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Supply chain management scholar's research impact: moderated mediation analysis

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Abstract

Purpose – The purpose of this paper is to draw on social capital theory to develop a model to explain the determinants of a supply chain management scholar's academic research impact.
Design/methodology/approach – Drawing from a database of 450 supply chain management scholars in different countries collected from ResearchGate and the World Bank, the bootstrapping method was applied on the moderated mediation analysis.
Findings – Analysis of the mediating role of a scholar's social capital suggests that social capital theory has a strong explanatory power on the relationship between a scholar's research skill and academic impact. To account for the boundary effect at the country-level, the authors further examine if this mechanism differs by country in the supply chain management research context.
Research limitations/implications – The findings from this study are from a single research area, which limits the generalizability of the study. Although the data are collected from different sources, including ResearchGate and the World Bank, it is cross-sectional in nature. The variables in this model do not have strong causal relationships.
Practical implications – The results suggest that supply chain management scholars can reap the benefits of their social capital. Specifically, scholars can enhance their academic impact by increasing their social capital.
Originality/value – The results provide a reference for supply chain management scholars keen on enhancing their academic research impact. It also provides a reference to explain why country-level differences can influence these scholars.

Keywords Social media, Social capital, Universities, Research, Analysis, Bibliographies
Paper type Research paper

1. Introduction

Scientific scholars usually obtain peer recognition and funding opportunities by sharing their research outcomes. The most popular and common method of knowledge sharing is to share their publications through academic social websites. The literature suggests that social networking sites are better suited for networking and maintaining a professional image in the academic community (Dermentzi *et al.*, 2016) Practically, scholars have been adopting academic social websites professionally for their research endeavors because of the

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convenience of forming new connections with their peers (Yu *et al.*, 2016; Kuo *et al.*, 2017). Today, scholars can collaborate, publish, and promote their work online (De Vocht *et al.*, 2017). Wang and Chen (2012) further suggest that when more members with similar interests join an online community, network externalities can form, and interaction ties would occur. Furthermore, these users are more likely to participate regularly because they believe that their friends or reference groups are concerned with their participation (Yu *et al.*, 2016).

To date, ResearchGate is the largest online social platform used in the scholar community for knowledge sharing (Yu *et al.*, 2016; Thelwall and Kousha, 2015). ResearchGate was founded by Madisch in 2008, as a means to transform the way researchers conduct their research (Thelwall and Kousha, 2015). On ResearchGate, researchers can exchange research ideas and share articles freely to facilitate collaboration without additional cost from other researchers elsewhere. To some degree, ResearchGate is the "Facebook" equivalent for scholars. On ResearchGate, users can announce their findings, communicate with others, and keep abreast of the other scholars' publications. The uniqueness of ResearchGate is that its website not only allows member researchers to publish and share their publications but also provides a platform for the researchers to interact with others informally. ResearchGate combines both bibliometrics and altmetrics to create a general performance measurement for organizations and researchers alike (Yu *et al.*, 2016). Traditional bibliometric, a performance metric, is used for evaluating the number and impact of research publications. In ResearchGate, the RG score, an impact point, represents a scholar's academic impact.

In ResearchGate, supply chain management is a large research group which is rapidly growing in number and quality. Given that international trade has increased rapidly in recent decades, more supply chain management scholars are directing their research to explain how commercial supply chains manage their supply chains efficiently to facilitate trade. This increase is accompanied by the growth in human and social capital in the logistics industry (Hartmann and Herb, 2014). Thus, the study on supply chain management should follow apace with economic development (Ni *et al.*, 2016; Shah and Brueckner, 2012; Lee, 2015). In particular, the study of the global supply chain management scholar's academic impact can lend an international perspective to supply chain management and can help the community to have a better understanding of this scientific area (Rao *et al.*, 2013).

Overall, this study makes three contributions. First, this research extends previous studies that focused on the scholar's academic impact. While research has found that the scholar's research ability, such as research skills, can influence their research performance including academic impact (Dakhli and De Clercq, 2004), we lack sufficient knowledge to explain this. Therefore, Hong and Zhao (2016) introduce an information communication mechanism to explain how network composition influences scientific performance. Liu *et al.* (2017) use meta-analysis to explore the relationship between social network site use and academic performance. However, these research works overlooked the underlying mechanism. As such, our paper explores the underlying mechanism of the relationship between a scholar's research skill and the corresponding academic impact by testing the mediation effect of the scholar's social capital. Second, this study examines the boundary effect of this mediation process. Specifically, the investigation of the economic development as the country-level moderator facilitates an understanding of the country-level variation. Third, multiple data sets were included in our analysis, including ResearchGate and the World Bank database, thus providing a rich and robust empirical foundation for investigation. For example, while Yu *et al.* (2016) selected 300 supply chain management ResearchGate members, we expanded the database and collected data of 450 supply chain management scholars from universities in various countries with country-level data from the World Bank.

In this paper, we first introduce five hypotheses posited from the theoretical relationships amongst research skill, social capital, and a country's economic development. Next, we test these hypothesized relationships and analyze whether the hypotheses are supported.

