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REAL ESTATE TREND PREDICTION USING LINEAR REGRESSION AND ARTIFICIAL NEURAL NETWORK TECHNIQUES

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ABSTRACT

An accurate assessment of future housing prices is crucial to critical decisions in resource allocation, policy formation, and investment strategies. In this work, linear regression and artificial neural network were employed to model home price indices, using datasets of the S&P/Case-Shiller home price index and twelve demographic and macroeconomic features in five metropolitan statistical areas: Boston, Dallas, New York, Chicago, and San Francisco. The data, ranging from March 2005 to December 2018, were collected from the Federal Reserve Bank, the Federal Bureau of Investigation, Macrotrends, and Freddie Mac. Three time-lagging situations were compared: no lag, a 6-month lag, and a 12-month lag. Since some data were available monthly, some quarterly, and some annually, two methods to compensate missing values, backfill and interpolation, were compared. The models were evaluated for accuracy and mean absolute error. The results showed that linear regression performed well in predicting long-term trends, while artificial neural network was suitable for short-term prediction. It was found that input factors that were statistically significant varied in different areas. The results also showed that the technique to compensate missing values and the implementation of time-lag influenced the models' performances, both of which require further investigation.

INTRODUCTION

The housing market is the sale and acquisition of real estate for residential or commercial purposes (Bank of England, n.d.). In the United States (US), the real estate industry accounts for 832,000 jobs and 15% of the GDP in 2018 (Stupak, 2019). As of 2020, the US housing market is worth around $33.6 trillion, a market value equal to the annual GDP of the US and China combined (Gerrity, 2020). Individual buyers, investors, businesses, and governments are all affected by the housing market. For all the stakeholders, confident assessments of the housing market in the near- and long-term future are important for critical decisions about policy making, asset allocation, and portfolio and investment management (Conway, 2018, Lyons, 2017). There is a need to develop a model that will accurately predict future housing market trends.

In this study, the S&P/Case-Shiller Home Price Indices (HPI) (S&P Dow Jones Indices LLC, n.d.), the leading measure of US residential real estate prices, were modeled by linear regression (LR) and artificial neural network (ANN) methods, using twelve demographic and macroeconomic features in five metropolitan statistical areas (MSA): Boston, Dallas, New York, Chicago, and San Francisco. The selected five areas represented different market trends. This paper adds to the knowledge about the influence of macroeconomic and demographic factors determinants for housing prices in different US real estate

markets. This work also compares the influence of different data imputation methods and different time-lag situations on the model's performance. The results call for further investigation of the effectiveness of the technique to compensate missing values and the implementation of time lag.

The remainder of the paper is organized as follows. Initially, there is a review of the literature on the influences of demographic and macroeconomic factors on house price trend; research work to build predictive models for home price index; application of artificial intelligence in real estate studies. The need for more work on the influence of demographic and macroeconomic factors on house price trend in different markets, the influence of data imputation methods on building predictive models using real world data, and the effects of time lag on building predictive models are also identified in this section. In the succeeding section, a discussion of the data and methodology utilized in the study is provided. Analysis of results are provided in the results and discussion section. The final section offers comments and suggestions for future research.

LITERATURE REVIEW

Many factors influence the housing market, including household income, wealth, metropolitan statistical area (MSA) population, age of household heads, racial composition, local tax policy, interest rates, land constraints, regulatory constraints, and construction costs (Rodda & Goodman, 2005). Current econometric research on the effect of macroeconomic determinants, demographic conditions, and policy factors on housing price is often contradictory (Trofimov et al., 2018). Most papers show a significant, positive correlation between GDP and household income and housing prices; however, factors like money supply, interest rates, and disposable income are often disputed among studies (Tripathi, 2019, Trofimov et al., 2018). A study by Renigier-Biłozor and Wiśniewski (2013) showed that the economic and financial conditions of different European countries had variable influence on the prices of real estate. Given that the housing market is heterogeneous, that is, house price dynamics vary greatly across regions (Nam, 2020), the effect of macroeconomic and demographic variables on different real estate markets over different time periods must be examined specifically. By running the same linear regression algorithm on data over the same time period across five different markets, this present research was able to compare the coefficients of different input variables and to determine significant variables in each market. It was found that, depending on the studied area, the influence of demographic and macroeconomic factors varied.

