

Corporate Sustainability and Trade Credit: Evidence from ESG

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Abstract. ESG is an extension of the concept of green investment and reflects the concept of sustainable development of enterprises. More and more enterprises are using trade credit financing for their business which is an important part of debt financing. But the influence of corporate ESG performance on trade credit financing has not been explored entirely. We investigate whether and how ESG rating affect the amount of trade credit financing, using a sample of more than 3000 Chinese listed firms from 2011 to 2020. The results show that enterprises with good ESG performance can obtain more trade credit financing. In addition, the results remain significant after a series of robustness tests. The above conclusions not only enrich the research on the economic consequences of corporate ESG performance, but also provide empirical evidence for enterprises to effectively improve trade credit financing.

1 Introduction

As the social attention to corporate social responsibility include environment, society and corporate government dimension continue to rise increasingly, whether the normal purchase and sale relationship, or through trade credit financing, other stakeholders especially suppliers need to analyze factors of business and their potential risks. At the international level, on December 12, 2015, the 21st United Nations Climate Conference held in Paris adopted the Paris Agreement. On April 22, 2016, nearly 190 countries and the European Commission signed the Paris Agreement at the United Nations headquarters in New York, putting forward the grand blueprint of realizing “net-zero emissions” in 2050. In September 2020, at the General debate of the 75th session of the United Nations General Assembly, General Secretary Xi China solemnly announced to the world that it will strive to achieve carbon peak by 2030 and be carbon neutral by 2060. Sustainable development, and climate change in particular, is the key issue of our time. The focus on sustainability gave birth to ESG. And the enterprise is the backbone force of sustainable development. A company's environmental performance, for example on carbon emissions, is closely watched, and how it manages its relationships with employees, suppliers and customers, as well as the communities in which it operates, as well as its leadership, auditing and internal controls. In order to properly assess the opportunity risks associated with this, investors need not only high-quality, transparent and globally compatible sustainability disclosures with financial statements [1, 2], but also ESG ratings that assess the overall level of sustainability performance of companies. ESG ratings provide enterprises with a comprehensive framework on sustainable development, increasingly provide policy makers, practitioners and other stakeholders with information about sustainable

development in details.

Combing through relevant literature on driving factors and economic consequences of ESG in corporate financing, many scholars document that corporate environmental, social and corporate governance performance can significantly reduce cost of capital, which seldom studies the trade credit financing of suppliers. Trade credit financing is an informal financing method of mutual assistance between enterprises, which can effectively alleviate the information asymmetry between enterprises, promote the development of enterprises constrained by financing and improve the efficiency of capital allocation. Therefore, when the allocation of credit resources is reduced, trade credit often becomes an alternative financing method for bank credit to reduce the adverse impact of the decline in the availability of bank credit. But according to the stakeholder doctrine that R. Edward Freeman represent, for upstream suppliers, while providing trade credit to enterprises, they may face delayed payment and loss of investment opportunities and commitments, which results in bad debt losses and other risks. For downstream customers, the trade credit provided to the buyer enterprise is in the form of prepayment. Therefore, the level of enterprise credit is directly related to the trade credit provided by suppliers and customers and greatly affects its working capital, which not only affect the capital turnover, but also may face the purchase of goods can not be timely recovery of the risk, so they maybe decrease the supply of trade credit to enterprises to avoid risks [3]. Besides, according to the principal-agent theory, we can find that the motivation of management to engage in company business activities may be just to cover up their own immoral behavior [4]. It is difficult for suppliers and customers to verify the purpose and reliability of enterprise ESG practice. Such egoistic behavior will have a negative impact on trade credit.

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Therefore, it is reasonable to deduce that enterprises' investment in ESG will have a series of economic consequences on upstream and downstream business credit. So, can outstanding ESG performance, as a sign of high-quality development, significantly promote enterprises' access to more trade credit financing from suppliers? It is particularly important to study this problem.

In this study, we aim to investigate the effect of ESG ratings on trade credit financing amount. Trade credit financing is mainly based on the mutual trust mechanism, which provides short-term financial support for enterprises, that is to say, more trustworthy enterprises are more likely to obtain financing at a lower cost. ESG ratings is an alternatives information source for suppliers and customers to assess the level of company's credit. They not only decrease operation risk but also reduces the default risk, even can alleviate information asymmetry by complement additional non-financial information. As a result, improving the company's ESG rating will significantly increase the amount of deposit receive and accounts payable, thus increasing the amount of trade credit financing. Specially, we set out to answer the research question that whether and how ESG ratings affect the amount of trade credit financing.

