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# **CEO COMPENSATION AND EARNINGS SENSITIVITY: A PERSPECTIVE FROM CEO DUALITY**

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## **ABSTRACT**

*The design of chief-executive-officer (CEO) compensation influences a CEO's decisions and the degree to which the company in question values foreign and domestic earnings. This study explores how CEO compensation structure influences foreign and domestic earnings. This study investigates 1,393 listed and over-the-counter companies from 2001 to 2004. The results show that when a CEO also serves as the chairperson of the board of directors, the design of CEO compensation does not assign high weighting to foreign earnings. By contrast, when a CEO is not the chairperson of the board of directors, the design of CEO compensation assigns significantly high weighting to foreign earnings. This research is one of the few studies that explore the influence of a CEO who also serves as the chairperson of the board of directors on CEO compensation composition. The findings reveal that agency problems due to a CEO also serving as the chairperson of the board of directors may influence the importance of foreign earnings in relation to CEO compensation. This study substantially contributes to the fields of corporate governance and earnings management.*

**JEL:** M41 M52

**KEYWORDS:** CEO Compensation, CEO Duality, Earnings Sensitivity, Corporate Governance

## **INTRODUCTION**

This study explores the compensation structure of chief-executive-officer (CEO) working in listed and over-the-counter (OTC) companies. A CEO is responsible for the corporate strategies, growth, risk, budget, and performance of a company and influences the allocation of corporate resources and investment funds (Currim, Lim, and Kim, 2012). In a perfect market and under an effective compensation contract, a CEO's investment decisions and the calculation of an investment's present value should be based on the interests of all shareholders (Jensen, 1986). However, because of information asymmetry, CEOs typically have access to more information than shareholders. When conducting decision-making and resource management, a CEO often considers only short-term goals (Mizik, 2010). Therefore, determining a suitable CEO compensation structure is crucial in enabling a board of directors to supervise their CEO.

Because of limited resources for economic development in Taiwan, making transnational investments to obtain additional resources has become a commonly adopted strategy. Internationalization helps companies enhance their competitiveness and business performance (Lu and Beamish, 2004). Previous studies have indicated that to encourage CEOs to take responsibility for company risks, companies often use a compensation design to motivate CEOs (Miller, Wiseman, and Gomez-mejia, 2002). Therefore, how a board of directors responds to the risks of internationalization and adjusts their CEO's compensation contract warrants investigation.

According to previous studies, compensation is significantly and positively correlated with performance (Lambert and Larcker, 1987, Murphy, 1998). Huson, Tian, Wiedman, and Wier (2012) analyze earnings composition and CEO compensation and indicate that in the final year of a CEO's term of office, to prevent the CEO from manipulating earnings to raise his or her level of compensation, the reward committee typically adjusts the earnings composition and assigns low weighting to discretionary accruals. A fair compensation design can motivate a CEO and encourage him or her to be responsible for company risks and achieve corporate goals. Thus, the first objective of this study is to explore whether a company values foreign and domestic earnings differently when designing CEO compensation.

A company's internationalization strategies exacerbate the information asymmetry and agency conflicts between internal managers and external shareholders (Duru and Reeb, 2002). Therefore, the present study considers that when a company's CEO is the chairperson of the board, the occurrence of agency conflicts is reduced and the compensation contract does not require adjustment. If a CEO is not the chairperson of the board, the company requires a strong supervision mechanism to supervise its CEO's internationalization strategies. Accordingly, the compensation composition values the performance of foreign earnings. This is the second research objective of this study. The remainders of this study include the sections of literature review, data and methodology, results and conclusions.

## LITERATURE REVIEW

A compensation design is a crucial mechanism for a board of directors to supervise a CEO. Compensation design has received substantial attention from numerous researchers. For example, most related studies have shown that compensation is significantly and positively correlated with performance; a company that offers high compensation exhibits excellent business performance (Lambert and Larcker, 1987, Murphy, 1998). If compensation is closely related to performance, the incentive effect of a CEO's compensation is strong.

However, some studies have indicated that if compensation depends too heavily on an accounting performance indicator, the motivation of a CEO to manipulate earnings is enhanced (Watts and Zimmerman, 1986). Grant, Markarian, and Parbonetti (2009) indicate that if a compensation contract contains a strong incentive to take responsibility for risk, CEOs' decisions regarding the adoption of a financial statement method are influenced, and accordingly, the company in question endeavors to stabilize its earnings.

Some studies have explored how to determine suitable compensation indicators. For example, Hayes and Schaefer (2000) indicate that a board of directors typically considers financial and nonfinancial information indicators in a CEO's compensation contract. Tsai (2003) finds that after a performance indicator for the current period has been controlled, CEO compensation contains information regarding a company's future business performance, indicating that CEO compensation is determined based on nonfinancial indicators. In summary, CEO compensation has a substantial impact on business performance and is influenced by numerous internal company factors; for example, a company's domestic and foreign earnings can influence CEO compensation.

Chen (2012) finds that innovation and production performance are two nonfinancial performance indicators that are significantly and positively correlated with CEO compensation. Enterprises adopt different strategies depending on the degree to which they value innovation and production. For example, an enterprise that seeks to develop its own brand values innovation performance over production performance when designing CEO compensation.

Previous studies have explored the influence of corporate governance or company size on CEO compensation. For instance, Lin and Hu (2003) indicate that for enterprises with high growth opportunities,

CEO compensation is highly correlated with business performance. The relationship between the supervision mechanism of the board of directors and CEO compensation depends on company size. For large-scale (small-scale) companies, the relationship between this supervision mechanism and CEO compensation is a complementary (substitution) relationship. Lin, Kuo, and Wang (2013) find that if a CEO is experienced and the company is a large-scale company, the company exhibits unsatisfactory business performance and the CEO has high compensation. The cited studies have shown that CEO compensation is closely related to company size, innovation, and performance.

For companies that engage in business activities overseas, corporate earnings comprise domestic and foreign earnings (Lacina, Marks, and Shin, 2013). Foreign earnings are influenced by numerous factors in a host country. Operating a business is considerably more complex in a foreign market than in the company's domestic market because of differences in culture, regulations, customs, and government systems. In addition, because foreign markets differ considerably from the Taiwanese market, information asymmetry occurs easily. Accordingly, foreign earnings are easily influenced by earnings management, and thus CEO compensation is insensitive to foreign earnings. Thus, we propose the first hypothesis:

*H1: CEO compensation is significantly less sensitive to foreign earnings than to domestic earnings.*

Numerous studies have explored the influence of a CEO also serving as the chairperson of the board of directors, also known as CEO duality. Donaldson and Davis (1991) consider that under such circumstances, the highly concentrated power can enhance business operating efficiency. By contrast, Patton and Baker (1987) indicate under CEO duality, the function of the chairperson of the board of directors to supervise the CEO on behalf of the board and shareholders is lost, and thus agency problems occur.

Yermack (1996) finds that CEO duality can weaken the supervision function of the board of directors, thereby negatively influencing business performance. Steven and Nina (2008) find that CEO duality can reduce the occurrence of performance-based incentives. In other words, CEO duality may increase compensation. Similarly, Irani, Gerayeli, and Valiyan (2017) find that CEO compensation is negatively correlated with managerial ownership and CEO duality is significantly and positively correlated with CEO compensation. Therefore, CEO duality can increase CEO compensation. In summary, CEO duality and CEO compensation are closely related.

Nagar et al. (2003) assert that when a CEO intends to benefit him or herself, he or she is highly likely to conceal information related to the company. Muslu (2010) indicates that when a CEO has considerable influence over the board of directors, he or she is highly likely to conceal information regarding CEO compensation. A company often considers a CEO's compensation contract as crucial for ensuring shareholder interest. A company's internationalization strategies can exacerbate the information asymmetry between internal managers and external shareholders (Duru and Reeb, 2002), potentially leading to severe agency conflicts between managers and external shareholders.

The present study considers that when a CEO is also the chairperson of the board of directors, agency conflicts occur less frequently and the company in question does not need to adjust the compensation contract. However, when a CEO is not the chairperson of the board of directors, the company requires a strong supervision mechanism to supervise the CEO's internationalization strategies. Accordingly, compensation composition highly emphasizes the importance of foreign earnings performance. Thus, we propose the second hypothesis:

*H2: CEO compensation is insensitive to foreign earnings when a CEO is also the chairperson of the board of directors*

## DATA AND METHODOLOGY

### Samples

In Taiwan, since 2005, CEO compensation reported in annual financial statements is displayed in “brackets” (i.e., a range as opposed to the exact amount) and information on detailed for individual people cannot be obtained. Therefore, this study investigates listed and OTC companies in Taiwan from 2001 to 2004. During the sample observation period, global market has just recovered from the 2000 stock market crash. CEO compensation may be an important issue that was looked into in this financial market crisis. Hence, our study intends to explore this issue in time of stock market recovery.

Sample compensation data is obtained from the Taiwan Economic Journal (TEJ). Annual reports of shareholders’ meetings and annual financial statements are also collected. Data regarding financial and market performance and control variable in the model are obtained from the TEJ. The financial and insurance industries are excluded from this study because of the nature of those industries. Data of 1,393 listed and OTC companies from 2001 to 2004 are collected.

Table 1 shows the distribution of sample companies according to industry type (Panel A) and that of sample companies over the years (Panel B). As shown in Panel A of Table 1, electronic businesses account for the highest proportion of the total number of sample companies (58.4%) mainly because numerous electronic businesses and OTC companies are listed. As shown in Panel B of Table 1, from 2001 to 2004, the number of samples increased annually, indicating that the number of listed and OTC companies increased annually during this period.

Table 1: Distribution of Sample Companies According to Industry Type and Distribution of the Sample Companies from 2001 to 2004

<b>Panel A Distribution of Sample Companies According to Industry Type</b>					
<b>Industry Type</b>	<b>TEJ Industry Type</b>	<b>Number of Industries*</b>	<b>Sample Size</b>	<b>Sample Ratio</b>	<b>Sample Size–Number of Industries Ratio</b>
Cement	11	5	11	0.008	2.200
Food	12	12	22	0.016	1.833
Plastic	13	15	39	0.028	2.600
Textile	14	17	46	0.033	2.706
Electric motor	15	35	65	0.047	1.857
Electrical cable	16	9	14	0.010	1.556
Chemistry	17	43	89	0.064	2.070
Glass	18	1	3	0.002	3.000
Papermaking	19	3	7	0.005	2.333
Steel	20	23	57	0.041	2.478
Rubber	21	8	24	0.017	3.000
Automobile	22	2	6	0.004	3.000
Electronics	23	368	813	0.584	2.209
Construction	25	25	38	0.027	1.520
Transportation	26	13	31	0.022	2.385
Tourism	27	5	10	0.007	2.000
General merchandise	29	12	22	0.016	1.833
Cultural & creative	32	3	4	0.003	1.333
Oil and gas	97	7	10	0.007	1.429
Others	99	35	82	0.059	2.343
	Total	641	1,393	1.000	2.173
<b>Panel B Distribution of Sample Companies from 2001 to 2004</b>					
Year	2001	2002	2003	2004	Total
Sample size	209	304	415	465	1,393

*This table shows distribution of sample companies. Panel A shows that electronic businesses account for the highest proportion of the total number of sample companies (58.4%). Panel B shows that the number of listed and OTC companies increased annually during this the sample period.*

Empirical Model

In a compensation contract, an enterprise often associates compensation with performance to motivate its CEO. In other words, an enterprise often uses performance to reflect its CEO’s efforts (Banker and Datar, 1989). The assessment of a performance variable can be based on market performance or accounting performance.

In this study, the sensitivity of CEO compensation to accounting performance assessment is examined. Therefore, after market performance has been controlled in the empirical regression, accounting performance is explored and domestic and foreign earnings in relation to accounting performance are analyzed. According to previous studies on the sensitivity of compensation to performance (Aggarwal and Samwick, 1999), Model (1) is established by Equation (1) in this study:

$$\ln COM_{it} = \alpha_0 + \alpha_1 ACC_{it} + \alpha_2 RET_{it} + \alpha_3 OUTDIR_{it} + \alpha_4 FOWN + \alpha_5 ASSET + \alpha_6 DEBT_{it} + \alpha_7 MB_{it} + \alpha_8 SDRET + \sum IND + \sum YEAR + \varepsilon_{it} \tag{1}$$

where  $\ln COM$  is the logarithm of CEO compensation,  $ACC$  denotes the accounting performance indicator (subtracting total assets from earnings before interest and taxes),  $\alpha_1$  denotes the sensitivity of compensation to accounting performance, and the other variables are control variables.

In this study, when analyzing a compensation contract, different weighting values are assigned to domestic and foreign earnings. Considering accounting performance, domestic and foreign earnings are assessed separately, and variation in domestic earnings ( $\Delta DEARN$ ) and that in foreign earnings ( $\Delta FEARN$ ) are calculated. To test the hypotheses, Model (1) is modified into Model (2) by Equation (2) as follows:

$$\Delta COM_{it} = \alpha_0 + \alpha_1 \Delta DEARN_{it} + \alpha_2 \Delta FEARN_{it} + \alpha_3 \Delta FEARN_{it} \times DUALITY_{it} + \alpha_4 \Delta FEARN_{it} \times NDUALITY_{it} + \sum CONTROL_{it} + \varepsilon_{it} \tag{2}$$

Variable Assessment

*CEO compensation:* In this study, based on data on share allotment to senior managers in the TEJ database, we collect data on CEO salaries, bonuses, expenses (including special expenses and food expenses), and dividends. The data on dividends are obtained from the TEJ. The number of dividend shares is first calculated. The number of dividend shares for the current month is calculated as follows: number of dividend shares for the current month  $\times (1 + \text{share allotment rate}) + \text{number of transferred shares following share allotment}$ . Share allotment rate = stock dividends (NT\$) / 10 (stock dividends must be divided by NT\$10). In contrast to Lin and Hu (2003), the TEJ considers the number of transferred shares during the current month following share allotment. Therefore, errors related to share allotment should be minimized. Then, the number subsequently was multiplied by the ex-right value to obtain a CEO’s dividend. Finally, the logarithm of the sum of a CEO’s salary, bonus, expenses, and dividend is used to assess CEO compensation.

*CEO Duality:* In this study, we use two dummy variables ( $DUALITY$  and  $NDUALITY$ ) to examine the effect of CEO duality. If a CEO is also the chairperson of the board of directors,  $DUALITY$  equals 1; otherwise,  $DUALITY$  equals 0. If a CEO is not the chairperson of the board of directors,  $NDUALITY$  equals 1; otherwise,  $NDUALITY$  equals 0.

*Control Variables:* This study explores the factors that influence how a company designs a compensation contract. Following previous studies (Lambert, Larcker, and Weigelt, 1993, Finkelstein and Hambrick, 1989), several variables are controlled. Market performance (RET) is calculated based on rewards following market adjustment over all 12 months of the year. Market risks (SDRET) is measured by the standard deviation of RET for the first 5 years. Proportion of external director seats (OUTDIR) is measured by the proportion of external director seats to total director seats. Proportion of shares owned by foreign shareholders (FOWN) is measured by the proportion of shares owned by foreign shareholders to outstanding shares. Company risks (DEBT) is assessed based on a corporate debt ratio (total indebtedness / total assets). Company size (SIZE) is measured based on the logarithm of a company's total assets. Investment opportunities (MB) is assessed based on a company's market capitalization and net worth (market capitalization / net worth).

## RESULTS

Table 2 presents the descriptive statistics (i.e., mean, standard deviation, median, and quartile) of various variables. As shown in Table 2, the mean, standard deviation, and median of CEO compensation ("COM" in the table) are 15.356, 1.020, and 15.208, respectively. The mean, standard deviation, and median of market performance (RET) are 23.559, 63.667, and 10.689, respectively.

The mean, standard deviation, and median of market risks (SDRET) are 61.629, 47.135, and 49.594, respectively. The mean, standard deviation and median of the proportion of shares owned by foreign shareholders (FOWN) are 6.534, 10.249, and 2.020, respectively. The mean, standard deviation, and median of the proportion of external director seats (OUTDIR) are 0.307, 0.192, and 0.333, respectively. The mean, standard deviation and median of company risks (DEBT) are 0.430, 0.150, and 0.445, respectively. The mean, standard deviation, and median of company size (SIZE) are 22.355, 1.370, and 22.072, respectively. The mean, standard deviation, and median of investment opportunities (MB) are 1.761, 1.011, and 1.504, respectively. The mean, standard deviation, and median of variation in domestic earnings (DEARN) are 0.061, 0.066, and 0.051, respectively. The mean, standard deviation, and median of variation in foreign earnings (FEARN) are 0.013, 0.043, and 0.000, respectively.

Table 3 shows correlations among all the variables. The upper right triangle shows Pearson correlations and the lower left triangle shows the Spearman correlations. Although several variables indicate significant correlations, we gauge the VIF (variance inflation factors) values by using the procedures proposed by Kennedy (1992) and the results show that no problem of multicollinearity among the variables with all the VIF values less than 10.

Table 4 presents the results of the regression analyses. According to Model (1), compensation is significantly influenced by domestic and foreign earnings. The coefficient for domestic earnings (DEARN) is significantly greater than that for foreign earnings (FEARN). Therefore, H1 is not supported. The samples are divided into two groups. In Model (2), the CEO is not the chairperson of the board of directors; CEO compensation is significantly influenced by domestic and foreign earnings. In Model (3), the CEO also serves as the chairperson of the board of directors; CEO compensation is not influenced by domestic or foreign earnings.

In Model (4), all samples are examined using Equation (2); the results show that the coefficient for  $FEARN \times DUALITY$  is 0.147, which is nonsignificant, and the coefficient for  $FEARN \times NDUALITY$  is 2.261, which is significant. These results support H2. Therefore, a company where the CEO is not the chairperson of the board of directors places greater emphasis on the importance of foreign earnings during compensation design than does a company where the CEO also serves as the chairperson of the board of directors.



Table 2 Descriptive Statistics

Variable	Mean	Standard Deviation	First Quartile	Median	Third Quartile
COM	15.356	1.020	14.733	15.208	15.876
RET	23.559	63.667	-17.084	10.689	44.293
SDRET	61.629	47.135	32.132	49.594	79.980
FOWN	6.534	10.249	0.110	2.020	7.935
OUTDIR	0.307	0.192	0.200	0.333	0.429
DEBT	0.430	0.150	0.322	0.445	0.536
ASSET	22.355	1.370	21.384	22.072	22.988
MB	1.761	1.011	1.039	1.504	2.167
DEARN	0.061	0.066	0.023	0.051	0.091
FEARN	0.013	0.043	-0.002	0.000	0.016

This table shows the descriptive statistics, including mean, standard deviation, first quartile, median and third quartile. The mean, standard deviation, and median of CEO compensation are 15.356, 1.020, and 15.208, respectively.

Table 3 Pearson and Spearman Correlation Analyses

	COM	RET	SDRET	FOWN	OUTDIR	DEBT	ASSET	MB	DEARN	FEARN
COM	1	-0.038 (0.156)	0.069 (0.011)**	0.324 (0.000)***	-0.076 (0.005)***	-0.081 (0.002)***	0.456 (0.000)***	0.315 (0.000)***	0.240 (0.000)***	0.038 (0.154)
RET	-0.040 (0.141)	1	0.301 (0.000)***	-0.067 (0.012)**	-0.054 (0.043)**	0.036 (0.179)	0.051 (0.056)*	0.264 (0.000)***	0.062 (0.021)**	0.040 (0.137)
SDRET	0.103 (0.000)***	0.171 (0.000)***	1	0.001 (0.975)	-0.094 (0.000)***	0.036 (0.179)	0.134 (0.000)***	0.183 (0.000)***	0.076 (0.005)***	-0.043 (0.107)
TFOWN	0.351 (0.000)***	-0.074 (0.006)***	0.050 (0.060)*	1	-0.100 (0.000)***	0.007 (0.787)	0.466 (0.000)***	0.211 (0.000)***	0.083 (0.002)***	0.056 (0.035)**
OUTDIR	-0.071 (0.008)***	-0.055 (0.042)**	-0.075 (0.005)***	-0.133 (0.000)***	1	0.000 (1.000)	-0.359 (0.000)***	0.113 (0.000)***	0.099 (0.000)***	0.074 (0.006)***
DEBT	-0.070 (0.009)***	0.008 (0.777)	0.002 (0.947)	0.011 (0.670)	0.012 (0.651)	1	0.222 (0.000)***	-0.152 (0.000)***	-0.391 (0.000)***	0.003 (0.913)
ASSET	0.454 (0.000)***	0.091 (0.001)***	0.168 (0.000)***	0.498 (0.000)***	-0.337 (0.000)***	0.253 (0.000)***	1	0.020 (0.456)	-0.078 (0.003)***	0.019 (0.482)
MB	0.342 (0.000)***	0.235 (0.000)***	0.198 (0.000)***	0.219 (0.000)***	0.127 (0.000)***	-0.119 (0.000)***	0.011 (0.681)	1	0.521 (0.000)***	0.138 (0.000)***
DEARN	0.273 (0.000)***	0.085 (0.001)***	0.081 (0.003)***	0.061 (0.023)**	0.095 (0.000)***	-0.380 (0.000)***	-0.115 (0.000)***	0.537 (0.000)***	1	-0.424 (0.000)***
FEARN	0.050 (0.061)*	0.065 (0.016)**	-0.052 (0.055)*	0.105 (0.000)***	0.039 (0.143)	0.089 (0.001)***	0.072 (0.007)***	0.082 (0.002)***	-0.381 (0.000)***	1

This table shows Pearson and Spearman correlation analyses. Figures in the upper right portion above the diagonal line are Pearson correlation coefficients and those in the lower left portion below the diagonal line are Spearman correlation coefficients. Figures in parentheses are p values; \*\*\*, \*\*, and \* denote the significance levels of 1%, 5%, and 10%, respectively.

Table 4 Regression Analyses

Independent Variable	Dependent Variable: COM			
	Model 1	Model 2 Duality=0	Model 3 Duality=1	Model 4
Intercept	6.839 (0.000)***	7.395 (0.000)***	5.530 (0.000)***	6.849 (0.000)***
RET	-0.001 (0.018)**	-0.001 (0.094)*	-0.001 (0.046)**	-0.001 (0.018)**
SDRET	-0.001 (0.051)*	-0.002 (0.003)***	0.000 (0.632)	-0.001 (0.050)**
FOWN	0.004 (0.095)*	0.006 (0.036)*	-0.001 (0.821)	0.004 (0.089)*
OUTDIR	0.067 (0.597)	-0.088 (0.582)	0.201 (0.356)	0.069 (0.588)
DEBT	-0.554 (0.002)***	-0.349 (0.113)	-0.909 (0.006)***	-0.560 (0.002)***
ASSET	0.383 (0.000)***	0.357 (0.000)***	0.447 (0.000)***	0.383 (0.000)***
MB	0.133 (0.000)***	0.108 (0.007)***	0.214 (0.001)***	0.134 (0.000)***
DEARN	2.737 (0.000)***	3.903 (0.000)***	0.099 (0.931)	2.706 (0.000)***
FEARN	1.988 (0.005)***	3.039 (0.000)***	-0.495 (0.718)	
FEARN*DUALITY				1.470 (0.126)
FEARN*NDUALITY				2.261 (0.004)***
INDUSTRY	control	control	control	control
YEAR	control	control	control	control
Adjusted R <sup>2</sup> (%)	40.7%	45.2%	31.1%	40.6%
N	1387	922	465	1387

This table shows the results of regression analyses. Model 2 and Model 3 reports the results based on the DUALITY. Model 4 reports the results covering the interaction of the variables which include FEARN, DUALITY and NDUALITY. \*\*\*, \*\* and \* denote the significance levels of 1%, 5%, and 10%, respectively.

## CONCLUDING COMMENTS

An increasing number of companies are investing funds overseas. This study examines CEO compensation composition, compares domestic and foreign earnings in a contract, and explores the influence of CEO duality on the relationship between CEOs and foreign earnings. Because corporate governance increasingly receives attention, the results of this study can facilitate understanding of the sensitivity of CEO compensation contracts to domestic and foreign earnings.

This study investigates 1,393 listed and OTC companies from 2001 to 2004. The results show that in companies where the CEO also serves as the chairperson of the board of directors, CEO compensation does not emphasize the importance of foreign earnings. By contrast, for companies where the CEO is not the chairperson of the board of directors, CEO compensation highly emphasizes the importance of foreign earnings.

This study is one of few studies that explore the influence of CEO duality on CEO compensation composition. The findings show that agency problems due to CEO duality may influence the importance of foreign earnings in relation to compensation. The results of this study can serve as a reference for future studies on corporate governance, international enterprises, and CEO compensation. In addition, in practice, the results of this study can facilitate understanding of the interrelationships between CEO compensation in Taiwan, CEO duality, and domestic and foreign earnings. Thus, this study has theoretical and practical value.

Inevitably, this study has limitations that can be extended in the future research. The data we collected was during the period after financial market crash. Although this period has significant meaning for our research purpose, future research may expand the sample period, which may make our results more robust. On the other hand, our study has a limitation that we only investigate the research issues domestically. However, CEO compensation may have different results in different cultural contexts. Future research is encouraged to conduct a cross-cultural research to make a comparison between the Chinese culture and the Western culture.

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# **EVALUATING REAL ESTATE MUTUAL FUND PERFORMANCE USING THE MORNINGSTAR UPSIDE/DOWNSIDE CAPTURE RATIO**

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## **ABSTRACT**

*The purpose of this research is to explore the viability of utilizing the Morningstar upside/downside capture ratio (UDCR) as viable measure of mutual fund risk and its relation to return. This research examines and compares result of the Sharpe ratio to the Morningstar upside/downside capture ratio (UDCR) in an effort to determine if the UDCR might better explain the ex-post performance of the mutual funds examined. Three sectors of 268 mutual funds are examined; these include domestic equity real estate, domestic equity value funds, and global equity real estate as defined and reported on the Morningstar database. This research considers the traditional measures of risk which include the standard deviation of returns along with the Sharpe ratio. The empirical results suggest that UDCR may provide a more accurate fit in explaining real estate mutual fund returns than the Sharpe Ratio.*

**JEL:** G10, G11, G17

**KEYWORDS:** Real Estate, Mutual Funds, Morningstar, Sharpe Ratio

## **INTRODUCTION**

Investors today have a plethora of mutual funds to select from. At the end of 2015, there were over 15,000 mutual funds in the United States with combined assets of \$18.1 trillion, according to the Investment Company Institute (ICI), a trade association of U.S. investment companies. In mid-2016, 44.4 percent of US households owned shares of mutual funds or other US-registered investment companies—including exchange-traded funds, closed-end funds, and unit investment trusts—representing an estimated 55.9 million households and 95.8 million investors. The investor who is interested in real estate mutual funds also has a considerable selection with over two thousand reported on the Morningstar<sup>®</sup> data base.

This research focuses on real estate mutual funds as existing literature reveals that the unique risk characteristics of real estate asset provide significant portfolio diversification benefits for including such assets in a diversified portfolio. Kuhle (1987), Grissom et al. (1987), Georgiev et al. (2003), Chen et al (2005) and Lee (2010) provide evidence of how real estate investments can reduce risk in a mix-asset portfolio and/or enhance the completeness of the financial market. Utilizing more robust financial econometrics techniques, Chaudhry et al. (2010), Fei et al (2010) and Lee (2014) show support of the diversification benefits documented in earlier studies. Moreover, recent studies [e.g., Lizieri (2013) and Luchtenberg and Seiler (2014)] investigating portfolio diversification benefits of real estate investments following the financial crisis of 2008-2009 contend that real estate investments provide significant diversification benefits even during substantial market declines in both the stock market and the real estate markets. In sum, the inclusion of real estate assets in a diversified portfolio is non-trivial and thus cannot be ignored.

This research examines and compares result of the Sharpe ratio to the Morningstar upside/downside capture ratio (UDCR) in an effort to determine if the UDCR might better explain the ex-post performance of the mutual funds examined. In other words, this study considers the traditional measures of risk which include the standard deviation of returns along with the Sharpe ratio and how these conventional measures of risk performance in relation to that of the UDCR. The purpose of this research is to consider first the performance of domestic equity real estate funds in comparison to equity value funds and equity global real estate funds. This study is intended to evaluate the potential for using the UDCR as a viable measure of performance in identifying mutual fund return potential for future study. Secondly, this research examines a comparison between the Sharpe ratio and the UDCR by comparing correlation coefficients of the three mutual fund sector category returns for the UDCR, standard deviations, and the Sharpe ratio. The empirical results suggest that UDCR may provide a more accurate fit in explaining real estate mutual fund returns than the Sharpe Ratio.

The remainder of this paper is organized as follows: The next section presents a review of relevant literature. The paper then describes the mutual fund sample/data and research methodology, followed by discussion of the results of the empirical analysis. The final section is the conclusion.

## LITERATURE REVIEW

It is widely accepted that the Sharpe Index [Sharpe (1966, 1994)] is one of the most widely used methods for calculating risk-adjusted return. Meyer and Rasche (1992) show that the Sharpe index is an adequate risk-return performance measure given that certain conditions regarding investor risk tolerance and expected rates of return are satisfied. The research work of Eling and Schuhmacher (2007), Eling (2008) and Schuhmacher and Eling (2012) utilize rank-order correlation technique and other similar empirical approaches to examine the efficacy of various performance measures and conclude that the widely known Sharpe index is the appropriate risk-adjusted measure.

Nevertheless, the Sharpe Index can be inaccurate when risky assets such as mutual funds that do not have return property based on the normal distribution assumptions. Certain risky assets may have a high degree of kurtosis or negative skewness in return distributions. The Sharp ratio also tends to have shortcomings when it is used to analyze portfolios with significant non-linear risk functions, such as futures/options, warrants, and in some cases mutual funds. The Sharpe ratio uses the standard deviation of returns in the denominator as its proxy of total portfolio risk, which assumes that returns are normally distributed. Previous studies have documented that returns on financial assets may not be normally distributed and thus, the Sharpe ratio may not be an adequate performance measure.

Given the weaknesses of the Sharpe Index, alternative risk-adjusted return methods have considered over the years, including the Treynor Index [see Treynor (1962, 1965)] and the Sortino Ratio [see Sortino and van der Meer (1991), Sortino and Price (1994) and Sortino and Forsey (1996)]. Researchers have argued that the Treynor index; however, does not include any value gained for superior portfolio management gains. A list of portfolios ranked based on the Treynor index is useful only when the portfolios are actually sub-portfolios within the context of a larger, fully diversified portfolio. Otherwise, portfolios with varying total risk, but identical systematic risk or beta risk, will be ranked the same. Another weakness of the Treynor index is its use of ex-post beta data. Investments will inevitably perform differently in the future than they did in the past. For instance, a mutual fund carrying a beta of 1.5 will not likely be 1.5 times as volatile as the market forever. By the same token, a portfolio cannot be expected to generate 10% returns over the next decade because it generated 10% returns over the last 10 years.