We focus this assessment initially on factors that could determine the research scholar's academic impact. Pre-supposing a moderated mediation effect, we integrate a moderated regression analysis with path analysis to comprehensively analyze this simultaneous moderation and mediation.

2. Theory and hypotheses development

Several constructs and theoretical lenses can apply to this study. In what follows, we will highlight the key constructs and theory applicable to our work.

2.1 Social capital theory

Social capital theory has been receiving attention in the literature and has been studied at multiple levels, including the individual (Raider and Burt, 1996), organizational (Nahapiet and Ghoshal, 1998), and societal (Dasgupta and Serageldin, 2001). The term social capital has multiple definitions, interpretations, and uses (Di Ciommo *et al.*, 2014; Johnson *et al.*, 2013). In this study, we define social capital as "the collective value of all social networks and the inclinations that arise from these networks to do things for each other. Social capital, in this view, emphasizes specific benefits from the trust, reciprocity, information, and cooperation associated with social networks. Researchers have positioned social capital as a key factor to understanding knowledge creation" (Nahapiet and Ghoshal, 1998), which directly influenced the academic impact of researchers. Individuals are able to access and leverage resources embedded in social networks through interactions (Sharmeen *et al.*, 2014). Researchers who are situated closer to the core of their social network may benefit professionally (Tomás-Miquel *et al.*, 2016).

The strength of social relations indicates how well an individual knows his/her exchange partners. However, explicit knowledge is modifiable; it can be easily transferred from one person to another, frequently without interpersonal interaction. Scholars can easily find and follow other scholars they are interested in, and read and download these scholar's publications through ResearchGate. Moreover, collaboration with colleagues from different research groups can help researchers to increase their citation counts (Li *et al.*, 2013).

Scholars have applied social capital in the theoretical and empirical studies of a scholar's academic performance (Gonzalez-Brambila, 2014). For example, McFadyen and Cannella (2004) found that social capital, such as the opportunity of interactions among scholars, have positive relationships with knowledge creation and academic performance. The size and composition of a scientist's social network (Hong and Zhao, 2016), and the value of social capital (Oranye *et al.*, 2017) can have a significant effect on their scholarly performance. Abbasi *et al.* (2011), and Evans *et al.* (2016) have reported that scholars who are better connected to and participated actively in such academic communities achieve more scholastically.

2.2 Research skill and social capital

In the modern academic environ, researchers are more likely to cooperate with each other. International cooperation makes their study more convincing and global. Researchers are more likely to cooperate with other scholars who possess different research skills. Collaboration can deliver greater diversity of resources, skills, knowledge, insights, and perspectives. Empirical studies have shown that scholars tend to collaborate with those who can help them in terms of methodology or theory building. Seibert *et al.* (2017) have shown that co-authoring is positively correlated to the number of publications in the highest-quality journals for a researcher. For instance, Cantor *et al.* (2010) have examined 3,116 articles published in seven logistics journals from 1987 to 2007, and have concluded that scholars in the logistics domain value co-authored research. Their results show that co-authorship and the frequency of citations are significantly related. This leads us to posit that cross-disciplinary and international collaboration are conduits for providing knowledge, and

they facilitate an ongoing knowledge exchange for developing a better understanding of the studied area. Research skill is a scholar's human capital, which refers to the stock the scholar possesses in terms of knowledge and abilities that can help to facilitate the flow of change in scholarly pursuit and scientific progress. Such capital is valuable for a specific research area or method (Dakhli and De Clercq, 2004).

Research skills can be developed through formal training and education aimed at updating and renewing one's capabilities in order to do well in research collaboration (Dakhli and De Clercq, 2004). As such, research skills can improve one's ability to possess better social capital in research. Dasgupta and Serageldin (2001), in their review of social capital, concurred with Coleman (1990) and emphasized the importance of research skills for developing social capital. On ResearchGate, some evidence implicitly suggests that supply chain management scholars who have more research skills may have more followers. For example, a supply chain management scholar from ResearchGate, scholar A, has 27 research skills. There are 57 scholars following his personal page. In contrast, scholar B who has 5 skills has only 7 followers. This example suggests that a scholar with more skills may have more followers. In other words, a scholar with more skills may possess greater social capital. Thus, we posit the following hypothesis:

H1. A scholar's research skill is positively related to the scholar's social capital.

2.3 Social capital and academic impact

Scholars, with high social capital have higher academic impact than those with few followers. Amjad *et al.* (2016) found that the number of co-authors and the work of their co-authors who have high academic impact have great impact on the ranking of the author. McFadyen and Cannella (2004) found that when individuals seek partners to exchange information and knowledge, these individuals will be influenced by their partners. The number of followers, as a proxy of social capital, explains how a scholar's skill influences the scholar's academic impact. On ResearchGate, scholars who have a large number of followers have a higher academic impact than those with lower social capital. This is because supply chain management scholars with high social capital will influence other scholars who view their study by following their personal pages. These followers can know the recent improvements including the new publications and topics from the scholars they follow. This suggests that scholars who have more followers will have greater academic impact. Hence, we posit the following hypothesis:

H2. A scholar's social capital is positively related to the scholar's academic impact.

