixed effects	YES	YES	YES	YES	YES	YES	YES
Country-specific time trends	YES	YES	YES	YES	YES	YES	YES
Industry-specific time trends	YES	YES	YES	YES	YES	YES	YES
Firm-level controls	YES	NO	NO	NO	NO	NO	NO
Observations	312,298	283,327	341,195	339,185	339,185	331,375	340,141
R-squared	0.047	0.033	0.057	0.174	0.130	0.017	0.034
Number of newid	59,496	54,326	61,530	61,187	61,187	60,532	61,342

Clustered standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

Table 4 - The effect of gender quotas on firm performance
Publicly limited companies. OLS estimates

VARIABLES	(1) logvadip	(2) logtfp	(3) logemployee	(4) logcostlav	(5) logcostdip	(6) roe	(7) roa
Treated firms	0.014 [0.013]	0.056 [0.042]	0.014 [0.018]	0.044** [0.019]	0.015 [0.010]	-0.450 [0.758]	-0.097 [0.191]
Constant	3.348*** [0.073]	5.090*** [0.113]	3.276*** [0.102]	6.857*** [0.123]	3.589*** [0.045]	15.056*** [3.416]	6.151*** [0.879]
Year fixed effects	YES	YES	YES	YES	YES	YES	YES
Country fixed effects	YES	YES	YES	YES	YES	YES	YES
Industry fixed effects	YES	YES	YES	YES	YES	YES	YES
Country-specific time trends	YES	YES	YES	YES	YES	YES	YES
Industry-specific time trends	YES	YES	YES	YES	YES	YES	YES
Firm-level controls	YES	YES	YES	YES	YES	YES	YES
Observations	312,298	283,327	341,195	339,185	339,185	331,375	340,141
R-squared	0.418	0.369	0.665	0.666	0.328	0.031	0.053

Clustered standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

Table 5 - The effect of gender quotas on firm performance
Private and public limited companies. Firm fixed effects estimates

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	logvadip	logtfp	logemployees	logcostlav	logcostdip	ROE	ROA
Treated firms	-0.029*** [0.008]	-0.001 [0.008]	0.048*** [0.007]	0.058*** [0.006]	0.003 [0.006]	-0.295 [0.834]	-0.208 [0.132]
Constant	3.760*** [0.012]	5.116*** [0.002]	4.135*** [0.002]	7.814*** [0.002]	3.632*** [0.002]	31.899*** [0.342]	7.426*** [0.048]
Year fixed effects	YES	YES	YES	YES	YES	YES	YES
Country-specific time trends	YES	YES	YES	YES	YES	YES	YES
Industry-specific time trends	YES	YES	YES	YES	YES	YES	YES
Firm-level controls	YES	NO	NO	NO	NO	NO	NO
Observations	564,266	494,938	672,219	634,028	634,028	624,329	647,299
R-squared	0.047	0.028	0.059	0.156	0.071	0.016	0.028
Number of newid	110,823	99,463	127,209	118,827	118,827	118,766	121,169

Clustered standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

Table 6 - The effect of gender quotas on firm performance
 Large firms (sales>80 millions of Euros). Firm fixed effects estimates