While the Sharpe index considers both upside and downside risks (total return volatility), the Sortino ratio essentially ignores the upside volatility and reflects the negative portion of the total risk. The Sortino ratio

is a variation of the Sharpe index, in that it uses only the negative portion of the standard deviation as the measure for volatility. By using only the downside volatility, the Sortino ratio argues that the investor should only be concerned with downside “risk” and pay little attention to upside volatility. It has been claimed that the Sortino ratio may be more robust in performance measure than the Sharpe index since most risk-averse investors are more concerned about downside risk or return volatility in a down market [see Sortino and Van der Meer (1991), Sortino and Price (1994) and Sortino and Forsey (1996)].

Since the Sharpe Ratio is an appropriate risk-return measure for mutual funds, this study examines the performance of the Sharpe Index relative to that of the Morningstar upside/downside capture ratio. The UDCR is readily available from the Morningstar mutual fund database. Investors can easily obtain the Morningstar proprietary ratios to determine their mutual fund investment selection.

The Morningstar upside/downside capture ratio shows you whether a given fund has gained more or lost less than the broad market benchmark during periods of market strength and weakness, and if so, by how much. Upside capture ratios for funds are calculated by taking the fund's monthly return during months when the benchmark had a positive return and dividing it by the benchmark return during that same month. Downside capture ratios are calculated by taking the fund's monthly return during the periods of negative benchmark performance and dividing it by the benchmark return. Morningstar<sup>®</sup> displays the upside and downside capture ratios over one-, three-, five-, 10-, and 15-year periods by calculating the geometric average for both the fund and index returns during the up and down months, respectively, over each time period. This study considers only the three year upside/downside capture ratios.

An upside capture ratio over 100 indicates a fund has generally outperformed the benchmark during periods of positive returns for the benchmark. Meanwhile, a downside capture ratio of less than 100 indicates that a fund has lost less than its benchmark in periods when the benchmark has been in the red. If a fund generates positive returns, however, while the benchmark declines, the fund’s downside capture ratio will be negative (meaning it has moved in the opposite direction of the benchmark). All stock funds' upside and downside capture ratios are calculated versus the S&P 500.

Within the context of this study, the upside/downside capture ratio for each mutual fund was used to aggregate each of the three fund categories. The average for each category was calculated by adding the value of each upside ratio value to each downside ratio value for each on the funds within each category. If the result of the calculation was positive, this would be a fund which outperformed the market index. By definition the market index would have a composite upside (100) minus the downside (100) value of zero (100-100). Therefore, any stock with a composite upside/downside ratio which is positive, by definition, would outperform the index.

## DATA AND METHODOLOGY

The sample for this research consists of three different mutual fund sectors. This included seventy-one domestic equity real estate funds, one hundred and thirty two domestic equity value funds, and sixty five equity global real estate funds as reported in the Morningstar database. Return data was reported on all 268 funds for the last three years.

Table 1 summarizes the data collected and calculated for each mutual fund sector category. The first row of Table 1 records the average annual returns for three years for the three sector categories. This data was collected for a time period of August 2013 through July 2016. All mutual funds in the data set had their annual returns calculated using equation 1:

$$R_i = \frac{[P_{i+1} - P_i]}{P_i} \quad [1]$$

Where:

$R_i$  = the annual rate of return

$P_{i+1}$  = the price of the Mutual fund at the end of the year

$P_i$  = the price of the Mutual fund at the beginning of the year

The annual return values were then calculated for each of the mutual funds within the following sectors:

1. The domestic US real estate mutual fund equity sector
2. The US value fund mutual fund equity sector
3. The Global real estate mutual fund sector

The domestic US real estate mutual fund equity sector category contained a total of 71 mutual funds that received the Morningstar 4 and/or 5 star rating. The US value fund mutual fund equity sector included a total of 132 mutual funds that qualified with the Morningstar

4 and/or 5 star rating. Finally, the Global real estate mutual fund sector included 65 mutual funds that qualified with the Morningstar 4 and/or 5 star rating.

In addition to the actual ex-post return calculations from equation [1], standard deviations of return were calculated for each mutual fund using equation 2:

$$s = \sqrt{\frac{1}{N-1} \sum_{i=1}^N (x_i - \bar{x})^2} \quad [2]$$

Table 1: Descriptive Statistics for the Three Categories of Funds

	US Real Estate Mutual Funds (N=71)	US Value Funds (N= 132)	Global Real Estate Funds (N= 65)
Average Returns	9.64%	7.85%	8.34%
Average Standard Deviation of Returns	1.46%	2.01%	1.10%
Average Sharpe Ratio	0.72	0.63	0.71
Standard Dev. Sharpe Ratio	0.11	0.15	0.08
Average Beta	0.94	0.92	0.89
Standard Deviation of Beta	0.14	0.34	0.07
Average UDC Ratio Margin	38.16	-18.82	26.94
Standard Dev. of Over/Under Margin	9.98	12.75	7.13

Table 1 summarizes the statistics that were used in this study. Starting with the average returns for the three different fund categories down to the standard deviations of each of the statistics calculated and used for each variable including the Sharpe ratio and the Upside/Downside Capture Ratio.

## RESULTS

Table 1 summarizes the statistics that were generated in this study. The first line, average returns for each of the three categories reveals that the US real estate mutual fund category actually outperformed the other two categories with an average return of 9.64% versus 7.85% for the US value fund category, and 8.34% for the global real estate fund category. The standard deviation of returns were calculated for the three categories as 1.46% for the US real estate mutual fund category, 2.01% for the US value fund category, and 1.10% (lowest) for the Global mutual fund category.

The next line of Table 1 reports the average Sharpe ratio for each mutual fund category. The US and Global real estate mutual funds have the highest Sharpe ratios at 0.72 and 0.71, while the value fund category has

the lowest Sharpe ratio at 0.63. The Sharpe Ratio is a measure for calculating risk-adjusted return, and this ratio has become the industry standard for such risk calculations. The next line calculates the standard deviation of the Sharpe ratio and it is interesting to note that the two real estate fund categories have the lowest standard deviations among the three categories, with the Global real estate mutual funds having the smallest deviation at a value of 0.08 which is almost half of what the domestic fund categories exhibit.

The fifth line of Table 1 reports the average beta value, where beta is a measure used in fundamental analysis to determine the volatility of an asset or portfolio in relation to the overall market. To calculate the beta of a security, the covariance between the return of the security and the return of market must be known, as well as the variance of the market returns. Beta is calculated using historic monthly data for each of the mutual funds in this data set. It is interesting to note that the beta values for all three categories are relatively close in value. However, the standard deviation of beta values is noticeably smaller for the Global real estate date set. This may suggest a close similarity in returns among the Global real estate mutual funds.

The next line in Table 1 is the average upside/downside capture ratio. The upside/downside capture ratio shows you whether a given fund has gained more or lost less than the broad market benchmark during periods of market strength and weakness, and if so, by how much. Upside capture ratios for funds are calculated by taking the fund's monthly return during months when the benchmark had a positive return and dividing it by the benchmark return during that same month. Downside capture ratios are calculated by taking the fund's monthly return during the periods of negative benchmark performance and dividing it by the benchmark return. Morningstar<sup>®</sup> displays the upside and downside capture ratios over one-, three-, five-, 10-, and 15-year periods by calculating the geometric average for both the fund and index returns during the up and down months, respectively, over each time period. This study considers only the three year upside/downside capture ratios.

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The average UDC ratio was calculated for each mutual fund in each group considered and this average for each group is reported in line seven of Table 1. The US real estate mutual fund category has the greatest positive number with an aggregate value of +38.16. The Global real estate mutual fund category scored a +26.94, with the value fund category actually scoring an aggregate value of -18.82, indicating that the value fund mutual category underperformed the market index. Table 2 presents the calculated values for the Z scores for a one-tailed test between the various mutual fund categories is based on formula 3.

$$Z = \frac{\bar{x}_1 - \bar{x}_2 - \Delta}{\sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}} \tag{3}$$

where  $\bar{x}_1$  and  $\bar{x}_2$  are the means of the two samples,  $\Delta$  is the hypothesized difference between the population means (0 if testing for equal means),  $\sigma_1$  and  $\sigma_2$  are the standard deviations of the two samples, and  $n_1$  and  $n_2$  are the sizes of the two samples.

Table 2: Calculated Z Scores for the Three Categories of Fund Returns

Fund Category	US Value Funds (N= 132)	Global Real Estate Funds (N= 65)
US Real Estate Mutual Funds (N=71)	7.21*	5.91*
US Value Funds (N= 132)	-	-1.64

Table 2 reports the Z-score statistic that determines if two mean values are significantly different from one another. In this case, two of the three categories were significantly different from the comparison among categories. \*Significant at the  $\alpha = 0.05$  level

Table 2 would suggest that, at least for the three-year period examined, that generally the two real estate mutual fund categories performance (as measured by average mean returns), exceeded those returns of the US value (equity) funds. Specifically, a statistically significant value of 7.21 was calculated for the Z value between means for the returns of the US real estate mutual fund category and the value fund mutual fund category. In addition, there was a significant statistical difference (Z score = 5.91) between the US real estate mutual fund category and the Global real estate mutual fund category. Table 3 presents the calculated values for the correlation coefficients among the three different groups of mutual funds in this study.

Table 3: Correlation Statistics for the Three Categories of Funds

Fund Category	Correlation of Fund Returns with UDC Ratio	Correlation of Fund Returns with Sharpe Ratio
Us real estate mutual funds (n=71)	0.933	0.409
Us value funds (n= 132)	0.789	0.927
Global real estate funds (n= 65)	0.912	0.773

Table 3 presents the correlation values among the various category returns with the Morningstar UDCRs and Sharpe ratios.

The results displayed in Table 3 would suggest that the UDCR appears to be a better fit for explaining returns for real estate than for equity mutual funds. The correlation coefficient for US real estate mutual funds return with the UDCR is 0.933. This is significantly greater than the Sharpe Ratio of 0.409, thereby suggesting that the UDCR may better predict the overall performance of the US real estate funds. Further, the UDCR also appears to be a better predictor for the Global real estate mutual fund category as well, with a correlation coefficient of 0.912 versus 0.773 for the Sharpe ratio. While these are preliminary results, they would suggest the UDCR may provide a more accurate fit in explaining real estate mutual fund returns.

### CONCLUDING COMMENTS

Various risk-return measures of mutual funds have been examined in the existing literature. The purpose of this research is to explore the viability of utilizing the Morningstar upside/downside capture ratio (UDCR) as viable measure of mutual fund risk and its relation to return. This research investigates and compares result of the Sharpe Ratio to the Morningstar upside/downside capture ratio (UDCR) in an effort to determine if the UDCR might better explain the ex-post performance of the 268 mutual funds examined.

Three sectors of mutual funds are examined; these include domestic equity real estate, domestic equity value funds, and global equity real estate as defined and reported on the Morningstar database.

This study demonstrates that the Morningstar Upside/Downside Capture Ratio (UDCR) outperforms the Sharpe Ratio, in terms of capturing investment return of different categories of real estate mutual funds. The results suggest the UDCR may provide a more accurate fit in explaining real estate mutual fund returns. The Morningstar proprietary risk measure is thus a useful tool for investors evaluating the investment performance of real estate mutual funds. The conclusion supports the use of the UDCR rather than the conventional Sharpe Ratio in performance evaluation of real estate mutual funds.

This research is the first attempt to study the viability of the Morningstar UDCR. The sample of mutual funds and study time periods are limited. Future study should extend the UDCR across other mutual fund sub-sectors to see if similar results occur and extend the sample period to 5-10 years or beyond to further shed light on the performance of the UDCR. This would produce further evidence on the importance of the Morningstar upside/downside capture ratio.

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# THE IMPACT OF TECHNOLOGY ON BUSINESS AND SOCIETY

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## ABSTRACT

*Technology, specifically the interrelationships of Artificial intelligence (AI), big data, and the Internet of things (IoT), is accelerating its ability to help businesses do more with less and provide better results. Businesses can use technology to decrease time from product idea to product creation and product creation to customer delivery, while using fewer workers. Costs can be cut as automation and robots replace humans who need wages and benefits. Although this will create more products and services at lower prices, it may also decrease the number of consumers for those products and services. There has been significant research in those jobs and activities that can be automated now and in the near future. With jobs disappearing, a new economy is growing that turns employees into contract workers who work from gig to gig in solitude. While this new structure of work may allow some people the work/life balance to pursue their creative goals, for others it may mean a life with no stability or future. The result may be a two-tiered society where the rich can afford expensive products and services, and the poor require governmental assistance because although products can be produced more cheaply, they cannot afford them and so they are not produced.*

**JEL:** M0

**KEYWORDS:** Technology Disruption, Business and Technology, Sharing/Gig Economy, Peer-To-Peer Structure

## INTRODUCTION

Technology is accelerating its ability to help businesses do more with less and provide better results. Artificial intelligence (AI), big data, and the Internet of things (IoT), work together to create programs that businesses can use to decrease time from product idea to product creation and product creation to customer delivery. Manyika et al. (2013) say that “Advances in artificial intelligence, machine learning, and natural user interfaces (e.g., voice recognition) are making it possible to automate knowledge-worker tasks that have long been regarded as impossible or impractical for machines to perform” (p. 6). Big data is “things one can do at a large scale that cannot be done at a smaller one, to extract new insights or create new forms of value, in ways that change markets, organizations, the relationship between citizens and governments, and more” (Mayer-Schönberger & Cukier, 2013, p. 6). Chui, Löffler, and Roberts (2010) define the Internet of Things (IoT) as “sensors and actuators embedded in physical objects—from roadways to pacemakers—[that] are linked through wired and wireless networks, often using the same Internet Protocol (IP) that connects the Internet” (para. 2.). IoT captures data that AI can organize into big data. This paper will look at the major disruptions to society and the economy that are the result of technology’s ability to allow businesses to automate work that humans have done. The first section will look at the breakthroughs in technology and how they have changed the structure and processes of business. The second section will look at the meaning of work in society and the possible results of not having work. The third section will look at the sharing economy as a growing segment that could provides jobs with purpose

for many people, but will require changes in business structure and management, government responses, and economic measurement, as well as changes in how citizens' well-being is maintained.

## LITERATURE REVIEW

In combination, AI, big data, and IoT provide instant, detailed information about current and potential customers' needs and preferences that then feeds new product ideas. They produced robots that can replace humans in manufacturing, restaurants, retail, and banking. They produced IBM's Watson that can sift through millions of pages of research in seconds to provide doctors information about diagnosis and treatment options that will result in better, more affordable healthcare (Kaplan, 2015, p. 150), and Google's Deep Mind program that can read lips more accurately than human lip readers (Chui, George, & Miremadi, 2017, p. 1). In finance, "Automated trading algorithms are now responsible for nearly two-thirds of stock market trades" (Ford, 2015, p. 56). In customer service, Amazon is piloting Echo Look that will have a camera and microphone and will give you feedback on how items of clothing look on you. In products, 3D printing is printing a toupee that is a biomaterial scalp prosthetic that matches skin and hair color plus hair curl and thickness.

The Triple Pundit: People, Planet, Profit (2015) recently reported that "GE estimates that convergence of machines, data, and analytics will become a \$200 billion global industry over the next three years" (para. 1). The analysis of Manyika et al. (2015) "estimates that the IoT has a total potential economic impact of \$3.9 trillion to \$11.1 trillion a year by 2025. At the top end, that level of value—including the consumer surplus—would be equivalent to about 11 percent of the world economy" (p. 23). More importantly, Chui et al. (2016) argue that today's technologies could "automate 45 percent of the activities people are paid to perform" and "about 60 percent of all occupations could see 30 percent or more of their constituent activities automated, again with technologies today" (para 4). The World Robotics Report 2016 predicts that there will be 2.6 million units by 2019; "today 70 percent of industrial robots are currently at work in the automotive, electrical/electronics and metal and machinery industry segments" (International Federation of Robotics, 2016, para. 3). The World Economic Forum (2015) identified tipping points by 2025 for technology that include an 84% chance for producing a 3D printed car and a 76% chance of a 3D liver being transplanted, as well as a 90% chance that 90% of the population will have access to the Internet and a 69% chance that over 50% of Internet traffic will go to appliances and devices in homes (p. 7). Kilham (2014) predicts that "A day will come when almost every worker will collaborate with an AI computer or a robot, and almost every adult will have a robot to help around the house" (p. 89).

Human labor involves very little "capex," or capital expenditures—up-front payments for things like buildings, machinery and equipment—but high "opex," or operational expenditures, the day-to-day costs such as salary and employee benefits. Robots come with a diametrically opposed cost structure: their up-front capital costs are high, but other operating costs are minor—robots don't get a salary. As the capex of robots continues to go down, the opex of humans becomes comparatively more expensive and therefore less attractive for employers. (Ross, 2016, p. 37)

Boston Consulting Group (2015) predicts the business benefits: "robots will cut labor costs by 33 percent in Japan, 24 percent in Canada and 22 percent in the United States and Taiwan" (para 4).

Several factors have fueled the AI revolution. Foremost among them is the maturing of machine learning, supported in part by cloud computing resources and widespread, web-based data gathering. Machine learning has been propelled dramatically forward by "deep learning," a form of adaptive artificial neural networks trained using a method called backpropagation. This leap in the performance of information processing algorithms has been accompanied by significant progress in hardware technology for basic operations such as sensing, perception, and object recognition. New platforms and markets for data-driven products, and the economic incentives to

find new products and markets, have also contributed to the advent of AI-driven technology. (Stanford University, 2016, p. 14)

Business leaders will need to increase their awareness of how these new applications will affect their organizations, both in operations and processes. Technology will also change the way employees work within a company as they learn to work with robots and automation. An avalanche of new algorithms will be able to search big data for information about customers and will provide businesses data about how to satisfy current customers and acquire new ones by understanding how to advertise to them, but businesses must understand how to use technology to support their business objectives.

### Technology's Effects on Business

Chui et al. (2017) say that automation “can deliver significant value that is unassociated with labor substitution” (p. 2) and is allowing companies to find new ways to understand the preferences of customers, improve operations by using predictive-maintenance tools, optimize documentation work, and respond immediately to weather changes that affect products. “However, extracting value from automation often entails redesigning entire processes, not just automating individual components of the process (p. 5). They also warn that business leaders must continually look at what competitors are adopting to ensure that any disruptive use of technology does not make a business model obsolete.

Ford (2015) argues that businesses must adopt AI and robots in order to stay competitive because robots can do jobs faster and cheaper than humans can. Automation allows supply to match demand since robots, unlike humans who are paid to continue producing with the excess stored in warehouses that cost money to maintain, can be idled at no cost when demand slows. In addition, of course, robots can work 24/7 and do not require health benefits and vacation, nor do companies that use them pay taxes on the work they do. The few humans that are needed will need skills to use, maintain, and repair the programs and robots, but these skills might not be ones that the majority of those who had done the work can learn. However, to make efficient use of AI and robots, detailed process analyses must be done in order to understand where robots, for example, can improve overall efficiency, not just efficiency of a task. This is especially important because the experts agree that many jobs will have tasks that can be automated, even though entire jobs cannot be. This means that humans' jobs will need to be redefined and training will be needed.

Robots will produce clear benefits to society. There will be fewer work-related injuries; fewer traffic accidents; safer, less invasive surgical procedures; and myriad new capabilities, from sick, homebound children being able to attend school to giving the power of speech to those who are deaf and mute. It is a net good for the world. (Ross, 2016, p. 42)

However, the world still needs consumers to buy what robots produce. Ford (2015) cites a story about Henry Ford II asking the union boss how he will get the robots to pay union dues and the union boss asking Ford how he will get the robots to buy the cars (p. 193). Robots will change the efficiencies of accomplishing tasks and will decrease costs, but that will require that humans learn to work with robots. Robots currently deliver goods in hospitals, factories, and unload container ships. They take orders, cook, and deliver food in a restaurant in China. They provide counseling services and instruct recovering stroke patients in proper exercise. They operate the pharmacy at UCSF Medical Center. They perform surgery. They provide banking services and investment advice (without a fee). Robotic companies are close to perfecting robots that can pick items from shelves and pack them twice as fast as humans, which means they could “reduce the labor cost of fulfilling online orders by 20%” (Baskin, 2017, para. 7), and, of course, robots can work 24/7. Five years ago, *The Economist's* Special Report of Manufacturing and Innovation reported that a Japanese manufacturer of industrial robots had reached a point on some production lines that allowed the production to be unsupervised for a week at a time. 3D printing machines can print 24/7 without supervision. However, “All of these automated machines require someone to service them and tell them

what to do. Some machine operators will become machine minders, which often calls for a broader range of tasks” (Making the Future, 2012, p. 19).

Thus, businesses will need to change their processes and analyze their job tasks in order to know what technologies to adopt and how to implement them. They will also have to continue to use technology to monitor the demand for their products, since the financial benefit of automation can diminish if the demand for products does not match the assumptions made when the AI programs or robots were purchased. Businesses will have to provide retraining for employees to learn to operate and maintain robots, and to use the results of big data analytics for strategic decisions. Businesses will also need to pay attention to new products that are being created by the sharing or peer-to-peer (P2P) economy that is increasing as a result of more people losing their jobs.

### Technology and the Future of Human Work

These networks churn out huge volumes of data that flow to computers for analysis. When objects can both sense the environment and communicate, they become tools for understanding complexity and responding to it swiftly. What’s revolutionary in all this is that these physical information systems are now beginning to be deployed, and some of them even work largely without human intervention. (Chui, Löffler, & Roberts, 2010, para. 2)

The research shows differences in how economists and technology experts perceive the future as more and more work tasks are automated. Some fear that millions of people will be left without work and income because not enough new jobs will be created for most of them (Clifton, 2011; Ford, 2015; Palmer, 2017). Ford (2015) cites a paper by Beaudry, Green, and Sand in 2013, which found “that around the year 2000, overall demand for skilled labor in the United States peaked and then went into precipitous decline. The result is that new college graduates have increasingly been forced into relatively unskilled jobs—often displacing non-graduates in the process” (p. 127). Others think that this technological revolution will follow the pattern of the industrial revolution and new jobs will be created as the old are automated, just as farm workers moved to factory jobs (Kaplan, 2017; Aepfel, 2015). Kaplan (2017) cites an analysis by the Information Technology & Innovation Foundation that found that 57% of the jobs that workers did fifty years ago, no longer exist today. The timetable for when the new jobs will be created relative to job losses is a subject of contention. “Tomorrow’s labor market will be increasingly characterized by competition between humans and robots. In tomorrow’s workplace, either the human is telling the robot what to do or the robot is telling the human what to do” (Ross, 2016, p. 247).

Regardless, human labor will be a decreasing driver of economic growth. Labor shortages for many work tasks are pushing technology ahead more quickly. Online retailing has increased the need for thousands of people to pick and pack goods, but it is difficult to find enough humans, so tech companies are in a race to develop robots that can. In many warehouses today, the humans pack the boxes with products brought to them from the warehouse shelves by robots. A result of a survey of senior executives of 315 global companies conducted in 2015 the World Economic Forum (2016) found that technology would have a significant effect on jobs. For top trends in 2015-2017, 34% of the survey responders, rated “Mobile Internet and cloud technology” as a top trend, and 26% cited “Advances in computing power and Big Data.” “The Internet of Things,” “Advanced manufacturing” and “3D printing.” For top trends in 2018-2020, “Artificial intelligence and machine learning,” “Advanced robotics and autonomous transport,” and “Advanced materials, biotechnology and genomics” were identified as top drivers (World Economic Forum, 2016, pp. 6-7).

Table 1: Employment Effect of Drivers of Change by Job Family

Job Family	Compound Growth Rate 2015-2020
Computer and Mathematical	3.21%
Architecture and Engineering	2.71%
Management	0.97%
Business and Financial Operations	0.70%
Sales and Related	0.46%
Installation and Maintenance	-0.15%
Construction and Extraction	-0.93%
Arts, Design, Entertainment, Sports and Media	-1.03%
Manufacturing and Production	-1.63%
Office and Administrative	-4.91%

(World Economic Forum, 2016, p. 16)

The study identified robotics and autonomous transport, the Internet of Things, advanced manufacturing and 3D printing as four of the top five drivers within the Architecture and Engineering job family, which still has positive growth. Big Data, the Internet of Things, and cloud technology were cited as affecting Office and Administrative Job family. The negative rate of -4.91% will severely affect those in the low and middle sectors of the economy, and these people may not have other options for work unless they can afford retraining (Table 1). Construction and Extraction employees will also be affected at -0.93%; even today, Rio Tinto uses self-driving trucks at one of its mines, and says it has decreased its workforce by a third through automation (Ghost in the Machine, 2017). Thus, it is obvious that global leaders are recognizing the significance of technology disruptors to their industries.

Frey and Osborne (2016) developed a significant quantitative research model matching near-term technologies to job skills required for 702 occupations identified in O\*NET, the task measures list from the U.S. Department of Labor. Their research analyzes 702 occupations and ranks them according to probability of being “computerisable” or “not computerisable.” They found that 47 percent of U.S. blue-collar and white-collar employment professions are at high risk of significant automation: Service; Sales, and Related; Office and Administrative Support; Farming, Fishing, and Forestry; Construction and Extraction, Installation, Maintenance, and Repair; Production; Transportation and Material Moving. The study identifies “Perception and Manipulation (finger dexterity, manual dexterity, cramped work space, awkward positions),” “Creative Intelligence (Originality, Fine arts),” and “Social Intelligence (social perceptiveness, negotiation, persuasion, assisting and caring for others),” as having a lower chance at present of being automated. However, Chui et al. (2017) point out that robots now have skin that “is able to feel textures and find objects by touch, and robots are becoming more adept at physical tasks (such as tying a shoelace) that require fine motor skills. Thus, robots may increase the chance of those skills being automated. Chui et al. (2016) and Maniyka et al. (2017) also focus on activities rather than occupations. They used O\*NET occupations and analyzed both the technical feasibility of automating each activity and amount of time spent on each in the U.S. economy. Their final research showed that

Almost half the activities people are paid almost \$16 trillion in wages to do in the global economy have the potential to be automated by adapting currently demonstrated technology, according to our analysis of more than 2,000 work activities across 800 occupations. While less than 5 percent of all occupations can be automated entirely using demonstrated technologies, about 60 percent of all occupations have at least 30 percent of constituent activities that could be automated. (Maniyka et al., 2017, p. iv)

They identified “Managing others” and “Applying expertise” as “Least susceptible” to automation and “Stakeholder interactions” and “Unpredictable physical work” as “Less susceptible” (although 25% of this activity can be automated). “Data collection,” “Data processing,” and “Predictable physical work” are “Highly susceptible.” However, it should be noted that their study shows only 7% of the time spent in all occupations is in “Managing others” and only 14% in “Applying expertise,” 16 % in “Stakeholder

interactions,” and 12% in “Unpredictable physical work.” On the other end, 17% of time spent in all occupations is in “Data collection,” 17% in “Data processes,” and 18% in “Predictable physical work” (p. 3). Thus, there is a high percentage of activities that can be automated, but the activities that cannot be automated actually occupy small percentages of employee time. The complete analysis published in 2017 looks at the global environment and includes case studies and sections on the determinants for the speed of future development (Manyika et al., 2017).

Chui, Manyika, and Miremadi (2016) and Kaplan (2015, 2017) see the disappearance of activities in jobs, rather than jobs themselves, thus requiring humans to still do many tasks, and thus consolidating those tasks as jobs for humans. Chui et al. (2016) point out that “one-fifth of the time spent in U.S. workplaces involves performing physical activities or operation machinery in a predictable environment, 78% of which could be automated” (p. 4). Even though the tools will work without humans, for example, in checking for defects in oil pipelines or identifying individual parts of a machine that are close to breaking, humans will still need to manage the resulting actions. Brynjolfsson and McAfee (2014) comment that “While computer reasoning from predefined rules and inferences from existing examples can address a large share of cases, human diagnosticians will still be valuable even after Dr. Watson finishes its medical training because of the idiosyncrasies and special cases that inevitably arise” (p. 192). The same will probably be true of self-driving cars that will be automated only under normal driving conditions. The head of technology and innovation at Rio Tinto’s mines in Australia said that automated equipment has replaced drivers, but increased the need for people skilled in a combination of electrical and mechanical engineering, a job that did not exist until now (Aepfel, 2015). The World Economic Forum (2016) and Frey and Osborne (2016) focused on skills and found that the share of work that requires certain skills is decreasing, as is demand, as a result of technological disruption. The World Economic Forum (2016) analyzed the change in demand for skills in all industries (Table 2).

Table 2: Change in Demand for Core Work-Related Skills, 2015-2020, all Industries

Work Related Skills	Scale of Skills Demand in 2020
Cognitive Abilities	15%
Systems Skills	17%
Complex Problem Solving	36%
Content Skills	10%
Process Skills	18%
Social Skills	19%
Resource Management Skills	13%
Technical Skills	12%
Physical Abilities	4%

(World Economic Forum, 2016, p. 22)

The flat demand for Physical Abilities corresponds with the “highly susceptible to automation” that Manyika et al. (2017) found. The importance of increasing demand for Complex Problem Solving skills and Social skills is significant, because they are learned skills that will require training opportunities to develop. These analyses are extremely valuable to business leaders moving forward, but it is important to recognize that technology is also moving forward rapidly. Thus, the perception and mobility tasks assumed by Frey and Osborne (2016) may be computerizable in the near future. Palmer (2017) identifies five jobs that robots will take first: Middle management, Commodity Salespeople, Report Writers like sports and financial writers who report numbers, accountants and bookkeepers, and doctors (para. 2). Aquino (2012) also cites sports writers, and adds pharmacists, baby sitters, and soldiers.

There are still limitations. Machines lack common sense, cannot always pick up on social and emotional cues, and still struggle to understand and generate natural language. Yet the pace of technological progress, propelled by massive increases in computer power and cloud storage, suggests the next frontier will soon be crossed” (Chui et al., 2017, p. 1).