2.4 Mediating role of social capital in research skill and academic impact

The above hypotheses suggest that a scholar's research skill has an influence on the scholar's social capital which may in turn have a positive effect on the scholar's academic impact. Therefore, the scholar's academic impact is directly influenced by the scholar's research skill through social capital. Research skill is the human capital of a researcher. Kilkenny *et al.* (1999) propose a human capital model of performance, which suggests that high performance results from human capital. In addition, they found that all measures of social capital exert an effect on individual performance. Moreover, Boxman *et al.* (1991) report that there is a direct effect of social capital on individual performance. Social capital adds to, rather than replace, human capital in explaining individual performance. Based on the above argument, we propose a mediating model to explain the relationship amongst research skill, social capital, and academic impact. Thus, we propose the next hypothesis:

H3. A scholar's social capital mediates the relationship between the scholar's research skill and academic impact.

2.5 National economic development as moderator

The efficiency of the research and higher education system in a country is dependent on the economic development level of that country (Varsakelis, 2006). Countries with high economic development usually invest more resources on research and higher education than countries with low economic development. According to Abbott and Doucouliagos (2003), in most developed countries with a high efficiency research system and higher education system, the universities there are funded largely by public sector bodies, such as the Department of Employment, Education and Training in Australia. In a developed country, the public universities are autonomous bodies established under legislation. A high efficiency research system provides scholars with more opportunities to share, follow, and discuss their studies with others. In such a high efficiency system, the results of a study from a scholar can be better diffused. This system provides scholars with a platform to expand their studies and propagate their results faster and wider than a low efficiency research system. Thus, a research system with high efficiency can magnify and expand the scholar's academic impact. However, it cannot be concluded that there is no scope for improvement in the efficiency of these systems, but rather, the efficiency of a research system in countries with strong economic development level may be higher than countries with weak economic development. In other words, for a supply chain management scholar, the impact of his or her study can vary depending on the home country's state of economic development. Figure 1 summarizes the theoretical model of this study. To explain the relationships amongst country economic development, supply chain management scholar's research skill, and the corresponding academic impact, we propose the following hypotheses:

H4. A country's economic development moderates the relationship between a scholar's research skill and the academic impact.

H5. A country's economic development moderates the mediation effect of a scholar's academic impact between a scholar's research skill and academic impact.

3. Method

3.1 Research context

Scholars tend to turn to the internet nowadays to communicate and disseminate their research rather than to read the journal articles and to attend conferences (Yu *et al.*, 2016; Dermentzi *et al.*, 2016). Individual and organizational websites are created by researchers and academic organizations to provide academic information. Social websites such as Google Scholar, Microsoft Academic Search (MAS), Mendeley, LinkedIn, Academia.edu, and ResearchGate are social platforms that allow researchers to share their publications. Thelwall and Kousha (2015), by using data from the profile pages of Academia.edu, found that the researcher's academic impact results from both academic and social capital. Their finding suggests that the academic social network sites are hybrid and are genuinely new additions to the academic communication platform (Fu *et al.*, 2014).

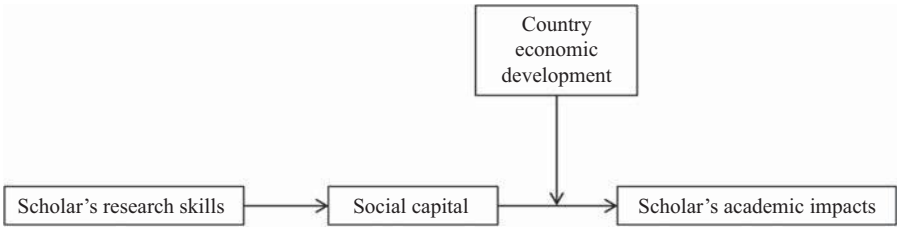

Figure 1.
Theoretical model

We collect data from ResearchGate, which is built for sharing knowledge among the researchers. Google Scholar had also been considered for the data collection. However, compared to the information on Google Scholar, the data found on ResearchGate are more complete and comprehensive. With 14 million researchers, ResearchGate is large enough to provide massive open access and free of charge information that we need. In our sample, we need not only basic indicators such as impact points, number of publications, number of downloads, and profile views but also indicators about research skills, such as modeling. These data are not available on Google Scholar. However, these indicators can be easily found and coded from the personal profiles of the researchers on ResearchGate. As such, we decided to call on ResearchGate as our data source.

ResearchGate began when two researchers discovered that the collaboration with other researchers from different locations was difficult. The mission of ResearchGate is to connect researchers from all over the world and provide a platform for them to share and exchange academic findings, output and ideas easily. In ResearchGate, housing over 80 million publications, 9 million researchers, and a million answers to research questions, users can find ways to promote their research and expand their academic impact.

According to the ResearchGate website, the platform has five main functions. First, scholars can share publications, have access to millions of publications, and publish their data. Second, scholars can obtain statistics and find out who has been reading and citing their work. Third, organizations can post job information to hire researchers they need on the platform. Fourth, scholars can post research questions, get answers from others, and find solutions to research problems. Finally, scholars can readily connect and cooperate with other colleagues, peers, co-authors, and specialists in their field.

