



On granting a social license to operate:  
The added value of integrity- and competence-  
based trust, project benefits and organizational  
performance

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## Abstract

The social license to operate (SLO) was extensively studied in the mining sector and is linked to community acceptance of a company's operations. This study's aim is to provide a better understanding of what underlies granting a SLO and to further develop the approach to measure it quantitatively. We draw on Moffat and Zhang's (2014) conceptual model where engagement (contact quality and quantity), procedural justice, and impacts influence SLO through changes in the level of trust in the project owner. Data gathered for a consultancy project in the south of Portugal, close to a mining site, was used to replicate Moffat and Zhang's (2014) conceptual model and to extend it by: a) differentiating between two dimensions of trust (integrity-based trust and competence-based trust), b) differentiating between positive and negative impacts, and c) adding organizational performance variables. The results replicated the original conceptual model in a different setting. Additionally, they also support the added value of the extensions proposed with the two dimensions of trust having specific mediation effects, positive impacts of a firm's mining operations having a greater influence than negative ones and environmental concerns also having a significant mediated effect on SLO. Limitations and suggestions for further research in this context are discussed.

*Keywords: social license to operate, integrity-based trust, competence-based trust, organizational performance, community acceptance*

## Resumo

A licença social para operar (do inglês, SLO) foi extensivamente estudada no setor de mineração e está ligada à aceitação pelas comunidades das operações de uma empresa. O objetivo deste estudo é fornecer uma melhor compreensão do que está subjacente à concessão da SLO e desenvolver a abordagem para medir o a SLO de uma forma quantitativa. Foi utilizado o modelo conceptual de Moffat e Zhang (2014) onde o envolvimento (qualidade e quantidade de contatos), justiça processual e impactos influenciam a SLO através de mudanças no nível de confiança no proprietário do projeto. Os dados recolhidos no âmbito de um projeto de consultoria no sul de Portugal, perto de uma mina, foram utilizados para replicar este modelo conceptual de Moffat e Zhang (2014) e para o alargar através: a) da diferenciação de duas dimensões de confiança (confiança baseada na integridade e confiança baseada na competência), b) da diferenciação de impactos positivos e negativos, e c) da adição de variáveis de desempenho organizacional. Os resultados replicaram o modelo conceptual original num contexto diferente. Adicionalmente, os resultados também suportam o valor das extensões propostas com as duas dimensões de confiança tendo efeitos específicos de mediação, impactos positivos de uma empresa de mineração tendo maior influência do que os negativos e preocupações ambientais tendo também um efeito mediado significativo no SLO. Limitações e sugestões para pesquisas adicionais neste contexto são discutidas.

*Palavras-chave: licença social para operar, confiança baseada na integridade, confiança baseada na competência, desempenho organizacional, aceitação da comunidade*

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## 1. Introduction

As societal beliefs and the notion of the natural environment have been changing over the last years, industries that have a negative impact on it are facing direct opposition and demonstration actions at the local level (Moffat, Lacey, Zhang & Leipold, 2016). Also, the public becomes more concerned and involved in the climate change. The awareness of potential hazards is greater than ever leading to an increased willingness to oppose to anything that might be harmful (Connor, Freeman & Higginbotham, 2009). However, not only environmentally impactful projects are affected by an opposing community. Social-psychological theories say that if people feel the personal relevance there is a tendency to act upon it, i.e. if something is affecting a neighborhood (positively or negatively) a member of that community is likely to feel personally involved and is thus more likely to express his/her opinion (Scannell & Gifford, 2013). The almost 50 years long “ZAD” movement in France successfully opposing the construction of a new airport being just one example of communities that are willing to demonstrate for their neighborhood (Willsher, 2017). Hence, it becomes more important for companies to include the affected communities in their decision making processes and to get acceptance for their operations. Furthermore, researchers argue that “communities are expecting to receive a greater share of the benefits from these operations and require assurances that the industries involved are appropriately regulated” (Prno, 2013, p.577). However, the question naturally arises if the concept of a social license to operate is an ethically acceptable one if companies which e.g. hazard the environment seek to be granted with it. After all, shouldn't the communities stand up for their homes and the environment?

The concept of a social license to operate has been researched in the previous years in many different industries and is granted if the socio-economic risks by the operations of a company are low (Boutilier & Thomson, 2011). “It refers to the ongoing acceptance and approval of a companies' operations by local community members and other stakeholders that can affect its profitability” (Moffat & Zhang, 2014, p. 61). Moffat, Lacey, Zhang and Leipold (2016) state that the relationship between such actors is of evolving nature. Moreover, the authors Moffat and Zhang (2014) argue that it is not enough to only invest money in community programs (as some companies do) and that a more sophisticated approach is necessary to get their approval. Many different companies operating in different industries are relying on such acceptance as the shift in corporate social responsibility and environmental sustainability is induced by the fact that mediocre practices (in terms of environmental behavior) can substantially affect perception by society as well as reputation, what could then affect profit (Azapagic & Perdan, 2000). Corporate Social Responsibility (CSR) is somewhat related to the

social license to operate in this sense. Wilburn and Wilburn (2011) even say that some companies are adopting processes of a SLO as part of their corporate social responsibility strategy. The concept of CSR is defined by five different dimensions, as Dahlsrud (2008) states. Those are: the environmental dimension (i.e. environmental concerns in business operations), the social dimension (i.e. the impacts of business operations on society), the economic dimension (i.e. preserving profitability), the stakeholder dimension (i.e. how organizations interact with different groups of stakeholders) and lastly the voluntariness dimension (i.e. that such actions are beyond legal obligations). Having this broad definition in mind, it becomes clear that there are similarities between the two concepts. Especially considering the social and stakeholder dimension. However, some authors argue that CSR is not voluntary anymore. It has become a standard procedure for companies, or even a business model. They fear loss of customers and competitive advantage without having such policies implemented (Wilburn & Wilburn, 2011). Thus, the absence of having adopted such construct could lead to substantial problems for any company.

The construct of a social license to operate emerged from within the mining industry as a reaction to its implied environmental and social impacts (Boutilier & Thomson, 2011) but it can easily be extended to other operations involving land which locally unwantedly used by companies (Popper, 1985). Namely, all kinds of energy producing operations (i.e. oil, gas but also “green energy” production such wind and solar power plants (Hall, Ashworth & Devine-Wright, 2013), major infrastructure projects (i.e. airports, roads, rails etc.), agriculture, farming (Shepherd & Martin, 2008) as well as forestry (Moffat, Lacey, Zhang & Leipold, 2016). Especially resource development industries have encountered discontent by societies due to its social and ecological impacts. These movements brought up an increased attention to engaging and integrating various views of involved actors (Van Tatenhove & Leroy, 2003).

An important question that stems from this discourse about the importance of SLO is how can companies be granted with such a license and how do they maintain it? Moffat & Zhang (2014) have proposed and tested one of the few conceptual models in the literature depicting how SLO is granted. According to the authors, trust plays a major role in determining SLO. Thus it seems important to understand how trust works in this relationship and which exact dimension of it affects the acceptance the strongest. To gain trust Moffat and Zhang (2014) argue that procedural fairness, contact quantity and quality (i.e. engagement) as well as impacts on the social infrastructure are important variables. Depending on a company’s operations and the impacts it has on communities there might be a positive or negative influence on trust and then in turn on the overall approval, too. However, their study is facing some

fundamental limitations, i.e. their measurement of impacts. Hence, the aim of this study is to improve their model by more rigorous measurements as well as extending their model by other potential predictor variables.

SLO could prevent a costly conflict with the affected communities. With increasing environmental standards by the public, it becomes more important for companies to gain and maintain such a license in order to establish a trust-based and sustainable relationship between communities and companies or whole industries. Considering the costly risks when failing to get approval to operate by the local communities it is necessary to understand what companies should pay attention to and comply with when dealing with their neighborhoods. Hence, the concept of social license to operate is academically relevant as it might give a better understanding of which policies are important to introduce for a company and which are not, possibly saving money on “unnecessary” community programs. Furthermore, companies become more sustainable if they improve on the various dimensions affecting the social license to operate. Consequently, depicting and validating a theoretically sound conceptual model is of great interest for all sorts of companies relying on approval by surrounding communities.

