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# Including social performance as a measure for resilient and green freight transportation

Adrian Solomon[a,b,*], Panayiotis Ketikidis[b,c], S.C. Lenny Koh[a]

[a] The University of Sheffield, Sheffield, United Kingdom
[b] South East European Research Centre, Thessaloniki, Greece
[c] The University of Sheffield International Faculty, CITY College, Thessaloniki, Greece

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ABSTRACT

Whilst the literature shows a clear relation between institutional pressures (normative, coercive, mimetic) on the adoption of Resilient and Green Freight Transportation (RGFT) practices on the one hand, and economic, operational and environmental performance on the other, very few studies have considered the role of social performance (both society and employee-wise) in this equation. Social performance is currently under investigation as a potential success indicator in RGFT practice implementation. However, well-established models that include this social indicator still lack in the field. To this end, this research builds upon an institutional theory-based model which includes social performance as one of the decision-making factors in the industry. A sample of 107 freight transporters from South East Europe (SEE) provides the data to test several structural relations through path analysis.

Results show that the three aforementioned institutional pressures positively impact on RGFT practice implementation. However, the relation is positive for all three pressures only when successful RGFT practice implementation has a moderating effect. Similarly, RGFT practice implementation positively impacts on social performance, through which as moderator, it also yields environmental and economic performance. Lastly, the results show that social performance positively impacts on economic and environmental performance. Overall, this study contributes to institutional theory and green supply chain management by demonstrating the need for including social performance as a success indicator in RGFT practice implementation. Ultimately, this study provides insights for industries and policymakers from SEE and comparable regions.

## 1. Introduction

The growing environmental and social pressures (Behnam et al., 2017) exerted by governments, competitors, customers, society and caused by potential supply chain disruptions are driving corporations to implement sustainable and resilient practices. Nevertheless, the relevant literature rarely acknowledges social performance as an individualized factor in the implementation of sustainable resilience strategies (as a sub-theme of green supply chain management (GSCM) and RGFT). Enhanced employee satisfaction, societal-friendliness and social approval are associated with social performance in RGFT, contributing to social well-being, reduced health problems, enhanced social satisfaction and proper skill-development. Social performance measurement can also support local/national regulatory bodies and should thus be a key decision-making factor (Zhu et al., 2013).

* Corresponding author at: The University of Sheffield, Sheffield, United Kingdom.
*E-mail address:* asolomon@seerc.org (A. Solomon).

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As such, there is a vast literature focusing on the relationship between institutional pressures (normative, coercive, mimetic) on the adoption of sustainable resilience practices and economic, operational and environmental performance (i.e. Yang, 2018; Zhu et al., 2013). However, very few studies have included social performance (both society and employee-wise) in the discussion. Recent research clearly shows that a view of the social factor as a direct performance measure (rather than an implicit/indirect outcome of environmental or economic performance) is gaining currency among academics, policy-makers, and practitioners (Rezaee et al., 2017; Fahimnia et al., 2015).

With 23% of global carbon-dioxide emissions originating from the transportation industry, it is even more imperative policy-makers work to control its environmental and social impact. Apart from CO2 emissions, the sector's overall social impact is detrimental through the high levels of air toxicity and noise generated as well as infrastructure deterioration which impacts on the health and well-being of affected communities nearby transportation structures and networks (European Commission, 2017). As global trade is highly reliant on transportation, the environmental and social impact of moving goods is becoming of high importance for corporations. Globally, carriers transport more than 8 billion tons of freight annually (Yeh et al., 2017). Moving freight creates traffic congestion, air pollution, noise and high fuel consumption with a direct negative impact on society. For example, transportation is a critical part of the European Union (EU) economy (European Commission, 2017), accounting for around 7% of the EU's GDP and 5% of the European job market. The growing importance of freight transportation from a social and environmental perspective is even more urgent especially in sight of the latest EU environmental and social regulations (Schaltegger and Wagner, 2017). However, certain European regions lag in implementing RGFT practices with a social performance factor.

In this paper, Romania, Bulgaria, Serbia, the Former Yugoslav Republic of Macedonia (FYROM), Greece and Turkey comprise the South East European (SEE) region, amounting to about 120 million inhabitants and being the road freight gateway between Western Europe, Middle East, and Asia. The SEE region lags in fulfilling RGFT practices (Tzannatos et al., 2016; Solomon et al., 2017). What's more, the SEE region is constantly prone to natural disasters, human errors and faulty infrastructure, which have put the region in the topmost problematic EU regions for freight transportation (SEETAC, 2016). Such disruptions can cause substantial environmental and social damage in the region if we fail to understand the link between implementing resilient and green freight transportation (RGFT) strategies and their social performance. These concerns will have become even more relevant by 2050 when the SEE's freight intensity will have increased exponentially with the connection of Western European transportation corridors to the Far East.

In this context, this research builds upon the institutional theory-based model of Zhu et al. (2013) and extends it by introducing social performance as an individual factor in a path analysis structural model, drawing on a sample of 107 freight transporters from the SEE. The authors analyze causal relations between the three institutional pressures (normative, coercive and mimetic), RGFT practice implementation and performance (economic, environmental, social).