Other Forces

In addition to the speed of jobs being lost through automation, many economists and experts also see another force that also decreases the number of jobs—the restructuring of a business to decrease size and cost. There is the current move by U.S. companies to shift work to contractors, which leads to lower pay and few, if any, benefits. “Some large U.S. companies outsource 20-50% of their workforce” (Weber, 2017, para. 8). Deloitte’s chief talent officer said, “as much as 40 percent of the U.S. workforce may be part-timers by 2020” (as cited in Green, 2015, para. 24). By outsourcing entire job units with the employees to contractors, companies have avoided being perceived by the government and social media as laying off employees. The government and social media definitely criticize if a company lays off workers by replacing them with robots, but if the jobs are outsourced first, the company can then automate processes and this will decrease the number of employees it needs from the outsourcing companies. The outsourcing firms hire contract workers as needed for specific tasks for specific time periods, so they do not offer benefits like health or retirement. “Changing work environments and flexible working arrangements” is one of the trends World Economic Forum (2015) reported that as having a current impact.

Another parallel trend is that as companies decide to move manufacturing back to the U.S. in response to increasing wages in other countries and increased transportation costs, they build new plants that are automated from the beginning. Fewer humans will be hired than would have been in an older factory. Although a new plant may increase a geographic area’s available jobs, the historical number of employees and support industries cannot be used to predict future ones. Additionally, individual countries are requiring businesses to manufacture products in-country rather than import them. As companies make more products closer to their consumers, in some cases in response to this demand of individual countries, the global supply chain is changed. Jobs in transportation may diminish as transportation companies try to cut costs and move to more automation on ships, and using robots to unpack them. Amazon has a patent for a container that would be operated on rail or road that would use drones to take products from the container to the customer’s door.

New companies are starting with technology so they become profitable with fewer people. AT&T was the most valuable company in 1964; today Google is worth 1B more but with less than a tenth of AT&T’s workforce (Thompson, 2015). Ford (2015) points out that YouTube was founded by three people who employed sixty-five people and sold the company in two years to Google for \$1.65 billion. He also cites an example of the CEO of Good Data that uses Amazon’s cloud services for data analysis who said that before technology, he would have had to hire 30,000 employees to service 6,000 clients, but now he needs only 180 employees. “With 6,000 clients I don’t know what all those other people will do now, but this isn’t work they can do anymore. It’s a winner-takes-all consolidation” (Ford, 2015, p. 107). New industries are most labor-efficient, but they do not require many people. Schwab (2016) notes that there is a change in definition and value of ownership: Amazon, the largest retailer, does not own stores, Uber, the largest transportation provider does not own cars, and Airbnb, the largest provider of sleeping rooms does not own hotels (p. 159).

The Work Humans Will do

There is a group of experts who focus on the importance of work to the American society. “The sanctity and preeminence of work lie at the heart of the country’s politics, economics, and social interactions. What might happen if work goes away” (Thompson, 2015, p 52)? “The purpose of our economy is to serve the public interest, rather than the other way around” (Kaplan, 2015, p. 164). Thompson (2015) says “. . . one pursues a calling not only for pay or status, but also for the intrinsic fulfillment of the work itself” (p. 61).

Part-time work is creating a new type of economy, alternatively called the sharing, peer, or gig economy. Whether peer to peer (P2P) or gig, the economy is based on sharing of talent and resources. However, in

terms of whether part-time work is a path to fulfilling one's purpose or passion is a subject of disagreement. It is possible that elimination of full-time jobs make a new artisanal economy focused on self-expression. Thompson (2015) argues this might bring independence, and a chance to develop one's talents and focus on one's purpose: "The next wave of automation could return us to an age of craftsmanship and artistry" (p. 59). However, Schwab (2016) is concerned that only a few will actually be able to have this kind of work and life, and even Thompson (2015) recommends that a minimum income for all would be necessary. "Several economic studies have found that the overall self-reported level of happiness is highest when the economic disparities in society are minimized, even after controlling for all other known factors" (Kaplan, 2015, p. 164). This would be an improvement from the lack of purpose today's employees feel.

A 2017 Gallup report of worker satisfaction found that as many as 70% of Americans do not feel engaged by their current jobs. "Purpose, meaning, identify, fulfillment, creativity, autonomy—all these things that positive psychology has shown us to be necessary for well-being are absent in the average job" (Hunnicut as cited by Thompson, 2015, p 55). Green (2015) found that although some young, educated workers do not want to commit to one particular job or employer because they don't want to repeat their parents' experiences of committing to a career or employer for years only to be laid off, many others want more work/life balance, and want to work part-time so they can do what they have time to be creative and do what they are passionate about. A true peer-to-peer (P2P) structure is one in which people buy and sell directly to one another without a business structure or third party, in either person or, more often, through an Internet site set up by the seller. Amazon and eBay provide the Internet platform for a fee, so this adds a third party. Brynjolfsson and McAfee (2014) suggest that a peer economy allows people to do meaningful work; they can make the things they create easily available for others to buy.

Green (2015) describes the Freelancers Union, which coordinates health insurance and retirement plans for freelancers and part-time employees who do contract work for companies and work in the peer economy, as one support group that can develop the foundation for stabilizing a sharing economy. Brynjolfsson and McAfee (2014) also suggest that entrepreneurs will create their own businesses, but there is a pattern showing that those who succeed have difficulty growing because the big companies will either copy their product or service or buy them out.

The other side of the sharing economy is one in which people cannot make a living doing work that is meaningful to them. It is also possible that some people have to put together a string of jobs that are not meaningful in order to survive, and with the knowledge that the availability of future jobs are uncertain. This is the gig economy. It has created a new business structure that provides gigs, mostly short term or part-time, through the Internet. For example, Uber hires drivers to transport people, Seamless hires drivers to deliver meals, Homejoy hires housecleaners, Airbnb connects travelers and renters, and Task Rabbit connects people who need specific jobs done with those who can do them, for fees from the one needing the work done and from the one doing the work. Heller (2017) cites a 2016 Pew study that "found that seventy-two per cent of American adults had used one of eleven sharing or on-demand services, and that a third of people under forty-five had used four or more" (para. 15). One element that is increasingly important in the sharing economy is social media. Social media can provide reams of data for AI to analyze and interpret about individual customer needs, but it can also mean a level of accountability that has not been required in the past.

No longer can a seller of substandard services expect to feed on a continuing stream of naïve or ill-informed consumers. No longer can the seller expect to be insulated from competitors in other locations who can deliver a better service for less. Research by Michael Luca of Harvard Business School has found that the increased transparency has helped smaller independent restaurants compete with bigger chains because customers can more quickly find quality food via rating services like Yelp, reducing their reliance on brand names' expensive marketing campaigns. (Brynjolfsson & McAfee, 2014, p. 118)



The next gig may depend on what one's current customer says online about satisfaction. Whether this model will provide a sustainable income for enough people and what changes will be necessary for laws, particularly tax laws, is the big question. In Eggers' novel *The Circle* (2014), customer service employees spend much of their time sending emails to customers encouraging them to change their ranking of 8 or 9 to a 10. The sharing/peer/gig economy requires understanding the responsibilities of independent contractors for federal and tax purposes. The IRS has a Web page called "Sharing Economy Tax Center" that explains that regardless of the lack of a Form W-2 or Form 1099 from the person who contracted your services, gig income must be reported. This may require the federal government to allocate more resources investigating whether individuals who report no income are actually contract workers. Heller (2017) describes one company that makes all of its gig workers W-2 employees because, although it is more expensive, attrition is low.

Just as free goods rather than physical products are an increasingly important share of consumption, intangibles also make up a growing share of the economy's capital assets. Production in the second machine age depends less on physical equipment and structures and more on the four categories of intangible assets: intellectual property, organizational capital (new business processes techniques of production), user-generated content, and human capital. (Brynjolfsson & McAfee, 2014, p. 119)

### Social

Thompson (2015) took a first-hand look at a peer economy in Youngstown, Ohio, after its steel mills had shuttered. Between 1977 and 1982, the town lost "50,000 jobs and \$1.3 billion in manufacturing wages. The effect was so severe that a term was coined to describe the fallout: 'regional depression'" (p. 51). When he returned in 2015, he found a city of people doing gig work. Some were happy to have time to follow their passions, but others just watched television or played video games when they had no work. Hunnicutt says the unemployed "sleep and watch television because of loss of status and demoralization. People are happier complaining about jobs than they are luxuriating in too much leisure. Unproductive downtime leads to guilt. Pride is based on past accomplishments" (as cited in Thompson, 2015, p. 55). Additionally, the social community that is part of a workplace is gone, not just as people join the gig economy, but as they work virtually when they have full-time jobs. "Problems caused by unemployment move beyond the personal sphere; widespread joblessness shatters neighborhoods and leaches away their civic spirit" (Ford, 2017, p. 580). Heller (2017) tells of a gig worker who came to hang some artwork on Heller's walls who told him that

He rarely met other taskers, he said; there were no colleagues in his life with whom he could share experiences and struggles. The flexibility was great, if you had something to be flexible for. "The gig economy is such a lonely economy," he told me. He left his drill behind after he finished the work, but I was out when he returned the next day to get it. I never saw him again. (para. 95)

"Contrary to the past, the notion of belonging to a community today is more defined by personal projects, individual values and interests rather than by space (the local community), work, and family" (Schwab, 2016, p. 94). Bailenson says that virtual-reality technology will replace today's social life with a 'cyberexistence' (as cited in Fowler, 2016). This is foreshadowed by the experiences in the online community called Second Life years ago. People created new identities in the form of avatars and then bought property, built houses, and bought and sold 'products;' they even put money in banks without realizing the banks were not legitimate and the bank 'owners' stole the money. Avatars even married other avatars (even though the 'owners' had spouses in real life), and one woman filed for divorce based on her husband's 'second wife' on Second Life. Another woman killed her husband's avatar because he was 'married' to another avatar; the husband tried to have her convicted of murder in the real courts.

What does the “end of work” mean, exactly? It does not mean the imminent of total unemployment, nor is the United States remotely likely to face, say, 30-50% unemployment within the next decade. Rather, Technology could exert a slow but continual downward pressure on the value and availability of work—that is, on wages and the share of prime-age workers with full-time jobs. (Thompson, 2015, p. 53)

Another technological change discussed by Kelly (2016), Ross (2016) and Schwab (2016) that will be used by the sharing economy, especially B2B, will be bitcoin and digital currencies, which are based on the idea of a distributed trust mechanism called the *blockchain*, a way of keeping track of trusted transactions in a distrusted fashion. “Forty-eight% of respondents said that the tipping point of 10% of global gross domestic product (GDP) stored on blockchain technology will be met by 2025” (Schwab, 2016, p. 155).

Certainly, automation can be used to transform the costs of a process by reducing labor costs, for example, when end-to-end digitization is used to create straight-through processing of a transactional process. As we have also documented, automation can not only enable a reduction in labor costs, it can also bring a range of other benefits related to performance improvements, such as greater throughput, improved reliability, raised quality, better safety, and other gains. Some forms of automation, for example those that are based on machine learning techniques such as deep learning, improve their performance over time when they have access to more data. (Manyika et al. 2017, p. 110)

### Two Tier Society

One scenario for this new economy sees a split society where there would be no middle class. There would be the rich, who make money by creating new products, manufacturing robots, or working for service providers like Facebook, Amazon, Airbnb, Homejoy, Uber, and TaskRabbit. This group would also include employees who are on the payroll whose skills are necessary because employers could pay them higher wages as automation brings down the cost of products and services (Brynjolfsson & McAfee, 2014, p. 143). The poor would work lower-end jobs for those who are rich and still want to hire humans as gardeners and housekeepers and babysitters using the gig economy. “People pay more to watch a barista brew their latte than for a comparable product from a vending machine” (Kaplan, 2017, para. 11).

For the first time since before the Great Depression, over half the total income in the United States went to the top 10% of Americans in 2012. The top 1 percent earned over 22 percent of income, more than doubling their share since the early 1980s. The share of income going to the top hundredth of one percent of Americans, a few thousand people with annual incomes over \$11 million, is now at 5.5% after increasing more between 2011 and 2012 than any year since 1927-28. . . . The top 20% got more than 100% of the increase and the bottom 80% saw a net decrease. The top 1% increased their earnings by 278 percent between 1979 and 2007, compared to an increase of just 35% for those in the middle of the income distribution. Between 1973 and 2011 the median hourly wage only grew 0.1 percent per year, but productivity grew an average of 1.56% per year. (Brynjolfsson & McAfee, 2014, p. 129)

Thompson (2015) calls the working class the ‘Precariat,’ “a working class that swings from task to task in order to make ends meet and suffers a loss of labor rights, bargaining rights, and job security” (p. 58). One problem with this model is that the economy is based on the rich spending their money on goods and services. “Spreading long-term social benefit is hard. . . . If gigging platforms are necessary to keep people in cash, the model’s social erosions have to be curbed. How can the gig economy be made sustainable at last?” (Heller, 2017, para. 67).

Is this the beginning of a new and flexible work revolution that will empower any individual who has an Internet connection and that will eliminate the shortage of skills? Or will it trigger the onset of an inexorable race to the bottom in a world of unregulated virtual sweatshops. . . . The challenge we face is to come up with new forms of social and employment contracts that suit the changing workforce and the evolving nature of work. We must limit the downside of the human cloud in terms of possible exploitation while neither curtailing the growth of the labour market nor preventing people from working in the manner they choose. (Schwab, 2016, p. 48)

### Government Changes

Business leaders must confront the possible futures they face. They need to review their business purpose, products, and processes in the light of a sharing economy that may make products they produce available at cheaper prices or artisan versions of those products that cannot compete with their products. They must understand how technology will affect not only them, but also their competitors, since the automation a competitor uses may undercut the price. More importantly, they must demand that government respond to this sharing economy so that there are consumers. If most of the population works in the gig mode, they may be only able to afford the basics. Autonomous vehicles in a sharing economy may mean people do not need the expense of owning a car, or tools, or lawn equipment; they could use them on an as-needed basis from someone else in exchange for providing something of value for that person, whether it be an object or a service. Not only would the sales of things decrease, but the parts of the economy that supported the use of those things would decrease also, like parking garages and storage facilities, or even back-yard sheds. The consumer economy diminishes when you take away the consumers.

“Overall, robots can be a boon, freeing up humans to do more productive things—but only so long as humans create the systems to adapt their workforces, economies, and societies to the inevitable disruption” (Ross, 2016, p. 37). However, at a 2017 U.S. National Governors Association meeting, Elon Musk said that a regulatory agency was needed to control development of AI, because not only it would threaten human jobs but also it could spark a war (Higgins, 2017). “In a million small ways, next-generation AI apps will lessen the friction of modern life. Living without them will seem, in retrospect, like driving with no springs or shocks” (Gelernter, 2016, para. 5). This might lead to the dystopia that AI created in Egger’s novel, *The Circle* (2014). The response to the disruption must come from government, not only in terms of supporting businesses in this new sharing economy, but also in terms of supporting workers who live in the sharing economy. Taxes that provide for workers’ well-being, like social security and worker’s compensation will diminish as millions of workers work on a gig basis, and companies pay taxes on the few employees they have left. Blockchain and digital currencies will also allow people in the sharing economy not to have public transactions of money they have made on which to pay taxes.

Many of the experts (Brynjolfsson & McAfee, 2015; Ford, 2015; Kaplan, 2015; Kelly, 2016; Ross, 2016; Schwab, 2016) discuss the need for the government to provide either work, like the Work Projects Administration’s projects during the Great Depression, or the Civilian Conservation Corps (Brynjolfsson & McAfee, 2015; Kaplan, 2015), or paying people via nonprofits to do socially beneficial tasks, or provide a basic guaranteed income to maintain society (Ford, 2015; Ross, 2016). Other suggestions are job sharing and incubators, which would require that businesses be involved. Kaplan (2015) says we must teach the surplus workers with obsolete skills new ones: “We need to teach old dogs new tricks—but not just any tricks, tricks that employers will pay them to perform. And the only people who know for sure what tricks these are, are the employers themselves” (p. 152). Brynjolfsson & McAfee (2014) recommend instituting Pigovian taxes.

First, they reduce the amount of undesirable activity; if a utility is taxed based on the amount of sulfur dioxide it releases into the atmosphere, it has strong incentives to invest in scrubber technology that leaves the air cleaner. Second. Pigovian taxes raise revenue for the government,

which could be used to compensate those harmed by the pollution (or any other purpose). They're a win-win. (p. 225)

### New Economic Metrics are Needed

The intangible benefits delivered by the growing sharing economy—better matches, timeliness, customer service, and increase convenience—are exactly the type of benefits identified by the 1996 Boscini Commission as being poorly measured in our official price and GDP statistics. This is another way in which our true growth is greater than the standard data suggest. (Brynjolfsson & McAfee, 2014, p. 119)

As Kaplan (2015) reports, “In fact, there are two groups of people without jobs. The first are those who are looking for a job and can't find one, Indeed, that's the official U.S. Bureau of Labor Statistics definition of being unemployed. The other group is what the bureau calls “not in the labor force,” which includes retirees. This does not mean these people are not working, just that they are not getting paid for working” (p. 170).

With a greater volume of digital goods introduced each year that do not have a dollar price, this traditional GDP heuristic (units produced) is becoming less useful. . . . The U.S. Bureau of Economic Analysis defines the information's contribution to the economy as the sum of the sales of software, publishing, motion pictures, sound recording, broadcasting, telecommunications, and information and data processing services. According to the official measures, these account for just 4% of our GDP today, almost precisely the same share of GDP as in the late 1980s, before the World Wide Web was even invented. But clearly this isn't right. The official statistics are missing a growing share of the real value created in our society. (Brynjolfsson & McAfee, 2014, p. 112)

Brynjolfsson & McAfee (2014) recommend that the human development index be used to fill in some of the gaps in official GDP statistics. They also recommend using the multidimensional poverty index that considers indicators like nutrition, sanitation and access to water, and also the Gallup-Healthways Well-Being Index that has many years of data (p. 123).

What's more, the collapse in the share of GDP going to labor actually understates how the situation has deteriorated for the typical workers. The official measure of labor compensation includes soaring wages for a small number of superstars in media, finance, sports, and corporate positions. . . . While the share of national income to capital has been growing at the expense of labor, economic theory does not necessarily predict that this will continue, even if robots and other machines take over more and more work. The threat to capital's share comes not (just) from the bargaining power of various types of human labor, from CEOs or labor unions, but, ironically, from other capital. In a free market, the biggest premiums go to the scarcest inputs needed for production. In a world where capital can be replicated at a relatively low cost (think of computer chips or even software), the marginal value of capital will tend to fall, even if more capital will be used. (Brynjolfsson & McAfee, 2014, p. 145).

### A Path Forward

Business leaders will need to pay closer attention to the technology that is on the horizon, not just the applications that are being marketed. This will require evaluating their work processes to identify which tasks can be automated, and who is now doing those tasks. As the studies demonstrate, automating tasks can sometimes mean employees will no longer do 50% of the tasks they currently complete. Thus, layoffs will not be easy. Some employees who are being kept on the payroll may require training to take on tasks that they do not have now, but which those who are being laid off do. This analysis may then lead to a

decision to keep only those jobs that are core to the business and contracting out others. However, this may require new processes to identify acceptable contract employees and manage them as possibly gig workers. Leaders will also need to analyze the skills necessary for employees who are moving into new positions. If those positions need problem solving skills or social skills, a decision about whether to hire someone new that has the necessary skills or retrain existing employees must be made. Obviously, the more robots and 3D printers that are introduced to the organization, the more need for people who can maintain and repair them. The more AI and IoT is used, the more employees are needed to ensure that there are no data breaches, that appropriate data is accessed, that algorithms are correctly created, and this may require new skills that current employees do not have.

Government agencies need to understand the possible impacts of technology not only on how society operates, both positive and negative. This includes assuring that an individual's personal information is safe from hackers, and that businesses do not sell or give away that data to other businesses. If there is a movement toward a gig economy and a 'precariat,' this will require changes to access to healthcare since most citizens will not have it. There may also be negative changes in taxes, as those who are in the gig economy do not pay taxes on their work, and as companies hire fewer and fewer full-time employees for whom they must pay taxes and report income. Homelessness may rise without the funds to provide affordable housing. Education institutions must also adapt to ensure that students provided opportunities to develop problem solving, systems, process, and social skills that will be necessary in the new workplace. Additionally, students must have learning experiences with the technology, such as robots and 3D printers. They must know how to write an algorithm and how to request data from Watson. They must know how to analyze and evaluate the data they receive. If the possibilities of the gig economy allow people to live their dreams and be creative, schools must help students understand how to earn money from doing what was just a pastime in the past. The research demonstrates that technology is progressing rapidly, more rapidly in some areas than others, but business and society must be prepared for the technological shifts before they come, not after. Automated cars will change transportation infrastructure needs, and parking structures may be archaic if the automated car meets Uber. Electric vehicles have already changed the need for parking places that have chargers. 3D printers will decrease the need for shipping parts, which will disrupt global trade. Scenario thinking and asking "What if?" is more important than ever so that business and society are prepared for the future.

## CONCLUSION

As physical and organizational boundaries are becoming increasingly blurred, organizations are going to have to become significantly more agile in the way they think about managing people's work and about the workforce as a whole. Work is what people do and not where they do it. Businesses will increasingly connect and collaborate remotely with freelancers and independent professionals through digital talent platforms. Modern forms of association such as digital freelancers' unions and updated labour market regulations will increasingly begin to emerge to complement these new organizational models. For policymakers, an important set of regulations concerns the portability of safeguards and benefits between jobs and the equivalent treatment in law of different forms of labour and employment types. (World Economic Forum, 2016, p. 30) Even if a company is completely automated, demand must be there. 3D printers may allow artisans to create their own products and eBay may allow them to be sold B2B, but there still needs to be a demand. Supply may increase as more people can follow their dreams. As people who use Airbnb have discovered, renting your room or apartment is easier before the neighborhood becomes a place travelers want to stay. Then you may have more competition so you may have to spend money upgrading your dwelling. You may also have so many customers that you spend time and money cleaning than following your own passion, which was what the room rental was supposed to provide. Many artists and musicians have had other jobs so they could afford to follow their passion of creating art and music. Now those jobs will be gone, but there may be more people trying to make money in artistic endeavors. The demand for any product or service must exist, even for robots. Brynjolfsson and McAfee (2014) claim

that the best solutions will come from creativity and innovation that increase the value of human labor (p. 245). For business leaders, Manyika et al. (2017) highlight the new responsibilities.

Companies who recognize both the opportunities and threats of automation to competitiveness will engage and embrace the potential that these technologies represent, prioritizing a set of active experiments to start climbing the learning curves earlier rather than later. To help diagnose where automation could most profitably be applied to improve performance, business leaders may want to conduct a thorough inventory of their organization's activities and create a heat map of where automation potential is high. Business processes shown to have activities with high automation potential could be reimaged under scenarios where they take full advantage of automation technologies (rather than mechanically attempting to automate individual activities using current processes). The benefits and feasibility of these automation-enabled process transformations could then be used to prioritize which processes to transform using automation technologies. Business leaders and their organizations will also need to become more knowledgeable about the evolution of the technologies themselves, understanding the art of the possible, and the potential for the future, in order to best position their enterprises to take advantage of automation. This is not just "book knowledge" that comes from reading about technologies, or visiting global centers of innovation, but practical knowledge that comes from devoting some resources to continually and purposefully experimenting with technologies on real problems, and then scaling those that demonstrate promise. Perhaps the most vital component to being successful at deploying automation is the hard work that has to be done to prepare and adapt human capital to work in complementary ways with technology. (Manyika et al., 2017, p. 111)

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# **FACTORS THAT INFLUENCE JOB SATISFACTION OF TELEWORKERS: EVIDENCE FROM MEXICO**

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## **ABSTRACT**

*Changes that society undergoes due to factors such as information, communication and changes in organizations, generate new forms of work and different factors of job satisfaction. Telework presents a flexible form of work organization. In view of these changes, teleworkers modify their work processes. The present study identifies factors that influence the job satisfaction of teleworkers in Mexican companies. We analyzed 247 teleworkers from different companies. We worked with the dependent variable teleworker job satisfaction and the independent variables, amount of work, work load, training, environmental conditions, work independence, promotion possibilities, relationship with supervisor, stability and job security. We find that job satisfaction is driven by the tasks assigned to the position, training obtained from the company, the relationship with his supervisor and the environmental conditions of the workplace. Stability, job security and possibilities of promotion and growth statistically have low relation with job satisfaction.*

**JEL:** M12, M55, O3, 031, 032

**KEYWORDS:** Teleworking, Factors, Job Satisfaction, Mexican Companies

## **INTRODUCTION**

Technological changes generate new life styles and changes in the world of work. As a result, organizations must generate new strategies that reflect the characteristics of the current workforce. These characteristics include working conditions, labor relations, productivity and job satisfaction. It is important that the company achieves a balance of family needs and professional development of the worker. Telework plays an important role, as it presents an alternative form of labor organization that reflects the new workforce. Teleworking has three important elements as proposed by Ugarte (2004) and Thibault (2001) these are: a) the geographic or locative element: which assumes that teleworking is first and foremost a type of distance work; b) the technological or qualitative element of remote work, requires the intensive use of a specific technology that allows for the development of a productive task outside the organizations center of operations; and c) the organizational element allows working remotely and using telecommunications and information technology. Through the use of these elements services are provided in a different way.

Telework involves not just anyone who uses the tools of teleworking. Rather it involves using these tools to escape traditional ways of working within the organization. Teleworking is a different way of organizing and carrying out work, in a context of decentralized work activities that were previously carried out in the company operations center (Vittorio, 2004). Bauregard and Henry (2009) show that employees who telework tend to experience higher levels of satisfaction than those who do not.

Telework decreases the contact between superiors and subordinates as noted by Gala (2001). A disadvantages, for the teleworker occurs if there is a sense of isolation. The lack of supervision might result in a lack of motivation. Negative reactions to management changes, when these are not accepted by

managers or staff of the company, hinders the security of information by streaming through external networks to the company.

In a study on work-family enrichment Pérez (2014), notes the relationship between availability and adoption of flexible practices with job satisfaction and the organizational commitment of the employees. Employees that telecommute obtain social resources of the communication and interaction with their companions. These types of resources can function as social support resource by stimulating positive experiences at work that lead to a general feeling of a positive affect. Confidence and additional personal energy drives employees in both personal and work areas (Hunter et al., 2010).

Osio, (2010) studied teleworking. He notes an option in the digital age of not going to a place of work and not having relations with other workers can produce a feeling of isolation in the worker. This isolation might adversely affect worker performance. The objective of this research is to identify factors that influence the job satisfaction of teleworkers. We identify significant variables related to the labor relations of teleworkers.

The remainder of the paper is organized as follows. The next section provides a brief literature review. The following section provides a discussion of the methodology used, sample size and timeframe. Next, the results are introduced and discussed. The paper closes with some concluding comments and suggestions for further research.

## LITERATURE REVIEW

Teleworking was defined for the first time in the 1970s by Jack Nilles, as: "any form of substitution displacements related to work activity by information technologies" Thibault (2001). Teleworking is a flexible form of work organization that consists of the performance of the professional activity without the physical presence of the worker in the company, and implies the permanent use of some means of communication for contact between the worker and company (Gray, Hodson & Gordon, 1995). The purpose of health at work is to achieve the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all work (OTI, 2003). Sparks, Faragher & Cooper (2001) note that changes generated by the new working conditions give rise to new conceptions of the nature of organizational welfare, health and safety at work. Based on this, the following factors associated with Satisfaction were analyzed.

*Satisfaction and Labor Dissatisfaction:* Research shows that factors involved in producing satisfaction (and motivation) at work are somewhat separate and distinct from those that lead to dissatisfaction at work. Thus, we must consider separate factors, depending on whether satisfaction or dissatisfaction is analyzed. It follows that these two feelings are not opposed to each other. The opposite of satisfaction at work is not dissatisfaction. On the other hand, lack of satisfaction and, evenly, the opposite of dissatisfaction is not satisfaction, but lack of dissatisfaction. Herzberg's bifocal theory states that motivation is generated by the search for an optimal satisfaction of certain needs, which produce job satisfaction (López, 2005).

Given that work is a central aspect of people's lives (Luque, Gómez & Cruces 2000), argue that workers must have a safe and healthy work environment. Organizations, should promote healthy work environments that promote job satisfaction and well-being and an optimal quality of working life (Seabury, Lakdawalla and Reville 2005).

*Amount of work:* Teleworking modifies the structures of space and time at work. Given that physical limits and temporary structures of the workplace have traditionally been used to control employees, their elimination in the framework of telework can be interpreted as an increase in the autonomy of employees. Changes in supervision, as well as spatial and temporal flexibility, can give autonomy to teleworkers

(Dimitrova, 2003). According to the literature review of Bailey & Kurland (2002) the effects of teleworking could diminish or disappear as the frequency of telework decreases. However, few studies consider this variable.

*Tasks Assigned:* Burawoy (1985) argues that capitalists continuously transform production through the extension of the working day, the intensification of work and the introduction of new machines that seek to produce at the lowest possible cost (Higuaita, 2010). They do not worry about worker welfare. From an economic perspective it could be argued that efficiency is related to the rational use of resources (Koontz, 1999, p.12). (Maruyama, Hopkinson, & James, 2009) analyzed the responses of 1566 teleworkers and determined that more time telecommuting results in a better the balance of work life. According to the researcher, saving time in transfers from home to work enables people to have more time to attend to family matters.

*Job training:* A training process is composed of several phases, which must be mastered and applied, before carrying out any training action. With regard to training for change, the phases are the same, but the content and scope of each is different. Determination of the needs, establishment of the objectives, determination of the actions (training plan), preparation of the programs, development of the methodology, measurement of the results, and follow-up are important elements of the process (González & Tarragó, 2008).

*Environmental conditions:* One argument that affects the interest of people to telecommute is the possibility of having a more quiet environment to concentrate. Working in offices can result in many distractions that make it difficult to carry out tasks (Peters, Tijdens, & Wetzels, 2001). The effectiveness of telework could be moderated by the way the physical work space is adapted (Kossek, Lautsch, & Eaton, 2005). Indeed, a main symbol that people use to separate the link between work environment and family environment is the physical space (Fonner & Stache, 2012). The construction labor conditions index by states for Mexico shows that the states with the best conditions are in general the northern states: Coahuila, BCS, Aguascalientes, Nuevo Leon, BC and Chihuahua (Rodríguez & Oreggia, 2009).

*Work independence:* Beltrán and Sánchez (2002) maintain that the appearance of teleworking brings great benefits to companies, such as an increase in productivity, labor independence, the reduction of absenteeism, the reduction of fixed costs and the flexibilization of the working day.

*Work Promotion:* Many teleworkers fear that not being seen in the office or of not establishing personal relationships, "face to face" with their bosses is a disadvantage. However, a study conducted by the Small Business Administration in 1993 concluded that teleworkers obtain promotions in greater proportion than those who go every day to the office. The firm, Find/SVP, says that an increasing proportion of these teleworkers are employed by medium and small companies (Finquelievich, 1998).