In this work, the S&P/Case-Shiller Home Price Indices and twelve demographic and macroeconomic factors were studied for five metropolitan areas -- Boston, Dallas, New York (NY), Chicago, and San Francisco (SF). The data were collected from the Federal Reserve Bank (Federal Reserve Bank, n.d.), the Federal Bureau of Investigation (FBI) (Federal Bureau of Investigation, n.d.), Macrotrends.net (Macrotrends, n.d.), and Freddie Mac (Freddie Mac, n.d.).

The time ranges of available data for twelve features were varied, limiting the range of the final dataset that contained all features. Additionally, some factors were available monthly, some quarterly, and some yearly, leading to missing values. Missing values in features is a widely known problem in data-driven modeling and can be addressed by several methods, such as eliminating the feature, imputing the data with a mean, imputing the data by last observation, or using algorithms that support the missing values. However, the methods of dealing with missing data and their impact on the model's performance are rarely discussed in real estate modeling studies. In this work, two methods of imputing missing values, i.e., backfill and interpolation, were compared and discussed. The final datasets used for modeling ranged from March 2005 to December 2018 and included all features monthly, after imputing missing data points.

The intersection of real estate and artificial intelligence technology is still in the exploratory stage (Conway, 2018). Most of the previous work has focused on using artificial intelligence (AI) and machine learning (ML) for valuation (Conway, 2018). Predicting housing price trends using artificial intelligence techniques

has attracted increasing attention in recent years (Abidoye et. al., 2019, Li, 2009, Niu & Niu, 2019, Renigier-Biłozor & Wiśniewski, 2013, Vargason, 2019). In this work, linear regression (LR) and artificial neural network (ANN) methods have been employed to create data-driven models, and the predictive accuracy of the models were compared and discussed. These algorithms have performed well in the past for prediction tasks (Abidoye et al., 2019, Gruma & Govekarb, 2016, Nisha & Sreekumar, 2017). LR has been used in establishing real estate price index models over a long time period (Bailey et. al., 1963, Malpezzi et. al., 1980). ANN has been successfully used in several recent studies to model the housing price index with high accuracy (Abidoye et al., 2019, Renigier-Biłozor & Wiśniewski, 2013).

Autoregressive integrated moving average (ARIMA) and vector autoregressive (VAR) methods have been used to establish time-series models to predict housing price indices, too (Gupta et. al., 2011, Vishwakarma, 2013, Xie & Hu, 2007). ARIMA models were shown to be suitable for short-term forecasting, such as one-step-ahead forecasts (Karakozova, 2004, Stevenson & Young, 2007, Tse, 1997, Vishwakarma, 2013). In Gupta et al.'s (2011) work, eight time-lags were used, while in Abidoye et. al.'s (2019) work, five time-lags were adapted from studies of media influence on the stock market. A study suggested that the lag length for the VAR model should be two (Baffoe-Bonnie, 1998). Yet, another report did not discuss time lag (Li et. al., 2009). Time lag is an important variable in establishing predictive models, and more studies that experiment with time lags are needed.

Some studies focusing on AI modeling of the housing price index did not consider time lag (Renigier-Biłozor & Wiśniewski, 2013, Shukry et. al., 2012, Lim et. al., 2016). This work compared three sets of models with three different time-lag conditions: no lag or point prediction; a 6-month lag; and a 12-month lag, i.e., in the 6-month lag model, demographic and macroeconomics factors from six months ago were used as input parameters to model the current month's home price index, while in the no-time-lag model, factors in the current month were used to model the current month's home price index.

DATA AND METHODOLOGY

Data

The twelve macroeconomic and demographic features for each MSA chosen for this study were:

> 30-year fixed mortgage rate
> Per-capita personal income
> Resident population
> Unemployment rate
> Total gross domestic product (GDP)
> Crime rate
> Percentage of the population with mortgage debt
> Median debt
> Percentage of the population with severely delinquent debt
> New private housing structures authorized by building permits
> Index of economic conditions
> Consumer price index for all urban consumers -- all items, less shelter.

Previous studies typically suggested that these factors were influential in determining housing prices (Rodda & Goodman, 2005; Tripathi, 2019; Trofimov et al., 2018).

