J.B.M.

ISSN: 1535-668X Vol. 26, No. 1, March 2020

Journal of Business and Management

Published by Department of Management Information Systems
College of Commerce, National Chengchi University

This page is intended to be blank.

Journal of Business and Management

Volume 26 Number 1 March 2020

ISSN: 1535-668X

J.B.M.

Vol. 26, No. 1
March 2020

J.B.M.

Vol. 26, No. 1
March 2020

Contents

Journal Library Form Letter

To: Librarian
From:

Name: _____

Position: _____

Department: _____

Email Address: _____

Re: Journal subscription recommendation

I recommend that the Library subscribe to the *Journal of Business and Management* - JBM (ISSN: 1535-668X). This journal can be ordered through EBSCO.

I recommend this journal because (check one or more of the following):

1. I have evaluated the content of this journal and can confirm that the high quality of these articles will be of significant benefits to faculty and students in teaching and research.

2. I will be using this journal for my courses and reading lists.

3. I will be using this journal for my own research and scholarship.

4. This journal is highly ranked in the ISI Journal Citation Reports and is, therefore, a critical acquisition for our collection in business and management.

5. I am a member of the Editorial Board and as such will be using it regularly for research, article submission, and as a teaching aid.

6. Other (specify):_____

Signature:_____ Date:_____

Editorial

Eldon Y. Li
Wei-Hsi (Frank) Hung

Editorial Objective

JBM is a double-blind refereed, authoritative reference addressing working or potential business and management theories/practices as well as the emerging issues of interest to academics and practitioners. The primary editorial objective of the *JBM* is to provide a forum for the dissemination of theory and research in all areas of business, management, and organizational decisions areas. We invite research articles, comprehensive reviews, and case studies that provide insights into the business phenomena occurring every day. Authors of *JBM* are always encouraged to offer recommendations to readers exemplifying the applicability of their research findings.

Research Topics

In this issue, we have accepted four research papers for publication in JBM. The first paper is "Deciphering luxury consumption behavior from knowledge perspective," co-authored by Chi-Hsien Kuo and Shinya Nagasawa. The second one is "Luck versus skill in evaluating hedge fund managers' performance," reported by Rama K. Malladi. The third one is "Trends in organizational behavior: a systematic review and research directions," examined by Shilpi Kalwani and Jayashree Mahesh. Finally, a study on "Impacts of industrial revolutions on the enterprise performance management: a literature review," is presented by Buşra Taşkan, Buket Karatop, and Cemalettin Kubat.

We thank very much the authors for sharing their knowledge by contributing the papers and the reviewers for taking their precious time to offer improvement suggestions to the authors. Special thanks go to National Chengchi University in Taiwan for the administrative support and to Western Decision Sciences Institute for the financial support. Without all these scholars and partners the publication of JBM is not sustainable. Please note that the views expressed in these papers are those of the authors and not of the editors, editorial board, JBM, WDSI, National Chengchi University, or Chung Yuan Christian University. We hope these papers are interesting to read and useful to your future research. On behalf of the Editorial Board, I thank you very much for your continuous support. Finally, we would like to take this opportunity to wish you all to be safe and healthy under the recent epidemic of coronavirus. We hope the contagion will end soon and we, the people, can get back to our normal living conditions in no time.

Reference to this paper should be made as follows: Li, E.Y. & Hung, W.H. (2020). Editorial. *Journal of Business and Management, 26 (1)*, March, i-iii.

About the Author

Eldon Y. Li*

Chair Professor of MIS and Director of Ph.D. Program in Business
College of Business
Chuang Yuan Christian University
Chung Li, Taoyuan 32023, Taiwan
E-mail: eli@cycu.edu.tw
& Chair Professor of Marketing
Department of Marketing
School of Economics and Management
Tongji University, Shanghai, P.R. China

Wei-His (Frank) Hung

Professor of MIS and Director of CINTES
College of Commerce
National Chengchi University
Wenshan, Taipei 11605, Taiwan
E-mail: fhung@nccu.edu.tw

*Corresponding author

Eldon Y. Li is Chair Professor of MIS and Director of Ph.D. Program in Business at Taiwan Chung Yuan Christian University, and Chair Professor at Shanghai Tongji University. He is the former University Chair Professor and department chair of the Department of Management Information Systems at the National Chengchi University (NCCU), Taiwan. He holds a bachelor degree (1975) in international trade from NCCU and both MSBA degree (1978) in management information systems and Ph.D. degree (1982) in information systems and quantitative sciences from Texas Tech University, USA. He was the Dean of College of Informatics and Director of Graduate Institute of Social Informatics at Yuan Ze University, Chung Li, Taiwan (2003-2005), the Founding Director of Graduate Institute of Information Management, National Chung Cheng University, Chia Yi, Taiwan (1994-1996), the Coordinator of Management Information Systems Program, California Polytechnic State University, San Luis Obispo, USA (1986-1989; 2001-2003). He has published over 260 papers in the areas of electronic business, service innovation, decision systems, human factors in information technology (IT), strategic IT planning, software engineering, total quality management, information management, and business management. His papers have appeared in top

journals such as *Communications of the ACM, Communications of Association for Information Systems, Computers & Education, Decision Support Systems, Information & Management, Journal of Association for Information Systems, Journal of Management Information Systems, Omega,* and *Research Policy*, among others.

Wei-Hsi (Frank) Hung is Professor of Management Information Systems at National Chengchi University, Taiwan. He holds a Ph.D. degree from University of Waikato, New Zealand. His research interests are in the areas of e-commerce, IS alignment, knowledge management, and supply chain management. His research papers appeared in journals such as *Decision Support Systems, Communications of the Association for Information Systems, Industrial Marketing Management, Journal of Global Information Management, Journal of Computer Information Systems, Computers in Human Behavior, Technology Analysis & Strategic Management, Telematics and Informatics, Internet Research, Pacific Asian Journal of Association for Information Systems, International Journal of Logistics Research and Applications, Journal of Information Management, Asia Pacific Management Review, Communications of the ICISA, International Journal of Web Portals,* and *Electronic Journal of Information Systems Evaluation*.

This page is intended to be blank.

Deciphering Luxury Consumption Behavior from Knowledge Perspectives

Chi-Hsien Kuo
Shinya Nagasawa

Abstract

Purpose – *The purpose of this paper is to explain the psychological processes from brand knowledge to behavioral outcomes in luxury consumption.*

Method – *Structural Equation Modeling (SEM) method is applied to test the structural relations of the psychological processes, mediated through brand trust and brand desirability, and explain how brand knowledge can result in consumer behavior. This study focuses on three distinctive dimensions of brand knowledge: brand familiarity, luxury involvement, brand country-of- origin identification, and their intermediating paths through brand trust and brand desirability to affect purchase intention and result in purchase action or verbal recommendation.*

Findings –*Brand knowledge in general does strongly associate with the psychological processes involving with trust and desirability that increase purchase intention and promote behavioral outcomes. The meditation effects are much stronger via the perception of desirability than that of trust, and this finding is consistent for both luxury involvement and brand country-of- origin identification.*

Limitations – *The dataset used in this study is not adequately representative, and the sample size could be expanded. Further studies may include cross-cultural comparison, and survey or interview of business practitioners to provide in-depth understanding of luxury consumer behavior and customer long-term relationship management.*

Implications – *Practitioners of luxury goods marketing should invest in marketing strategies that address certain social peer groups to significantly influence their target market.*

Originality – *This paper extends consumer brand knowledge research to luxury field. Besides, this paper provided novel routes for both academia and business sector research.*

Keywords: luxury goods marketing, luxury retail strategy, consumer brand knowledge perspective, luxury in the digital era.

JEL classification: M19, M31

Reference to this paper should be made as follows: Kuo, C. H. & Nagasawa, S. (2020). Deciphering luxury consumption behavior from knowledge perspectives. *Journal of Business and Management*, *26*(1), March, 1-21. DOI: 10.6347/JBM.202003_26(1).0001.

Introduction

With the rapid global expansion of luxury brands over recent decades, luxury consumer behavior has changed at an equal pace through their brand knowledge learning process. While the global luxury market is ultra-competitive, it has flourished over the past few decades and will reach a value of €320–350 billion by 2025 (Bain & Company, 2018). However, according to Deloitte (2017), an increasing number of luxury brands are struggling due to sudden changes in competitive marketplaces. For example, some brands hesitate to embrace e-commerce, while others are unaware of how they can manage a digital brand or of the impact that their marketing strategy has on different cultures around the world. Specifically, China plays a vital role in global luxury consumption, with its population having spent 770 billion RMB (USD 115 billion) on luxury items in 2018— a third of the entire global spend (McKinsey,2018).

Among the luxury consumer groups worldwide, it is estimated that two most prominent purchase groups of luxury goods: Millennials (those born between the early 1980s and the mid-1990s) and Generation Z (those born after the mid-1990s), will account for 45% of luxury-market consumption by 2025 (Bain & Company, 2017). Younger consumers in the digital age mainly receive brand information and brand knowledge from digital platforms, such as social media. They have expanded their brand knowledge specifically via online and offline channels and may internalize it (Keller, 2003). Millennials grew up with the Internet, and Generation Z cannot imagine a world without it (Forbes, 2017). They have values that contrast with those of their parents' generation and no longer buy luxury brands as status symbols. This behavior has disrupted the established luxury paradigm (Bain & Company, 2018).

Previous generations such as the Baby Boomers and Generation X experienced "Luxury" as something close to what has been defined by Goody (2004) "refined enjoyment, of elegance, of things desirable but not essential". This definition describes luxury as representing the recognition of financial success and wealth. Typically, this kind of luxury plays a vital role in shaping self-presentation in public and business environments. On the other hand, Millennials and Generation Z purchase luxury brands "to feel different rather than fit in with society" (McKinsey, 2018). However, with the changing luxury paradigm, a question arises regarding what motivates modern consumers to buy luxury brands.

Academically, some attention has focused on consumer (psychological) perceptions of luxury brands (Christodoulides et al., 2009; Vigneron and Johnson, 1999; Vickers and Renand, 2003). Others have discussed the effects of country-of-origin (COO) on consumer decisions when they are purchasing luxury goods (Lampert and Jaffe, 1998; Ahmed et al., 2004; Koschate-Fischer et al., 2012). However, until now, there has been minimal research on the effect of knowledge

of luxury brands on the behavior of digitally integrated consumers.

Owing to advanced Internet technologies and platforms, consumer consumption in the luxury business industry has been prevalent in the form of online or offline shopping. For example, by 2018, global digital sales of women's luxury fashion were expected to grow from 3% of the total market to 17%, making a total market size of USD 12 billion (McKinsey, 2018). At the same time, consumers are gaining brand knowledge from multichannel social media and from their purchasing experiences. Furthermore, recent innovative technologies have enabled consumers to obtain extensive information about luxury brands, such as through 3D tours on online storefronts and "stories" function on Instagram or Facebook.

Although luxury consumption behavior has received attention from both the business world and academia in recent years, there is yet minimal research on luxury consumer behavior based on perspectives of knowledge, attitude, and behavior. To understand the relationship between consumers' knowledge of luxury brands and how this influences their attitude and behavior, researchers have proposed a framework based on Fishbein and Ajzen (1975) the theory of reasoned action (TRA) and a consumer luxury-brand knowledge perspective to understand consumer purchase behavior. In this study, we employed the 4 stages of behavioral process described by TRA to explain consumer behavior of luxury consumption. Among the various consumer brand knowledge components, we selected and integrated brand familiarity, luxury involvement, and brand COO identification with luxury shopping experiences to test the proposed framework in this study. The empirical data comes from Chinese consumers of luxury consumption (primarily Millennials and members of Generation Z) and the results may provide business insights for practitioners to conduct future research.

Literature Review

Theoretical underpinning

Fishbein and Ajzen (1975) proposed TRA and postulating that behavior can be predicted by intention and that intention is dependent on attitude, subjective norms. In addition to the theoretical grounding of TRA, the two-factor theory (Berlyne, 1970) identifies both novelty and complexity as drivers of hedonic value. Novelty plays an essential part in motivation theory in areas of research such as exploratory behavior when it comes to luxury purchasing behaviors. For individual experiences, evaluating the novelty of a product provides an impetus for absorbing luxury brand knowledge through a range of exploratory behaviors, such as surfing the Internet, viewing mass media, or actual shopping experiences. The result of this evaluative activity is eventually encapsulated as a consumer's attitudinal inclination to the brand. As for complexity, it is a negative function of hedonic value and shall be kept as simple as possible. In this field, attitude is a

favorable or unfavorable feeling toward a product (Ajzen, 1991). If individuals believe that gaining brand knowledge will engender excitement about the quality, reputation, or effectiveness of a brand, then they are more likely to view the brand marketing activity as worthwhile, which often leads to positive purchase decisions.

The above psychological processes, specifically mediated through brand trust and desirability, have long been understood as explaining how brand knowledge can result in consumer behavior. They play a significant role in driving attitudinal responses and behavioral engagement in luxury purchasing experiences, as well as in recommending luxury brands to others. In addition, subjective norms are the attitudes or behaviors that may stem from cultural norms, group beliefs, or an individual's family and social network. Given its subjective features, this concept is associated with personal involvement in luxury products or brands, and hence, may be captured in the research questionnaire measurement items that reflect consumers' positive feelings in the course of their luxury involvement. The result of an attitudinal disposition toward a luxury brand is also a critical factor that impacts on the perceptual process that shapes behavioral intention and actual actions.

Brand Knowledge

Consumer brand knowledge concerns the cognitive representation of a brand (Peter and Olson, 1999). It defines how consumers gain personal meaning from a brand and commit it to memory, for example, all descriptive and evaluative brand-related information. There are two critical aspects to using this concept of consumer memory in the brand-leveraging process. First, the level of existing consumer brand knowledge that affects how in-depth consumers' knowledge of a brand is. Second, leveraging entails linking the brand to other processes in consumers' lives, such as knowing how brand knowledge functions as a purchasing trigger and the antecedent of consumption is an effective way to decipher consumer behavior (Keller, 2003; Kuo and Nagasawa, 2018).

According to Keller (2003), brand knowledge is the source of brand equity and is composed of multiple factors (awareness, attributes, benefits, image, thoughts, feelings, attitudes, and experiences), which include individual cognitive and affective responses to brand-related information. Brand knowledge is usually incorporated into consumers' overall brand evaluation and becomes a part of their memory, leading to some consumption behaviors in the future. The above conceptualization shapes the central research hypothesis proposed in this paper: If consumers were more knowledgeable about luxury brand, their trust in and desire for the brand increases, and this leads to a stronger purchase intention, which is later substantiated by actual purchase behavior or the word-of-mouth effect.

While brand knowledge generally refers to comprehensive information relating to a brand, there are many specific concepts that have been developed to capture essential aspects of brand knowledge. In this paper, the researcher focuses on three specific dimensions: brand familiarity, luxury involvement, and brand COO identification, all of which are essential sources of brand knowledge for consumers.

1. Brand Familiarity

Brand familiarity signifies the extent—both direct and indirect—of a consumer's experience with a brand (Alba and Hutchinson, 1987; Kent and Allen, 1994). Examples of this include consumer in-store purchasing experiences, searches for brand products, and visits to online platforms that display information about brand items, their features, or their history.

Luxury brands may invest in marketing strategies that collaborate with online platforms to showcase their brand story or heritage. Similarly, luxury brands propose international fairs, cross-promote with celebrities, and leverage relationships with technology companies to increase both conscious and unconscious brand familiarity among potential customers and to capture the structure of consumer knowledge of a brand (Campbell and Keller, 2003).

2. Luxury Involvement

Luxury involvement represents the degree to which a consumer considers a specific purchase decision and perceives this action as important to them (Schiffman and Kanuk, 1983). It is particularly relevant for consumers who are willing to invest time and money in purchasing decisions more often than do ordinary customers, or who regularly check contemporary seasonal products. These individuals usually belong to a peer group or social network that shares an approach to and perception of luxury involvement. Such consumers may join e-forums or brand communities to share and discuss brand personalities, designs, and other pertinent topics.

Consumers with higher degree of luxury involvement tend to be early adopters of fashion trends and demonstrate greater awareness of fashion. Such consumers are much more willing to try fashionable or novel products (Zhang and Kim, 2013).

3. Brand Country-of-origin Identification

Brand COO can be defined as the place, region, or country from which a brand is perceived to belong to the brand's target consumers (Thakor and Kohli, 1996). The brand COO identification also refers to the strength of the brand node in consumer's memory. For example, the luxury brand Hermes is famous for its craftsmanship and extraordinary leather goods. Customers expect Hermes bags to be handmade in France rather than in some other country. Some prior studies

have argued that the COO significantly affects evaluations of product quality and perceptions and that it positively affects consumers' willingness to pay higher prices for luxury brands (Dinnie, 2004). For example, Chinese businessmen build factories in rural Italy in order to label their product "Made in Italy." These "Italian" products sell well at a premium price on Chinese platforms such as Taobao or T-Mall. Thus, brand COO identifiability is a crucial factor that contributes to consumer brand knowledge.

Brand Trust

The impact of consumers' prior knowledge on their learning and perceptual processes is profound because they process new information and stimuli in terms of their current cognitive scheme and re-evaluate the brand. Despite the varying degree of experience or knowledge consumers might possess, they tend to have higher standards and criteria when they are required to make a perceptual judgment that shapes their behavioral responses, mainly when the prior knowledge and the new information are not congruent with each other (Kuo & Nagasawa, 2018). Conversely, if they feel that the information is not novel to their existing knowledge, they might immediately act reflexively due to brand loyalty. Therefore, the learning-to-trust route proposition may take one of two causal paths: either consumers will re-evaluate the brands or products within their cognitive scheme and subsequently adopt specific behavioral responses, or they will respond based on their prior knowledge because their existing cognitive scheme is not subject to new knowledge.

Reichheld and Schefter (2000) developed a long-term loyalty program with customers that required business practitioners first to gain their trust. When consumers are aware of and can comprehend the knowledge of a luxury brand and hold positive associations with the brand in their minds, they place more trust in the brand and perceive it as more desirable. Behavioral evidence has also shown that an increasing level of consumer trust in luxury brands leads to consistent consumer brand loyalty (Gassenheimer et al., 1998; Kuo and Nagasawa, 2015). For example, when someone praises a specific brand, that person is communicating a desire to be connected to the people who consume that brand (Husic and Cicic, 2009).

Mayer et al. (1995) argue that brand loyalty enables consumers to be more confident in predicting the future performance of a luxury brand, which is essential because consumers are willing to pay more for those brands and will support a company's new and innovative products over time. Highly recognizable brands can generate positive attitudinal responses resulting in an increased number of repurchases. This explains why long-term brand trust, or brand loyalty, can reinforce behavioral outcomes—although re-evaluation might reduce brand trust if new experiences and information contradict what consumers are accustomed to.

Brand Desirability

Desire is the strong feeling that people experience of wanting something; it is one of the most fundamental aspects of human nature, an inner force that instinctively drives human behavior. Psychologist (Lewis, 1996) usually view desire as a bodily function, though some regard it as a mental state that may contribute to in-depth and multifaceted emotions and actions. Smith (1987) points out that desire is the driving force that motivates all human actions and that the ultimate source of people's values lies in desire.

In marketing practice, managers often create advertisements that arouse basic human desires and aim to create greater brand awareness and business success. A commonly observed strategy is to use celebrity endorsements to attract one's attention to crucial attributes of a brand that one may desire. Another approach is to use human desire, such as by creating a sense of scarcity. Luxury brands are good examples of the strategy of using human desire in order to perpetuate the dream of luxury (Kapferer, 2012). As business practitioner of the famous Italian automobile company-- Ferrari, Enrico Galliera, stated, "People love to have something that you have to desire, you have to dream for—that is not available immediately to anybody just because you have money."(Davis, 2019) According to commodity theory (Brock, 1968) scarcity (or rarity) enhances the level of desirability of any objects that can be possessed. Studies have shown that scarcity may increase the level of desirability of particular brands or products, especially those goods that can satisfy consumers' social needs or allow them to communicate with friends or peers (Verhallen, 1982). In research on luxury brands, however, prior research on desire or brand desirability is quite limited. Much current work focuses on an intuitive assumption regarding the rarity of goods and its effect on brand desirability (Hwang, Ko, and Megehee, 2013; Kapferer and Falette-Florence, 2016). In the US and France, a study (Dubois & Patermault, 1995) has shown that a decrease in rarity (i.e., an increase in market penetration) significantly reduces the desirability of luxury brands. This conclusion has been partially supported by a recent study (Kapferer and Falette-Florence, 2018) in Asian markets. However, rarity promotes the level of desirability, the market penetration rate continues to grow, which suggests that the rarity is merely an artificial sense created by various marketing strategies rather than a genuine scarcity.

Research Model and Hypothesis

Hypotheses Development

"Brand familiarity" is defined as the store of favorable knowledge about a particular luxury brand that is accumulated in the course of consumers' previous direct or indirect purchasing experiences (Campbell and Keller, 2003). Searching relation information for a specific luxury brand product and knowing more about

a certain brand may lead to greater familiarity with that brand and may produce feelings of a greater level of satisfaction, trust, and desirability. Thus, brand familiarity positively influences consumer trust and increases the level of desirability (Ha and Perk, 2005). Lane and Jacobson (1995) have also found that brand familiarity influences a brand's value on the stock market and that stock market performance indirectly reflects consumer trust and human desire.

H1a: Brand familiarity has a positive effect on consumers' trust.
H1b: Brand familiarity has a positive effect on consumers' desire for a brand.

In addition to brand familiarity, previous studies have shown that consumers' knowledge is reflected in other characteristics, such as luxury involvement. Involvement is defined as one's willingness to be exposed to another based on the confidence that the other is benevolent, honest, open, credible, and well-qualified. Karakuş and Savaş (2012) demonstrate that a willingness to engage in something has a positive relationship with trust. Therefore, involvement in an experience associated with luxury brands or related information from multiple channels, such as physical stores and online resources, is likely to increase consumers' trust and desire for luxury brands. For example, using cross-cultural case studies, Ind and Iglesias (2016) explain how companies create brand desire and engage customers to act as their champions. Their suggestions for companies are for them to increase customers' involvement and to offer security (a sense of trust) and surprise (Ind and Iglesias, 2016). This study extends the concept of consumer involvement and hypothesizes its positive effects on the perceptual process, including consumers' brand trust and desire for a brand.

H2a: Luxury involvement has a positive effect on consumers' trust.
H2b: Luxury involvement has a positive effect on consumers' desire for a brand.

While few studies have investigated the effect of COO on services or products (Ahmed et al., 2002), it has been found that, alongside a brand's corporate reputation, COO can significantly influence trust and product desirability (Chéron and Propeck, 1997; Zaheer, 2006). One way of understanding trust is through categorization theory (Rosch, 1978), which argues that individuals make use of various categories to describe the characteristics of objects in order to reduce cognitive effort. The object that possesses most of the characteristics pertaining to a category is defined as a prototype. When confronted with a new stimulus, individuals categorize it by comparing it to the prototype. Prior knowledge associated with a prototype is applied to the new stimulus. Following this rationale, countries can be viewed as categories. Based on the positive or negative experiences associated with a prototype within such a category, a consumer's initial level of trust increases or decreases accordingly. Therefore, such prototypical associations will vary for different countries (Balabanis et al., 2002). For example, Germany is famous for its automobile industry (e.g. BMW and Porsche) and consumers trust the mechanics of the cars themselves as well as the long history of the prestigious German automobile brands. Similarly, Chéron and

Propeck (1997) found that the effect of COO image significantly affects product evaluation and its level of desirability.

H3a: Brand COO identification has a positive effect on consumers' trust.
H3b: Brand COO identification has a positive effect on consumers' desire for a brand.

The hypotheses above cover all the knowledge-driven effects on the perceptual process in which the mechanism of cognitive mediation is assumed to center on consumers' trust and desirability. This study aims to test the learning-to-trust causal paths by investigating the perceptual mediation process, which argues that perception influences behavioral intention and consequently results in an actual purchase or brand recommendation. The hypotheses that follow state all the necessary causal links throughout the entire mediation process. Hypotheses 4a and 4b state the positive relationship between cognitive perception and behavioral intention. Hypotheses 5a and 5b state the positive relationship between behavioral intention and real action.

H4a: Consumers' trust is positively related to their purchase intention.
H4b: Consumers' desire for a brand is positively related to their purchase intention.

H5a: Consumers' purchase intention is positively related to their actual purchase.
H5b: Consumers' purchase intention is positively related to brand recommendation.

Model Specification

The overall model, based on Hypotheses 1a. to 5b, is illustrated in Figure 1. It delineates a knowledge-driven model of consumer behavior in which consumers react to new information or stimuli using their cognitive scheme by initiating another perceptual process or directly making reflexive behavioral decisions. Figure 1. presents the overall scheme of the path model as a structural equation model.

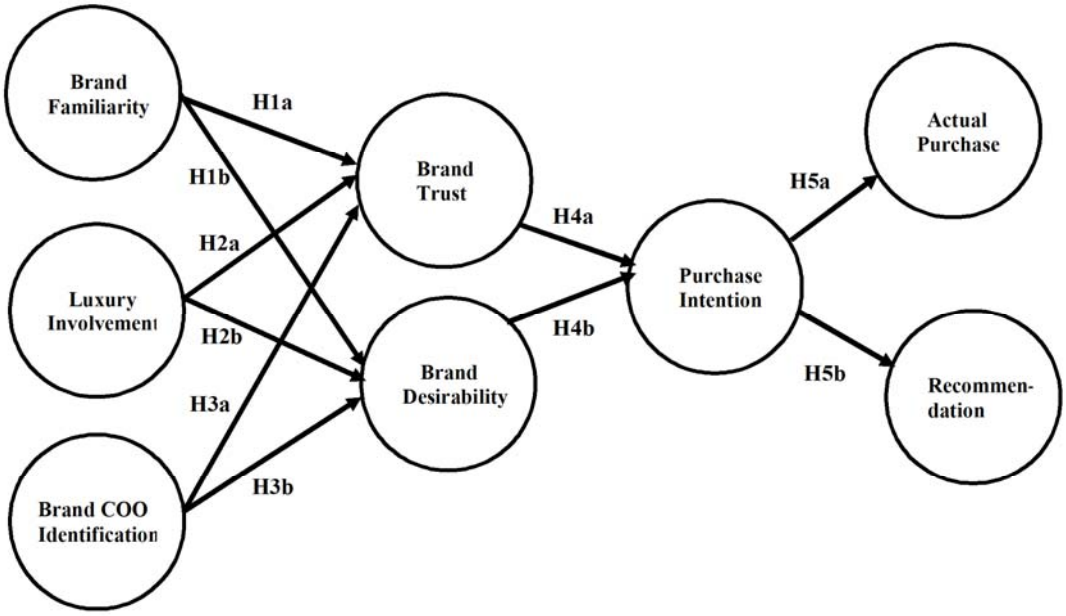


Figure 1: Overall path model of knowledge-driven consumer behavior

Method

Data and Measurement

The data used in this paper is derived from a dataset the researcher collected in 2015–2016 using SurveyMonkey. The sample size is 379 and includes experienced Taiwanese and Chinese customers. The demographic information is reported in Table 1. As can be seen, there are more female respondents than male respondents (72.8% vs. 27.2%), most of the respondents are between age 26 and 45 (74.3%), most have the college level of education (68.1%), and the income fits the normal distribution with a slightly heavy left tail because the younger people under age 30 might still in school or underemployed.

Table 1: Demographic information (n=379)

Measure	Item	Frequency	Percent
Gender	Male	103	27.2
	Female	276	72.8
Age	≤ 20	6	1.6
	21-25	33	8.7
	26-30	90	23.7
	31-35	82	21.6
	36-40	49	12.9
	41-45	61	16.1
	46-50	30	7.9
	51-55	19	5.0

	≥ 56	9	2.4
Education	High School or Less	33	8.7
	Undergraduate	258	68.1
	Graduate/Post-graduate	88	23.2
Income (NTD/per month)	≤ $10000	21	5.5
	$10001-$30000	72	19.0
	$30001-$60000	157	41.4
	$60001-$90000	63	16.6
	$90001-$120000	28	7.4
	$120001-$150000	14	3.7
	≥ $150001	24	6.3

Regarding the measurement of theoretical constructs, the focus is on consumers' brand knowledge, which is measured using indicators of brand familiarity (BF), luxury involvement (LI), and brand COO identification (CO). For the variables relating to cognitive mediation, including brand trust (BT), brand desirability (BD), purchase intention (PI), actual purchase (AP), and brand recommendation (RC), three to four indicators are employed to capture the latent constructs. The design of the measurement instruments is based on the previous literature. Table 2 lists all the constructs, their measurement items, and sources of literature.