*Employment relationship:* A contextual element that can moderate the effects of teleworking is the management style of the supervisor. Wiesenfeld, Raghuram, and Garud (1999) pointed out that control methods for worker supervision can be dysfunctional for those who telecommute. At the same time, Pyöriä (2011) and Golden (2009) mention that for teleworking to work, it is necessary for supervisors to leave traditional management based on control and focus more on results-based management. The previous conclusion is also reaffirmed by Mello (2007) who states the appropriate teleworking officer depends on the supervisor feeling comfortable delegating the responsibilities of the whole unit of work and giving discretion to the way the subordinate completes the work assignments. In addition, flexibility allows teleworkers to better organize their time, which allows them to have less conflict between work and family (Kossek, Lautsch and Eaton, 2006).

*Stability and job security:* technical specialization, continuous training, safety and health at work, social protection, collective representation of professional interests, negotiation of working conditions and job

search, have very different profiles for which fully satisfactory solutions have not been identified (Sánchez, 1994: 13). The Labor Law must act in correspondence with these changes. In recent years, regulations in the field of occupational safety and health have emerged thinking of "good employment" which is associated with the conditions of quality of working life (Bourhis & Mekkaoui, 2010).

## METHODOLOGY

This study was conducted from October to November 2016 in Chihuahua, México. The sample size was selected from a population who uses technology for work and household tasks and with an college degree (Bachelor's degree, Master's and Doctorate). To determine the population and sample size, we use the 2015 Household Availability and Use of Information Technologies Report from the Instituto Nacional de Estadística y Geografía (INEGI) (INEGI, 2015). The analysis considers individuals who (1) live in Chihuahua, (2) have a Bachelor's (Licenciatura), Master's or Doctorate degree, (3). We examined individuals who do teleworking, remote work or computer work-related activities from home. We identified 64,955 individuals who met these characteristics. From this population, we selected a sample size of 382 individuals. We used Survey Monkey to contact our survey. From the 382-surveyed individual, we were able to use 247 completed and valid surveys in this study, leaving us with confidence level of 95% and margin of error of 6.25%.

We analyzed job satisfaction as the dependent variable and, amount of work, tasks in charge, training, environmental conditions, work independence, promotion possibilities, relationship with the supervisor, stability and job security as independent variables. We followed Solís' (2015), validated by Gutek, Searle and Klepa (1991) methodology. We use Saxena, Ansari and Shankar (1995) instrument. Our objective was to determine what factors influence job satisfaction of telecommuters in Mexican companies.

Job Satisfaction was measured by an item that indicates how satisfied the teleworker is. The response scale used for this item was: very satisfied, satisfied, neither satisfied nor dissatisfied, dissatisfied, very dissatisfied.

The independent variables: Amount of work, tasks at work, job training, environmental conditions, work independence, job promotion possibilities, relationship with the supervisor, stability and safety, were evaluated by means of an item. The response scale used for this item was: very satisfied, satisfied, neither satisfied nor dissatisfied, dissatisfied, very dissatisfied. The control variables were sex and age. We utilized statistical correlation techniques. The data were calculated with the statistical package Minitab 17, as well as the use of Excel to graph the expected results.

## RESULTS AND DISCUSSION

This study aims to determine factors that influence job satisfaction of telecommuters in Mexican companies. We analyzed 247 telecommuters from different companies. The survey was applied to 60 male and 40 females with ages ranging from 22 to 61 years and having a college degree (Bachelor, Master's and Doctorate). Telecommuters were employed by companies in different sectors of the economy and work in a place outside the company for which they are hired. Due to incomplete or invalid data entry, we were able to use only 247 of 382 surveys in this study. Table 1 present Pearson correlation analysis and Table 2 shows chihuahua teleworks perceived job satisfactions as percentages.

Table 1: Averages, Standard Deviation and Correlations of the Variables Under Study

Panel A: Analysis							
Variables	Mean	Standard Diviation	Work Satisfaction	Amount of Work	Homework	Training	Environmental Conditions
Amount of work	3.891	0.848	0.355				
Tasks Assigned	3.960	0.731	0.446	0.666			
Training	3.822	0.967	0.398	0.536	0.605		
Environmental conditions	3.798	0.906	0.419	0.563	0.583	0.525	
Relationship with supervisor	3.927	0.951	0.354	0.424	0.469	0.467	0.365

Panel B: Analysis					
Variables	Mean	Standard Diviation	Work satisfaction	Work independence	Possibilities of promotion
Work Independence	3.676	1.400	0.392		
Possibilities of promotion	3.656	1.051	0.339	0.418	
Stability and job security	3.911	0.980	0.274	0.314	0.511

Table 1 shows the Pearson correlation analysis for all the variables used for the study. Panel A includes the variables such a job satisfaction with significant correlation ( P-value < . 05). Panel B includes the variables that did not have a significant correlation (P-value > . 05).

Table 2: Satisfaction Level per Variable (Percentage)

Item	Very Satisfied	%	Satisfaction Scale	%	Neither Satisfied Nor dissatisfied	%	Dissatisfied	%	Very Dissatisfied	%	Total
1.Work Satisfaction	59	23.8	122	49.3	53	21.4	10	4.0	3	1.2	247
2. Amount of Work	50	20.4	139	56.2	40	16.1	17	6.8	1	0.40	247
3.Type of work assigned	51	20.6	144	58.2	44	17.8	7	2.8	1	0.40	247
4.Job Training and development	66	26.7	98	39.6	60	24.2	19	7.6	4	1.6	247
5.Enviromental Conditions	48	19.4	128	51.8	50	20.4	15	6.0	6	2.4	247
6.Work Independance	71	28.4	123	49.7	41	16.5	8	3.2	4	1.6	247
7. Work Promotion	55	22.6	94	38.0	67	27.1	20	8.0	11	4.4	247
8.Relation with Supervisor	78	31.5	93	37.6	61	24.6	10	4.0	5	2.0	247
Job Security	71	28.7	111	44.9	46	18.6	10	4.0	9	3.6	247
Total	549	100	1052	100	462	100	116	100	44	10	

Table 2 shows the results of a survey conduction during 2016 to 247 Mexican workers. The survey explored indicators of job satisfaction as perceived teleworkers. Results are presented by variable and per scale (Very Satisfied, Neither satisfied nor dissatisfied, Dissatisfied and very dissatisfied). Totals are also presented per variable.

As Table 2 shows teleworks in Chihuahua perceieved job satisfactions as follows: *Work Satisfaction:* Of the 247 telecommuters surveyed, 23.8% (59) telecommuters responded to be very satisfied, 49.3% (122) satisfied, 21.4% (53) Neither satisfied, nor dissatisfied, 4.0% (10) dissatisfied and 1.2% (3) of the teleworkers very dissatisfied.

*Amount of Work:* Of the 247 telecommuters surveyed, 20.4% (50) indicated that they were very satisfied, 56.2% (139) satisfied, 16.1% (40) indicated that they were neither satisfied nor dissatisfied, 6.8% (7) dissatisfied and 40% (1) very dissatisfied with the amount of work assigned by the company where they work.

*Type of work assigned:* 20.6%(51) of teleworkers surveyed indicated that they are very satisfied, 58.2% (144) indicate very satisfied, 17.8%(44) were neither satisfied nor dissatisfied, 2.8% (17) dissatisfied and 40% (1) very dissatisfied with the tasks entrusted to their Job title.

*Job Training and Development:* Of the 247 telecommuters surveyed, 26.7% (60) expressed their satisfaction, 39.6% (90) were satisfied, 24.2% (60) were neither satisfied nor dissatisfied, 7.6% (19) were dissatisfied and 1.6% (4) were very dissatisfied with the probability receiving training or offered formal education by the company for which they work.

*Environmental Conditions:* 19.4% (48) of the surveyed workers were very satisfied with the environmental conditions of their place of work. 51.8% (128) were satisfied, 20.4% (50) were neither satisfied nor dissatisfied, 6.0% (15) were dissatisfied and 2.4% (6) were very dissatisfied.

*Work Independence:* 28.45 (71) Teleworkers were very satisfied with level of work independence given by the company they work, 49.7% (123) indicated satisfied, 16.5% (41) responded neither satisfied nor dissatisfied, 3.2% (8) indicated dissatisfied, and 1.6% (4) stated that they were very dissatisfied with their independence.

*Work Promotion:* From the survey applied to the 247 telecommuters, 22.6%(55) Telecommuters expressed being very satisfied with the possibilities of promotion offered by the company, 38.0% (94) stated satisfied, 27.1% (67) responded neither satisfied nor dissatisfied, 8% (20) indicated that they were dissatisfied and 4.4% (11) indicated very dissatisfied with the possibilities of promotion offered by their company.

*Relation with Supervisor:* 31.5% (78) telecommuters indicated they were very satisfied and having a good relationship with their supervisor, 37.6 (93) stated they were satisfied, 24.6%(61) indicated neither satisfied nor dissatisfied, 4% (10) expressed dissatisfaction and 2% (5) indicated very dissatisfied with the relationship they have with their supervisor.

*Job Security:* 28.7% (71) of the teleworkers surveyed indicated they were satisfied to their job security, 44.9% (111) responded satisfied, 18.6% (46) indicated neither satisfied nor dissatisfied, 4%(10) were dissatisfied and 3.6% (9) were very dissatisfied with their job security.

## CONCLUSION

This study determines factors that influence the job satisfaction of telecommuters in Mexican companies. We analyzed 247 telecommuters from different companies. A survey was applied to 60% male and 40% females with ages ranging from 22 to 61 years and having a college degree (Bachelor, Master's and Doctorate). Telecommuters were employed by companies in different sectors of the economy and work in a place outside the company for which they are hired. We used Survey Monkey to apply a questionnaire to the 382-surveyed individuals. However, due to incomplete or invalid data entry, we were able to use only 247 surveys in this study.

Evidence shows that job satisfaction is high among telecommuters. More than half, 73.1% of the telecommuters surveyed responded to be satisfied with their work. A lower percentage of them 26.6% said they were undecided, dissatisfied and very dissatisfied with the work they perform. When evaluating the variable amount of work, we found positive perceptions, where 76.6% said they were satisfied and only 23.3% of them indicate being undecided or dissatisfied. Tasks assigned presented similar results, where 78.8% of the workers responded to be satisfied with the tasks assigned and only 21% indicate to be dissatisfied or very dissatisfied.

The results for job training were slightly lower but still positive, where 66.3% responded to be satisfied with job training possibilities and 33.4% were unsatisfied or unhappy with the company offering of job training or education. With regard to working conditions, most telecommuters surveyed, 71.2% were satisfied with the environmental conditions and only 28.8% of respondents indicated that they were undecided or dissatisfied with the workplace environmental conditions. Independence at work also presented high levels



of satisfaction, where 78.1% of respondents were satisfied with the level of independence and only 21% were undecided or dissatisfied in this work aspect.

When analyzing job promotion, we discovered the level of satisfaction was not high. Some 60.6% of the teleworkers surveyed said they were satisfied with the company's policies regarding job promotion, with 39.5% percentage being undecided or dissatisfied with possibilities of job growth within the company. Relationship with supervisor also presented high level of satisfaction. 73.65 of Telecommuters responded to be satisfied in the relationship with their supervisor and 30.6% were undecided and dissatisfied with the relationship with their supervisor. Job security shows that 73.6% of the workers surveyed responded to be satisfied with the stability and job security they perceived at work and 26.2% said they were undecided and dissatisfied their job security.

Relationship with the supervisor and tasks assigned were the variable with the highest level of satisfaction. On the other hand. teleworkers reported lower level of satisfaction for the variables job promotion. Further research may extend the analysis to determine the underline causes of lower level of satisfaction for job promotion. Teleworking is a new form of work used by a large number of companies in Mexico. Monitoring and evaluation of working conditions for telecommuters are important and offer opportunities for future research

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# **EFFECT OF COMPLEMENTARY PRODUCT FIT AND BRAND AWARENESS ON BRAND ATTITUDE AFTER M&AS: WORD OF MOUTH AS A MODERATOR**

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## **ABSTRACT**

*The main purpose of this study was to examine how complementary product fit and awareness influence brand attitude after Mergers and acquisitions (M&As). The study also examined the moderating effect of word of mouth. A survey was conducted with 411 respondents (162 males and 249 females), who completed a questionnaire in Chinese. The results indicated that brand awareness had a positive influence on brand attitude. Regarding the product fit effect, the product fit did not show any significant effect on brand attitude. The results also indicated that WOM had a significant influence on product fit and brand awareness. A few studies have evaluated the effect of brand awareness, product fit and WOM on brand attitude after M&A. The contribution of this research is to help managers understand the potential effects of brand awareness and WOM on the acquirer's image*

**JEL:** M31

**KEYWORDS:** Complementary Product Fit, Brand Awareness, Mouth of Mouth, M&As

## **INTRODUCTION**

As the economic environment becomes increasingly competitive, companies need to grow rapidly, be profitable, and have a dominant market position (Schuler and Jackson, 2001). Mergers and acquisitions (M&As) have become a key element of many companies' growth strategies (Fairfield-Sonn, Ogilvie and DelVecchio, 2002). Aside from in-market M&As, numerous companies employ cross-market M&As to search for more expertise, and complementary brands would be the optimal choice, e.g. Google acquired Youtube and Microsoft acquired NOKIA Mobility. Recent research on brand alliance has proposed that the consumers' perception of "product fit" or how they perceive the compatibility of two product categories, is expected to play a vital role in how consumers' react to brand alliances (Simon and Ruth, 1998). Bluemelhuber et al also found that product fit is positively related to consumer attitude (Bluemelhuber, Carter and Lambe, 2007). However, a little attention has been paid to the impact of complementary product fit on the consumers' evaluation of the acquirer brand after M&As.

Brands that are familiar to consumers are more likely to be preferred by the consumers, which is how brand awareness would affect the consumers' decision-making process (MacDonald and Sharp, 2000; Huang and Sarigöllü, 2012). Many companies seek to tie up with well-known brands to increase their brand image, e.g. HTC acquired Beats Electronics in order to differentiate their handsets and enhance their brand image in an increasingly competitive mobile phone industry (Saroj, 2012). However, does the acquisition of a well-known brand increase the acquirer's brand performance? In 2013, HTC and Beats ended a two-year partnership that had never really met either side's expectations (Brain, 2013). On the other hand, a number

of companies acquired less-known brands for their competitive strengths, such as Google's purchase of Android Inc. According to a report from IDC, Android-based devices accounted for 79% of all smartphones shipped in the second quarter of 2013 (Reed, 2013). From the above-mentioned examples, it becomes apparent that how to take advantage of acquired brand awareness is a critical issue for the managers of the acquirer brands. However, research on brand awareness is scarce (Huang and Sarigöllü, 2012), and especially, the effect of brand awareness after M&As still requires an in-depth study.

According to a Nielsen report in 2013, approximately 84% of respondents said that they trusted recommendations from friends and family (Nieseln, 2013), and expertise is also a critical element of word-of-mouth (WOM) (Kempf and Palan, 2006). Therefore, WOM is the most trusted non-commercial source of information to the consumers. Consumers' choices are likely to be influenced by WOM when the product is difficult or even impossible to evaluate before purchase (Senecal and Nantel, 2004). After M&As, consumers are uncertain regarding the future performance of the two brands, thus WOM from experts becomes a key factor in the consumers' decision-making process. However, there has been surprisingly little research on this important topic.

“Brand attitude is a necessary communication effect if brand purchase is to occur (Percy and Rossiter, 1992)”, but a few research studies have examined the change in consumers' attitude after M&As. The present study aims to fill the research gap by focusing on complementary product fit and the effects of brand awareness on customers' perception of the acquirer brand, and how this influences the consumers' brand attitude after M&As. In addition, this study will also evaluate the moderating effect of WOM. The article will conduct an experiment to test our hypotheses. We will manipulate three variables: complementary product fit, brand awareness and WOM valance. The gap between complementary product fit and brand awareness is between subject factors, and the WOM is the moderating factor. The research will use MANOVA to examine the data. Finally, the conclusions and managerial implications of the article are discussed.

## LITERATURE REVIEW

### Brand Attitude

Attitude toward a brand, or brand attitude, is a vital component in the valuation of a brand's equity (Liu, Li, Mizerski and Soh, 2012). Brand attitude is defined as the consumers' overall evaluation of the brand (Wilkie, 1986; Keller, 1993). Many studies have found that user experience and accumulation of brand image is a key determinant toward brand attitude (Wu and Lo, 2009). The brand extension research of Eva and José (2010) discovered that “the more favorable the attitude is to the extension, more favorable is the attitude toward the extended brand”. Previous studies on brand alliance have revealed that consumer's brand attitude influences his/her response toward brand alliance (Simon and Ruth, 1998; Rodrigue and Biswas, 2004). Moreover, in a research on online brand alliance, the results demonstrated that the attitudes toward brand alliance would positively affect the brand's website, brand equity and purchase intention (Delgado-Ballester and Hernández-Espallardo, 2008). Except for brand extension and alliance, brand attitude also likely impacts consumers' response toward a corporate brand's merger (Machado, Lencastre, de Carvalho, Costa, 2011).

### Product Fit

The construct of “fit” has been measured by evaluating the connection between the product categories involved in the alliance (Dickinson and Heath, 2008) and the extension (Aaker and Keller, 1990). Furthermore, the extant studies in brand alliance and brand extension demonstrated that perceived fit between partner brands or extension products is a powerful factor that determine the attitude toward brand alliance and brand extension (Aaker and Keller, 1990; Simon and Ruth, 1998; Delgado-Ballester and

Hernández-Espallardo, 2008). Aaker and Keller (1990) identified various bases of fit between two product classes and the bases are (1) complementary, which indicated that consumers view two product classes as complementary if the two products are consumed jointly to satisfy a particular need (Henderson and Quandt, 1989) ; (2) substitute, the extent to which one product can replace the other in satisfying the same need (Park, Milberg and Lawson, 1991); (3) transfer, the degree to which the manufacturing skill that is required for the extension overlaps with an existing skill (Park et al., 1991). According to the above bases, the current manuscript focuses on the complement between the acquirer and acquired, and we propose that complementary product fit is the key determinant in the consumers' overall evaluation of the similarity between the acquirer and the acquired product categories after M&As.

Why is the fit important to brand alliance, brand extension or even to M&As? One reason is that “the transfer of the perceived quality of a brand will be enhanced when the two product classes fit together in some way (Aaker and Keller, 1990)”. Two theoretical perspectives are compatible with the above opinion: Categorization Theory and Information Integration Theory. Categorization Theory has been applied to a number of marketing research studies, such as brand extensions and alliance. Similarity is a critical issue in categorization (Carrilat, Harris and Lafferty, 2010). Individuals usually group similar objects in the same category and place dissimilar objects in other categories (Medin, Goldstone, and Gentner 1993). From the perspective of the categorization theory, one can evaluate co-brand partnerships by transferring quality perception from one partner brand to another. When consumers perceive a “fit” between these partners, more easily they transfer the quality perception of one partner to the other partner's brand (Ahn and Sung, 2011). On the other hand, with category-based processing, consumers transfer quality perception from the original to the new brand extension (Aaker and Keller, 1990). Thus, based on the Categorization Theory, when the consumers perceive a high fit between the acquirer and the acquired brand, more easily they shift quality perception from the acquirer to the acquired brand.

Information Integration Theory proposes that individuals rely on prior experience to comprehend the information received from a stimulus (Anderson, 1981). “According to the information integration theory, attitudes or beliefs are formed and modified as people receive, interpret, evaluate and then integrate stimulus information with existing beliefs or attitude (Simon and Ruth, 1998)”. The Information Integration Theory suggests that the individuals' existing attitude will be integrated with the new information provided by the alliance, thus influencing the individuals' attitude toward brand alliance (Lafferty and Goldsmith, 2003 ; Chan and Cheng, (2012).Buil, de Chernatony and Hem(2009) also demonstrated that brand extension strategy on parent brand equity will be more favorable when the perceived fit is higher between the parent brand and the extension fit and the purchase. Based on the Categorization Theory and the Information Integration Theory, an M&A is more successful if the fit between the acquirer and the acquired product categories is high. The higher the fit of the product categories after M&As, stronger will be the attitude. Based on the above overview, our hypothesis is as follows:

*Hypothesis 1: The greater the perceived product fit between the acquirer and the acquired brand, more increase will be in the acquirer's brand attitude.*

### Brand Awareness

“Brand awareness is the ability of a potential buyer to recognize or recall that a brand is a member of certain product category (Aaker, 1991)”. “Previous research has verified that extensions of high equity brands enjoy a more positive attitude. The main reason lies in the fact that these extensions have highly perceived quality, positive associations derived from the original brand and more brand awareness and familiarity (Buil et al., 2009) ”. As a result, brand awareness is essential for a successful extension of the brand. Aside from brand extension, brand awareness is vital for the acquirer in M&As because acquisition can exploit prior brand awareness and exclude other brand building efforts and the need for expensive advertising

(Mann and Kohli, 2012). Through the M&A process, companies hope to maintain a balanced relationship between the customers, acquirer and acquired brands, in order to obtain cognitive consistency as advocated by Balance Theory (Heider, 1958).

The Balance Theory proposes that “customers’ value harmony among their thoughts and they are motivated to reconcile incongruent thoughts” (Dean, 2002). If there is an imbalance, people would change their attitudes or behavior to restore the balance. Therefore, people are inclined to like whatever is associated with what they already like, and vice versa (Dalakas and Levin, 2005). Based on the Balance Theory, if a customer has a positive awareness perception of the acquired brand, then they will more likely have a positive perception of the acquirer. On the other hand, Signaling Theory (Nelson, 1974) advocates that companies present a variety of information to buyers; therefore, they need to find different ways of communicating with them (James, Lyman and Foreman, 2006). Furthermore, consumers also look at the sellers for a signal to support them in making their purchase decision (Rodrigue and Biswas, 2004). According to the Signaling Theory, if a reputed and well-known brand in a brand alliance keeps its famous brand name when pairing with an unknown brand, consumers might infer that the brand alliance represents a credible signal (Delgado-Ballester and Hernández-Espallardo, 2008). A growing stream of research supported the notion that an alliance with a well-known, reputable brand can improve the consumers' evaluations of perceived product quality, as well as their attitude toward the brand (Voss and Gammoh, 2004). According to the Balance Theory and the Signaling Theory, an M&A is more successful if the acquired brand is well-known, and higher the awareness of the acquired brand after M&As, stronger will be the attitude. From the above overview, our hypothesis is that:

*Hypothesis2: Greater the brand awareness of the acquired brand, more increase will be there in the acquirer’s brand attitude.*

### Word of Mouth Valance

When consumers' trust on both advertising and the organization decrease, and is accompanied with reduced television viewing, word of mouth (WOM) offers a significant competitive advantage (International Word of Mouth Marketing Conference, 2005; Sweeney, Soutar and Mazzarol, 2008). Consumers tend to prefer informal, personal information sources when making purchase decisions because they find their reference groups and peers to be a credible source of information (Richins, 1983 ; Murry, 1991; Kempf and Palan, 2006).

Previous studies concluded that valance is a vital attribute in WOM (Harrison-Walker, 2001; de Matos and Rossi, 2008). “Valance refers to the nature of the content of WOM which could be positive, negative, neutral or mix (Yang, Kim and Amblee, 2012)”. The present study will focus on the positive and negative WOM. A positive opinion can enhance the target’s evaluation; on the other hand, a negative opinion can harm the target’s evaluation (Khare, Labrecque and Asare, 2011). However, negative WOM messages are thought to have a great influence on the receiver (Arndt, 1967; Sweeney, Soutar and Mazzarol, 2012). Several research studies proposed that consumers perceive negative information as more persuasive and diagnostic than positive information of similar intensity (Sen and Lerman, 2007; Pan and Zhang, 2011). This notion is consistent with the theory of Negativity Bias (Christodoulides, Michaelido and Argyriou, 2012). Negativity Bias proposes that negative information tends to have a greater effect on the evaluation than comparably extreme positive information (Ito, Larsen, Smith and Cacioppo, 1998) because bad experiences or negative input are more memorable and have a more significant influence than positive experiences or input (Fiske, 1980; Baumeister, Bratslavsky, Finkenauer, and Vohs, 2001; Christodoulides et al., 2012).



The Moderating Effect of WOM Valance

The Balance Theory advocates that “customers’ value harmony among their thoughts and that they are motivated to reconcile incongruent thoughts” (Dean, 2002). If there is any imbalance, people would change their attitudes or behaviors to restore the balance. Therefore, people are inclined to like whatever is associated with what they already like, and vice versa (Dalakas and Levin, 2005). In the present study, the Balance Theory has been applied to a relationship system involving three separate entities: product fit, WOM valance and customers’ brand attitude. Based on the Balance Theory, this system will reach a balanced state if a customer’s brand attitude increases toward the acquirer brand when the product fit between the acquirer and acquired brands is high and WOM is positive. On the other hand, this system will reach a balance state when the product fit is low and WOM is negative, causing the consumers’ brand attitude toward the acquirer to decrease, a case of worst scenario.

There are also two cases of imbalance relationship: one is a high-product fit with negative WOM and the other is a low-product fit with positive MOW. How will the consumers’ brand attitude toward the acquirer change after an M&A? Based on the theory of negative bias, WOM's focus on the valance of the message indicated that a negative WOM message has a significant influence on the evaluation of the product (Arndt, 1967). Previous studies also demonstrated that negative information is considered more important by the receivers of WOM communication than positive information (Sen and Lerman, 2007). Other researchers suggested that greater confidence displayed by consumers in WOM over other sources is due to uncertainty-reduction benefit, informativeness and perceived lack of bias (Hoch and Ha, 1986; Brown and Reingen, 1987; Herr, Kardes and Kim, 1991; Khare et al., 2011). Since the results of M&A are uncertain, the effect of WOM will be greater than the evaluation of the product fit. Thus, the consumers’ brand attitude will be better in a low-product fit with positive WOM than a high-product fit with negative WOM. Based on the previous discussion, we hypothesize that:

*Hypothesis 3: WOM valence has a moderating effect on product fit and brand attitude.*

Regarding the moderating effect of WOM valance between brand awareness and brand attitude, based on the Balance Theory and the Theory of Negative Bias, the present study proposes the hypothesis that:

*Hypothesis 4: WOM valence has a moderating effect on brand awareness and brand attitude*

The Effect of Product Fit, Brand Awareness and WOM Valance on Brand Attitude

A number of researchers stated that brands' awareness, quality and brand equity are critical factors in the success or failure of co-branding (Rao, Qu, and Ruekert, 1999; Washburn et al., 2004). Other studies indicated that product fit and brand fit are important drivers of effective co-branding. (Simon and Ruth, 1998; James, 2005). Apart from co-branding, brand awareness and product fit are two vital factors in M&As. Based on the Balance Theory (Heider, 1958), if the acquirer and acquired brands receive the same brand awareness and belong to similar industries, then consumers will acquire a favorable view of connection between the acquirer and the acquired.

WOM is an essential element that influences consumers' attitude toward a brand. According to the assimilative and contrastive effects, “a consumer’s opinion of a WOM target after exposure to a WOM message might align with the direction of the message (assimilate) or diverge from the message’s position (contrast) (Khare et al., 2011)”. “An assimilation effect results as a consequence of the target being perceived to be similar to the context, and this is referred to as a perceptual assimilation effect (Lee and Suk, 2010).” Based on the concepts of assimilative and contrastive effects, when an M&A case similar to the above-mentioned example (a high-awareness brand acquiring another high-awareness brand in a similar industry) generates a positive WOM, the positive WOM message then creates an assimilative effect and

have a higher brand attitude. On the other hand, when a high-awareness brand acquires a brand in a dissimilar industry under the same situation, consumers enter an unbalanced state, thus creating a contrastive effect. The consumers then have a weaker brand attitude. Looking at another situation, if a high-awareness brand acquires a low-awareness brand in a dissimilar industry but obtains a positive WOM, the contrast effect will cause consumers to have a weaker brand attitude than if the high-awareness brand had acquired a similar industry brand and obtained a positive WOM. From the above overview, our hypothesis is that:

*Hypothesis 5: There will be significant interaction between product fit, brand awareness and WOM.*

## DATA AND METHODOLOGY

### Research Design

In order to test our hypotheses, we conducted an experiment in which three variables were manipulated: The gap between complementary product fit after M&As. Complementary product fit uses two levels: high-complementary product fit and low-complementary product fit. Brand awareness also employs two levels: a high-awareness brand acquires a high-awareness brand, and a high-awareness brand acquires a low-awareness brand. WOM from experts was divided into two levels: positive and negative. Namely, these studies are a 2 (complementary product fit)×2 (brand awareness)×2 (WOM valance) between-subject design. The gap between complementary product fit and brand awareness is between subject factors, and the WOM is the moderating factor. The research was analyzed using MANOVA to examine the data.

### Pre-Test

The Institute for Information Industry in Taiwan found that 86.5% of households in Taiwan have at least one computer, and each household had an average of 2.4 computers in 2013; therefore, computers have gained widespread popularity in Taiwan. In addition, consumers in Taiwan have taken computer courses since primary school. As a result, computer users are appropriate subjects for this study. The present study used Google as the acquirer in the experiment because Google is the top-ranked website, based on a combination of global visitors and page views (Alexa, 2013). Based on the points stated previously, this study conducted three pre-tests to assess the consumers' perception.

The present study employed “naming methods” in Pre-test One (Pappu, Questerand Cooksey, 2006; Lee, Lee and Wu, 2011), which sampled a number of customers with experience using computers. The respondents were asked to create a list of product categories where they thought the complementary product category fit with Google is either high or low. Pre-test One entailed sampling 40 consumers with 10.35 years of experience using computers. The results revealed that mobile phone industry has a high product fit compared with television industry, which is a low-fit industry.

Pre-test Two also used “naming methods” to survey customers about their view of high and low-awareness brands in the product categories in step one. Pre-test Two involved sampling 40 consumers with 9.02 years of experience using computers. The results demonstrated that Apple is the high-awareness brand for mobile phones and In focus was considered the mobile phone company with a low-awareness brand. Regarding the television industry, the results indicated that Panasonic is the high-awareness brand, whereas Heran is the low-awareness television brand.