Besides, ResearchGate provides the overall evaluation of a researcher's academic impact, which account for the quantity of publications, number of questions asked and answered, and the number of followers. Thus, ResearchGate's score measures academic reputation based on an individual researcher's contributions and interactions (Thelwall and Kousha, 2015).

Although the literature has provided mixed results on its popularity, activity, authority and accessibility (Nicholas *et al.*, 2016), ResearchGate is changing the way scholars publish their work and gain peer recognition and social capital (Thelwall and Kousha, 2015). Citations indicate recognition and the social capital of the cited author. This recognition is important for academic careers and research evaluations (Moed, 2006). Logically, scholars should apply a wide range of methods to ensure that their publications are accessible and visible to others (Thelwall and Kousha, 2015). Traditionally, scholars seek to publish their papers in high-impact journals or conferences, to advertise them in social media and their classes (Haglund and Olsson, 2008). However, the new norm for scholars is to list their work on online curricula vitae or to list them on online academic social platforms, such as ResearchGate.

Given that the increased visibility benefits of listing publications in multiple sites online outweigh the cost of the time taken to register them, scholars who embrace the new mode of spreading and sharing research online seem to gain greater recognition and social capital. This multiple online availability of research can presumably increase the citation count and thus increase a scholar's academic impact. Put simply, ResearchGate provides scholars with a new way to gain citations, thus improving their social capital and academic impact.

3.2 Sampling procedure

Supply chain management scholars play an increasingly prominent role in research and academia. This is evident as the supply chain management studies attract greater international academic impact. On ResearchGate, supply chain management scholars are a large academic group, for the number of publications on ResearchGate focusing on supply

chain management study forms a large share and the number of new publications studying supply chain management is increasing rapidly. The total number of followers in 2016 for the supply chain management discipline is 20,123, an increase of 5,673 in just one year.

One of the authors compiled and collected the data from the personal file webpages of the supply chain management scholars on ResearchGate. In our sample selection process, 450 ResearchGate supply chain management members were selected in the supply chain management group. The personal files of the scholars should have the basic information we need such as nationality, followers, and the RG score. Empty profiles and inactive accounts are abandoned by the data selection procedure as such profiles are deemed useless for our study. We submit that the sample is representative of the supply chain management scholars since the scholars chosen are diversified in terms of nationality and institution.

The sample of scholars collected from ResearchGate is from 70 countries and more than 400 academic institutions. While we can study this new online academic platform on a global perspective, having a variety of data can make our results more convincing and objective. Including scholars from different countries and institutions into our sample can support the understanding of the influence of a country's economic growth on a scholar's social capital and academic impact, and to identify the relative success of the countries that are increasing or decreasing their scientific success *vis-à-vis* others. For these reasons, it is instructive to select scholars from different countries.

The scholars in our sample are mainly chosen as follows: 87 scholars from the USA (19.3 percent), 29 scholars from China (6.43 percent), 27 scholars from the UK (5.59 percent), 24 scholars from France (5.32 percent), 23 scholars from Germany (5.1 percent), 21 scholars from Canada (4.65 percent), 18 scholars from Spain (3.99 percent), and 16 scholars from Iran (3.54 percent). The following countries such as Italy, Turkey, India, Greece, Australia, with scholars, form less than 3.5 percent of the sample size. The institutions of the scholars in the sample are discrete. At most four scholars come from the same institution including the Amirkabir University of Technology, Laval University, Universitat Politècnica de València, and the University of Leuven. Each of these institutions accounts for 0.911 percent of the total number of institutions in the sample. Three scholars come from the following seven institutions: Aalto University, École Nationale Supérieure des Mines de Saint-Étienne, Griffith University, McGill University, Shanghai Jiao Tong University, University of Macedonia, and the University of Minnesota Twin Cities. For the rest of the institutions in our sample, 47 institutions have two scholars, and 305 institutions have only one scholar. This indicates our sample include various universities, which is a good mix of supply chain management scholars from around the world. We have included a table in Table AI that contains the key information of this data set for each country.

ResearchGate tries to combine both bibliometrics and altmetrics to provide an inclusive and objective performance measurement for organizations and scholars. Traditional bibliometrics is a performance indicator measuring the amount and impact of publications such as books, articles, and publications. In ResearchGate, impact points directly measure the academic impact of organizations and scholars (Yu *et al.*, 2016). In our sample, we not only collected data of academic impact but also collected indicators such as the number of followers, number of skills, and topics. These indicators can provide us with a comprehensive and objective view to study the social capital and academic impact of the supply chain management scholars on ResearchGate.

3.3 Measures

Our study focuses on the active researcher members in ResearchGate, which refers to those who interact with peer researchers and ask or answer questions through this social medium. We identify researchers in the supply chain management group. There are 450 ResearchGate members with a ResearchGate score greater than 3.0 who were selected from the SCM group.