Table 2: Information of the measurement model

Scale	Item Description	Source
Brand Familiarity (BF)	BF1. I am familiar with this brand	Koschate-Fischer et al. (2012)
	BF2. How much knowledge I have in the history of this brand?	
	BF3. How much experience I have in purchasing the product of this bran?	Campbell and Keller (2003)
	BF4. I know all the information of this brand.	
	BF5. I am an expert in buying the product of this brand.	
Luxury Involvement (LI)	LI1. It is important to me to have the information of fashionable products.	Kim et al. (2012)
	LI2. My friend around me will recommendation some fashionable products.	
	LI3. I usually own one or more fashionable products.	
	LI4. I am fond of purchasing fashionable products.	Zhang and Kim (2013)
	LI5. It is important to me to own luxury bags.	
	CO1. I know the country of origin of this brand.	

Brand COO Identification (CO)	CO2. I buy this product because I know it was made in the country of origin.	Vigneron et al. (2004)
	CO3. I would not consider buying it if this product was not made in the country of origin.	
Brand Trust (BT)	BT1. This brand delivers what it promises	Erdem et al. (2006)
	BT2. This brand's claim is believable.	
	BT3. This brand keeps showing what it promises.	
	BT4. This brand has ability to deliver what it promises.	
Brand Desirability (BD)	BD1. This brand provides complete information about its craftmanship.	Kapferer (2012)
	BD2. This brand offers customers to try many times to know what it likes.	
	BD3. This brand is alluring.	Vigneron et al. (2004)
Purchase Intention (PI)	PI1. I will seriously consider to buy the product of this brand.	Bian and Forsythe (2012)
	PI2. If I need to buy a luxury product, I will consider to buy this brand.	
	PI3. If I need to buy a luxury product, there is great chance I will buy this brand.	
	PI4. I am very likely to purchase this brand.	
Actual Purchase (AP)	AP1. Luxury purchase frequency.	This study
	AP2. Number of luxury items purchased in the past six months.	
	AP3. Time of the most recent purchase of luxury brand.	
Recommendation (RC)	RC1. I will recommend the product of this brand when someone have similar needs.	Erdem et al. (2006)
	RC2. I will actively recommend the product of this brand to others.	
	RC3. I will share my experience of purchasing the product of this brand actively.	

Statistical Methods and Model Specification

The main methods applied in the analysis that follows are structural equation modeling and path analysis. The statistical package Mplus 8.0 was used for all analyses. The validity of the measurement model will be tested by conducting reliability analysis and confirmatory factor analysis, with the examination of the correlations among all latent constructs. Then the result of the path analysis will be reported to see whether the structural relations corroborate with the research model as illustrated in Figure 1 by Hypotheses 1a to 5b.

Statistic Findings

The Measurement Model

The validity of the measurement model can be evaluated with the reliability analysis. The usual standard for a valid construct is that composite reliability (Cronbach's alpha) should be at least greater than 0.7. As Table 3 presents, all the latent constructs have a composite reliability between 0.72 and 0.95, and mostly above 0.87. This indicates excellent measurement validity for most constructs. In addition, the average variance extracted is all between 0.57 and 0.89, showing a decent explained variance (larger than 0.5) by the measurement items. (Bagozzi and Yi, 1988)

Table 3: Descriptive statistics of constructs

Construct	No. of Items	Composite reliability	Mean(SD)	AVE	VIF
Brand Familiarity (BF)	5	0.90	4.04(1.60)	0.71	1.82
Luxury Involvement (LI)	5	0.87	4.55(1.40)	0.63	1.34
Brand COO Identification (CO)	3	0.74	4.81(1.70)	0.63	1.46
Brand Trust (BT)	4	0.95	5.22(1.12)	0.89	1.49
Brand Desirability (BD)	3	0.87	5.02(1.30)	0.75	1.67
Purchase Intention (PI)	4	0.88	5.31(1.11)	0.76	1.07
Actual Purchase (AP)	3	0.72	2.77(1.51)	0.57	n/a
Recommendation (RC)	3	0.88	4.77(1.25)	0.76	n/a

Note: n/a, "not applicable" because "AP" and "RC" are dependent variables. All the items apply a 7-point likert scale.

Confirmatory factor analysis is applied to check each measurement item's internal validity. Each item should exhibit high factor loading (at least ≥0.5) with its designated constructs (italic numbers) and much lower cross-loadings with other non-designated constructs. As Table 4 shows, all of the items except CO1 shows a high loading on its designated construct, and mostly above 0.7. And the exception item CO1 only slightly fall short the standard (0.48), which is a borderline case and could be acceptable. For all the cross-loadings, none of them is above 0.5, and mostly have a trivial number smaller than 0.2. All above evidence indicates that the measurement model is nicely corroborated and it well explains the factor structure presented in Table 4.

Table 4: Confirmatory factor analysis and cross-loadings

	BF	LI	CO	BT	BD	PI	AP	RC
BF1	*0.72*	0.09	0.07	0.17	0.07	0.08	0.05	0.07
BF2	*0.85*	0.10	0.14	0.12	0.12	0.04	0.07	0.09
BF3	*0.78*	0.12	-0.01	0.05	0.01	0.11	0.23	0.02
BF4	*0.81*	0.24	0.15	0.09	0.09	0.15	0.16	0.02
BF5	*0.83*	0.15	0.10	0.04	0.02	0.10	0.19	0.11
LI1	0.22	*0.72*	-0.02	0.12	0.08	0.06	0.09	0.12
LI2	0.07	*0.71*	-0.03	0.12	0.06	0.10	0.12	0.18
LI3	0.18	*0.84*	0.09	0.04	0.04	0.04	0.14	0.10

LI4	0.04	*0.88*	0.04	-0.01	0.05	0.03	0.06	0.06
LI5	0.14	*0.69*	0.09	0.04	0.19	0.25	0.07	0.11
CO1	0.42	0.02	*0.48*	0.17	0.00	0.10	0.13	0.21
CO2	0.20	0.05	*0.86*	0.15	0.15	0.13	0.05	0.03
CO3	0.07	0.06	*0.86*	0.07	0.12	0.11	-0.05	-0.04
BT1	0.15	0.09	0.10	*0.85*	0.15	0.21	0.02	0.10
BT2	0.11	0.09	0.05	*0.90*	0.16	0.14	0.04	0.10
BT3	0.12	0.07	0.12	*0.87*	0.19	0.17	0.02	0.18
BT4	0.11	0.07	0.10	*0.87*	0.17	0.19	0.02	0.16
BD1	0.13	0.13	0.05	0.19	*0.77*	0.19	-0.09	0.03
BD2	0.07	0.12	0.13	0.22	*0.83*	0.26	0.11	0.14
BD3	0.06	0.16	0.16	0.28	*0.80*	0.23	0.09	0.17
PI1	0.14	0.14	0.11	0.17	0.19	*0.74*	-0.01	0.22
PI2	0.10	0.13	0.12	0.19	0.24	*0.84*	0.02	0.17
PI3	0.11	0.15	0.11	0.23	0.20	*0.79*	0.06	0.20
PI4	0.26	0.07	0.07	0.32	0.15	*0.59*	0.33	0.14
AP1	0.17	0.18	0.10	-0.02	0.04	0.06	*0.80*	0.08
AP2	0.27	0.18	0.09	-0.03	0.06	0.00	*0.71*	0.02
AP3	0.14	0.04	-0.11	0.11	-0.03	0.08	*0.74*	0.03
RC1	0.13	0.15	0.11	0.23	0.05	0.32	0.05	*0.72*
RC2	0.09	0.23	-0.01	0.17	0.11	0.16	0.04	*0.84*
RC3	0.10	0.21	-0.01	0.13	0.15	0.17	0.08	*0.85*

Note: Italic numbers indicate item loadings on the assigned constructs.

At last, all the correlation coefficients among the latent constructs are reported in Table 5. As can be seen, the diagonal elements are all significantly higher than others, indicating that those constructs are distinctive conceptually as well as empirically. Notice that the inter-correlations between some constructs are higher than others, for instance, Purchase Intention with both of Brand Trust and Brand Desirability, and Recommendation with Purchase Intention. Those high inter-correlations shows that these constructs are strongly associated and might have greater path effects in the structural equation analysis when the overall path model is evaluated with control demographic variables included.

Table 5: Correlation among constructs and the square root of the AVE

	BF	LI	CO	BT	BD	PI	AP	RC
BF	0.84							
LI	0.48	0.79						
CO	0.54	0.24	0.79					
BT	0.38	0.33	0.50	0.94				
BD	0.52	0.59	0.61	0.56	0.87			
PI	0.48	0.52	0.54	0.67	0.65	0.87		

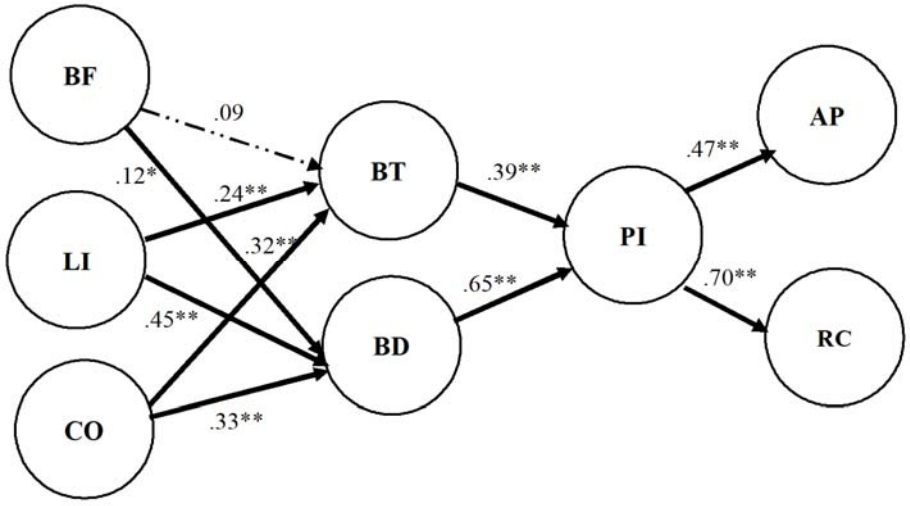
AP	0.49	0.44	0.29	0.25	0.44	0.47	0.76	
RC	0.39	0.49	0.36	0.55	0.63	0.75	0.32	0.87

Note: Diagonal elements (in italics) are the square root values of the average variance extracted (AVE)

Structure Equation Model

The structural question model is evaluated by adding the four demographic variables (gender, age, education, income) as control variables in assessing all the structural relations. Mplus reports three fit statistics, CFI, TLI and RMSEA, to test the model fit. According to Hooper, Coughlan, and Mullen (2008), an excellent model fit is defined by CFI>0.95, TLI>0.95, and RMSEA<0.06, and the cut-off acceptable criteria should be at least CFI>0.9, TLI>0.9, and RMSEA<0.1.

As shown in Figure 2, the results offer strong evidence of corroboration to the overall model because nearly all of the path effects are significant (asterisks show significant p-values) in accord with what Figure 1 illustrated. Among all the hypothesis from Hypothesis 1a to 5b, only Hypothesis 1a is not supported (p=0.134, non-significant as shown in the dashed line), suggesting that familiarity with luxury brands does not merely result in more brand trust because consumers already have prior knowledge and therefore become fatigued in their perceptions.



Note: Level of Significance: *p≦0.05, **p≦0.01. Solid lines show significant results,
and the dashed line show a non-significant one.

Figure 2: The overall result of the knowledge-driven path model

Examining the magnitude of the path effects shows that meditation effects are much stronger via the perception of desirability than that of trust. This finding is consistent for both luxury involvement and brand COO identification. The finding reflects two important empirical facts: first, different kinds of knowledge determine whether a perceptual process is needed to reach a behavioral decision. Although luxury involvement and brand COO identification did require further cognitive

mediation, this finding did not apply in the case of brand familiarity. Second, desirability and trust are found to be two distinct perceptual characteristics. The former is the stronger mediator for the effects of verbal actions, such as the word-of-mouth effect. Overall, the purchasing of luxury products is found to be more of a reflexive action than one based on cognitive evaluation. However, it is also found that reputation may change as a result of a knowledge-driven cognitive process initiated by exposure to luxury brands and gaining more COO information.

Conclusion

Historically, published papers in this field have typically focused on the issue of consumer perceptions and the COO of luxury brands. In this article, the researchers employed a consumer-knowledge perspective to explain consumer purchasing behavior in luxury markets based on the theory of planned behavior. Consumer trust and brand desirability have been used as mediators between consumer knowledge and behavioral intentions, empirically testing the construction of actual luxury consumers.

Since consumer knowledge positively influences trust and brand desirability, practitioners can enhance the depth of their brand culture through marketing strategies. For example, knowledge-based information may be broadcast through marketing activities. Such differential processing and the manifestation of the brand story to a digitally integrated cohort may convey brand knowledge to consumers with a high level of luxury involvement.

Another suggestion is differentiation and specialization. Marketing the difference between production methods allows consumers to obtain products with unique attributes through their brand knowledge. Some luxury brands emphasize that their products are made solely by hand from natural materials. Differentiating their manufacturing process allows them to charge a substantially higher price than do other brands. By engaging in such consumer brand knowledge activities, luxury brands can develop intrinsic and extrinsic connections with existing customers while also attracting new customers.

Our research shows that brand familiarity, luxury involvement, and brand COO identification all play an integral part in establishing consumer trust, which leads to consumer purchase intention, and actual purchase behavior. A greater degree of consumer trust accelerates consumers' intention to purchase brand products and generates a stronger intention to practice word-of-mouth behavior.

In order to increase brand awareness and engagement with brand familiarity, luxury involvement, and brand COO identification in a luxury goods marketing strategy, it is essential to identify how the luxury market is evolving and how the current generation has different needs from those of previous generations. This is

especially true for the younger generations in the Chinese market, which is the growth engine for the luxury market.

Managerial Implications

Marketing strategies should focus on customers who may have a different set of needs and reasons for investing in luxury goods relative to the previous generation of consumers. Additionally, both physical and online branding should be streamlined for the sale of authenticity using a multichannel approach that focuses on building brand trust, increasing brand awareness, and engaging customers in the brand story.

Increased customer engagement will lead to a higher volume of sales and significant customer retention. In the future, a heightened awareness of the geographical location of luxury goods consumers, where and how they buy and sell, will continue to play a pivotal role in how and where to implement marketing strategies.

The aforementioned advices are applicable for brands to expand their customer segmentation toward the increasingly young consumers of luxury goods markets.

References

Ackermann, C., McEnally, R., and Ravenscraft, D. (1999). The performance of hedge funds: Risk, return, and incentives. *Journal of Finance*, 54(3):833–874.

Agarwal, V. and Naik, N. Y. (2000). Multi-period performance persistence analysis of hedge funds. *Journal of Financial and Quantitative Analysis*, 35(3):327–342.

Agarwal, V. and Naik, N. Y. (2004). Risks and portfolio decisions involving hedge funds. *Review of Financial Studies*, 17(1):63–98.

Barclay Hedge. (2019). Assets under Management. Retrieved March 15, 2019, from https://www.barclayhedge.com/solutions/assets-under-management/ .

Barras, L., Scaillet, O., and Wermers, R. (2010). False discoveries in mutual fund performance: Measuring luck in estimated alphas. *Journal of Finance*, 65(1):179–216.

Berk, J. B. (2005). Five myths of active portfolio management. *Journal of Portfolio Management*, 31(3):27–31.

Berk, J. B. and Green, R. C. (2004). Mutual fund flows and performance in rational markets. *Journal of Political Economy*, 112(6):1269–1295.

Berk, J. B. and Van Binsbergen, J. H. (2015). Measuring skill in the mutual fund industry. *Journal of Financial Economics*, 118(1):1–20.

Brown, S. J., Goetzmann, W. N., and Ibbotson, R. G. (1999). Offshore hedge funds: Survival and performance, 1989-95. *Journal of Business*, 72(1):91–117.

Carhart, M. M. (1997). On persistence in mutual fund performance. *Journal of Finance*, 52(1):57–82.

CFA Institute. (2019). Hedge Fund Strategies. Retrieved from https://www.cfainstitute.org/en/membership/professional-development/refresher-readings/2020/hedge-fund-strategies.

Cohen, R. B., Coval, J. D., and Pástor, L. (2005). Judging fund managers by the company they keep. *Journal of Finance*, 60(3):1057–1096.

Cornell, B. (2009). Luck, skill, and investment performance. *Journal of Portfolio Management*, 35(2):131–134.

Cuthbertson, K., Nitzsche, D., and O'Sullivan, N. (2008). Uk mutual fund performance: Skill or luck? *Journal of Empirical Finance*, 15(4):613–634.

Daniel, K., Grinblatt, M., Titman, S., and Wermers, R. (1997). Measuring mutual fund performance with characteristic-based benchmarks. *Journal of Finance*, 52(3):1035– 1058.

Fama, E. F. and French, K. R. (2010). Luck versus skill in the cross-section of mutual fund returns. *Journal of Finance*, 65(5):1915–1947.

Ferson, W. E. and Schadt, R. W. (1996). Measuring fund strategy and performance in changing economic conditions. *Journal of Finance*, 51(2):425–461.

Fung, W. and Hsieh, D. A. (2001). The risk in hedge fund strategies: Theory and evidence from trend followers. *Review of Financial Studies*, 14(2):313–341.

Fung, W. and Hsieh, D. A. (2004). Hedge fund benchmarks: A risk-based approach. *Financial Analysts Journal*, 60(5):65–80.

Fung, W., Hsieh, D. A., Naik, N. Y., and Ramadorai, T. (2008). Hedge funds: Performance, risk, and capital formation. *Journal of Finance*, 63(4):1777–1803.

Getmansky, M., Lee, P. A., and Lo, A. W. (2015). Hedge funds: A dynamic industry in transition. *Annual Review of Financial Economics*, 7:483–577.

HFRI. (2012). HFRI Indices Performance Tables. Retrieved from https://www.hedgefundresearch.com/family-indices/hfri.

Hsieh. (2012). David Hsieh's Data Library with seven hedge fund risk factors. Available at https://faculty.fuqua.duke.edu/~dah7/HFRFData.htm.

ICI. (2019). 2019 Investment Company Fact Book. 2019 Investment Company Fact Book. Retrieved from https://www.ici.org/pdf/2019_factbook.pdf

Jensen, M. C. (1968). The performance of mutual funds in the period 1945–1964. *Journal of Finance*, 23(2):389–416.

Jones, R. C. and Wermers, R. (2011). Active management in mostly efficient markets. *Financial Analysts Journal*, 67(6):29–45.

Kacperczyk, M., Sialm, C., and Zheng, L. (2005). On the industry concentration of actively managed equity mutual funds. *Journal of Finance*, 60(4):1983–2011.

Kim, S., In, F., Ji, P. I., and Park, R. J. (2014). False discoveries in the performance of Australian managed funds. *Pacific-Basin Finance Journal*, 26:244–256.

Kosowski, R., Naik, N. Y., and Teo, M. (2007). Do hedge funds deliver alpha? A Bayesian and bootstrap analysis. *Journal of Financial Economics*, 84(1):229–264.

Kosowski, R., Timmermann, A., Wermers, R., and White, H. (2006). Can mutual fund "stars" really pick stocks? new evidence from a bootstrap analysis. *Journal of Finance*, 61(6):2551–2595.

Malladi, R. and Fabozzi, F. J. (2017). Skillful hiding: evaluating hedge fund managers' performance based on what they hide. *Applied Economics*, 49(7):664–676.

Pástor, L. and Stambaugh, R. F. (2002). Mutual fund performance and seemingly unrelated assets. *Journal of Financial Economics*, 63(3):315–349.

Ptak, J. (2014). Death of Active?. Morningstar. Available at https://www.morningstar.com/articles/670259/death-of-active.

Powers, T., Young, E., Williams, B., and York, E. (2017). Unaccountable, Unaffordable, 2017. American Legislative Exchange Council. Retrieved from https://www.alec.org/publication/unaccountable-unaffordable-2017/.

Storey, J. D. (2002). A direct approach to false discovery rates. *Journal of the Royal Statistical Society: Series B (Statistical Methodology)*, 64(3):479–498.

Storey, J. D. (2011). False discovery rate. *International Encyclopedia of Statistical Science*, pages 504–508.

Storey, J. D., Taylor, J. E., and Siegmund, D. (2004). Strong control, conservative point estimation and simultaneous conservative consistency of false discovery rates: a unified approach. *Journal of the Royal Statistical Society: Series B (Statistical Methodology)*, 66(1):187–205.

Storey, J. D. and Tibshirani, R. (2003). Statistical significance for genomewide studies. *Proceedings of the National Academy of Sciences*, 100(16):9440–9445.

Szmigiera, M. (2019). Global assets of US-based mutual funds 1998-2018. Retrieved June 1, 2019, from https://www.statista.com/statistics/255518/mutual-fund-assets-held-by-investment-companies-in-the-united-states/.

TASS. (2012). TASS Hedgefund Database. Retrieved October 12, 2012, from https://www.lipperweb.com/Handlers/GetDocument.ashx?documentId=13062

Waite, S., Massa, A., and Cannon, C. (2019). Asset Managers With $74 Trillion on the brink of Historic Shakeout. Retrieved from https://www.bloomberg.com/graphics/2019-asset-management-in-decline/.

Weinberg, N. (2018). What Big Hedge Fund Fees Pay For. Bloomberg Business Week. Retrieved from https://www.bloomberg.com/news/articles/2018-02-09/what-big-hedge-fund-fees-pay-for.

Wermers, R. (2000). Mutual fund performance: An empirical decomposition into stock-picking talent, style, transaction costs, and expenses. *Journal of Finance*, 55(4):1655– 1703.

Yang, L. and Liu, W. (2017). Luck versus skill: Can Chinese funds beat the market? *Emerging Markets Finance and Trade*, 53(3):629–643.

Acknowledgment

I particularly acknowledge Dr. Eldon Y. Li, editor of the Journal of Business Management, for his helpful comments during the review and publication process.

About the Author

Chi-Hsien Kuo*
Ph.D. Candidate
Graduate School of Commerce, Waseda University
3rd Floor, Bldg.11, 1-6-1 Nishi-Waseda, Shinjuku-ku, Tokyo 169-8050, Japan
Tel: +81-(0)3-3202-4369
Email: theone.reine@fuji.waseda.jp

Shinya Nagasawa
Full Professor
Graduate School of Commerce, Waseda University
3rd Floor, Bldg.11, 1-6-1 Nishi-Waseda, Shinjuku-ku, Tokyo 169-8050, Japan
Tel: +81-(0)3-3202-4369
Email: Nagasawa@waseda.jp

*Corresponding author

Chi-Hsien Kuo is a Ph.D. candidate at the graduate school of commerce at Waseda University, Tokyo, Japan. Her researches focus on luxury brand management and strategic marketing. She presented many papers at international conferences, e.g., The 11th Global Brand Conference.

Shinya Nagasawa is Professor in the Faculty of Commerce, Waseda Business School, Waseda University. He is the leading expert in Japan on luxury branding, visiting professor at Sciences Po (Paris Institute of Political Studies), Paris and ESSEC Business School, France, former LVMH chair professor, editorial board members of *Luxury Research Journal*, *Journal of Global Fashion Marketing*, and *Journal of Marketing Trends*.

Luck versus Skill in Evaluating Hedge Fund Managers' Performance

Rama K. Malladi

Abstract

Purpose – *The purpose of this paper is to examine if excess returns produced by hedge fund managers are due to luck or skill.*

Method – *False Discovery Rate (FDR) method addresses the question of how manager skill, as opposed to luck, affects abnormal risk-adjusted return performance of actively-managed funds. This study uses the FDR method to separate hedge fund managers into one of three groups: a) Skilled; b) Unskilled; and c) Zero-alpha (i.e., neutral). After identifying skillful hedge fund managers, the Fung-Hsieh benchmark model is used to understand the source of excess returns.*

Findings – *After analyzing hedge fund monthly returns from 1999 to 2012 using the FDR method, only 2.68% of managers of hedge funds are found to be truly skilled, 33.20% are unskilled, and the rest are managers of zero-alpha funds. There is evidence to suggest that skillful fund managers are better at using emerging markets, foreign exchange, and commodities compared to unskilled managers.*

Limitations – *This study is restricted to hedge funds. Further studies may include participants from other alternative investments (i.e., private equity, real estate) to see if skill exists in other alternative asset classes.*

Implications – *Investors pay a significantly higher fee to hedge fund managers, hoping that the manager has skill in producing higher risk-adjusted returns. Therefore, investors (such as public pension funds) need to know if a manager is producing any excess returns due to luck or skill.*

Originality – *Luck versus skill debate has raged on for over three decades in the mutual fund segment. This paper extends this debate to the hedge fund segment. Besides, this paper applies the FDR method, initially intended for use in Biological Sciences, to evaluate hedge fund performance.*

Keywords: hedge fund, false *discovery* rate, FDR, performance evaluation, luck, skill.

JEL classification: G14, G18.

Reference to this paper should be made as follows: Malladi, R. (2020). Luck versus skill in evaluating hedge fund managers' performance. *Journal of Business and Management, 26*(1), March, 22-39. DOI: 10.6347/JBM.202003_26(1).0002.

Introduction

The march of passive investing has been one of the defining themes of asset management over the past decade. The active vs. passive debate is upending the investment industry (Ptak, 2014). The exodus from active funds has sent manager fees inexorably lower, led to the loss of thousands of jobs, and forced large-scale consolidation among firms (Waite et al., 2008). According to the 2019 Investment Company Fact Book, passive (index) funds have doubled as a share of the fund market between 2008 and 2018. By year-end 2018, total net assets in these passive funds grew to $6.6 trillion USD – index-based mutual funds and ETFs together accounted for 36 percent of assets in long-term funds, up from 18 percent a decade earlier. Though shrinking in market share, actively-managed funds continue to be a dominant segment, with 64 percent of the fund assets market share in 2018 (ICI, 2019).

Of all actively-managed funds, hedge funds tend to be the most active since they charge a significantly higher fee compared to mutual funds and deploy various active investment strategies. Hedge funds are considered by some to be the epitome of active management (Fung et al., 2008). By year-end 2018, $2.87 trillion USD was invested in the global hedge fund industry (BarclayHedge, 2019), or 104% growth since 2011. In contrast, $17.71 trillion USD is invested in the global mutual funds registered in the U.S. during the same period (Szmigiera, 2019), or 52% growth since 2011. So, it appears that despite all the merits of passive investing, and the availability of investable passive ETFs since 1993, active funds are experiencing significant growth from a dominant market share position. Therefore, it is essential to understand if the returns produced by active fund managers are due to skill level or simple luck.

This paper is organized in the following sections: Literature Review, Data, False Discovery Rate (FDR) description, FDR Bootstrap Method that separates skill from luck. Fund Performance Model that decomposes returns, Discussion of Results, Conclusion, and Managerial Implications.

Literature Review

Do active fund managers who actively trade different assets add value? Academics have debated this issue since the seminal paper of Jensen (1968), who found that on average active mutual funds were not able to predict security prices well enough to outperform the passive strategy of buy-the-market-and-hold. Though it is well documented by Wermers (2000) that the average U.S. equity mutual fund underperforms its benchmark, Kosowski et al. (2007) found that the cross-sectional standard deviation of the alphas for individual funds is high, indicating the possibility that some funds are performing very well and others very poorly. However, the majority of this excess performance in a mutual fund

universe is attributed to luck rather than skill by several authors, most notably Fama and French (2010), Barras et al. (2010), and Berk (2005).

Numerous papers have been written on the value creation of active mutual fund managers, starting with Jensen (1968), Ferson and Schadt (1996), Carhart (1997), Daniel et al. (1997), Wermers (2000), P´astor and Stambaugh (2002), Cohen et al. (2005), Kacperczyk et al. (2005), Kosowski et al. (2006), Barras et al. (2010), and Fama and French (2010), etc. A survey of the literature by Jones and Wermers (2011) on the value of active management shows that the average active managers do not outperform, but a significant minority of active managers do add value. Berk and Van Binsbergen (2015) find that the average mutual fund has used the skill to generate about $3.2 million USD per year. Since the late 1990s, the empirical properties of hedge fund performance have been documented by many authors such as Brown et al. (1999), Agarwal and Naik (2000), and Agarwal and Naik (2004). For a review of hedge fund performance literature, refer to Getmansky et al. (2015). Unlike the literature on mutual fund performance, several hedge fund performance studies document positive risk-adjusted returns in the hedge fund industry, starting with Brown et al. (1999), Ackermann et al. (1999), Agarwal and Naik (2000), Fung and Hsieh (2004), Kosowski et al. (2007), and Fung et al. (2008), etc.