Pre-test Three surveyed consumers' opinions about the product fit and brand awareness from the results of pre-tests one and two. Respondents rated complementary product fit on a five-point bipolar semantic differential scale. Measures for the dimensions of complementary product fit were based on previous

research studies conducted by Aaker and Keller (1990) and Simon and Ruth (1998). Complementary product fit was grounded by “is/ is not consistent” and “is/is not complementary”. Measures for brand awareness were based on the research carried out by Yoo, Donthu and Lee (2000). Brand awareness was grounded by: “I know what brand x looks like”, “I can recognize X among other competing brands”, “I am aware of X”, “some characteristics come to my mind quickly”, “I can quickly recall the symbol or logo of brand x” and “I have difficulty in imagining X in my mind(R)”. Furthermore, this study utilized a T test to verify whether there is a significant difference in perceived product fit and brand awareness between the brands from the product categories. In addition, we performed a paired-sample t test to determine whether there is any significant difference between product fit and brand awareness in Pre-test Two. Pre-test Three involved sampling 53 consumers.

Survey Instrument and Measure

The current study utilized a questionnaire consisting of three sections. Section One contained information about a fictional international M&A. Eight versions of the M&As were created with each questionnaire containing one version. In Section Two, respondents were asked to rate their perceptions of the acquirer brand. The questionnaire contained items measuring brand attitude and complementary product fit, brand awareness and WOM for manipulation check (see Appendix I). The respondents rated their perception of this dimension on a five-point Likert-type scale or bipolar semantic differential scale. Measures for the constructs were based on previous research and literature (Aaker and Keller, 1990; Simon and Ruth,1998; Yoo et al., 2000; Coulter and Punj, 2007; Khare et al., 2011; and Dolbec and Chebat, 2013).Section Three of the questionnaire gathered the respondents' demographics, such as gender, age, and level of education. The questions in Sections Two and Three were identical in all six versions of the questionnaire. The questions in Section One varied depending on the version given. All of the survey items were written in Chinese. Each respondent completed only one version of the questionnaire.

Sampling

We employed convenience sampling, with students from two universities in northern Taiwan in May, 2015 as the unit of analysis. There were 411 respondents (162 males and 249 females) who completed a questionnaire in Chinese (Table 1). The profiles of the respondents are shown in Table 2.

Table 1: Description of the Respondents

Item	Description	Frequency	Percentage
Gender	Male	162	39.4%
	Female	249	60.6%
Age	<20	145	35.3%
	21-30	252	61.3%
	31-40	9	2.2%
	41-50	3	0.7%
	>50	2	0.4%

*This table shows the description of the respondents. We use two demographics variables one is gender and the other is age. And the results shows that most of the respondents are female and located in 21-30. In addition, because we collect the sample from university, thus the age above age 41 are not very much.*

Table 2: Research Design

Brand Fit	Product Fit	WOM	Sample
High	High	Positive	46
	High	Negative	43
	Low	Positive	55
	Low	Negative	60
Low	High	Positive	57
	High	Negative	57
	Low	Positive	45
	Low	Negative	48

*This table shows the sample size in each cell of the research design. Brand fit divided into group: high and low fit and product also divided into two group: high and low fit. Word of mouth divided into two group: positive and negative. And the sample size is 43 ~ 60 in each cell.*

## RESULTS AND DISCUSSION

### Reliability and Manipulation

The scales for the construct were analyzed using Cronbach’s  $\alpha$  to determine whether they possessed acceptable levels of reliability or not (Nunnally, 1978). The Cronbach’s  $\alpha$  of the acquirer’s brand attitude was 0.93 and higher than 0.7, indicating that the construct had an acceptable reliability. Manipulation checks were performed to confirm that the manipulations were successful. The t-test results displayed a significant difference between the brand awareness, product fit and WOM. The results revealed the following: high brand awareness fit versus low brand awareness fit,  $p = 0.00$ ; high product fit versus low product fit,  $p = 0.00$  and positive WOM versus negative WOM,  $p=0.00$ . The results indicated that the manipulations of the brand awareness fit, product fit and WOM functioned as intended. Main Effect ANOVA was employed to test the main effect in order to analyze the effect of each variable in detail. Table 3 lists the mean and standard deviations for the brand awareness, product fit and WOM.

Table 3: Means and Standard Deviations

Construct	Brand Awareness		Product Fit		WOM	
	High	Low	High	Low	Positive	Negative
Brand Attitude	3.78(0.05)	3.54(0.05)	3.66(0.5)	3.64(0.5)	3.80(0.5)	3.50(0.5)

*This table shows the means and standard deviations of brand attitude for brand awareness, product fit and word of mouth. Of all the cell, positive WOM has the best brand attitude and negative WOM has the worse brand attitude. In addition, high and low brand awareness get the highest difference in brand attitude.*

ANOVA was conducted to test the hypotheses, in order to analyze the effect of each variable in detail. Table 4 lists a summary of the ANOVA results, demonstrating that various levels of brand awareness after M&A have a significant effect on brand attitude, thereby supporting H2. However, product fit did not show any significant effect on brand attitude; therefore, the results did not support H1. In addition, the results revealed that brand attitude had a significant two-way and three-way interaction between brand awareness, product fit and WOM. Since an interaction effect emerged for brand attitude, we conducted a simple main effect test for each brand awareness, product fit and WOM to examine the differences in greater detail.

The ANOVA results for positive WOM indicated a significant interaction effect between brand awareness and product fit. From Figure 1, the results demonstrated that when WOM was positive for a high-awareness brand that had acquired a high-awareness brand in the similar industry (high product fit), it will have a higher brand attitude after M&A compared with the acquisition of a brand in a dissimilar industry (low product fit). However, if a brand acquires a low-awareness brand in a dissimilar industry (low product fit), under same conditions, it will have a higher brand attitude after M&A than if it had acquired a brand in a similar industry (high product fit). These results support H5. In addition, based on Table 4, we also found that interaction between brand awareness and WOM was significant, the results thereby supporting H4. The

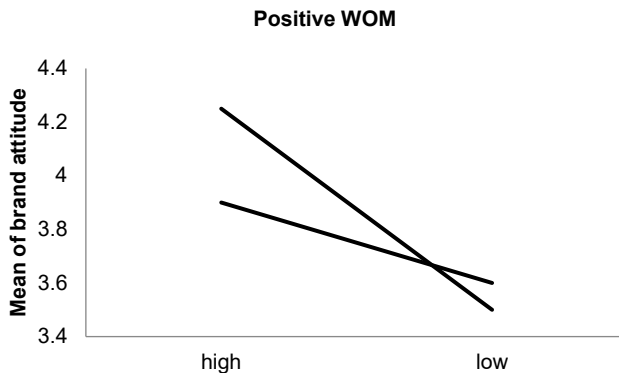
results also show that the interaction effect between product fit and WOM was not important, thereby not supporting H3.

Table 4: ANOVA Results: Significance of Multivariate Tests

Source	df	F	P vale
intercept	1	10606.46	0.00
Brand awareness	1	9.82	0.02**
Product fit	1	0.09	0.75
WOM	1	18.02	0.00**
Brand awareness*Product fit	1	0.15	0.69
Brand awareness*WOM	1	19.24	0.00**
Product fit*WOM	1	1.75	0.18
Brand awareness*Product fit*WOM	1	5.84	0.01**

This table shows the ANOVA results. The first four rows show the results of direct effect on brand attitude and the last four row show the results of interaction effect on attitude. \*\*\*, \*\* and \* indicate significance at the 1, 5 and 10 percent levels respectively.

Figure 1: Relation Between Product Fit and Brand Awareness



This figure shows the relation between product and brand awareness. The results show that when WOM was positive for a high-awareness brand that had acquired a high-awareness brand in the similar industry (high product fit) will have a higher brand attitude. But if acquire a low brand awareness brand, the low product fit will get more attitude than high product fit.

**CONCLUSIONS**

M&A have recently become more common than before, but the outcomes failed to match expectations (Nelsestuen, 2008; Yang, Davis & Robertson, 2012). In fact, the failure rate of mergers and acquisitions lies somewhere between 70% and 90% (Christensen, Alton, Rising, and Waldeck, 2011). How to maintain the acquirer’s brand value is a crucial issue for manager, but studies on brand management after M&A have been surprisingly rare. In addition, there are many M&A case are crossover such as Foxcon acquired Sharp and even some less famous brands acquired more famous brand such as Gilly motor acquired Volvo. Consumers will decrease their faith in these kinds of M&A and how to decrease the uncertainty from consumers is a very important thing for acquirer. Thus our study will find out how to increase consumers’ confident and the present study is one of the few to examine how brand awareness and product fit affect brand attitude after M&A.

The present study collected 411 respondents (162 males and 249 females) from two universities in northern Taiwan. We used experimental design and ANOVA method was used to test the hypothesis. We tested H1 and H2 to determine the fit between complementary product and brand awareness with the consumer’s attitude after M&A. Table 4 presents a summary of the ANOVA results and also demonstrates that different levels of variance between two brand awareness after M&A have a significant effect on brand attitude. According to Balance Theory, a stronger attitude toward the original target results in a greater likelihood of the attitude impacting an association with the target in a similar manner (Dalakas & Levin, 2005). Table

4 indicates that after acquiring a brand with a high awareness, the resulting higher perception scores among respondents were comparable to a brand with a low awareness.

The results revealed that H1 was not supported. Although the results were not in agreement with those presented by other studies on product fit (Simon and Ruth, 1998; Hamzaoui and Merunka, 2006), we discovered another fact based on the results. The fictional scenario in the questionnaire was the acquisition of a company in the TV industry by Google as part of its strategy to develop a plan for a smart home. Numerous experts stated that future hub of a smart home could simply be incorporated into a smart TV, such as Apple TV, which continued to evolve as a smart home hub (Tilley, 2014; McGrath, 2015). Therefore, although the TV industry has a low product fit with Google, it is a critical element in Google's strategy to map out the next step in the development of a smart home. Thus, consumers might believe that acquiring a TV company might be a low product fit, but it can result in a crucial complementary product fit because it enhances diversification of Google. The characteristics of the TV industry also can explain why the results did not support H3.

Regarding H5, the present study intended to examine the interaction effect of brand awareness, product fit and WOM on the consumer's attitude after M&A. It was surprising to discover that when WOM was positive, low brand awareness and low product fit displayed a higher score than low brand awareness and high product fit. A possible reason may be the expectation that the mobile phone industry will experience limited growth in the future (IDC, 2015), while the smart home is the next major business opportunity. Among all of the smart home devices, smart TV is the first step of the consumers to build a smart home. Thus, even though the product fit was low, the consumers' attitude was more than the high product fit based on the low brand awareness and positive WOM. From the above, we can find that that brand awareness had a positive influence on brand attitude. Regarding the product fit effect, the product fit did not show any significant effect on brand attitude. The results also indicated that WOM had a significant influence on product fit and brand awareness.

### Managerial Implications

"Global M&A rose by 38 per cent than the previous year to \$2.18tn in the first half, the highest since 2007, according to Thomson Reuters data. (Fontanella-Khan, Massoudi and Rennison, 2015)". An upsurge in M & A activity was viewed as a positive indicator for both economy and economic growth (Hayes, 2015). When a company endeavors to enter a new market or increase its market share, M&A is generally the easiest, fastest, and most valuable strategy. Furthermore, using M&A, an acquirer can secure all of the assets of the acquired company, including tangible and intangible assets (Lee et al., 2011). Thus, how to evaluate a suitable target is a vital question for the managers of the acquirer company.

When an acquirer selects a target for M&A, brand awareness and reputation should be the first considerations. The current research results revealed that a higher fit of the brand awareness after an M&A results in a stronger brand attitude. Thus, acquisition of a high-awareness brand increases both the consumers' perception of the acquirer and the money they are willing to pay for the brand's products/services after M&A, and decreases the consumers' intention to switch to a rival brand. While selection of a suitable target is important for the acquirer, management of WOM effect is another critical challenge for the acquirer. Nielsen's Global Trust in Advertising reports from the last few years have highlighted a trend— people have lost faith in advertising, and prefer to rely on recommendations from friends and consumer opinions found online (Chaney, 2012). When the acquirers want to use WOM as a marketing strategy, they must pay attention to the source who comment on the M&A that can make consumers more willing to believe this issue. A source will be perceived as more credible when it (1) possesses greater expertise and (2) is less prone to bias (Brown, Broderick and Lee, 2007).

### Limitations and Future Research

We employed only extraneous factors to investigate how brand awareness and product fit affect the consumers' perception of an acquirer. However, numerous internal factors of a brand, such as brand personality, can also influence the consumers' evaluation of two such brands after an M&A. Future studies can take internal brand factors into account to analyze the effect on two brands after an M&A. Although the country of origin is an important factor that can impact the consumers' attitude toward an acquirer (Lee and Lee, 2011), several studies have suggested that intention to purchase is no longer determined simply by the level of economic development of the country of origin. Instead, ethnocentric attitudes and beliefs affect consumption choices (Klein, 2002; Huang, Phal and Lin, 2010). Given the increasing frequency of cross-border M&As, companies based in countries with historical animosity toward each other will be forced to work together. Therefore, the factors, viz. ethnocentrism and animosity must be considered, since these factors will undoubtedly influence the consumers' perception of M&A. Future studies can employ these two factors to analyze the effect on two brands after an M&A.

The sample used in this study all are students, so the results maybe can't represent the all the consumers. The future research can collect more different type of consumers to make the results more consistent to the real world. The present study use eight fictional international M&A cases to survey respondents' attitude, but respondents maybe not have any feelings about this case because they are not real. The future studies can use some real cases that can make respondents reveal more feeling about the acquirer or acquired brands.

Appendix I: Questionnaire Elements

	indicator	Sources
Brand attitude	Like/dislike	Coulter and Punj (2007); Dolbec and Chebat, 2013
	Good/bad	
Complementary Product fit	Positive/negative	Aaker and Keller (1990); Simon and Ruth(1998)
	Favorable/unfavorable	
Brand awareness	is/ is not consistent	Yoo et al.(2000)
	is/is not complementary	
WOM	I know what brand x looks like	Dolbec and Chebat (2013)
	I can recognize X among other competing brands	
	I am aware of X	
	some characteristics come to my mind quickly	
	I can quickly recall the symbol or logo of brand x	
	I have difficulty in imagining X in my mind(R)	
	The expert's evaluation of the M&As was (1=very negative, 5= very positive)	
	The expert's opinions about the M&As was (1= unfavorable, 5=favorable)	

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# **ALIGNMENT BETWEEN STRATEGIC PLANNING AND HUMAN RESOURCE PROCESSES: A QUALITATIVE STUDY**

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## **ABSTRACT**

*The United States Congress in 1987 voted to enact the Malcolm Baldrige National Quality Award with the goal of encouraging U.S. businesses and other types of organizations to approach and deploy effective quality processes in the delivery of their products and services. The Malcolm Baldrige National Quality Award provides a framework of internal assessment for companies to use in their planning and implementation of quality initiatives. Through this internal assessment process, company leadership gains a better understanding of the alignments/linkages within its operations in order to modify its processes for meeting or exceeding customer expectations and requirements. The purpose of the research is to examine the extent of the alignment between strategic planning processes and human resource processes. Eleven manufacturing companies were selected for a site visit. Each of these 11 companies represents a different industry sector, geographical location, and organizational size. Documents searches, personal interviews, and observations were used to collect the data. The initial observations of the alignment between the two categorical variables strategic planning and human resource processes suggest that a moderate to weak alignment is present.*

**JEL:** M1, M540, I210

**KEYWORDS:** Strategic Planning, Human Resources, Malcolm Baldrige Quality Award, Quality Management

## **INTRODUCTION**

The highly competitive global environment in the 1980's spurred a major quality revolution for companies in the United States. In response, the United States Congress in 1987 voted to enact the Malcolm Baldrige National Quality Award (MBNQA) with the goal of encouraging U.S. businesses and other types of organizations to approach and deploy effective quality processes in the delivery of their products and services. The MBNQA provides a framework of internal assessment for companies to use in their planning and implementation of quality initiatives. Through this internal assessment process, company leadership gains a better understanding of the alignments/linkages within its operations in order to modify its processes for meeting or exceeding customer expectations and requirements. The underlying philosophy for these quality-driven companies is a strong passion to continuously improve. The MBNQA award is a nationally and internationally accepted standard currently available in several sector categories: business (large and small), education, government, non-profit, and health care. Under a set of predetermined criteria, organizations are examined in seven categories: leadership, strategy, customer, measurement/analysis/knowledge management, workforce, operations, and results.

The purpose of this research study is to examine the alignment of variables related to strategic planning and human resources planning. The recent state of the literature does not empirically address the alignment issue for Malcolm Baldrige winners; the recent research literature only addresses Baldrige winners in

general normative terms. As a result, this research study adds to the body of knowledge as an empirical analysis to assess if alignment is present in Malcolm Baldrige winning companies and to follow up on research studies of Malcolm Baldrige winning manufacturing companies from the 1990s and early 2000s. Follow up studies are important to periodically conduct in order to identify whether or not Malcolm Baldrige winning companies continue to adopt and implement the Malcolm Baldrige National Quality framework in their organizations. The remainder of this paper is organized as follows: literature review, methodology, results, conclusions, concluding remarks, references, acknowledgements, and biography.

## LITERATURE REVIEW

### Malcolm Baldrige Framework

The Malcolm Baldrige Framework consists of seven categories: Leadership, Strategy, Customers, Measurement/Analysis/and Knowledge Management, Workforce, Operations, and Results. (U.S. Department of Commerce, 2017). The Malcolm Baldrige National Quality Award Program is based on 11 core values and concepts. These values and concepts are the foundation for integrating key organizational requirements within a results-oriented framework. The underlying core values and concepts for business are: “customer-driven quality, leadership, continuous improvement and learning, valuing employees, fast response, design quality and prevention, long-range view of the future, management by fact, partnership development, public responsibility and citizenship, and results focus” (U.S. Department of Commerce, 2017). For each sector, these core values and concepts are translated into the Criteria for Performance Excellence (CPE), and reflect validated leading-edge management/administrative practices against which an organization can measure itself. The Criteria for Performance Excellence represent a common language, making it easier for organizations to share knowledge and transfer best practices. They provide a systems perspective for understanding performance management.

Ford and Evans (2000) argue that by viewing the Criteria for Performance Excellence as an “... integrative model of organizational effectiveness that encompasses a number of cross-functional disciplines”, a large body of research related to the CPE framework actually does exist. An in- depth examination of the CPE’s strategic planning category was conducted. The authors demonstrate that the strategic planning framework represented by the CPE aligns considerably with the conceptual literature. The authors suggest that despite the lack of direct scholarly validity of the CPE, the Malcolm Baldrige framework embodied by the CPE is grounded in research-based principles. A number of research streams support the consideration of human resources in the strategic planning process. One such stream relates to management development and has been cited as important for both strategy formulation (Andrews, 1971; Wright and Snell, 1998; Delery, 1998; Hodgetts, 1999; Hambrick and Mason, 1984; Mintzberg, 1973; and for strategy implementation, (Kerr and Jackofsky, 1989). In an article by James F. Huggett, the author states “the key to meaningful change in your organization is to align every thought, action, and behavior (the manifestations of an organization’s culture) with the clearly defined and communicated vision you have established. ... managing context is a process of establishing clear frameworks for decision making (based on the organization’s vision and strategy and the work group’s specific objectives), and then empowering employees to make decisions within those frameworks. ... embedded in your organization are a number of systems that shape the behavior of your employees. Some are obvious and intentional; others are subtle and unintentional. ...Any soft system that is in conflict with the outcomes you desire will act as a barrier to change. The sooner these systems are identified and aligned, the better” (Huggett, 1999). The Huggett research suggests that without a framework, strategic planning and human resource practices may result in barriers to effective change outcomes.

In an article by Richard M. Hodgetts et.al., the authors examine perspectives from several small business Malcolm Baldrige award winners. These small businesses emphasize the importance of creating a culture conducive to and supportive of strategically aligned quality systems, part of which are a sense of



empowerment by the employees and employee recognition and rewards. The authors state “small businesses implementing high-performing quality efforts (Baldrige Award Winners) are able to achieve their objectives and outpace the competition because they have created the right conditions for their success. ...Baldrige winners have an overall philosophy and strategy that encompasses all areas of product and service delivery. They do not emphasize one area to the exclusion of others. Additionally, all employees are involved in the effort and understand what is expected of them. As a result, each Baldrige winner is a unified organization” (Hodgetts, 1999).

Several authors employed empirical research methods to test and validate the causality of the Criteria for Performance Excellence (CPE) in the Malcolm Baldrige National Quality Award framework (Wilson, (2000); Meyer, (2001); Curkovic, (2000); Badri, (2006). The general statistical findings show significance in causality for the leadership criteria as the driving force for all other CPEs. The study conducted by Wilson et.al. shows predictor variables in each CPE category. The leadership category is the most important driver of system performance results. The second most important driver of performance is the process management category (now changed to operations category in the 2017 Malcolm Baldrige Criteria for Performance Excellence framework). However, the authors found no direct effects on financial results. Winn and Cameron (1998) studied the MBNQA CPE framework for the validity of the proposed relationships amongst the MBNQA dimension in higher education. This study found that in the literature there is no clear definition of quality; as a result, the MBNQA framework and the surrogate variables contained within the framework are difficult to ascribe to an unclear definition of quality. The empirical results of the study helped to create a modified model or a more simplified version of the model in order to manage quality improvement initiatives.

Griffith, (2013) applied the Malcolm Baldrige National Quality Award criteria to a hospital environment for Malcolm Baldrige award winners from 2002-2008. The research limited the examination to the Knowledge Management criteria (now changed to Measurement, Analysis, and Knowledge Management in the 2017 MBNQA CPEs). The findings of this research showed the MBNQA framework assists in the effectiveness for the variables accuracy, confidentiality, timeliness, and security. Lee (2003). examined the impact of the MBNQA criteria on organizational quality. The authors’ findings suggest that the MBNQA framework leads to positive effects on organizational quality. Hart and Schlesinger applied the MBNQA framework to human resource activities. Similar to the Lee study, Hart and Schlesinger (1991) found the MBNQA framework assists in achieving total quality management in human resources.

## DATA AND METHODOLOGY

The specific sample identified for this research study are business sector manufacturing companies who have either won the Malcolm Baldrige National Quality Award or their respective state award based upon the Malcolm Baldrige criteria. From this list of award winners, letters were sent to each organization requesting a site visit. Only 11 companies responded affirmatively for a site visit; these 11 companies represent a convenience sample. The empirical data at the 11 company locations were collected over four years (2013-2016). Each of these 11 companies represents a different industry sector, geographical location, and organizational size. Table 1 identifies the specific breakdown across sector, geography, and size.

In the 11 manufacturing companies, three companies are in the automotive sector, six companies are located in the Midwest and five companies are small in size. Within each of the large and small manufacturing companies, 30 and 20 employees respectively were systematically randomly selected from each plant's employee list. Table 2 shows the gender and employee job type of the respondents.

Table 1: Distribution of Companies by Sector, Location, and Size

Sector	Location	Size
Foods	East	Large
Automotive	Midwest	Small
Electronics	West	
Chemicals	South	

\*Table 1 identifies the distribution of companies by sector, location, and size. Column 1 shows the sectors; column 2 shows the number of companies for each sector; column 3 shows the geographical location; column 4 shows the number of companies for each geographical location; column 5 shows the size of the companies; and column 6 shows the number of companies for each size. Of the 11 sites visits, two are in the Foods sector, three in the Automotive sector, three in the Electronics sector, two in the Chemicals sector, and one in the Health Care sector. Two companies are located in the East, six in the Midwest, one in the West, and two in the South. Six of the companies are large and five companies are small.

Table 2: Demographic Data by Gender and Employment Category

	Male	Female	Management	Professional	Other
Gender	157 (56%)	123 (44%)			
Employee Job Type			51 (18%)	61 (22%)	168 (60%)

\*Table 2 shows the percentages by gender and employment category for the 280 respondents; Fifty-six percent of the respondents are male and 44 percent are female. Eighteen percent of the respondent group hold management positions; 22 percent hold professional-type positions; and 60 percent represent all other types of positions.

Thirty-six percent of the respondents are male and 44% percent are female. Eighteen percent of the respondents hold management positions, 22% hold professional-type positions, and 60% hold other types of positions. Site visit information was collected from several sources: documents, personal interviews, and observations. These multiple sources of information were used primarily as a means of cross validation of data as well as mutually exclusive sources of data. Initially, 34 variables that represent strategic planning and human resource processes were examined at each of the companies. For this study, only 13 of those initial 34 variables will be reported. The 13 variables are: core values, vision, mission, goals, strategies, human resource policies, training, development, job design, selection practices, monetary compensation, termination practices, and performance appraisals. Measurement and scoring procedures vary according to the source of information. Data from personal interviews are measured using content analysis procedures; data from both document searches and observations are measured using frequencies. Frequencies are used as the method for collecting data from document searches and observations. The basis used for the percentage calculations of these frequencies was determined as a function of the total presence and absence of alignments for the specific variables examined.

## RESULTS

For this research study, the qualitative analysis will be limited to the selected variables of strategic planning (core values, vision, mission, goals, and strategy) and human resource processes (human resource policies, training, development, job design, selection practices, termination practices, monetary compensation, and performance appraisals) for the companies in the study. The approach I have elected to take is to report the results in two ways: 1) in what ways each of the companies are similar in their strategic planning processes and their approaches to human resources management; and 2) to identify the frequencies of alignment between strategic planning and human resource processes.

### Strategic Planning

As a point of comparison, the most significant and obvious similarity for all companies in the study is their strategic planning process itself. In all 11 companies, strategy development and policy deployment

processes serve as the foundation for all company activity and effort. More than simply foundation, however, the strategic planning processes actively drive resource allocation, performance measures, rewards and recognition, continuous improvement, information and analysis, fact-based decision making, and performance-oriented results.

### Strategic Planning Process

*Phase 1:* Each organization collects information from its various markets, competitors, customers and other relevant sources in order to project a forecast of volume/revenue.

*Phase 2:* Each of these companies routinely compare themselves on critical indicators to their key competitors.

*Phase 3:* Internal capability and resource availability information is collected to determine allocation of resources and prioritization of organizational goals.

*Phase 4:* Information gathered from Phases 1-3 are then used to develop the unit strategies and combined into annual operating budgets.

*Phase 5:* Unit strategies along with their corresponding budgets are reviewed by institutional senior leadership for alignment amongst unit segments.

*Phase 6:* The implementation of the unit strategies is managed through the policy deployment methodology. Each subunit provides their key goals to support the strategies of the organization and the unit segments. This bottom-up strategic development process enables these companies to encourage ownership of their goals and to become accountable for their accomplishment. As part of the strategy development and deployment process, these companies also define key performance indicators which have been agreed upon by the unit and subunit personnel, which become the mechanism by which performance results will be measured.

*Phase 7:* The key performance indicators are reviewed periodically at the lowest level of responsibility to the highest level.

*Phase 8:* If a change is warranted in performance or plan, contingency plans are reviewed against goals, and if necessary, activated.

*Phase 9:* As the strategic plan is carried out, deviations from the original goals are expected. In recognition of this reality, the planning process of these companies is designed as a dynamic process capable of adapting rapidly to changing environmental conditions. These companies use horizontal and vertical communication to keep a continuous and vigilant eye on the plan and on the environment.

All 11 companies in the study developed a vision and mission statement, and established core values to which strategy development and deployment were derived. The vision, mission and core values were the philosophical guiding principles by which the companies operated. As was earlier mentioned, no company activity or effort was conducted unless those activities were aligned with the companies' guiding principles and strategic goals and objectives. Although different terminology is used to describe each company's core values, there are common themes amongst them. For example, customer focus, teamwork, integrity, quality-driven, respect, trust, empowerment, partnerships, and continuous improvement appear as stated core values. For effective operational results to occur, these companies recognize that the organizational strategies must be communicated and well understood by all organizational members. Table 3 identifies

the aggregate frequency percentages for the strategic planning variables, core values, vision, mission, goals, and strategies.

Table 3: Aggregate Frequency Percentages for Strategic Planning Variables Core Values, Vision, Mission, Goals, and Strategies

Strong	9%
Moderate	47%
Weak	44%

*\*Table 3 reports the results of the frequency analysis for the strategic planning variables core values, vision, mission, goals, and strategies. Column one categorizes the frequencies according to strong, moderate, and weak. Column two identifies the percentages within each category.*

The results from the aggregate frequency analysis for the strategic planning variables core values, vision, mission, goals, and strategies shows a 91% frequency in the moderate and weak categories. The key performance indicators or key measures as they are sometimes called become the mechanisms/tools for translating vision, mission, and strategy into more concrete concepts that can be measured and understood. For the most part, between four and ten clearly defined key measures, developed and selected by senior leadership in conjunction with unit leadership, representing a wide range of organizational interests, were identified by these companies as true indicators of success or failure within their respective organizations. These key measures then become the foundation for all subunits to define performance measures that are directly related to that specific subunit's responsibility. Through the processes involved in strategic planning goal setting, reviews of performance results relative to targets/goals, each subunit takes ownership and commitment for their performance. The core values of these companies reinforce the idea that personnel throughout the entire organization must have a clear understanding of what their department is working toward and how they as individuals can contribute to the effort.

Alignment occurs through the process of bottom-up strategy planning and deployment. At each level of bottom-up strategy planning, each unit and subunit are connected vertically, and at the organization level, each unit segment is connected horizontally. The process owners who establish targets for their respective unit objectives within these companies address the following questions: 1) what do the objectives measure—i.e., what surrogates are used to measure the objectives; 2) how are the objectives linked to key measures, mission, and strategy; 3) what is the source of data; and 4) who collects the data, and how often is the data collected and analyzed? It is generally recognized by each of these companies that valid and reliable information and critical analysis leads to fact-based decision making for effective management of their respective companies, and system integrity.

This latter point may seem obvious, but is often the source of many misunderstandings, confusion, and suspicion by personnel who, after all, are the implementational forces/energies of organizational performance and results. Through linkages and alignment within these companies' operations, there is a strong belief by leadership that each function, role, and process must be designed and implemented for internal consistency and integrity. Generally occurring through the improvement cycle process, teams of individuals discuss misalignments within their respective areas. It may sound ridiculous that an organization would have internal barriers or disincentives that discourage the achievement of the unit's goals, but this is often the case when an organization does not pay attention to the alignments within its system.

### Human Resource Focus

The human resource focus for this particular study included the specific variables training, development, selection practices, job design, monetary compensation, termination practices, performance appraisals, and human resource policies. In addition to these specific human resource variables mentioned above, the

variables of teamwork, communication input/feedback and empowerment will be included in this discussion. In 10 out of 11 companies, teams/teamwork is a stated core value. Senior leadership recognizes the value of cross-functional work processes for enabling their employees to share knowledge and continuously improve. For employees to function effectively in teams, they are provided with extensive training and development programs for personal growth and organizational improvement. In 8 of the 11 companies, teams manage their own work systems including scheduling, work assignments, time off, peer review, and work flow. Compensation systems are aligned with team-based work activities by rewarding individuals for team-based performance. The performance appraisal process includes a significant percentage of peer assessment as input providing a documented record for rewarding merit increases for the achievement of goals and the demonstration of skills. Table 4 identifies the aggregate frequencies for the human resources variables human resource policies, training, development, selection practices, job design, monetary compensation, termination practices, and performance appraisals.

