THE GBB INDEX: A PROPOSAL TO MEASURE THE GENDER BALANCE ON COMPANY BOARDS

Maria João Guedes *, Sara Falcão Casaca **

* *Corresponding author*, ISEG (Lisbon, School of Economics and Management), University of Lisbon, Lisbon, Portugal
Contact details: ISEG (Lisbon, School of Economics and Management), University of Lisbon, Rua do Quelhas 6, 1200-781, Lisbon, Portugal
** ISEG (Lisbon, School of Economics and Management), University of Lisbon, Lisbon, Portugal

OPEN ACCESS

How to cite this paper: Guedes, M. J., & Casaca, S. F. (2021). The GBB index: A proposal to measure the gender balance on company boards [Special issue]. *Journal of Governance & Regulation, 10*(2), 249–257.
https://doi.org/10.22495/jgrv10i2siart6

ISSN Print: 2220-9352
ISSN Online: 2306-6784

Received: 12.03.2021
Accepted: 17.05.2021

JEL Classification: G3, G38, G39
DOI: 10.22495/jgrv10i2siart6

Abstract

Gender balance on company boards is one of the core goals of greater social justice and gender equality in societies (Council of Europe, 2003). To this end, it is pivotal to adequately measure whether boards are balanced and close to parity. This research proposes a gender balance on boards (GBB) index to measure the balance between women and men on the boards of directors of firms. It varies between zero, when the board is homogenous with only women or only men, and one, when the board is totally balanced with 50% women and 50% men. It is designed so that it can be adapted according to the theoretical framework, and it can serve as a practical tool for measuring and monitoring the results and progress of the firm, industry, or context against the desired benchmark. The index can be used as a guide for policymakers, regulators, and other social actors including the media on the degree of uptake of actions required to improve governance practices. It provides simple, objective, and comparable data that can be used to raise awareness in society about progress towards a greater gender-balanced representation on corporate decision-making bodies.

Keywords: Women on Boards, Index, Firms, Parity, Gender Balance

Authors' individual contribution: Conceptualization — M.J.G. and S.F.C.; Methodology — M.J.G.; Software — M.J.G.; Validation — M.J.G. and S.F.C.; Formal Analysis — M.J.G.; Investigation — M.J.G.; Writing — Original Draft — M.J.G. and S.F.C.; Writing — Review & Editing — M.J.G. and S.F.C.; Visualization — M.J.G. and S.F.C.; Supervision — M.J.G. and S.F.C.; Project Administration — M.J.G. and S.F.C.

Declaration of conflicting interests: The Authors declare that there is no conflict of interest.

Acknowledgements: The authors acknowledge the valuable research support from Dr. Paul Edge in the mathematical development of the GBB index, as well as the financial support from the Foundation of Science and Technology (Project funded: PTDC/SOC-ASO/29895/2017 and UIDB/04521/2020).

1. INTRODUCTION

The research has long recognised the important role that board members play in the strategic actions of a firm. The board of directors plays a pivotal role in ensuring that value is created for all the stakeholders (Adams, 2016). When the board fails to deliver results and to fulfil expectations, then the stakeholders begin to question the quality of the board and its corporate governance. Previous studies have examined the characteristics of the board such as size and independence (Adams, Hermalin, & Weisbach, 2010), separation of roles (Krause & Semadeni, 2014), remuneration and the expertise of directors (Huse, 2007). Studies of women on boards (WoB) have flourished over the last decade (Mensi-Klarbach, Seierstad, & Gabaldon, 2017). These studies have shown that boards are dominated by "male, stale, and pale" (Myatt, 2014). This epigram encapsulates in a few words the very restricted access, exclusionary practices, and firewalls behind which many boards operate (Bendl & Schmidt, 2010) in the manner of "old boys' clubs" (McDonald & Westphal, 2013). The increase in studies on board representation has been motivated by the growing number of countries opting for either a regulatory route (hard laws) or a voluntary approach (soft laws) to promote greater gender balance on corporate boards. Policy changes have very often been in response to pressure from various social actors, such as civil society organizations, politicians, governments, and the media to increase the share of women exercising economic decision-making (Terjesen, Sealy, & Singh, 2009).

All these trends have generated a particular interest on the part of management studies in researching the influence of WoB on a firm's overall performance and other related outcomes. As a consequence, the research has produced a mounting number of studies, reports, debates, and explanations on how the representation of women on boards could be beneficial, detrimental, or neutral for performance and value creation.

Despite the interest in the topic, there is still an imperfect understanding of how a greater gender balance can affect the performance, value, financial reporting, and other outcomes of a firm (e.g., Bhat, Chen, Jebran, & Memon, 2020; Ullah, Fang, & Jebran, 2019; Martinez-Jimenez, Hernández-Ortiz, & Fernández, 2020; Hurley & Choudhary, 2020). Similarly, the evidence is also limited when it comes to nonfinancial performance measures (see Nguyen, Ntim, and Malagila, 2020, for an up-to-date and comprehensive systematic literature review of research on WoB, for both financial and non-financial performance measures). Therefore, we argue that studies may not be asking the right questions, may not be dealing with endogeneity concerns appropriately, and may not be adequately addressing and measuring gender balance on corporate boards. Recent studies have paid particular attention to endogeneity concerns and have used more sophisticated and appropriate research designs to mitigate the identification problems (Conyon & He, 2017). However, how to measure the representation of WoB remains relatively less researched. Consequently, the inconsistent findings that past studies have rendered can partly be attributed to how the representation of men and women in the boardroom has been measured.