## 2. Hypotheses and background

### 2.1. Introducing social performance in RGFT practice

The literature is increasingly focused on the perceived overlap between social, economic, and environmental performance. However, recent research aims to challenge this purported overlap and to demonstrate that social performance is a stand-alone indicator of successful environmental practice implementation (Rezaee et al., 2017; Fahimnia et al., 2015). In an editorial note for a special issue on social performance (Behnam et al., 2017), the editors argue in favour of quantifying social performance in the decision-making framework of modern supply chains. As a case in point, an indicative independent quantifiable performance categorization specific to RGFT (as part of GSCM), can be found in Table 1 (based on the work of Zhu et al., 2013; Govindan et al., 2015; Fahimnia et al., 2015):

Freight transporters' business models suggest that the reason why environmental and social performance is measured is not the firm seeking to improve economic performance. Rather, social and economic performance is measured as a result of regulatory pressures (Koh et al., 2017, 2016; Francis and White, 2016). Institutional theory explains how an organization incorporates practices based on pressures (Yang, 2018; Hirsch, 1975), whether coercive, mimetic or normative. Researchers have used this theory as a framework for understanding the adoption of green practices, providing thus the potential for explaining the relation between RGFT practice implementation and economic, environmental and social performance. The Appendix A of this paper (in Table 3) gives examples and definitions of what coercive (consumer/society/business partner-driven), mimetic (competitive) and normative (regulatory) pressures are. To this end, the first hypothesis to be tested in this research is the following:

**Table 1**
Differentiating performance in RGFT practice implementation.

| Environmental | Economic | Social |
|---|---|---|
| CO2 emissions optimization | Reduced fuel consumption* | Reduced noise |
| GWP impact optimization | Optimized routes | Employee satisfaction |
| Toxicity/landfill amount reduction | Reduced environmental penalties* | Enhanced safety |
| Waste amount reduction | Reduced delays; customer complains | Fair treatment |
| Certifications | Reduced fleet damage | Social acceptance |

* The impact of diesel fuels both in terms in consumption reduction and environmental penalties is included in these categories.

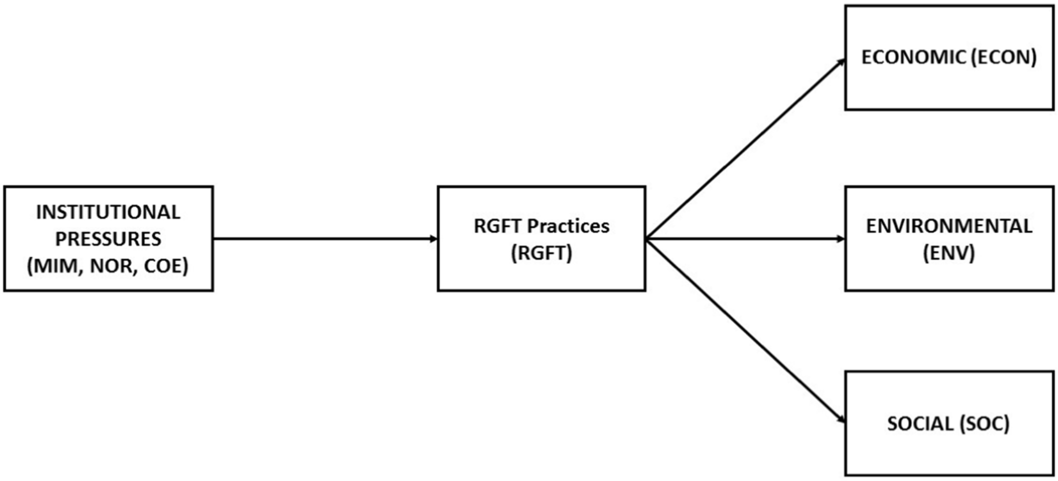


**Fig. 1.** Theoretical model.

**Table 2**
Descriptive statistics for the measured factors.

| Item group | Sub-group(s) | Mean | Std. Deviation |
|---|---|---|---|
| Institutional pressure | Normative (NOR) | 4.00/5 | 0.789 |
| | Coercive (COE) | 3.64/5 | 0.851 |
| | Mimetic (MIM) | 3.63/5 | 0.819 |
| RGFT practice | RGFT practice list (RGFT) | 4.01/5 | 0.885 |
| Observed performance | Economic (ECON) | 3.79/5 | 1.019 |
| | Environmental (ENV) | 3.79/5 | 0.972 |
| | Social (SOC) | 3.61/5 | 1.044 |

Means are calculated based on a 5 point scale range. Further explanations on the items from Table 2 can be found in the Appendix A.