Table 4: Aggregate Frequency Percentages for Human Resource Variables—Human Resource Policies, Training, Development, Selection Practices, Job Design, Monetary Compensation, Termination Practices, and Performance Appraisals

Strong	1%
Moderate	37%
Weak	62%

*\*This table shows the aggregate frequency percentages for human resources practices. Column 1 categorizes the frequency percentages according to strong, moderate and weak. Column 2 identifies the frequency percentages.*

Although each company states a commitment to the alignment of human resources practices, the results of the aggregate frequency analysis in Table 4 suggest that 99% of the companies have only a moderate and weak alignment.

## CONCLUSIONS, LIMITATIONS, AND FUTURE RESEARCH

The purpose of the paper is to examine the alignment between strategic planning and human resources processes. What companies state they are committed to and what they actually do may not be aligned. The methodology used to collect the data were interviews, documents searches, and observations. Based on the aggregate frequencies analysis of the strategic planning variables (core values, vision, mission, goals, and strategies) and the human resources processes (human resource policies, training, development, selection practices, job design, monetary compensation, termination practices, and performance appraisals) the results show moderate and weak alignments between strategic planning and human resources processes. On a more detailed examination of the alignment between strategic planning and human resource processes per data collection type, the results suggest that a moderate to weak alignment is present when the data sources are the interviews and personal observations. When the data source is the document searches, the results yield a strong/moderate alignment between these respective variables. The inconsistency from independent data sources on alignment presents confusing and conflicting findings; therefore, no clear conclusions can be made on the alignment issue at the present time.

### Limitations

Limitations of the research are the convenience sample for the 11 companies studied, aggregate frequency counts only, and no statistical analysis on the individual variables.

### Future Research

Directions for future research may include a detailed examination related to the conflicting results amongst the different data collection methods found in this study. Additional future research might include statistical analyses such as pairwise correlations, multiple regression, and ANOVA for the selected 13 variables in this study and a more inclusive analysis of the initial 34 variables. The statistical analyses could provide a more detailed examination of each variable's relationship to the issue of alignment between strategic planning and human resource processes.

### **CONCLUDING COMMENT**

Without exception, all of the 11 companies in the research study state they use their strategic planning process cycle as the primary alignment mechanism and driver toward the deployment of company activity. At this level of detail, each of these companies identify stakeholder requirements, key performance measures, and links to business drivers in order to align their strategic goals and strategies to operational action plans at all levels in the organization. The cascading effect of the strategic planning process links various business units through information networks for timely, accurate input and feedback. Any changes in the business environment may prompt a quicker response time from all business units. However, the results of this study show mixed results for alignment depending upon data collection method.

The most significant cross-cutting attribute shared by all of these companies is that they are winners of a state or national quality award based upon the Malcolm Baldrige criteria (the sample for the study was chosen for that parameter). These companies realize that their quality initiatives could not be implemented or sustained without a valid framework in place. The Malcolm Baldrige framework provides a validated assessment process driven by the organization's strategy and action plans, tailored to their specific customer/stakeholder focus and critical key success factors as identified by the organization. The self-assessment process allows the organization to identify organizational strengths and to target key opportunities for improvement. Organizational alignment, communication, and performance results function in an integrated, holistic systems approach supported by resources aligned to the achievement of organizational goals. All of these are consistent with the Malcolm Baldrige framework and core values

The 11 site visits of these quality award winners afforded this researcher the opportunity to collect a large quantity of data on leadership, strategic planning, communications, and human resource practices. In general, all of these companies are committed to performance excellence, and state this commitment through their approach and deployment practices. Each of these companies ascribed to a continuous improvement philosophy. In addition, each company supports and reinforces its commitment to quality by allocating financial and other resources to strategic objectives.

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# **SENSITIVITY OF DIRECTORS TO WORKPLACE WELLBEING AND RISK MANAGEMENT: EVIDENCE FROM SMALL AND MEDIUM ENTERPRISES IN BELGIUM**

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## **ABSTRACT**

*This research analyses small and medium enterprises directors' sensitivity to CSR, and more specifically to workplace wellbeing and risk management. We conducted a questionnaire survey of 1,800 directors of Belgian small and medium enterprises to determine their perceptions and actions regarding these two aspects. According to Beaupré et al. (2008), these notions can form part of socially responsible human resources management. The 220 directors who answered our survey feel that good relations with and between their employees, as well as clear objectives, contribute to workplace wellbeing. Although 85% of directors view employee wellbeing as an objective for their small and medium enterprise, just 68% assess occupational risks, the motivations being to comply with the regulatory framework but also to improve working conditions.*

**JEL:** M1, I3, L2

**KEYWORDS:** Wellbeing, Risk Management, Small and Medium Enterprise (SME), Sensitivity, CSR

## **INTRODUCTION**

Although large companies have been involved in CSR for several decades (CIDD, 2006, Martinet and Reynaud, 2004), small and medium enterprises (SMEs) are also striving to make achievements in social responsibility, which is continually gaining ground in this sector under the impetus of various national and European institutions (Oueghlissi, 2013, Berger-Douce, 2008). Accounting for 99.8% of businesses in Europe (Eurostat, 2015), SMEs are key participants in the economy. They play indeed a role in job creation, producing products and services for society, and economic growth (Hasle and Limborg, 2006). SMEs are therefore a key field of research. In recent years, and particularly since 2006 (Louche and Michotte, 2011), the volume of research conducted into CSR in SMEs has continued to grow (Oueghlissi, 2013, Berger-Douce, 2008, Paradas, 2008, 2006). Furthermore, the numerous social responsibility support tools offered to SMEs are evidence of the interest in sustainable development and highlight the benefits of adopting socially responsible strategies (Quairrel and Auberger, 2005). Although CSR practices are not absent from the SME world, they are more intuitive than they are strategic or formal (Louche and Michotte, 2011). They are also less investigated and structured than the largest companies' practices. SMEs can act as the driving force behind sustainable solutions and progress at various levels (social and environmental) (Forget, 2011). According to Wolff and Bosia (2014), SMEs' involvement in a socially responsible approach is not necessarily prompted by a desire to improve their reputation or brand image. Instead, it may be due to an intention to motivate or retain their personnel, or to ethical arguments (Jenkins, 2006). Both strategic and intrinsic (philanthropic) motivations could therefore lead SMEs to engage in CSR (Fitjar,

2011). Oueghlissi (2013) and Perrini et al (2007) also believe that SMEs, without even realising it, are usually involved in CSR initiatives.

The distinguishing characteristics of SMEs' responsible engagement (compared with large companies) are primarily linked to internal management constraints: lack of time, lack of human and financial resources, lack of appropriate skills, poor communication, etc. As a result, small businesses engage in sustainable, informal practices (Battaglia et al, 2014, Oueghlissi, 2013, Russo and Tencati, 2009, Jenkins, 2006). Nevertheless, despite certain weaknesses, SMEs also have certain strengths that enable them to respond to sustainable development challenges. As such, Forget (2011) stresses their potential in terms of local job creation and proximity to their business environment and stakeholders. This geographical and interpersonal proximity (Torrès, 2000) therefore fosters strong local integration that encourages a CSR approach. In a quantitative study of 84 SMEs, Berger-Douce (2008) highlights the fact that local development is one of the major strategic concerns for 76.2% of these companies. Their small size also enables SMEs to leverage a greater ability to react and adapt to change (Oueghlissi, 2013, Berger-Douce, 2008). Several drivers can prompt SMEs to invest in CSR practices. They may engage in response to certain constraints imposed by their stakeholders or simply in response to their director's ethical convictions (Oueghlissi, 2013, Brodhag, 2011). Our research will focus on SME directors and their sensitivity to the labour aspect of CSR. We investigate the perceptions that this can generate in relation to workplace wellbeing and risk management. These aspects can form part of socially responsible HR management. We also explore any initiatives implemented in these areas. The first part of this article will focus on reviewing the literature. We will then explore the methodology used. Lastly, we will present and discuss the results of our survey.

## LITERATURE REVIEW

### CSR Directors: A Key Participant in the CSR Approach

Directors play a central role in the decisions made within their company (Julien and Marchesnay, 1988). These decisions are heavily influenced by their personality, values and perception (Spence et al, 2007). According to Wolff and Bosia (2014), Louche and Michotte (2011) and Spence et al (2007), it is primarily these values, rather than an instrumental and strategic view of CSR, that lead an SME director to engage in a CSR approach. As such, *"SME directors are more likely to develop ways of thinking about CSR which are more ethical than economic in nature"* (Kechiche and Soparnot, 2012: 99). Depending on their ethical mindset, directors are more or less inclined to initiate this type of approach. As such, after reading work on CSR in SMEs, Mhissen Mhedhebi et al (2015: 5) note that *"the entrepreneur is considered the linchpin in the firm's engagement and everything depends on their vision"*.

Nevertheless, we cannot ignore the interactions between directors and their environment and the consequences of these interactions. Both the individuals that surround them and the surrounding organizational structure, as well as their professional networks, external resources (trainers, accountant, etc.), etc., could impact their perception and practices. Despite SME directors' engagement and their convictions about introducing an ethical approach, it is nevertheless difficult for them to implement this approach (Berger-Douce, 2008) either due to a lack of knowledge, unavailability, indifference or the absence of resource persons. However, Luetkenhorst (2004) shows that businesses that engage in a CSR approach make gains in terms of competitiveness, reputation, retention and relations with institutions.

### From CSR to Social Responsibility

According to Saulquin (2004) and the French National Institute for Statistics and Economic Research (INSEE) (2012), depictions of CSR from companies are largely dominated by labour concerns. In the context of SMEs, several authors stress the predominance of personnel, and therefore the labour dimension, when it comes to addressing CSR. As such, Cornet and El Abboubi (in Imbs and Ramboarison Lalao, 2013)

stress that CSR in SMEs is liable to be characterised by involvement in local communities and the improvement of employee wellbeing or safety. Labelle and St-Pierre (2010) also point out that SME directors are highly sensitive to social objectives concerning their personnel. It appears that internal stakeholders, including personnel, are the main driving force behind CSR in SMEs (Louche and Michotte, 2011). As such, employees and suppliers are understood to have replaced customers as SME directors' central concern in terms of CSR (Gendre-Aegerter, 2008).

According to Hammann et al (2009), two reasons may explain why it is important for SMEs to develop socially responsible practices aimed at employees. Firstly, SME directors have a very close relationship with their employees and developing CSR practices aimed at them could generate benefits for the SME. Secondly, as a result of their socially responsible behavior, SMEs could have an advantage in terms of recruiting labour, particularly because staff are usually geographically close to them. In addition to the fact that an SME's personnel are one of its most influential partners and in addition to the benefits that can result from a CSR approach, INSEE (2012) provides another explanation for this high level of interest in the labour aspect of CSR in SMEs: it may also be due to the need for companies to meet certain legal obligations and the existence of various consultation bodies within companies (health, safety and working conditions committee etc.). As such, the relationship between a director and his/her personnel is thought to be at the heart of CSR issues. Given that, in SMEs, the director is usually responsible for HR management issues (Mahé de Boislandelle, 1988), it is clear just how important the director can be in circulating CSR within his/her company and instilling socially responsible HR practices.

#### Workplace Wellbeing and Risk Management

According to Danna and Griffin (in Delobbe et al, 2009), these two notions do not need to be approached separately in the sense that worker health and safety risk factors can be viewed as the background to workplace wellbeing. Furthermore, *"the dynamic system of risk management is characterised by the fact that it plans prevention and the implementation of the wellbeing policy by aiming to control risks to worker wellbeing by detecting and analysing them and establishing concrete preventive measures"* (Belgian General Directorate for Humanisation of Work, 2013: 9). Workplace wellbeing and risk management are thought to strengthen a socially responsible HR management approach that aims in particular to protect employees (Beaupré et al., 2008). Indeed, examining the links between HR management and CSR, Barthe and Belabbes (2016: 107) conclude that *"responsible human resources management results in the implementation of tools and practices that foster maximum wellbeing for all employees by protecting them and fairly recognising their values"*.

The study by Pezé (2010) shows that improving employee wellbeing is a concern for SME directors, whose main driver is not so much stress management per se as achieving a more general state of wellbeing, or at least satisfaction, in the workplace. This focus is not simply a declaration of good intention; it is supported by concrete actions involving the achievement of "good" working environments. Meanwhile, Gendre-Aegerter (2008) observes that SME directors feel very responsible for their employees in terms of workplace safety and health issues, as well as in terms of staff motivation, satisfaction and low turnover. Furthermore, Coëdel et al (2015) and Kechiche and Soparnot (2012) add that a hands-on management style, involving dialogue between director and employees, could lead to a more effective consideration of their wellbeing. It is clear that in terms of wellbeing, SMEs, far more so than large companies, can count on close relationships that could contribute to wellbeing by fostering the circulation of information, the creation of a specific working environment, the clarification of each person's roles, etc. which all lay the foundations for workplace wellbeing (Delobbe et al, 2009).

As far as workplace risk management is concerned, this is the company director's legal responsibility. In Belgium, it was the subject of the act of 4 August 1996 concerning employee wellbeing during the conduct of their work. In 2014, this was supplemented by new legislation introducing the notion of workplace

psychosocial risks (including stress and burnout) and emphasising the necessary prevention of these risks. These regulations refer to *"the probability that one or several worker(s) suffer psychological damage, which may also be accompanied by physical damage"* (Lo Giudice, 2014: 42) following exposure to a work situation that includes a hazard.

According to the Belgian General Directorate for Humanisation of Work (2013), five categories of factors on which employers can have an impact may also cause a work situation deemed hazardous: the organization of work (the company's policies, working procedures, employee independence, etc.), working conditions (training opportunities, ability to reorganise working time, salary, etc.), working life conditions (physical demands, exposure to noise, lighting, etc.), the content of work (workload, information about the task to perform, involvement in decisions, etc.) and interpersonal relations at work (quality of relationships, management style, work atmosphere, etc.). As such, employers are obliged to identify risks that are liable to emerge in their business, to analyse them and to establish an appropriate action plan. Although this analysis does not appear to pose problems for employers, it seems that transitioning from the analysis phase to developing an action plan is more problematic for companies that do not necessarily know which actions to develop or that lack resources.

As such, a study conducted by Hansez in 2006 (in Lo Giudice, 2014) found that one company in two has not drawn up an action plan. In France, INRS (2011), the French National Safety and Research Institute for occupational accident prevention, conducted a survey of 1,000 directors of (very) small businesses and found that 19% of these directors consider psychosocial risks to be the most significant risks in terms of workplace health and safety. On this subject, directors of very small businesses tend to consider stress to be the most significant risk. Nevertheless, the study observed that the theme of workplace health and safety is not the number one concern of all of the directors surveyed, who are more concerned about commercial and financial matters. According to Flohimont (in Lo Giudice, 2014), the new Belgian legislation aims to go further than complying with legal obligations by making workplace wellbeing and the consideration of psychosocial risks a genuine company development plan. This framework ties in with the fundamental meaning of socially responsible approaches. It highlights the possibility that legal constraints can represent a real opportunity for SME directors to invest in CSR.

In terms of standard industry practice, it would be beneficial to seek to gain a better understanding of SME directors' sensitivity to workplace wellbeing and risk management. With this in mind, the structure of our questioning will involve two parts. The first part will examine the notion of workplace wellbeing, while the second part will draw a connection between workplace wellbeing and risk management. We feel that this analysis is original in several respects: to our knowledge, it has not yet been conducted in the Belgian context. Furthermore, it has the merit of not only examining the practices put in place by SME directors, but also investigating their perceptions of workplace wellbeing and risk management in their establishment.

## DATA AND METHODOLOGY

Our exploratory study is based on a quantitative analysis of data collected via a questionnaire sent to directors of Belgian SMEs. The sample of companies to which we sent this questionnaire was created using Belfirst, a Belgian database that represents the economic fabric of Belgian and Luxembourg companies. The company profile defined to create the sample was primarily based on the staff headcount criterion. As such, the small and medium-sized enterprises chosen for the sample meet the staff headcount criterion of the European definition, namely fewer than 250 employees (recommendation 2003/361/EC of 6 May 2003, in effect since 1 January 2005). Note that we did not exclude micro-enterprises from our survey (fewer than nine employees), which account for 93% of companies in the European Union (Russo and Tencati, 2009). This sets us apart from various studies on CSR in SMEs, which excluded this type of company due to their low staff headcount (Johnson, 2015, Russo and Tencati, 2009, Jenkins, 2006). As such, our sample is comprised of 1,800 SMEs in the Belgian region of Wallonia.

The questionnaire we sent to the SMEs contained multiple-choice questions and questions using five-point Likert scales. It was distributed in paper format in 2015 (along with a pre-stamped envelope for returning the questionnaire). It also contained a link so that directors wishing to do so could complete the survey in electronic format. We received a total of 220 usable questionnaires (12.22% response rate). The analysis of the results is based on a descriptive statistical analysis conducted using the SPSS software.

## RESULTS AND DISCUSSION

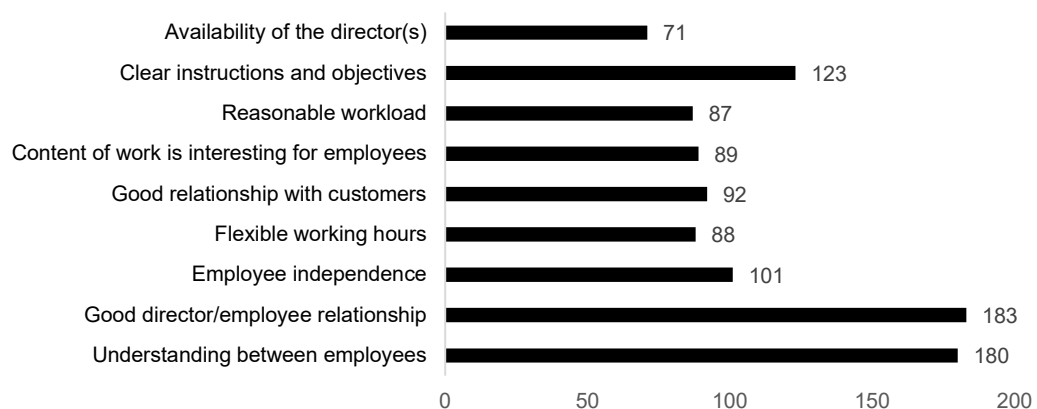
The results enabled us to gain a better understanding of SME directors' sensitivity to their staff's wellbeing and to risk management, and to ascertain their practices in these areas.

### Workplace Wellbeing

To gain a better understanding of the notion of wellbeing, we felt it was useful to examine how the directors in our sample view this notion. We asked them to look at a series of items and indicate the main elements that they felt characterise workplace wellbeing (multiple choices were possible). Figure 1 shows that for the majority of directors (at least 180 respondents out of 220), workplace wellbeing is mainly defined by good relations between staff and the company's director. Other elements (at least 101 respondents out of 220) such as, firstly, staff autonomy and, secondly, clear instructions and objectives also characterise workplace wellbeing, according to the directors.

The fact that good relations between a director and their staff are considered, by over 80% of our respondents (183 out of 220) as a factor that contributes to workplace wellbeing is in line with the findings of Coëdel et al (2015) and Galabova and McKie (2013). Indeed, the latter believe that a hands-on management style involving dialogue between director and employees can help to factor in staff wellbeing. However, it might seem paradoxical that although many directors draw a connection between the good relations they may have with their staff and wellbeing, far fewer believe that their availability contributes to wellbeing. It is also worth noting that clear objectives and instructions are considered by Pez  (2010) to be a primary prevention action that helps to develop a "good" working environment. Galabova and McKie (2013) believe that placing importance on the content of work and making it interesting, or paying attention to workload could be a way to prevent monotony at work and compensate for the lack of career prospects in SMEs.

Figure 1: Definition of Workplace Wellbeing (N=220)



*This figure shows the main elements that characterise workplace wellbeing for the directors (based on a series of items and with multiple choices possible).*

We then investigated directors' sensitivity to the question of wellbeing, in the specific context of SMEs. We asked them to say whether or not they agreed with a series of statements to assess their sensitivity relative to the size of the company (SME versus large company). The first two items in Table 1 indicate that the majority of directors do not seem to associate sources of stress and workplace wellbeing with the size of a company. These results appear to be in line with the observations of Pezé (2010), who observed that SME directors do not consider stress to be one of their main concerns and say that their staff experience little negative stress, although this does not mean they are not sensitive to how their employees feel. Conversely, over 64% of respondents (third item) seem to think that a smaller sized company makes it easier for staff to blossom.

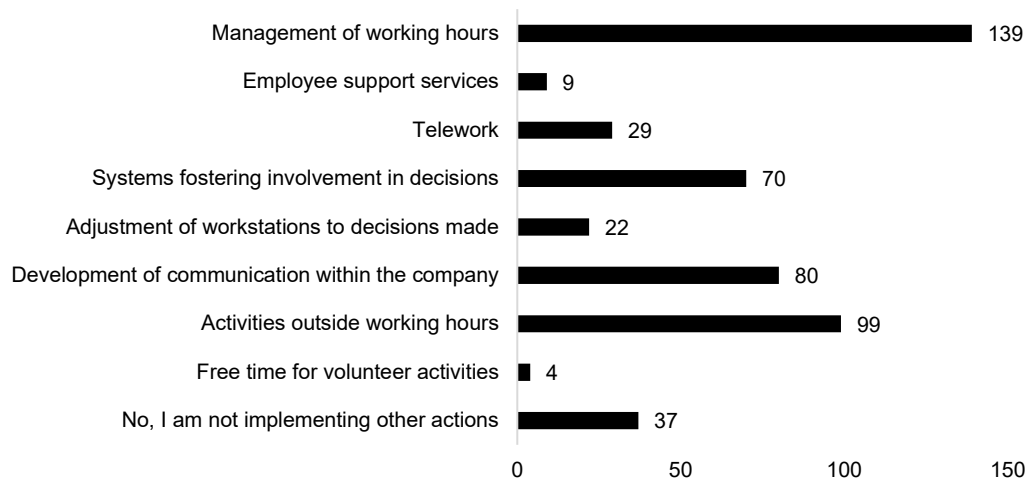
Table 1: Director's Sensitivity to the Issue of Wellbeing in the Specific Context of Small and Medium-Sized Enterprises (SME Versus Large Company) (N= 220)

	<b>Strongly Disagree/ Disagree</b>	<b>Neutral</b>	<b>Agree/ Strongly Agree</b>
There are bigger sources of stress in SMEs than in large companies	<b>105</b>	53	60
Large companies are more attentive to staff wellbeing than SMEs	<b>127</b>	51	41
It is easier for staff to blossom in SMEs	25	54	<b>141</b>
SMEs foster a connection between people	8	19	<b>189</b>
The director's availability fosters staff wellbeing	9	36	<b>175</b>

*This table shows if the directors agree or not (from strongly disagree to strongly agree) with a series of statements to assess their sensitivity relative to the size of the company (SME versus large company). The results are presented in three columns for a better visibility.*

In table 1 we also examined the notion of proximity, which is one of the major specific characteristics of SMEs. This highlighted two findings (fourth and fifth items). Firstly, over 87% of respondents think that small companies foster proximity. Secondly, over 79% of respondents believe that by being close to their staff they foster their wellbeing. This supports the finding that good relations between staff and directors, highlighted in figure 1, are considered by our respondents to be a contributing factor to workplace wellbeing. However, this result might seem paradoxical given that just 32% of the directors surveyed associated their availability for staff with their wellbeing. We then asked the study's respondents how their sensitivity to workplace wellbeing translates into concrete actions within the company (multiple choices were possible). Figure 2 shows that 63% of respondents have implemented a working time management system (organization of working hours) that is liable to foster employee wellbeing (Dex and Scheibl, 2001). Over 31% of the respondents have also introduced activities outside working hours (teambuilding, meals, etc.), developed communication within the company and put in place systems that enable their employees to participate in decision-making. According to Delobbe et al (2009), these factors are liable to contribute to staff wellbeing. Some of them (staff events, work-life balance) also correspond to socially responsible practices identified by Jenkins (2006) in the UK. According to Perrini et al (2007), these CSR practices call for employee involvement at various levels of an SME.

Figure 2: Actions in Favor of Staff (N=220)



This figure shows how the sensitivity to workplace wellbeing of SME directors translates into concrete actions within the company (based on a series of items and with multiple choices possible).

Lastly, we wanted to investigate the sensitivity and willingness of directors in terms of corporate social responsibility. In response to the statement "a company must be socially responsible to ensure staff wellbeing", we asked the directors to position themselves on a five-point Likert scale (from strongly disagree to strongly agree). Over 67% responded positively. Secondly, using this same scale, we assessed a statement that considers workplace wellbeing to be a central concern for a company: "my staff's wellbeing is an objective for the company". As such, 85% of the directors consider wellbeing to be a company objective. These two statements will be analysed in greater depth in the following section (alongside risk management).

Workplace Risk Assessment and Management

We asked the directors whether they had conducted an assessment within their company of the risks to which their staff are exposed. 68% (147 out of 219) answered 'yes', while 32% answered 'no' (72 out of 219). Note that risk management is a legal obligation for Belgian employers. By failing to meet this legal obligation, these 32% of respondents could match the profile of eco-defensive companies (Gondran, 2001, in Callot, 2014), which tend to ignore this issue and not comply with the law. The following Tables 2 and 3 aim to compare director sensitivity to wellbeing and the implementation of a risk assessment practice.

Table 2: Risk Assessment \* "a Company Must Be Socially Responsible to Ensure Staff Wellbeing" (N=216)

		A Company Must Be Socially Responsible to Ensure Wellbeing			Total
		Strongly Disagree/Disagree	Neutral	Agree/Strongly Agree	
Risk assessment	No	2	16	51	69
	Yes	8	43	96	147
Total		10	59	147	216

This table compares director sensitivity to workplace wellbeing and the implementation of a risk assessment practice. It shows if the directors agree or not (from strongly disagree to strongly agree) with the item "A company must be socially responsible to ensure wellbeing" depending on if the enterprise sets up a risk assessment practice. The results are presented in three columns for a better visibility.

Table 3: Risk Assessment \* "My Staff's Wellbeing Is an Objective for The Company" (N=218)

		My Staff's Wellbeing is an Objective for the Company			Total
		Strongly Disagree/Disagree	Neutral	Agree/Strongly Agree	
Risk assessment	No	2	8	61	71
	Yes	6	16	125	147
Total		8	24	186	218

*This table compares director sensitivity to workplace wellbeing and the implementation of a risk assessment practice. It shows if the directors agree or not (from strongly disagree to strongly agree) with the item "My staff's wellbeing is an objective for the company" depending on if the enterprise sets up a risk assessment practice. The results are presented in three columns for a better visibility.*

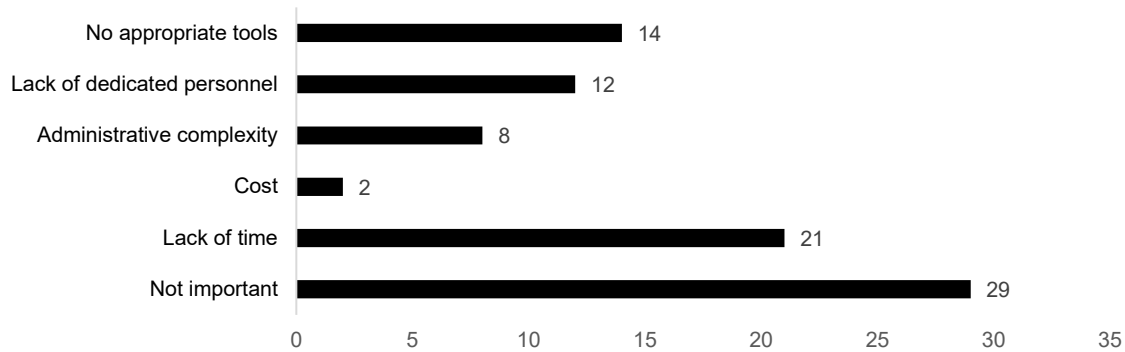
Several observations can be gleaned from table 2. Although 147 respondents seem aware of the importance of being socially responsible to foster staff wellbeing, just 96 of them (64%) assess risks within their company. Conversely, some directors (8 respondents) who do not appear to be sensitive to social responsibility implement risk assessment practices. We can draw the same observations as in table 3. Although 186 respondents consider workplace wellbeing to be an objective for the company, 61 respondents do not assess risks. The observations gleaned from the cross-tabulations 2 and 3 are striking. It would therefore be beneficial to gain a better understanding of the reasons behind the introduction or otherwise of risk assessment within companies.

As such, we wanted to determine why some of our respondents (73 out of 220) did not assess risks. Figure 3 shows that the main reasons are: the directors feel it is unimportant (29 out of 71), a lack of time (21 out of 71) and a lack of available tools (13 out of 71). These results do not tally with the observations of Kechiche and Soparnot (2012) or Jenkins (2006), who say that the financial or practical materials for implementing a CSR approach are limited. Consequently, although many of our directors (just over 85%) view staff wellbeing as an objective for the company, this does not necessarily translate into the consideration of workplace risks. According to Martin and Guarnieri (2008), this could be due to the fact that directors believe that occupational risks are primarily linked to employee behavior and carelessness, and therefore do not fall within their remit. These two authors refer to a study conducted by Eakin in 1992, noting that directors who believe that their company does not pose any specific workplace risk (notably connected to health and safety) have not yet experienced serious problems in these areas.

Conversely, those that have had more negative experiences took the issue of workplace risks more seriously. Fitjar (2011) also agrees with this finding, observing that a lack of staff specifically dedicated to CSR and a lack of time can lead to SMEs responding more reactively than proactively to CSR issues. Connections can also be drawn with the findings of Hasle and Limborg (2006), who reveal an interesting paradox that we can connect with the information provided by SME directors concerning wellbeing: according to these authors, small businesses usually have the best psychosocial workplace environment, characterised by close relations and stemming from the director's values. However, these companies also encounter the most workplace risks and have the most difficulty controlling these risks. Could the importance that directors in the sample place on good relations with and between their staff cause them to play down the management of workplace risks? Note that the factors mentioned by our respondents match the hurdles identified by Louche and Michotte (2011) and Fitjar (2011) in implementing a responsible approach within SMEs and tally with the results of a study conducted by the INRS (2011) into occupational risks in SMEs.