This thesis aims to replicate the proposed conceptual model by Moffat and Zhang (2014) in a, geography-wise, different setting, to test its applicability elsewhere. The intention is to identify a universal and more importantly, a measurable approach for a SLO, across industries as well as across the globe. For this, two different dimensions of trust (i.e. integrity-based trust and competence-based trust) which are widely accepted in the literature, are analyzed within this model to further understand which mechanisms of the social license to operate are of interest for companies seeking to be granted with such license (Poppo & Schepker, 2010). This might give firms insights on what to put their focus on when trying to engage with the surrounding communities. Furthermore, the measurement of impacts used by Moffat and Zhang (2014) will be adapted. Separating positive and negative impacts enhances the measurement due to the assumption that they are orthogonal. Lastly, organizational performance measures will extend the model as Maeda and Miyahara (2003) suggested that they play a role in determining trust.

The research will be structured into two parts with four different research questions. The first part considers the proposed model by Moffat and Zhang (2014) while the second part explores further predictors of SLO.

### 1.1. Part I: Replication of Moffat and Zhang (2014)

The first research question tests the proposed conceptual model by Moffat and Zhang (2014) and if it is applicable in a different setting (same industry, different location) as this dissertation will test the concept of SLO in the case of a southern Portuguese mining site.

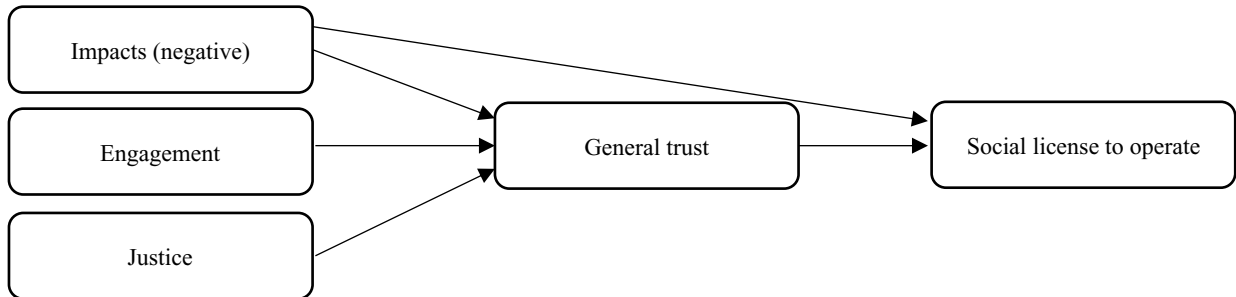


Fig. 1. Conceptual model of a social license to operate introduced by Moffat and Zhang (2014)

#### 1.1.1 Research question 1:

*Are the results of measuring the conceptual model of a social license to operate, introduced by Moffat and Zhang (2014) replicable in a southern Portuguese mining site?*

### 1.2. Part II: Extension of Moffat and Zhang's model

The second part extends the proposed conceptual model by Moffat and Zhang (2014) by a) differentiating between integrity-based and competence-based trust, b) differentiating between positive and negative impacts and c) adding organizational performance measures.

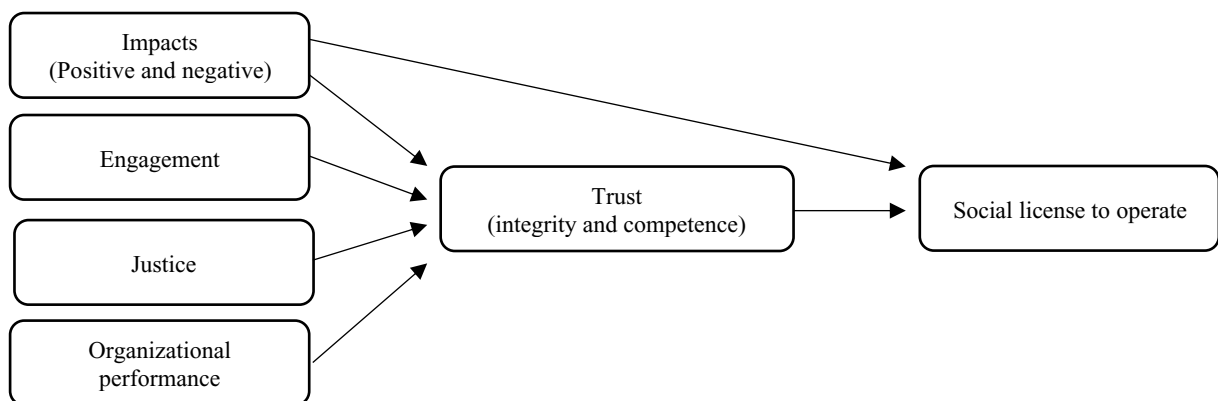


Fig. 2: Conceptual model of a social license to operate with two different dimensions of trust, differentiating between positive and negative impacts, as well as the organizational performance

The first research question of Part II addresses the mediator trust of this conceptual model. Specifically, if the results vary when introducing different dimensions of trust, namely a) competence-based trust and b) integrity-based trust.

#### 1.2.1. Research question 2:

*Does trust mediate the relationship between the determinants and the social license to operate? If so, which dimension of trust has the strongest effect specifically?*

The third question addresses if the differentiation between positive impacts and negative ones have different effects on the different dimensions of trust or directly on the social license to operate.

#### 1.2.2. Research question 3:

*Does differentiating between positive and negative impacts change the effect of the impacts factor? And if yes, which one is stronger in influencing the social license to operate? Is the relationship mediated through the different dimension trust or are there direct effects, too?*

Lastly, the fourth question addresses the company's performance. That is, its mitigation of negative impacts, its concern with work ethics, safety and the environment. Those variables might influence the levels of trust or the approval directly.

#### 1.2.3. Research question 4:

*Does the company's performance (i.e. its mitigation efforts, its concern with work ethics, safety and the environment) shape the approval in through the different dimensions of trust?*

In sum, the first question replicates the proposal by Moffat and Zhang (2014). The second, third and fourth question go beyond their introduced model and explores the different effects of two dimensions of trust, the difference between positive and negative impacts as well as organizational performance.

## 2. Literature Review

### 2.1. The social license to operate

The general objective of this study is to extend the understating about the social license to operate. Many scholars attempted to measure the construct of a social license to operate quantitatively in order to support industry, governments and communities understanding what forms a SLO and what encourages relationships among such stakeholders ultimately producing better payoff for all (Moffat, Lacey, Zhang & Leipold, 2016).

As Moffat and Zhang argue that SLO is “... the ongoing acceptance and approval of a companies’ operations by local community members and other stakeholders that can affect its profitability” (Moffat & Zhang, 2014, p. 61) the concept seems to be related with legitimacy as approval or acceptance are commonly used synonyms for it (e.g. Boutilier & Thomson, 2011). It appears that a company is seeking to legitimize its actions. Deephouse and Suchman (2008, p.51) describe a legitimate organization as an organization that has the benefit of “pursuing its actions in largely unquestioned freedom”. Thus, having legitimacy for ones’ actions is linked to the social license. However, as Thomson and Boutilier (2011) illustrate, there is a small line between those two concepts. The social license is determined and defined by expectations of stakeholders who approve and/or trust the company’s activities. Such approval goes beyond simply accepting or legitimizing it. Thus, the concept becomes more important than ever, considering the increasing involvement of the public (i.e. due to easy access to information) and their willingness to oppose (Connor, Freeman & Higginbotham, 2009).

Moffat and Zhang (2014) introduced a model to measure the social license to operate. That model includes different predictors of the approval by communities. These are: impacts, contact quality, contact quantity, procedural fairness (justice) and trust. Trust serves as a mediator for all the other predictors, whereas impacts have a direct effect on approval (Fig. 1, Moffat & Zhang, 2014). Their results show that procedural fairness, contact quantity as well as impacts have a significant effect on trust, and in turn trust on determining the SLO. Furthermore, they found out that impacts do not seem to play an important role in directly determining SLO.