To empirically test the develop hypotheses, this paper set out to analyse a large sample of Chinese listed firms from 2011 to 2020. Following the extant literature [5], we obtained detailed information about ESG ratings from Huazheng as proxies for ESG sustainability performance. This paper finds that overall ESG sustainability performance has a significant positive effect on the trade credit financing, providing possible explanations for these results.

This paper contributes to the literature on the determinants of trade credit financing. A large stream of literature demonstrates that operation risks, default risks and information asymmetry are related to trade credit financing [6, 7]. Besides, this paper complements the research regarding the consequences of ESG. Exploiting a novel data, our paper sheds further light on the question of whether and to what extent different ESG ratings lead to change risks and trade credit financing amount. Specially, our paper deeply studies of the role mechanism of ESG rating on business credit financing.

The rest of the paper is organized as follows: Section 2 presents literature review and develops the hypothesis. Section 3 describes the sample, variable construction and empirical results and robustness check, while Section 5 presents additional tests and channel analyses. We conclude in Section 6.e a two-column format, and set the spacing between the columns at 8 mm. Do not add any page numbers.

2 Literature Review and Hypothesis Development

2.1. Literature Review

As an important component framework of the green

economy, ESG has become a global hot topic widely studied by policy makers, practitioners and academic scholars at home and abroad. Specifically, a large stream of existing researches give weight to the factors of ESG and its economic consequences, that is, whether and to what extent a company assumes social responsibility while pursuing profit maximization or shareholders maximization. Due to investment demand, the public's attention to ESG ratings is more and more increasing, and the independent third-party ESG rating system is also constantly improving and standardizing, which shows that ESG rating is an important indicator to evaluate the sustainable development of enterprises, and also affects investors' investment decisions.

Prior papers document that ESG can significantly reduce corporate financing costs. There is a significantly negative association between different ESG components and equity capital cost [8]. Moreover, environmental and governance sustainability obviously decrease equity capital cost, but social sustainability does not evidently. Researchers investigates the relationship between ESG and loan rate, and find that ESG ratings is an useful proxy for default risk [9]. Banks with strong environmental sensitivity, often provide higher loan rate to firms without meeting their environmental obligations, which alleviates loss from default and long-term operational risk. Besides, higher ESG ratings mean corporate with better information transparency, which results in lower debt financing costs and broadening channels of financing [10].

According to the report of the World Trade Organization in 2018, trade credit plays a major role in international economy, with up to 80% of international trade amount. Widespread enterprises are using trade credit financing as an informal financing method. However, as an important part of short-term debt financing, the impact of enterprise ESG performance on trade credit financing has not been sufficiently studied. Trade credit financing is principally demonstrated accounts payable (purchasing goods or services from suppliers) and deposit received (selling goods or services to customers), as a continuous debt financing based on buy-sell relationship between the two parties. In order to promote product sales and expand market share, upstream suppliers often take the initiative to provide trade credit to downstream customers to improve market competitiveness. When the downstream customer is in a strong position and the supplier is in a fierce market competition, the downstream customer in a strong position can threaten to obtain more trade credit by replacing the supplier. Therefore, the existence of business credit, and the customer's strong position, product market competitiveness and good credit [11]. Additionally, credit-worthy firms largely receive a permissible extension of the deadline for payment of the goods, without the supplier's collateral deposit. And limits of deposit received paid by downstream enterprises retailers typically determined by default risks. Prior scholars investigate the relationship of suppliers and firms, and find that more creditworthy embodies more convincing purchasing power and larger payment discounts [12].

2.2 Hypothesis Development

Unlike developed countries, bank credit discrimination is widespread in China. Therefore, trade credit financing is a vital source of short-term financing for corporations, it is one of the most widely used methods in supply chain finance. In recent years, a firm's responsible behavior not only affect stockholders and debt holders, but also customers, and others in the development process. The concept of ESG is highly compatible with the concept of sustainable development in China, it is conducive to promote the stable operation of enterprises. This paper document that there are three reasons for the correlation between ESG performance and business credit: the decrease of operation risk, the increase of corporate reputation and the decrease of information asymmetry.