Seeking to move the field of study forward, we propose a new way of measuring the gender balance on boards — the GBB index — which will enable objective comparisons within and between firms, industries, and countries over time. In this current research, it is no part of our intention to review past literature on the relation between WoB and performance and other related outcomes, nor to perform a meta-analysis to summarize the results. Instead, our aim is to propose a novel, informative, and simple way to measure the balance between women and men on corporate boards.

With the proposed GBB index, we are not advocating that one sex should prevail on boards to obtain better results. Instead, our objectives are fourfold. First, we aim to show how the researchers' theoretical framework and analytical criteria may lead to different results and how that may help to explain the mixed results obtained so far. Second, our purpose is to provide researchers and practitioners with a practical, informative tool to monitor the results of the firm, the industry, or the context against the desired benchmark and, in the event of any discrepancy, to guide the uptake of necessary actions to improve corporate practices. Third, we seek to furnish policymakers, regulators, and stakeholders with objective, comparable data on progress in board representation at the firm, industry, national, and international level so that they are enabled to make better-informed decisions. Fourth, our intention is to supply all other social actors including the media with simple, objective, and comparable data that can be used to raise society's awareness of progress towards gender balance in corporate decision-making bodies.

Furthermore, we propose a way of measuring WoB that may help to reconcile previous results. Researchers and practitioners can use the GBB index to assess and compare progress towards a more balanced gender representation on corporate boards. They can also use it to draw comparisons between WoB and performance or other outputs and to assess progress in related areas.

The remainder of the paper is structured as follows. Section 2 presents a review of the literature and justifies the need for a new way to measure gender balance on boards. It reviews existing work and describes current ways of measuring gender diversity, as well as highlighting the need for a new way to measure gender balance on boards. This new way needs to consider the theoretical framework, the line of argument (utility/business cases and social justice/equality, or ideally both of them), and the sector or the phenomenon under study. Next, we present the methodology used to construct the index and possible variants. Lastly, the final section presents our conclusion and addresses the implications of our study for research, practice, and society.

2. LITERATURE REVIEW

Are studies measuring gender balance in an accurate way and addressing the right question when it comes to the implications of women's representation in the boardroom? As Hoogendoorn, Oosterbeek, and van Pragg (2013) show, there is an imperfect understanding of where the optimal share of women on boards lies. Moreover, the utility argument and business cases have tended to dominate the debate whereas, in our view, the social justice and equality arguments are fundamental elements of the case for increased gender balance on corporate boards (see further discussion of this issue in Seierstad, 2016).

Studies have used different ways of measuring the presence of WoB. Some studies use a dummy equal to one if the board has at least one woman (and zero otherwise) or the percentage of women on boards (e.g., Adams & Ferreira, 2009; Nielsen & Huse, 2010). However, some questions remain unanswered, such as the optimal share of WoB and the inherent social dynamics (Hoogendoorn et al., 2013). Other studies have shown the importance of a "critical mass" (e.g., Campbell & Mínguez-Vera, 2008; Torchia, Calabrò, & Huse, 2011; Nguyen, Locke, & Reddy, 2015; Post & Byron, 2015). And some have stressed that a board can appoint women solely for symbolic reasons (e.g., in order to avoid the accusation of discrimination or to fulfil the regulatory requirements). Such an approach is unlikely to translate into substantive changes in board dynamics (Guedes, Gaio, & Soares, 2018). In this respect, Rosener (1995) draws on Kanter's work (1977a, 1977b) to argue that one woman on a board is often dismissed as mere *tokenism*. Furthermore, two women are still not enough to be taken seriously. There is no consensus about the right number of women or the right share of women on boards, though most studies have claimed the importance of a critical mass of at least three women (Konrad & Kramer, 2006; Konrad, Kramer, & Erkut, 2008; Torchia et al., 2011). According to these studies, such a critical mass improves the intra-board dynamics and decision-making through improving communication, breaking gender stereotypes, and creating an atmosphere in which women feel freer to make their voices heard and to contribute more actively. In these circumstances, they are more likely to be listened to (Konrad et al., 2008). Still, the magic number of three has its limitations since "three women on a board of six has a different dynamic than three women on a board of twelve" (Guedes et al., 2018, p. 183).

Another important question needs to be raised. Why is the number important? Are we measuring boards with the right outcomes in mind? Is it all about the possible effects on firms' performance? Because women represent half the population, some scholars claim that the principle of *parity* should apply to any decision-making body (Lépinard, 2018). Those who advocate a greater share of women on boards tend to centre their view on the core societal goals of greater social justice and gender equality. For this line of thinking, the minimum number of women would represent parity, or close to it — that is to say, a number that represents the equal distribution of power, responsibilities, and access to economic and strategic decision-making between women and men. By this reasoning, the representation of either women or men in any decision-making body in public life should not fall below 40%, which is parity's minimum threshold (Council of Europe, 2003).