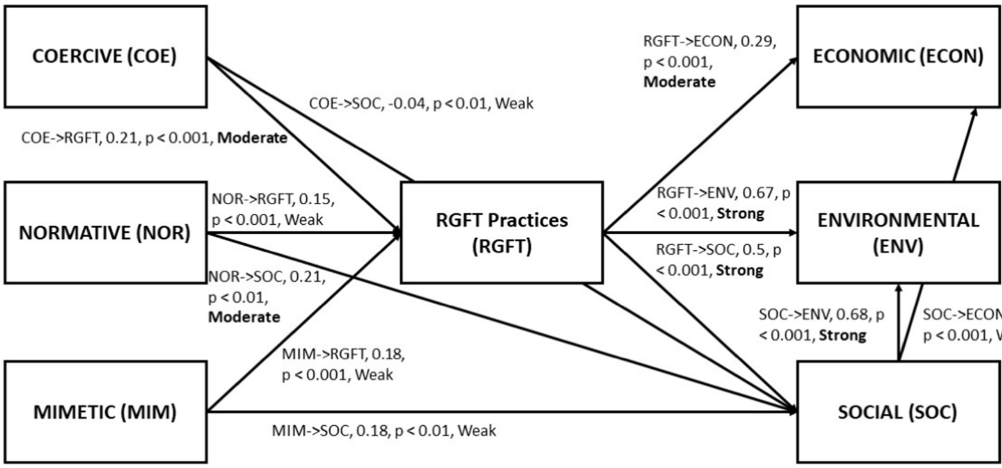


**Fig. 2.** Path diagram.

**H1.** The three types of institutional pressures (coercive, mimetic and normative) impact on RGFT practice implementation

In their paper, Zhu et al. (2013) discuss the three institutional pressures concerning economic, environmental and operational performance GSCM practices in the manufacturing sector. However, they do so without directly focusing on the role of social performance. A similar study is performed by Yang (2018) in the ship container sector. Further, Kamalahmadi (2016) and Minsker et al. (2015) have also studied variations of RGFT practice implementation. Govindan et al. (2015) discuss the paradigms of lean, green and resilient supply chains to address the gaps in the literature of RGFT practice implementation (Francis and White, 2016; Azevedo et al., 2013; Carvalho et al., 2012). In all the studies above, the authors analyze social performance as an indirect effect of lean & green supply chains. However, the authors of this paper envision social performance as an independent and direct measurement and not an indirect outcome. To this end, the second and third hypotheses follow as:

**H2.** The three types of institutional pressures (coercive, mimetic and normative) impact on social performance with RGFT practice implementation as a moderating effect

**H3.** RGFT practices are positively related to social performance

As can be seen from the previous examples posited above, regardless of institutional pressures, organizations implement RGFT practices whenever the organizations can record quantifiable benefits. To this end, the environmental and economic performance measurements have received substantial attention by researchers (Yang, 2018; Fahimnia et al., 2015; Zhu et al., 2013), some of whom have developed quantitative models to demonstrate the relation between institutional pressures, environmental practice implementation and economic and environmental performance. However, no established model exists for including social performance. As such, the fourth hypothesis is:

**H4.** Social performance has a positive relation to economic and environmental performance

Based on the aforementioned theoretical considerations, this paper proposes the theoretical construct depicted in Fig. 1 which draws upon the causal relationships between (i) institutional pressures, (ii) RGFT practices implementation and (iii) economic, environmental and social performance described by institutional theory. The ultimate aim is to understand the structural positioning and causal links of the social performance factor to the other factors to further expanding upon the research performed by Zhu et al. (2013).

### *2.2. Social performance and RGFT in South East Europe and beyond*

Globally, more than 8 billion tons of freight moves internationally (Yeh et al., 2017), a number which continues to grow. Moving freight creates traffic congestion, air pollution, noise and high fuel consumption with a direct negative impact on society. More specifically, apart from CO2 emissions, the sector's overall social impact is detrimental through the high levels of air toxicity and noise generated as well as infrastructure deterioration which impacts on the health and well-being of affected communities (near transportation structures and networks). This situation becomes dire during disruptions in which road freight transportation recovers in an energy-intensive manner, causing additional environmental and social damage (Pregnolato et al., 2017). Road freight transportation is the major polluting sector, also particularly prone to risks, disasters, and disruptions. Moreover, since road freight transportation predominates over other transport means (72,7% of the EU's freight transportation for example), these issues become even more significant and need addressing (Demir et al., 2011).

Transportation is a critical part of the EU economy (European Commission, 2017), accounting for around 7% of the EU's GDP and 5% of the European job market. To date, there have been many attempts to promote the implementation of RGFT practices in the EU. For the upcoming period, the growing importance of freight transportation in adopting more RGFT practices is, even more, pressing especially in the context of the latest EU environmental regulations and target objectives concerning this sector. Such objectives and policies set a clear agenda for boosting social performance and limiting the negative impact on societies (Schaltegger and Wagner, 2017). However, certain European regions lag in implementing RGFT practices.

The SEE region is struggling to ensure the wide implementation of RGFT practices (Tzannatos et al., 2016; Solomon et al., 2016). Behind this struggle lay factors such past heavy industrial production, mono-industrial areas, current monopolistic markets, weak environmental regulations, regulatory framework, industrial restructuring, environmental constraints, high energy intensity, inefficient energy technologies and lack of proper social policies. The SEE region has a history of earthquakes, landslides, floods, wildfires, and heavy snow that negatively impact freight transportation and supply chains (Blaikie et al., 2014). These disasters cause infrastructure degradation and disruptions that lead to severe social and environmental damage (Vaughan et al., 2015). Also, severe congestion, infrastructure faults and lack of training also cause of disruption in freight transportation in the SEE region. In the absence of RGFT practice implementation with social performance measurement, normal business operations could intensify financial strains, social unrest and poor social well-being (Oswald and Mohammed, 2016; Brzozowska, 2016).