However, the source of these positive risk-adjusted returns can be due to either the manager's luck or skill. A very useful technique called False Discovery Rate was developed by Storey (2002), Storey and Tibshirani (2003), and Storey (2011) to control for false discoveries in Biological Science. This FDR technique was later applied to a mutual fund setting by Barras et al. (2010), referred to as BSW method in this paper, to estimate the proportion of skilled funds (those with a positive alpha, net of trading costs and expenses), zero-alpha funds, and unskilled funds (those with a negative alpha) in the entire population. This paper extends the BSW method to evaluate hedge fund manager performance, to attribute any excess performance to either luck or skill, and to identify underlying fund strategies that can explain any excess performance. The luck versus skill debate has been extended from the U.S. mutual fund market to the U.K. mutual fund market by Cuthbertson et al. (2008), to the Chinese mutual fund market by Yang and Liu (2017), to the Australian managed funds by Kim et al. (2014), and to large-cap value funds by Cornell (2009). Besides, Malladi and Fabozzi (2017) quantified manager skill by creating metrics based on returns of 'confidential holdings' of U.S. hedge fund managers. In this paper, an attempt is made to extend the luck versus skill debate using the FDR method to hedge funds.

Data

Monthly global hedge fund returns (including fund of funds) are obtained from the TASS database (TASS, 2012) for all 6,392 hedge funds (including fund of funds) between March 1999 to January 2012. A total of 420,432 hedge fund

monthly returns are analyzed in this paper. These funds include both active and inactive (i.e., closed, liquidated, or stopped reporting for any reason). Data beyond 2012 could not be obtained though it would have been helpful. The window of analysis includes both the dot-com and the financial crisis periods. The trend line showing the number of funds, as well as the average monthly returns of all funds are provided in Figure 1 and Table 1. Fund performance calculations are performed based on Fung and Hsieh (2001) with data obtained from their website (Hsieh, 2012).

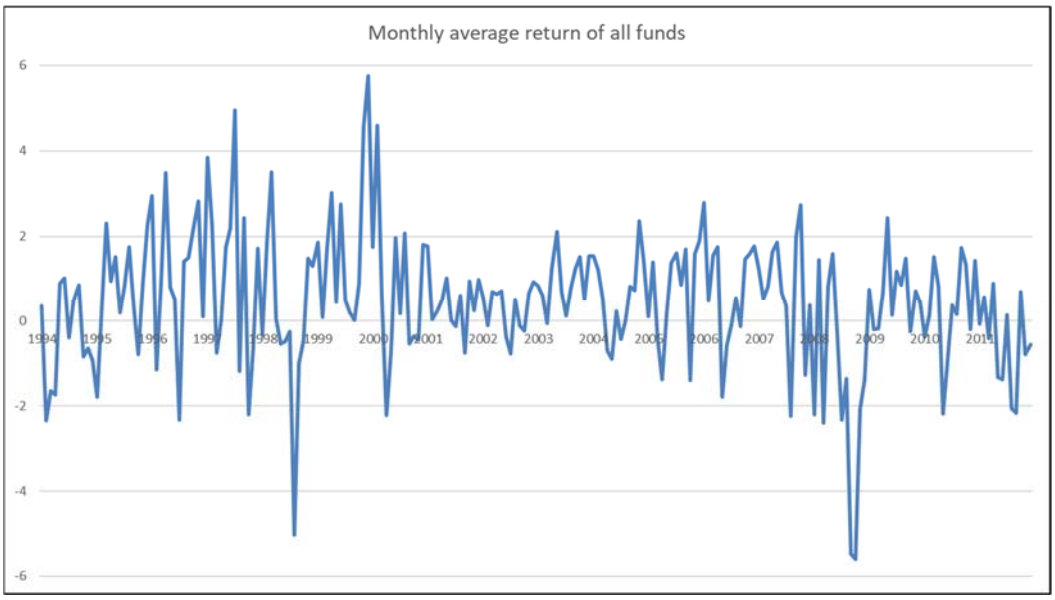


Figure 1: Average monthly return of the 6,392 hedge funds from 03/1999 to 01/2012.

Table 1: Descriptive statistics of hedge fund monthly returns (from 03/1999 to 01/2012).

Descriptive Statistics of Monthly Returns (in %)	
Number of hedge funds	6,392
Number of Monthly Returns	420,432
Mean	0.46
Standard Error	0.11
Median	0.52
Standard Deviation	1.56
Kurtosis	2.52
Skewness	-0.36

Range	11.34
Minimum	-5.59
Maximum	5.75

False Discovery Rate (FDR)

A seemingly reasonable way to estimate the prevalence of skilled fund managers is to count the number of funds with sufficiently high estimated alphas, $\hat{\alpha}$. In implementing such a procedure, one is conducting a multiple hypothesis test because all funds are being examined rather than just one fund. However, a simple count of significant-alpha funds does not properly adjust for luck in such a multiple test setting —many of the funds will have significant estimated alphas by luck alone (i.e., their true alphas are zero).

Three different performance categories are defined as follows (note the difference between actual (or true) alpha α, and estimated alpha $\hat{\alpha}$.

(1) Unskilled funds: Funds that have managers with stock-picking skills insufficient to recover their trading costs and expenses, creating an alpha shortfall: $\alpha < 0$. The proportion of the unskilled funds in the population is denoted by π_A^-.

(2) Zero-alpha funds: Funds that have managers with stock-picking skills sufficient to recover trading costs and expenses, $\alpha = 0$. The proportion of the zero-alpha funds in the population is denoted by π_0.

(3) Skilled funds: Funds that have managers with stock-picking skills sufficient to provide an alpha surplus beyond simply recovering trading costs and expenses, creating an alpha surplus, $\alpha > 0$. The proportion of the skilled funds in the population is denoted by π_A^+. The sum of π_A^-, π_0, and π_A^+ is 100%.

To illustrate, consider a population of funds with skills just sufficient to cover trading costs and expenses (truly zero-alpha funds). With a significance level of 5%, one should expect that 5% of these zero-alpha funds will have significant estimated alphas. Some of them will be unlucky (significant with $\hat{\alpha} < 0$). Others will be lucky (significant with $\hat{\alpha} > 0$), but all will be *false discoveries*: funds with significant estimated alphas $\hat{\alpha} > 0$, but zero true alphas α. The BSW approach much more precisely estimates the proportions of unskilled and skilled funds in the population (those with truly negative and positive alphas, respectively), and their respective locations in the left and right tails of the cross-sectional estimated alpha (or estimated alpha *t*-statistic) distribution.

One main virtue of this approach is its simplicity: to determine the frequency of false discoveries, the only parameter needed is the proportion of

zero-alpha funds in the population, π_0. Rather than arbitrarily impose a prior assumption on π_0, this approach estimates it with a straightforward computation that uses the *p*-values of individual fund estimated alphas—no further econometric tests are necessary. A second advantage is its accuracy over the standard approach that assumes a null hypothesis that all funds have an alpha of zero to control for luck.

How does one measure the frequency of false discoveries in the tails of the cross-sectional (alpha) *t*-distribution? The null hypothesis, H_0, is that fund *i* has no abnormal performance, and the alternative hypothesis, H_A, being that the fund delivers either positive or negative performance:

$$H_0 : \alpha_i = 0,\ H_A : \alpha_i > 0 \text{ or } \alpha_i < 0 \qquad (1)$$

At a given significance level, γ, it is clear that the probability that a zero-alpha fund exhibits luck equals $\gamma/2$. If the proportion of zero-alpha funds in the population is π_0, the expected proportion of false positives, or "lucky funds", or zero-alpha funds with positive and significant *t*-statistics is

$$E(F_\gamma^+) = \pi_0\gamma/2 \qquad (2)$$

Suppose that one chooses a significance level, γ, of 10%. Of course, one cannot observe the true alphas of each fund in the population. So, how does one best infer the prevalence of each of the above skill groups from performance estimates for individual funds? First, use the *t*-statistic, $\hat{t}_i = \hat{\alpha}_i/\hat{\sigma}_{\hat{\alpha}_i}$, as the performance measure in which the numerator is the estimated alpha for fund *i*, and the denominator is the estimated standard deviation. Kosowski et al. (2007) show that a *t*-statistic has superior statistical properties relative to the alpha because alpha estimates have differing precision across funds with varying lives and portfolio volatilities.

Since $E(F_\gamma^+)$ is the expected proportion of false positives, or lucky funds, and $E(S^+)$ is the significant positive alpha funds, or expected proportion of lucky and skilled funds, calculate the expected proportion of truly skilled funds, $E(T^+)$. The following denotations are used: $\widehat{T_\gamma^+}$ for truly skilled funds, $\widehat{S_\gamma^+}$ for significant alpha funds, and $\widehat{F_\gamma^+}$ for false discoveries (i.e., lucky funds). They can be decomposed as follows.

$$\widehat{T_\gamma^+} = \widehat{S_\gamma^+} - \widehat{F_\gamma^+} = \widehat{S_\gamma^+} - \hat{\pi}_0\gamma/2 \qquad (3)$$

$$E(T_\gamma^+) = E(S_\gamma^+) - E(F_\gamma^+) = E(S_\gamma^+) - \pi_0\gamma/2 \qquad (4)$$

By the same token, the proportion of funds with a negative and significant *t*-statistic, $E(S_\gamma^-)$, overestimates the proportion of unskilled funds because it includes some unlucky zero-alpha funds. Because the probability of a zero-alpha

fund being unlucky is also equal to $\gamma/2$, the expected proportion of unskilled funds is

$$E(T_\gamma^-) = E(S_\gamma^-) - E(F_\gamma^-) = E(S_\gamma^-) - \pi_0\gamma/2 \qquad (5)$$

The FDR among the statistically significant positive-alpha funds, or expected proportion of lucky funds in the portfolio at the significance level γ, is

$$FDR_\gamma^+ = E(F_\gamma^+)/E(S_\gamma^+) = \pi_0\gamma/2E(S_\gamma^+) \qquad (6)$$

Now one can estimate the proportions of unskilled and skilled funds in the entire population π_A^- and π_A^+, simply by choosing an appropriately large value for γ. Ultimately, as γ increases, $E(T_\gamma^-)$ and $E(T_\gamma^{\mp})$ converge to π_A^- and π_A^+, thus minimizing Type II error (failing to locate truly unskilled or skilled funds).

FDR Bootstrap Method

The next key step is to estimate π_0, the proportion of zero-alpha funds, using the fund returns data. The FDR bootstrap procedure proposed by Storey (2002) and Storey et al. (2004) is used to estimate π_0. The FDR approach is very straightforward, as its sole inputs are the (two-sided) *p*-values associated with the (alpha) *t*-statistics of each of the *M* funds. In our case *M* = number of hedge funds (including fund of funds) = 6,392. For any given fund *i* (*i*=1,..., *M*), the estimated *p-value* is compared with a conventional significance level γ (5%, 10%, or Type I error). The null hypothesis of no performance is rejected if the *p*-value is smaller than γ, implying that fund *i* has a significant estimated alpha. Fund *i* is called significant if its *p*-value is smaller than γ.

By definition, zero-alpha funds satisfy the null hypothesis, $H_{0,i}: \alpha_i = 0$, and therefore have *p*-values that are uniformly distributed over the interval [0, 1]. In contrast, *p*-values of unskilled and skilled funds tend to be very small because their estimated *t*-statistics tend to be far from zero. This information is used to estimate π_0 without knowing the exact distribution of the *p*-values of the unskilled and skilled funds. The estimated proportion of zero-alpha funds, $\hat{\pi}_0(\lambda^*)$ where λ^* is a threshold value computed from the data so that a vast majority of fund's *p*-values larger than the threshold value λ^*. λ^* is chosen such that the mean square error (MSE) of $\hat{\pi}_0(\lambda)$, defined as $E(\hat{\pi}_0(\lambda) - \pi_0)^2$, is minimized. This means that

$$\lambda^* = argmin_\lambda \widehat{MSE}(\lambda) \qquad (7)$$

$$\widehat{\pi_0}(\lambda^*) = \frac{\widehat{W}(\lambda^*)}{M}\frac{1}{(1-\lambda^*)} \qquad (8)$$

First compute $\hat{\pi}_0(\lambda^*)$ using Equation (8) across a range of λ values (λ = 0.01, 0.05, 0.10, 0.20. . . 0.90, 0.95, and 0.99). In this Equation, $\hat{W}(\lambda^*)$ is the number of funds with p-values exceeding λ^* and $\frac{\hat{W}(\lambda^*)}{M}$ is the area covered by the bars to the right of λ, as plotted in Figure 2, based on the estimated p-values computed from the hedge funds return data. Second, the effect of changing λ^* on $\hat{\pi}_0(\lambda^*)$ is characterized using Equation (8). From this graph, one can see that the proportion of zero-alpha funds in the population, π_0, attains a minimum value, denoted as $\hat{\pi}_{min0}(\lambda)$. Third, for each possible value of λ, 1,000 bootstrap replications are created for $\hat{\pi}_0(\lambda)$ by drawing with replacement from a M x 1 vector of fund p-values. These are denoted by $\hat{\pi}_0^b(\lambda)$, where b=1, 2,..., 1000. Finally, λ^* is selected such that Equation (7) is satisfied, where

$$\widehat{MSE}(\lambda) = \frac{1}{1{,}000}\sum_{b=1}^{1{,}000}\left[\hat{\pi}_0^b(\lambda) - \hat{\pi}_{min0}(\lambda)\right]^2 \qquad (9)$$

Likewise, the unskilled fund returns have the least statistically significant relationship with the MSCI benchmark, whereas the skilled funds have the most significant relationship.

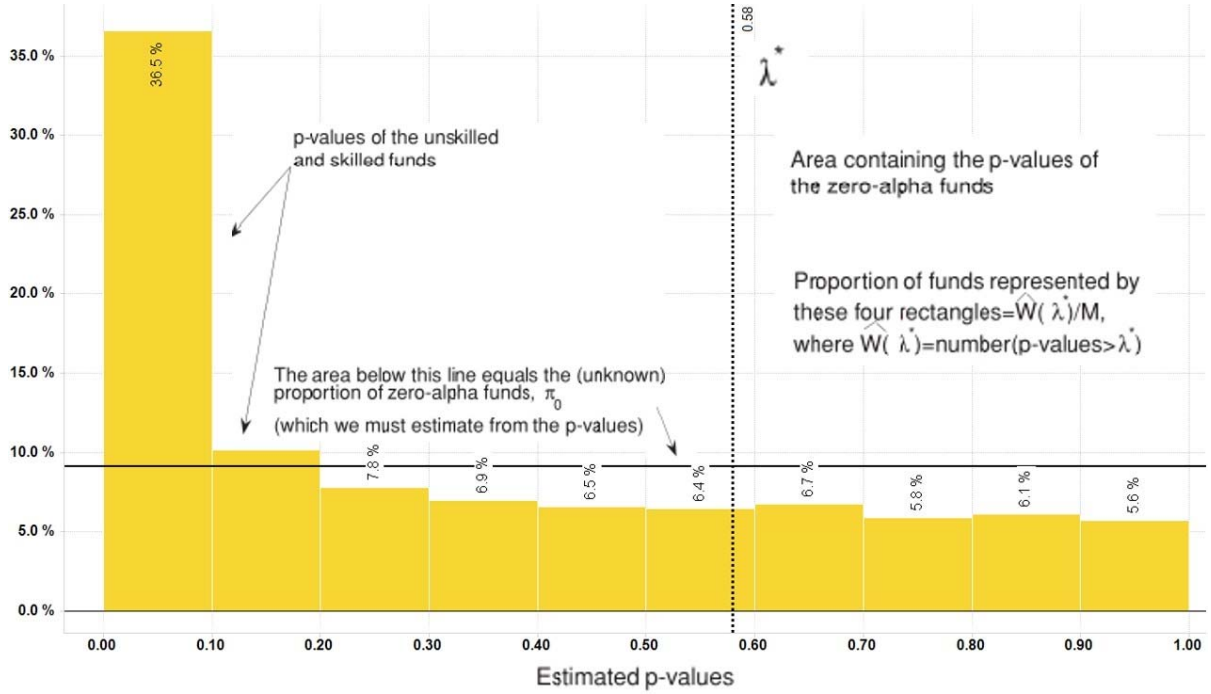


Figure 2: Histogram of fund p-values for M=6,392 funds.

The diagram in Figure 2 is used to estimate the proportion of zero-alpha funds, $\hat{\pi}_0(\lambda^*)$ where λ^* is a threshold value computed from the data such that a vast majority of fund's p-values larger than the threshold value λ^* come from zero-alpha funds. λ^* is computed as 0.58 such that the mean square error (MSE) of $\hat{\pi}_0(\lambda^*)$, defined as $E(\hat{\pi}_0(\lambda) - \pi_0)^2$, is minimized. The area under bars to the right

of $\lambda^* = \frac{\widehat{W}(\lambda^*)}{M} = 6.39\%/5 + 6.68\% + 5.82\% + 6.05\% + 5.63\% = 25.47\%$. By substituting these values in Equation (8), $\hat{\pi}_0(\lambda^*) = 60.57\%$. This figure is formatted very similar to the one in Barras et al. (2010) for comparison purposes.

Although the main advantage of this procedure is that it is entirely data-driven, $\hat{\pi}_0(\lambda^*)$ is not overly sensitive to the choice of λ^*. For instance, a simple approach that fixes the value of λ^* to intermediate levels (such as 0.5 or 0.6) produces estimates similar to the MSE approach. By solving for λ in Equation (7), one can compute that λ^* is 0.58. From this value, the proportion of zero-alpha funds in the population, $\hat{\pi}_0(\lambda^*)$ can be computed as 60.57%. The proportion of skilled funds in the population, π_A^+ is 2.94% (188 out of M = 6,392). The rest are unskilled funds with a proportion, π_A^-, of 36.49%. The proportion of lucky funds is computed as 3.02% using Equation (2) for a given significance level γ of 10%.

After choosing a significance level, γ (e.g., 10%), observe whether $\hat{t}_i$ lies outside the thresholds implied by γ (denoted by t_γ^- and t_γ^+) and label it significant if it is such an outlier. When γ is 10%, t_γ^- is -1.65 and t_γ^+ is 1.65. The probability that the observed t-statistic is greater than t_γ^+ = 1.65 equals 5% for a zero-alpha fund and 91% for a skilled fund. Multiplying these two probabilities by the respective proportions represented by their categories (π_0 and π_A^+) yields 5.70%, or 5.70% of funds have a positive and significant t-statistic. This proportion is denoted by $E(S_\gamma^+)$ and includes both lucky and skilled funds, out of which the proportion of truly skilled funds, $E(T_\gamma^+)$, is computed using Equation (4) as 0.0570 - 0.03029 = 0.0268, or 2.68%. Similarly multiplying the two probabilities by the respective proportions represented by their categories (π_0 and π_A^-) yields 36.23%, meaning 36.23% of funds have a negative and significant t-statistic. This proportion is denoted by $E(S_\gamma^-)$ and includes both unlucky and skilled funds, out of which the proportion of truly unskilled funds, $E(T_\gamma^-)$, is computed using Equation (5) as 0.3623 - 0.03029 = 0.3320, or 33.20%. This implies that the $FDR_\gamma^+ = \pi_0\gamma/2E(S_\gamma^+) =$ (0.6057*0.1)/(2*0.057) = 53.13%, according to Equation (6). So, it can be concluded conclude from the data that only 2.68% of the 6,392 evaluated hedge funds are truly skilled, 33.20% are unskilled, and the remaining 64.13% are zero-alpha funds.

Fund Performance Model

To compute fund performance, the Fung-Hsieh benchmark model from Fung and Hsieh (2001) is used in this paper. Hedge fund strategies typically generate option-like returns. Linear-factor models using benchmark asset indices have difficulty explaining them. Fung-Hsieh model describes how to model hedge fund returns by focusing on the popular "trend-following" strategy, in addition to the equity and fixed-income oriented risk factors. In Hsieh (2012) model described in Equation (10), the first three factors are related to equity, next two for fixed-income, and the last three for trends of bonds, currencies, and commodities. These trend following factors capture nonlinear exposures to bonds, currencies, and commodities. All these eight factors are shown in Figure 3.

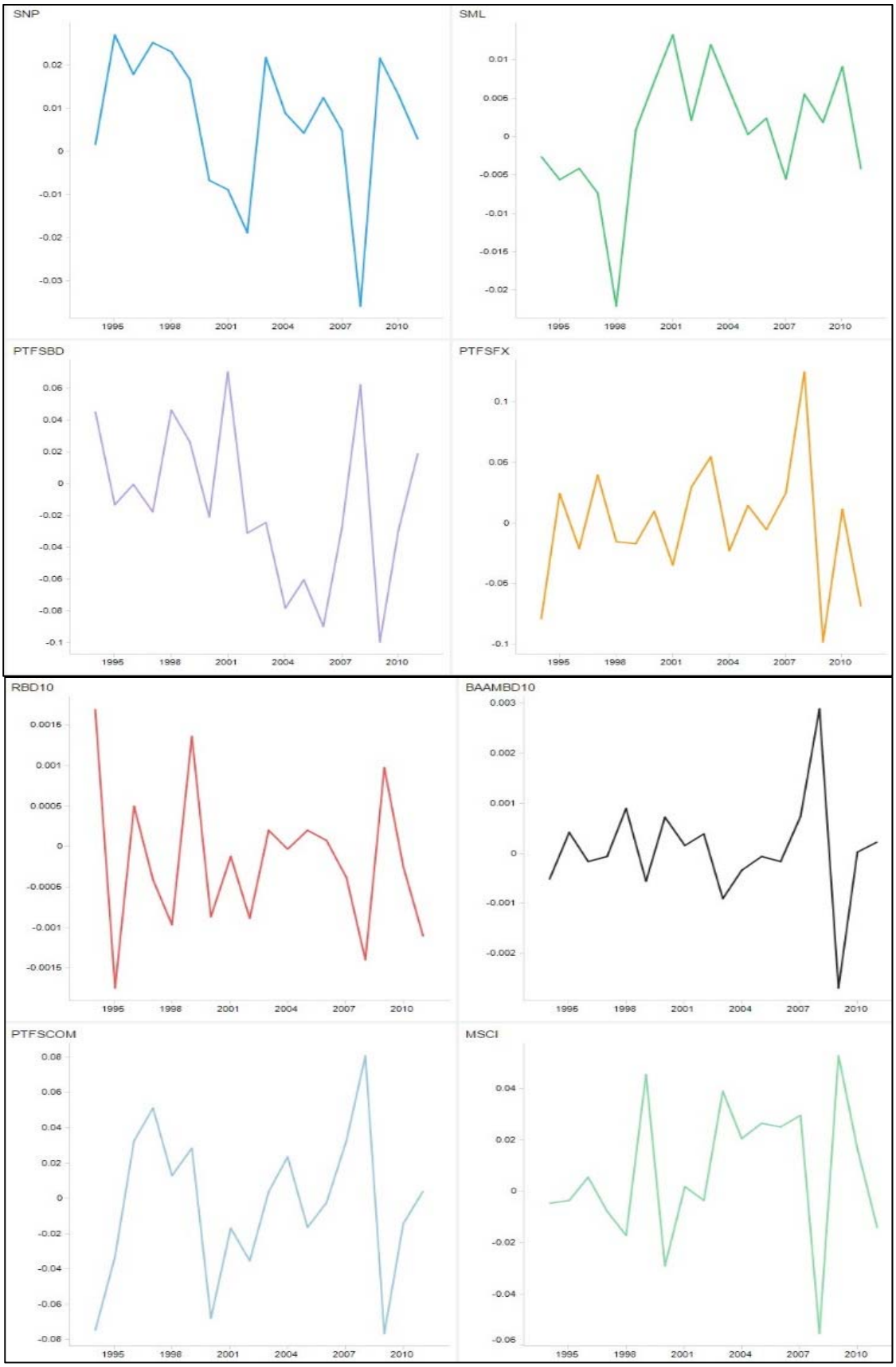


Figure 3: Eight underlying factors from 1999 to 2012, as shown in Equation (10).

$$r_{exc_{i,t}} = \alpha_i + \beta_i^1 SNP_{exc_t} + \beta_i^2 SML_t + \beta_i^3 MSCI_{em_t} + \beta_i^4 RBD10_t + \beta_i^5 BAAMBD10_t + \beta_i^6 PTFSBD_t + \beta_i^7 PTFSFX_t + \beta_i^8 PTFSCOM_t + \varepsilon_{i,t} \quad (10)$$

where, $r_{exc_{i,t}}$: excess returns of the hedge fund *i* in month *t*,
SNP_{exc_t}: monthly return on the S&P500 minus the 1-month T-bill return,
SML_t: Russell 2000 index monthly return minus S&P500 monthly return,
$MSCI_{em_t}$: monthly return on the MSCI Emerging Markets index,
$RBD10_t$: change in constant maturity yield 10-year T-note,
$BAAMBD10_t$: change in the spread between Moody's *BAA* bonds and 10-year T-note,
$PTFSBD_t, PTFSFX_t, PTFSCOM_t$: returns on Primitive Trend Following Strategies (*PTFS*) for bonds(*BD*), currency(*FX*), and commodities (*COM*).

Discussion

The results of the FDR analysis of hedge funds can be summarized in three ways. First, hedge fund manager's monthly returns are analyzed to understand if a hedge fund manager is producing superior returns, and how much of that return can be attributed to pure luck versus skill defined by the false discovery rate approach. Using the FDR bootstrap method as described in the FDR Bootstrap Method section, computations in this paper uncover that only 2.68% of the 6,392 evaluated hedge funds are truly skilled, 33.20% are unskilled, and the remaining 64.13% are zero-alpha funds.

Even though this paper focuses on hedge funds and previous papers focused on mutual funds, findings in this paper are broadly similar to the previous findings of other researchers. As reported by Fama and French (2010), only 2.3% of the mutual fund managers have an alpha of more than 2.5% per year. Similarly, Barras et al. (2010) have found that out of the 2,076 actively managed U.S. open-end, domestic equity mutual funds that existed between 1975 and 2006, 75.4% were zero-alpha funds, 24.0% were unskilled, while only 0.6% were skilled. Cuthbertson et al. (2008) have found that in aggregate, U.S. and U.K. mutual funds are made of 75.0% zero-alpha, 20.0% unskilled, and only 0.5% skilled. The results from these papers are summarized in Table 2. The skill level of hedge fund managers shows a similar pattern to the skill level of mutual fund managers (i.e., both groups have a very low proportion of skill and a high proportion of zero-alpha). However, as a group, hedge fund managers appear to be at least four times more skillful than mutual fund managers, supporting a body of evidence to back Berk and Green (2004) model of active portfolio management.

Table 2: Comparison of results from three papers.

	U.S. mutual funds (Barras et al., 2010)	U.K. mutual funds (Cuthbertson et al., 2008)	Global hedge funds (This Paper)
Unskilled	24.0%	20.0%	33.20%
Skilled	0.6%	0.5%	2.68%
Zero-alpha	75.4%	75.0%	64.13%

Second, the underlying portfolio characteristics of skilled and unskilled hedge fund managers are studied using the Fung and Hsieh (2001) model described in the Fund Performance Model section. Using the aggregate alpha at the fund level for a given month, multiple regression is conducted with the excess return of the hedge fund as the dependent variable and the eight factors as the independent variables. The monthly fund returns are analyzed at the aggregate level, and by the type of fund manager (unskilled, skilled, and zero-alpha), as measured by the FDR technique. The results are summarized in Table 3.

Most hedge funds track different benchmarks, such as the ones listed in Hedge Fund Research Indices (HFRI, 2012). Databases do not accurately report the underlying benchmark for a given hedge fund. So, the excess return of a hedge fund is computed as the difference between the fund return and the S&P500 return. The unskilled fund returns have the most statistically significant relationship (*p*-value of 0.02) with the underlying benchmark (S&P500), possibly due to index hugging (i.e., keeping investment weights very similar to the underlying index). Whereas, the skilled funds have the least significant relationship (*p*-value of 0.52) with the S&P500. As one would guess, the zero-alpha fund's *p*-value of 0.27 falls in between that of the unskilled and skilled funds. Likewise, the coefficients show that skilled-fund return (with a coefficient of 1.83) is less dependent on the S&P500 return than the unskilled-fund return (which has a coefficient of 5.21).

Finally, it can be observed in Table 3 that the skilled hedge funds use MSCI emerging market stocks, bonds, currencies, and commodities more effectively than the unskilled hedge funds – skilled fund returns show lower *p*-values and higher coefficients when compared to those of the unskilled funds. Since investing in these five categories of assets (i.e., emerging market stocks, bonds, currencies, and commodities) requires a sufficient amount of skill compared to the plain-vanilla S&P500 stocks, it can be interpreted that skilled hedge funds are adept at investing in complex asset categories across the globe and deploy a range of strategies (CFA Institute, 2019).