However, even though the concept of a social license to operate involves perceptions of individuals and communities in every existing definition, it only has been poorly grounded with social psychology measures and concepts. Moreover, statistical modelling of the construct is very limited and existing models face methodological limitations (e.g. model fit is computed within predicted paths) and inconsistent ad hoc use of variables (i.e. Moffat & Zhang’s (2014)

model faced some substantial limitations. One of them is that they introduced different dimensions of trust but did not measure the different effects in their model after all. Furthermore, their measurement of impacts seems to be ad hoc as it does not capture the broad spectrum of impacts in their setting. They used a continuum to assess impacts, which does not allow for both, positive and negative ones. Literature, however, shows that it can be more complex and it is often dealt with contradictory information, e.g. that the respondent acknowledges positive impacts such as better infrastructure, but at the same time recognizes rising housing prices as a negative impact (Thomson & Boutilier, 2011). Hence, it is not sufficient to use a continuum in the analysis.

In order to overcome these challenges, the analysis will be adapted on both dimensions, methodologically and theoretically to provide a more rigorous estimation method of the social license to operate.

## 2.2. Theoretic concepts of the key variables

To further ground the proposed analysis and to clarify the variables, it is important to understand and define the used theoretic concepts of the variables included as this was one major concern in the study of Moffat and Zhang (2014).

### 2.2.1. Trust

Trust not only seems to be the center of the relationship. Most scholars in this area agree, that it plays a major role. However, trust can be obtained in different dimensions, as literature suggests (Thomson & Boutilier, 2011). In order to derive practical implications from the social license to operate it is crucial to understand which dimension of trust is touched the most and hence what to act upon.

Lewicki, McAllister and Bies (1998) defined trust in their research paper as a certain positive faith/expectations regarding someone else's actions or actions of any group (e.g. a company, any organization). Moffat and Zhang (2014) argue that trust is the key for a company to be granted with a social license to operate as it serves as the instrument through which individuals connect to that company. Meaning, when trust levels are high, individuals grant a social license to operate an vice versa. Their study results support this argument (Moffat & Zhang, 2014). Thomson and Boutilier (2011) as well as Warhurst (2001) also suggest that trust is a key for the concept of the social license to operate. Therefore, the question arises which dimension exactly is important for the concept and why. Poppo and Schepker (2010) identified two types of trust in the context of two different groups interacting, which applies here as we

are dealing with the company and the community (as interacting groups). One type of trust is the integrity-based trust the second type is competence-based trust. The first one refers to the belief of the trustor that the trustee is following a certain compass of morality and principles, hence acting with integrity. The latter describes the trustors belief of the trustee being competent in what he/she/it/they intent to do. It is related to the perception of the other party's set of skills as well as knowledge. Literature shows that it has been consistently moved beyond a simple and general measure of trust and uses different dimensions (e.g. Siegrist, Connor & Keller 2012; Jijelava & Vanclay, 2017). Integrity-based trust and competence-based trust are specifically important for this study as they are significant determinants of trustworthiness (Kim, Ferrin, Cooper & Dirks, 2004). Differentiating between the two dimensions of trust (integrity-based and competence-based) inside the conceptual model proposed by Moffat and Zhang (2014) might provide a better understanding of how SLO is granted, and is thus integrated in this analysis.

### 2.2.2. Approval

Approval is the ultimate goal of a company and represents having a social license to operate and thus works as the dependent variable. It is defined as “the feeling of having a positive opinion of someone or something” (dictionary.cambridge.org, 2019). This means that in order for a company to get approval for its operations by its surrounding communities they need to make sure that they have a positive feeling about its business. The other following independent variables explain what kind of actions and policies a firm can undertake in order to earn such positive feeling, through gaining trust.

### 2.2.3. Justice

Justice, i.e. procedural fairness is a well-known concept in academic literature. It refers to the process of decision making and in how far the affected stakeholders perceive that they had an acceptable say during that process (e.g. Tyler, 2000; Besley 2010). Tyler (2000) suggested that procedural fairness has an influence on agreement/acceptance over a period of time. Individuals are more likely to accept bad consequences if they feel that they had a voice during the decision-making process or if the decision was explained in a way that they are able to understand the reasons behind it (Bies & Shapiro, 1988). Thus, procedural fairness could be affecting if a social license to operate is granted or not.

#### 2.2.4. Positive and negative impacts (Consequences)

Consequences include the positive as well as negative impact company's operations have on surrounding communities. Zhang and Moffat (2015) argue that individuals weigh up benefits against costs before forming their opinion. Benefits include for example, labor, infrastructure and economic wellbeing. Whereas negative impacts include health issues, noise, traffic, and increased housing prices. While evaluating costs and benefits it is probable that individuals not only take the impact on themselves into account but also on society. Zhang and Moffat (2015) adapted this construct by reshaping the social exchange framework (Homans, 1961; Blau, 1964; Emerson, 1972) used in tourism to the mining industry. They state that if individuals of the surrounding communities outweigh the positive impacts over the negative ones it induces a positive mindset and thus granting a social license is more likely.

However, as mentioned above, this way of assessing impacts might make it too simple, as there are contradictory opinions about impacts (e.g. Thomson & Boutilier, 2011). Outweighing positive against negative impacts does not give companies, or industries (i.e. whoever is interested in obtaining a social license to operate) the necessary means to interpret and work upon. In order to know which dimension they should put their focus on, a differentiated measure is necessary and enhances Moffat and Zhang's (2014) model. Thus an adapted measurement is used as an extension of their model.

#### 2.2.5. Engagement

Engagement refers to the contact between a company seeking to obtain a social license to operate and the communities that grant it. Specifically, it involves the contact between those players. Pettigrew and Tropp (2006) found out through their meta analytic test that contact between different groups of people (i.e. intergroup contact) has a positive effect on the relation and decreases prejudice. Hence the engagement or intergroup contact should be taken into account when looking for indicators for a social license to operate. Moffat and Zhang (2014) differentiated between contact quality and contact quantity in order to assess whether companies should increase the frequency of contact with their neighbors or rather work on better and eventually longer points of contact through face to face meetings for example. This differentiation will be part of the analysis.

### 2.2.6. Organizational performance

Organizational performance is a new set of variables that will be added to the model proposed by Moffat and Zhang (2014). It is composed of four different measures. These are mitigation efforts of the organization, its work ethics concern, its safety concern as well as its environmental concern.

Firstly, mitigating (negative) impacts might be a major concern for companies to reduce the risk of costly demonstrations. However, if their efforts to mitigate are not present to the affected people this attempt might be irrelevant when trying to be granted with a social license to operate. Therefore, it is important to take the perceived organizational efforts to mitigate its impacts into consideration for this research. Moffat and Zhang (2014) showed with their analyses that the perception of the impacts on social infrastructure did not have a strong direct effect on the social license to operate. However, as discussed above, trust does seem to play a role in the relationship which could be correlated with the perception of a company mitigating its impact. Interestingly, Moffat and Zhang (2014) identified the potential influence of such efforts. However, they did not include it in their analysis specifically, as they measured it as part of their impact measurement. Attempting to mitigate negative impacts might increase trust in the organization by the communities (Moffat, Lacey, Zhang & Leipold, 2016).

Secondly, perceptions about the company's ethical/ moral conduct includes perceptions about the company's working conditions and in general its treatment of employees. Furthermore, the company's concern with safety measures (i.e. the use of the right equipment, adequate ventilation in the mines, correct use of explosives) might change perceptions of the community about its legitimacy. Equally, their perception about the companies' handling of environmental regulations and principles. Sustainability is not assessed as an objective construct but rather subjectively via individual ideas, views, values as well as individual perceptions about the company's handling of the issue. Bansal and Roth (2000) found out that legitimation is one of the three major reasons why companies "go green" due to the reason that ecological responsibility and sustainability as well as ethical conduct are of special interest by the communities. Maeda and Miyahara (2003) proved with their study that perceived organizational concern, its perceived care about potential (environmental) risks as well as its perceived organizational performance positively affects trust. However, they did not differentiate between competence-based and integrity-based trust. It seems rather intuitive though that such performance measures influence the competence-based dimension of trust rather than integrity-based trust.

Perceptions about organizational performance are therefore used as an extension of the model by Moffat and Zhang (2014) in order to better understand what determines communities' trust (either competence-based or integrity-based).

### **3. Methodology**

#### **3.1. Sample**

The sample consist of 403 surveyed individuals living close to a mining site in southern Portugal. The stakeholders, i.e. the participants were chosen based upon two criteria.