Lastly, the SEE region is in the process of integrating infrastructure, regulations and business operations with the existing European freight transportation/supply chain corridors (SEETO, 2016). This development will have even more devastating effects on the SEE region when increased volumes of traffic prevail and will further cause disruptions that RGFT practices will not address. The European Commission (2017) anticipates an exacerbation of the situation as SEE serves as the freight gateway of Europe to the Far East (European Commission, 2017). To this end, freight transporters from SEE are in great need of implementing RGFT practices and of understanding that, besides environmental and economic performance, social performance can bring positive outcomes when implementing RGFT.

## 3. Methodology

### *3.1. Survey design*

Following the analytical framework proposed by Zhu et al. (2013), this study builds upon the theoretical construct presented in Fig. 1, which includes three main institutional pressures (mimetic, coercive and normative), the RGFT practices, and three performance dimensions (economic, environmental and social). The three institutional pressures derive from institutional theory (Hirsch, 1975). Kamalahmadi (2016) and Christopher and Peck (2004) prompt the model theoretical construct for RGFT practices that road freight transporters can implement. The three dimensions of performance present our addition of social performance as the main performance indicator for supply chain operations to the theoretical construct because of recent scientific consensus that advocates for the inclusion (Fahimnia et al., 2015).

The survey used in this research derives from surveys previously utilized by Zhu et al. (2013) and Solomon et al. (2017). In order to measure the components of the construct, a standardized five-point scale (1–5) was utilized to test the degree of RGFT practice implementation (1 – no implementation; 5 – full implementation) as well as for the performance significance (1 – none; 5 – very significant) and institutional pressures (1 – unimportant; 5 – very important). A non-applicable option "N/A" was also included for each item. The Appendix A shows the items measured in the survey in detail.

### 3.2. Sample design

The chosen sample included major road freight transporters from SEE (Romania, Bulgaria, Serbia, FYROM, Greece, and Turkey) as these countries are the main polluters and generators of environmental, economic and social impacts. The SEE block an ideal region to study the implementation of RGFT, especially given the fact that research predicts growth in transportation intensity in the region by 2050 (SEETO, 2016). Researchers contacted the transporters available in national business registries from transporters' associations via phone and email within one month. Researchers contacted 405 companies received 107 valid responses (26.41% response rate). Researchers compared both the phone responses (38% out of the total) and the email responses (62% out of the total) through mean values and significance ($p < 0.05$) to mitigate any potential bias. In the case of the email responses, the surveyors were instructed to follow up with clarifying questions over the phone.

The surveyed sample consisted of transportation managers (22%), environmental managers (7%), compliance officers (5%), operations managers (48%) and transportation coordinators (18%) with assumed knowledge on the surveyed items. Researchers performed two specific assessments to ensure that the respondents have this knowledge and certify the validity of their answers. Firstly, researchers performed a pilot study preceding the main data collection (12 respondents) across different sectors, countries and job types to ensure that the respondents were familiar with the knowledge tested through the survey (no amendment of the questions was required). Secondly, the information sheet preceding the survey questions contained an overview of the knowledge/topics and researchers advised the respondents to select "N/A" in case they did not have the necessary knowledge for the specific item.

Additionally, Zhu et al. (2013) suggest two approaches to mitigate the common method bias as well as the common rater effect. In this study, researchers avoided the common method bias by performing a pretest of the theoretical construct. Researchers pretested the survey in six (6) interviews (one in each country) and based on the results of this testing, and the survey was adapted. The common rater effect was mitigated by reassuring the respondents about the confidentiality of their responses while making the disclosure of personal information optional. Ensuring that the responses remained confidential led to the reduction of the leniency, central tendency and strictness parameters of the common rater effect.

Researchers used SPSS & AMOS software to perform Harman's single factor test and to test the fitness of the model to counter potential common method bias. The results show the following fitness outcomes for the theoretical construct:

$$X^2(dF) = 7.53,\ RFI = 0.21,\ CFI = 0.74,\ NFI = 0.73,\ IFI = 0.75,\ RMR = 0.027,\ RMSEA = 0.37,\ GFI = 0.981$$

These results denote a moderate model fit with a strong $GFI > 0.9$ and RMR close to 0. However, NFI should have been higher than 0.9. Nevertheless, the model is deemed acceptable (Chang et al., 2010) with a low likelihood of common method bias.

### 3.3. Validity and reliability

Researchers tested construct validity via exploratory factor analysis in SPSS, and the results show an average factor loading/communality of 0.589 or higher for each item and a total variance of 73.3% which denotes satisfactory representation as well as the practical significance of the construct (Chang et al., 2010). Additionally, a reliability test was performed on the entire construct as well as on the individual items. Cronbach's alpha shows high reliability (0.860) for the construct as well as for the individual scores for each item group: institutional pressures (0.779), RGFT practices with performance dimensions (0.893), performance dimensions (0.907). Lastly, content validity was ensured by building upon highly cited and scientifically confirmed survey items with feedback from the targeted industry. These results denote that reliability-wise, the construct is acceptable (Zhu et al., 2013).