Table 3: Fund performance using Fung and Hsieh (2001) benchmark model.

Unskilled funds					**Zero-alpha funds**				
Multiple R	0.712				Multiple R	0.76			
R Square	0.506				R Square	0.57			
Adjusted R Square	0.487		N	2122	Adjusted R Square	0.55		N	4099
Standard Error	0.966				Standard Error	1.08			
	Coefficients	*Standard Error*	*t Stat*	*P-value*		*Coefficients*	*Standard Error*	*t Stat*	*P-value*
Intercept	0.522	0.067	7.777	0.000	Intercept	(0.28)	0.08	(3.73)	0.00
SNP	5.212	2.231	2.336	0.020	SNP	(2.75)	2.50	(1.10)	0.27
SML	4.908	2.053	2.390	0.018	SML	(3.90)	2.30	(1.69)	0.09
MSCI	8.274	1.491	5.549	0.000	MSCI	(13.55)	1.67	(8.11)	0.00
RBD	(52.116)	32.484	(1.604)	0.110	RBD	41.30	36.41	1.13	0.26
BAAMBD	(159.471)	41.495	(3.843)	0.000	BAAMBD	185.28	46.50	3.98	0.00
PTFSBD	(0.655)	0.462	(1.420)	0.157	PTFSBD	0.20	0.52	0.39	0.70
PTFSFX	0.864	0.378	2.287	0.023	PTFSFX	(1.04)	0.42	(2.46)	0.01
PTFSCOM	0.983	0.526	1.869	0.063	PTFSCOM	(1.34)	0.59	(2.28)	0.02
Skilled funds					**All funds together**				
Multiple R	0.77				Multiple R	0.75			
R Square	0.59				R Square	0.56			
Adjusted R Square	0.58		N	171	Adjusted R Square	0.55		N	6392
Standard Error	1.22				Standard Error	1.05			
	Coefficients	*Standard Error*	*t Stat*	*P-value*		*Coefficients*	*Standard Error*	*t Stat*	*P-value*
Intercept	0.11	0.08	1.30	0.20	Intercept	0.351	0.073	4.836	0.000
SNP	1.83	2.82	0.65	0.52	SNP	4.151	2.421	1.715	0.088
SML	3.03	2.59	1.17	0.24	SML	4.061	2.225	1.825	0.069
MSCI	16.85	1.88	8.94	0.00	MSCI	11.693	1.613	7.248	0.000
RBD	(36.68)	41.04	(0.89)	0.37	RBD	(44.921)	35.205	(1.276)	0.203
BAAMBD	(227.56)	52.43	(4.34)	0.00	BAAMBD	(199.289)	44.719	(4.456)	0.000
PTFSBD	0.05	0.58	0.09	0.93	PTFSBD	(0.394)	0.500	(0.788)	0.432
PTFSFX	1.13	0.48	2.37	0.02	PTFSFX	0.951	0.409	2.324	0.021
PTFSCOM	1.55	0.66	2.32	0.02	PTFSCOM	1.198	0.570	2.101	0.037

Conclusion

Using the FDR method, it is found that only 2.68% of the hedge funds are genuinely skilled, 33.20% are unskilled, and 64.12% are zero-alpha funds. There is evidence to suggest that unskilled funds may engage in index hugging. Whereas, skilled hedge funds use MSCI emerging market stocks, bonds, currencies, and commodities more effectively than the unskilled hedge funds. The skill level of hedge fund managers shows a similar pattern to the skill level of mutual fund managers (i.e., both groups have a very low proportion of skill and a high proportion of zero-alpha). However, as a group, hedge fund managers appear to be at least four times more skillful than mutual fund managers.

Managerial Implications

In the U.S., several public pension funds face unfunded liabilities (i.e.,

pension funds will not have sufficient assets to pay future retirees in full). These unfunded liabilities impact millions of current and future retirees. As of 2018, unfunded public pension liabilities top $6 trillion USD, amounting to $18,676 USD of unfunded liabilities for every U.S. resident. Lack of proper funding and artificially high estimates of future returns have prodded many pension funds into chasing higher returns. For instance, managers have shifted from fixed-income instruments (such as treasury bonds and high-grade corporate bonds) to publicly traded equity and also to alternative investments. This alternatives class of investments (including private equity, real estate, and hedge funds) is particularly problematic — Although an opportunity for outsized gains may exist, these investments are often riskier, more challenging to value, and less liquid (Powers et al., 2017). The fees charged by hedge funds, traditionally 2 percent of assets plus 20 percent of any profits, can be hundreds of times higher than those of the lowest-cost mutual funds (Weinberg, 2018). Investors pay a significantly higher fee to hedge fund managers hoping that the manager has skill in producing higher risk-adjusted returns. Therefore, investors (such as public pension funds) need to know if a manager is producing any excess returns due to luck or skill.

References

Ackermann, C., McEnally, R., and Ravenscraft, D. (1999). The performance of hedge funds: Risk, return, and incentives. *Journal of Finance*, 54(3):833–874.

Agarwal, V. and Naik, N. Y. (2000). Multi-period performance persistence analysis of hedge funds. *Journal of Financial and Quantitative Analysis*, 35(3):327–342.

Agarwal, V. and Naik, N. Y. (2004). Risks and portfolio decisions involving hedge funds. *Review of Financial Studies*, 17(1):63–98.

BarclayHedge. (2019). Assets Under Management. Retrieved March 15, 2019, from https://www.barclayhedge.com/solutions/assets-under-management/ (February 29, 2020).

Barras, L., Scaillet, O., and Wermers, R. (2010). False discoveries in mutual fund performance: Measuring luck in estimated alphas. *Journal of Finance*, 65(1):179–216.

Berk, J. B. (2005). Five myths of active portfolio management. *Journal of Portfolio Management*, 31(3):27–31.

Berk, J. B. and Green, R. C. (2004). Mutual fund flows and performance in rational markets. *Journal of Political Economy*, 112(6):1269–1295.

Berk, J. B. and Van Binsbergen, J. H. (2015). Measuring skill in the mutual fund industry. *Journal of Financial Economics*, 118(1):1–20.

Brown, S. J., Goetzmann, W. N., and Ibbotson, R. G. (1999). Offshore hedge funds: Survival and performance, 1989-95. *Journal of Business*, 72(1):91–117.

Carhart, M. M. (1997). On persistence in mutual fund performance. *Journal of Finance*, 52(1):57–82.

CFA Institute. (2019). Hedge Fund Strategies. Retrieved from https://www.cfainstitute.org/en/membership/professional-development/refresher-readings/2020/hedge-fund-strategies (February 29, 2020).

Cohen, R. B., Coval, J. D., and Pástor, L. (2005). Judging fund managers by the company they keep. *Journal of Finance*, 60(3):1057–1096.

Cornell, B. (2009). Luck, skill, and investment performance. *Journal of Portfolio Management*, 35(2):131–134.

Cuthbertson, K., Nitzsche, D., and O'Sullivan, N. (2008). UK mutual fund performance: Skill or luck? *Journal of Empirical Finance*, 15(4):613–634.

Daniel, K., Grinblatt, M., Titman, S., and Wermers, R. (1997). Measuring mutual fund performance with characteristic-based benchmarks. *Journal of Finance*, 52(3):1035– 1058.

Fama, E. F. and French, K. R. (2010). Luck versus skill in the cross-section of mutual fund returns. *Journal of Finance*, 65(5):1915–1947.

Ferson, W. E. and Schadt, R. W. (1996). Measuring fund strategy and performance in changing economic conditions. *Journal of Finance*, 51(2):425–461.

Fung, W. and Hsieh, D. A. (2001). The risk in hedge fund strategies: Theory and evidence from trend followers. *Review of Financial Studies*, 14(2):313–341.

Fung, W. and Hsieh, D. A. (2004). Hedge fund benchmarks: A risk-based approach. *Financial Analysts Journal*, 60(5):65–80.

Fung, W., Hsieh, D. A., Naik, N. Y., and Ramadorai, T. (2008). Hedge funds: Performance, risk, and capital formation. *Journal of Finance*, 63(4):1777–1803.

Getmansky, M., Lee, P. A., and Lo, A. W. (2015). Hedge funds: A dynamic industry in transition. *Annual Review of Financial Economics*, 7:483–577.

HFRI. (2012). HFRI Indices Performance Tables. Retrieved from https://www.hedgefundresearch.com/family-indices/hfri (February 29, 2020).

Hsieh. (2012). David Hsieh's Data Library with seven hedge fund risk factors. Available at https://faculty.fuqua.duke.edu/~dah7/HFRFData.htm.

ICI. (2019). 2019 Investment Company Fact Book. 2019 Investment Company Fact Book. Retrieved from https://www.ici.org/pdf/2019_factbook.pdf (February 29, 2020).

Jensen, M. C. (1968). The performance of mutual funds in the period 1945–1964. *Journal of Finance*, 23(2):389–416.

Jones, R. C. and Wermers, R. (2011). Active management in mostly efficient markets. *Financial Analysts Journal*, 67(6):29–45.

Kacperczyk, M., Sialm, C., and Zheng, L. (2005). On the industry concentration of actively managed equity mutual funds. *Journal of Finance*, 60(4):1983–2011.

Kim, S., In, F., Ji, P. I., and Park, R. J. (2014). False discoveries in the performance of Australian managed funds. *Pacific-Basin Finance Journal*, 26:244–256.

Kosowski, R., Naik, N. Y., and Teo, M. (2007). Do hedge funds deliver alpha? A Bayesian and bootstrap analysis. *Journal of Financial Economics*, 84(1):229–264.

Kosowski, R., Timmermann, A., Wermers, R., and White, H. (2006). Can mutual fund "stars" really pick stocks? New evidence from a bootstrap analysis. *Journal of Finance*, 61(6):2551–2595.

Malladi, R. and Fabozzi, F. J. (2017). Skillful hiding: evaluating hedge fund managers' performance based on what they hide. *Applied Economics*, 49(7):664–676.

Pástor, L. and Stambaugh, R. F. (2002). Mutual fund performance and seemingly unrelated assets. *Journal of Financial Economics*, 63(3):315–349.

Ptak, J. (2014). Death of Active?. Morningstar. Available at https://www.morningstar.com/articles/670259/death-of-active (February 29, 2020).

Powers, T., Young, E., Williams, B., and York, E. (2017). Unaccountable, Unaffordable, 2017. American Legislative Exchange Council. Retrieved from https://www.alec.org/publication/unaccountable-unaffordable-2017/ (February 29, 2020).

Storey, J. D. (2002). A direct approach to false discovery rates. *Journal of the Royal Statistical Society: Series B (Statistical Methodology)*, 64(3):479–498.

Storey, J. D. (2011). False discovery rate. *International Encyclopedia of Statistical Science*, pages 504–508.

Storey, J. D., Taylor, J. E., and Siegmund, D. (2004). Strong control, conservative point estimation and simultaneous conservative consistency of false discovery rates: a unified approach. *Journal of the Royal Statistical Society: Series B (Statistical Methodology)*, 66(1):187–205.

Storey, J. D. and Tibshirani, R. (2003). Statistical significance for genomewide studies. *Proceedings of the National Academy of Sciences*, 100(16):9440–9445.

Szmigiera, M. (2019). Global assets of US-based mutual funds 1998-2018. Retrieved June 1, 2019, from https://www.statista.com/statistics/255518/mutual-fund-assets-held-by-investment-companies-in-the-united-states/ (February 29, 2020).

TASS. (2012). TASS Hedgefund Database. Retrieved from https://wrds-www.wharton.upenn.edu/pages/about/data-vendors/thomson-reuters/ (February 29, 2020).

Waite, S., Massa, A., and Cannon, C. (2019). Asset managers with $74 trillion on the brink of historic shakeout. Retrieved from https://www.bloomberg.com/graphics/2019-asset-management-in-decline/ (February 29, 2020).

Weinberg, N. (2018). What big hedge fund fees pay for. *Bloomberg Business Week*. Retrieved from https://www.bloomberg.com/news/articles/2018-02-09/what-big-hedge-fund-fees-pay-for (February 29, 2020).

Wermers, R. (2000). Mutual fund performance: An empirical decomposition into stock-picking talent, style, transaction costs, and expenses. *Journal of Finance*, 55(4):1655– 1703.

Yang, L. and Liu, W. (2017). Luck versus skill: Can Chinese funds beat the market? *Emerging Markets Finance and Trade*, 53(3):629–643.

Acknowledgment

I thank Professor Rene Garcia for his help in evaluating results and providing data, and Pallavi Malladi for providing statistical research and editorial support. I particularly acknowledge Dr. Eldon Y. Li, editor of the Journal of Business Management, for his helpful comments during the review and publication process.

About the Author

Rama K. Malladi
Department of Accounting, Finance, & Economics, SBS C315
College of Business Administration and Public Policy (CBAPP)
California State University - Dominguez Hills (CSUDH)
1000 E. Victoria Street, Carson, CA 90747, USA
Phone: +1 (310) 243-3560
Email: rmalladi@csudh.edu

Rama K. Malladi is an Associate Professor of Finance at the College of Business Administration and Public Policy of the California State University, Dominguez Hills. He has taught 26 finance and investment classes at the undergraduate, graduate, and MBA levels. Dr. Malladi received a Ph.D. in Finance from the EDHEC Business School, a Grandes École in France, with Dr. Frank Fabozzi as his dissertation adviser, M.B.A. from the UCLA Anderson School of Management, and Master of Technology in Electrical Engineering from the Indian Institute of Technology (IIT), Madras in India. Besides, he holds a Bachelor of Technology in Electrical and Electronics Engineering with a first-class distinction. Dr. Malladi has served in several leadership positions, including the President and Board of Governor of CFA Society Los Angeles. He earned Chartered Financial Analyst, Chartered Alternative Investments Analyst, Financial Risk Manager, and Project Management Professional designations.

Trends in Organizational Behavior: A Systematic Review and Research Directions

Shilpi Kalwani
Jayashree Mahesh

Abstract

Purpose – *The purpose of this paper is to present a step-by-step guide to facilitate understanding of emerging trends in the discipline of Organizational Behavior using the technique of Systematic Literature Review.*

Method – *Literature review is done by systematically collecting the existing literature over the period of 1990-2019. The literature is categorized according to the Journal Name and Ranking, Database, and Geographical Distribution (country wise). Literature is also categorized on the basis of type of study (empirical/conceptual), variables used, scales used, sample studies and sub area of study (Leadership/Motivation etc). This classification can serve as a base for researchers who wish to conduct meta-analysis on emerging trends in Organizational Behavior.*

Findings – *A disciplined screening process resulted in 81 relevant research papers appropriate for the study. These papers explain the emerging trends in the discipline since 1990.*

Limitations – *Due to the vast areas and sub-areas covered under Organizational Behavior, it is not possible to study the entire discipline since 1990 in a single study. Hence the study only focuses on relevant and emerging trends in Organizational Behavior.*

Implications – *The study aims to fill the gap of unavailability of a structured systematic literature review in the discipline of Organizational Behaviour. This may serve as an important source of information for Academicians, Practitioners. The study postulates new avenues for future research.*

Originality – *The study contributes to the methodology for conducting Systematic Literature Reviews in the field of management, specifically in Organizational Behaviour. It highlights an effective method for mapping out thematically, and viewing holistically, emerging research trends.*

Keywords: Future Workplaces, Systematic Literature Review, Organizational Behavior

Reference to this paper should be made as follows: Kalwani, S., Mahesh, J. (2020). Trends in organizational behavior: A systematic review and research directions. *Journal of Business and Management, 26*(1), March, 40-78. DOI: 10.6347/JBM.202003_26(1).0003.

Introduction

Organization Behavior is the study of human behavior in an organizational setting (Baron and Greenberg, 1990). It is a multidisciplinary subject devoted to understanding of individual and group behavior, interpersonal processes, and organizational dynamics. It has emerged from the disciplines of psychology, sociology, political science, and economics (Schneider 1985). The study of Organizational Behavior as a discipline can be categorized into three simple levels: micro level (individual); meso level (group) and macro level (organization) (Barbour, 2017).

The period before 1890 is known as the Pre-Scientific Management era. In the period after 1890, Management Theories started gaining importance. Scientific Management was developed during this period. Scientific Management is also a theory of management, which focuses on improving economic efficiency, especially labor productivity. The period between 1920 and 1930 characterizes the growth of literature on human relations (Warner, 1994). This inter-war period paved way for work groups emerging as an important component of human relations. In 1920's, Hawthorne Effect studied the socio-psychological impact of human behavior in organizations. This study focused on relationship between productivity and variables such as lighting in the workplace, clean workstation, allowing employees to build and work in teams, and having regular breaks. (Mayo et al., 1939). The growing importance of people factor as the core of human relations became a concern for many active organizations in that inter-war period (Follet 1941; Child 1969). During the Word War I, considerable efforts were made to boost up worker's motivation due to war crisis. Similar practices were observed after 1918 in the peace time after World War II. Organizational behavior started to establish post World War II, specifically after 1945, as an academic discipline.

Due to the traditional and obsolete practices adopted by Human Relations, Organizational Behavior as a discipline started gaining importance. It emerged as the study of the structure and functioning of the organizations, its culture, its sub-elements and behavior of the groups and individuals within them. It emerged as an interdisciplinary science interlinking disciplines of sociology, psychology, economics, political science, social anthropology and production engineering. (Pugh et al., 1975).There has been significant literary work done post 1945 after establishment of Organizational Behavior as a discipline.

However, there is a dearth of a well-defined, relevant and structured study that explains the development of the discipline over the years. The need to understand how the discipline will work towards academic and practical implication for future research under the light of multi-disciplinarily gives rise to the need of framing this research paper. Thus, the purpose of this paper is to depict a clear picture of sub-elements in complexities and explore innovative areas of research that would help researchers and scholars in postulating new research avenues for research and development in the domain of Organizational Behavior. These new developments in the discipline will help practitioners take sound decisions backed by a systematic literature base.

In the forthcoming sections, the paper explains the various dimensions and sub-elements of Organizational Behavior. The evolution and establishment of the domain is defined in detail with the help of the technique of Systematic Literature Review. A step-by-step objective approach and the literature can serve as a basis for future research by scholars, as well as for implementation by practitioners.

Review Methodology and Structure

Identification of relevant literature

The first step in the review was identifying the relevant literature on organizational behavior. A total of 81 research papers spread across the time-period of 1990-2019 were considered for the study. The growing significance of understanding Organizational Behavior as a discipline and Systematic Literature Review as a review technique is the primary reason behind selection of the period of 1990-2019 for the study.

Scholarly databases such as EBSCO, Emerald, Springer, Elsevier, Wiley, ProQuest, J Stor and Taylor and Francis were searched using the key phrase 'literature review' 'systematic literature review' and 'organizational behavior'. A total of 93 papers were identified for the study.

Inclusion and Exclusion Criteria

- Keyword: Using the database of ISI Web of Knowledge and the keyword "Organizational Behaviour" 26,418 papers were identified.
- Discipline: Using the inclusion criteria of "Management" as a discipline, the number of papers was reduced to 10,535.
- Language: Selection of "English" as a language reduced the number to 10,454
- Review Papers: Using "Review Papers" as the inclusion criteria, the number reduced down to 774 papers
- Research Areas: Using "Management Science", "Psychology", "Behavior Science", "Social Science", "Education Research", "Operation and Management Science", "Communication", "Sociology" as the inclusion category for allied research areas, 416 research papers were retrieved. Out of which 81 relevant research papers concerning performing Systematic Literature Review on emerging trends in Organizational Behavior were studied.

Analysis of Results

Table 1: Country-wise distribution of research papers.

Country	1990-1995	1996-2000	2001-2005	2006-2010	2011-2019	TOTAL
USA	2	5	6	10	19	42
UK	1	2	1	3	5	12
India	-	-	-	-	3	3
Australia	-	-	2	1	2	5
Belgium	-	-	-	-	1	1
Thailand	-	1	-	-	-	1
Brazil	-	-	-	-	1	1
Canada	-	-	-	1	2	3
China	-	-	-	-	2	2
Egypt	-	-	-	1	-	1
Germany	-	-	-	-	3	3
Israel	-	1	-	-	-	1
Netherlands	-	-	-	1	-	1
Norway	-	-	-	-	1	1
Singapore	-	-	1	-	-	1
Spain	-	-	-	-	1	1
Switzerland	-	-	-	-	1	1
Turkey	-	-	-	-	1	1
TOTAL	3	9	10	17	42	**81**

Inference: The country wise segregation shows that there has been manifold increase in the literature availability concerning Organizational Behavior after 1990 (see Table 1). And hence the period of 1990- 2019 has been chosen for the study. The table also shows the growth and prominence of Organizational Behavior as a discipline in developed countries like USA & UK. Hawthorne Studies which was a major development in the discipline was carried out in Western Electric, USA. Due to the majority of developments in the discipline being associated with USA, availability of literary studies is maximum for USA here. In the Indian context, the availability of prominent literature is scarce, and is mainly observed after the period of 2011. Hence there is a dearth of research literature in Organizational Behavior in Indian Context.

Organizational Behavior by definition is concerned with the study of what people do in an organization (social system), and how that behavior affects the performance of the organization at Individual, Group & Organization Level (Robbins and Judge, 1993). Hence we have classified the papers and sub-areas on the basis of three unit of analysis: Individual, Group and Organization.

Table 2: Subject-area wise distribution of research papers.

Unit of Analysis	**Areas in Organizational Behaviour**	**1990-1995**	**1996-2000**	**2001-2005**	**2006-2010**	**2011-2019**	**TOTAL**
Individual	Emotions at Workplace	-	-	1	1	4	6
	Personality	-	-	-	3	4	7
	Motivation	1	4	2	1	-	8
Group	Leadership	-	2	2	-	11	15
	Communication	3	1	-	-	1	5
	Group Effectiveness, Competition and Performance	1	2	-	-	4	7
Organization	Positive Organizational Behaviour	-	1	2	2	3	8
	Organizational Citizenship Behaviour	-	-	-	1	4	5
	Technology and Virtual Organizations	-	-	1	2	2	5
	Workplace Demographics and Gender Roles	-	-	2	-	1	3
	Work Stress and Workplace Deviance	-	-	-	1	3	4
	Organizational Culture	-	-	1	-	2	3
	Organizational Politics and Conflict Management	-	-	-	1	3	4
	Corporate Social Responsibility	-	-	-	-	1	1
	TOTAL	5	10	11	12	43	**81**

Inference: Table 2 displays the patterns in literary studies in various sub-areas of Organizational Behavior over the past decade. Some of the sub-areas indicating significant shift in patterns are discussed in the following statements. Emerging subject area like

'Emotions at Workplace' has seen a literary growth in studies from 16.66% in 2001-2005 to 66.66% in 2011-2019. Also with changing patterns of Leadership, a tremendous growth in the sub-domain can be observed. Literary studies in 'Leadership' have moved from 8.33% in 1996-2000 to 83.33% in 2011-2019.

Table 3: Journal wise distribution of research papers.

Journal Name	No. of Papers	ABDC Ranking	Database
Academy of Management	1	A*	Academy of Management
The Leadership Quarterly	9	A*	Elsevier
Annual Review of Organizational Psychology and Organizational Behavior	2	A*	Annual Reviews
Human Relations	2	A*	Sage Publications
European Journal of Marketing	1	A*	Emerald Group Publishing
Academy of Management Review	2	A*	Academy of Management
Organization Studies	1	A*	Sage Publications
Journal of International Business Studies	1	A*	Springer International Publishing
MIS Quarterly	1	A*	Association for Information Systems (AIS)
Journal of Applied Psychology	5	A*	American Psychological Association
Journal of Management	10	A*	Sage Publications
Journal of Management Studies	3	A*	John Wiley & Sons, Inc.
Journal of Organizational Behavior	6	A*	John Wiley & Sons, Inc.
Personnel Psychology	1	A*	John Wiley & Sons, Inc.
Psychological Bulletin	1	A*	American Psychological Association
Psychological Review	1	A*	American Psychological Association
International Journal of Management Reviews	1	A	John Wiley & Sons, Inc.

Journal of Applied Psychology: An international review	1	A	John Wiley & Sons, Inc
Journal of Business Ethics	1	A	Springer International Publishing
Journal of Knowledge Management	1	A	Emerald Group Publishing
Personnel Review	1	A	Emerald Group Publishing
Journal of Personality	1	A	John Wiley & Sons, Inc
Journal of Supply Chain Management	1	A	John Wiley & Sons, Inc.
Journal of World Business	1	A	Elsevier
Journal of World Business	1	A	Elsevier
Small Group Research	2	A	Sage Publications
International Journal of Conflict Management	1	A	Emerald Group Publishing
Human Performance	1	A	Taylor and Francis Online
International Journal of Manpower	1	A	Emerald Group Publishing
Work and Occupations	1	A	Sage Publications
Asia Pacific Journal of Management	1	A	Springer International Publishing
Organizational Psychology Review	1	B	Sage Publications
Journal of Social Psychology	1	B	Taylor & Francis Online
Production Planning and Control	1	B	Taylor & Francis Online
Human Resource Development Review	2	B	Sage Publications
Human Resource Development Quarterly	1	B	John Wiley & Sons, Inc.
European Journal of Work and Organizational Psychology	1	B	Taylor & Francis Online
The Learning Organization	1	C	Emerald Group Publishing
Management Research Review	1	C	Emerald Group Publishing

International Entrepreneurship and Management Journal	1	C	Springer International Publishing
Negotiation and Conflict Management Research	1	C	John Wiley & Sons, Inc.
Journal of Development Effectiveness	1	C	Taylor & Francis Online
Journal of Health Services Research and Policy	1	C	Sage Publications
Journal of Managerial Psychology	2	C	Emerald Group Publishing
Management Research News	1	C	Emerald Group Publishing
Management Research News	1	C	Emerald Group Publishing
Management Review Quarterly	1	-	Springer

Inference: Table 3 represents study of top journals for the review. 30.76% Journals considered for the analysis have A* ranking in ABDC. And 26.92% of Journals considered here for analysis have A ranking in ABDC (ABDC here is a Journal Quality Ranking given by Australian Business Deans Council). Apart from top journals in Organizational Behavior, A* Journals such as Psychological Bulletin, European Journal of Marketing, Journal of Applied Psychology and others from different disciplines have been considered to provide an interdisciplinary approach to the study.

Trends and Future Directions of Research

Organizational behavior is an interdisciplinary field of study, drawing from the psychological and sociological sciences. One of the main reasons for this interdisciplinary approach is because the field of organizational behavior involves multiple levels of analysis. These levels of analysis are necessary to understand behavior within organizations and also with context to the surrounding environment, because people do not act in isolation. Employees influence their environment and are also influenced by their environment. Hence we have studies the emerging trends in the light of Individual, Group and Organizational level of analysis.

Individual Level

Personality Traits

The aim of organizational behavior and work psychology has been to understand and uncover reasons behind why individuals vary in their motivation to work. A personality trait provides a person with an inclination to behave in a certain way (Eysenck, 1985). The relationship

between motivation and individual personality traits as well as situational factors is of prime importance to understand sub-elements of organizational behavior (Furnham 2009). The study of personality traits in the formative years was marked by factor-analytic approach developed by Cattell and Eysenck. The Sixteen Personality Factor Questionnaire (16PF) is a self-report personality test developed by Raymond B. Cattell, Maurice Tatsuoka and Herbert Eber Cattell in 1949. Cattell developed the 16 personality factor (16PF) questionnaire with empirical justifications and identified 16 key personality dimensions. He explained that these 16 personality types accounted for the variance in individual differences between people. Eysenck's approach towards the study of personality types was at more basic level. He identified initially two (extraversion and neuroticism) and later three or four underlying personality factors. Chronologically the next big development was the "big five" model by J.M Digman in 1990. It identified five major factors underlying human individual differences in personality. The big five factors are described as conscientiousness, neuroticism, extraversion, agreeableness, and openness. There are also some competing frameworks such as the "big three" (neuroticism, extraversion, and psychoticism) and the more pragmatic "big nine" (Hough, 1992). Trait factor-analytic theory clearly implies that personality characteristics lead towards a particular behavior across a variety of different situations. Behavior is a summation of consistent individual differences in one's personality and function of the situations. A more recent development is the concept of reciprocal determinism developed by Bandura (1986). The concept focuses on the three key sets of variables, behavior, personal qualities, and situations, which interact in a mutually reciprocating way. It provides clarity on the context regarding the understanding of personality variables. To understand individual behavior as a part of work psychology and organizational behavior, study of personality trait is an important exercise. Future research on the various possible combinations of personality traits with respect to the work environment can work wonders for practitioners ahead. Such study will help the organization understand employee behavior holistically.