This score was selected because 90 percent of ResearchGate members have a ResearchGate score of greater than 3.0, which indicates that our sample is representative. The data on research skills, social capital, and the scholar's academic impact are coded from ResearchGate. Research skills is measured by the number of research skills a scholar has. The more skills a scholar has indicates s/he has various research skills. Social capital is measured by the number of followers a scholar has. A large number of followers indicate that the scholar has high social capital. A scholar's academic impact is measured by using a scholar's impact points, which are computed based on the total impact factors of the journal articles that the researcher from a university has authored/co-authored. Country economic development is measured by the Gross Domestic Product (GDP) of the scholar's country, taken from the World Bank database. Two variables are controlled, namely, the scholar's number of research topics and country culture. We control for the number of research topics conducted by a scholar as the more topics a scholar focuses on, the more research skills the scholar will have, which may distort the results. Country culture is a control variable because a scholar in a high power distance country may have more followers. People in high power distance countries tend to accept the inequalities in power distribution in organizations (Clugston *et al.*, 2000). When a scholar has higher level research skills, more people may follow his/her website. We measure the power distance culture of a scholar's country by using the data found from the World Values Survey and hosted on the website maintained by Hofstede (http://geert-hofstede.com/china.html).

3.4 Analysis strategy

For the mediation tests, we followed the recommendations of MacKinnon *et al.* (2002), and Preacher and Hayes (2004). The bootstrap method was used to avoid the problems associated with the non-Normal distribution of data. For the moderation test, an interaction term was created and its significance tested (Aiken *et al.*, 1991). The moderated mediation or the "conditional indirect effect" (Preacher *et al.*, 2007) indicating the contingent nature of the mediation effect depend on the moderator(s). Following Edwards and Lambert (2007), we test our model by integrating the moderated regression analysis with path analysis to comprehensively analyze the simultaneous moderation and mediation (Hayes, 2012). Figure 2 summarizes the research model. As noted from Figure 2, in the first stage, social capital regressed on a scholar's research skills, the host country's economic development,

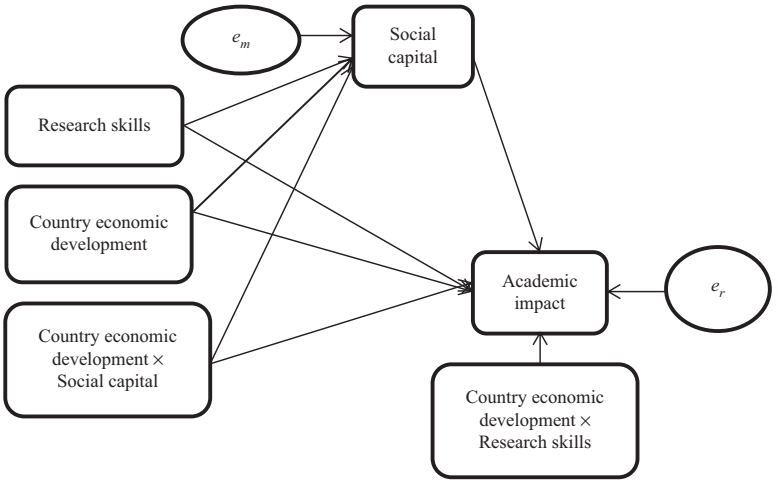

Figure 2.
Research model

Note: e_m and e_r are the error terms of social capital and academic impacts respectively

and the interactive term of these two variables. The construct, "academic impact," is regressed on these three factors as well. In addition, social capital and its interactive term with the host country's economic development are included as predictors for the moderated mediation analysis. Potential multicollinearity was avoided by centering the variables and expressing the interaction terms as a product of the centered scores of the component variables. Control variables were included in all the regression runs unless otherwise specified. A flowchart found in Figure A1 summarizes our analysis.

4. Results

The means, standard deviations, and bivariate correlations among the studied variables are reported in Table I. The results show that a scholar's research skills are positively correlated with social capital. In addition, social capital is positively correlated with a scholar's academic impact.

Our statistical results, as shown in Table I, support *H1*, namely, a scholar's research skills is significantly and positively related to the scholar's social capital ($B = 0.32$, $p < 0.001$). The same applies for *H2* which posits that a scholar's social capital is positively related to the scholar's academic impact ($B = 0.66$, $p < 0.001$). For the mediation hypothesis (*H3*), the indirect effect is statistically different from zero, as evidenced by a 95 percent bias-corrected bootstrap confidence interval that contains zero ($B = 0.23$; CI [0.10; 0.44]; $\alpha = 0.05$). These results suggest that a mediation effect exists. Therefore, *H3* is supported.