Firstly, the distance of their residence to the mining site: a sample of 50 participants living 8km, 16km and 24km away from the mining site were surveyed. The selection of the villages to run the surveys under this criterion are based on convenience: rural villages will be prioritized, still once rural villages have been surveyed, the heads of municipalities can also be surveyed (if within the radius distance). Secondly, the municipality of residence. Here, sample of 50 participants per municipality are surveyed. This makes a total of total of 250 participants surveyed under this criterion. The selection of the villages to run the surveys under this criterion are also based on convenience: here the heads of municipalities are prioritized.

The participants' distance to the mine is between 0 and 45 km with an average of 17,5km. The respondents are between 18 and 93 years old. The average, however, is 51 years. 57% of the surveyed individuals are male and 43% female. Furthermore, 98% of the respondents are of Portuguese nationality. One third described their residence as rural, the other two thirds as urban. Most of the respondents are employed (47,6%), while 27,7% are already retired. 11,7% are self-employed while the rest is either unemployed (9%), a student (2,2%) or permanently disabled (0,5%). Regarding the educational level, most of the participants (28,2%) attended secondary school (until 12<sup>th</sup> grade) and 28,2% went to basic school (until 10<sup>th</sup> grade). 24,4% only Furthermore, 15,4% went to university (either obtained a bachelor or master degree or a PhD) and 1,7% did not attend any school.

#### **3.2. Method**

As this thesis aims to test variables that influence the concept of a social license to operate, data is handled quantitatively. In the context of a consultancy project, data was

gathered and although it was originally obtained for consulting purposes, it was contracted that usage for scientific purposes is allowed.

Local communities around a Southern Portuguese mining site were surveyed (on an individual basis) in 2017. SPSS Statistics and R will be used to test relationships between the variables. Specifically, descriptive statistics, correlations and structural equation models. A process is tested through which a social license to operate is generated using a good theoretical ground and sophisticated statistical tests. This way recommendations can be given. The approach to this type of study was introduced and tested by Moffat and Zhang (2014). The statistical path modelling of the social license to operate was conducted using path analysis in R Studio with the lavaan package (Rosseel, 2012).

### 3.3. Data analysis

Model assessment was evaluated using the guidelines proposed by Brown (2006). Meaning, overall goodness of fit: RMSEA  $\leq 0.08$  and Comparative Fit Index (CFI)  $\geq 0.09$  and Tucker-Lewis Index (TLI)  $\geq 0.90$ . The assessment of the mediation parameter estimates are evaluated based on their statistical significance (due to conducting an exploratory analysis, the criteria for marginal statistical significance of  $p \leq 0.10$  is assessed). The RMSEA, CFI and TLI indicate differences between models as well as the AIC and BIC (lower values indicating better models). Mediation effects are interpreted considering statistical significance of standardized mediation parameter and guidelines proposed by Hemphill (2003) for the interpretation of the magnitude of the effects are followed.

### 3.4. Instruments

As most of the variables were measured using more than one item (see Table 1) composite measures had to be computed. For statistical validation of measures with more than two items the exploratory factorial analysis was used. For only two items, Pearson's correlation was assessed.

#### 1) Social license to operate (Approval)

- Measured with one item. Thus, no need to compute a composite measure.

#### 2) General trust

- Measured with one item. Thus, no need to compute a composite measure.

### 3) Integrity-based trust

- Measured with one item. Thus, no need to compute a composite measure.

### 4) Competence-based trust

- Measured with one item. Thus, no need to compute a composite measure.

### 5) Positive and negative impacts

- Computation into two factors (one for positive impacts one for negative impacts):

Exploratory factorial analysis:

- Two items dropped due to low loadings (Positive: new job opportunities, Negative: lower housing availability)
- Loadings:  $> 0,40$
- Explained variance: 47%
- Reliability: 0,89 and 0,88

### 6) Contact quantity

- Measured with one item. Thus, no need to compute a composite measure.

### 7) Contact quality

- Measured with one item. Thus, no need to compute a composite measure.

### 8) Procedural fairness

- Composited into one factor.

Exploratory factorial analysis:

- Loadings:  $> 0,57$
- Explained variance: 51%
- Reliability: 0,54

### 9) Work ethics

- Composited into one factor.

Exploratory factorial analysis:

- One item dropped due to low loadings (provision)
- Loadings:  $> 0,73$
- Explained variance: 76%
- Alpha: 0,85

#### 10) Safety concern

- Composited into one factor.

Exploratory factorial analysis:

- Loadings:  $> 0,73$
- Explained variance: 76%
- Alpha: 0,95

#### 11) Environmental concern

- Composited into one factor.

Exploratory factorial analysis:

- Loadings:  $> 0,73$
- Explained variance: 76%
- Alpha: 0,93

#### 12) Organizational efforts to mitigate impacts

- Measured with one item. Thus, no need to compute a composite measure.

Construct	Variable	Measurement	Reference
Social license to operate	Approval (1 item)	10 point scale (0 not at all, 10 very much)	Adapted from Moffat & Zhang (2014)
Trust	General trust (1 item)	10 point scale (0 disagree, 10 agree)	Adapted from Moffat and Zhang (2014), Tam, Hewstone, Kenworthy and Cairns (2009) and Gundlach and Cannon (2010)
	Integrity-based trust (1 item)	10 point scale (0 disagree, 10 agree)	
	Competence-based trust (1 item)	10 point scale (0 disagree, 10 agree)	
Consequences	Positive impacts (8 items)	10 point scale (0 not significant, 10 very much so)	Adapted from Zhang and Moffat (2015)
	Negative impacts (15 items)	10 point scale (0 not significant, 10 very much so)	Adapted from Moffat and Zhang (2014) and Zhang and Moffat (2015)
Contact	Contact quantity (1 items)	10 point scale (0 none at all, 10 a great deal)	Adapted from Brown, Vivian and Hewstone (1999)
	Contact quality (1 item)	10 point scale (0 negative, 10 positive)	
Justice	Procedural fairness (3 items)	10 point scale (0 disagree, 10 agree)	Adapted from Tyler and Lind (1992) and Tyler (2000)
Org. performance	Work ethics concern (7 items)	10 point scale (0 not at all, 10 very much so)	Based on Saleem (2004)
	Safety concern (7 items)	10 point scale (0 not at all, 10 very much so)	Based on Widerlund, Ecke and Öhlander (2014)
	Environmental concern (4 items)	10 point scale (0 disagree, 10 agree)	Based on Bansal and Roth (2000)
	Org. efforts to mitigate (1 item)	10 point scale (0 disagree, 10 agree)	Based on Tinker, Cobb, Bond, and Cashmore (2005)

Table 1: Operationalization of the variables

#### 4. Analysis

The analysis is divided into three different parts. To get a first impression and overview of the key variables, descriptive statistics and correlations are presented. Secondly, the replication of the proposed model by Moffat and Zhang (2014) is analyzed to answer to Research question 1. Thirdly, the model extensions are presented and analyzed to answer to Research questions 2, 3 and 4.

#### 4.1. Descriptive statistics and correlations

Table 2 shows the frequencies of the analyzed variables. The social license to operate has a high mean of 8.18 (from 0 to 10), with a small standard deviation of 1.88. Meaning, it shows rather high values; only 12% of the respondents answered that they do not approve/accept the operations by the company (i.e. they answered with a “5” or lower). Furthermore, contact quantity shows very low values (Mean=3.6) with a very high standard deviation of 4.21. Approximately 50% of the participants said that they have never been contacted by the company. In contrast to that, a mean of 7.98 shows that even though the respondents said that they were not in contact much, the quality of the contact is still very high. Only 10% rated it lower than 5. Additionally, the three dimensions of trust show all very high means. Although, a slight difference between competence-based and integrity-based trust is noticeable. Participants rather trust (in general) in the company’s competence than in its integrity. Competence-based trust also has the second lowest standard deviation. Work ethics, safety concerns as well as environmental concerns show predominantly positive values. Lastly procedural fairness and organizational efforts to mitigate have a well spread variability.