The outputs of the models were S&P/Case-Shiller Home Price Indices, Index Jan 2000=100 (HPI) (S&P Dow Jones Indices LLC) for five different MSAs. S&P/Case-Shiller Home Price Indices are the leading

measures of US residential real-estate prices. They track the purchase price and resale value of single-family homes and are widely viewed as barometers of the US housing markets and broader economy.

Data were collected from the Federal Reserve Bank (Federal Reserve Bank, n.d.), Federal Bureau of Investigation (FBI) (Federal Bureau of Investigation, n.d.), Macrotrends.net (Macrotrends, n.d.), and Freddie Mac (Freddie Mac, n.d.). The time ranges of available data for each feature were varied, limiting the range of the final dataset containing all features. The range of the data used was from March 2005 to December 2018, and the frequency of the data was monthly, after filling in missing values. All data except mortgage rate and consumer price index for all urban consumers: all items less shelter were data for each MSA. Mortgage-rate data used were national data, due to the difficulty of locating publicly available mortgage rate data for each MSA. Data of the consumer price index for all urban consumers: all items less shelter were for core-based statistical areas (CBSA) due to availability of this data from Federal Reserve Economic Data (FRED). Table 1 summarizes the sources of each feature's data as well as the frequency of the data points, e.g., monthly, quarterly, or yearly.

Table 1: Frequency and Source of Features

Feature	Frequency	Source
S&P/Case-Shiller Home Price Index, Index Jan 2000=100	Monthly	S&P Dow Jones Indices LLC, retrieved from federal reserve economic data (FRED), Federal Reserve Bank of St. Louis
30-year fixed mortgage rate	Monthly	Freddie Mac
Unemployment rate	Monthly	U.S. Bureau of Labor Statistics, Unemployment Rate, retrieved from FRED, Federal Reserve Bank of St. Louis
New private housing structures authorized by building permits	Monthly	U.S. Census Bureau, New Private Housing Structures Authorized by Building Permits, retrieved from FRED, Federal Reserve Bank of St. Louis
Economic conditions index	Monthly	Federal Reserve Bank of St. Louis, Economic Conditions Index, retrieved from FRED, Federal Reserve Bank of St. Louis
Consumer price index for all urban consumers: all items less shelter	Monthly	U.S. Bureau of Labor Statistics, Consumer Price Index for All Urban Consumers: All Items Less Shelter, retrieved from FRED, Federal Reserve Bank of St. Louis
Percent of the population with mortgage debt	Quarterly	Federal Reserve Bank of New York: Consumer credit explorer
Median debt	Quarterly	Federal Reserve Bank of New York: Consumer credit explorer
Percent of the population with severely delinquent debt	Quarterly	Federal Reserve Bank of New York: Consumer credit explorer
Per capita personal income	Yearly	U.S. Bureau of Economic Analysis, Per Capita Personal Income, retrieved from FRED, Federal Reserve Bank of St. Louis
Resident population	Yearly	U.S. Census Bureau, Resident Population, retrieved from FRED, Federal Reserve Bank of St. Louis
Total GDP	Yearly	U.S. Bureau of Economic Analysis, Total Gross Domestic Product, retrieved from FRED, Federal Reserve Bank of St. Louis
Crime rate	Yearly	FBI: Crime in the US and Macrotrends.net

This table summarizes the sources and frequency of the twelve input variables and one output used in the study. The output, the S&P/Case-Shiller Home Price Index, was bolded and italicized. The three frequencies, monthly, quarterly, and yearly, in the second column indicate that the original data were available monthly, quarterly or yearly from the corresponding sources listed in the third column.

Missing Data Imputation

Since there were three different frequencies of available data, there were missing values in quarterly and yearly data sets. Different data imputation methods can be used to fill for missing values. In this study, missing values in quarterly and yearly data were filled by two methods: interpolation and backfilling. To fill by interpolation, values in between the two known endpoints were linearly regressed. To backfill, the

endpoint value was filled in for all the points before it, up to the previous endpoint. The accuracy of the models trained on data filled by these two methods was compared.

Time Lag

The time-lagging effect was considered, and there were three kinds of models established: no-lag, a 6-month lag, and a 12-month lag. The no-lag model used the features at a certain time point to produce the home price index for the same time point. The 6-month-lag model used features at a certain time point to produce the home price index for 6 months later. Similarly, the 12-month lag model produced the home price index for one year later.