Motivation

Out of all the subject themes in the disciplines of Organizational Behavior and Industrial Organizational Psychology, motivation has consistently been one of the most confusing (Locke and Henne 1986, Shamir 1991). There have been a lot of motivational theories that have developed over years. Need theories (Maslow 1954, Mc. 1985), equity or social comparison theory (Adams 1965), expectancy theory (Vroom 1964), reinforcement theory (Hamner 1975), goal setting theory (Locke and Latham 1990), intrinsic motivation theory (Hackman and Oldham 1990).The problem is not with the development or addition of new theories but with universal applicability of the same. (Shamir 1991). So the need is not to add more motivational theories but to reconceptualise the existing ones. It is difficult to say what may motivate an employee as it may differ on the basis of individual characteristics. The overall aim should be to have employees identify their own welfare and wellbeing with that of the organization. (Bruce and Pepitone 1999, Milne 2007).

The basis of employee motivation has always been to hoard knowledge because of the competitive advantage that this would give to an organization. The new organizational culture shaping up however defies the older norms. It believes in sharing of knowledge and hence is progressing towards Knowledge Management. The restructuring of motivational

theories in the light of knowledge management will help understand employee motivation and help organizations match individual goals with organizational goals (Milne, 2007). Future direction of research in this area can help the researchers and practitioners understand the dynamics of factors that keep employees motivated at work. This may then help organizations solve the issue of attrition rate to some extent.

Attachment Theory and Emotions at Workplace

The concept of Emotional Intelligence and management of emotions at workplace has emerged as a powerful concept in work psychology in the last decade (Zeidner, Roberts, and Matthews, 2004, Hjerto 2017). The growing importance of managing emotions at working has led to evolution of concepts like "Attachment Theory". The theory states that how attachment dynamics are directly related to positive organizational outcomes such as follower proactivity (Wu & Parker 2017, Yip 2015), ethical decision making (Chugh, Kern et al.,2014, Yip 2015), effective negotiation behavior (Lee & Thompson2011, Yip 2015), and creative problem solving (Mikulincer, Shaver et al.,2011, Yip 2015).

Whereas it also states the negative aspect that when attachment needs are not fulfilled, consequences follow. There is increased stress (Schirmer and Lopez, 2001, Yip 2015), higher reports of burnout (Littman-Ovadia, Lavy et al., 2013, Yip 2015), and increased turnover (Tziner, Oren et al., Yip 2015) among other undesired outcomes. The influence of attachment theory on organizational behavior has grown manifold.

The number of literature available for the last 5 years is much more than the preceding 25 years combined. The implementation of learnings from the theory can serve as an important tool for managing emotions at workplace and promoting healthy work relationships (Yip 2015).

Managing emotions at workplace is an emerging and challenging issue for most of the organizations. Further research on understanding the dynamics of work relationships, and its impact on employee morale and productivity, can help organizations boost employee engagement to considerable extent.

Group Level

Communication Relationship Satisfaction (CRS)

There has been a significant amount of research in the past decade trying to understand the factors affecting commitment of the employees to their organization. Research has also stated the importance of individual as well as organizational influence on organizational commitment (Angle & Perry, 1983). One of the most important reasons for lack of commitment is the disengagement of employee in important organizational decisions. The importance of communication and member's satisfaction with communication relationships cannot be overlooked (Putti1990).

Communication Relationship Satisfaction (CRS) is the extent to which and individual seeks information regarding their job role and is informed about the

organizational activities. Communication Relationship Satisfaction may be defined as the "personal satisfaction inherent in successfully communicating to someone or successfully being communicated with" (Thayer 1967). Communication Relationship Satisfaction can either be defined as an attitudinal or behavioral concept (Salancik 1977). The study of the impact of individual as well as group attitude and behavior on the concept can help us understand and resolve the issue of organizational commitment to some extent. Further research in this area can help us understand the dynamics of human communications at workplaces with respect to the job role and line of authority involved.

Leadership and Change

Scholars have had contrary views on the established leadership theories. Some of them argue that these theories fail to capture some of the construct space around how leadership is conceptualized (Dickson, Castano, Magomaeva and Den Hartog 2012; Dorfman et al 1997; Liden 2012; Psui 2007; Hiller,Sin, et al., 2019). There has been a considerable and parallel shift in the scholarly view of leadership dimensions. Earlier the simplistic one-dimension approach to leadership wherein ''concern withpeople'' versus ''concern with production'' were seen as mutually exclusive leader options (Vecchio 2002). Fieldler's (1967) construct of the Least Preferred Co-worker went through a lot of criticism for being one of its kind bi-polar views. It was said that there is an ideal combination displayed in these constructs. (Vecchio2002).Later, the leadership style defined by Kurt Lewin gained popularity. His classification of leadership includes Autocratic, Democratic, and Laissez Faire leadership (Kurt Lewis, 1974). Post 1974, there have evolved multiple takes on leadership from Charismatic Leadership, Contingency Theory of Leadership, Participative Leadership, Leader- Member Exchange Theory, to Situational Leadership.

Moving past the traditional backdrop, the emergence of value-driven leadership seems to be a growing theoretical stream of thought and research well suited for the complexity of organizational behavior in the 21st century. The shift in the style of leadership is due to the strategic restructuring witnessed by organizations. The recent emerging trend in leadership has been the Paternalistic Leadership (PL). Paternalistic Leadership is defined by genuine concern, kindness by leader for follower's holistic wellbeing. It is based on the expected or typical relationship between a parent (father) and a child. (Aycan 2006; Chen and Farh 2010;Farh and Cheng 2000; Hiller, Sin et al., 2019). Further research on these new theories of leadership, that are value driven as well as focus on the overall wellbeing of the followers, can pave the way for future workplaces. A thorough understanding and study of these emerging leadership styles will solve a lot of organization issues and grievances.

Organization Level

Organizational Identification and Corporate Social Responsibility

Organization identification is yet another emerging trend in the discipline of Organizational Behavior. It is defined as a perceived unity with the feeling of belonging to an organization

(Ashton and Mael 1989; Shen 2014). The concept stems from social identity theory which suggests that people categorize themselves and others into social groups in order to develop a positive self-esteem (Shen 2014). An organization's conformity to social norms may help the employees relate and belong to the organization as well as build a positive self-esteem. (Ashforth and Mael, 1989; Dutton et al., 1994; Mathieu and Zajac, 1990; Shen 2014). Under various components of the institutional theory, the regulative and normative structures and activities forces organizations to adhere to social norms (Scott 1995, Shen 2014). Adhering to social norms and taking up Corporate Social Responsibility (CSR) helps employees identify with the organization and is considered a positive influence on various employee behaviors (Rupp et al., 2006, Shen 2014). Practitioners as well as researchers can study the correlation between Organizational Identification, Corporate Social Responsibility and employee engagement. The positive correlation can be enhanced if the factors involved in the equation are studied carefully.

Organizational Citizenship Behavior (OCB)

The term Organizational Citizenship Behavior was coined by Bateman and Oregan (1983). Though there were studies prior to coining of the term that observed employee's willingness to cooperate in the workplace (Katz and Kahn 1966, Lanndon, Venus et al., 2018). Organizational Citizenship Behavior is the work-related cooperation offered by an employee beyond his work obligations. Organizational Citizenship Behavior has been explored in various disciplines and contexts lately. Research in the domain has shown a strong relationship between individual level outcomes (e.g. managerial ratings of employee performance, reward allocation decisions, and a variety of withdrawal-related criteria) as well as organizational-level outcomes (e.g. productivity, efficiency, reduced costs, customer satisfaction, and unit-level turnover) with Organizational Citizenship Behavior (Podsakoffet al. 2009; Lanndon,Venus et al., 2018).

Further research in this area can help researchers, practitioners and policy makers understand the individual as well as group level outcomes associated with the concept. Thus understanding of Organizational Citizenship Behavior in its entirety can help resolve important issues of workplace deviance and employee commitment.

Discussion and Conclusion

There seems to be no doubt that the future of workplaces will uphold major challenges pertaining behavior at individual, group and organizational level. The study delves into research of such patterns at workplaces. The period from 1990- 2019 has been selected for study because of the significant growth rate associated with the discipline during this time. The period has observed major growth in research literature and emerging concepts such as Communication Relationship Satisfaction (CRS), Organization Citizenship Behavior (OCB), Attachment Theory and others. The vast array of topics covered under Organizational Behavior does not make it possible to study the entire discipline since 1990 in a single study. Hence the study limits to understanding and analyzing trends in Organizational Behavior since 1990. This Systematic Literature Review did not place any

limitation on the publication year of journal articles; however, evolution of some significant trends (Such as Organizational Citizenship Behavior and Organizational Identification, Attachment Theory etc) in Organizational Behavior took place post 1990. There are a large number of research papers and materials available for study under the well-establish discipline of Organizational Behavior. Due to the inclusion and exclusion criteria used for the screening of the papers, there is a possibility of missing out on some important research work or papers.

This acts as one of the major limitations of the study. Researchers or practitioners can identify the papers that have not been covered under the study to further conduct a research on them. The sub-area wise (motivation, leadership etc) segregation of literature is on the basis of availability of papers used for the study. This makes it difficult to observe trends such as growth in a particular sub-area over the last decade. The limitations mentioned above can serve as a base for future research.

Despite these limitations, our review contributes to practice by focusing exclusively on individual, group and organizational behavior pertaining future of workplaces. This helps practitioners understand how recent trends in Organizational Behavior can form a basis of future challenges at workplaces. This will not only help develop competent and strategically flexible workplaces but also to develop an efficient policy framing guidelines. We hope this contribution inspires more research on developing trends in Organizational Behavior that will define future of workplaces.

References

Aguinis, H., Simonsen, M. M., & Pierce, C. A. (1998). Effects of nonverbal behavior on perceptions of power bases. *The Journal of Social Psychology*, 138(4), 455-469.

Ashforth, B. E., Harrison, S. H., & Corley, K. G. (2008). Identification in Organizations: An examination of four fundamental questions. *Journal of Management*, 34(3), 325–374.

Ashkanasy, N. M., Härtel, C. E. J., & Daus, C. S. (2002). Diversity and emotion: The new frontiers in Organizational Behavior research. Journal of Management; 28(3), 307–338.

Ashkanasy, N. M., Humphrey, R. H., & Huy, Q. N. (2017). Integrating emotions and affect in theories of management. *Academy of Management Review*, 42(2), 175–189.

Banks, G. C., Gooty, J., Ross, R. L., Williams, C. E., & Harrington, N. T. (2018). Construct redundancy in leader behaviors: A review and agenda for the future. *The Leadership Quarterly*, 29(1), 236-251.

Bolino, M. C., Kacmar, K. M., Turnley, W. H., & Gilstrap, J. B. (2008). A multi-level review of impression management motives and behaviors. J*ournal of Management*, 34(6), 1080–1109.

Bonaccio, S., O'Reilly, J., O'Sullivan, S. L., and Chiocchio, F. (2016). Nonverbal behavior and communication in the workplace. *Journal of Management*, 42(5), 1044–1074.

Brown, A. D., & Starkey, K. (1994). The effect of organizational culture on communication and information. *Journal of Management Studies*, 31(6), 807–828.

Bruce J. Avolio; William L. Gardner (2005). Authentic leadership development: Getting to the root of positive forms of leadership. *The Leadership Quarterly,* 16 (3), 315-338

Carnes, C. M., Xu, K., Sirmon, D. G., & Karadag, R. (2019). How competitive action mediates the resource slack–performance relationship: A meta-analytic approach. *Journal of Management Studies*, 56(1), 57-90.

Carnes, C. M., Xu, K., Sirmon, D. G., & Karadag, R. (2018). How competitive action mediates the resource slack-performance relationship: A meta-analytic approach. *Journal of Management Studies*, 56(1), 57-90.

Cascio, W. F., and Montealegre, R. (2016). How technology is changing work and organizations. *Annual Review of Organizational Psychology and Organizational Behavior*, 3(1), 349–375.

Chiaburu, D. S., & Harrison, D. A. (2008). Do peers make the place? Conceptual synthesis and meta-analysis of coworker effects on perceptions, attitudes, OCBs, and performance. *Journal of Applied Psychology*, 93(5), 1082–1103.

Clark, M. A., Robertson, M. M., & Young, S. (2018). "I feel your pain": A critical review of organizational research on empathy. *Journal of Organizational Behavior*, 40(2), 166-192

Cooper, H. M. (2003). Editorial. *Psychological Bulletin*, *129*(1), 3–9.

Donia, M. B. L., Johns, G., Raja, U., & Khalil Ben Ayed, A. (2017). Getting credit for OCBs: potential costs of being a good actor vs. a good soldier. *European Journal of Work and Organizational Psychology*, 27(2), 188–203.

Eldor, L. (2016). Work engagement. *Human Resource Development Review*, 15(3), 317–339.

Ferris, G. R., Ellen, B. P., McAllister, C. P., & Maher, L. P. (2019). Reorganizing Organizational Politics research: A review of the literature and identification of future research directions. *Annual Review of Organizational Psychology and Organizational Behavior*, 6(1), 299–323.

Furnham, A., Eracleous, A., & Chamorro-Premuzic, T. (2009). Personality, motivation and job satisfaction: Hertzberg meets the Big Five. *Journal of Managerial Psychology*, 24 (8), 765-779

Götz, M., Bollmann, G., and O'Boyle, E. H. (2018). Contextual undertow of workplace deviance by and within units: A systematic review. *Small Group Research*, 50(1), 188-203

Hatch, M. J., & Schultz, M. (1997). Relations between organizational culture, identity and image. *European Journal of Marketing*, 31(5-6), 356-365.

Hiller, N. J., Sin, H. P., Ponnapalli, A. R., & Ozgen, S. (2019). Benevolence and authority as weirdly unfamiliar: A multi-language meta-analysis of paternalistic leadership behaviors from 152 studies. *The Leadership Quarterly*, 30(1), 165-184.

Hjerto, K. B. (2017). Burning hearts in conflict: new perspectives on the intragroup conflict and team effectiveness relationship. International *Journal of Conflict Management,* 28(4), 536-536.

Knight, C., Patterson, M., & Dawson, J. (2016). Building work engagement: A systematic review and meta-analysis investigating the effectiveness of work engagement interventions. *Journal of Organizational Behavior*, 38(6), 792–812.

Kudret, S., Erdogan, B., & Bauer, T. N. (2019). Self-monitoring personality trait at work: An integrative narrative review and future research directions. *Journal of Organizational Behavior*, 40(2), 193-208.

Locke, E. A., & Latham, G. P. (1990). *A Theory of Goal Setting & Task Performance*. Prentice-Hall, Inc.

Luthans, F., & Youssef, C. M. (2007). Emerging positive organizational behavior. *Journal of Management*, 33(3), 321–349.

Maslow, A. H. (1943). A theory of human motivation. *Psychological Review*, 50(4), 370.

Mathieu, J., Maynard, M. T., Rapp, T., & Gilson, L. (2008). Team effectiveness 1997-2007: A review of recent advancements and a glimpse into the future. *Journal of Management*, 34(3), 410–476.

Pandey, J. (2019). Factors affecting job performance: An integrative review of literature. *Management Research Review*, 42(2), 263-289.

Putti, J. M., Aryee, S., and Phua, J. (1990). Communication relationship satisfaction and organizational commitment. *Group & Organization Studies*, 15(1), 44–52.

Rhoades, L., and Eisenberger, R. (2002). Perceived organizational support: A review of the literature. *Journal of Applied Psychology*, 87(4), 698–714.

Shen, J., & Benson, J. (2016). When CSR is a social norm. *Journal of Management*, 42(6), 1723–1746.

Smith, M. B., Hill, A. D., Wallace, J. C., Recendes, T., & Judge, T. A. (2018). Upsides to dark and downsides to bright personality: A multidomain review and future research agenda. *Journal of Management,* 44(1), 191-217.

Swab, R. G., & Johnson, P. D. (2019). Steel sharpens steel: A review of multilevel competition and competitiveness in organizations. *Journal of Organizational Behavior,* 40(2), 147-165

Upasna A. Agarwal, Vishal Gupta, (2018). Relationships between job characteristics, work engagement, conscientiousness and managers' turnover intentions: A moderated-mediation analysis. *Personnel Review,* 47(2), 353-377

Weikamp, J. G., and Göritz, A.S. (2016). Organizational citizenship behavior and job satisfaction: The impact of occupational future time perspective. *Human Relations,* 69(11), 2091–2115.

Youssef, C. M., and Luthans, F. (2007). Positive organizational behavior in the workplace. *Journal of Management,* 33(5), 774–800.

Zeidner, M., Matthews, G., & Roberts, R. (2004). Emotional intelligence in the workplace: A critical review. *Applied Psychology*, 33(3), 371-399.

Appendix

Table A: Literature Classification for further meta-analysis

Literature is classified on the basis of type of study (empirical/conceptual), variables used, scales used, sample studies and sub area of study. This can be further used by researchers and practitioners to conduct meta-analysis.

Paper title	Sub-area	Type	Variables Used	Scale Used/ Studies	Sample Size/ Number of papers
Benevolence and authority as weirdly unfamiliar: A multi-language meta-analysis of paternalistic leadership behaviors from 152 studies	Leadership	Empirical	1)Employee out-comes 2)Attitudes towards leader 3)Leadership constructs 4)Follower cultural values 5)Leader and subordinate demographics Methodological Variables: 1) Criterion type (cross-source/non-self-report vs. self-report). 2) The language of the publication (English vs. non-English), and 3) Source (cross-sectional vs. longitudinal).	PL scale (Cheng et al.,2000)	165 independent samples from 152 studies (N= 68,395)
Convergence and divergence of paternalistic leadership: A cross-cultural investigation of prototypes	Leadership	Empirical	1. Paternalistic Leadership 2. Transformational Leadership 3. Nurturant task Leadership 4. Participative Leadership 5. Authoritarian Leadership 6. Vertical Collectivism	1. Paternalistic Leadership: Aycan's (2006) 21-item paternalistic leadership questionnaire (PLQ) 2. The Transformational Leadership measure of Bass and Avolio (1994) was used in this study. 3. Nurturant-task Leadership: Sinha's (1995) ten-item scale 3. Participative Leadership: Seven items of the Leadership Style Scale	1272 employees

				(Sinha 1995) 4. Authoritarian Leadership: ten items of the Leadership Style Scale (Sinha, 1995) 5. Vertical Collectivism : The four-item measure (Singelis et al., 1995)	
Benevolent leadership and follower performance: The mediating role of leader-member exchange (LMX)	Leadership	Empirical	**Variables:** Benevolent Leadership; Leader-member exchange; Follower task performance; Organizational Citizenship Behaviour towards the Organization **Control Variable:** Gender, Education level, Age, Organization tenure, and Leader–follower dyad tenure to follower task performance and Organizational Citizenship Behaviour towards the Organization	1. Benevolent Leadership: Cheng et al.'s (2000) scale 2. Leader-member exchange: 7-item LMX scale from Liden, Wayne, and Stillwell (1993) 3. Follower task performance : 5-item scale from Williams and Anderson (1991) 4. Organizational Citizenship Behaviour towards the Organization: 8-item scale developed by Lee and Allen (2002)	Sample of 223 leader–member dyads in a non-profit organization
Paternalistic leadership and employee voice: Does information sharing matter?	Leadership	Empirical	1. Paternalistic leadership (PL) 2. Transformational leadership 3. Employee voice 4. Organizational citizenship behavior (OCB) 5. Control variables: Sex, Age and Education Levels are	Paternalistic Leadership: Cheng et al. (2000) scales Transformational Leadership: Podsakoff et al.'s (1990) Employee Voice: Van Dyne and LePine (1998) Organizational Citizenship Behaviour: Lee and Allen (2002)	Sample of 286 leader–follower dyads collected from a manufacturing firm

			the Demographic Characteristics		
When CSR Is a Social Norm: How Socially Responsible Human Resource Management Affects Employee Work Behavior	CSR	Empirical	1. Supervisor-rated task performance 2. Peer-rated extra-role helping behavior 3. Socially responsible HRM 4. Organizational identification 5. Perceived Organizational Support 6. Cooperative norms 7. Employee rated/provided variables 8. Manager provided variables	1. Supervisor-rated task performance: Williams and Anderson (1991) 2. Peer-rated extra-role helping behavior: Organ and Konovsky (1989) 3. Socially responsible HRM: Orlitzky and Swanson (2006) 4. Organizational identification: Mael and Ashforth (1992) 5. Perceived Organizational Support: Hekman, Steensma, Bigley, and Hereford (2009) 6. Cooperative norms: Chatman and Flynn's (2001) 7. Employee rated/provided variables: Sun, Aryee, and Law (2007) 8. Manager provided variables: (Brammer & Millington, 2003) (Datta, Guthrie, & Wright, 2005)	35 manufacturing companies, 50 employees selcted randomly from each company. Total sample size= 1750
Beyond Collective Beliefs: Predicting Team Academic Performance From Collective Emotional Intelligence	Emotions	Empirical	1. Collective Emotional Intelligence 2. Team Academic Performance 3. Collective General Self-Efficacy (GSE) 4. Team-Level GSE (Team Potency)	16-item self-report scale, WLEIS, to measure ability-based EI (De Dreu & Gelfand, 2008; Law et al., 2004; Shi & Wang, 2007; Wong & Law, 2002). Scale is divided into four dimensions: self-emotion appraisal (SEA), other emotion appraisal (OEA), use of emotion (UOE), and regulation of emotion (ROE), each of which is assessed by four items	818 master's students, organized into 199 teams

Relationship between communication satisfaction and organizational identification: an empirical study	Communication	Empirical	1. Communication Satisfaction 2. Organizational Identification	1. Down's, (1990) Communication Audit Questionnaire (CAQ) 2. Organizational Identification Scale developed by Ashforth (1992)	67 working executives, working in 55 different organizations
Organizational citizenship behaviour and job satisfaction: The impact of occupational future time perspective	OCB	Empirical	1. Occupational future time perspective 2. Organizational Citizenship Behaviour 3. Job Satisfaction 4. Control Variables	1. Occupational future time perspective: Occupational Future Time Perspective scale (OFTP) (Zacher and Frese, 2009) 2. Organizational Citizenship Behaviour: Lee and Allen's (2002) scale 3. Job satisfaction: Brayfield and Rothe's (1951) job satisfaction scale by Judge et al. (2005) 4. Control Variables: Age,Gender,Education : OFTP (Zacher and Frese, 2009, 2011)	323 participants
Relationships between job characteristics, work engagement, conscientiousness and managers' turnover intentions: A moderated-mediation analysis	Work Engagement	Empirical	1. Conscientiousness 2. Job characteristics 3. Work engagement 4. Turnover intentions 5. Control variables	1. Conscientiousness: John et al. (1991) 2. Job characteristics: Idaszak and Drasgow (1987) 3. Work engagement: Schaufeli et al. (2006) 4. Turnover intentions: Wayne et al. (1997) 5. Control variables: demographic variables (age, gender, education, job tenure and job level) (Wiersema and Bantel, 1993)	1,302 valid responses out of the 2,000 people reached
Building work engagement: A systematic review and meta-analysis investigating the effectiveness of work engagement interventions	Work Engagement	Empirical	1. Work Engagement 2. Vigour 3. Dedication 4. Absorption	Utrecht Work Engagement Scale (UWES)	Twenty studies met the inclusion criteria while performing SLR. Study sample sizes ranged between 45 (Carter, 2008) and 612 (Vuori et al., 2012)

What motivates employees according to over 40 years of motivation surveys	Motivation	Empirical	1. Full appreciation of work done 2. Feeling of being in on things 3. Sympathetic help with personal problems 4. Job security 5. Good wages 6. Interesting work 7. Promotion and growth in the organization 8. Personal or company loyalty to employees 9. Good working conditions	"Factors that motivate me" Survey (1992)	460 employees
How Competitive Action Mediates the Resource Slack-Performance Relationship: A Meta-Analytic Approach	Competition	Empirical	1. Slack 2. Competitive Aggressiveness 3. Performance 4. Competitive Complexity	-	139 article
Something(s) old and something(s) new: Modeling drivers of global virtual team effectiveness	Technology	Empirical	1.Virtuality 2.Interdependence 3.Percentage of time allocated to team 4.Preparation activities 5.Transactive memory systems 6.Team effectiveness	1. Team effectiveness: (Podsakoff,MacKenzie, Lee, & Podsakoff, 2003) 2. Team mediator variables: Mathieu and Marks (2006)	Sample of 60 global,virtual supply teams from a large multi-national organization
The role of affect and leadership during organizational change	Organizational Change	Empirical	1. Organizational Change 2. Transformational Leadership 3. Commitment to Change 4. Affect	Watson and Clasrk (1992)	Sample size (n=430)
Perceived organizational support: A review of the literature	Perceived Organizational Support	Empirical	1. Perceived Organizational Support 2. Fairness 3. Organizational Rewards 4. Job Conditions 5. Supervisor Support	1. Eisenberger et al.'s scale 2. Hrebiniak and Alutto (1972) 3. Perceptions of Politics Scale (Ferris & Kacmar, 1992)	Review of 70 studies

Do peers make the place? Conceptual synthesis and meta-analysis of coworker effects on perceptions, attitudes, OCBs, and performance	Organizational Citizenship Behaviour	Empirical	1. Coworker support 2. Coworker antagonism 3. Role perceptions 4. Work attitudes 5. Withdrawal 6. Effectiveness	-	161 independent samples and 77,954 employees
Positive organizational behavior in the workplace - The impact of hope, optimism, and resilience	Positive Organizational Behaviour	Empirical	1. Performance 2. Job Satisfaction 3. Work Happiness 4. Organizational commitment	1. Snyder et al.'s (1996) 2. State Hope Scale 3. Scheier and Carver's (1985, 1992) 4. Shifren and Hooker (1995) 5. Block and Kremen's (1996) 6. Oldham and Hackman's (1980)	Two studies (N = 1,032 and N = 232)
Individual- and Organizational -Level Consequences of Organizational Citizenship Behaviors: A Meta-Analysis	Organizational Citizenship Behaviour	Empirical	1. Organizational Citizenship Behaviour 2. Employee Performance 3. Reward Allocation Decisions 4. Employee Turnover Intentions 5. Actual Turnover 6. Absenteeism 7. Productivity, 8. Efficiency 9. Reduced costs 10. Customer Satisfaction 11. Unit-level turnover	-	1. Individual level outcomes: 168 independent samples (N = 51,235 individuals) 2. Unit level outcomes: 38 independent samples (N= 3,611 units)
Authentic leadership development: Getting to the root of positive forms of leadership	Leadership	Conceptual	1. Positive psychological capital 2. Positive moral perspective 3. Leader self-awareness 4. Leader self-regulation 5. Leadership processes/behaviors 6. Follower self-awareness 7. Follower self-regulation 8. Follower	-	-

			development 9. Organizational context 10. Performance		
Self-monitoring personality trait at work: An integrative narrative review and future research directions	Personality	Conceptual	1. Self- monitoring 2. Leadership emergence 3. Performance 4. Social Networks 5. Impression Management 6. Employee Selection Process	-	112 research studies
I feel your pain". A critical review of organizational research on empathy.	Emotions	Conceptual	1. Affective Empathy 2. Cognitive Empathy 3. Behavioral Empathy 4. State and Trait Empathy 5. Observer Empathy and Judged Empathy 6. Sympathy/Empathic Concern/Compassion 7. Emotional Contagion and Affective Crossover 8. Emotional Intelligence 9. Empathic Accuracy	-	Sample literature from the period of 1983-2018 was chosen for study
Steel sharpens steel: A review of multilevel competition and competitiveness in organizations	Competition	Conceptual	1. Individual Competitiveness 2. Competitiveness in Teams 3. Competitive Processes 4. Collective Competitiveness	-	-