	Mean	Min.	Max.	Standard Deviation
Social license to operate	8.18	0	10	1.88
Negative impacts	2.89	0	10	2.55
Positive impacts	5.52	0	10	2.51
Contact quality	7.98	0	10	1.97
Contact quantity	3.6	0	10	4.21
Procedural fairness	5.73	0	10	2.5
General trust	7.81	0	10	2.09
Competence-based trust	8.51	0	10	1.61
Integrity-based trust	7.06	0	10	2.46
Work ethics	6.59	0	10	2.31
Safety concerns	8.41	0	10	1.5
Environmental concern	7.45	0	10	2.5
Org. efforts to mitigate	6.1	0	10	2.82

Table 2: Descriptive statistics

Secondly, Table 3 shows the bivariate Pearson correlations. In general, there is a relatively high correlation between most of the variables. Some of them are quite obvious, while others are not. The correlations give a first impression on the underlying relationships. Notably, there is a high, statistically significant correlation between the social license to operate and general trust ( $r=0.55$ ) and the two dimensions of trust; integrity-based trust ( $r=0.48$ ) slightly higher than competence-based trust ( $r=0.45$ ). These values suggest that between trust and the social license to operate is a strong correlation. Naturally, the types of trust are all highly correlated ( $r\geq 0.47$ ). Interestingly, however, is the high correlation between the company's environmental concern ( $r=0.45$ ), its safety concerns ( $r=0.35$ ) as well as its efforts to mitigate impacts ( $r=0.32$ ) with the social license to operate. Hence, the suggested model extension with the organizational performance variables might reveal new underlying processes. Furthermore, environmental concerns by the company are highly correlated with the three types of trust measured ( $r\geq 0.40$ ) and procedural fairness ( $r=0.44$ ). That suggests the importance of environmental standard when it comes to trust. Strikingly, there is a very strong positive correlation of  $r=0.68$  between environmental concerns and safety concerns. Furthermore, the organizational efforts to mitigate its impacts and the company's environmental concerns are highly linked ( $r=0.43$ ), which might mean that the mitigation efforts happen in regard to the environment in the perception of the respondents. Mitigation efforts are also correlated with procedural fairness ( $r=0.47$ ), which seems quite obvious due to the fact that the respondents might perceive mitigation efforts as a "fair" operation. Although interesting, that procedural fairness and contact quality is only moderately correlated ( $r=0.30^*$ ), even though procedural fairness is about having a voice in decision-making processes (i.e. contact quality could strengthen their ability to raise their voice).

	Social license to operate	Negative impacts	Positive impacts	Contact quality	Contact quantity	Procedural fairness	General trust	Competence-based trust	Integrity-based trust	Work ethics	Safety concerns	Environmental concern	Org. efforts to mitigate
Social license to operate	1	-0.25*	0.26*	0.24*	0.11*	0.26*	0.55*	0.45*	0.48*	0.15*	0.35*	0.45*	0.32*
Negative impacts		1	-0.03	-0.27	-0.08	-0.25*	-0.24*	-0.19*	-0.24*	-0.25*	-0.31*	-0.32*	-0.23*
Positive impacts			1	0.19	0.31	0.38*	0.29*	0.24*	0.43*	0.16*	0.14*	0.33*	0.35*
Contact quality				1	0.42	0.30*	0.35*	0.29*	0.35*	0.21*	0.16	0.39*	0.35*
Contact quantity					1	0.25*	0.08	0.17*	0.09	-0.09	0.07	0.21*	0.22*
Procedural fairness						1	0.42*	0.28*	0.42*	0.24*	0.24*	0.44*	0.47*
General trust							1	0.52*	0.70*	0.38*	0.36*	0.46*	0.30*
Competence-based trust								1	0.47*	0.25*	0.35*	0.40*	0.31*
Integrity-based trust									1	0.37*	0.32*	0.48*	0.41*
Work ethics										1	0.23*	0.28*	0.20*
Safety concerns											1	0.68*	0.21*
Environmental concern												1	0.43*
Org. efforts to mitigate													1

*Note: Pearson correlations; \*p<0.05*

Table 3: Correlation matrix

## 4.2. Part I: Replication of Moffat and Zhang (2014)

### 4.2.1. Research question 1

To answer to research question 1, the path model proposed by Moffat and Zhang was replicated. Table 4 shows that replicating the model proposed by Moffat and Zhang (2014) shows a good overall fit (Chi-Square value (9.00) = 149.25,  $p < 0.00$ ; RMSEA = 0.08; TLI = 0.93; CFI=0.98; AIC = 1241.52; BIC = 1266.70). Effect sizes and significances are similar. Contact quantity might not have a significant effect on trust due to the fact that approximately 50% of the respondents could not be included in the analysis, as they have never (“0”) been contacted by the company. Interesting, however, in this setting is the fact that negative impacts do not have an significant effect on trust. The mediating paths of contact quality and procedural fairness via trust, show positive and statistically significant values of 0.18 and 0.21 respectively.

In conclusion, replicating the path analysis in a different setting (i.e. in a mining site in Southern Portugal) shows similar results to those of Moffat and Zhang’s analysis from 2014.

## 4.3. Part II: Extensions of Moffat and Zhang’s model

### 4.3.1. Research question 2

Including two different dimensions of trust (namely integrity-based trust and competence-based trust; Extension 2) in the model that was originally developed by Moffat and Zhang (2014) shows a good overall fit of the model with Chi-Square (15.00) = 171.93,  $p < 0.00$ ; RMSEA = 0.05; TLI = 0.97; CFI = 0.99; AIC = 1890.67 and a BIC = 1937.99. Interestingly, the direct effect of negative impacts on SLO becomes significant in this model with an effect size of -0.12. Furthermore, there seems to be a stronger effect on integrity-based trust also through it. There is a statistically significant mediation of contact quality and procedural fairness through both, integrity-based and competence-based trust. However, just as above, the path through integrity-based trust shows stronger effects. Hence, including integrity- and competence-based trust replicates the model of Moffat and Zang (2014) with similar fit but it suggests the possibility of trust specific effects, i.e. stronger ones via integrity-based trust.

### 4.3.2. Research question 3

Extending the model with differentiating between positive and negative impacts (Extension 3) shows, again, a good overall fit of the model: Chi-Square (15.00) = 213.60,  $p < 0.00$ ; RMSEA = 0.05 ; TLI = 0.98; CFI = 1.00; AIC = 1854.46 and lastly a BIC = 1911.22.

Strikingly, the direct effect of negative impacts on the social license to operate is statistically significant, while the direct effect of positive impacts is not. However, positive impacts (i.e. benefits) seem to have a greater impact on trust (both dimensions). Again, the analysis showed overall stronger effects on integrity-based trust compared to competence-based trust. Furthermore, contact quantity has a statistically significant effect (-0.13) on integrity-based trust. It also shows that there is a statistically significant mediation of positive impacts, contact quantity, contact quality, procedural justice via integrity-based trust. However, only contact quality has a significant mediation through competence-based trust. Additionally, positive impacts seem to have stronger effects, compared to negative impacts.

Thus when including integrity- and competence-based trust as well as differentiating between positive and negative impacts reveals a similar good fitting model and there are trust specific effects. Again, there is a stronger effect of positive impacts compared to the negative ones.

#### 4.3.3. Research question 4

When further extending the model (Extension 4), by adding variables of organizational performance to it, it shows a better overall fit with Chi-Square (15.00) = 189.24,  $p < 0.00$ ; RMSEA = 0.04 ; TLI = 0.96; CFI = 1.00; AIC = 1085.99 and lastly a BIC = 1155.24. Again, there is a statistically significant effect of negative impacts on the social license to operate. Noticeable is also that environmental concerns of the company as well as its efforts to mitigate impacts have a statistically significant effect on trust. Repeatedly, integrity-based trust seems to have stronger effects than competence-based trust. There is a significant mediation of procedural justice, positive impacts, environmental concern, and organizational efforts to mitigate impacts via integrity-based trust and only contact quantity via and competence-based trust. Concerns with the environment and positive impacts seem to have stronger effects whereas contact quality loses relevance when the different organizational variables are added. Work ethics and safety concern to not have a noticeable effect, however.

Thus including integrity- and competence-based trust, positive as well as negative impacts and organizational performance variables shows on the one hand a much better fitting model (i.e. lower values in the AIC and BIC measures), and on the other hand it shows specific effects for both types of trust. Furthermore, there is a strong effect of positive impacts and organizational performance variables in this model (i.e. environmental concern and organizational efforts to mitigate).