Areas

The five selected metropolitan statistical areas for this study were Boston, New York (NY), San Francisco (SF), Dallas, and Chicago. These areas exhibited different housing market trends from 2005 to 2018: growth-decline-rapid growth to new high (Boston and SF); growth-decline-growth to recovery (NY); growth-decline-slow growth (Chicago); and flat with small variances-growth (Dallas). Two datasets containing data on the selected features in each area were created, one for interpolated data and one for backfilled data. Within each of these sets, three datasets for each of the lagging patterns were created. In total, thirty datasets were created.

Algorithms

The models selected for this study were linear regression (LR) and artificial neural network (ANN). When implementing the models, all datasets were split into a train set and a test set. The train set was used to train the model, and the test set was used to validate the model's performance or to see how well it could generalize to new data. In this study, the 2005-2017 HPI and its corresponding input features data were used as the training set. The 2018 HPI and its corresponding input features data were used as the test set. For each MSA, thirty ANN and thirty LR models were created.

A data normalization process was conducted first. This function was used to change the values in different columns to a common scale, to avoid distorting differences among multiple columns, as shown in Equation 1:

$$x_{new} = \frac{x - \mu}{\sigma} \tag{1}$$

Where μ is the mean value, and σ is a standard deviation. This process is called standardization or Z-score normalization. The function produces a normally distributed dataset.

The LinearRegression package in sklearn was utilized to build the LR model. The least-squares algorithm was adopted by the package and can be explained in the following equations (Angelini, 2019, Groß, 2012):

$$f(x) = X\beta + \epsilon \tag{2}$$

$$y = \begin{pmatrix} y_1 \\ \vdots \\ y_n \end{pmatrix} \tag{3}$$

$$X = \left(\begin{bmatrix} x_{1,1} & \cdots & x_{1,p} \\ \vdots & & \vdots \\ x_{n,1} & \cdots & x_{n,p} \end{bmatrix} \right) \tag{4}$$

$$\beta = \begin{pmatrix} \beta_1 \\ \vdots \\ \beta_n \end{pmatrix} \tag{5}$$

$$\in = \begin{pmatrix} \in_1 \\ \vdots \\ \in_n \end{pmatrix} \tag{6}$$

$$min\ L\big(y, f(x)\big) = \sum_{i=1}^{n} [y_n - f(x_i)]^2 \tag{7}$$

Where y is the observed target, x is the variable, β is the coefficient for the variable, ∈ is the error term, and L is the residual sum of squares between the observed targets and the predicted targets. The task of this algorithm is to find a set of coefficients and errors that can achieve the smallest residual sum of squares between observed and predicted outputs. The quality of the model was determined by Mean Absolute Error (MAE), Root Mean Square Error (RMSE), and accuracy. A small MAE value represents high consistency between the predictions by the model and the actual labels. A small RMSE proves that the spread of predicted errors is small. The MAE and RMSE are calculated by the two equations below:

$$MAE = \frac{1}{N}\sum_{i=1}^{N}|\hat{y}_i - y_i| \tag{8}$$

$$RMSE = \sqrt{\frac{\sum_{i=1}^{N}(y_i - \hat{y}_i)^2}{N}} \tag{9}$$

Where N is the number of data points, ŷ is the predicted value, and y is the actual value.

The ANN model used in this study had two hidden layers and 64 neurons in each layer. The neurons in the input layer were determined by the input properties and parameters. There were 832 parameters in hidden layer 1, 4160 parameters in hidden layer 2, and 65 parameters in the output layer. An RMSprop function was added onto the original back-propagation algorithm to avoid overfitting, which is represented by the following equations:

$$E[g^2]_t = \beta E[g^2]_{t-1} + (1-\beta)\left(\frac{\delta C}{\delta w}\right)^2 \tag{10}$$

$$w_t = w_{t-1} - \frac{\eta}{\sqrt{E[g^2]_t}}\frac{\delta C}{\delta w} \tag{11}$$

Where E[g] is the moving average of squared gradients, δC/δw is the gradient of the cost function, β is the moving average parameter, and η is the learning rate. The feed-forward, back-propagation process was conducted 400 times (epochs) to reach a global minimum. MAE and accuracy were applied to assess and summarize the quality of the ANN model.