Better ESG ratings can decrease operation risk. ESG can improve a firm's sustainability performance, through the application of ESG concept. In production chain, cost effective alternative energy can be used to meet carbon emission requirements, therefore, waste and contamination can be reduced, which in turn improve ESG level, eventually reduce operating risks significantly, which can stimulate the technological innovation of enterprises and improve the competitive advantage of enterprises' products in the market [8]. Moreover, the proposal of ESG promotes the compulsory and legalization of corporate environmental and social responsibility, which is an innovation in corporate governance level [13]. Companies with high ESG rating are often better than those with low qualifications in Undertaking of business and green development, thus reducing litigation risks and operation risks. Firms with high ESG ratings are less likely to halfway out and shirking responsibility, partnering with such companies can reduce overall risk and transaction costs for both parties. Therefore, better ESG performance means higher subjective awareness and management input in environmental protection, social responsibility and corporate governance.

Enterprises with good ESG performance have a higher reputation [14], which reduces the default risk. Specifically, enterprises achieve capital accumulation on the basis of reciprocity and mutual benefit. A high ESG rating will improve stakeholders' optimistic expectations of suppliers, increase customer stickiness, and obtain more trade credit amount for enterprises. According to stakeholder theory, even if the unethical operation means achieve short-term windfall profits at the expense of the other partners' interests, the impact on goodwill is bound to damage the good interaction with the industry partners in the future, and the long-term operation is difficult to achieve. Besides, Suppliers can reasonably believe that companies that focus on environmental and social responsibility are in a more robust financial conditions, the purchaser is honest and trustworthy, and that companies will pay off accounts payable within the contract period, because these companies have easy access to financing sources and generate sufficient cash flow [15]. Additionally, the performance of ESG highlights its preference of satisfying suppliers' social responsibility with correct values, thus shortens the trust

distance between ESG and suppliers [11]. Thus, suppliers often prolong payment terms for companies with good ESG performance in order to achieve long-term cooperation. In general, enterprises with good ESG performance are not only conducive to maintaining good customer relations, but also provide credit guarantee for the quality of products sold, help enterprises to grow and occupy a dominant position in the market competition, and facilitate them to obtain trade credit from suppliers more easily.

Moreover, in order to get a higher ESG ratings, managers have incentives to improve information transparency and strengthen external supervision, so as to promote enterprises to obtain more trade credit financing. Enterprises need to alleviate information asymmetry by providing additional non-financial information and high-quality information. Specifically, if information asymmetry or false information occurs in an enterprise, the supplier cannot fully understand the financial and operating risks of the enterprise, and will usually reduce or refuse to provide trade credit to the enterprise out of caution. With corporate activities such as environmental, social and corporate governance more internal information can be conveyed to the outside world, which can alleviate agency problems such as earnings management, insider trading and tax transfer brought by insider information advantage, improve the information asymmetry between enterprises and suppliers, and facilitate suppliers to understand the financial risks of enterprises. Therefore, low degree of information asymmetry provides enterprises with a way to obtain more trade credit financing from upstream enterprise [16]. As suppliers and other partners are more willing to provide trade credit to enterprises with high information transparency, enterprises with better ESG performance may have more credit financing.

Therefore, this paper proposes the following hypothesis:

H1: Corporate sustainability is positively associated with trade credit financing.

3 Research Design

3.1 Sample Selection and Data Sources

Our sample starts with all Chinese firms listed on Shanghai and Shenzhen stock exchanges for years 2011 to 2020. We collect financial and corporate government data from Accounting Research (CSMAR) database, and ESG data are retrieved from the Huazheng [5], respectively, and merge them with STATA. In this process, we exclude (1) firms with financial difficulties or listing suspension (ST, PT firms); (2) firms with no available ESG data via Huazheng; (3) firm-years that are missing necessary data for the variables used in our analysis. The result was a total of 21739 company-quarterly observations for 3,116 companies. In addition, in order to reduce the influence of outliers on the empirical results, this paper indents all continuous variables by 1%. Table 1 provides the definitions of all variables used in this paper. We start with nine variables which have been related to

corporate economic performance. These variables include (1) corporate size (Size); (2) average return on equity for the current year (Roa); (3) board size (B_size); (4) independent director ratio board number (Indep); (5)

proportion of fixed assets (PPE); (6) ratio of total debt to total assets in year (Lev); (7) net cash flow from operation activity scaled by total assets (Cfo).