To date, one limitation that needs to be acknowledged is the dearth of studies that effectively examine the composition and dynamics of boards that are wholly gender-balanced. The reason for this scarcity is that boards are still dominated by males. Studying boards with a share of one to three women, but rarely more, may not reflect all of the dynamics and outcomes of truly gender-balanced boards.

An interesting, related line of research looks at the possibility of a nonlinear effect. In other words, the question is not about "any or how many" women but whether there is a nonlinear relationship between the number of women on the board and the firm's outcomes. The answer to this question is found in the work of Kanter (1977a, 1977b) who shows that different compositions of groups can be conducive to different group dynamics. Researchers have two possible ways to investigate the effects of a nonlinear relationship. The first (and simplest method) is to include a quadratic term that embraces the possibility that the effect of the number of women changes when there are more women. Should the quadratic term be negative (and significant), then an inverted U-shape relationship exists, which means the performance or other outcomes increase up to a certain threshold (presumably the critical mass). This approach is adopted by Hoogendoorn et al. (2013) who confirm the existence of an inverted U-shape relationship between the share of women and sales, profits, and earnings per share.

The second (and more detailed) method is based on Kanter (1977a, 1977b) and extends her approach of distinguishing four types of the group according to the gender composition and the effect that each of those groups has on performance. The first is a uniform and homogeneous group, either all men or all women. The second is a skewed group that has a low level of gender balance and is usually in the range of 15/85% (irrespective of who is the dominant social group). The third is a tilted group where the range is broadly between 20/80% and 35/65% of either men or women. The fourth is a gender-balanced group that is in the range of 50/50% to 40/60%. Kanter's predictions on the performance of the different groups have been tested empirically by Spangler, Gordon, and Pipkin (1978), Fenwick and Neal (2001), and Joecks, Pull, and Vetter (2013). The results from these studies are mixed and raise some concerns. While Joecks et al. (2013) use multivariate analysis, the other two studies base their conclusions on a mean comparison of the groups. Consequently, some caution is recommended. Fenwick and Neal (2001) and Joecks et al. (2013) provide some support for Kanter's argument in finding that the tilted group outperforms the skewed group (uniform and balanced groups are not significant). However, Spangler et al. (1978) find the opposite results.

The precise share of women that reflects the peak in performance or other considered outcomes is not known. The studies thus far undertaken have produced varied and even contradictory results. On the one hand, Joecks et al.'s (2013) findings reflect a critical mass between 20% to 40% (a tilted group). The authors suggest that the optimal number is likely to be 30%, which roughly translates into an absolute number of three women on the board — an outcome that is in line with past evidence (e.g., Konrad & Kramer, 2006; Konrad et al., 2008; Torchia et al., 2011). On the other hand, Hoogendoorn et al. (2013) find 0.55% as the peak value for the share of women. Despite the apparent disagreement on what is the optimal share of WoB, these studies agree with the critical mass predictions that, after a certain threshold is reached, the contributions of women become more pronounced and affect firms' outcomes to a greater extent. Whether that number should be three needs further validation.

Finally, other studies use the so-called "gender diversity index". These studies opt for one of two possibilities. The first set of studies uses a composite index that looks at several dimensions of diversity, such as age, tenure, and rank in addition to gender and compiles them into a single measure. Examples of such indices are the board heterogeneity index of Wahid (2012) or the consultancy indexes, such as the Equilar Gender Diversity Index and the Bloomberg Gender-Equality Index, or from other institutions such as the FTSE's Women on Board Leadership Index Series. These indices incorporate various dimensions of diversity, even though they may be difficult to replicate as access to all the data required is often quite limited, time-consuming, or expensive. Moreover, gender is regarded as just one more category of diversity, which underestimates the presence of women and men in all the other social groups. As a consequence, contrary to our goal, a gender diversity index does not allow us to measure the balanced representation of men and women in corporate decision-making positions and, therefore, frustrates our efforts to chart progress towards gender parity and a more gender-equal society (Lépinard, 2018).

Our approach is aligned with the studies that use an index that looks at the single dimension of being a woman or a man and having a seat on the board of directors (e.g., Miller & del Carmen Triana, 2009; He & Huang, 2011; Joecks et al., 2013). The most frequent measure used to look at diversity in the board is based on Blau (1977) and is called the Blau index. In the case of boards with two categories ($K = 2$) — that is, composed of men and women — the index is calculated as:

$$Blau_{i,t} = 1 - \sum_{k=1}^{k2} p_{i,t}^2 \quad (1)$$

where, p is the proportion of women on board i in year t. The index determines the chance of two randomly selected individuals from a certain group belonging to different categories — in this case, men or women.

In light of the importance of understanding the effects of changes in the share of WoB, we need more studies that employ appropriate techniques. To that end, we propose an index that is practical and simple but yet informative, and that takes nonlinear effects into account and enables researchers to choose the curve according to the theoretical framework, the line of argument (utility/business cases or social justice/equality, or ideally, both of them), and the sector or the phenomenon under study.

3. THE GBB INDEX

3.1. The general GBB index

The proposed GBB index measures the balance between women and men on corporate boards. Inspired by the work of Blau (1977) and Agresti and Agresti (1978), we elect to use a standardized index.