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	logvadip	logtfp	logemployees	logcostlav	logcostdip	ROE	ROA
Private and public limited companies							
Treated firms	-0.018 [0.012]	-0.014 [0.011]	0.002 [0.009]	0.035*** [0.007]	0.015* [0.008]	-1.184 [1.174]	-0.510*** [0.165]
Constant	3.755*** [0.053]	5.757*** [0.006]	5.367*** [0.008]	9.348*** [0.005]	3.813*** [0.006]	33.843*** [0.901]	8.158*** [0.115]
Year fixed effects	YES	YES	YES	YES	YES	YES	YES
Country-specific time trends	YES	YES	YES	YES	YES	YES	YES
Industry-specific time trends	YES	YES	YES	YES	YES	YES	YES
Firm-level controls	YES	NO	NO	NO	NO	NO	NO
Observations	99,805	79,757	133,008	119,615	119,615	120,282	125,249
R-squared	0.062	0.027	0.054	0.157	0.044	0.015	0.033
Number of newid	24,833	18,165	35,078	29,936	29,936	30,304	31,158
Only public limited companies							
Treated firms	-0.017 [0.013]	-0.007 [0.012]	0.047*** [0.012]	0.052*** [0.009]	0.011 [0.009]	-2.127 [1.346]	-0.779*** [0.189]
Constant	3.739*** [0.070]	5.878*** [0.007]	5.921*** [0.007]	9.681*** [0.006]	3.770*** [0.004]	26.872*** [0.888]	7.296*** [0.115]
Year fixed effects	YES	YES	YES	YES	YES	YES	YES
Country-specific time trends	YES	YES	YES	YES	YES	YES	YES
Industry-specific time trends	YES	YES	YES	YES	YES	YES	YES
Firm-level controls	YES	NO	NO	NO	NO	NO	NO
Observations	52,589	47,541	59,186	58,086	58,086	57,540	58,892
R-squared	0.070	0.034	0.043	0.196	0.093	0.019	0.044
Number of newid	11,573	10,472	13,057	12,820	12,820	12,769	12,931

Clustered standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

Table 7 – Indicators of gender imbalances

Country	Overall – Rank	Economic participation and opportunity - Rank	Share of women in the boards in 2007
Belgium	10	27	6
France	16	57	9
Germany	12	34	11
Italy	69	114	3
Spain	29	84	6
Portugal	39	44	3

Source: World Economic Forum, 2014 and EC, 2014

Table 8 - The effect of gender quotas on firm performance by region
Public limited companies. Firm fixed effects estimates

VARIABLES	(1) logvadip	(2) logtfp	(3) logemployees	(4) logcostlav	(5) logcostdip	(6) ROE	(7) ROA
NORTH (Belgium, France, Germany and Netherlands)							
Treated firms	-0.033** [0.013]	-0.031** [0.014]	0.028** [0.013]	0.015 [0.012]	-0.005 [0.008]	-0.365 [2.029]	-0.179 [0.240]
Constant	3.847*** [0.021]	5.084*** [0.003]	4.246*** [0.003]	7.969*** [0.003]	3.734*** [0.002]	29.905*** [0.505]	7.913*** [0.073]
Year fixed effects	YES	YES	YES	YES	YES	YES	YES
Country-specific time trends	YES	YES	YES	YES	YES	YES	YES
Industry-specific time trends	YES	YES	YES	YES	YES	YES	YES
Firm-level controls	YES	NO	NO	NO	NO	NO	NO
Observations	150,255	132,519	170,273	168,320	168,320	163,319	169,500
R-squared	0.047	0.032	0.067	0.199	0.150	0.012	0.024
Number of newid	32,868	29,304	34,425	34,086	34,086	33,629	34,250
SOUTH (Italy, Portugal and Spain)							
Treated firms	-0.015 [0.010]	0.024** [0.010]	0.096*** [0.010]	0.090*** [0.009]	-0.007 [0.007]	-1.732 [1.120]	-0.610*** [0.204]
Constant	3.724*** [0.026]	5.269*** [0.004]	4.386*** [0.003]	7.907*** [0.003]	3.520*** [0.002]	22.675*** [0.463]	6.356*** [0.073]
Year fixed effects	YES	YES	YES	YES	YES	YES	YES
Country-specific time trends	YES	YES	YES	YES	YES	YES	YES
Industry-specific time trends	YES	YES	YES	YES	YES	YES	YES
Firm-level controls	YES	NO	NO	NO	NO	NO	NO
Observations	162,043	150,808	170,922	170,865	170,865	168,056	170,641
R-squared	0.055	0.043	0.055	0.158	0.117	0.026	0.053
Number of newid	26,628	25,022	27,105	27,101	27,101	26,903	27,092

Clustered standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1