Table 1. Definitions of variables.

Exploratory Principal Component Analysis	
TM1	Accounts payable and notes payable by liabilities total;
ESGRank	Huazheng ESG rating, assigned 1 - 9;
Control variables	
Size	Natural logarithm of market value of equity in year t;
Roa	Average return on equity for the current year;
B_size	Natural logarithm of the ratio of the number of directors to the total number of directors;
Indep	Independent director ratio board number;
PPE	Fixed assets by total assets;
Lev	Ratio of total debt to total assets in year t;
Cfo	Net cash flow from operation activity scaled by total assets;

3.2 Dependent variable

Consistent with prior studies [17-19], we use accounts payable, notes payable and advance receipts by liabilities total as proxies for trade credit financing (TCF).

3.3 Independent variable

Drawing on the practice of existing paper [5], Huazheng ESG rating is selected to measure the ESG fulfillment of enterprises. Compared to other ESG evaluation systems, Huazheng ESG indicators have high applicability, timeliness and wide coverage. Among them, the Huazheng ESG rating is divided into AAA, AA, A, BBB, BB, B, CCC, CC, C nine levels from high to low, and this article assigns ESG according to the above rating distribution, AAA is 9, AA is 8, and so on, C is 1.

3.4 Control variables

Referring to previous studies [20-23], this paper controls characteristics that can influence trade credit financing amount including the size of the enterprise (Size), the utilization efficiency of total assets (Roa), board size (B_size), board independence (Indep), Scale of fixed assets (PPE), Leverage ratio (Lev), net cash from operating activities (Cfo). In addition, annual and industry

fixed effects are controlled.

3.5 Model specification

We employ the following model to examine the hypothesis.

$$TM1 = \alpha_0 + \alpha_1 ESGRank + \alpha_2 Controls + Industry FE + Year FE + \varepsilon \quad (1)$$

4 Empirical Results

4.1 Descriptive statistics and univariate analysis

Table 2 reports the summary statistics of all firm-year observations, the number of observations is 21739. The mean and median value of TM1 are 0.329 and 0.295, respectively, reflecting the amount of trade credit financing. The mean and median value of ESG rating are 6.492 and 6. Indep, Roa and Cfo displays a relatively balanced distribution with the mean of 0.380, 0.038 and 0.043 and median of 0.364, 0.036 and 0.043, respectively. Size and PPE both show some positive skewness with the mean of 22.112 and 0.225 and median of 21.928 and 0.191, respectively. For the firm size, we take a log value of the ratio of the number of directors to the total number of directors that the mean and median value are 2.285 and 2.197. Cfo results in a balanced distribution with the mean and median of 0.043. The mean and median value of Lev are 0.446 and 0.441.

Table 2. Descriptive statistics.

Variable	N	Mean	SD	p25	p50	p75
TM1	21739.000	0.329	0.209	0.161	0.295	0.466
ESGRank	21739.000	6.492	1.058	6	6	7
Size	21739.000	22.112	1.327	21.154	21.928	22.868
Roa	21739.000	0.038	0.058	0.014	0.036	0.065
B_size	21739.000	2.285	0.246	2.197	2.197	2.398
Indep	21739.000	0.380	0.071	0.333	0.364	0.429
PPE	21739.000	0.225	0.166	0.096	0.191	0.320
Lev	21739.000	0.446	0.214	0.277	0.441	0.607
Cfo	21739.000	0.043	0.071	0.005	0.043	0.085

4.2 Main results

Columns (1) and (2) of Table 3 presents the regression results of ESG performance and trade credit financing. From the data shown in column (1), the regression coefficient between ESGRank and trade credit financing is 0.00630, without other control variables, and it is significant at the level of 1%, indicating that the better the enterprise ESG performance, the more trade credit financing, ESG performance and trade credit financing is significantly positive. When the interaction term between ESGRank and trade credit financing, except for control variable is introduced in column (2), therefore, the coefficient of the variable is 0.00373 and statistically significant at the 1% level. The results are consistent

with the hypothesis H1.