For the moderation analysis (*H4*), a host country's economic development positively moderates the relationship between social capital and a scholar's academic impact ($B = 0.26$, $p < 0.01$). This interaction is depicted graphically in Figure 3. The effect of social capital on

		1	2	3	4	5
1	Scholar's research skills					
2	Social capital	0.44**				
3	Country economic development	−0.10*	−0.04			
4	Scholar's academic impact	0.05	0.53**	0.15**		
5	Power distance	0.03	−0.01	−0.75**	−0.06	
6	Research topics	0.36**	0.34**	−0.02	0.15**	0.01

Note: *,**Significant at 0.01 and 0.05 level (two-tailed), respectively

Table I. Means, standard deviations, and correlations of variables

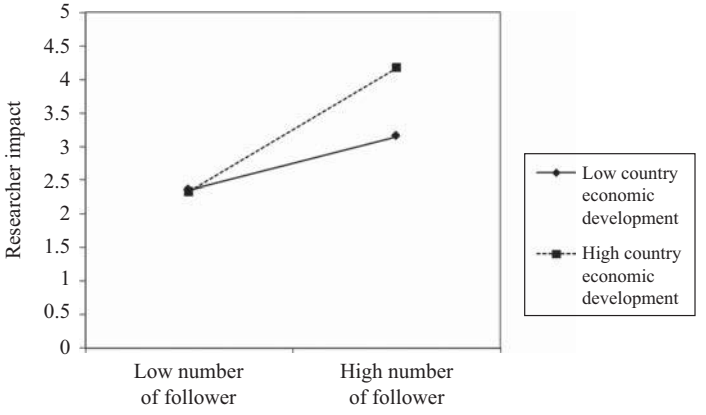

Figure 3. Interaction between social capital and country's economic development on scholar's academic impact

a scholar's academic impact is high for a country with higher economic development; this effect is low for a country with low economic development. The results for the different groups supporting *H4* are presented in Table II (Model 2).

H5 proposed the moderated mediation effect used to assess the indirect effect of a scholar's research skill on the scholar's academic impact (through social capital) at the high and low levels of a country's economic development. We used linear regression with maximum likelihood estimates and 5,000 data draw for the bootstrapping procedure. The results suggest that the indirect effect of a scholar's research skill on the scholar's academic impact (through social capital) between a country with low economic development and a country with high economic development is significant (estimate $= 0.10$; CI [0.09; 0.24]; $\alpha = 0.05$). Thus, *H5* is supported. These results are consistent with the results of earlier studies. Figure 4 summarizes the results.

5. Discussion

This paper seeks to fill the gap in explaining the relationship between a supply chain management scholar's research skill and the corresponding academic impact. In sum, with the data of 450 supply chain management scholars collected from ResearchGate and the World Bank databases, this paper draws the conclusion that factors including research skills, social capital, and a host country's economic development level can influence the academic impact of supply chain management scholars. Specifically, the results indicated a scholar's research skills influences the scholar's social capital (*H1*), which in turn has a positive effect on the scholar's

Table II.
Path analytic test of moderated mediation

	Model 1		Model 2	
	B	M(SE)	B	M(SE)
DV	Social capital		Scholar's academic impacts	
Intercept	0.00	0.04	0.02	0.04
Power distance	−0.03	0.06	0.11	0.06
Research topics	0.20***	0.05	−0.02	0.04
Scholar's research skills	0.32***	0.05	−0.16***	0.05
Social capital			0.66***	0.05
Country economic development	−0.03	0.07	0.25***	0.04
Social capital × country economic development			0.26***	0.04
Mediation test				
Indirect effect			0.23***	0.09
Model R^2	0.21***		0.45***	

Note: ***$p < 0.001$

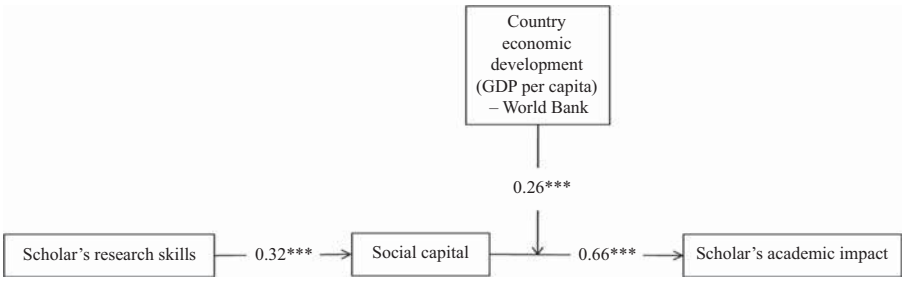

Figure 4.
Statistical results

Note: ***$p < 0.001$

academic impact (*H2*). In addition, the scholar's social capital mediates the relationship between a scholar's research skills and the corresponding academic impact (*H3*). This mediation effect is stronger for countries with a higher level of economic development than for those with a lower level of economic development (*H4* and *H5*). We hope that this study can shed light on the research about academic impact and can help scholars to extend their academic impact, thus making the study more generalizable in the future.

Based on the data from ResearchGate and the World Bank, we found that social capital theory can explain the relationship between a scholar's research skills and the corresponding academic impact. In addition, the economic development of a country moderated this relationship and the mediation effect of social capital. With the findings, our study provides some implications for theory and practice, and suggestions for future research.

5.1 Theoretical implications

This research offers two theoretical implications. First, this paper examined how to explain the relationship between a scholar's research skills and the scholar's academic impact by testing the mediation effect of a scholar's social capital. The results indicated that a scholar's research skills influence the scholar's social capital, which in turn influences the scholar's professional performance. A supply chain management scholar with varied research skills has more followers than one with a fewer number of research skills. More followers suggest that the publications will have a higher chance of being read and cited. The ideas and results from the researchers with a higher social capital skill will be more widespread and stand a better a better chance of being accepted.