### 3.4. Modelling approach: path analysis

Path analysis is an extension of the multiple regression method that aims to provide estimates regarding the magnitude and significance of causal relationships between sets of variables supported by hypothesis-making (O'Rourke, 2013). Path analysis has widely been used in supply chain modeling (Nahmias and Cheng, 2009). According to Zhu et al. (2013), path analysis is relevant in cases with small sample size and which build upon less well-established models to revealing new concepts. The authors argue that path analysis for less well-established models will yield better results than other similar approaches, such as structural equation modeling (SEM). Even more, researchers have not fully explored the social performance factor, and the proposed causal model is not well established. Zhu et al. (2013) also use path analysis to test a similar causal model aiming to understand the causal links between institutional pressures, internal and external GSCM practices as well as economic, environmental and operational performance. Similarly, McAdam et al. (2010) utilized path analysis to propose causal models driven by applying structural equation modeling in a similar context, though on a well-established model, highlighting thus the need for applying path analysis on less-established models.

## 4. Results

### 4.1. Descriptive statistics

A descriptive statistics overview on the respondents shows that of the 107 respondents, 14 (13%) have less than 50 employees, 45 (42%) have between 51 and 250 employees and 48 (45%) have more than 251 employees. Similarly, 18 of the respondents (17%) come from family-owned enterprises (which is a growing trend in SEE), 60 (56%) come from private enterprises either regional or international and 29 (27%) come from public-private partnerships. Table 2 provides an overview of the average results for the institutional pressures, RGFT practice implementation and observed performance.

As can be seen in Table 2, the three institutional pressures are highly rated by the sampled SEE freight transporters with the normative one being the most relevant one (4.00 versus 3.64 and 3.63 out of 5). The standard deviation for the normative pressure is also the smallest – denoting thus, higher aggregation and uniformity of the responses (0.789 versus 0.851 and 0.819). Similarly, the implementation level of RGFT practices scored higher (4.01 out of 5) than economic and environmental performance, both of which scored an average of 3.79 (out of 5). Therefore, our sample respondents might perceive economic and environmental performance as being complimentary. Social performance has the lowest average score (3.61 out of 5), and the highest standard deviation (1.04), suggesting that this performance is either our respondents lacked enough information to understand the measure properly or that a measure misspecification exists. In the next section, we use path analysis to understand the correlations of these variables and the implications of those results.

### 4.2. Path analysis results

A path diagram has been created in SPSS AMOS 21.0 and linked to the coded data file. The COE, NOR and MIM variables have been correlated with bi-directional paths to specify their covariance. Fig. 2 shows a representation of the path diagram with weighted results. The ECON, ENV, SOC, and RGFT variables have been assigned with unobserved variable error loads (with the regression weight parameter set to 1) to enable the estimations. Researchers used the following computational parameters: mean estimation and intercepts were included and excluded when calculating model fit parameters, such as GFI, as well as standardized estimates, factor score weights and squared multiple correlations.

In order to verify the issue of multi-collinearity, researchers calculated the variance inflation factor (VIF) via the collinearity diagnosis tool of SPSS. The results show the following VIFs for each relevant path:

$$COE -> RGFT\,(1.78),\ MIM - SOC\,(3.57),\ SOC -> ECON\,(2.94),\ SOC -> ENV\,(2.68),$$
$$COE -> SOC\,(3.57),\ RGFT -> ECON\,(2.69),\ MIM -> RGFT\,(1.84),\ RGFT -> SOC\,(3.57),$$
$$NOR -> RGFT\,(1.84),\ RGFT -> ENV\,(4.73),\ NOR -> SOC\,(3.55).$$

Multi-collinearity can become problematic in cases where relationships exist between independent variables as this can impact on the effectiveness of path weight measurement (Chang et al., 2010). The literature on interpreting the VIF results, though widely dispersed, suggests any VIF that is under 5.0 points towards a moderate multi-collinearity (Lin, 2008) while any VIF under 2.0 denotes minimum risk of multicollinearity (Zhu et al., 2013). As such, the VIF scores for the tested paths have a risk of moderate to low multi-collinearity.

## 5. Discussion

### 5.1. Hypothesis 1: Institutional pressures impact on RGFT practice implementation

Hypothesis 1 is supported by the path analysis results which show positive path weights between the three institutional pressures and the RGFT practice implementation (COE:0.21, NOR:0.15, MIM:0.18). These findings are in line with Zhu et al. (2013) denoting that RGFT implementation has similar institutional effects in SEE. The analysis also reveals that the NOR pressure (4.00/5) is rated higher than both COE (3.64/5) and MIM (3.63/5) pressures. These results suggest the SEE region is still functioning through policy enforcement, rather than market-driven approaches where institutions would self-adapt their RGFT practices based on COE and MIM pressures from competition and customers (SEETO, 2016). Nevertheless, there is evidence that institutions in SEE have an inner transformational desire to incorporate eco-innovations (either RGFT or RGSCM) to adapt to global standards and trends (Solomon et al., 2016). Such outcomes are in agreement with the literature on institutionalism and green supply chain management (Dubey et al., 2015; Govindan et al., 2015).