When all variables are used simultaneously, the regression coefficient of the size of the enterprise (Size), is significantly negative, as well as scale of fixed assets (PPE) and leverage ratio (Lev). Specifically, the coefficient of Size, PPE, and Lev is 0.00774, 0.0756 and 0.320, and it is significant at the level of 1%. On the other hand, Cfo remains statistically significant at the 1% level with the coefficient of 0.0852, which is significantly positive. And the estimated coefficient of the Indep is 0.0260 and significantly negative at the 10% level. The regression coefficient of Roa and B_size are 0.0114 and 0.00605, which is closed to the level of 10%. Thus, regression results of control variables are basically consistent with the results of existing literatures [20, 21, 24, 25].

Table 3. Main results.

	(1)	(2)
Variables	Error	Bias (Optimism)
ESGRank	0.00630***	0.00373***
	(5.65)	(3.53)
Size		-0.00774***
		(-4.25)
Roa		0.0114
		(-0.66)
B size		0.00605
		(-1.41)
Indep		-0.0260*
		(-1.96)
PPE		-0.0756***
		(-7.56)
Lev		-0.320***
		(-41.22)
Cfo		0.0852***
		(-6.62)
Year Fixed Effects	Yes	Yes
Industry Fixed Effects	Yes	Yes
Observations	21739	21739
Adjusted R2	0.1113	0.1114

Note: This table presents the regression results of the joint impacts of ESG ratings on trade credit financing. Standard errors clustered at the firm level are shown in parentheses. Here, *, ** and *** indicate significance at the 10%, 5% and 1% levels (two-tailed), respectively.

4.3 Endogeneity analyses

4.3.1 Alternative variables

Referring to the practice of prior paper [26], this paper redefines trade credit financing as accounts payable and notes payable by liabilities total, and reconstructs the trade credit financing (TCF). The purpose of this test is to confirm whether the previously examined relationship between ESG rating and the amount of the trade credit financing even after controlling for the additional interaction terms that may replace the relationship by their own interacting effects. The results are shown in Table 4. As shown, regression coefficients between ESGRank and

TCF is still significantly positive, which proves the robustness of the result, at the 1% level with 0.00465.

When including other control variables, the regression coefficient of ESG rating is 0.00168, which is closed to the level of 10%. In addition, Size, PPE, Lev all remains statistically significant at the 1% level with the coefficient of 0.00861, 0.165, and 0.357, which is significantly negative. Cfo remains statistically significant at the 1% level with the coefficient of 0.278, which is significantly positive. We can guess that the increase of net cash flow from operating activities means that the stronger the cash creation ability of the enterprise, the more stable the financial foundation, and the stronger its solvency and external financing ability. Therefore, the above research results are still significant after robustness test.

Table 4. Regression results using the PSM matched sample.

Variables	(1) Error	(2) Bias (Optimism)
ESGRank	0.00465***	0.00168
	(3.60)	(1.39)
Size		-0.00861***
		(-4.13)
Roa		0.0268
		(-1.36)
B size		0.00737
		(-1.5)
Indep		-0.0327*
		(-2.16)
PPE		-0.165***
		(-14.45)
Lev		-0.357***
		(-40.18)
Cfo		0.278***
		-18.89
Year Fixed Effects	Yes	Yes
Industry Fixed Effects	Yes	Yes
Observations	21739	21739
Adjusted R2	0.0442	0.1194

5 Conclusion and Enlightenment

5.1 Research conclusion

This paper takes China's A-share listed companies from 2011 to 2020 as samples to investigate the influence of ESG performance on trade credit financing. At present, the ESG rating of enterprises is positively related to trade credit financing. Compared with the period of loose monetary policy, ESG performance plays an important role in promoting the amount of trade credit financing.

5.2 Research Enlightenment

First, ESG information is an effective communication tool for enterprises by enhancing ESG performance and the trust of stakeholders to improve external performance. Therefore, enterprises should implement ESG concept in the process of development and operation, and insist on construct a harmonious environment that company strategy and culture can integrate the development of friendship, social responsibility and corporate governance. In the meanwhile, with the increasing demand of stakeholders for ESG adequate information, the requirements for ESG information disclosure of listed companies are increasing, the ESG management of listed companies should be strengthened and be further improved [27].