Second, the results indicated that the mediation effect is stronger for countries with higher economic development than those with lower economic development. We found that for a supply chain management scholar, s/he has a higher research impact if s/he works in a country with better economic development. This is because the research system in such a country is more efficient. The study outcomes of the scholar can be better diffused, publicized, and recognized. However, in countries with a lower level of economic development, where the research system is not as efficient as the research system in the developed countries, a valuable publication from a scholar may be undervalued and unrewarded. In extreme examples, a war torn country will pay less attention to scholarly pursuits, thus a scholar's productivity can be easily underestimated. Though the scholar from a country with a lower level of economic development has equal number of research skills and an equal amount of social capital as the peers from countries with a higher level of economic development, his/her academic impact will be lower than his/her peers. Thus, countries that value academic research should focus on developing the economic environment to improve the academic research impact in their countries.

5.2 Practical implications

Our findings may also be of interest to other scholars who want to improve their research impact because our results can inform this accordingly. The results imply that supply chain management scholars can reap the benefits of their social capital. Specifically, the results indicate that scholars can enhance their academic impact by increasing their social capital. Scholars should cooperate with others to increase their academic impact. In this way, scholars can obtain more citations and feedback on their research. The more the other researchers know about these studies, the higher the likelihood that they will apply the findings and translate the results to practice. Such findings may be used in more practical areas and benefit more people.

In addition, the strong correlation between altmetrics and bibliometrics indicates that the researchers who have greater academic impact can usually enjoy greater social impact among researchers who share similar research interests (Yu *et al.*, 2016). Scholars can also

move to countries with better economic development to improve their academic impact. However, this may be difficult. Many factors such as family, religion, culture, and personal preferences deter scholars from moving from their home country to a better host country (Gawlewicz, 2014).

Finally, our study also provides insights for organizations and institutions such as companies and universities to evaluate the academic performance of their researchers for promotion and funding decisions. A researcher's academic impact can be measured by evaluating their research skills, social capital, and the state of the country's economy. Based on the evaluations of these indicators which could reflect a researcher's academic impact, institutions can make appropriate funding decisions to increase the research outcome from an already existing pool of limited funds.

5.3 Limitations and future research

While the insights gained from this study are important for both theory and practice, this study has four limitations which limit the generalizability of the study but at the same time provide potential avenues for future research.

First, the findings from this study are from a single research area. Future research could replicate the theoretical model in the other fields, such as biomedical research and chemical research, and the samples in the other knowledge-intensive industries.

Second, the data collected from ResearchGate and the World Bank are cross-sectional. Future work could collect longitudinal or experimentation data to examine the causal relationships between the scholars' academic impact and its antecedents. Specifically, future research could adopt a longitudinal or experimental design to test the dynamic process. For example, scholars can use a case-scenario or a lab experiment to examine where a scholar's research skills could determine the academic impact of the scholar.

Third, this paper mainly studied the effect of social capital at an individual level. Future research can study the impact at a higher level. For example, it is important to examine whether the university's reputation could influence a scholar's social capital. Therefore, future studies could collect more university-level data to examine whether social capital is related to a scholar's academic impact and explore the potential boundary conditions.

Finally, future research can explore other mediating mechanisms and the potential boundary conditions. Besides the processes examined in this paper, we admit that other mechanisms may exist which mediate the relationships among research skill, social capital, and academic impact. These limitations are worth examining in future studies.

6. Conclusions

This paper has applied social capital theory to explain the factors that determine a supply chain management scholar's academic impact. Data on 450 supply chain management scholars from various universities were collected and analyzed through a path-analysis approach. A moderated mediation analysis was used in studying the effect of social capital theory on a scholar's research skills and academic level. The results inform that the mediation effect of a scholar's social capital explains the relationship between a supply chain management scholar's research skills and academic impact. In addition, the moderation analysis shows that a country-level moderator can influence the academic impact of the scholar. The results thus provide supply chain management scholars with suggestions about how to enhance their academic research impact. While our study only focuses on the supply chain management domain, the scholars from the other domains can also draw inspiration from this study on how to enhance their academic impact.