Construct redundancy in leader behaviors: A review and agenda for the future	Leadership	Conceptual	1. Traditional Leader Behaviors 2. Values based and Moral leader behaviors 3. Relational Correlates 4. Unit/Group behavioral effectiveness criteria 5. Follower behavioral effectiveness criteria	-	57 meta-analytic studies
Contextual Undertow of Workplace Deviance by and Within Units: A Systematic Review	Workplace Deviance	Conceptual	1. Workplace deviance 2. Counterproductive work behavior 3. Organizational misbehavior 4. Workplace aggression 5. Workplace violence 6. Antisocial behavior 7. Unethical behavior	-	Literature from the period 1995 to 2017 was considered
Getting credit for OCBs: potential costs of being a good actor vs. a good soldier	Organizational Citizenship Behaviour	Conceptual	1. Organizational Citizenship Behaviour 2. Organizational Concerns and Prosocial Values (Selfless Motives) 3. Impression Management (Self-Serving Motives) 4. Affective Committment 5. Equity Sensitivity 6. Performance 7. Reward Recommendations	1. Rioux and Penner (2001) 2. Sauley and Bedeian's (2000) 3. Meyer, Allen, and Smith's (1993) 4. Wayne and Liden's (1995) 5. Allen and Rush's (1998)	Sample of 197 employee-supervisor dyads
Reorganizing Organizational Politics Research: A Review of the Literature and Identification of Future Research Directions	Organizational Politics	Conceptual	1. Political Characteristics 2. Political Actions 3. Political Outcomes	1. Scales of impression management (Bolino & Turnley 1999) 2. Influence tactics (Kipnis & Schmidt 1988) 3. General political behavior (e.g., Valle & Perrewe 2000, Zanzi et al. 1991) 4. Individual political behavior (i.e., Liu et al. 2010, Sun & Chen 2017)	-

Affect and leader-member exchange in the new millennium: A state-of-art review and guiding framework	Leadership	Conceptual	1. Affect and leader-membership exchange 2. Personal affectivity 3. Discrete affect 4. Emotional intelligence 5. Emotional labor 6. Affective climate	-	Sample of 199 relevant articles
Peacemaking at the Workplace: A Systematic Review	Peace-making	Conceptual	1. Relational Peacemaking 2. Procedural Peacemaking 3. Emotional Peacemaking 4. Content help	1. Van Dyne and LePine (1998) 2. Giebels and Yang (2009)	3560 respondents from 12 different studies
Diversity and emotion: The new frontiers in organizational behavior research	Emotions	Conceptual	1. Mood theory 2. Emotional labor 3. Affective events theory (AET) 4. Emotional intelligence	1. Openness to dissimilarity scale (Fujimoto et al., 2000; Härtel et al., 1999) 2. Organizational diversity inventory (Hegarty & Dalton, 1995)	-
Upsides to Dark and Downsides to Bright Personality: A Multidomain Review and Future Research Agenda	Personality	Conceptual	1. Bright Traits 2. Dark Traits	1. 12-item Dirty Dozen (Jonason & Webster, 2010) 2. 27-item Short Dark Triad (SD3; Jones & Paulhus, 2014) 3. Machiavellian Personality Scale	-
The experience of work stress and the context of time: Analyzing the role of subjective time	Work Stress	Conceptual	1. Cultural influences 2. Organizational influences 3. Individual influences 4. Situational influences	-	-
Nonverbal Behavior and Communication in the Workplace: A Review and an Agenda for Research	Communication	Conceptual	1. Display Personal Attributes 2. Exercise Dominance and Establish Hierarchy 3. Promote Social Functioning 4. Foster High-Quality Relationships 5. Display Emotions	-	-

Effects of Nonverbal Behavior on Perceptions of Power Bases	Non-verbal Behaviour	Conceptual	1. Facial expression 2. Visual behavior 3. Body posture 4. Reward 5. Coercive 6. Legitimate 7. Referent 8. Expert 9. Credibility	1. Hinkin and Schriesheim's (1989) power scales 2. Nesler et al. (1993)	170 nontraditional U.S. undergraduate students
Integrating Emotions and Affect in Theories of Management	Emotions	Conceptual	1. Emotional Intelligence 2. Emotional Labor 3. Emotion-related organizational routines 4. Organizational-level paradoxes involving affect 5. Emotion Management Actions 6. Organizational structures 7. Emotion-Based Organizational Routines	Self- report scale by Jarvis	-
Relations between organizational culture, identity and image	Organizational Culture	Conceptual	1. Organizational Culture 2. Organizational Identity 3. Organizational Image	-	-
The effect of organizational culture on communication and information	Organizational Culture	Conceptual	1. Organizational Culture 2. Information 3. Communication	-	-
Meaning, Self and Motivation in Organizations	Motivation	Conceptual	1. Self Concept 2. Behaviour	-	-
The effects of formal mentoring on employee work motivation, organizational commitment and job performance	Motivation	Conceptual	1. Opportunities to interact 2. Closeness of relationship 3. Work motivation 4. Organizational Commitment 5. Job Performance	-	A pair of 39 mentors and 39 mentees

Motivation, incentives and organisational culture	Motivation	Conceptual	1. Reward characteristics 2. Organisational characteristics 3. Team characteristics 4. Individual differences	-	-
Factors affecting job performance: an integrative review of literature	Job Performance	Conceptual	1. Family Stressors 2. Job Stressors 3. Individual Stressors 4. Individual Resources 5. Job Resources 6. Organizational Resources 7. Social Resources	-	-
Work Engagement: Toward a General Theoretical Enriching Model	Work Engagement	Conceptual	1. Work Engagement 2. Employee–organization relationship 3. Job Involvement 4. Job Satisfaction	Utrecht Work Engagement Scale	-
Bridging Domains in Workplace Demography Research: A Review and Reconceptuali zation	Workplace Demography	Conceptual	1. Workplace Demography at Individual Level 2. Workplace Demography at Group Level 3. Workplace Demography at Firm Level	-	-
Inclusion and Diversity in Work Groups: A Review and Model for Future Research	Work Groups	Conceptual	1. Work Groups 2. Inclusiveness Climate 3. Inclusive Leadership 4. Inclusiveness Practices	Diversity and inclusion practices scale : Roberson (2006)	-
Core Self-Evaluation and Goal Orientation: Understanding Work Stress	Work Stress	Conceptual	1. Core self-evaluation (CSE) 2. General life stress 3. Goal orientation	1. Coping and Stress Profi le (CSP; Olson & Stewart, 1988) 2. Self-esteem (Rosenberg, 1965) 3. Self-effi cacy (Judge et al., 1998) 4. Locus of control (Levenson, 1981) 5. Neuroticism (Eysenck & Eysenck, 1968) 6. VandeWalle's (1997)	178 individuals participating in a leadership development program

How Technology Is Changing Work and Organizations	Technology	Conceptual	1. Technology 2. Organizational Psychology 3. Organizational Behaviour	-	-
Personality Strength and Situational Influences on Behavior: A Conceptual Review and Research Agenda	Personality	Conceptual	1. Personality Trait 2. Personality Strength	-	-
The good soldier: who is, s(he)? Leadership and gender advantage	Gender	Conceptual	1. Gender Roles 2. Altruism 3. Sportsmanship 4. Courtesy 5. Civic Virtue	-	-
Self-determination theory and work motivation	Motivation	Conceptual	1. Extrinsic Motivators 2. Intrinsic Motivators 3. Self-determination theory 4. Work motivation	-	-
A Multi-Level Review of Impression Management Motives and Behaviors	Impression Management	Conceptual	1. Impression Management at Individual Level 2. Application of Impression Management theory and concepts 3. Organizational Level Impression Management	1. Kumar and Beyerlein (1991) 2. Kacmar and Valle (1997) 3. Harrison, Hochwarter, Perrewe, and Ralston's (1998)	Three samples of 144, 236, and 204 fulltime employees
Identification in organizations: An examination of four fundamental questions	Organizational Identification	Conceptual	1. Organizational Identification 2. Organizational Commitment	-	-
Team effectiveness 1997-2007: A review of recent advancements and a glimpse into the future	Team Effectiveness	Conceptual	1. Cultural influence on teams 2. Human resource systems 3. Openness climate 4. Multiteam systems coordination 5. TMT–environment interface	-	-

Emerging positive organizational behaviour	Positive Organizational Behaviour	Conceptual	1. Positive traits 2. Psychological resource capacities 3. Positive organizations 4. Positive behaviours	-	-
Personality, motivation and job satisfaction: Hertzberg meets the Big Five	Motivation	Conceptual	1. Personality 2. Work values 3. Job satisfaction	1. Ten item personality inventory (Gosling et al., 2003) 2. Work values questionnaire (WVQ) (Furnham et al., 2005) 3. The job satisfaction scale (Warr et al., 1979)	Total of 202 fulltime workers
A Systematic Literature Review of Servant Leadership Theory in Organizational Contexts	Leadership	Conceptual	1. Cross-Cultural Applicability 2. Servant Leader Attributes 3. Followers' Well-Being 4. Spirituality 5. Demographics 6. Team Level Effectiveness 7. Implementation of Servant Leadership	Servant Leadership Scale developed by Ehrhart (2004)	39 appropriate studies
Organizational learning and knowledge in public service organizations: A systematic review of the literature.	Organizational Learning	Conceptual	1. Organizational Learning 2. Organizational Knowledge	-	Sample literature of 131 research papers
A Multi-Dimensional Framework of Organizational Innovation: A Systematic Review of the Literature	Organizational Innovation	Conceptual	1. Organizational Innovation 2. Leadership	-	Literature studies over the past 27 years have been considered
Integrating experimental and observational personality research – the contributions of Hans Eysenck	Personality	Conceptual	1. Extraversion 2. Impulsivity 3. Neuroticism	-	Literature after 40 years of Eysenck's plea for experimental approaches to personality research

The 'Big Five' Personality Variables--Construct Confusion: Description Versus Prediction	Personality	Conceptual	1. Affiliation 2. Potency 3. Achievement 4. Dependability 5. Adjustment 6. Agreeableness 7. Intellectance 8. Rugged Individualism 9. Locus of control	-	For all nine personality constructs, sum of samples= 25,135
A Theory of Goal Setting & Task Performance	Goal Setting & Task Performance	Conceptual	1. Self-efficacy 2. Goals 3. Performance	Wood and Locke's self-efficacy scale (1987)	-
Burning hearts in conflict: New perspectives on the intragroup conflict and team effectiveness relationship	Conflict Management	Conceptual	1. Cognitive task conflict 2. Emotional relationship conflict 3. Emotional task conflict 4. Team effectiveness	1. Intragroup Conflict Scale (Jehn, 1994, 1995, 1997) 2. IC scale (Hjerto, 2017) 3. Cognitive Conflict, Emotional Conflict and Emotional Relationship conflict scales a (Jöreskog and Sörbom, 1993)	61 work teams consisting of a total of 313 team members from six companies
Emotional Intelligence in the Workplace: A Critical Review	Emotional Intelligence	Conceptual	1. Emotional self-awareness 2. Regulation of emotions in the self 3. Social awareness of emotions and empathy 4. Regulating emotions in others 5. Motivational tendencies 6. Character	Bar-On's EQ-I Scale	Sample of 314 participants
A historical review of the development of organizational citizenship behavior (OCB) and its implications for the twenty-first century	Organizational Citizenship Behaviour	Conceptual	1. Organizational Citizenship Behaviour 2. Altruism 3. Conscientiousness 4. Courtesy 5. Civic virtue 6. Sportsmanship	Six-dimension scale developed by Lin (1991)	134 journals from different sources and a total of 267 articles
A Cultural Analysis of Paternalistic Leadership in Chinese Organizations	Leadership	Conceptual	1. Respect for Authority 2. Expectation of Leader's Benevolence	1. Cheng and Zhuang's Scale (1981) 2. Chinese CPM Scale (Ling, 1991)	1. The PRC (N = 1020) 2. Taiwan(N = 1176) 3. Hong-Kong(N = 261)

Benevolence and authority as weirdly unfamiliar: A multi-language meta-analysis of paternalistic leadership behaviours from 152 studies.	Leadership	Conceptual	1. Paternalistic Leadership 2. Task performance 3. Citizenship behaviors 4. creativity 5. attitudes towards the leader 6. Job attitudes 7. Leader effectiveness 8. Follower performance 9. Attitudes 10. Behaviors	Paternalistic Leadership Scale (Cheng et al., 2000)	165 independent samples from 152 studies (total N = 68,395) in fourteen countries
Conceptualizing leadership across cultures	Leadership	Conceptual	1. Leadership Theories 2. Cultural Contingencies	-	-
Communication Relationship Satisfaction and Organizational Commitment	Communication	Conceptual	1. Top management 2. Supervisor relationships	ICA-OCR instrument	122 white-collar employees in an engineering company
How Situational Cues and Mindset Dynamics Shape Personality Effects on Career Outcomes	Personality	Conceptual	1. Personality Traits 2. Situational Cues 3. Career Outcomes 4. Career enabling behaviour 5. Cognitive-affective personality system	-	-
Personality traits and personal values of servant leaders	Personality	Conceptual	1. Personality Traits 2. Personal Values 3. Age 4. Educational level 5. Conscientiousness 6. Extraversion 7. Neuroticism of leaders	-	Sample of 81 leaders and 279 of their direct reports
Planning Internal Communication Profile for Organizational Effectiveness	Communication	Conceptual	1. Communication Satisfaction 2. Communication Alignment 3. Communication Sensitivity Programmes	-	-

Relationship development and marketing communication: an integrative model	Communication	Conceptual	1. Communicator's intentions and qualities (ethos) 2. Communication climate (pathos) 3. Constructive dialogues with customers (logos)	-	-
Organizational Structure, Environment and Performance: The role of Strategic Choice	Organizational Performance	Conceptual	1. Organizational Structure 2. Organizational Performance 3. Contextual Environment 4. Technology 5. Firm Size	-	-
Leadership: do traits matter?	Leadership	Conceptual	1. Drive 2. Leadership motivation 3. Honesty and integrity 4. Self-confidence 5. Cognitive ability 6. Knowledge of the business 7. Charisma 8. Creativity 9. Flexibility	-	-
Team leadership	Leadership	Conceptual	1. Leadership Processes 2. Team Effectiveness 3. Team Cognitive Processes 4. Team Motivational Processes 5. Team Affective Processes 6. Team Coordination Processes	-	4 superordinate and 13 subordinate leadership dimensions and relate these to team effectiveness
Ethics, character, and authentic transformational leadership behaviour	Leadership	Conceptual	1. Ethics 2. Character 3. Authentic Transformational Leadership 4. Distributive Justice 5. Value Congruence 6. Stakeholder Theory	-	-
Leadership development:: A review in context	Leadership	Conceptual	1. Leader 2. Ledership Development	-	-

Intrinsic and Extrinsic Motivation	Motivation	Conceptual	1. Motivation 2. Attribution 3. Expectancy-value 4. Selfefficacy 5. Achievement goal perspectives	-	-
Aging, Adult Development, and Work Motivation	Motivation	Conceptual	1. Cognitive abilities 2. Personality 3. Affect 4. Vocational interests 5. Values 6. Self-concept	-	-
Gender and Motivation	Motivation	Conceptual	1. Attribution 2. Expectancy-value 3. Selfefficacy 4. Achievement goal perspectives	-	-
Information technology, organizational restructuring and the future of middle management	Technology	Conceptual	1. Information Technology 2. Organizational Restructuring	-	1000 questionnaire responses from managers of BIM, 150 questionnaire responses from corporate members
Demographic diversity and faultlines: The compositional dynamics of organizational groups	Demographics	Conceptual	1. Group Faultiness 2. Group Member Characteristics 3. Organizational Groups 4. Demographic Diversity	-	Sample of 345, 251, 344 and 250 people for group A, B, C and D, respectively.

Attachment theory at work: A review and directions for future research	Emotions	Conceptual	1. Adult attachment types 2. Adult Attachment Scale 3. Relationship Questionnaire 4. Attachment Style Questionnaire 5. Adult Attachment Questionnaire 6. Experiences in Close Relationships 7. Revised Experiences in Close Relationships 8. Self-reliance Inventory 9. Social Group Attachment Scale 10. Shortened ECR 11. Revised ECR—Relationship Structures Questionnaire 12. Experience of Relationships Survey 13. Secure base support 14. Supervisor security provision 15. Adult attachment interview 16. Lexical decision attachment prime 17. Visualization and writing attachment prime	Adult attachment types (Hazan & Shaver, 1987) Adult Attachment Scale (Collins & Read, 1990) Relationship Questionnaire (Bartholomew & Horowitz,1991) Attachment Style Questionnaire (Feeney et al., 1994) Adult Attachment Questionnaire (Simpson et al., 1996 Experiences in Close Relationships (Brennan et al., 1998) Revised Experiences in Close Relationships (Fraleyet al., 2000) Self-reliance Inventory (Joplin et al., 1999) Social Group Attachment Scale (Smith et al., 1999) Shortened ECR (ECR-short) (Wei et al., 2007) Revised ECR—Relationship Structures Questionnaire(Fraley et al., 2011) Experience of Relationships Survey (Richards & Schat,2011) Secure base support (Feeny & Thrush, 2010; Wu &Parker, 2017) Supervisor security provision (Lavy, 2014) Adult attachment interview (Main & Goldwyn, 1998) Lexical decision attachment prime (Mikulincer et al., 2002) Visualization and writing attachment prime (Baldwin et al.,1996; Chugh et al., 2014)	97 articles considered for the study

Table II: Distribution and Analysis of Variables

Variables are categorized on the basis of their sub-area and distribution over years (1990-2019). Table II includes the categorization of the variables used in 81 papers (empirical as well as conceptual) considered for the study.

SUB-AREA	1990-1994	1995-1999	2000-2004	2005-2009	2010-2014	2015-2019
Leadership	Superior's Leadership Qualities Autonomy	-	-	Positive psychological capital Positive moral perspective Leader self-awareness Leader self-regulation Leadership processes/behaviors Follower self-awareness Follower self-regulation Follower development Organizational context Performance	Paternalistic Leadership Transformational Leadership Nurturant task Leadership Participative Leadership Authoritarian Leadership Vertical Collectivism	Employee out-comes Attitudes towards leader Leadership constructs Follower cultural values Leader and subordinate demographics
Corporate Social Responsibility	-	-	Environment Concern Cost Benefit	-	-	Supervisor-rated task performance Peer-rated extra-role helping behavior Socially responsible HRM Organizational identification Perceived Organizational Support

						Cooperative norms
Emotions	-	-	Behavior Patterns Emotional Adequacy	-	Affective Empathy Cognitive Empathy Behavioral Empathy State and Trait Empathy Observer Empathy and Judged Empathy Sympathy/Empathic Concern/Compassion Emotional Contagion and Affective Crossover Emotional Intelligence	Collective Emotional Intelligence Team Academic Performance Collective General Self-Efficacy (GSE) Team-Level GSE (Team Potency)
Communication	-	-	-	Communication Satisfaction Organizational Identification	-	Inter group communication Grapevine Communication Satisfaction
Organizational Change	Organizational Support		Perceived Organizational Support Fairness Organizational Rewards Job Conditions Supervisor Support	Coworker support Coworker antagonism Role perceptions Work attitudes Withdrawal Effectiveness	Transformational Leadership Commitment to Change Affect	Occupational future time perspective Organizational Citizenship Behaviour Job Satisfaction

Work Engagement	-	-	-	-	Job Performance Communication Job Satisfaction Behavior Engagement	Conscientiousness Job characteristics Work engagement Turnover intentions Vigour Dedication Absorption
Motivation	-	Full appreciation of work done Feeling of being in on things Sympathetic help with personal problems Job security Good wages Interesting work Promotion and growth in the organization Personal or company loyalty to employees Good working conditions	-	-	Appreciation Engagement Involvement Performance	Job engagement Job Performance Motivation
Competition	-	-	Productivity Competition Performance	-	-	Slack Competitive Aggressiveness Performance

						Competitive Complexity
Technology	-	Role of Internet Job Performnace Online Outcomes	-	-	Virtuality Interdependence Percentage of time allocated to team Preparation activities Transactive memory systems Team effectiveness	Virtual Workplaces Performance Outcomes
Workplace Demography	Gender Age Experience	-	-	Workplace Diversity Workplace Ageing	-	Group Faultiness Group Member Characteristics Organizational Groups Demographic Diversity
Personality	Personality traits Type A or Type B Personality	-	-	Behavior Outcomes Job Performance Personality Traits	-	Self- monitoring Leadership emergence Performance Social Networks Impression Management Employee Selection Process

Acknowledgment

I would like to express my gratitude towards the esteemed faculty members of Department of Management, BITS Pilani for their constant guidance and support. Also my sincere thanks to my colleagues for their support.

About the Author

Shilpi Kalwani*
Department of Management,
Birla Institute of Technology and Science,
Pilani, Rajasthan (India)
Country: India
Tel.: +91-8085681072
E-mail: shilpibsp@gmail.com

Jayashree Mahesh
Department of Management,
Birla Institute of Technology and Science,
Pilani, Rajasthan (India)
Country: India
Tel.: +91-8949709082
E-mail: jmahesh@pilani.bits-pilani.ac.in

*Corresponding author

Shilpi Kalwani is currently a Research Scholar in the Department of Management of Birla Institute of Tech. & Science. (BITS), Pilani. She has completed her MBA from ICFAI Business School, Hyderabad Campus. A full-time PhD research scholar at BITS Pilani with prior corporate experience of working as a Business Analyst with a Fortune 500 Company. A TEDx Speaker, Author, and a Life Coach due to the right blend of required skills and opportunities. Her research areas are Human Resources and Organizational Behavior.

Dr. Jayashree Mahesh is currently an Assistant Professor in the Department of Management of Birla Institute of Tech. & Science. (BITS), Pilani. She has completed her PhD from BITS-Pilani, Pilani Campus. The title of her thesis is 'Indian' Management Practices in the I.T. Sector - An Empirical Investigation. She has more than 10 years of teaching experience in BITS. She has a wide experience in teaching HR and Communication related courses. Her research interests are in the area of Management Practices, Cross Cultural Management, Indian Management and Culture. She is a member of Academy of Management and INDAM (an affiliate of AOM)

Impacts of Industrial Revolutions on the Enterprise Performance Management: A Literature Review

Buşra Taşkan
Buket Karatop
Cemalettin Kubat

Abstract

Purpose – *Developments in the industrial revolutions also influence enterprises which are indispensable for commercial life, as well as social and cultural life. These changes which occur in the enterprises about production methods and technologies with the revolutions, naturally affect all the processes of the enterprises, and the methods and tools used also change. As structures of enterprises change the ways in which their performances are evaluated, inevitably change. The methods of evaluating the performance of progressively growing businesses also have to change inevitably and get more complicated. It is obvious that enterprises need to evaluate their performance in order to survive and reach business excellence. Enterprise performance management is an important tool which is driven by strategies of the enterprises and pushes the enterprises to use their resources effectively at the same time. Therefore in this study, interaction of enterprise performance evaluation methods with the facts up to the Industry 4.0 is discussed in the historical development process.*

Method – *Literatures on the enterprise performance evaluation methods up to the 2010 and the industrial revolutions up to the Industry 4.0 were researched and the relations between the facts have been tried to be established.*

Findings – *When the results are evaluated, developments in the field of enterprise performance management have taken place with the first, second and third industrial revolutions. These developments have gained momentum especially in the Industry 3.0 and the most known and the most used methods in the field of enterprise performance evaluation have emerged in this period.*

Limitations – *In this study, the effect of industrial revolutions on the field of enterprise performance management is evaluated by examining the relationship between industrial revolutions and enterprise performance evaluation methods. In future studies, this impact can be evaluated by examining the relationship between the different facts in the field of enterprise performance management and the industrial revolutions.*

Implications – *Industrial revolutions have profoundly affected the field of enterprise performance management as well as every area of life and will continue to affect. It is excepted to be used the artificial intelligence techniques which form basis of the fourth industrial revolution, in the future studies at the field of enterprise performance management.*

Originality – *The significance of this paper is examination of the impacts of industrial revolutions up to the Industry 4.0 on development of the field of enterprise performance management. This study will pave the way for better predictions about how the fourth industrial revolution will create a trend in the field of enterprise performance management.*

Keywords: industrial revolutions, enterprise performance management, enterprise performance measurement, performance measurement models

Reference to this paper should be made as follows: Taşkan, B., Karatop, B., Kubat, C. (2020). Impacts of industrial revolutions on the enterprise performance management: A literature review. *Journal of Business and Management*, *26*(1), March, 79-119. DOI: 10.6347/JBM.202003_26(1).0004.

Introduction

All developments in the history are mainly originating from the needs of human beings and the industrial revolutions that occurred and are coming are the result of these needs. The first industrial revolution (the Industry 1.0), the second industrial revolution (the Industry 2.0) and the third industrial revolution (the Industry 3.0) were respectively realized through mechanization, electricity and information technology. At the beginning of the Industry 1.0, there was domestic production. Towards the end of the Industry 1.0, it was began to shift to textile mills, which we can call the first modern enterprises of that time. As a result of the industrial revolutions which have occurred, the technology has developed gradually, but of course, the developing technology has brought new problems.

Enterprise performance evaluation is very important for businesses to maintain their assets. Prior to the Industry 1.0, the domestic system was dominant in production, and the performance information in the simplest sense was provided only by registrations held by traders in order to record past exchanges and to keep track of highly disorganized stocks. Then the first modern commercial enterprises of that time began to emerge and subsequent developments led to the inevitable change in the area of enterprise performance evaluation. Therefore, new methods were needed to evaluate the performance of developing enterprises.

The Industry 1.0, first appeared in the textile, iron and coal production and water transport sectors in the UK in the 1700s (Weetman, 2016), and was later seen in eastern Europe and the United States in a few decades (World Heritage Encyclopedia(a)). The invention of the steam engine by James Watt in 1788, the use of coal instead of wood as the energy source, the use of machine power instead of human or animal power, the first application of internal combustion engines, the transformation of chemical energy obtained from coal into thermal energy and mechanical energy are significant developments which made this revolution possible.

The Industry 2.0, also known as the Technological Revolution, has emerged as a result of changes in energy resources and basic raw materials. In this period oil, steel, electricity and chemicals as well as steam, coal and iron were used in the production processes. Internal combustion engine, telephone, microphone, gramophone, radio, lamp, car tire, bicycle, typewriter, cheap newsprint are the innovations of this revolution. The impacts of the Industry 2.0 have been extensively seen in the United States, Germany and the United Kingdom, as well as in France, the Low Countries (geographical region including Belgium, Luxembourg and the Netherlands) and Japan. It is thought that the Industry 2.0 started in 1860 with the invention of the cheap steel production method by the British Inventor H. Bessemer and reached its peak in the mass production and production line prior to the first world war as a result of the enormous increase in early factory electrification through the spread of this method (World Heritage Encyclopedia (b)).

The Industry 3.0 which is characterized by the automation and digitalization of production, is the result of developments such as the discovery of nuclear energy and the invention of computers (Evan & Manion, 2002). The determinative features of this period were innovations in areas such as biogenetic, synthetic materials, microelectronic technology, fiber optics, biotechnology, laser technology, nuclear energy, computer technology, and telecommunication. As a result of the revolutions that occurred, oil and other fossil fuels started to run out and the technologies acquired and sustained by these energy sources began to become obsolete and got difficult to maintain their sustainability. Worse still, the annoying effects of climate change resulting from fossil fuel-based industrial activities have increased, ecosystems have deteriorated and natural disasters have reached tremendous levels. For all these reasons, renewable energy sources such as solar and wind have become important and the concept of sustainability has come to the fore.

Due to the increasing conditions of competition, enterprise performance evaluation is vital and becomes increasingly complex for different reasons. In this study, the historical development of enterprise performance evaluation is analyzed in relation to the revolutions up to the Industry 4.0. The aim of this study is to help the researchers to make predictions for the future and to help them make sense of the

trends, based on the historical relationships between industrial revolutions and enterprise performance management.

Historical Development of the Enterprise Performance Management Field Taking into Consideration the Industrial Revolutions up to the Industry 4.0

The area of enterprise performance management is examined in four main periods based on the industrial revolutions up to the Industry 4.0 as shown below;

Enterprise Performance Management for the Pre-Industry 1.0 Period

Before the first modern commercial enterprises emerged, the domestic system was dominant in production and in this system raw materials were transformed into products by the mutual cooperation of merchants and artisans. While merchants provided the necessary raw materials to the artisans, the artisans were transforming these raw materials into products. In return for this production, merchants were paying to the artisans a piece-by-piece and selling finished products in the markets. Market prices provided all the managerial information that merchants needed, while merchants kept accounts to record past exchanges and to keep track of highly dispersed stocks. It was clear, therefore, that they did not keep these accounts in order to provide decision and control information (Johnson, 1981).

Along with merchant entrepreneurs began to coordinate the textile-making processes at the central business locations, market prices were insufficient to provide the needed knowledge. With the wage contracts carried out in this new factory system, the employees started to be paid hourly instead of part-time payment. In addition, as non-labor conversion inputs were provided from within the company, managers considered it necessary to explain the internal conversion costs (Johnson, 1981).