Second, for investors, ESG performance can be used as a method for investors especially upstream and downstream investors to judge the sustainable development ability of enterprises and assist them to identify and position enterprises. In addition, for investment institutions in the capital market, better source of investment return are derived from innovative ESG

investment methods to apply, advanced ESG investment products to explore, and promising ESG investment projects to carry out, by controlling risks.

Third, for the government, the ESG concept is in consistent with the demand of high-quality economic development in China, which is to shake off downward pressure on the economy and maintain the capital market. Hence, government departments should gradually improve the ESG information disclosure system of listed companies, quantify the ESG information disclosure standards of enterprises, and push into the supporting incentive and restraint mechanism of ESG information disclosure by policy making. For example, give appropriate rewards to enterprises that actively disclose ESG information, at the same time, the regulatory authorities should strengthen the punishment for false ESG information disclosure, raise the cost of false information disclosure, guide enterprises to make correct ESG decisions, comprehensively enhance the sustainable development ability of enterprises, and strive to achieve high-quality development of economy and society.

References

1. V. Minutiello, P. Tettamanzi, Corp. Soc. Responsib. Environ. Manag., **29**, 1 (2022)
2. A. Tsang, Y. G. Yang, Account. Rev., **87**, 3 (2012)
3. W. Sun, Y. Ding, J. Bus. Res, **116**, 5 (2020)
4. H. Sam, H. Zhou, J. Int. Financ. Manag. Account., **19**, 1 (2008)
5. JY. Gao, DX. Chu, YH. Lian, J. Zheng, Secur. Mkt. Her., **31**, 11 (2021)
6. S. Sayema, Z. Norhayah, Z. Dalilawati, Sustain., **10**, 6 (2018)
7. TM. Wasara, F. Ganda, Sustain., **11**, 16 (2019)

8. AC. Ng, Z. Rezaee, *J. Corp. Financ.*, **34**, 10 (2015)
9. SC. Myers, NS. Majluf, *J. Financ. Econ.*, **13**, 2 (1984)
10. N. Raimo, A. Caragnano, M. Zito, F. Vitolla, M. Mariani, *Corp. Soc. Responsib. Environ. Manag.*, **34**, 3 (2021)
11. W. Jing, J. Dai, *Ind. Manage. Data Syst.*, **118**, 1 (2017)
12. M. Giannetti, M. Burkart, T. Ellingsen, *Rev. Financ. Stud.*, **24**, 1 (2011)
13. M. A. Bellamy, S. Dhanorkar, R. Subramanian, *J. Oper. Manag.*, **66**, 7 (2020)
14. E. Afum, Y. Agyabeng-Mensah, Z. Sun, B. Frimpong, I. Acquah, *J. Manuf. Technol. Manag.*, **31**, 7 (2020)
15. A. Maaloul, D. Zeghal, W. Ben-Amar, S. Mansour, *Corp. Reput. Rev.*, **3**, 2 (2021)
16. N. Houqe, K. Ahmed, G. Richardson, *Intl. J. Account. Rev.*, **55**, 3 (2020)
17. Tien-Shou, Huang, *J. Inform. Optim. Science.*, **34**, 2 (2013)
18. R. Fisman, I. Love, *J. Financ.*, **58**, 1 (2003)
19. CW. Haley, RC. Higgins, *Manag. Science.*, **20**, 4 (1973)
20. V. D'Amato, R. D'Ecclesia, S. Levantesi, *Dec. Econ. Financ.*, **44**, 11 (2021)
21. R. Manita, MG. Bruna, R. Dang, L. Houanti, J. Mundy, JM. Sahut, *J. Appl. Account. Res.*, **19**, 5 (2017)
22. S. Kotsantonis, C. Pinney, G. Serafeim, *J. Appl. Corp. Finance.*, **28**, 2 (2016)
23. J. Feder, *J. Pet. Technol.*, **72**, 6 (2020)
24. B. Bonnie, CX. Cao, C. Chen, *J. Corp. Finance.*, **52**, 7 (2018)
25. C. Reverte, *Corp. Soc. Responsib. Environ. Manag.*, **19**, 5 (2012)
26. H. XU, J. WU, M. DAO, *Rev. Quant. Finance Account.*, **54**, 4 (2019)
27. A. Goss, GS. Roberts, *Soc.Sci. Electron. Pub.*, **35**, 7 (2011)