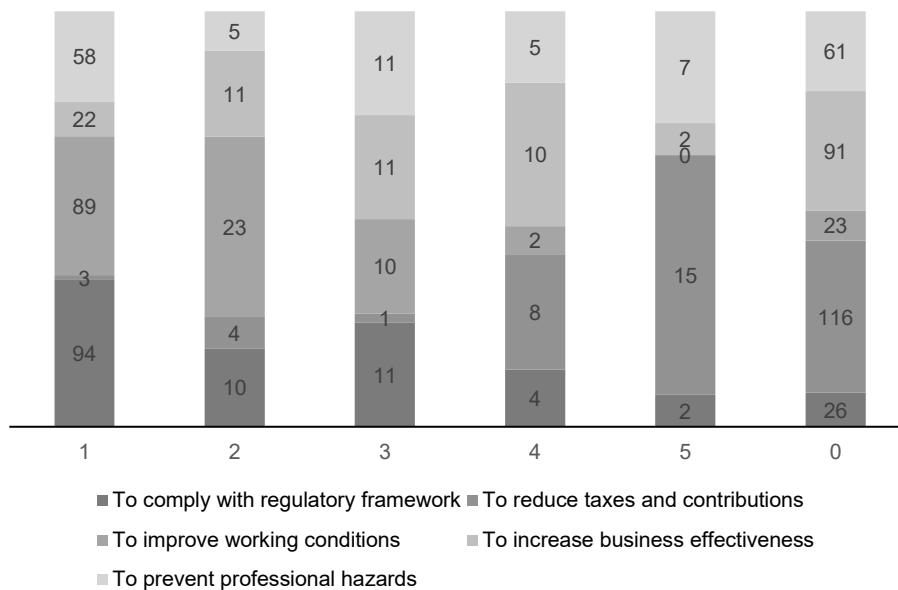
Figure 3: Reasons for the Non-Assessment of Risks (N=71)



This figure shows the main reasons for the non-assessment of risks within companies (based on a series of items and with multiple choices possible).

Furthermore, the study also shows that in the case of companies that have assessed risks (147 out of 220 respondents), a variety of reasons, at different levels of importance, motivated their choice. Figure 4 shows which factors were prioritised (1 representing the highest-priority factors, 5 the lowest-priority and 0 the non-priority) by SME directors to encourage them to implement a risk management policy. The main motivation prioritised in risk assessment is compliance with the regulatory framework (cited 94 times as priority 1). This is followed in turn, as priority 1, by improving working conditions (cited 89 times), professional hazards (cited 58 times), increasing business effectiveness (cited 22 times) and reducing taxes and contributions (cited 3 times). We can see that the items that are not at all considered to a factor in encouraging risk assessment concern the ability to increase business effectiveness or reduce taxes.

Figure 4: Reasons for the Assessment of Risks (N=147)

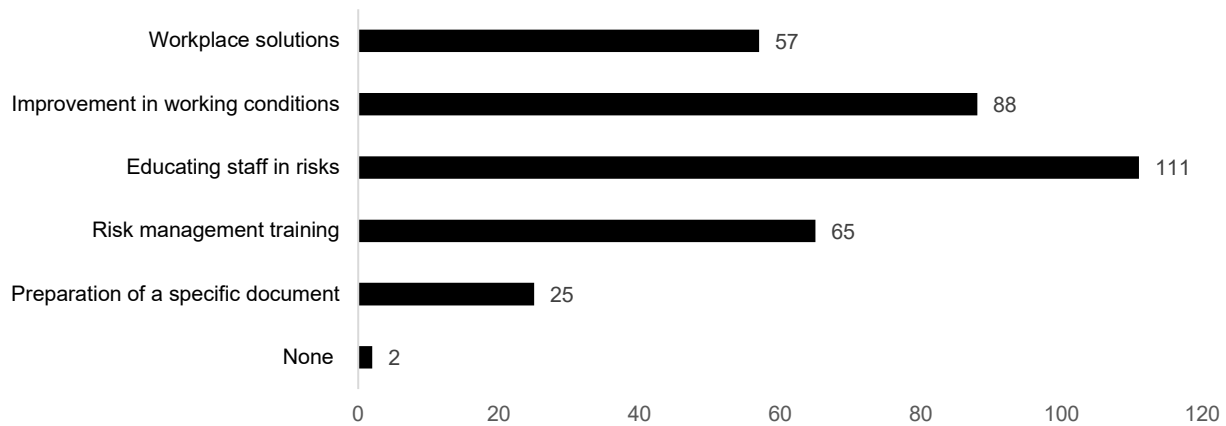


This figure shows the main reasons, at different levels of importance, for the assessment of risks within companies. It shows which factors were prioritised (1 representing the highest-priority factors, 5 the lowest-priority and 0 the non-priority) by SME directors to encourage them to implement a risk management policy.

Lastly, we asked the respondents how they implement this risk management. Figure 5 shows us that the risk management implementation methods identified by SME directors are to raise staff awareness of risks (77% of directors), improve working conditions (62% of directors) and provide risk management training

(45% of directors). These results partially tally with the trends observed by the INRS (2011) in terms of risk prevention in SMEs.

Figure 5: Risk Management Implementation Methods (N=145)



*This figure shows the risk management implementation methods identified by SME directors (based on a series of items and with multiple choices possible).*

## CONCLUSION

Our research examined SME directors' sensitivity to the labour aspect of CSR. We examined two themes that can form part of a socially responsible approach: workplace wellbeing and risk management. These aspects can form part of socially responsible HR management. We also explore any initiatives implemented in these areas. To achieve this, we made an exploratory study based on a quantitative analysis of data collected via a questionnaire sent to 1,800 directors of Belgian SMEs (Wallonia region). This survey allows us to gather their insights into these two themes and find out about the actions developed on this subject. To our knowledge, our study is the first Belgian study to examine the perceptions and actions that SME directors can develop in the field of CSR and more specifically workplace wellbeing and risk management. Furthermore, although these topics appear to have been the subject of research in large companies, they seem to have received less coverage in the context of SMEs.

Many of 220 respondents of the study believe that good relations with staff contribute to workplace wellbeing. This sentiment is confirmed by the recognition of the role that a close relationship between directors and staff plays in creating this workplace wellbeing. What's more, 85% of our respondents view the latter as an objective for their company. In terms of actions aimed at their personnel, over 50% of our respondents mentioned systems that allow personnel to organise their working hours. We also observed that although workplace wellbeing is an objective for the vast majority of our directors, just 68% of them assess workplace risks, even though this is a legal requirement stated in legislation on employee wellbeing. This is even more paradoxical given that a lack of importance is the primary motivation for directors who say they do not conduct this risk assessment. Meanwhile, directors who do conduct this assessment attribute it to the legal obligations they are required to meet, as well as, to a relatively similar extent, their desire to improve working conditions. Could this desire prompt a director to initiate a socially responsible approach?

We are aware of certain limitations of our research: we can wonder about the representativeness of our respondents sample (12.22% response rate). Moreover, we cannot rule out the respondents are probably more sensitive to CSR and workplace wellbeing issues. Nonetheless, in terms of managerial involvement, our study highlights a significant proximity effect in how SME directors define workplace wellbeing. Although the majority of SME directors surveyed said that this is an objective, the fact remains that much progress needs to be made on risk management and assessment. This raises some questions: do SME

directors not draw a connection between workplace risk management and wellbeing? Could the lack of importance placed on workplace risks be attributed to the fact that directors feel that the small size of their organization and their proximity to employees shield them from potential workplace risks?

These questions could indicate that work needs to be carried out on educating directors in workplace risk management and the resulting effects. They can also be further investigated in our upcoming research, notably by creating segmentations, like Russo and Tencati (2009), based on the size of companies that respond to our survey. Jenkins (2006) also called for research that, more than differences in terms of size and sector, highlights the labour prospects resulting from different forms of SME depending on whether they belong to a family, their type of growth, etc. Given that we have data on how our SMEs perceive their HR management, we hope to be able to contribute, in our upcoming research, to developing knowledge that better reflects the diversity of SMEs.

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# **CREATING RESEARCH INVENTIONS BY COMBINATION OF MULTIPLE THEORIES AND CONCEPTS: AN IMPLICATION FROM DEVELOPING A NEW MATHEMATICAL MODEL FOR CORPORATE ALLIANCES**

Satoshi Tomita, Rikkyo University

## **ABSTRACT**

*A mathematical model to express the mutual complementary relationship between two companies during the matching phase in a corporate alliance was developed recently. The model made possible the computational expression of the relationship as a value. The developers applied the methodology of modeling in cyber informatics of computer science to the research of corporate alliances. Additionally, the developers combined the theoretical framework of Resource-Based View (RBV) with the concept of flow in physics and the concept of Give and Take in psychological science. The combination of these theories and concepts lead to the successful construction of a brand new mathematical model. The model was implemented by programmatic means, which proved its validity. In this way, the combination of multiple theories and concepts has proven to be the key factor for creating new inventions in management studies. These days, research activities including the management field are becoming progressively mature, much more segmented, and increasingly specific. As a result of this, researchers tend to concentrate only on a single theory, framework or discipline. This trend obstructs the creation of new inventions in management studies. This paper asserts that the combination of multiple theories and concepts by importing them from other different scientific fields is significantly important and useful, and is a key to success for innovation in research activities.*

**JEL:** C60

**KEYWORDS:** Mathematical Model, Corporate Alliance, Resource-Based View (RBV), Combination of Multiple Theories, Creation of Inventions

## **INTRODUCTION**

This paper presents a new mathematical model for corporate alliances and imply how to create research inventions in management studies by combinations of multiple theories and concepts. The paper defines a corporate alliance as “The state in which two or more companies are independent, in order to develop new business or expand existing business by the exchange of complementary management resources provided to each company regardless of the presence or absence of a binding contract or capital relationship, with continued cooperation, to share the outcome.” This definition is originally from Yoshino and Rangan (1995), which is the first comprehensive study on the different types, classes and definition of corporate alliances. A new mathematical model of mutually complementary for corporate alliances was proposed by Tomita and Takefuji (2015, 2016a, 2016b, 2016c, 2016d) and Tomita (2017). The mechanism of the formation in the matching phase of a corporate alliance between two companies can be implemented programmatically and computed as a value. In the development of the

model, the combination of Resource-Based View (RBV), the concept of flow in physics and the theory of Give and Take in human relations of psychology served as the main theory framework.

In the model, the success of a corporate alliance between two companies is increasingly more probable as the mutual complementary relationship, which is the exchange of strengths and weaknesses of each company, becomes increasingly stronger. The model has been constructed making use of a one-dimensional matrix, bipolar vector, and a distance from the maximum point on a two-dimensional map. The process of development of the model in this paper is used as a case study. The paper asserts that the combination of multiple theories and concepts by importing them from other different scientific fields is significantly important and useful, and is a key to success for innovation in research activities.

The organizational layout of this paper is as follows. The paper starts by reviewing past research on basic management theories such as Resource-Based View (RBV) or other useful concepts for development of the model like the concept of Give and Take in psychological sciences and flow in physics. From there I will outline the proposed mathematical model which expresses the relationship between two companies in a corporate alliance. Then, this paper explains the mechanism of corporate alliances using the terms of flow intensity and flow balance. Until the development of this model, the relationship of two companies in a corporate alliance could not be calculated as a number. However, by the combination of multiple concepts and theories, this model has been created and it is now possible to express the strength of a relationship as a numerical value. If we use the developed model, we can choose the most optimal alliance partners among multiple candidates and select pairs more likely to be successful among a large group of potential partner companies. This is the effectiveness of the model.

## LITERATURE REVIEW

In relation to prior research on corporate alliances between two companies, the theoretical background was presented by Yasuda (2003, 2006, 2010, 2016). This theory relies primarily on Resource-Based Theory. Research on Resource Base View (RBV) has been performed in the alliance research from viewpoints including resource characteristics, alliance type, risk management in Das and Teng (1998) and Das and Teng (2000). In Lavie (2006), emphasis is placed on the relationship rather than the establishment of resources. As a genealogy of business science in alliance research, the fundamental theory used as the starting point is Resource-Based View (RBV) as presented by Wernerfelt (1984) and Barney (1991). As a development, Yasuda (2003, 2006, 2010, 2016) presents the idea that "An alliance is the exchange of management resources" as a new analytical approach to research on strategic alliances. Yasuda (2003, 2006, 2010, 2016) defines the resources owned by companies in a simplified manner as the five management resources of (1) technical resources, (2) human resources, (3) production capacity, (4) sales force, and (5) capital resources. It concludes that an alliance is the exchange of these five management resources.

In Tomita and Takefuji (2015, 2016a, 2016b, 2016c, 2016d) and Tomita (2017), the source of the competitive advantage of a company depends on internal management resources of the company, so in order to grasp the concept of an alliance being to acquire management resources, the main theoretical framework used for alliance research was resource-based theory. However, in these previous studies, there existed no mathematical model that expressed the relationship between the assumed candidate companies. For example, in Mitsuhashi and Greve (2009) research dealing with the matching stage of the alliance had not yet established a mathematical model. There was a mathematical matching model in the field of market design by Roth (2015), but it was not targeted for intercorporate alliances. Tomita and Takefuji (2015, 2016a, 2016b, 2016d) had for the first time in that area become the "white space" in this field of research by constructing a mutually complementary mathematical model expressing the relationship in an intercorporate alliance between companies during the matching phase. In Tomita and Takefuji (2016c) and Tomita (2017), additional mathematical models of mutual complementary, additive and synergistic alliances were proposed. The results of the extensive research in academic papers in the field of psychology



by Schaufeli (2006) reveal that it is the claim of over 8,000 professionals (teachers, doctors, nurses, police, prisoner security, social workers, mental disability workers) that the breakdown of the balance of Give and Take is the main cause of burnout.

That is, when a relationship is too far imbalanced or mismatched, it results in a Give and Take imbalance or otherwise lopsided or unfair situation for one party or the other, which in turn causes a breakdown in the relationship, known as burnout. In the scope of this paper, the imbalance and resulting burnout occurs when the gap between rewards and cost is too great. From this, we have taken the concepts of the social exchange theory of Give and Take as it pertains to personal relationships and used it in this study to construct a mathematical model for corporate alliances. Tomita and Takefuji (2016d) and Tomita (2017) incorporate the idea of social exchange theory of Give and Take, which has been studied in personal relationships, into the study of building a mathematical model of the alliance. Schumpeter (1912) said new knowledge is created by new combinations of already existing knowledge. This is prior important literature for this research.

## OUTLINE OF PROPOSED MATHEMATICAL MODEL

### Summary of the Mutually Complementary Mathematical Model for Corporate Alliances

The concept of a mutually complementary alliance model, revolves around the idea that strengths of company B will complement the weaknesses of company A, and vice versa. The strengths of company A complement the weaknesses of company B. The mutually complementary strength depends on the complements provided from one company to the other. If the compliments from one company or both are large, the mutually complementary strength will be large. That is, the mutually complementary relationship in a corporate alliance is a bipolar model based on the mutually attracting forces between two companies. Regarding the proposed mutual complementary mathematical model in Tomita and Takefuji (2015, 2016a, 2016b, 2016c, 2016d) and Tomita (2017), there will be an outline provided. In this paper, even though there will be explanations of the physical concept of flow and Give and Take as used in interpersonal relationships, prior to these explanations there will be an outline of the mutual complementary mathematical model.

### Utilizing a One-Dimensional Matrix and Bipolar Vector to Express the Strengths and Weaknesses between Two Companies

The strengths and weaknesses of companies A and B can be expressed as a one-dimensional matrix of eight characteristics representing management resources, each graded with values between 1 and 5. The eight characteristics are mainly based on management resources. Also, the integer values represent the score evaluating the strength and weakness of these characteristics for each company. As an example, consider the two following companies,

$$\begin{aligned} \text{Company A} \quad a &= (1, 5, 4, 2, 2, 1, 3, 5) \\ \text{Company B} \quad b &= (5, 1, 1, 3, 4, 2, 3, 2) \end{aligned}$$

From the above, the result “c” can be evaluated by subtracting the values of each of the characteristics of Company B from Company A in order to get a directional bipolar vector with values for each characteristic ranging from 0 to 4 (positive or negative). That is to say, we can express the mutually complementary relationship between two companies as a bipolar vector.

$$\begin{aligned} \text{Company A} - \text{Company B} \\ c = a - b &= (-4, 4, 3, -1, -2, -1, 0, 3) \end{aligned}$$

Summation of Plus and Minus Bipolar Vectors (Positive and Negative Integers)

As an example, in companies A and B mentioned previously, the value expressing the provided strengths from company A to company B is the summation of positive integers (plus' bipolar vector):

$$4 + 3 + 3 = 10$$

This number (10) shows the strengths of company A that complement the weaknesses of company B. Conversely, taking the summation of negative integers (minus' bipolar vector):

$$-4 + (-1) + (-2) + (-1) = -8$$

This number (-8) shows the strengths of company B that complement the weaknesses of company A. The two numbers (10, -8) show the mutually complementary relationship between company A and company B.

The Relationship Strength Mathematically Expressed as the Distance from the Maximum Point

The strengths of the mutually complimentary distance are expressed by measuring the distance from the largest mutually complimentary point of strength. Namely, in regards to the bipolar vector of the length from 0 to 4 of the eight characteristics, the maximum mutually complementary value determined from taking two sets of half the number of characteristics (4) with a maximum length of 4 for each, which is the longest possible bipolar vector bilaterally.

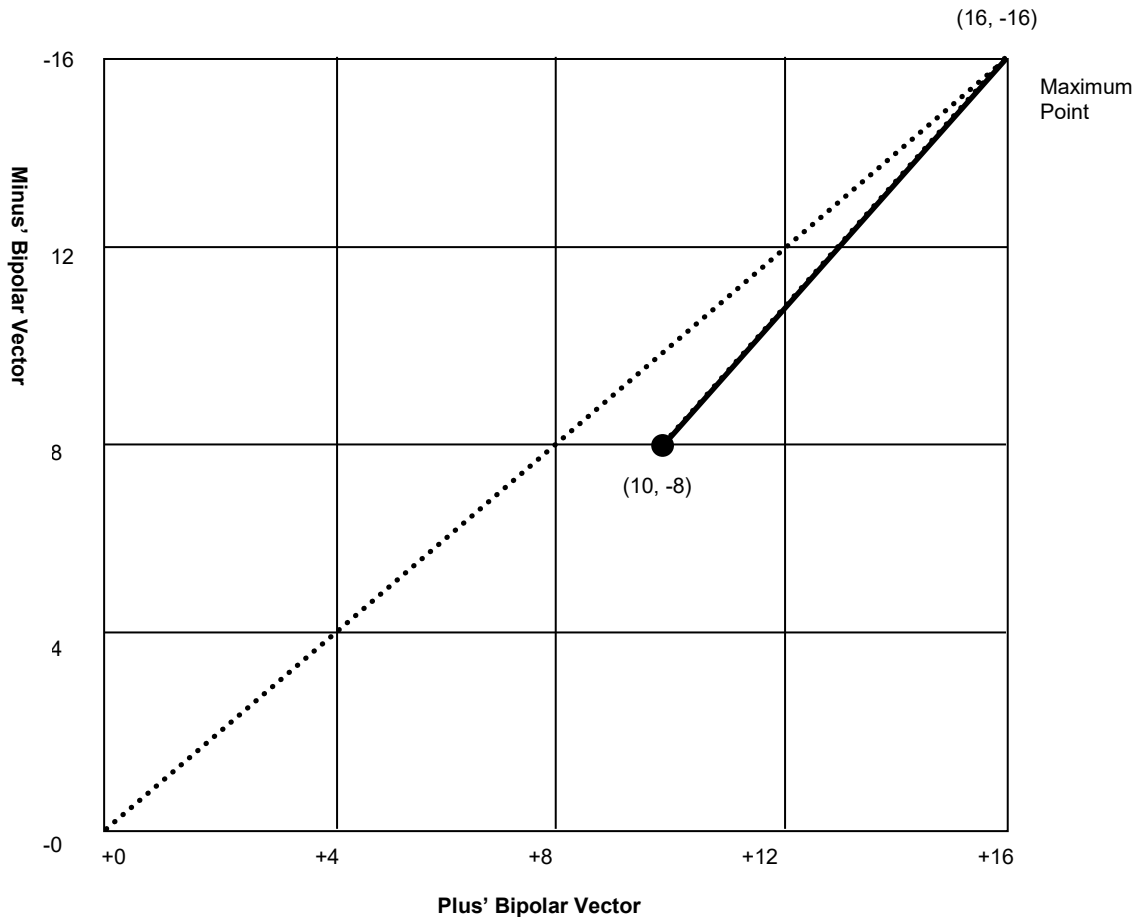
$$(8 \text{ characteristics} / 2) * \text{Maximum length of } 4 = (16, -16)$$

The distance (d) between two points is calculated as follows:

$$d = \sqrt{(a_1 - a_2)^2 + (b_1 - b_2)^2}$$

The maximum value of the mutually complementary strength of (16,-16) is shown as the distance from (0, -0) to (16, -16), which is named the maximum point. The model expresses the strength of the mutually complementary relationship between two companies as a distance from the maximum point mathematically. When the distance from the maximum point is small, it indicates that the mutually complementary strength is strong. Since it is simpler to subtract from larger numbers, we have inverted the magnitudes of the values. For example, with a mutually complementary strength of (10, -8) for companies A and B, it is possible to calculate the distance from (16, -16) by means of subtraction from the maximum value as shown in Figure 1 below.

Figure 1: Mathematical Expression by the Distance from the Maximum Point



*This figure shows the example representing the mutually complementary strength of two companies by the distance from the maximum value of the mutually complementary strength. In case of 8 characteristics, the maximum value of the mutually complementary strength is (16,-16) and the point presenting the mutually complementary strength of Company A and Company B is (10,-8).*

Mutually Complementary Strength and the Related Coefficient as a Value

The mutually complementary strength derived and explained above can be expressed by the following formula:

$$\sqrt{2 \times \left(\frac{4 \times \text{len}(c)}{2}\right)^2 - \left[\left(\frac{4 \times \text{len}(c)}{2} - \text{Plus}\right)^2 + \left(\frac{-4 \times \text{len}(c)}{2} - \text{Minus}\right)^2\right]}$$

In the above formula, len(c) is the number of characteristics, Plus=Σ (positive integers), and Minus=Σ (negative integers). When this value is normalized to a value between zero and one it becomes easier to handle. The relative mutually complementary strength can be calculated from the following formula, and is here forth defined as the mutually complementary strength coefficient.

$$1 - \frac{\sqrt{\left(\frac{4 \times \text{len}(c)}{2} - \text{Plus}\right)^2 + \left(\frac{-4 \times \text{len}(c)}{2} - \text{Minus}\right)^2}}{\sqrt{\left(\frac{-4 \times \text{len}(c)}{2}\right)^2}}$$

In the above formula, len(c) is the number of characteristics, Plus=Σ (positive integers), and Minus=Σ (negative integers).

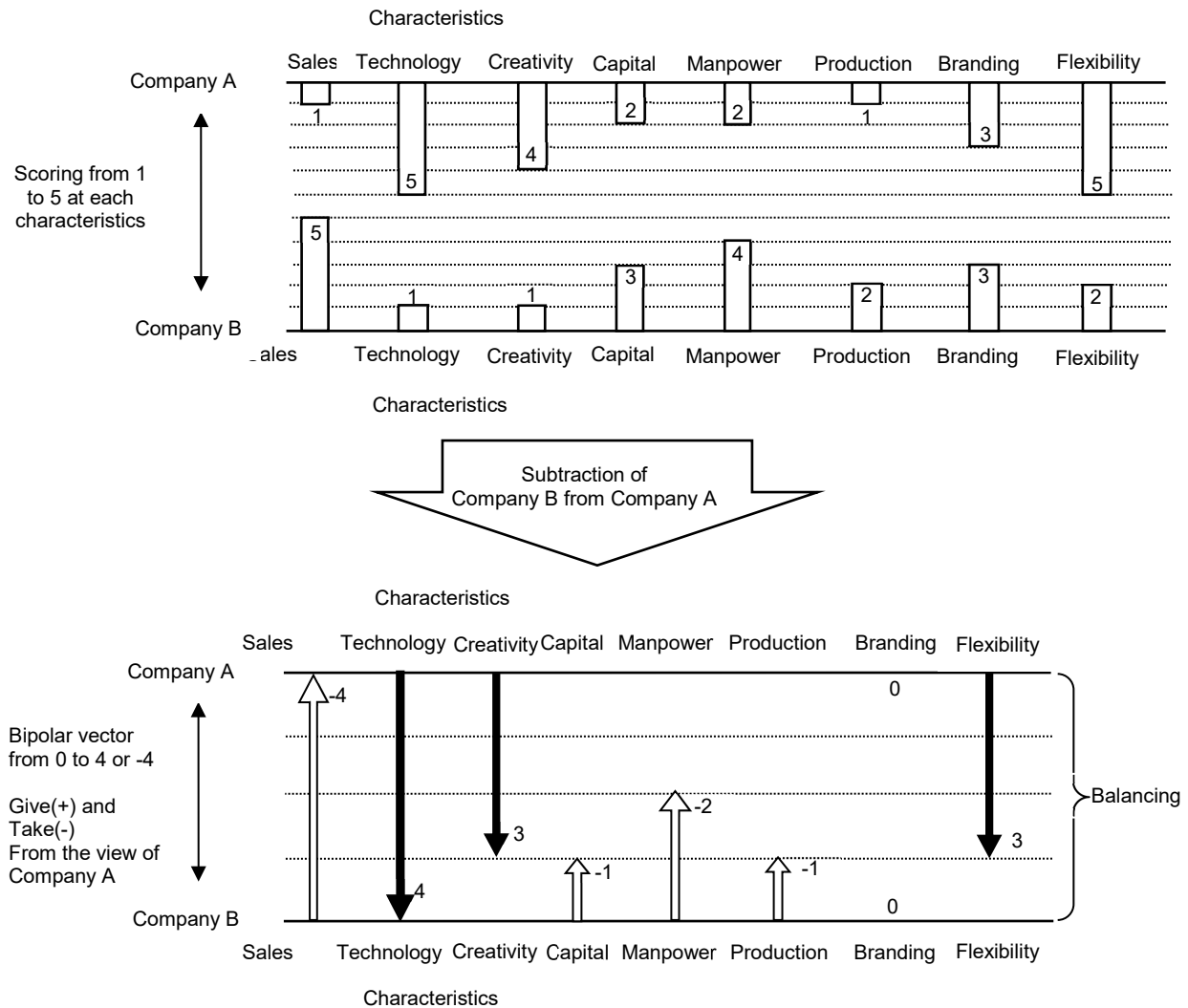
### Import of the Concept of Give and Take - Explanation by Flow Intensity and Flow Balance

In the previous sections, the outline of this mutual complementary mathematical model proposed by Tomita and Takefuji (2015, 2016a, 2016b, 2016c). In their papers, the model was simply explained by the spin glass model of magnetic force. Furthermore, in Tomita and Takefuji (2016d) and Tomita (2017), the concept of flow in physics and Give and Take in psychological science are incorporated into the construction of the model as backgrounds of the theoretical concept. That is to say, the two terms of flow intensity and flow balance were used to strengthen the framework of the model. In this way, flow intensity was originally used in physics involving electricity and magnets. Also, flow balance was originally used for interpersonal relationships of give and take. In other words, reward and cost between two people. Tomita and Takefuji (2016d) and Tomita (2017) imported these two concepts from other science fields.

The provision of strengths from Company A to Company B is the “Give”, and received resources to supplement the weaknesses becomes the “Take”. This also applies in reverse the same way. If the strengths offered (Give) from one or both companies is large and complement (Take) for the weaknesses from the alliance partner is large, the mutually complementary relationship will become stronger. If we were to explain this with the concept of flow intensity, we would say that the flow intensity is strong when mutually complementary relationships are strong. Strictly speaking, when the exchange between Give and Take is large. When the mutually complementing strength is weak, we state that the flow intensity is weak.

In this mutually complement model, the stronger the flow intensity, the more likely the alliance is to be successful. However, based on the idea of Give & Take, if the relationship consists only of Gives from one company to another, the relationship will result in burnout. In other words, using another concept, it is necessary to consider flow balance, and it is important to consider the balance of the Gives and Takes between the two companies. In the mutually complement model, when there are bipolar vectors of plus and minus, that is, when the Gives and Takes are bidirectional, the flow balance is maintained and the alliance is more likely to be successful. In this way, we can explain that in the mutually complementary model of an alliance using flow intensity and flow balance, in corporate alliances if the flow intensities of mutually complementary strengths and weaknesses are strong and the flow balance is maintained, and the alliance is more likely to be successful. If we explain this using the concept of flow intensity and flow balance the maximum mutual complementary strength relationship state is that in which the state of maximum flow intensity and flow balance is maintained evenly.

Figure 2: Flow Intensity and Flow Balance between Companies a and b



This figure illustrates the complimentary relationship between Companies A and B by flow intensity and flow balance as new concepts.

As explained in Figure 2, when both plus and minus bipolar vectors are present, the provided strengths (Give) and compensated weaknesses (Take) exist, there is flow intensity and the flow balance is maintained, the alliance can be successful.

Unsuccessful Pattern 1: No Balancing (One-Sided Relationship)

Company A is scored in every characteristic, which are all larger than those of Company B. In this case, Company A is only providing resources to Company B unilaterally with no balancing. In other words, there are only plus' bipolar vectors from Company A to B, making it one-sided. Since there is no appeal for Company B to Company A, in this case the corporate alliance cannot be successful. Conversely, in the case where the scores for Company B are all larger than those of company A, Company B is only providing strengths to Company A unilaterally. With only minus' bipolar vectors, the relationship is one-sided, and because there is no appeal for Company A to Company B, in this case the corporate alliance cannot be successful.

### Unsuccessful Pattern 2: No Intensity (Identical Strengths and Weaknesses)

In the case the scores for Companies A and B are identical, there are no complementary benefits for either company, so the corporate alliance cannot be successful. When the strengths and weaknesses of Companies A and B are the same, the flow intensity becomes zero. In this model, we consider a corporate alliance not to be successful when there are only strengths being provided unilaterally in a corporate alliance (plus' or minus' bipolar vectors only), there is no balancing of Give and Take, or the strengths and weaknesses of two companies are identical (flow intensity is zero) and therefore there is no mutually complementary relationship possible. As shown previously in Figure 1, the corporate alliance is only successful when there is a bilateral relationship of both plus' and minus' bipolar vectors, and there is a balance of Give and Take of strengths and weaknesses.