The GBB index is constructed to vary between zero, the case where the board is formed by a homogenous group, and one, the case where the board is formed by wholly balanced groups. Thus, the proposed GBB general index equation is:

$$GBB\ Index\ = 4^k * (Percentage\ of\ Women\ )^k (Percentage\ of\ Men)^k \quad (2)$$

The GBB index is designed to enable researchers and practitioners to adapt it according to the theoretical framework and the context under study, whether it be a firm, an industry, or a specific geographical context. It only requires the percentage of women (or men) on corporate boards to be calculated.

While most studies have not reached a consensus regarding the optimal size of a board of directors, size does not influence the values in our index. Our measure is not sensitive to group size. Furthermore, adding a new board member of the less represented sex will always result in a better score than removing a board member of the more represented sex. The effect of this is to ensure that the index favours larger board sizes. However, the most effective way to increase the index score is to replace members of the over-represented sex with the under-represented sex in a move towards parity.

However, some studies show that boards adjust their size to the mean of the board's size in the country. For example, Ning, Davidson, and Wang (2015) find that there is a mean reversion trend in board size over time. This finding considers the selection process that accounts for the costs and benefits of the choice of board size. Ideally, the appointment of new board members should consider the competence of the members. We, therefore, endorse the view that, according to the social justice and equality argument, the optimal size of representation is at least 40% of either women or men (Council of Europe, 2003; Lépinard, 2018).

However, boards frequently have an odd number of members to break voting deadlocks and because of the belief that odd-number boards make higher quality decisions (Deng, Gao, & Liu, 2012). In that event, a mix of 50% male and 50% female is impossible, as is a perfect index score of one. As Deng and colleagues have found, the larger the board, the less pronounced are the performance effects and the less important it is to have an odd and large number of members on the board. But this does not diminish the validity of this or similar indexes.

Our measures align with the related work of Humbert and Guenther (2017) and Humbert, Ivaškaitė-Tamošiūnė, Oetke, and Paats (2015) in that they are not detrimental to either sex nor do they assume that being of particular sex brings certain advantages to firms.

3.2. The K-factor and the proposed K

3.2.1. The choice of the K-factor

To enable comparison, the researcher needs to decide on the value of K. This decision can change the value of the index considerably.

Multiplication by the percentage of each sex ensures that the index is zero when the board is just composed of men or women. The denominator of $50\% * 50\% = 0.25$ ensures that the index is one when the board is equally representative. These mathematical properties of the index are sustained whether we take the square, the cube, or any exponent of the multiplied percentages.

We define K as the exponent variable that can be chosen according to the theory, sector, or phenomenon under study. The choice of K gives different types of results and curves. For example, consider the hypothetical cases of boards that have the following percentages of women: 0%, 10%, 20%, 30%, 40%, and 50%. The values of the GBB index will vary from zero and one, as presented in Table 1.

Table 1. GBB index values, by values of K and percentages of women on boards

	Percentage of WoB					
K	*0%*	*10%*	*20%*	*30%*	*40%*	*50%*
1	0	0.36	0.64	0.84	0.96	1
2	0	0.13	0.41	0.71	0.92	1
3	0	0.05	0.26	0.59	0.88	1
4	0	0.02	0.17	0.50	0.87	1

Table 1 demonstrates that the larger the value of K, the smaller the GBB index's score for each percentage. Take, for example, the percentage of women equal to 10%; this represents the case of more homogenous groups, which are further away from parity. When $K = 1$, the GBB index is 0.36, when $K = 2$ it is 0.13, and when $K = 4$ it is 0.02. This case demonstrates the importance of the decision by the researcher to adjust the value of K in line with reality and of the judgment to penalize more (or less) the groups that are further away from parity. Consequently, it illustrates how the choice of K is pivotal as the value selected leads to different results and conclusions.

Figure 1. GBB index curves, with the different values of K

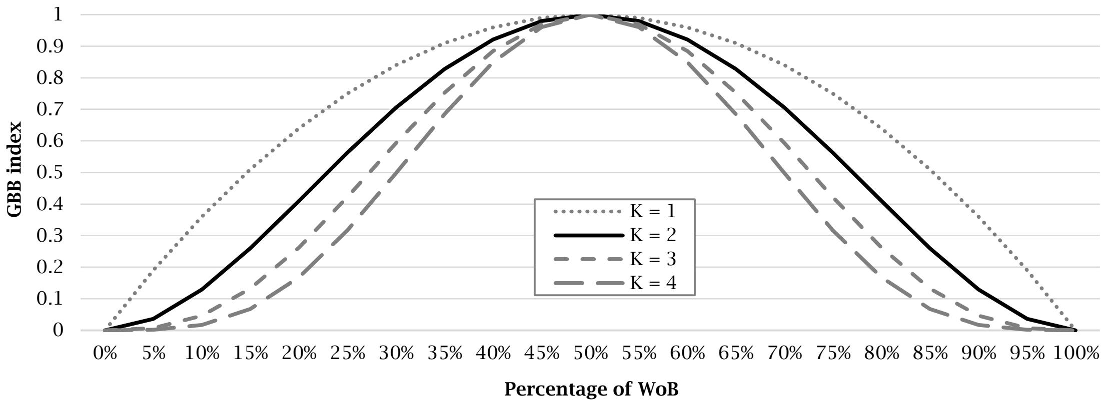


Figure 1 shows how the different curves of the index vary with the different values of K. According to Figure 1, K determines the relative index score attributed to a greater gender balance, but there is no single or correct value for K. Also, it shows that there is no detrimental judgement for the base case of the GBB because a board with 10% of women will score exactly the same as a board with 10% of men — both are at the same distance from parity and, thus, mirror each other in the wings of the curve.