	Replication of the model by Moffat and Zhang (2014)			Extension 1					Extension 2					Extension 3				
	Direct effect on SLO	Direct effect on general trust	Mediated effect (general trust)	Direct effect on SLO	Direct effect on integrity-based trust	Direct effect on competence-based trust	Mediated effect (integrity-based trust)	Mediated effect (competence-based trust)	Direct effects on SLO	Direct effect on integrity-based trust	Direct effect on competence-based trust	Mediated effect (integrity-based trust)	Mediated effect (competence-based trust)	Direct effect on SLO	Direct effect on integrity-based trust	Direct effect on competence-based trust	Mediated effect (integrity-based trust)	Mediated effect (competence-based trust)
Negative impacts	-0.09	-0.08	-0.05	0.12*	-0.05	-0.03	-0.02	-0.01	-0.12*	-0.07	-0.04	-0.03	-0.01	-0.13*	0.05	0.01	0.02	0.00
Positive impacts	-	-	-	-	-	-	-	-	0.06	0.43*	0.10	0.16*	0.02	0.14	0.30*	-0.08	0.1*	-0.02
Contact quantity	-	-0.08	-0.05	-	-0.10	-0.11	-0.04	0.02	-	-0.13*	0.10	-0.05*	0.02	-	0.00	0.2*	0.00	0.05*
Contact quality	-	0.32*	0.18*	-	0.27*	0.23*	0.11*	0.05*	-	0.25*	0.22*	0.10*	0.05*	-	0.13*	0.02	0.05	0.01
Procedural fairness	-	0.62*	0.21*	-	0.40*	0.16*	0.17*	0.03*	-	0.23*	0.12*	0.09*	0.02	-	0.15*	0.12	0.05*	0.03
Work ethics	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.07	0.02	0.03	0.00
Safety concern	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-0.09	0.09	-0.03	0.02
Environmental concern	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.32*	0.27*	0.11*	0.07*
Org. efforts to mitigate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.16*	0.15	0.06*	0.04

Note: \* $p < 0.1$ . Estimated standard coefficients represent the strength of the relationship between variables, with positive numbers indicating positive relationships and vice versa

Table 4: Results of the path analysis

## 5. Discussion

### 5.1. Main findings and implications

#### 5.1.1. The mechanism of SLO

The results support previous research by Moffat and Zhang (2014). Their model predicts that impacts, intergroup contact, procedural fairness affect the acceptance of community members through trust in an operating mining company. The test of their model in this study reveals similar results. Impacts did not show an effect on acceptance directly, nor through (general) trust. Mining companies should thus focus on a trusting relationships with their surrounding communities, which is achieved through increasing contact quality and acting with procedural fairness (i.e. giving the communities a voice in decision-making processes) (Moffat & Zhang, 2014).

Going beyond Moffat and Zhang's (2014) model and adding different dimensions of trust which are generally used in the literature, results show that integrity-based trust seems to play a more important role as a mediator than competence-based trust. It might be the case that if individuals do not think that the company in question acts with integrity, they cannot assess its level of competence due to the lacking moral compass or honesty (Connelly, Crook, Combs, Ketchen & Aguinis, 2018). Thus, causality is in question for the two different levels of trust.

However, this finding brings more light onto the question what companies need to consider when trying to establish a trusting relationship with their neighbors. It might be more effective to be working on conveying integrity and moral standards rather than building up an image of competence. Companies should be aware that the concept of trust does have different dimensions and that only working for one of them might not have the effect wished on the social license to operate.

Differentiating between positive and negative impacts of a company's operations also improved our understanding of SLO. This differentiation reveals that negative impacts do have a slight significant effect on the approval, while positive impacts only show a significant effect on trust (with a stronger effect on integrity-based trust, i.e. in line with the above-mentioned explanation). This might be due to the fact, that in general the communities valued the positive impacts as more significant compared to the negative ones (Table 2). Hence, the negative impacts might not be as important as the positive ones. In line with the argument above, positive impacts increase the level of integrity-based trust. Meaning, based on positive information the individuals process (i.e. about positive impacts) they perceive the company as more trustworthy (integrity-wise). In comparison to negative impacts that do not show a significant effect on

integrity-based trust. In practice, this could mean for companies that they should work on having a good impact in the neighborhood and increase its attractiveness. Hence companies should focus on understanding and answering to the needs of a community and build a trusting relationship through the various aspects discussed.

Lastly, the extended model analyzed revealed that including organizational performance measures provides a better understanding of SLO. Specifically, perceived organizational efforts to mitigate its negative impacts and the company's environmental concern have a significant effect in determining the social license to operate (through competence-based and integrity-based trust). Even though it seems to be quite natural that the perceived impact mitigation has an effect, it is quite astonishing considering that negative impacts do not seem to play a role in that relationship. In other words, it seems to be more important for a company to mitigate its negative impacts than having none.

As the correlation analysis already implied, the environmental concern of a company seems to be crucial for achieving trust by the communities. This finding is in line with Maeda and Miyahara's (2003) study which shows that if individuals perceive that organizations care about potential (environmental) risks the company is imposing in the area of operations they are more likely to have trust in the company. Interesting, however, is that only the environmental concern of the company has a significant effect on competence-based trust. None of the other organizational performance measures have a significant effect on competence-based trust, different to what expected (as competence-based trust reflects trust in capabilities and skills of the company in question).

#### 5.1.2. On the (un)ethical use of SLO

In general, it is still being discussed in how far the concept of the social license to operate is ethically acceptable in practice, considering that also potentially environmentally and socially harmful companies seek to be granted with such license, i.e. it is not in the interest of the public (nor the environment) that a company's operations which produce negative impacts get approval for it (Parsons, Lacey & Moffat, 2014). However, the relationship is somewhat more complex. Clearly, the ultimate goal is that companies reduce or completely abolish their negative impacts and have a trusting relationship with their neighbors and other stakeholders so that the firm can continue its operations smoothly. Both can be achieved with the mechanisms the social license to operate works with. Firms seeking to get approval are getting feedback and ideas from the communities through contact i.e. engagement (engagement influences trust and in turn approval as Moffat and Zhang's (2014) already developed in their

conceptual model). Through this mechanism as well as through lowering negative impacts and increasing positive ones (other predictor variables of trust and thus the approval) a win-win situation might be established, i.e. the social license to operate can work as part of CSR (Wilburn & Wilburn, 2011). The communities feel heard if the company listens to their ideas and (then) lowers its hazardous impacts as well as increasing positive impacts (win for the communities/ the environment). In turn the company is more likely to be granted with approval or a social license to operate (win for the company). The results also show that SLO is not something to simply brand out. A social license to operate means working together with the communities, i.e. establishing positive impacts and mitigating negative ones. However, working with broader stakeholders that are involved is just as important, shown by the considerable effect of environmental concerns.

### 5.1.3. On the (in)tangible nature of SLO

Most researchers agree that the social license to operate is an intangible construct that tentatively describes the everchanging relationships between stakeholders from in and around the industry (Cashore, Vertinsky & Raizada, 2001). It has been commonly used as an asset to assess the way a company's operations are perceived and judged by surrounding communities. However, as those communities consist of a number of individuals it is difficult to assess when a community approves, and when it does not. Asmus (2009) defined crucial aspects that need to be considered when trying to implement processes of a social license to operate. Among others, he argues that it is important to know how the community is defined, i.e. if there are "geographical boundaries", or are some actors in a community of more importance than other (e.g. elected politicians or other opinion leaders). Furthermore, there is no clear consensus of the community, which processes validate critical decision-making (i.e. a referendum or similar). Hence, in order to tackle such questions, stakeholders must be identified, categorized and their expectations have to be clear. Thomson and Boutilier (n.d.) state that

*"... the concept of the Social License to Operate presupposes that all of the families, clans, interest groups and institutions in a geographic area have arrived at a shared vision and attitude towards a resource development project. This kind of cohesion is often absent, and therefore may have to be built..."*

This statement touches the important point of building cohesion (together). Hence, even though SLO seems to be an intangible concept, the models of this study show that it can be tangible, and measured. However, the social license to operate is very dependent on complex representations of the proponent (i.e. the company) and its activity.