Enterprise Performance Management for the Industry 1.0 Period

The first modern business organizations which needed internal accounting information for decision-making and control, were mechanized, multi-process textile mills in the UK and the United States around the 1800s. These textile mills used double-sided cost calculations to determine the direct labor and fixed costs of converting the raw material into finished yarn and fabric (Johnson, 1981). According to historians, cost records of the factories which are integrated, multi-process textile mills, such as Charlton Mills in England (Stone, 1973), Boston Manufacturing Company during the 1820s and Lyman Mills Company, a cotton textile company founded in Boston in 1854, are the oldest

ones known up to now. These new records which include labor costs, the daily movement books recording the cotton pound transformed every day in the textile processes and general expenses, were kept to make short-term decisions and to control the conversion of raw materials to finished products (Johnson, 1981).

Enterprise Performance Management for the Industry 2.0 Period

During the 1850s and 1860s almost all of the basic techniques of modern accounting were discovered by the executives of the major American railways. New accounting practices were divided into three categories as financial, capital and cost accounting. The "operating ratio" that companies began to use in the late 1850s was a standard way to assess the financial results of a railway as well as balance-sheets. The type of renewal accounting that was specified by the 1870s was the standard form of capital accounting used by American railways and their repairs and renewals was charged to operating expenses, not in capital or fixed assets accounts (Chandler, 1977). The mass-production enterprises were established in the 1880s for the production of tobacco products, matches, detergents, photographic films and flour, and these enterprises adapted the internal accounting reporting systems of the railways to their own organizations. The most important was the emergence of the metal making and manufacturing industries. One of the most famous steel companies of that period was Carnegie's steel company (Kaplan, 1984). Although Carnegie and her colleagues did not generally deal with overheads and depreciation, their interests were almost exclusively focused on basic costs. Due to the long-term economic crisis of the 1870s, manufacturers began to turn their attention from technology to organization, and this new interest led to the first steps of the scientific management movement in the American industry (Chandler, 1977). The scientific management approach, in which names such as Frederick Taylor, A. Harrington Emerson, Hamilton Church and Henry Towne contributed to the emergence and development of, included not only the development of business standards, but also a new form of organization (Kaplan, 1984). The names such as Garcke and Fells (1887), A. Hamilton Church (beginning of 20th century) and J. Maurice Clark (1923) also contributed to cost accounting, while the use of break-even point graphs can be found in written works in the UK and the USA in 1903 and 1904 (Solomons, 1968); and in the mentioned studies, it was generally focused on the general expenses and how to allocate them. Typical manufacturing firms in the middle of the 19th century were transformed into vertically-integrated industrial firms, as seen in the large number of mergers between 1897 and 1903 (Johnson, 1975b). Thus, the organizations at unitary form emerged (Johnson, 1975a), and these enterprises included the design of complex accounting systems to carry out evaluations, transactions and planning across the firm (Johnson, 1975b).

In 1903, the DuPont Powder Company was transformed into a vertical-integrated company while it was formerly a single-function company (Johnson, 1975b) and F. Donaldson Brown also found the DuPont system in 1914, expanding the ROI approach

in about 1912 (Kaplan, 1984; Mark and Birkinshaw, 2015). Despite the aforementioned developments, in 1917 modern industrial enterprises still had structural weaknesses and the administrative class was just beginning of professionalization. DuPont and other new managerial businesses in the field, which were segmented according to central and functional, had serious flaws in the coordination of flows and the allocation of resources. Due to the severe economic recession that occurred from the summer of 1920 until the spring of 1922, there was a sudden and permanent decline in demand. In addition to Du Pont, General Electric, United States Rubber and other large enterprises, General Motors and Sears Roebuck responded to the stock crisis of 1920-1921 by developing techniques to determine and correct their flows according to carefully presumed future demand (Chandler, 1977). Du Pont and General Motors went further and developed a new form of organizational structure called the multi-divisional firm (Kaplan, 1984). General Motors' managerial accounting system introduced regulations that would help senior management to achieve "centralized control with distributed responsibility" (Johnson, 1978). By the 1930s, process engineers in France were guided to explore ways to improve production processes through better understanding of cause-and-effect relationships (Epstein and Manzoni, 1998) and as a result of these efforts a performance management system called Tableau de Bord, which is usually seen equivalent to the American Balanced Scorecard, was developed (Pezet, 2009). Enterprises performance evaluation methods in the Industry 2.0 period are described as the following in Table 1;

Enterprise Performance Evaluation for the Industry 3.0 Period

The limitations of ROE and ROI opened door for the search of alternative measures, although these measures were still based on the financial statements (Arnaboldi et al., 2014). One of these indicators is the residual income that emerged as the expansion of the ROI criteria in the period after World War II (Kaplan, 1984). In multi-divisional firms, the problem of transfer pricing related to the price of goods or services sold among business units in the same company may be a problem, but this problem could help companies to monitor the profitability of each segment (Collier et al., 2013). The mainstream approach, which began in the field of management accounting in the 1960s, was the application of numerical models to various planning and control problems. This literature which was encouraged by the development of operations research after the Second World War, described how analytical methods could be applied to cost accounting problems (Kaplan, 1984). The last 15 years are defined by the application of knowledge economy and agency theory to management accounting problems (Kaplan, 1984). The transaction cost economy, which emerged in the 1970s. It is a variation of the agency theory and very suitable for internal audit (Spraakman, 1997).

Yadav et al. (2013) examined the enterprises performance evaluation methods in 3 periods in their respective study. Therefore in this study, enterprises performance evaluation methods developed during the Industry 3.0 are examined in three main periods as 1945-1990 period, 1991-2000 period, 2001-2010 period. Enterprises

performance evaluation methods in the Industry 3.0 period are described as the following in Table 2 – Table 22.

1945-1990 Period

In this period, not only performance measurement frameworks based on financial measures, but also multi-dimensional performance measurement frameworks were developed. Management and cost accounting have been further developed and the concept of the social responsibility for enterprises has emerged for the first time in enterprise performance evaluation. In addition, the enterprise performance management area has begun to be linked to the strategies of the enterprises with the new accounting methods developed. Furthermore, quality concept has gained importance in the field of enterprise performance management with the methods based on total quality management principles.

1991-2000 Period

In this period, not only the methods based on financial measures, but also a balanced combination of financial and non-financial measures have been developed. In addition, causal relationships are considered and quality is also emphasized. During this period, a sustainability-oriented performance measurement system was developed for the first time. Conceptual maps, cause-effect diagrams and multi-criteria decision-making techniques are used in performance measurement methods. Performance measurement has begun to become more connected to strategies.

Companies have begun to lose market share against overseas competitors that can provide better quality products with lower cost and more variety. In order to regain competitive advantage, companies need not only to change their strategic priorities from low-cost production to quality, flexibility, short preparation time, reliable delivery, but also they applied the new philosophies and technologies of production management (e.g. computer integrated manufacturing, flexible manufacturing systems, just in time production, optimize production technology and total quality management). The implementation of these changes revealed that traditional performance metrics have many limitations and require the development of new performance measurement systems for success (Ghalayini and Noble, 1996).

2001-2010 Period

In this period, the methods developed based on the Balanced Scorecard as well as the methods focusing on the various stakeholders of an enterprise are noteworthy. Developed performance measurement methods generally have a holistic performance perspective.

Table 1: Performance measurement frameworks/models taking into consideration the Industry 2.0.

Name of the Model/Framework	*Author(s) and Year*	*Feature(s) of the Model/Framework*	*Dimensions of the Performance Measures*	*Advantage(s)*	*Disadvantage(s)*
DuPont System (These references are used for the method: Parrino et al., 2011; Mark and Birkinshaw, 2015; Bruns, 1998)	Brown, 1914	The system is used to calculate firms' return on equity (ROE).	Net profit margin, total asset turnover, financial leverage	The DuPont system provides a way to examine the underlying factors of a firm's profitability as well as it's an easy and practical approach, it's also a good method to examine how the rates of a company change over time and to compare two similar companies.	But like other financial analysis methods, the DuPont system doesn't reflect the current situations in the firm, it doesn't consider the cost of capital of the firm, besides being cost-oriented of the method provides a historical perspective, it gives little indication of future performance and encourages short termism.
Tableau De Bord (These references are used for the method: Pezet, 2009; Epstein and Manzoni, 1998; Lebas, 1996; Bourguignon et al., 2004; Bessire and Baker, 2005)	Process engineers, 1930s	The French Tableau De Bord which is generally seen equivalent to the American Balanced Scorecard, is a performance management system which is developed while seeking ways to improve production processes by better understanding cause and effect relationships.	Financial measures, quality measures, social measures, customer-focused measures, process-focused measures	Tableau De Bord is designed as a "balanced" combination of financial and non-financial indicators and is more than just a single document, too much value can be obtained from Tableau De Bord's development process.	While the method is more interested in daily operations, it's less interested in strategic issues.

Table 2: Performance measurement frameworks/models at the 1945-1990 period taking into consideration the Industry 3.0.

Name of the Model/Framework	*Author(s) and Year*	*Feature(s) of the Model/Framework*	*Dimensions of the Performance Measures*	*Advantage(s)*	*Disadvantage(s)*
Residual Income (These references are used for the method: Arnaboldi et al., 2014; Kaplan, 1984)	Marshall, 1890	Due to the limitations of ROE and ROI, the method emerged by being developed of ROI criteria in the period after the second world war.	Net operating income, cost of capital, invested capital	It takes into account the cost of capital of the firm and eliminates the shortcomings of the ROE and ROI.	Non-financial measures are not considered, the approach is not widely adopted.

Table 3: Performance measurement frameworks/models at the 1945-1990 period taking into consideration the Industry 3.0.

Name of the Model/Framework	*Author(s) and Year*	*Feature(s) of the Model/Framework*	*Dimensions of the Performance Measures*	*Advantage(s)*	*Disadvantage(s)*
Social Accounting (These references are used for the method: Basu, 2009; Everett and Neu, 2000; Lehman, 1999)	A group which consists of accounting scientists, 1970s	It advocates that large companies also have responsibilities towards people outside their shareholders.	Fringe benefits which are given to employees, pension arrangements for employees, health and safety measures, employee training programmers, industrial relations, pricing policies related to goods and services provided, quality control on the products sold, the integrity of the advertising campaigns, pollution controls and energy conservation.	The method also addresses some stakeholders apart from an enterprise's shareholders.	From a critical accounting perspective, it is argued that the social accounting has legalized the current situation by providing mistake to the development which can be made by companies and by no questioning the role that capitalism plays in maintaining different, exploiter social relations, Lehman (1999) states that methodological and useful trends within the reform accounting models can stop the formation of more serious and explanatory models.
Strategic Management Accounting (These references are used for the method: Simmonds, 1981; Tayles, 2011; Langfield-Smith, 2008)	Simmonds, 1981	The method is defined as the provision and analysis of management accounting data about a business and its competitors to be used in developing and following the business strategy.	Strategy, goals, customers, employees, processes, information	The method is more related to strategy rather than tactic, environmental or marketing-oriented, it focuses competitors and is long-term, it looks forward and is outward-oriented.	The concept itself is not largely understood, and its methods or techniques are not widely adopted.

Table 4: Performance measurement frameworks/models at the 1945-1990 period taking into consideration the Industry 3.0.

Name of the Model/Framework	*Author(s) and Year*	*Feature(s) of the Model/Framework*	*Dimensions of the Performance Measures*	*Advantage(s)*	*Disadvantage(s)*
Business Excellence Models (This reference is used for the method: Rocha-Lona et al., 2008)	Quality organizations, the end of the 1980s	Business Excellence Models (BEM) are quality management frameworks based on enterprise performance criteria created throughout the development of total quality management principles.	Dimensions vary according to each Business Excellence Model.	The implementation objectives of the Business Excellence Models vary according to the priorities of the organizations and some of these identified objectives are participation to reward, self-evaluation, business process improvement, measurement systems and strategic planning.	Models are a self-assessment rather than an objective measurement framework, the categories for measurement are very broad, and some dimensions cannot be measured.
Activity Based Costing (These references are used for the method: Fabozzi et al., 2007; Wyatt, 2012; Neely, 2004; Mark and Birkinshaw, 2015)	Kaplan and Cooper, 1988	Activity-Based Costing (ABC) is an expanded cost allocation process which assigns indirect costs firstly to actual activities and then to products based on their usage the activities.	Raw material cost, labor cost, general production cost (machine activity pool, assembly activity pool, quality control activity pool)	It resolves mistakes in evaluating the manufacturing cost of parts, the approach has been extremely supported in the past by both academics and consultants, ABC is especially valuable in the complex production environment where many products use the same inputs and is strong clearly recognizing the importance of activities and processes.	Many businesses have chosen to avoid from this technique, believing that the approach is too complex, and the method is weak due to the fact that it doesn't reattach the processes to strategies or stakeholders.

Table 5: Performance measurement frameworks/models at the 1945-1990 period taking into consideration the Industry 3.0.

Name of the Model/Framework	*Author(s) and Year*	*Feature(s) of the Model/Framework*	*Dimensions of the Performance Measures*	*Advantage(s)*	*Disadvantage(s)*
Sink and Tuttle Model (These references are used for the method: Sink and Tuttle, 1989; Tangen, 2004)	Sink and Tuttle, 1989	The model asserts that the performance of an organization is a complex interrelationship between the seven performance criteria: effectiveness, efficiency, quality, productivity, quality of work life, innovation, and profitability/budgetability.	Effectiveness, efficiency, quality, productivity, quality of work life, innovation, profitability/budgetability	Although many things have changed since the model was first introduced, the seven performance criteria are still important.	The model has some major limitations, for example the model does not consider the need for flexibility and the customer point of view.
Maskell Model (This reference is used for the method: Maskell, 1991)	Maskell, 1989	It's a useful model which is developed for American companies with the slogan performance measurement for world class manufacturing.	Delivery success and customer service, process time, production flexibility, quality, financial-based measures, social issues	The model provides a balanced measurement that financial and non-financial performance metrics coexist.	The model is more inter-oriented and some stakeholders are not included in the model.

Table 6: Performance measurement frameworks/models at the 1945-1990 period taking into consideration the Industry 3.0.

Name of the Model/Framework	*Author(s) and Year*	*Feature(s) of the Model/Framework*	*Dimensions of the Performance Measures*	*Advantage(s)*	*Disadvantage(s)*
Performance Measurement Matrix (This reference is used for the method: Neely et al., 1995)	Keegan, Eiler and Jones, 1989	The method's power lies at the way that it seeks to integrate different dimensions of performance and at the fact that it uses extensive terms such as "internal", "external", "cost" and "non-cost" which develops its flexibility.	Internal, external, cost and non-cost	The inherent flexibility of the method provides that it can adapt to every performance dimension which fits its frame.	Due to the fact that the inherent flexibility of the method will bring subjectivity about the addition of new measures, the success of the measurements will be affected from this.
Success Dimensions (This reference is used for the method: Maltz et al., 2003)	Shenhar and Dvir, 1990	The model is a multidimensional approach which defines effectiveness against three organizational levels (project, business unit and company) and four time preferences (very short, short, long, very long time preferences).	-	-	The main constraint of the method is that it does not provide specific operational measures for each dimension, the model is not tested at the enterprise level while it is experimentally tested at the strategic business unit and project levels and there is lack of focus on a company's human resources dimension.

Table 7: Performance measurement frameworks/models at the 1945-1990 period taking into consideration the Industry 3.0.

Name of the Model/Framework	*Author(s) and Year*	*Feature(s) of the Model/Framework*	*Dimensions of the Performance Measures*	*Advantage(s)*	*Disadvantage(s)*
Performance Measurement Questionnaire (These references are used for the method: Ghalayini and Noble, 1996; Ghalayini et al., 1997; Dixon et al., 1990)	Dixon, Nanni and Wollmann, 1990	The model was developed to assist managers in identifying the improvement needs of the organization, to determine supporting degree of current performance measures to improvements and to create an agenda for performance measurement improvements.	Quality, labor productivity, machine productivity	The method provides a mechanism to describe the company's improvement areas and their associated performance measures and tries to determine the supporting degree of current measurement system to such improvement areas.	The method cannot be considered as a comprehensive integrated measurement system and does not consider continuous improvement.
Customer Value Analysis (This reference is used for the method: Taticchi and Balachandran, 2008)	Customer Value, Inc., 1990	It is aimed that the method is a performance measurement system which is especially directed by the market, by detecting all performance measures around market parameters.	-	The model works with the tools such as value pricing charts, benchmarking analysis, product features-score comparison, priorities chart.	Excessive focusing on the market, which is the main feature of the model, is also a limiting factor.

Table 8: Performance measurement frameworks/models at the 1945-1990 period taking into consideration the Industry 3.0.

Name of the Model/Framework	*Author(s) and Year*	*Feature(s) of the Model/Framework*	*Dimensions of the Performance Measures*	*Advantage(s)*	*Disadvantage(s)*
Strategic Measurement Analysis and Reporting Technique (These references are used for the method: Cross and Lynch, 1988-1989; Ghalayini and Noble, 1996; Lynch and Cross, 1991; Ghalayini et al., 1997)	Wang laboratories, 1988-1989	The aim is to establish a management control system with performance indicators which are defined in order to define and maintain success.	Market, financial, customer satisfaction, flexibility, productivity, quality, delivery, cycle time, waste	The main strength of the method is its attempt to integrate operational performance indicators with company goals.	The system neither provide any mechanism to identify key performance indicators, nor it explicitly combine the idea of continuous improvement.

Table 9: Performance measurement frameworks/models at the 1991-2000 period taking into consideration the Industry 3.0.

Name of the Model/Framework	*Author(s) and Year*	*Feature(s) of the Model/Framework*	*Dimensions of the Performance Measures*	*Advantage(s)*	*Disadvantage(s)*
Results and Determinants Framework (These references are used for the method: Fitzgerald et al., 1991; Neely et al., 2007)	Fitzgerald et al., 1991	Reflecting the concept of causality which emphasizes that the results obtained today are a function of past enterprise performance	Competitiveness, financial performance, quality, flexibility, resource utilization, innovation	The results are defined as lagging indicators and the determinants are defined as leading indicators.	Non-financial measures, stakeholders and the importance of their behavioral aspects related to performance have been neglected.
Measures for Time-Based Competition (This reference is used for the method: Neely et al., 1995)	Azzone et al., 1991	The method tackles employ time as a way of competitive advantage.	R & D - engineering time, operations – throughput time, sales and marketing -order processing lead time	The measures of the method reflect the productivity and effectiveness dimensions of performance.	Quantitative measures are not enough for performance management.

Table 10: Performance measurement frameworks/models at the 1991-2000 period taking into consideration the Industry 3.0.

Name of the Model/Framework	*Author(s) and Year*	*Feature(s) of the Model/Framework*	*Dimensions of the Performance Measures*	*Advantage(s)*	*Disadvantage(s)*
Economic Value Added (These references are used for the method: Sherman, 2015; Kapil, 2010; Mark and Birkinshaw, 2015)	Stewart, 1991	Both debt and equity capital are included in the cost of capital.	Financial measures	It gives high-grade results, reduces the problem of agency by helping the company to bring the shareholder interest to the same level with administrative interest and reduces the problem of proxy and is closely related with the marketing value of the company.	The method is unsuccessful at looking to future, only financial measures are not sufficient to measure the performance of the enterprise.
Integrated Performance Measurement (This reference is used for the method: Yadav et al., 2013)	Nanni et al., 1992	It is emphasized service-focused approach rather than the product-focused approach of traditional management accounting.	Financial measures, strategic measures , operational measures	The method integrates management accounting field with strategic and operational perspectives and has developed management accounting intellection.	The method is not sufficient to measure enterprise performance because some performance dimensions are neglected.

Table 11: Performance measurement frameworks/models at the 1991-2000 period taking into consideration the Industry 3.0.

Name of the Model/Framework	*Author(s) and Year*	*Feature(s) of the Model/Framework*	*Dimensions of the Performance Measures*	*Advantage(s)*	*Disadvantage(s)*
EFQM Excellence Model (These references are used for the method: Trompenaars and Coebergh, 2014; Lawson et al., 2007; Neely et al., 2007; Neely and Adams, 2001; EFQM, 2012).	European Foundation for Quality Management, 1992	It's a business excellence model which assesses organizations for the European Quality Award and is developed based on the concepts of total quality management and sustainable excellence.	Leadership; people; strategy; partnerships and resources; processes, products and services; people results; customer results; society results; business results	The model presents a comprehensive performance idea addressing many areas of performance, emphasizes clearly inputs of performance improvement and shows the areas of results that need to be measured.	The model is a self-assessment rather than an objective measurement framework, the categories for measurement are very broad, while the results can be measured easily some of the inputs cannot be measured.
Balanced Scorecard (These references are used for the method: Neely et al., 2007; Ghalayini et al., 1997; Ghalayini and Noble, 1996; Kennerley and Neely, 2004; Kaplan and Norton, 1992)	Kaplan ve Norton, 1992	The method provides a balanced measurement by combining financial measures with non-financial measures.	Customer, financial, internal business, innovation and learning	The method more clearly connects performance measurement to the strategy of enterprise, prevents suboptimization, and provides a balanced measurement.	The method does not address some characteristics of the previous performance frameworks, does not include perspectives such as human resources and employee satisfaction, supplier performance, product/service quality and environmental/ community aspects to the framework and is not selected and applicable for the level of factory operations.

Table 12: Performance measurement frameworks/models at the 1991-2000 period taking into consideration the Industry 3.0.

Name of the Model/Framework	*Author(s) and Year*	*Feature(s) of the Model/Framework*	*Dimensions of the Performance Measures*	*Advantage(s)*	*Disadvantage(s)*
Triple Bottom Line (These references are used for the method: Polaine et al., 2013; Parsons, 2008; Christopher, 2010; Hubbard, 2009)	Elkington and SustainAbility company, 1994	It is a useful measurement framework which is derived from sustainability field, in order to both provide design instructions and evaluate results.	Environmental, economic, social	The method is useful while working with public institutions, but it is also increasingly popular in the private sector, the method involves many performance measures.	Measuring performance by measures of the method is not a simple task, the method has not succeeded in penetrating to enterprise performance systems and is seen very complex by some managers.
Service-Profit Chain (These references are used for the method: Mark and Birkinshaw, 2015; Heskett et al., 1994; Ennew and Waite, 2013; Wirtz et al., 2012)	Heskett et al., 1994	The method establishes relationships between profitability, customer loyalty and employee satisfaction, loyalty and productivity.	Internal service quality, external service value	The method handles two of the most important stakeholders of an enterprise, namely the customers and the employees, the causal links in the method are well-structured.	The method has been developed for service firms, does not explicitly address issues related to cost of quality, focuses more on revenue than profit, retention can be behavioral rather than attitudinal.

Table 13: Performance measurement frameworks/models at the 1991-2000 period taking into consideration the Industry 3.0.

Name of the Model/Framework	*Author(s) and Year*	*Feature(s) of the Model/Framework*	*Dimensions of the Performance Measures*	*Advantage(s)*	*Disadvantage(s)*
Return on Quality	Rust et al., 1995	The method is developed to make quality expenditures financially understandable.	Financial measures	The method does not necessitate any specific measurement approach and promotes quality in enterprises.	The method focuses on service quality, it must be verified that the model is generalizable to various industries.
Cambridge Performance Measurement Design Process (This reference is used for the method: Bourne et al., 2000)	Neely et al., 1996	The method was developed to design the performance measurement system.	-	The method guides each enterprise in designing its own performance measurement system.	In order to be able to determine the validity of the method, it has to be applied in different industries.

Table 14: Performance measurement frameworks/models at the 1991-2000 period taking into consideration the Industry 3.0.

Name of the Model/Framework	*Author(s) and Year*	*Feature(s) of the Model/Framework*	*Dimensions of the Performance Measures*	*Advantage(s)*	*Disadvantage(s)*
Input-Process-Output-Outcome Framework (These references are used for the method: Brown, 1996; Neely et al., 2007)	Brown, 1996	The method sees the performance management as a process.	Input measures, process measures, output measures, outcome measures	The model is useful in seeing the difference between the different measurement categories, and separating the output and the outcome measures has made it popular especially in the public sector.	The model assumption that there is a linear relationship set between inputs, processes, outputs, outcomes, and targets by determining each previous factor the next one, is much simplifying of the fact, the method does not consider external dynamics.
Consistent Performance Management System	Flapper et al., 1996	The system which encompasses all performance dimensions associated with the existence of the organization as a whole, is meant by the method.	-	Relationships between performances indicators are defined, target values or value ranges for performance indicators are determined, and performance indicators are classified according to three specified characteristics.	The framework is required to be applied in different types of organizations in order to examine the general usefulness of it.

Table 15: Performance measurement frameworks/models at the 1991-2000 period taking into consideration the Industry 3.0.

Name of the Model/Framework	*Author(s) and Year*	*Feature(s) of the Model/Framework*	*Dimensions of the Performance Measures*	*Advantage(s)*	*Disadvantage(s)*
Integrated Dynamic Performance Measurement System	Ghalayini et al., 1997	The system focuses on improving the competitiveness of manufacturing by overcoming limitations of existing performance measurement systems and motivating continuous improvement.	Customer satisfaction, compliance with customers, quality, delivery, manufacturing cycle time, cost of non-value added activities, process technology, education and training	The method takes precaution against sub-optimization, combines financial measures with operational performance measures by determining specific success areas, provides some critical performance measures which provide savings in terms of time, money and labor to three main areas of the company, success areas, performance measures and performance standards are dynamically updated by means of the method.	The method is extensively for manufacturing-based companies and the generalized application of the method is not discussed.
Shareholder Value (These references are used for the method: Rappaport, 1998; Bishop, 2009)	Rappaport, 1998	The method tries to maximize shareholder value.	Sales growth, cash profit margin, cash tax rate, working capital, capital expenditure, the risk-adjusted inflation, weighted average cost of capital and the time scale in which competitive advantage period is assessed.	The method provides principles to enterprises for creating value to their shareholders.	The method ignores other stakeholders of an enterprise such as employees, suppliers and customers.

Table 16: Performance measurement frameworks/models at the 1991-2000 period taking into consideration the Industry 3.0.

Name of the Model/Framework	*Author(s) and Year*	*Feature(s) of the Model/Framework*	*Dimensions of the Performance Measures*	*Advantage(s)*	*Disadvantage(s)*
Dynamic Performance Measurement Systems Model	Bititci et al., 2000	A self-auditing dynamic performance measurement system is developed with the use of information technologies-based management tools	-	Different from the full life cycle of performance measurement, it tackles the review mechanism, extends the model control cycle and is dynamic.	In the literature, the more common application of this framework is not emphasized, while the logic behind the review mechanism used in the model is shown with a simple scenario there is an important information gap to deal with more complex scenarios.
Integrated Performance Measurement Framework	Medori and Steeple, 2000	The method is developed to control and improve performance measurement systems.	Quality, cost, flexibility, time, delivery, future growth	The framework can be used without any external consultation, it's proved that the method develops existing measurement systems to improve competitive advantage.	In the second phase of the method the difficulties are found in correlating a company's strategy and the six competitive priorities of the performance measurement grid; because performance measurement is a dynamic process, document B may require to be updated as it may go out of fashion in time; the dimension which is based on too little competition for designing the performance measurement system is considered.

Table 17: Performance measurement frameworks/models at the 1991-2000 period taking into consideration the Industry 3.0.

Name of the Model/Framework	*Author(s) and Year*	*Feature(s) of the Model/Framework*	*Dimensions of the Performance Measures*	*Advantage(s)*	*Disadvantage(s)*
Quantitative Model for Performance Measurement System	Suwignjo et al., 2000	Identification of factors affecting performance and their relationships, hierarchical structuring of factors, use of *quantitative* models to measure the effects of factors on performance.	Cost per production unit (overhead, operating, total)	The effects of multi-dimensional factors on performance can be gathered in a single dimensionless unit.	As the method uses subjective measurement, the results may not be very accurate, the model has a period of use and it's valid only if the internal and external environment remains steady.

Table 18: Performance measurement frameworks/models at the 2001-2010 period taking into consideration the Industry 3.0.

Name of the Model/Framework	*Author(s) and Year*	*Feature(s) of the Model/Framework*	*Dimensions of the Performance Measures*	*Advantage(s)*	*Disadvantage(s)*
Action-Profit Linkage Model (These references are used for the method: Westbrook, 2000; Epstein and Westbrook, 2001; Taticchi and Balachandran, 2008; Epstein et al., 2000)	Epstein and Westbrook, 2001	The model defines measures and comments causal relationships between firm activities and corporate profitability.	Company actions, delivered product/service, customer actions, economic impact	The model concentrates on the specific actions of the company and their impact on employees, customers and finally on the corporate profitability, encourages the investment-based approach to manage trade-offs in decision-making, companies can adapt the model to many business situations and the model doesn't depend any specific data-collection or forecast procedure.	The proposed framework is only a starting point for exploring the relationships between key performance measures and therefore it's needed to arrange according to the job specifications of the company.
Performance Prism (These references are used for the method: Neely et al., 2007; Bourne et al., 2003)	Neely et al., 2001	The method adopts the stakeholder-focused view of performance measurement.	Stakeholder satisfaction, stakeholder contribution, strategies, processes, capabilities	As regards stakeholders, the method makes an important distinction between stakeholder satisfaction and stakeholder contribution; the method considers other stakeholder groups such as regulators, legislators and interest groups in addition to traditional stakeholders; the framework is so comprehensive and multi-dimensional which enables all measures to be planned over it.	There is little guidance as to how performance measures will be implemented and almost never assessment relating to the use of the frame for the existing performance measurement system has been made.