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Appendix 1

Country	*N*	Social capital	Scholar's academic impact	Research skills	Publication of university per person	University impact per person
Argentina	1	102.00	5.84	0.00	2.90	6.53
Australia	11	48.46	17.58	12.46	2.35	6.52
Austria	3	62.33	27.07	5.00	1.00	2.25
Belgium	6	52.67	32.80	7.33	4.38	14.52
Brazil	9	45.56	9.76	16.11	4.92	15.42
Canada	21	41.29	30.45	10.62	5.14	15.72
China	28	22.86	27.90	4.04	3.50	7.00
Colombia	4	54.25	11.20	10.75	0.32	0.67
Finland	10	57.60	23.47	10.60	2.16	6.16
France	24	77.96	43.02	14.29	1.89	3.60
Germany	23	51.00	19.06	16.26	2.18	5.16
Greece	11	74.36	29.88	17.91	1.63	2.57
Hong Kong	5	60.40	55.93	1.60	4.49	10.82
India	16	43.94	10.92	16.44	1.75	3.36
Indonesia	1	6.00	4.21	9.00	0.09	0.04
Iran	16	111.19	24.61	18.44	0.87	1.25
Israel	2	30.00	21.16	3.00	0.88	1.58
Italy	15	79.73	14.71	12.93	4.96	14.70
Japan	1	20.00	3.20	5.00	11.13	22.52
Malaysia	6	78.83	16.12	9.67	1.08	1.75
The Netherlands	9	41.00	15.67	7.56	3.47	11.57
New Zealand	1	60.00	32.34	0.00	4.27	13.05
Nigeria	1	5.00	4.78	4.00	1.20	1.78
Norway	3	19.00	24.91	15.00	1.04	2.57
Pakistan	1	15.00	5.48	0.00	0.82	0.26
Peru	1	596.00	24.42	95.00	0.11	0.25
Poland	2	89.50	12.42	39.50	1.36	2.13
Portugal	4	37.75	7.51	21.50	2.66	5.14
Singapore	2	7.50	6.53	5.00	3.46	7.85
South Africa	1	71.00	4.87	20.00	2.01	4.03
South Korea	8	27.75	20.64	7.13	4.98	10.75
Spain	18	50.00	19.48	7.89	2.69	6.54
Sweden	5	19.00	9.00	18.00	4.78	13.95
Switzerland	6	73.33	13.25	11.00	1.25	3.86
Taiwan	15	21.93	24.96	7.13	5.84	10.55
Turkey	16	58.25	16.81	7.44	1.74	3.24
UK	27	58.82	29.16	10.41	3.20	11.13
USA	87	52.79	41.75	7.64	5.63	19.01

Table AI. Key information of this data set for each country

Appendix 2

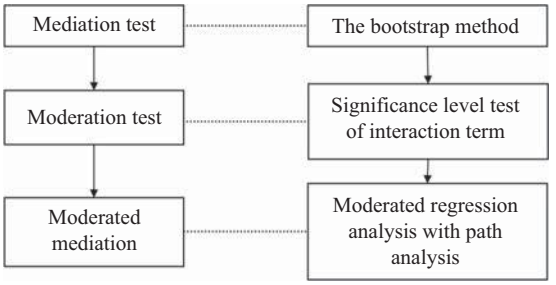

Figure A1. Flowchart of procedure of analysis

Appendix 3

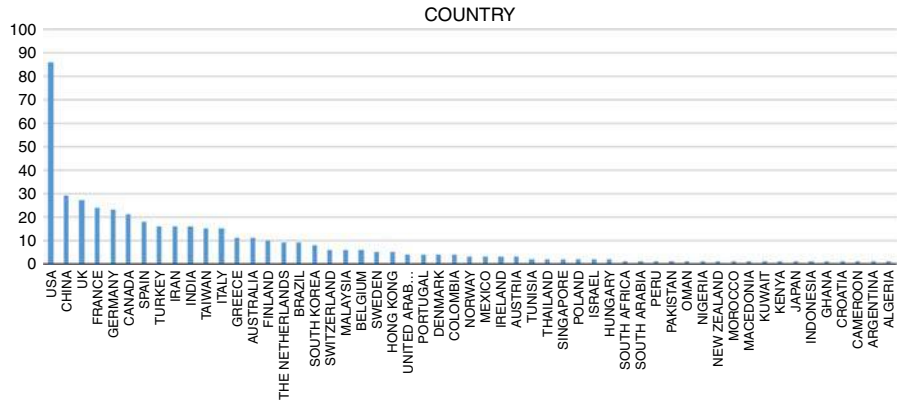

Figure A2. Breakdown of scholars by country

Appendix 4

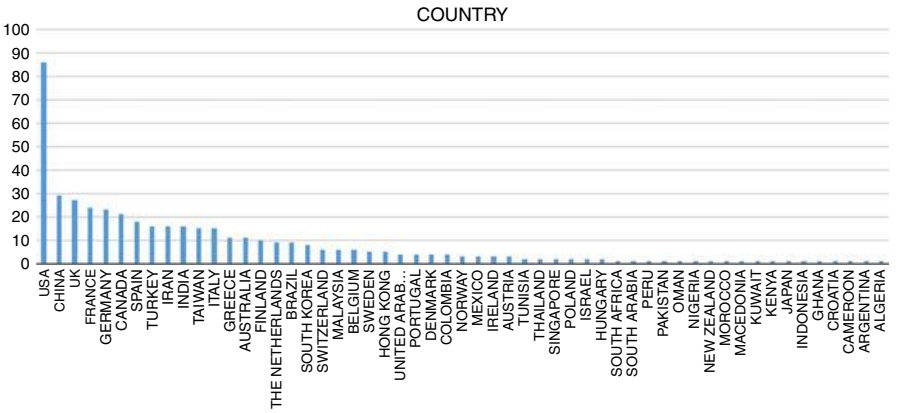

Figure A3.
Top 20 institutions

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