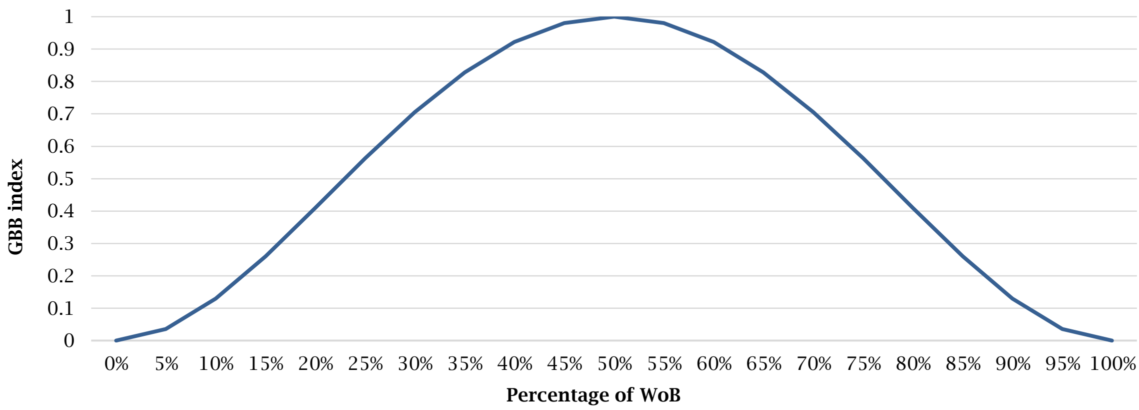
3.2.2. The K-factor = 2

In order to have comparable results across time and samples (boards, firms, and nations), the generality of researchers needs to choose a standardized K that consistently adjusts the index. Thus, empirical studies can use a representative value of K to assess the value that best fits the area under investigation — for example, the relative historical performance of firms with different board diversities, the effect of the industry in which the firm is located, among others.

In the case of the board of directors' gender balance, we propose the value of $K = 2$. Thus, the formula for the proposed GBB index is presented in equation (3).

$$GBB\ Index\ = 4^2 * (Percentage\ of\ Women\ )^2 (Percentage\ of\ Men)^2 \tag{3}$$

Figure 2. GBB index curves when $K = 2$



According to Figure 2 and Table 1, the values of the GBB index, when $K = 2$, are 0.13 and 0.92 when there is 10% and 40% of the under-represented sex. Thus, the higher values of the GBB index are reached when the board is closer to parity. The curve shows that the index heavily penalizes boards that are homogenous and those that are skewed somewhat less so. But it then rewards tilted boards that approach parity, reaching a peak with gender-balanced boards.

There are several reasons for our choice of $K = 2$. First, it is always true that, under our proposed general index equation, any positive value for K ensures that an inverted U-shape is produced and the index maximum of one occurs at an equal 50/50 split. Second, choosing K as an integer value simplifies the calculation because repeated multiplication can be used instead of applying the power function. Third, a value of $K = 1$ replicates the (standardized) Blau index if scaled to one (or equivalently the Index of Qualitative Variation [IQV], Agresti and Agresti, 1978). Fourth, it is differentiated from the Blau index in the sense that our index has a smaller increase in value when the first member of the opposite sex joins the board. For example, Table 2 compares our index with the percentage of women on boards and with the Blau index. According to the table, when we have 10% of WoB, the Blau index is equal to 0.18 and our GBB index is equal to 0.13. On the other hand, our index has higher increases in values when the percentage of WoB is close to the parity point. For example, in the case of increasing the percentage of WoB from 30% to 40%, our index changes by 0.22, while the Blau index increases by only 0.06. Thus, we seek to avoid unjustifiably rewarding what is in essence "token gestures" and instead endeavour to reward boards that are closer to a gender-balanced scenario. Fourth, using $K = 2$ still rewards the first steps towards diversity, but to a lesser extent. The greatest marginal increases in index value are just after the 20% representation level (to be more precise, at $0.5 \pm \sqrt{3}/6$). Higher levels of K essentially increase the level of representation that is considered to be a token gesture. And fifth, contrary to some indexes (e.g., Blau, 1977; Teachman, 1980), our measure is based on the proportion of each sex on the board and is not sensitive to group size (Biemann & Kearney, 2010). Previous studies have dealt with this limitation by normalizing the index (Harrison & Sin, 2006; Solanas, Selvam, Navarro, & Leiva, 2012).