By adding two different dimensions of trust, differentiating between positive and negative impacts as well as adding organizational performance variables a better, and more importantly a more detailed understanding of the social license to operate is provided and its tangibility proved. Based upon these findings companies might get a better idea on which dimensions to work upon and understand the importance of working together with their surrounding communities to ensure trusting relationships.

## 5.2. Limitations of the study

Although this study shows some interesting results and further identifies a more sophisticated quantitative way of measuring a psychological construct (i.e. SLO) and thus increases the understanding of it, there are some limitations to its meaningfulness.

One limitation of this study is the sample of the analysis. Most of the respondents are approving the operations of the company in question (Table 2). This might have led to a general bias in the results, as they only represent a general “positively minded” community.

Furthermore, as Boutilier and Thomson (n.d.) already pointed out, the social license to operate is a very dynamic construct, meaning that it could change from day to day. One day communities might have a very positive and trustful relationship towards the company in question, the next day they read about a scandal in the newspaper. Hence, their approval and trust might be shaken due to obtaining new information. Social psychological constructs (e.g. beliefs, opinions and perceptions) are dependent to new influences and information and can thus be easily changed. Therefore, the social license to operate has to be granted by the community and then maintained by the company. However, knowing what influences the approval and which dimension to work upon best will give companies the necessary knowledge to constantly work on the relationship with their surrounding communities. Specifically, on integrity-based trust seems to be important as shown in this analysis.

Another limitation might be that the construct of SLO and its influencing factors could appear differently in different settings and industries. In countries with a high awareness and movements against climate change, communities might be more likely to take away their approval if they do not trust the company anymore to do its best in mitigating environmentally harmful actions. On the contrary, in nations with a different understanding and attitude towards e.g. climate change, communities might behave more trustful to environmentally harmful operations. However, other unknown factors could play a role in the relationship.

### 5.3. Suggestions for further research

In order to further understand and apply the concept of a social license to operate, the approach of Moffat and Zhang (2014) to measure it quantitatively was tested in a different setting, however in the same industry. Furthermore, we saw that integrity-based trust plays an important role in determining the approval of communities. As a next step, it might be relevant to determine which actions and policies increase such dimension of trust. Meaning, how this still very theoretic concept could be applied in practice and how to specifically positively influence that factor. Measuring SLO over time in the same setting after introducing different policies could be a starting point for such research.

In addition, to further ground this new approach it would be necessary to test in various industries across the globe with different attitudes in samples. Also, testing it in more negatively minded (towards mining, or other operations) communities is of importance for further validating the new approach. Thus, it might be especially interesting in nations that are economically emerging countries (e.g. China, Chile, India, Brazil), where less (environmental) regulations are in place.

A third potentially interesting approach could be to test through an exploratory research format for other factors that influence the relationship either directly or through trust. As it was found out that the organizational performance regarding the environment seems to play a role in determining the social license to operate, these factors could be related to the perceptions about the climate change, political attitudes or the individuals own environmental preservation efforts.

Going into a different direction, analyzing communication methods could be a different starting point to further assess the social license. As it is a “social” license, it is highly influenced by perceptions, which in turn are easily influenced by new information. Changing the tone of communication, could therefore, in theory, change approval/disapproval.

## 6. Conclusion

As Wilburn & Wilburn (2011) mentioned in their paper, several firms use the mechanisms of the social license to operate, because on the one hand, it secures their operations, however, on the other hand companies apply it as an instrument to involve stakeholders and to ensure that there is commitment to norms and values. Hence, the concept has good impacts (i.e. involvement of different stakeholders in the decision-making process, and thus expectedly more favorable outcomes for them) even though all kinds of companies seek approval for their (potentially harmful) operations.

Hence further developing the construct of a social license to operate might have a positive effect on companies dealing with stakeholders, and gives them orientation which factors to take into consideration when making any kinds of decisions.

The analysis shows on which dimensions companies should focus on, when seeking to be granted with a social license to operate. Those are: positive impacts, contact quality, procedural fairness, environmental concerns as well as mitigation efforts. Those factors increase integrity-based trust, which in turn might get the company the necessary approval by their neighbors.

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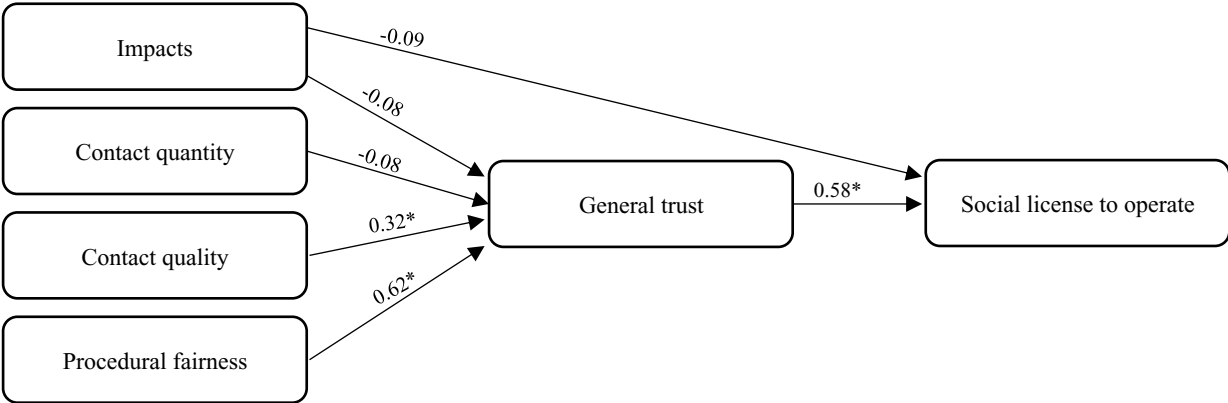
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**8. Appendix**

**8.1. Replication of Moffat and Zhang (2014)**



*Note: \*p<0.1. Estimated standard coefficients represent the strength of the relationship between variables, with positive numbers indicating positive relationships and vice versa.*

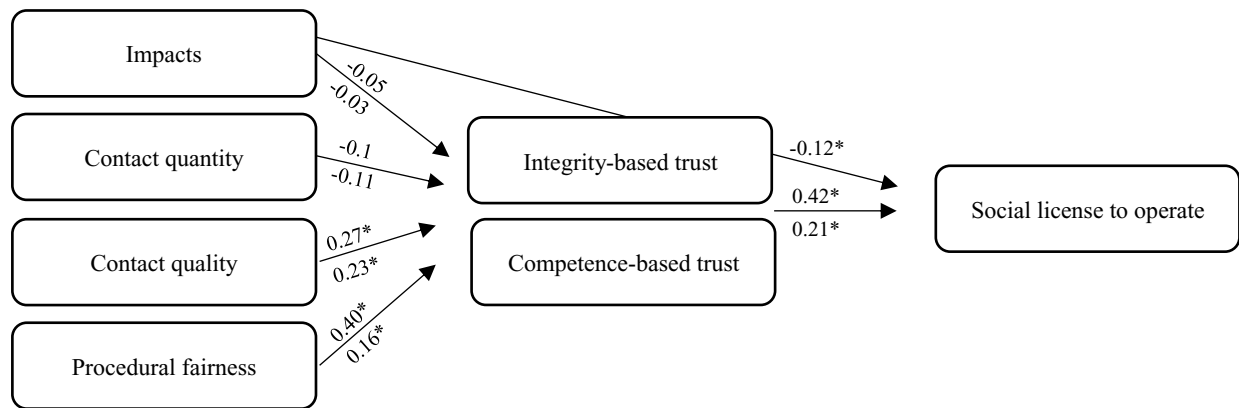
Fig. 3: Results of the model replication of a social license to operate from Moffat and Zhang (2014)

Variable	Mediated through	Est. standardized effect
Impacts		-0.05
Contact quantity	General trust	-0.05
Contact quality		0.18*
Procedural fairness		0.21*

*Note: \*p<0.1*

Table 5: Mediation paths via integrity-based and competence-based trust

## 8.2. Extension 1



Note: \* $p < 0.1$ . Estimated standard coefficients represent the strength of the relationship between variables, with positive numbers indicating positive relationships and vice versa. Numbers above arrow shows effect on/of integrity-based trust; below the arrow on/of competence-based trust