Regardless of the observed limited knowledge of RGFT practices in SEE, the positive relation between COE, NOR, MIM and RGFT practice implementation provides good incentives for the SEE block to learn from other developing countries/regions with similar transportation infrastructure and legislative frameworks. The finding is consistent considering the logistics performance index, country competitiveness reports, the human development index, as well as global sustainability and social impact pressures through legislation and risk adversity. The eco-modernization related to RGFT practice implementation can be done only via multi-stakeholder partnerships that will extend beyond the supply chain actors to encompass local governments, society representatives, infrastructure stakeholders and service providers, as foreseen by the quintuple helix model proposed by Carayannis et al. (2012). In this model, the institutional pressures (NOR, COE, MIM) on eco-innovation implementation (i.e., RGFT) are being translated into practice via bottom-up changes (socially-driven) within internal institutional policies to foster external policies and practices more effectively (either NOR, COE or MIM). Bottom-up change may also lead to an enhanced formalization and recognition of the social performance factor. Enhancing the relevance of COE and MIM will be done incrementally as the entire freight transportation ecosystem from SEE will evolve and eco-modernize, putting pressure on laggards to slowly adopt RGFT practices (Solomon et al., 2016).

### 5.2. Hypothesis 2: Institutional pressures impact on social performance with RGFT practices as moderator

There is evidence in the literature that proves the impact of institutional pressures (NOR, COE, MIM) on economic and environmental performance (Yang, 2018; Zhu et al., 2013). However, there is very limited research focusing on the relationship between institutional pressures and social performance (Behnam et al., 2017) in the field of RGFT practice implementation. The empirical results of this research, which emerged through the path analysis calculations, point towards controversial outcomes.

For example, the fact that COE- > SOC = −0.04 shows a mild negative relation between coercive pressures and social performance. The COE and SOC variables exhibit some collinearity (VIF = 3.57). Also, we have limited knowledge regarding RGFT practice implementation. We also recognize that freight transporters and infrastructure providers may not have the resources to both invest in social performance while responding to existing pressures from everyday operations (SEETO, 2016). However, if the moderating effect of the RGFT practice implementation is considered (COE- > RGFT = 0.21 & RGFT- > SOC = 0.50), then the RGFT-moderated relation between COE and SOC becomes 0.105 – showing thus a mild positive relation (COE- > SOC moderated by RGFT practices). These findings show that RGFT practice implementation has a moderating effect between coercive pressures and social performance, contributing thus to the efforts of promoting the incorporation of social performance indicators in the decision-making processes of freight transporters from SEE.

On the other hand, the relations between normative and mimetic pressures and social performance (NOR- > SOC = 0.21, MIM- > SOC = 0.18) show a mild inclination towards moderate positive impact, strengthening the argument for integrating social performance as a key decision-making factor. However, if one considers the moderating effect of RGSCM practice implementation, then the relations change as follows: NOR- > SOC = 0.07, MIM- > SOC = 0.08. These results are partially consistent with the literature in the sense that the lack of supportive policies (social-performance wise) for RGFT implementation in SEE could minimize the relevance of the normative pressure and explain the weight-drop for NOR (Solomon et al., 2016). Similarly, a lack of RGFT practice implementation by freight transportation competitors from SEE could explain the weight-drop for MIM. These outcomes indicate RGFT practice enactment in the SEE region is in its early stages (European Commission, 2016). However, even the mild positive relation supports the need for social performance measurement.

The SEE region needs policies that support/enforce RGFT practices to overcome limited business implementation. Such policies would subsequently trigger changes that would see freight transportation institutions from SEE eco-modernize and respond to mimetic pressures, all the while responding to coercive pressures from society and customers as Behnam et al. (2017) suggested. To this end, Hypothesis 2 is partially supported by showing that institutional pressures indeed impact on social performance. However, RGFT practice implementation reduced the positive impact due to the under-developed RGFT infrastructure in the SEE region.

### 5.3. Hypothesis 3: RGFT practice implementation is positively related to social performance

The empirical results of the path analysis show a strong positive relation between RGFT practice implementation and social performance (RGFT- > SOC = 0.50) thus supporting Hypothesis 3. The related VIF score (3.57), however, may pose threats to this result denoting a moderate risk of multicollinearity between RGFT and SOC. The mean score for the SOC performance measurement (the lowest as compared to ENV and ECON) of 3.61/5 with a standard deviation of 1.044 (highest of all measured items) points towards disaggregated responses on behalf of the freight transporters from SEE. This observation verifies the state RGFT practice implementation with few champions/early adopters and those that are not fully aware of such practices status from SEE (Vaughan et al., 2015).

Additionally, there is a question of whether the respondents were fully aware of the items targeted by this research. Controversially, the respondents rated the implementation level of RGFT practices as very high (4.01/5). However, there is evidence in the literature showing that the know-how on RGFT in SEE is very limited, suggesting that the freight transporters from SEE may be confusing the real underpinnings of RGFT with risk management, consumption reduction technologies and optimization, in general. Researchers observation that social performance is positively related to economic and environmental performance (SOC- > ECON = 0.10, SOC- > ENV = 0.68) also confirms the most recent research advocating for the need of the social performance factor (Rezaee et al., 2017; Fahimnia et al., 2015). Social performance concerning freight transportation is thought to create enhanced employee satisfaction, societal-friendliness and social approval of such transportation, contributing thus to social well-being, reduced health problems, enhanced social satisfaction and proper skill-development, and should thus be a key decision-making factor (Fahimnia et al., 2015). To this end, RGFT in SEE should play a key role in social performance as in many cases; the transportation infrastructure passes through inhabited areas and disasters that cause disruptions in freight transportation to have a substantial "social footprint" on the involved communities. With the envisioned freight intensity growth in SEE and with the aftermath of climate change, natural disasters (and not only) should indeed put pressure on freight transporters to incorporate the social performance indicators, besides the environmental and economic ones.