Table 2. Comparison of the GBB index values and Blau index for the case of $K = 2$

Proportion of chosen sex (either women or men)	*Blau index*		*GBB index*	
	Value	*Change*	*Value*	*Change*
0%	0	0	0	0
10%	0.18	0.18	0.13	0.13
20%	0.32	0.14	0.41	0.28
30%	0.42	0.1	0.71	0.30
40%	0.48	0.06	0.92	0.22
50%	0.5	0.02	1.00	0.08
60%	0.48	-0.02	0.92	-0.08
70%	0.42	-0.06	0.71	-0.22
80%	0.32	-0.1	0.41	-0.30
90%	0.18	-0.14	0.13	-0.28
100%	0	-0.18	0	-0.13

Table 3 shows how our index changes when we add a woman to the board of directors. For example, we use a board size of nine members (boards usually have between 7 and 12 members, depending on the firm's size, industry, the separation between the executive and supervisory, whether listed or not, and other factors). According to Table 3, the index reaches its peak when there are four or five women. Moreover, the largest change in the index value occurs when we pass from two to three women. This is in line with previous findings and supports the critical mass argument. Thus, adding one woman (a token) causes a smaller change in the index (0.16 change) than adding one woman when there are two already (0.32 change) or from three to four (0.31 change). At this point, women's contributions are no longer symbolic, and the group is close to a wholly gender-balanced board.

Table 3. Changes in GBB index when adding one woman (for the case $K = 2$)

Number of women before an increase in board size = 9	*Number of women after an increase of 1 woman*	*Proportion of women*	*GBB index*	*Change in index value*
	0	0.0%	0.00	0.00
0	1	11.1%	0.16	0.16
1	2	22.2%	0.48	0.32
2	3	33.3%	0.79	0.31
3	4	44.4%	0.98	0.19
4	5	55.6%	0.98	0.00
5	6	66.7%	0.79	-0.19
6	7	77.8%	0.48	-0.31
7	8	88.9%	0.16	-0.32
8	9	100.0%	0.00	-0.16

3.3. Combining samples to create a country or industry index

Another interesting feature of the index is that it permits the combination of samples and the creation of the industry, country, and other desired combined indexes. The averaging is done on the index variable, not the percentage of a specific sex. If, for example, an index contained two companies — one run solely by women, and one run solely by men — then averaging the percentage would give a perfect score of 50% women and an index of one, whereas the index should be zero.

The index score for each firm can be an arithmetic average, a geometric average, a market capitalization-weighted average, a board size weighted average, a total employee count weighted average, or any other relevant scheme. For the base case ($K = 2$), we recommend the arithmetic average, again for the sake of simplicity in calculation and explanation.

4. CONCLUSION

In this research, we propose a new way of measuring the share of women on corporate boards that contributes to moving the related field of knowledge, policy, and practice in a positive direction. The proposed GBB index should help to reconcile previous findings because it can be used by researchers and practitioners who are seeking to relate WoB to performance and other output measures so that progress in these domains can be assessed and compared. It shows how the choices in the way that the share of WoB is measured may have been driving researchers to inconclusive and mixed findings in terms of firms' performance and related outcomes.

Moreover, the GBB index has more comprehensive and far-reaching purposes. We affirm the importance of monitoring the progress that economies and societies are making towards greater social justice and gender equality. As a simple and practical tool, the index will make possible the monitoring of firms, industries, and contexts against the desired benchmark and, if needed, guide the necessary actions to improve governance practices. By measuring the representation of men and women in the way this study proposes, we hope that policymakers and all the relevant stakeholders will be better placed to make well-informed decisions. As many countries are implementing gender board quotas, either on a voluntary or mandatory basis, the index may also provide the necessary information to support policy readjustments and/or design complementary programmes. Moreover, it may provide other social actors, including the media, with simple, objective, and comparable data that can be used to inform larger audiences and raise awareness of progress towards a more gender-equal representation on corporate decision-making bodies.

As far as the debate on gender balance is concerned, we endorse the view that business cases are just one imperative. Advancement towards a more equal representation of men and women should create great benefits in terms of a more equitable society and a potentially symbolic impact on future generations (Huse, 2018). Further research will now be undertaken on the profile of men and women serving as boards members, as well as on their perceptions regarding the social dynamics of the boardroom (*intra board processes*) and the *outcomes,* including internal corporate policies, practices, and processes geared to the promotion of gender equality. Furthermore, we seek to integrate theory, research, policy, and practice by involving key stakeholders in evidence-based reflection on gender balance on boards and in a debate on how to advance and sustain gender-equality values in organisations and in society at large.

REFERENCES

1. Adams, R. B. (2016). Women on boards: The superheroes of tomorrow? *The Leadership Quarterly, 27*(3), 371–386. https://doi.org/10.1016/j.leaqua.2015.11.001
2. Adams, R. B., & Ferreira, D. (2009). Women in the boardroom and their impact on governance and performance. *Journal of Financial Economics, 94*(2), 291–309. https://doi.org/10.1016/j.jfineco.2008.10.007
3. Adams, R. B., Hermalin, B. E., & Weisbach, M. S. (2010). The role of boards of directors in corporate governance: A conceptual framework and survey. *Journal of Economic Literature, 48*(1), 58–107. https://doi.org/10.1257/jel.48.1.58
4. Agresti, A., & Agresti, B. F. (1978). Statistical analysis of qualitative variation. *Sociological Methodology, 9,* 204–237. https://doi.org/10.2307/270810
5. Bendl, R., & Schmidt, A. (2010). From 'glass ceilings' to 'firewalls' — Different metaphors for describing discrimination. *Gender, Work and Organization, 17*(5), 612–634. https://doi.org/10.1111/j.1468-0432.2010.00520.x
6. Bhat, K. U., Chen, Y., Jebran, K., & Memon, Z. A. (2020). Board diversity and corporate risk: Evidence from China. *Corporate Governance: The International Journal of Business in Society, 20*(2), 280–293. https://doi.org/10.1108/CG-01-2019-0001
7. Biemann, T., & Kearney, E. (2010). Size does matter: How varying group sizes in a sample affect the most common measures of group diversity. *Organizational Research Methods, 13*(3), 582–599. https://doi.org/10.1177/1094428109338875
8. Blau, P. M. (1977). *Inequality and heterogeneity: A primitive theory of social structure* (Vol. 7). New York, NY: Free Press.
9. Campbell, K., & Mínguez-Vera, A. (2008). Gender diversity in the boardroom and firm financial performance. *Journal of Business Ethics, 83*(3), 435–451. https://doi.org/10.1007/s10551-007-9630-y
10. Conyon, M. J., & He, L. (2017). Firm performance and boardroom gender diversity: A quantile regression approach. *Journal of Business Research, 79,* 198–211. https://doi.org/10.1016/j.jbusres.2017.02.006
11. Council of Europe. (2003). *Recommendation on balanced participation of women and men in political and public decision-making.* Retrieved from https://rm.coe.int/1680519084