RESULTS AND DISCUSSION

Linear Regression

Table 2 summarizes the statistics for the performance of LR models predicting 2018 HPI of the studied areas. Six models of each area have been built for two data imputation methods, backfilling and interpolating, and three lagging conditions, i.e., no-lag, a 6-month lag, and a 12-month lag. The MAE, accuracy, RMSE, R-squared, and adjusted R-squared of the train datasets of each metropolitan area were obtained and presented in Table 2. R-squared and adjusted R-squared are defined in the equations below as:

$$R^2 = 1 - \frac{\sum_{i=1}^{N}(y_i - \hat{y}_i)^2}{\sum_{i=1}^{N}(y_i - \mu)^2} \tag{12}$$

$$R_{adj}^{\;2} = 1 - \frac{(1-R^2)(N-1)}{N-k-1} \tag{13}$$

Where N is the number of data points, ŷ is the predicted value, y is the actual value, μ is the mean of y, and k is the number of variables in the model excluding the constant.

The MAE, RMSE and accuracy of the test datasets were also obtained and included in Table 2. The models for each MSA with highest accuracy and least MAE, using test datasets, are italicized in Table 2. The models with high accuracy also have small MAE and RMSE. Figure 1 compares the MAE of the test sets in all the LR models.

It can be seen in Table 2 that the accuracy for prediction values of all the train sets is very high (> 95.73%), the MAE is small (<6.98), and the R-squared and adjusted R-squared are close to 1. These results show that the prediction results of train sets have a high consistency with the true values. Thus, the success of the learning process is demonstrated.

Figure 1 and Table 2 show that the method of filling in missing data makes a difference in model accuracy. Comparing Figure 2 (A) and Figure 2 (B), the MAE varies when the strategy of data imputation changed for the same dataset, even though only seven out of twelve input variables required imputation. For example, MAEs of the SF models using testing datasets vary significantly; there is a difference of ~12 points between the MAE for the backfilled 12-month lag model and the interpolated 12-month lag model. As is similar to this study, real-world datasets frequently contain missing values for different reasons. Of course, there are other methods to compensate for missing values in a dataset, such as imputation using mean/median values, imputation using deep learning, hot-deck imputation, etc. The results in this study show that the data-filling technique used on a dataset that has a significant number of missing values can impact the quality of the data-driven model. It may be worthwhile to conduct future studies to investigate more thoroughly into the impact of data-filling techniques on creating a real estate price-trend model.

Figure 1 and Table 2 also show that choice of time lag influences the model's performance for each MSA. In both the interpolated and backfilled datasets, the MAEs of the models for each MSA varied by time lag. For example, the models of SF with backfilled data decreased significantly as time lag increased. A similar trend was seen in the backfilled data for Dallas. However, the exact variation of the MAEs vs. time lag was different for different markets. The MAEs of models for Chicago increased slightly with the increase in time lag in both backfilled and interpolated datasets.