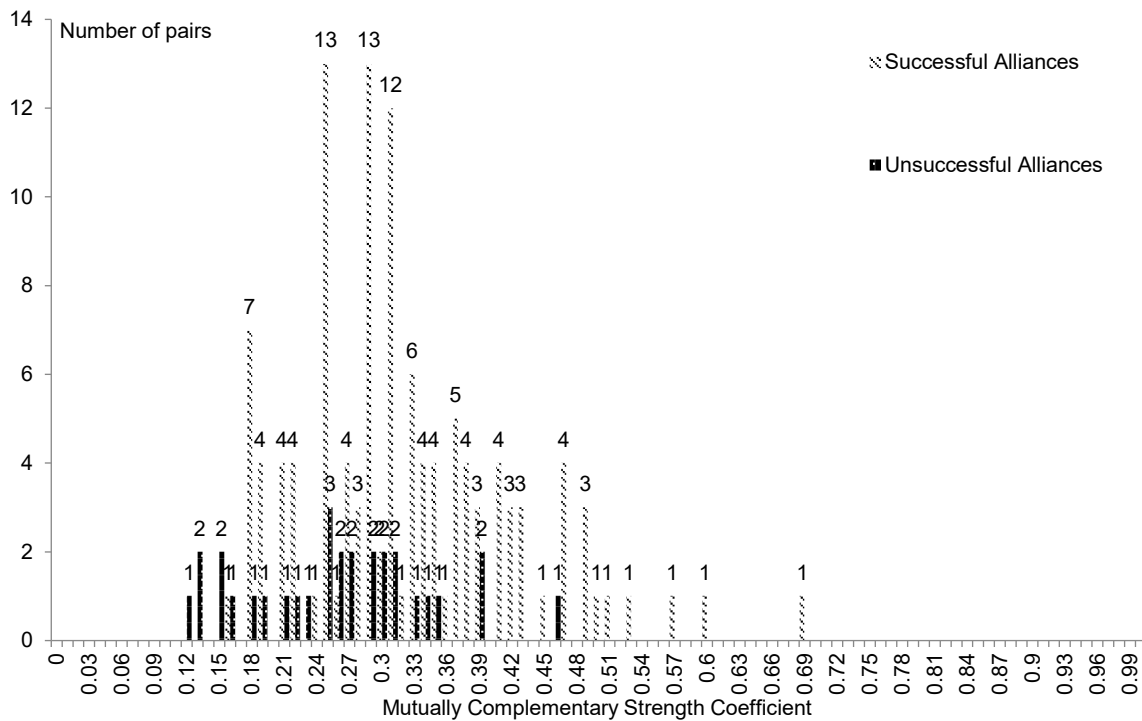
### The Status of the Maximum Complementary Relationship: When the Flow is Balanced at the Maximum Flow Intensity

Next, as mentioned in the previous section, we can say the strongest relationship between two companies in a corporate alliance, in which both companies complement each other's strengths and weaknesses at the maximum value, that is to say, the maximum flow intensity. If we explain the maximum mutually complementary strength in this relationship using the concepts of flow intensity and flow balance, this is the state in which the maximum flow intensity state is maintained and the flow balance remains balanced. Although the maximum magnitude of the plus and minus vectors are simply illustrated as 4 consecutive values in sequential order on both the left and right sides, in reality the maximum magnitude of the plus and minus vectors will exist at random across 8 characteristics divided into two groups of four. The state of a maximum mutually complementary relationship occurs when, by taking half of the number of characteristics from both companies, the result is the largest possible bipolar vector indicating the best possible balancing between two companies. In this case, the number of plus' and minus' bipolar vectors are the same, and when the length of the bipolar vector is at its maximum value, it is considered to be the maximum mutually complementary strength.

### Programmatic Implementation and Computation by Making Use of the Data set of 152 Consulted Companies

The authors have implemented this formula using the Python scripting language, and have made use of the empirical data set from 152 consulted companies from May 2008 to March 2015 to calculate the mutually complementary strength coefficient for all corporate alliances in the data set, and the data from both the successful and unsuccessful corporate alliances. As a result, we were able to confirm the validity of this proposed model. The above-mentioned formula was implemented in the Python scripting language in Tomita and Takefuji (2015, 2016a, 2016b, 2016c, 2016d) and Tomita (2017), and the mutually complementary strength coefficients were calculated by using 152 consulted companies as empirical data. The validity of the model was confirmed by comparing the coefficients for 121 pairs of successful alliances and 30 pairs of unsuccessful alliances. The graph plotting of the coefficients can be seen in Figure 3 below. The model was proven to be valid.

Figure 3: The Normalized Mutually Complementary Strength Coefficients for Successful Corporate Alliances and Unsuccessful Corporate Alliances



This Figure shows the distribution of the mutually complementary strength coefficients for 121 pairs of successful corporate alliances and 30 pairs of not-successful corporate alliances.

### CONCLUDING COMMENTS

From the new combination of Resource-Based View (RBV), the concept of flow in physics, the concept of Give and Take in psychology, and the method of cyber informatics in computer science, a brand new model has been developed. This innovative outcome in management studies comes from the combination of several theoretical concepts and imports methodology from other science fields, specifically cyber informatics of computer science. This outcome must have meaningfully significant implications for innovation in management research. The method of this research activity was accorded to the way of thinking as stated by Schumpeter, quite “a new combination.” This paper asserts that the invention in research activities should not focus solely on one specific field or discipline, but in order to successfully create new inventions like this development of mathematical model, researchers must be more open and flexible to borrow theories and concepts from other science fields and across disciplines as well as to combine them as this is the key to creating new, successful inventions in management studies. For future consideration, more concepts and methodologies from other research fields should be imported to management studies for acquiring new inventions. By taking this stance, even greater developments in management studies can be achieved.

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# IMPACT OF MIGRANT REMITTANCES ON THE FOOTWEAR INDUSTRY IN GUANAJUATO

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## ABSTRACT

*This research examines the perception footwear industry workers in the State of Guanajuato. The paper also explores the impact of migrant remittances on the industry. The most important region in Mexico for its footwear production is the State of Guanajuato. It is also a leading State for high migration. This research is quantitative, descriptive, and transversal. A convenience sample was selected to meet certain criteria. Fifty workers were surveyed in footwear distribution and sales centers in the municipality of León Guanajuato, Mexico. An instrument consisting of 21 items and 3 constructs was used. The study shows that only a third of migrants invest in the footwear industry. The difference is invested in agriculture, in the construction of their homes, and in maintaining of their families. In addition, 44% of respondents know at least one person deported and believe that many of them will try to cross the border again out of necessity.*

**JEL:** O150, R59

**KEYWORDS:** Migration, Local Development, Sustainability, Industry

## INTRODUCTION

Mexican migration is the result of a historical & unique relationship between the United States and Mexico. Mexicans inhabited California and Texas before the territory was even American. In turn, the Bracero Program stimulated the entry of thousands of Mexicans. Later, through family reunification policies, the entry of women and children was allowed, consolidating a definitive settlement of the population (Portes, 1998). Different dimensions of migration, including economic, social, political and cultural, reveal the complexity of this phenomenon. Therefore, the investigation of this topic proposes many challenges. In the 1993 Migration Survey in the Northern Border of Mexico began. The general objective was to obtain knowledge about the labor migration phenomenon between the northern border of Mexico and southern border the United States. The goal was to highlight its nature, volume and trends, its effects on the labor market and the impacts on both societies (Colef, 2007). An element of interest within the economic dimension of migration, and of increasing importance for some economies of countries that have emigration, is the sending of remittances. Remittances have an impact on the families that receive them and on the increase in their consumption levels (United Nations, 2016). Remittances and the footwear industry in Guanajuato are two important generators of income in the State. The question arises: Does receipt of these revenues relate to, and have an impact on, local development?

The purpose of this research is to analyze the perception of workers in the footwear industry in the State of Guanajuato. I wish to identify relationships between migration and investment in the industry. Guanajuato has traditionally been a state of strong migratory expulsion and it is recognized nationally and internationally for its footwear production. This industry employs an average of 112,727 people, contributing to 2.4% of the total employment of all manufacturing industries in Mexico. Further, Guanajuato generates 68.4% of the footwear production in Mexico and the municipality of León produces 57.8% (INEGI, Economic Census, 2009). This article has been structured into four sections. The first is based on a brief review of the literature which has allowed us to gain insight and the impact of remittances,

such as the shoe industry in the State of Guanajuato. The methodology is explained later. Finally, the results and the conclusions are presented.

## LITERATURE REVIEW

### Migration and Its Importance Within the Economy of Guanajuato

Migration impacts the dynamics of an economy where the population demands employment opportunities and income. Migrant's motivations are getting out of poverty and improvement of their quality of life and that of their families. Thus, migration promotes constant depopulation of many localities and municipalities, and impacts remittances to family members (Aguilar-Ortega, 2011). The impact of migration is analyzed by Binford (2006) from two major angles. The analysis relates to the impact of remittances, the functionalist, and the historical structuralist. The first assumes that remittances have the power to reduce poverty and income inequality and help stabilize families financially, as they are used for basic expenses such as food, education, health, and housing. They imply greater well-being for families and have a multiplying effect on the country's economy. On the other hand, the historical structuralist view considers emigration as having a negative effect on the economy and on the social structure of their communities. Within this view, emigration and remittances create a series of structural distortions that are reflected in an exacerbation of social conflict, economic differences, and inflation. This in turn fosters a vicious cycle that distorts the local economy and deteriorates its social structures. One problem faced by these communities is that they become dependent on remittances. This dependence leads to greater emigration, because the remittances help maintain the standard of living. According to this view, family remittances have little chance to initiate development because they are used for basic education, family maintenance, health, home construction, productive investments, etc. These not generate jobs, and the limited productive projects have little benefit.

Canales (2006) supports the theory that remittances have a limited and restricted impact on development promotion and the reduction of poverty. Remittances are essentially a salary fund which is transferred among families in similar socioeconomic conditions. Remittances are usually sent by precarious and vulnerable migrant workers to their relatives who live in poverty and are socially marginalized. In this way, remittances improve the standard of living in the receiver's homes, but they do not represent a strategy which permits them to solve the structural problems that perpetuate poverty. Papail (2002) also states that remittances received by urban households, in the central-western region of Mexico, are important resources for the reproduction of numerous families. However, during the nineties, the productive investments made, thanks to these remittances, seem to have intensified. This intensification allowed employees to become micro entrepreneurs at the end of their migration cycle in the United States to increase their incomes in their places of origin in Mexico.

Remittances contribute to the economy of families that remain within the communities of origin of the migrants. What is not clear, is to what extent they help their economic development. It is known that families use remittances for maintenance and to acquire, repair, or add to their house. However, we must identify to what extent they affect community development. We wish to know if they create productive businesses with their surplus which employ other people and create multiplier economic effects. In the third instance, we wish to know how they affect the creation of goods and service companies in major urban centers. We also wish to identify how much of the remittances leave the immediate region and is concentrated in large cities that produce and sell the products and services demanded by the communities that expel migrants (Arroyo Alejandro & Rodríguez, 2008).

In 2016, remittances to Mexico set a record of US\$26,970 million. Worldwide remittances could reach US\$606.4 million in 2017, up by 3.6%. In addition, in 2016, remittances to Mexico reached an all-time high of US\$ 26,970 million, representing 8.8% annual growth, largest growth in this flow since 2006 (Table

1). It surpasses the 2007 record when US\$26,059 million were received (Fundación BBVA Bancomer, Secretaría de Población, & Consejo Nacional de Población, 2017). States with the largest numbers of returnees were in the Western, Central-South and Northern regions of Mexico. Some 38.6% returned to towns with more than 100,000 inhabitants and 29.0% to towns with fewer than 2,500 inhabitants. The state of Guanajuato had from 2010 to 2015, 32,147 (6.5%) Mexican return migrants (Fundación BBVA Bancomer, Secretaría de Población, & Consejo Nacional de Población, 2017). Emigrants from Guanajuato between 2005-2009 were 142,691 and 2009-2014 66,001. The group consisted of women (28.9%) with average age 33.9 and men (71.1%) with average age 36. Top states of residence were Texas (33.25%), California (24.3%), Illinois (8.2%), North Carolina (3.7%) and Georgia (3.7%). Top municipalities of birth were León (8.8%), Celaya (7.2%), Irapuato (7.0%), Acambaro (4.6%), Penjamo (4.6%). Further, from the United States in 2016, 10,511 were repatriated. This consisted of adults 95.5% and children 4.5% (Fundación BBVA Bancomer, Secretaría de Población, & Consejo Nacional de Población, 2017) .

Table 1: Absolute Migration Intensity Index (IAIM), 2000-2010

Índex	2.17
% houses with	21,857,601
Remittances	3.6
Emmigrants to US	1.9
Circular Migrants	0.9
Returning Migrants	2.2

Source: CONAPO estimates based on INEGI, ten percent sample of Census 2010. Guanajuato has a very high Absolute Degree of Migration Intensity (4.86) and had with the biggest remittance receipts in 2016.

Guanajuato is among states that receives the most remittances and according to data from the National Institute of Statistics and Geography (INEGI, 2010). The activity that contributes most to the State Gross Domestic Product is commerce.

#### Importance of Footwear Industry in Guanajuato

The footwear industry in Mexico employed 112,727 people in 2014, contributing 2.4% of total manufacturing, according to the Economic Census (2009). Additionally, when acquiring supplies for the manufacture of footwear, the industry generates approximately 17 thousand extra jobs with its suppliers. The national production of Footwear is located in eight municipalities of the country mainly: a) León, Guanajuato contributes 57.8% of the total value of production, b) Guadalajara, Jalisco 10%, c) San Francisco del Rincon, Guanajuato 6.7% d) Purisima del Rincon, Guanajuato 3.9% e) Zapopan, Jalisco 3.1%, f) Iztapalapa, Federal District 1.4% g) Toluca, Mexico 1.3%, and h) San Mateo Atenco, Mexico 1.2% (Table 2). In total, Guanajuato generates 68.4% of the footwear production in the country (INEGI, Statistics regarding the footwear industry, 2014). Table 2 shows that 30.8% of economic units engaged in the manufacture of footwear obtained financing in 2014. This figure is higher than averages for the manufacturing sector (INEGI, Economic Census, 2009). Exports of footwear as of 2010 registered a growing behavior.

Table 2: The Most Important Municipalities in Mexico for Their Footwear Production

	Economic Units		Busy Staff		Production (Millions of Pesos)	
	Absolute	%	Absolute	%	Absolute	%
National	7,398	100	112,727	100	26,146	100
Leon, Guanajuato	2,330	31.5	57,064	50.6	15,119	57.8
Guadalajara, Jalisco	486	6.6	11,172	9.9	2,605	10
San Francisco del Rincon, Guanajuato	447	6.0	8,429	7.5	1,747	6.7
Purísima del Rincon, Guanajuato	176	2.4	4,448	3.9	1,018	3.9
Zapopan, Jalisco	60	0.8	2,791	2.5	810	3.1
Iztapalapa, Distrito Federal	7	0.1	551	0.5	353	1.4
Toluca, Mexico	6	0.1	1,069	0.9	347	1.3
San Mateo Atenco, Mexico	1,337	18.1	6,795	6.0	304	1.2
Total of the 8 municipalities	4,849	65.6	92,319	81.8	22,302	85.4
Rest of the municipalities	2,549	34.4	20,408	18.2	3,844	14.6

Source: Economics Census 2009. The municipalities were ordered according to the value of the production they contributed to the national total.

From 2010 to 2012 the growth rate was above 20%. In the first five months of 2014, exports decreased by 10.3% with respect to the same period in 2013 (INEGI, Tax Administration Service, & Ministry of Economy, Exports of footwear, 2013-2014). Some 94.1% of external sales of footwear products were exported to 10 countries in 2013. The bulk, 82.6% of footwear were exported to the United States. Exports of footwear from Mexico represented 0.5% of world exports, representing 24th place (International Trade Center, 2012). From the above, we can see the importance of both remittances sent to the State of Guanajuato and the footwear industry. This research focuses on studying whether remittances impact the footwear industry, mainly in the creation of companies and in the local and state development.

### METHODOLOGY

This research is quantitative, descriptive, and transversal. The instrument included 21 items. Respondents were selected based on two parameters: (1) an entrepreneur or worker in the footwear industry and (2) having relatives who migrated to the United States. A convenience sample was selected to meet certain criteria. Fifty workers were surveyed in footwear distribution and sales centers located in the municipality of León Guanajuato, Mexico. I achieved a 100 percent response rate. The sample was taken from August 30 to 02 September 2017. León, Guanajuato was selected because it is among municipalities with highest number of migrants. It is also the most important in terms of production of footwear and leather products in Mexico. Table 3 presents summary of variables and items analyzed.

Table 3: Operational Definition of Research Variables

Variables	Definition	Item	Unit of Measurement
Dependent	Type of need	a) Lack of job opportunities, b) low wages in Mexico, c) find a better job, d) economic need, e) improve their quality of life, f) insecurity in Mexico, g) family lives in the United States.	Instrument designed on the basis of 21 items
	Remittance expense	a) Family maintenance	
Independent	Investment of remittances in the State of Guanajuato	a) Agriculture b) Footwear Industry c) Properties	Analysis of the relationship between migration and the footwear industry
	Impact of remittances in the footwear industry of León Guanajuato		

This table shows that for the data collection an instrument consisting of 21 items and 3 constructs was used; demographic data of the sample, remittances and investment in the footwear industry.

RESULTS

We start our analysis with summary statistics presented in Table 4. We follow with migration trends and job selections reported in Tables 5 and 6. We continue with perceptions of the Mexican Government actions to reduce migration in Table 7). Table 8 addresses deportation issues, and Table 9 reports employment of migrants. Finally, Table 10 provides an analysis of issues regarding remittance.

Table 4: Summary Statistic, Demographic Information

Variable		Frequency	Percentage	Valid Percentage	Accumulated Percentage
Gender	Male	22	44.0	44.0	44.0
	Female	28	56.0	56.0	100.0
Place of origin	Celaya	24	48.0	48.0	48.0
	Leon	24	48.0	48.0	96.0
	Estado de México	1	2.0	2.0	98.0
	Salamanca	1	2.0	2.0	100.0
Type of entrepreneur	Manufacturer	31	62.0	62.0	62.0
	Distributor	14	28.0	28.0	90.0
	Both	5	10.0	10.0	100.0
Academic degree	None	2	4.0	4.0	4.0
	Elementary school	2	4.0	4.0	8.0
	Middle School	15	30.0	30.0	38.0
	High school	22	44.0	44.0	82.0
	Bachelor's degree	9	18.0	18.0	100.0
Current position	Receptionist	2	4.0	4.0	4.0
	Sales	37	74.0	74.0	78.0
	Owner	6	12.0	12.0	90.0
	Manager	5	10.0	10.0	100.0

*This table shows that 56% of respondents are women and 44% are men. 34% are married, 58% are single, 2% live in a free union, 1% are separated and 1% are widowed. 32% are 15 to 22 years old, 40% are 23 to 44 years old, 16% are 35 to 50 years old and 8% are over 50 years old. Relative to place of origin, 96% of respondents come from the municipalities of Celaya and León Guanajuato. Some 62% of respondents are manufacturers, 28% are distributors and 10% are both manufacturer and distributor. Additionally, we observe that 4% of respondents do not have academic training, 4% elementary school, 30% middle school, 44% high school and 18% bachelor's degree. Results show 56% have an average of 3 years of experience in the industry, 20% 4 to 9 years, 16% from 10 to 15 years and 8% more than 15 years, and relative to their current position 4% are receptionists, 74% are in sales, 12% are owners and 10% are managers.*

Table 5: Places Where Mexican Migrants Work in the United States

Variable		Frequency	Percentage	Valid Percentage	Accumulated Percentage
Do you have family members working in the United States?	Yes	35	70.0	70.0	70.0
	No	15	30.0	30.0	100.0
Places where Mexican migrants work in the United States	Texas	10	20.0	20.0	50.0
	California	6	12.0	12.0	66.0
	Illinois	3	6.0	6.0	74.0
	New York	2	4.0	4.0	54.0
	Washington	2	4.0	4.0	80.0
	Arkansas	1	2.0	2.0	68.0
	Tennessee	1	2.0	2.0	76.0
	Ohio	1	2.0	2.0	100.0
	Undecided	9	18.0	18.0	98.0
	Without family	15.00	30.00	30.00	30.00

*Table 5 shows that 70% of respondents claim to have family members working in the United States, and that Texas, California, and Illinois are the largest destinations for relatives of the Guajuatenses with 20%, 12% and 6% respectively. Interestingly, this implies that 18% do not have clarity as to where their relatives live within the United States.*

Parallel to migratory flow toward to United States, Census information also shows an increased in returned migrants. Approximately 80 percent of returned migration moved back to their hometown or place of birth (Zenteno, 2012).

Table 6: What Jobs do Your Family Members Have in the United States?

Variable		Frequency	Percentage	Valid Percentage	Accumulated Percentage
What jobs do your family members have in the United States?	Agriculture	10	20	20	84
	Construction	4	8	8	64
	Nanny	2	4	4	88
	Mechanics	2	4	4	92
	Waiters	2	4	4	98
	Carpentry	1	2	2	94
	House keepers	1	2	2	100
	Undecided	13	26	26	56
	No family	15	30	30	30
Why do Mexicans emigrate to the United States?	Lack of employment opportunities	11	22.0	22.0	22.0
	Low wages in Mexico	9	18.0	18.0	40.0
	Searching for better employment	8	16.0	16.0	56.0
	Economic necessity	14	28.0	28.0	84.0
	Improve their quality of life	6	12.0	12.0	96.0
	Mexico's insecurity	1	2.0	2.0	98.0
	Their families live in the US	1	2.0	2.0	100.0

*This table shows that family members of migrants from Guanajuato point out that the activities where they work are mainly, agriculture 20% and construction 8%. The rest work mainly in activities such as waiters, nannies, mechanics, carpenters, and house keepers. According to the opinion of respondents, there are several reasons why respondents migrate to the United States. The primary reason 28% because of economic necessity, 22% for lack of employment opportunities, 18% searching for better employment and 12% to improve their quality of life. However, they also found factors that influence, to a lesser extent, the decision to migrate, like Mexico's insecurity. Some are motivated because their families live in the United States (US).*

Mexicans migrate to the United States mostly in search of better job opportunities as well as to improve their quality of life and that of their families. However, Vega-Macias (2014) argues that migration has other consequences in Mexico, such as the impact it has on population levels, demographic ageing and imbalances and the masculinity index in Mexico businesses.

Table 7: Do You Think the Mexican Government is Doing Something to Reduce Migration?

Variable		Frequency	Percentage	Valid Percentage	Accumulated Percentage
Do you think the Mexican government is doing something to reduce migration?	Yes	8	16.0	16.0	16.0
	No	42	84.0	84.0	100.0
How do you think migrants returning should be supported?	Create business	3	6.0	6.0	6.0
	Competitive salaries	6	12.0	12.0	18.0
	More job opportunities	22	44.0	44.0	62.0
	Support with settling in Mexico	2	4.0	4.0	66.0
	Lower taxes	2	4.0	4.0	70.0
	Legal support	6	12.0	12.0	82.0
	Raise awareness of the Mexican life style	1	2.0	2.0	84.0
	No discrimination	2	4.0	4.0	88.0
	Support them to create projects	4	8.0	8.0	96.0
	Security to return	2	4.0	4.0	100.0

*Table 7 shows that 84% of respondents believe that the Mexican government does not do enough to reduce migration to the United States. Additionally, 46% indicated that last year, even with the restrictive immigration policies of the United States Government, migration has not diminished. Results show that among the actions that must be carried out to support return migrants from the perspective of the respondents are: create more job opportunities, pay competitive salaries, legal support, support them to create projects and create more businesses.*



Table 8: Do You Know People Originally from Guanajuato Deported in 2017?

Variable		Frequency	Percentage	Valid Percentage	Accumulated Percentage
Do you know people originally from Guanajuato deported in 2017?	Yes	22	44.0	44.0	44.0
	No	28	56.0	56.0	100.0
Do you think that migration has decreased in 2017?	Yes	27	54.0	54.0	54.0
	No	23	46.0	46.0	100.0

In Table 8, we see that 44% of respondents know at least one person deported and believe that many of them will try to cross the border again out of necessity. On the other hand, it can be interpreted that there is a slight decrease in migration from Guanajuato, Mexico to the United States.

Massey, Prend & Durand (2009), based on information from the Mexican Migration Project, a binational project by Princeton University, on Mexican migration to the United States, showed that there is a significant decrease inflows Migration in recent years. Migration flow has slowed and there has been an increase in migrants returning to Mexico. The reasons for these trends include a slowdown in the US economy which reduces the need for immigrant labor and tightening immigration control policies that discourage illegal migration to some extent. Despite an increase in return migration, there is no evidence to suggest that migrants end their aspirations to continue going north, either for the first time or to "start a new life" in the U.S. The figures reported relate to anti-immigrant policies, which affect the time an migrant will stays in the United States. However, this return migration does not end migration. It can be argued that outbound and inbound migration form a circular mobility in Mexico (Cassarino, 2004).

Table 9: Occupation of Family Members of Migrants

Variable		Frequency	Percentage	Valid Percentage	Accumulated Percentage
Municipalities in Guanajuato with the largest number of migrants.	Dolores Hidalgo	16	32.0	32.0	32.0
	San Felipe	10	20.0	20.0	52.0
	Acambaro	2	4.0	4.0	56.0
	Silao	3	6.0	6.0	100.0
	Irapuato	2	4.0	4.0	82.0
	Paseo	1	2.0	2.0	94.0
	No sabe	11	22.0	22.0	78.0
	Todo el Estado	5	10.0	10.0	92.0
Occupation of family members of migrants	Vendor	15	30	30	54
	Unemployed	9	18	18	72
	Footwear industry worker	7	14	14	24
	Farmer	5	10	10	10
	Housekeeper	5	10	10	90
	Construction worker	4	8	8	98
	Other	4	8	8	80
	Undecided	1	2	2	100

Table 9 shows that respondents identify two municipalities with the highest number of migrants: Dolores Hidalgo and San Felipe. However, 10% think that the entire State has a significant number of migrants. Results show that 30% of the families of migrants work as vendors, however they believe that 18% are unemployed and basically use the money they receive from remittances to maintain themselves. In addition, 14% work in the footwear industry, 10% in the farming industry and 10% as housekeepers.

Table 10: Impact Migrant Remittances in the Footwear Industry in Guanajuato

Variable		Frequency	Percentage	Valid Percentage	Accumulated Percentage
Employers of the footwear industry who were migrants	Yes	11	22.0	22.0	22.0
	No	39	78.0	78.0	100.0
Destination of migrant remittances in Guanajuato	Expenses	20	40.0	40.0	40.0
	Investment	3	6.0	6.0	46.0
	Both	27	54.0	54.0	100.0
Industry in which migrants invest in Guanajuato	Agriculture	26	52.0	52.0	52.0
	Footwear industry	16	32.0	32.0	84.0
	Commerce	3	6.0	6.0	90.0
	Home construction	5	10.0	10.0	100.0

Table 10 shows that 22% of respondents know a footwear industry entrepreneur who was a migrant. In addition, the table shows that respondents believe that 40% of remittances are spent, 6% is invested and 54% is used for both maintenance and investment in agriculture, the footwear industry, construction of a property or for maintenance of the family. Moreover, results show that migrants from Guanajuato mostly invest in agriculture at 52%, 32% in the footwear industry, 10% in home construction and 6% in commerce. Only one third of remittances are related to investment.

It is important to note that even though, Guanajuato migrants invest mainly in farming, one third have started businesses in the footwear industry. This confirms the existence of an impact between the remittances sent by the migrants and the footwear industry. Moreover, local and state development benefit from increase remittances and a strong footwear industry.

## CONCLUSIONS

This research examines the perception of workers in the footwear industry in the State of Guanajuato, and the impact of migrant remittances on that industry. Guanajuato is a source of migratory expulsion, since it is among leading states with the highest migration in Mexico. Results here show that 70% have relatives working in the United States, although not in all cases are they direct relatives. This research is quantitative, descriptive, and transversal. A convenient sample was selected to meet certain criteria. 50 workers from the footwear industry were interviewed at their place of work. They completed a 21-item instrument. Participants met two parameters: (1) an entrepreneur or worker in the footwear industry and (2) having relatives who migrated to the United States. The municipality of León, Guanajuato was selected due to its high migration and strong footwear production. Based on the results obtained, we identify that reasons for migration differ, ranging from the economic need, the desire to find better jobs, improving their quality of life, and an adventure. A significant number migrate to reach their families residing in the United States, even if this means risking their own safety and lives.

Predominant jobs in the United States are: vendor, farmer, construction workers. A minority work in activities such as waiters, babysitters, mechanics, carpenters, and housekeepers. The most frequent destinations of Mexican migrants are Texas, California, and Illinois. The Guajuatenses aren't the exception, they predominantly reside in the above listed states, as well as in New York and Washington. Most respondents (84%) believe that the Mexican government does not do enough to reduce migration to the United States. Even with restrictive immigration policies of the United States Government, migration has not diminished. The primary reason being the economic necessity of families is latent. Regardless of the restrictions, they continue to risk their lives to achieve a better standard of living. We affirm a relationship between remittances sent to the families of the migrants in Guanajuato and the footwear industry in Guanajuato. Results indicate 14% work in the footwear industry. The results suggest that 60% of remittances sent are used for both maintenance and investment in agriculture, the footwear industry, construction of a property or for family maintenance. Some 22% of respondents say they know an owner in the footwear industry who was a migrant. The results show that one third of remittances sent has been

invested in the footwear industry. This confirms there exists an impact on the industry and, therefore, on the local development of the state.

Like all research, the work here has limitations. During the data collection, many business owners were in the field. Therefore, ownership represent only 6% of the total sample size. In addition, some participants were reluctant to answer some questions due to fear of having the data use for criminal activities.

Migration is a complex phenomenon, which can be studied from different perspectives, and opens a wide range of opportunities for research. Future research might study, in greater depth, the ability for migrant families to save money, invest and their impact on local development. There is a lot of talk about investment, but migration scholars agree that migrants come from low-income families and even from families with extreme poverty. Remittances are a solution to the maintenance problem. But, income of the migrant is not always enough to pay for the cost of living in the United States and their family in Mexico. The lack of savings by migrant families may be in part due to culture. The number of return migrants is increasing, giving rise to the following questions: Are the families ready to return to Mexico? Is the Mexican government anticipating the economic and social impact of the increase in return migration indices? And What sustainable strategies should be implemented to confront return migration in Mexico? There is considerable opportunity for further research on the topic of international migration.

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