### 5.4. Hypothesis 4: Social performance has a positive relationship with economic and environmental performance

Analysis results show that SOC has a positive relation (mild and strong accordingly) with ECON and ENV (SOC- > ECON = 0.10, SOC- > ENV = 0.68). Moderate positive relationship results (RGFT- > SOC- > ENV = 0.34 and RGFT- > SOC- > ECON = 0.05) support hypothesis 4, and suggest social performance serves as a moderator between RGFT practice implementation and environmental and economic performance. The VIF scores for the two relations are acceptable (SOC- > ENV(2.68), SOC- > ECON (2.94)), with a low risk of multicollinearity. However, according to the mean-result of ECON, ENV, and SOC, ECON and ENV equally score a mean of 3.79/5 as opposed to SOC (3.61/5), and the standard deviations for ECON and ENV are also smaller than the one for SOC, denoting higher aggregation of the responses.

These results favour the claim for incorporating social performance in the decision-making framework of freight transporters from SEE. Freight transporters can gain more than just normative compliance by focusing on social performance, which links to environmental and economic performance. They can gain competitive advantages in their sector while also ensuring a long-term path for social acceptance and engagement of the social capital in their endeavours (Schaltegger and Wagner, 2017). Additionally, social performance triggers cost reduction via internal freight transporter practices. For example, better employee treatment, well-developed schedules, and routes, as well as employee training, can result in fewer accidents, reduced consumption (i.e., implicitly reduced emissions) and less staff complains among others, all in all contributing to more efficient operations and cost reduction.

## 6. Conclusions

### 6.1. Key findings and implications

This paper analyzed the causal relations between institutional pressures (mimetic, coercive, normative) on RGFT practice implementation and the emerging social, environmental and economic performance on a sample of 107 freight transporters from SEE. This study attempted to address a gap in the literature which rarely considered social indicators underperformance outcomes. To this end, this research built upon the institutional theory-based model proposed by Zhu et al. (2013) and added social performance in the decision-making factors. A quantitative approach (path analysis) was adopted to test the proposed relations.

The empirical results show that the three institutional pressures positively impact on RGFT practice implementation. However, the relation is positive for all three pressures only when successful RGFT practice implementation has a moderating effect. Similarly, RGFT practice implementation positively impacts on social performance, through which as moderator, it also yields environmental and economic performance. Lastly, the results show that social performance positively impacts on economic and environmental performance. These results support the need for adding social performance as an individualized factor in the success measurement of sustainable practice implementation.

Freight transporters require a better understanding of RGFT and its implications for social, economic and environmental performance to foster the adoption of social performance factors in RGFT practice through institutional pressure. Also, normative pressures must have specific guidelines for certifying, measuring and monitoring social performance and its influence on environmental and economic performance. Lastly, as the coercive pressures will grow with the latest (global) societal trends, the number of freight transporters that will adopt RGFT practices with social performance factors will increase and, thus, the mimetic pressure will drive the laggards to adhere.

The contribution of this research impacts on institutional theory and green supply chain management by demonstrating the need for including social performance in RGFT practice implementation. The research results give rise to more research models in this sector and establishing the role of social performance in structural models. This research provides insights for industries by demonstrating the direct impact of social performance on environmental and economic performance, reducing thus perception barriers and motivating industries to consider social performance to a greater extent. Finally, policymakers from SEE and comparable regions can build upon these findings and establish a proper regulatory framework towards assisting (and monitoring) freight transporters in adopting social performance factors.

### 6.2. Limitations and future research

The research model design adopts a low granularity level on the concept of RGFT practices because of the limited knowledge on RGFT practices in the targeted sample. However, future research should achieve high granularity and test sub-components of RGFT and their structural relations with the institutional pressures and social performance. The proposed model has a moderate risk of multicollinearity which can be reduced in future models by better structuring the relations and survey design. Similarly, although model fitness is acceptable, it can increase through future research. Past monopolistic governance among SEE freight transporters yields a small sample size for industry-specific research. Future research should build on the limitations of this paper and extend the efforts of establishing this model. One potential extension involves the application of structural equation modeling techniques to yield better results, coupled with a more in-depth focus on the role of normative pressure as regulators propose new regulations on this matter.

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## Appendix A

The following items have been tested in the survey (5-point Likert scale with a non-applicable “N/A” option as well for each item):

Importance level of institutional pressures for driving companies to adopt RGFT with environmental, social and economic performance:

(measured on a 5-point scale: 1 – unimportant; 5 – very important)

- Coercive:
  - o Social pressure to reduce noise
  - o Social pressure to reduce air pollution
  - o Customer/Social pressure to be environmentally sustainable
  - o Customer/Social pressure to adopt “eco-labels”
  - o Customer/Social pressure to become more involved in the co-creation of their product/service (user-driven design)
  - o Employee pressure for work-place safety
  - o Employee pressure for workplace welfare/satisfaction
  - o Higher organizational layers (in case of multinationals) pressure for horizontal environmental and social practice adherence
  - o Business partners pressure to adopt environmental certifications
  - o Business partners pressure to adopt social certifications
- Normative:
  - o Pressure for regulatory compliance to GHG emmisions
  - o Pressure for regulatory compliance to oil and other hazardous materials spills
  - o Pressure for regulatory compliance to environmental reporting
  - o Pressure for regulatory compliance to driver safety
  - o Pressure for regulatory compliance to driver wellbeing
  - o Pressure for regulatory compliance to noise
  - o Pressure for regulatory compliance to pollution
  - o Pressure for regulatory compliance to infrastructure deterioration
  - o Pressure for regulatory compliance to engine standards upgrades
- Mimetic:
  - o Environmental practices as disruptive innovation
  - o Social practices as disruptive innovation
  - o Environmental practices as incremental innovation
  - o Social practices as incremental innovation
  - o Cost efficiency pressure through environmental practices
  - o Cost efficiency pressure through social practices