12. Deng, X., Gao, H., & Liu, W.-L. (2012). *Does board voting efficiency affect corporate performance and governance? Evidence from the even-odd effects of corporate board.* http://doi.org/10.2139/ssrn.2112880
13. Fenwick, G. D., & Neal, D. J. (2001). Effect of gender composition on group performance. *Gender, Work and Organization, 8*(2), 205–225. https://doi.org/10.1111/1468-0432.00129
14. Guedes, M. J., Gaio, C., & Soares, N. (2018). Exploring the relationship between gender diversity and earnings management: Does critical mass matter? In A. Azevedo, & A. Mesquita (Eds.), *Proceedings of the International Conference on Gender Research ICGR 2018* (pp. 181–188). Retrieved from https://pure.spbu.ru/ws/portalfiles/portal/18198096/ICGR_2018_Proceedings_Download.pdf#page=202
15. Harrison, D. A., & Sin, H. (2006). What is diversity and how should it be measured. In A. M. Konrad, P. Prasad, & J. K. Pringle (Eds.), *Handbook of workplace diversity* (pp. 191–216). Thousand Oaks, CA: Sage Publications.
16. He, J., & Huang, Z. (2011). Board informal hierarchy and firm financial performance: Exploring a tacit structure guiding boardroom interactions. *Academy of Management Journal, 54*(6), 1119–1139. https://doi.org/10.5465/amj.2009.0824
17. Hoogendoorn, S., Oosterbeek, H., & van Praag, M. (2013). The impact of gender diversity on the performance of business teams: Evidence from a field experiment. *Management Science, 59*(7), 1514–1528. https://doi.org/10.1287/mnsc.1120.1674
18. Humbert, A. L., & Guenther, E. (2017). *The Gender Diversity Index, preliminary considerations and results.* Retrieved from https://ec.europa.eu/research/participants/documents/downloadPublic?documentIds=080166e5b16abef3&appId=PPGMS
19. Humbert, A. L., Ivaškaitė-Tamošiūnė, V., Oetke, N., & Paats, M. (2015). *Gender Equality Index 2015 — Measuring gender equality in the European Union 2005–2012.* Retrieved from http://eige.europa.eu/sites/default/files/documents/mh0215616enn.pdf
20. Hurley, D., & Choudhary, A. (2020). Role of gender and corporate risk taking. *Corporate Governance, 20*(3), 383–399. https://doi.org/10.1108/CG-10-2018-0313
21. Huse, M. (2007). *Boards, governance, and value creation: The human side of corporate governance.* https://doi.org/10.1017/CBO9780511611070
22. Huse, M. (2018). *Gender in the boardroom: Learnings from world-leader Norway* (FACTBase, Bulletin No. 58). Retrieved from https://www.committeeforperth.com.au/documents/factbase-bulletin-58-gender-in-the-boardroom-learnings-from-world-leader-norway-march-2018
23. Joecks, J., Pull, K., & Vetter, K. (2013). Gender diversity in the boardroom and firm performance: What exactly constitutes a "critical mass?". *Journal of Business Ethics, 118*(1), 61–72. https://doi.org/10.1007/s10551-012-1553-6
24. Kanter, R. M. (1977a). *Men and women of the organization.* New York, NY: Basic Books.
25. Kanter, R. M. (1977b). Some effects of proportions on group life: Skewed sex ratios and responses to token women. *American Journal of Sociology, 82*(5), 965–990. https://doi.org/10.1086/226425
26. Konrad, A. M., & Kramer, V. W. (2006, December). How many women do boards need? *Harvard Business Review, 84*(12), 22. Retrieved from https://hbr.org/2006/12/how-many-women-do-boards-need
27. Konrad, A. M., Kramer, V., & Erkut, S. (2008). Critical mass: The impact of three women on corporate boards. *Organizational Dynamics, 37*(2), 145–164. https://doi.org/10.1016/j.orgdyn.2008.02.005
28. Krause, R., & Semadeni, M. (2014). Last dance or second chance? Firm performance, CEO career horizon, and the separation of board leadership roles. *Strategic Management Journal, 35*(6), 808–825. https://doi.org/10.1002/smj.2139
29. Lépinard, E. (2018). The French parity reform. In E. Lépinard, & R. Rubio-Marín (Eds.), *Transforming gender citizenship — The irresistible rise of gender quotas in Europe* (Chapter 2, pp. 62–93). https://doi.org/10.1017/9781108636797.003
30. Martinez-Jimenez, R., Hernández-Ortiz, M. J., & Fernández, A. I. C. (2020). Gender diversity influence on board effectiveness and business performance. *Corporate Governance: The International Journal of Business in Society, 20*(2), 307–323. https://doi.org/10.1108/CG-07-2019-0206
31. McDonald, M. L., & Westphal, J. D. (2013). Access denied: Low mentoring of women and minority first-time directors and its negative effects on appointments to additional boards. *Academy of Management Journal, 56*(4), 1169–1198. https://doi.org/10.5465/amj.2011.0230
32. Mensi-Klarbach, H., Seierstad, C., & Gabaldon, P. (2017). Setting the scene: Women on boards in countries with quota regulations. In C. Seierstad, P. Gabaldon, & H. Mensi-Klarbach (Eds.), *Gender diversity in the boardroom* (Vol. 1: The Use of Different Quota Regulations, pp. 1–10). https://doi.org/10.1007/978-3-319-56142-4_1
33. Miller, T., & del Carmen Triana, M. (2009). Demographic diversity in the boardroom: Mediators of the board diversity — Firm performance relationship. *Journal of Management Studies, 46*(5), 755–786. https://doi.org/10.1111/j.1467-6486.2009.00839.x
34. Myatt, M. (2014). *Hacking leadership: The 11 gaps every business needs to close and the secrets to closing them quickly.* Hoboken, NJ: John Wiley & Sons.
35. Nguyen, T. H. H., Ntim, C. G., & Malagila, J. (2020). Women on corporate boards and corporate financial and non-financial performance: A systematic literature review and future research agenda. *International Review of Financial Analysis, 71,* 101554. https://doi.org/10.1016/j.irfa.2020.101554
36. Nguyen, T., Locke, S., & Reddy, K. (2015). Does boardroom gender diversity matter? Evidence from a transitional economy. *International Review of Economics and Finance, 37,* 184–202. https://doi.org/10.1016/j.iref.2014.11.022
37. Nielsen, S., & Huse, M. (2010). The contribution of women on boards of directors: Going beyond the surface. *Corporate Governance: An International Review, 18*(2), 136–148. https://doi.org/10.1111/j.1467-8683.2010.00784.x
38. Ning, Y., Davidson, W. N., & Wang, J. (2010). Does optimal corporate board size exist? An empirical analysis. *Journal of Applied Finance (Formerly Financial Practice and Education), 20*(2). Advance online publication. Retrieved from https://ssrn.com/abstract=2693077
39. Post, C., & Byron, K. (2015). Women on boards and firm financial performance: A meta-analysis. *Academy of Management Journal, 58*(5), 1546–1571. https://doi.org/10.5465/amj.2013.0319
40. Rosener, J. B. (1995). *America's competitive secret: Women managers.* https://doi.org/10.1093/acprof:oso/9780195119145.001.0001