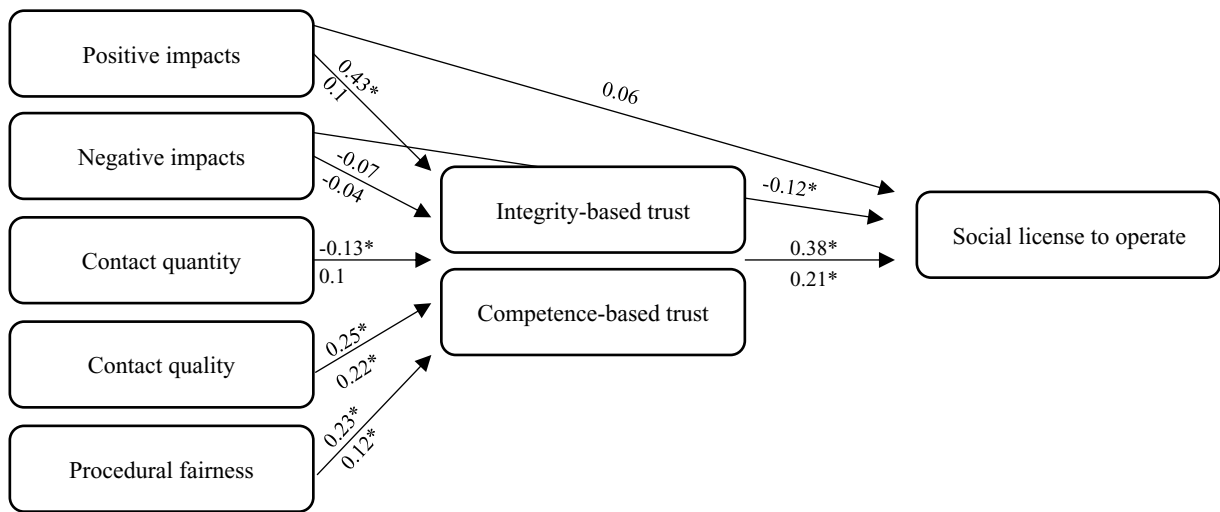
Fig. 4: Results of testing the conceptual model of a social license to operate with two different dimensions of trust

Variable	Mediated through	Est. standardized effect
Impacts		-0.02
Contact quantity	Integrity-based trust	-0.04
Contact quality		0.11*
Procedural fairness		0.17*
Impacts		-0.01
Contact quantity	Competence-based trust	0.02
Contact quality		0.05*
Procedural fairness		0.03*

Note: \* $p < 0.1$

Table 6: Mediation paths via integrity-based and competence-based trust

### 8.3. Extension 2



Note: \*  $p < 0.1$ . Estimated standard coefficients represent the strength of the relationship between variables, with positive numbers indicating positive relationships and vice versa. Numbers above arrow shows effect on/of integrity-based trust; below the arrow on/of competence-based trust

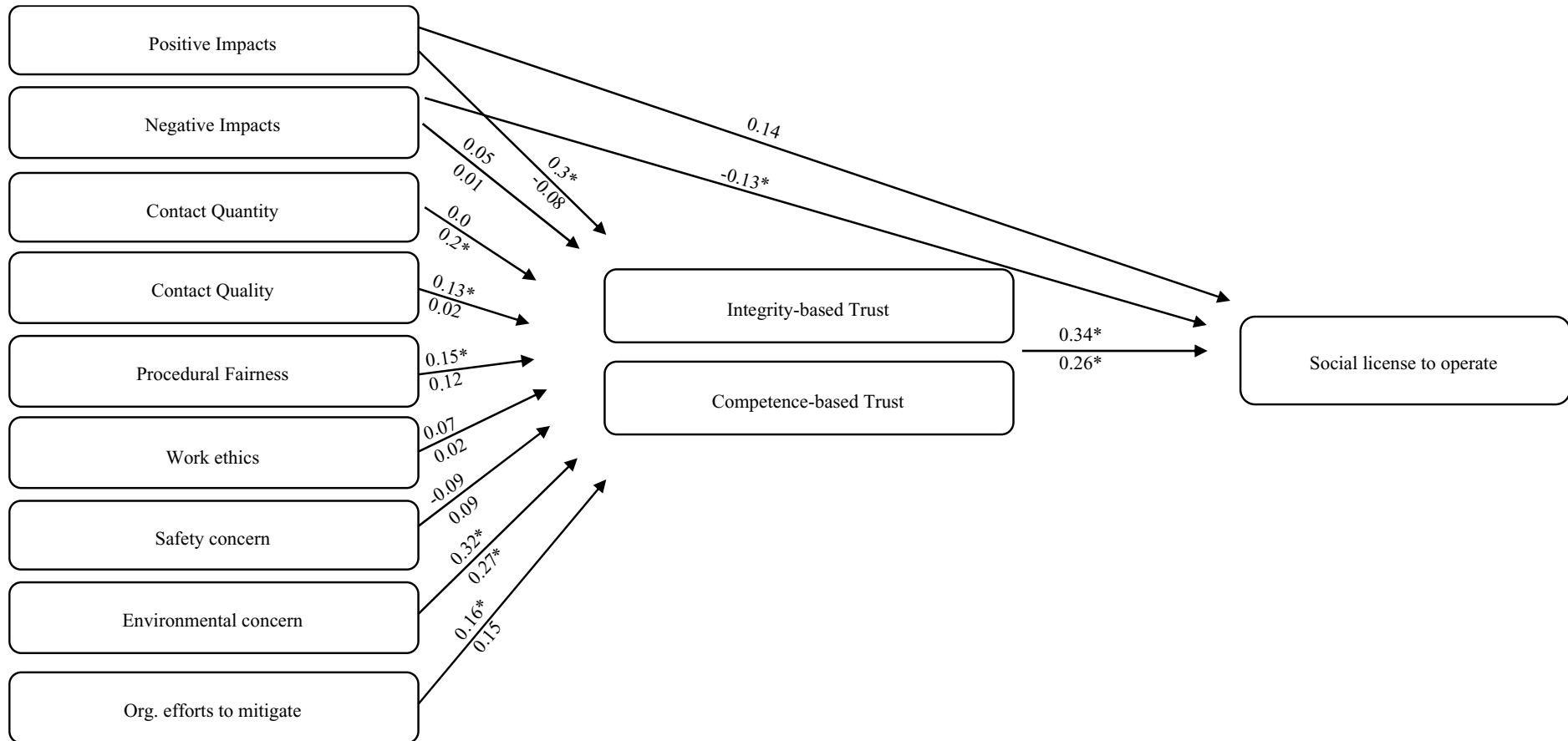
Fig. 5: Results of testing the conceptual model of a social license to operate with two different dimensions of trust and differentiating between positive and negative impacts

Variable	Mediated through	Est. standardized effect
Positive impacts		0.16*
Negative impacts		-0.03
Contact quantity	Integrity-based trust	-0.05*
Contact quality		0.1*
Procedural fairness		0.09*
Positive impacts		0.02
Negative impacts		- 0.01
Contact quantity	Competence-based trust	0,02
Contact quality		0.05*
Procedural fairness		0.02

Note: \* $p < 0.1$

Table 7: Mediation paths via integrity-based and competence-based trust

### 8.4. Extension 3



Note: \*  $p < 0.1$ . Estimated standard coefficients represent the strength of the relationship between variables, with positive numbers indicating positive relationships and vice versa. Numbers above arrow shows effect on/of integrity-based trust; below the arrow on/of competence-based trust.

Fig. 6: Results of testing the conceptual model of a social license to operate with two different dimensions of trust, differentiating between positive and negative impacts as well as adding organizational performance variables

Variable	Mediated through	Est. standardized effect
Positive impacts		0.1*
Negative impacts		0.02
Contact quantity		0.0
Contact quality		0.05
Procedural fairness	Integrity-based trust	0.05*
Work ethics		0.03
Safety concern		-0.03
Environmental concern		0.11*
Org. effort to mitigate		0.06*
Positive impacts		-0.02
Negative impacts		0.0
Contact quantity		0.05*
Contact quality		0.01
Procedural fairness	Competence-based trust	0.03
Work ethics		0.00
Safety concern		0.02
Environmental concern		0.07*
Org. effort to mitigate		0.04

Note: \* $p < 0.1$

Table 8: Mediation paths via integrity-based and competence-based trust