Implementation level of RGFT practices:
(measured on a 5-point scale: 1 – no implementation; 5 – fully implemented)

- A an assessment of the extent to which the company implements the following RGFT practices:
  - o Environmental Management System (e.g., ISO14001)
  - o Total quality environmental management
  - o Subscription to ISO14001 certification
  - o Changes of processes to reduce air pollution
  - o Changes of processes to reduce odor pollution
  - o Changes of processes to reduce noise
  - o Changes of processes to improve energy efficiency
  - o Changes of processes to reduce consumption of hazardous/toxic/harmful materials
  - o Redesign supply chain/logistics components for greater environmental efficiency
  - o Provides environmental training and education for employees
  - o Senior management commitment to implementing environmental measures
  - o Mid-level management support for the implementation of environmental measures
  - o Provides design specifications to suppliers that include environmental requirements
  - o Cooperates with suppliers to achieve environmental objectives
  - o Cooperates with suppliers to achieve social objectives
  - o Provides suppliers with written environmental requirements
  - o Asks suppliers to commit to waste and/or energy reduction goals
  - o Requires that suppliers have implemented an environmental management system
  - o Conducts environmental evaluation of suppliers
  - o Reliance on soft technology such as decision support systems and additional software in order to reach a new supply chain reconfiguration mechanism during disruptions
  - o Reliance on hard technology such (hardware) in order to reach a better and more efficient new transportation reconfiguration mechanism
  - o Interventions at the energy consumption and emission levels in order to mitigate the environmental impact while reconfiguring the system
  - o Improvement of future distribution mechanisms in order to avoid already encountered business inefficiencies

o Improvement of future distribution mechanisms in order to avoid already encountered environmental inefficiencies
o Mechanisms to raise awareness about the importance of environmental sustainability within the company

Significance level of performance:
(measured on a 5-point scale: 1 – none; 5 – very significant)
Economic performance

- An assessment of the extent to which the company considers the following performance indicators:
  o Value of fuel/energy consumption reduction
  o Reduced penalties and fines
  o Reduced number of customer complaints
  o Reduced number of damaged goods & fleet

Environmental performance

- An assessment of the extent to which the company considers the following performance indicators:
  o $CO_2$ emissions
  o Global Warming Potential (GWP) impact
  o Total resource depletion impact
  o Toxicity/landfill
  o Waste amount
  o Number of Environmental Certifications

Social performance

- An assessment of the extent to which the company considers the following performance indicators:
  o Noise levels
  o Employee satisfaction
  o Safety (in terms of number of accidents involving society)
  o Fair treatment
  o Social acceptance
  o Number of employe injuries
  o Employee training frequency
  o Consumer involvement in the company's operations (frequency)
  o Amount invested in CSR & community projects
  o Qualitative feedback/impact from the CSR projects
  o Quantitative feedback/impact from the CSR projects

See Table 3.

**Table 3**
Coercive, normative and mimetic pressures in RGFT.

| Coercive pressures (COE) | Normative pressures (NOR) | Mimetic pressures (MIM) |
|---|---|---|
| COE pressures are triggered by society/consumers.<br><br>Examples:<br>• Pressure from society to reduce noise, and air pollution which cause social unrest.<br>• Pressure from customers and/or society to be environmentally sustainable and adopt "eco-labels".<br>• Pressure from customers to become more involved in the co-creation of their product/service (user-driven design).<br>• Pressure from employees to improve the work-place safety and employee welfare/satisfaction.<br>• Pressure from higher organizational layers (in case of multinationals) for horizontal environmental and social practice adherence.<br>• Business partner pressures to adopt environmental and social certifications, standards and practices (i.e. process re-design, environmental management systems, etc.) | NOR pressures are triggered by governmental regulations.<br>Examples:<br>• Regulatory compliances to GHG emissions.<br>• Regulatory compliance to oil and other hazardous materials spills.<br>• Regulatory compliance to environmental reporting.<br>• Regulatory compliance to driver safety and wellbeing.<br>• Regulatory compliance to noise, pollution and infrastructure deterioration in urban areas.<br>• Regulatory compliance to engine standards upgrades. | MIM pressures are triggered by the desire to imitate and outperform business competition.<br>Examples:<br>• Desire to innovate and disrupt the competition by piloting new/innovative environmental and social practices.<br>• Incremental innovation and imitating the competition by adopting their related practices.<br>• Ensure cost and fuel consumption efficiency among cross-organizational wider supply chains in order to jointly achieve common targets. |

## Appendix B. Supplementary material

Supplementary data to this article can be found online at https://doi.org/10.1016/j.trd.2019.01.023.

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