41. Seierstad, C. (2016). Beyond the business case: The need for both utility and justice rationales for increasing the share of women on boards. *Corporate Governance: An International Review, 24*(4), 390–405. https://doi.org/10.1111/corg.12117
42. Solanas, A., Selvam, R. M., Navarro, J., & Leiva, D. (2012). Some common indices of group diversity: Upper boundaries. *Psychological Reports, 111*(3), 777–796. https://doi.org/10.2466/01.09.21.PR0.111.6.777-796
43. Spangler, E., Gordon, M. A., & Pipkin, R. M. (1978). Token women: An empirical test of Kanter's hypothesis. *American Journal of Sociology, 84*(1), 160–170. https://doi.org/10.1086/226745
44. Teachman, J. D. (1980). Analysis of population diversity: Measures of qualitative variation. *Sociological Methods and Research, 8*(3), 341–362. https://doi.org/10.1177/004912418000800305
45. Terjesen, S., Sealy, R., & Singh, V. (2009). Women directors on corporate boards: A review and research agenda. *Corporate Governance: An International Review, 17*(3), 320–337. https://doi.org/10.1111/j.1467-8683.2009.00742.x
46. Torchia, M., Calabrò, A., & Huse, M. (2011). Women directors on corporate boards: From tokenism to critical mass. *Journal of Business Ethics, 102*(2), 299–317. https://doi.org/10.1007/s10551-011-0815-z
47. Ullah, I., Fang, H., & Jebran, K. (2019). Do gender diversity and CEO gender enhance firm's value? Evidence from an emerging economy. *Corporate Governance, 20*(1), 44–66. https://doi.org/10.1108/CG-03-2019-0085
48. Wahid, A. S. (2012). Director heterogeneity and its impact on board effectiveness. *Journal of University of Harvard, 13*(1), 35–50. Retrieved from https://cd-www.rotman.utoronto.ca/FacultyAndResearch/AcademicAreas/Accounting/-/media/Files/Programs-and-Areas/Accounting/AcademicPapers/Wahid%20-%20job%20market%20paper.pdf