Table 19: Performance measurement frameworks/models at the 2001-2010 period taking into consideration the Industry 3.0.

Name of the Model/Framework	*Author(s) and Year*	*Feature(s) of the Model/Framework*	*Dimensions of the Performance Measures*	*Advantage(s)*	*Disadvantage(s)*
Kanji's Business Scorecard	Kanji and Sá, 2002	The method was developed taking into account the possibilities and limitations of the traditional Balanced Scorecard.	Organizational values, process excellence, organizational learning and delight the stakeholders	The method is not only a conceptual model but also a measurement, it determines the mutual relations between performance measures through structural equation modeling, the method takes into account more stakeholders compared to the Balanced Scorecard.	The method mostly focuses on external stakeholders.
Beyond Budgeting	Hope and Fraser, 2003	The method provides companies an alternative, compatible management model which enables to manage performance via especially adapted processes to present-day unstable market.	-	The method principles can create a set of adaptive management process as well as proposing a new, easy-to-understand management model and transfers power and decision-making authority from the center of the organization to employees.	The main emphasis in the model is on shareholders, other stakeholders are not adequately addressed.

Table 20: Performance measurement frameworks/models at the 2001-2010 period taking into consideration the Industry 3.0.

Name of the Model/Framework	*Author(s) and Year*	*Feature(s) of the Model/Framework*	*Dimensions of the Performance Measures*	*Advantage(s)*	*Disadvantage(s)*
Dynamic Multi-Dimensional Performance Framework	Maltz et al., 2003	Balanced Scorecard and Success Dimensions models provide a basis for the proposed model and to be added People Development as a separate performance dimension, is the main differentiator of the model.	Financial, market, process, people and future	The model is multidimensional inherently, it sees success as a dynamic, ongoing concept which is assessed at various time periods, represents many stakeholders, and the People Development dimension differentiates the model.	The application of the framework is not addressed adequately.
Performance Planning Value Chain	Neely and Jarrar, 2004	The method provides a systematic process for collecting a wide range of tools to use data to improve decision-making and derive value from it, and focuses on the effort to add real value to the organization.	-	The method provides a process for converting data to high-quality, value-added information which enables users to make more effective decisions.	The method is given only as a concept and experimental validation of it isn't shown.

Table 21: Performance measurement frameworks/models at the 2001-2010 period taking into consideration the Industry 3.0.

Name of the Model/Framework	*Author(s) and Year*	*Feature(s) of the Model/Framework*	*Dimensions of the Performance Measures*	*Advantage(s)*	*Disadvantage(s)*
Holistic Scorecard	Sureshchandar and Leisten, 2005	The method is a conceptual, theoretical framework developed for performance management in the software industry.	Financial, customer, business process, intellectual capital, employee and social perspectives	The proposed framework adds new perspectives to more holistically describe all dimensions of enterprise performance, also restructures existing perspectives to add more clarity to the topics addressed.	Causal relationships between different perspectives in the framework have not been explained, more experimental works have to be done to ensure the reliability and validity of the proposed measures, the generality of the framework has not been discussed.
Total Performance Scorecard	Rampersad, 2005	The model emphasizes the need and importance of combining the company's goals and desires with goals and desires of the individual to develop an organizational structure and philosophy.	Financial, customer, internal processes, knowledge & learning perspectives, process improvement, personal improvement	The method combines PDCA cycle, talent development cycle and Kolb's learning cycle with personal and organizational Balanced Scorecard.	The insights are established from experience and experimental validation isn't presented.

Table 22: Performance measurement frameworks/models at the 2001-2010 period taking into consideration the Industry 3.0.

Name of the Model/Framework	*Author(s) and Year*	*Feature(s) of the Model/Framework*	*Dimensions of the Performance Measures*	*Advantage(s)*	*Disadvantage(s)*
Holistic Performance Management Framework	Andersen et al., 2006	The model is an integrated framework for holistic performance management.	Stakeholders, market, supply chain management, value creation	The framework contains the different areas which be needed to act in unison and supports each other in order to completely bring into force an organization.	The framework is developed on a pilot study basis but should be seen as a test that should be further tested in other types of industries / organizations in order to verify its validity on a wider basis.
Flexible Strategy Game-Card (These references are used for the method: Yadav and Sagar, 2011; Yadav, 2014)	Sushil, 2010	It is an integrated and holistic framework for strategic performance management and considers performance from two perspectives which are the corporate point of view and the customer point of view.	Situation, actors, process, performance, value in offerings and relationships	The dynamic nature of the framework, the holistic viewpoint and duality viewpoint help it to be considered as a holistic framework in performance management for the enterprise.	Both experimental and case study are necessary to confirm and interpret this new performance management framework for a variety of conditions.

As can be seen from the methods described above, enterprise performance evaluation methods gained momentum in the Industry 3.0 period and the methods have adopted in practice were developed in this period.

Analysis between Revolutions

Associated with the industrial revolutions, transformations have been experienced in the energy regime, transportation and communication tools as well as production processes have also progressed. All these developments have deeply affected the social, cultural and economic lives of the societies in which the revolutions took place. The developments brought by the industrial revolutions have enabled mankind to make great progresses, but the troubles that these developments brought with them later, have directed humanity to new quests and have provided to take place the subsequent revolutions. In other words, all events in the industrial revolutions have triggered each other.

In the middle of the 15th century with the invention of the most primitive printing machine by Johannas Gutenberg and his colleagues, the bible was began to publish. In the Europe with the spread of published bibles and other books, the Europe began to experience the Age of Enlightenment (Clark and Cooke, 2015). The Industry 1.0, whose infrastructure was formed in the Age of Enlightenment, began in 1788 with the invention of steam engine. The main energy source used in this revolution was coal. Due to the invention of steam engines and the intensive use of coal and iron, great progresses have been made in maritime and rail transports. Factories which could be called as the first modern commercial enterprises of that period were established and for this reason a lot of people migrated from the villages to the cities due to employment opportunities. Therefore, labor costs remained at a low level for many years. The increase in the sales of British products led to capital stock. The telegraph, which was invented and continued its development in this period, was the means for communicating in this revolution.

The production problems arising from iron which were used extensively in the Industry 1.0, caused the invention of steel and this event led to the start of the Industry 2.0. Although many studies have been done on it before, lighting up the dark nights of electricity that the discovery and use of it fall on this period, has affected the social life deeply. Because oil was discovered in this period, oil was also used extensively in addition to coal as an energy source. Factories continued to grow and the population of cities increased gradually. One of the greatest inventions of this period was the development of cars working with petroleum derivatives with the discovery of oil. Due to the invention of steel, railroad transportation continued to progress also in this period. As a result of these, highways have been used very extensively and have shown great improvement. Communication tools such as

telephone and radio are also the innovations of this period. Thanks to the advances in transportation the relocation of people has become easier and information exchange between people with the developments in the communication tools, has increased. In this way, people's ability about questioning has increased and this has led to new discoveries.

The oil crisis in 1973, which is seen by some as the beginning of the Industry 3.0, increased the search for new energy sources of the industrialized countries and natural gas became the most important energy source of this revolution. However, since coal, oil and natural gas are non-renewable energy sources, scientists continued to search for energy sources and nuclear energy was discovered in this period. The first computer which is called as ENIAC, was developed to meet the automation needs of the army during the Second World War. Fighter aircrafts used during the Second World War also enabled the development of aircraft technologies. In this way, humanity met with the airline transport for the first time. As a result of the researches carried out in order to provide the communication between long distances frequently and easily, the internet which can be considered as the most important communication tool of all-time, was found. With the invention of Internet, information has spread more than ever, and the borders between countries have completely disappeared. In this period, new production philosophies were developed to increase productivity in production. In addition, the depletion of fossil fuels and their damages to the environment have directed humanity to renewable energy sources and the concept of sustainability has appeared for the first time.

As a result, the social and economic events which took place before the revolutions have triggered the revolutions and the revolutions realized have affected the economic and social events of the period that they took place. In other words, there is a mutual interaction.

Conclusions

The industrial revolutions that emerged from the needs of human beings have influenced/changed/transformed the market dynamics, social dynamics etc. in the period when they occurred, or from a different point of view, market dynamics, social dynamics, etc. required the realization of industrial revolutions. As a result, many factors have been influenced by industrial revolutions in business and social life.

Therefore, the development of enterprise performance evaluation in this study has been examined in relation to the revolutions up to the Industry 4.0. The development of enterprise performance evaluation has been studied from the

beginning to the 2010 by the literature review method and has been historically divided according to the industrial revolutions. The trend of change in industry has also been sought in enterprise performance evaluation methods.

When the results are evaluated, the developments have taken place in the enterprise performance evaluation methods along with the Industry 1.0, Industry 2.0 and Industry 3.0. These developments have gained momentum especially in the Industry 3.0 and the most known and the most used methods in the field of enterprise performance evaluation have emerged in this period. Prior to the Industry 1.0, records were sufficient to monitor market prices, stocks, and record historical exchanges. With the Industry 1.0 which started with the invention of the steam engine, the enterprises that could be defined as the first modern enterprises of that time emerged and the production was mechanized. The factories in this period used double-sided cost calculations. After the discovery of electricity, which is one of the most important developments of the Industry 2.0, mass production started. Thus, the existing methods for developing and growing enterprises were insufficient and almost all techniques of modern accounting, DuPont and Tableau De Bord were developed during this period. With the invention of the computers, one of the most important developments of the Industry 3.0, the period of automation at the production began. Because the structure of the enterprises changed significantly, the most important developments in the field of enterprise performance management were experienced in this period.

Enterprise performance evaluation is the real-life problem which is multi-criteria, complex and has uncertainties. Optimal results may be obtained by using artificial intelligence techniques in real-life problems. In this context, it is excepted to be used the artificial intelligence techniques which form basis of the Industry 4.0, in the future studies at the field of enterprise performance management.

Managerial Implications

Enterprise performance has always a significant impact on the activities of companies. Ways and tools to accurately measure performance have become an increasingly important field of research for both organizations and academics (Folan and Browne, 2005). However, in practice, we know that there are many companies that see enterprise performance equivalent to human resources performance and do not carry enterprise performance one step further. In fact, enterprise performance management is such a critical issue for businesses; development tool, mathematics of strategy determination… In this context, the concept of enterprise performance management should be comprehended very well not only by academicians but also

by business executives who are implementer of it and the development process of enterprise performance management should be examined. Providing a conceptual recognition of managerial impacts of enterprise performance management and examining the relationship between industrial revolutions and enterprise performance management are targeted in this article.

With the start of industrialization and mass production, the need to manage the performance of the institutions emerged. At the same time, industrial revolutions created profound effects and changes in the productions and managements of enterprises. We can say that the maximum developments in enterprise performance evaluation methods were experienced with the 3rd Industrial Revolution and the managerial effects peaked in this period. Artificial intelligence has entered into all areas of life in the present period. With these developments, efforts to establish enterprise performance calculation and forecasting models continue. More realistic performance results can be obtained by including tools such as big data and internet of things in enterprise performance calculations. With these models, proactive managerial effect will occur in the enterprises.

References

Andersen, B., Henriksen, B., & Aarseth, W. (2006). Holistic performance management: An integrated framework. International Journal of Productivity and Performance Management, 55(1), 61-78.

Arnaboldi, M., Azzone, G., & Giorgino, M. (2014). Performance measurement and management for engineers. San Diego: Academic Press.

Basu, S. K. (2009). Fundamentals of auditing. South Asia: Pearson India.

Bessire, D., & Baker, C. R. (2005). The French Tableau de bord and the American Balanced Scorecard: a critical analysis. Critical Perspectives on Accounting, 16(6), 645-664.

Birkinshaw, J., & Mark, K (2015). Key MBA models: The 60+ models every manager and business student needs to know. London: FT Publishing International.

Bishop, M. (2009). Economics: An A-Z guide. Profile Books. New York: The Economist.

Bititci, U. S., Turner, T., & Begemann, C. (2000). Dynamics of performance measurement systems. International Journal of Operations & Production Management, 20(6), 692-704.

Bourguignon, A., Malleret, V., & Nørreklit, H. (2004). The American balanced scorecard versus the French tableau de bord: The ideological dimension. Management Accounting Research, 15(2), 107-134.

Bourne, M., Mills, J., Wilcox, M., Neely, A., & Platts, K. (2000). Designing, implementing and updating performance measurement systems. International Journal of Operations & Production Management, 20(7), 754-771.

Bourne, M., Franco, M., & Wilkes, J. (2003). Corporate performance management. Measuring Business Excellence, 7(3), 15-21.

Brown, M. G. (1996). Keeping score: Using the right metrics to drive world-class performance. New York: Quality Resources.

Bruns, W. (1998, July). Profit as a performance measure: Powerful concept, insufficient measure. Paper presented at the Performance Measurement-Theory and Practice: the First International Conference on Performance Measurement, Cambridge, England.

Chandler, A. D. (1977). The visible hand: The managerial revolution in American business (pp. 411-414). Cambridge, Massachusetts: Harvard University Press.

Christopher, M. (2010). Logistics and supply chain management. London: Financial Times/ Prentice Hall.

Clark, W. W., & Cooke, G. (2015). Industrial development. In K.P. McCombs, & C. Johnston (Ed.), The green industrial revolution: Energy, engineering and economics (pp. 13-35). Oxford: Elsevier.

Collier, P. M., Kizan, S. M., & Schumann, E. (2013). Accounting for managers: Interpreting accounting information for decision-making (pp. 115-116). Canada: John Wiley & Sons.

Cross, K. F., & Lynch, R. L. (1988-1989). The SMART way to define and sustain success. National Productivity Review, 8(1), 23-33.

Dixon, J. R., Nanni, A. J., & Vollman, T. E. (1990). The new performance challenge: Measuring operations for world class competition. Homewood: Dow Jones-Irwin.

Ennew, C., Waite, N., & Waite, R. (2013). Financial services marketing: An international guide to principles and practice (Ed.2, pp. 311-332). London: Routledge.

Epstein, M., & Manzoni, J. F. (1998). Implementing corporate strategy: From tableaux de bord to balanced scorecards. European Management Journal, 16(2), 190-203.

Epstein, M. J., Kumar, P., & Westbrook, R. A. (2000). The drivers of customer and corporate profitability: Modeling, measuring and managing the causal relationships. In M. J. Epstein, & J. Y. Lee (Ed.), Advances in management accounting (pp. 43-72). New York: Elsevier.

Epstein, M. J., & Westbrook, R.A. (2001). Linking actions to profits in strategic decision making. MIT Sloan Management Review, 42(3), 39-49.

Evan, W. M., & Manion, M. (2002). Minding the machines: Preventing technological disasters. New Jersey: Prentice Hall.

Everett, J., & Neu, D. (2000). Ecological modernization and the limits of environmental accounting. Accounting Forum, 24(1), 5–29.

EFQM (2012). EFQM framework for innovation agencies (pp. 32-34). Belgium: EFQM

Fabozzi, F. J., Drake, P. P., & Polimeni, R. S. (2007). The complete CFO handbook: From accounting to accountability (pp.660-665). New Jersey: John Wiley & Sons.

Fells, J. M., & Garcke, E. (1887). Factory Accounts. London: Crosby Lockwood and Son.

Fitzgerald, L., Johnston, R., Brignall, T. J., Silvestro, R., & Voss, C. (1991). Performance measurement in service businesses. London: Chartered Institute of Management Accountants.

Flapper, S. D. P., Fortuin, L., & Stoop, P. P. M. (1996). Towards consistent performance management systems. International Journal of Operations & Production Management, 16(7), 27-37.

Folan, P., & Browne, J. (2005). A review of performance measurement: Towards performance management. Computers in Industry, 56, 663–680.

Ghalayini, A. M., & Noble, J. S. (1996). The changing basis of performance measurement. International Journal of Operations & Production Management, 16(8), 63-80.

Ghalayini, A. M., Noble, J. S., & Crowe, T. J. (1997). An integrated dynamic performance measurement system for improving manufacturing competitiveness. International Journal of Production Economics, 48(3), 207-225.

Heskett, J. L., Jones, T. O., Loveman, G. W., Sasser, W. E., & Schlesinger, L. A. (1994). Putting the service-profit chain to work. Harvard Business Review, 72(2), 164-174.

Hope, J., & Fraser, R. (2003). Beyond budgeting: How managers can break free from the annual performance trap. Boston: Harvard Business School Press.

Hubbard, G. (2009). Measuring organizational performance: beyond the triple bottom line. Business Strategy and the Environment, 18(3), 177-191.

J. Maurice Clark (1923). Studies in the Economics of Overhead Cost. Chicago: The University of Chicago Press.

Johnson, H. T. (1975(a)). Management accounting in an early integrated industrial: E. I. duPont de nemours powder company, 1903-1912. Business History Review, 49(2), 184-204.

Johnson, H. T. (1975(b)). The role of accounting history in the study of modern business enterprise. The Accounting Review, 50(3), 444-450.

Johnson, H. T. (1978). Management accounting in an early multidivisional organization: General motors in the 1920s. The Business History Review, 52(4), 490-517.

Johnson, H. T. (1981). Toward a new understanding of nineteenth-century cost accounting. The Accounting Review, 56(3), 510-518.

Kapil, S. (2010). Financial management (pp. 50-64). Noida: Pearson India.

Kaplan, R. S. (1984). The evolution of management accounting. The Accounting Review, 59(3), 390-418.

Kaplan, R. S., & Norton, D. P. (1992). The balanced scorecard: Measures that drive performance. Harvard Business Review, 70(1), 71-79.

Kanji, G. K., & Sá, P. M. (2002). Kanji's business scorecard. Total Quality Management & Business Excellence, 13(1), 13-27.

Kennerley, M., & Neely, A. (2004). Performance measurement frameworks: A review. In A. Neely (Ed.), Business performance measurement: Theory and practice (pp. 145-155). New York: Cambridge University Press.

Langfield-Smith, K. (2008). Strategic management accounting: How far have we come in 25 years. Accounting, Auditing & Accountability Journal, 21(2), 204-228.

Lawson, R., Desroches, D., & Hatch, T. (2007). Scorecard best practices: Design, implementation, and evaluation (pp. 53-56). New Jersey: John Wiley & Sons.

Lebas, M. (1996). Management accounting practice in France. In A. Bhimani (Ed.), Management accounting: European perspectives (pp.74–99). Oxford: Oxford University Press.

Lehman, G. (1999). Disclosing new worlds: A role for social and environmental accounting and auditing. Accounting, Organizations and Society, 24(3), 217–241.

Lynch, R. L., & Cross, K. F. (1991). Measure up: The essential guide to measuring business performance. London: Mandarin.

Maltz, A. C., Shenhar, A.J., & Reilly, R.R. (2003). Beyond the balanced scorecard: Refining the search for organizational success measures. Long Range Planning, 36(2), 187-204.

Maskell, B. H. (1991). Performance measurement for world class manufacturing: A model for American companies. Cambridge: Productivity Press.

Medori, D., & Steeple, D. (2000). A framework for auditing and enhancing performance measurement systems. International Journal of Operations & Production Management, 20(5), 520-533.

Neely, A., Gregory, M., & Platts, K. (1995). Performance measurement system design: A literature review and research agenda. International Journal of Operations & Production Management, 15(4), 80-116.

Neely, A. D., & Adams, C. (2001). Perspectives on performance: The performance prism. Journal of Cost Management, 15(1), 7–15.

Neely, A. (2004). Business performance measurement: Theory and practice (pp. 145-198). New York: Cambridge University Press.

Neely, A., & Jarrar, Y. (2004). Extracting value from data – The performance planning value chain. Business Process Management Journal, 10(5), 506-509.

Neely, A., Kennerley, M., & Adams, C. (2007). Performance measurement frameworks: A review. In A. Neely (Ed.), Business performance measurement: Unifying theories and integrating practice (pp. 143-162). New York: Cambridge University Press.

Parrino, R., Kidwell, D.S., & Bates, T. (2011). Fundamentals of corporate finance (pp. 145-146). New Jersey: John Wiley & Sons.

Parsons, P. J. (2008). Ethics in public relations: A guide to best practice (pp. 152-153). London: Kogan Page.

Pezet, A. (2009). The history of the French tableau de bord (1885-1975): Evidence from the archives. Accounting, Business & Financial History, 19(2), 103-125.

Polaine, A., Løvlie, L., & Reason, B. (2013). Service design: From insight to inspiration (pp. 167-168). New York: Rosenfeld Media.

Rampersad, H. K. (2005). Total performance scorecard: The way to personal integrity and organizational effectiveness. Measuring Business Excellence, 9(3), 21-35.

Rappaport, A. (1998). Creating shareholder value: A guide for managers and investors (pp. 112-132). New York: The Free Press.

Rocha-Lona, L., Eldridge, S., Barber, K. D., & Garza-Reyes, J.A. (2008, June-July). Using business excellence models for supporting decision making in strategic planning and business improvements. Paper presented at the Flexible Automation and Intelligent Manufacturing, Skövde, Sweden.

Rust, R. T., Zahorik, A. J., & Keiningham, T. L. (1995). Return on quality (roq): Making service quality financially accountable. Journal of Marketing, 59(2), 58-70.

Sherman, E. H. (2015). A manager's guide to financial analysis: Powerful tools for analyzing the numbers and making the best decisions for your business. United States: AMA Self-Study.

Simmonds, K. (1981). Strategic management accounting. Management Accounting, 59(4), 26-29.

Sink, D. S., & Tuttle, T. C. (1989). Planning and measurement in your organization of the future. Norcross: Industrial Engineering and Management.

Solomons, D. (1968). The historical development of costing. In D. Solomons (Ed.), Studies in cost analysis (pp. 3-49). Homewood: R.D. Irwin.

Yadav, G. (1997). Transaction cost economics: A theory for internal audit. Managerial Auditing Journal, 12(7), 323-330.

Sureshchandar, G. S., & Leisten, R. (2005). Holistic scorecard: Strategic performance measurement and management in the software industry. Measuring Business Excellence, 9(2), 12-29.

Suwignjo, P., Bititci, U. S., & Carrie, A. S. (2000). Quantitative models for performance measurement system. International Journal of Production Economics, 64 (1-3), 231-241.

Stone, W. E. (1973). An early english cotton mill cost accounting system: Charlton mills, 1810-1889. Accounting and Business Research, 4(13), 71-78.

Tangen, S. (2004). Performance measurement: From philosophy to practice. International Journal of Productivity and Performance Management, 53(8), 726-737.

Taticchi, P., & Balachandran, K. R. (2008). Forward performance measurement and management integrated frameworks. International Journal of Accounting & Information Management, 16(2), 140-154.

Tayles, M. (2011). Strategic management accounting. In M.G. Abdel-Kader (Ed.), Review of management accounting research (pp. 22-52). London: Palgrave Macmillan.

Trompenaars, F., & Coebergh, P. H. (2014). 100+ management models: How to understand and apply the world's most powerful business tools. Oxford: Infinite Ideas.

Weetman, C. (2016). A circular economy handbook for business and supply chains: Repair, remake, redesign, rethink (pp.117-120). London: Kogan Page.

Westbrook, R. (2000). Towards a managerial research agenda for customer satisfaction. Journal of Consumer Satisfaction, Dissatisfaction and Complaining Behavior, 13 (2000), 17-25.

Wirtz, J., Chew, P., & Lovelock, C. (2012). Essentials of services marketing. London: FT Press.

World Heritage Encyclopedia (a) “First Industrial Revolution”, World Heritage Encyclopedia.

World Heritage Encyclopedia (b) “Second Industrial Revolution”, World Heritage Encyclopedia.

Wyatt, N. (2012). The financial times essential guide to budgeting and forecasting: How to deliver accurate numbers. FT Publishing International.

Yadav, N., & Sagar, M. (2011, December). Evolution of flexible strategy game-card: A framework rooted in dual perspective of performance. Paper presented at the 11th Global Conference on Flexible Systems Management, Kozhikode, Kerala, India.

Yadav, N., Sagar, S., & Sagar, M. (2013). Performance measurement and management frameworks: Research trends of the last two decades. Business Process Management Journal, 19(6), 947-971.

Yadav, N. (2014). Flexibility aspects in performance management system: An illustration of flexible strategy game-card. Global Journal of Flexible Systems Management, 15(3), 181-189.

About the Authors

Buşra Taşkan*
Muş Alparslan University, Faculty of Engineering and Architecture, Department of Industrial Engineering, Güzeltepe Village, Muş, Turkey
E-mail: b.taskan@alparslan.edu.tr

Buket Karatop
İstanbul University Cerrahpaşa, Vocational School of Technical Sciences, Motor Vehicles and Transportation Technologies, Hadımköy, İstanbul, Turkey
E-mail: buket.karatop@istanbul.edu.tr

Cemalettin Kubat
Sakarya University, Faculty of Engineering, Department of Industrial Engineering, Serdivan, Sakarya, Turkey
E-mail: kubat@sakarya.edu.tr

*Corresponding author

Buşra Taşkan graduated from Department of Industrial Engineering of the Kırıkkale University in 2008. Subsequently, she got a master's degree at the Department of Industrial Engineering of the Gazi University in 2012. She still continues PhD program that she makes at the Department of Industrial Engineering of the Sakarya University. She is currently working as the research assistant at the Department of Industrial Engineering of the Muş Alparslan University. She still continues her academic studies on Enterprise Performance Management, Strategic Management, Optimization, Artificial Intelligence, Multi-Criteria Decision Making, Automated Storage and Retrieval Systems.

Buket Karatop graduated from Department of Industrial Engineering of the İstanbul Technical University in 1986. Subsequently, she got a master's degree at Department of

Industrial Engineering of the Yıldız Technical University. In 2015, she graduated from PhD program that she made at the Department of Industrial Engineering of the Sakarya University. She worked as an engineer at the various levels of the Alarko and Şişecam companies and as an academist at the Erciyes University, Atatürk University and Süleyman Demirel University. She did the duties of coordinatorship of Engineering Education Accreditation and Quality Development at the mentioned universities. As the Quality Development Director of Istanbul University Open and Distance Education Faculty, she managed the institutionalization process of the faculty and obtained ISO: 9001: 2008 certificate in distance education. She received an award in distance education through EFQM assessment. She did consultancy to the T. R. Ministry of Health about "process design and institutionalization of distance health education system under ISO 9001 and EFQM". She is currently working as the assistant professor at Istanbul University Cerrahpaşa. She still continues her academic studies on Strategic Management, Quality Management, Multi-Criteria Decision Making, Artificial Intelligence, Distance Learning, Akhi Order.

Cemalettin Kubat graduated from Department of Mathematics of the Ankara University in 1974. Subsequently, he got a master's degree at Department of Mathematics of the Ege University. In 1992, he graduated from PhD program that he made at the Department of Business Administration of the İstanbul University. He retired in the past weeks as the professor from Department of Industrial Engineering of the Sakarya University. He still continues her academic studies on Operations Research, Supply Chain Management, Manufacturing Systems, Artificial Intelligence, Strategic Planning and Multi-Criteria Decision Making.

ISSN: 1535-668X
Editorial Offices: *Journal of Business and Management*
Department of Management Information Systems
College of Commerce
National Chengchi University
No. 64, Section 2, Zhi-Nan Road
Wenshan District, Taipei City 11605
Taiwan (R.O.C.)
E-mail: eli@nccu.edu.tw

Information is available on our website: http://jbm.nccu.edu.tw/

The *Journal of Business and Management* is published by the Department of Management Information Systems at College of Commerce, National Chengchi University with the financial sponsorship from the Western Decision Sciences Institute. The primary editorial objective of the *Journal of Business and Management* is to provide a forum for the dissemination of theory and research in areas of business, management, and organizational decisions which would be of interest to academics, practitioners, and policy makers. Specific areas include, but not limit to: business analytics, case studies; business ethics, policy, law; corporate governance and social responsibility; electronic business, social commerce, mobile commerce; entrepreneurship, innovation, business venturing; enterprise management, human resource management; information management, project management; international business, marketing; operations and service management, supply chain management; strategic management, risk management, technology management.

National Chengchi University

Department of Management Information Systems
College of Commerce
National Chengchi University
No. 64, Section 2, Zhi Nan Road
Wenshan District, Taipei City 11605
Taiwan (R.O.C.)