Even though the best-performing models for different areas had different data imputation and time-lag conditions, generally, backfilled data with a 12-month lag performed very well, with a prediction accuracy
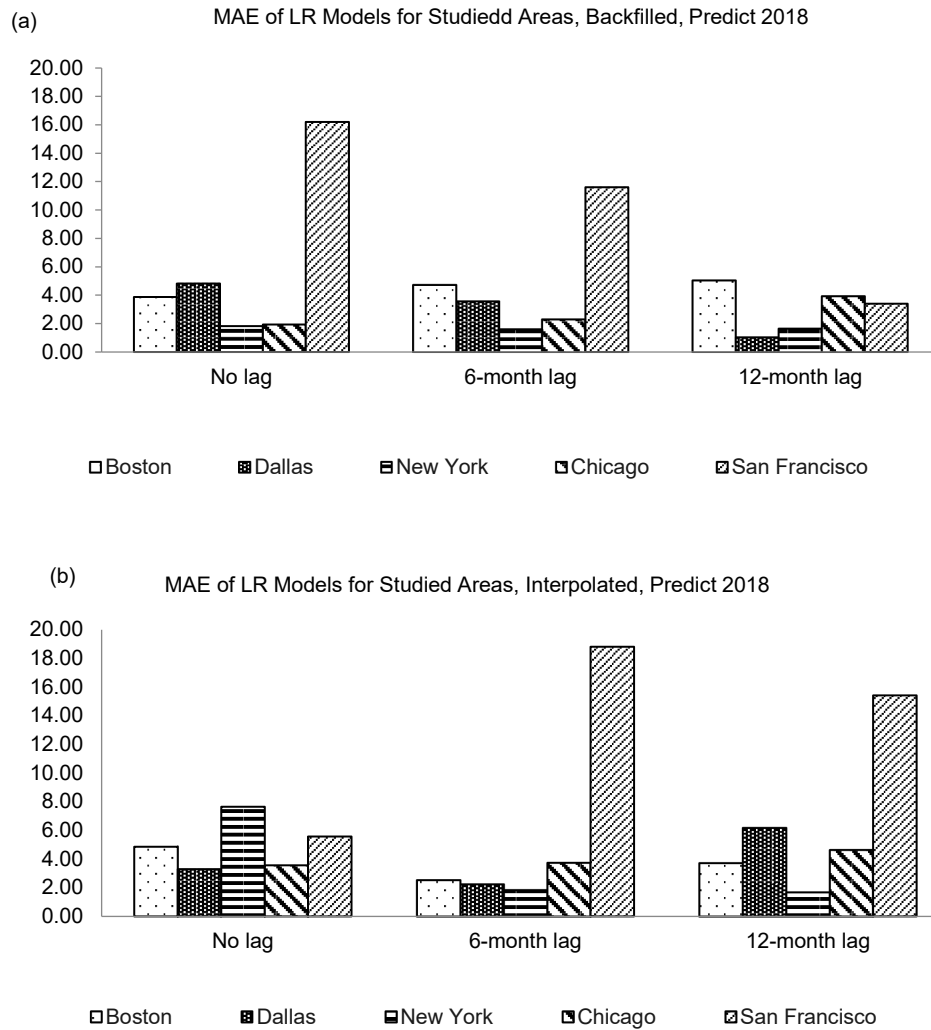
of >97.64% and MAEs of <5.04 for all five areas. Thus, the LR models showed reliable performance in predicting a housing price index one year ahead across different markets. An interesting extension for future studies would be finding the time lag that results in optimal performance of an algorithm on real-estate price prediction for specific area with selected data.

Table 2: Summary Statistics of Linear Regression Models Predicting 2018 HPI of Studied Areas

Panel A: No Lag			Boston	Dallas	New York	Chicago	San Francisco
Train set	Backfilled	MAE	2.1	2.1	2.15	1.81	4.72
		RMSE	2.6	2.63	2.73	2.27	6.03
		Accuracy	98.74%	98.32%	98.86%	98.62%	97.10%
		R Squared	97.19%	98.20%	97.48%	98.39%	97.64%
		Adjusted R Squared	96.95%	98.05%	97.27%	98.25%	97.44%
	Interpolated	MAE	1.85	1.45	1.51	1.73	4.55
		RMSE	2.29	1.8	1.97	2.21	5.93
		Accuracy	98.88%	98.86%	99.18%	98.67%	97.29%
		R Squared	97.81%	99.16%	98.58%	98.48%	97.72%
		Adjusted R Squared	97.62%	99.09%	98.46%	98.35%	97.53%
Test set	Backfilled	MAE	3.87	4.82	1.82	*1.93*	16.19
		RMSE	4.4	5.3	2.01	*2.08*	16.96
		Accuracy	98.19%	97.42%	99.08%	*98.65%*	93.88%
	Interpolated	MAE	4.85	3.31	7.65	3.57	5.57
		RMSE	5.38	3.57	8.96	3.74	6.31
		Accuracy	97.71%	98.23%	96.16%	97.50%	97.90%
Panel B: 6-month Lag			Boston	Dallas	New York	Chicago	San Francisco
Train set	Backfilled	MAE	2.11	1.79	1.96	2.74	6.62
		RMSE	2.58	2.25	2.64	3.43	8.38
		Accuracy	98.75%	98.61%	98.93%	97.91%	95.85%
		R Squared	97.27%	98.54%	97.46%	96.29%	95.54%
		Adjusted R Squared	97.04%	98.42%	97.24%	95.97%	95.16%
	Interpolated	MAE	1.83	1.29	1.65	2.8	6.27
		RMSE	2.2	1.6	2.22	3.61	7.38
		Accuracy	98.91%	99.00%	99.10%	97.88%	96.21%
		R Squared	98.03%	99.35%	98.20%	95.88%	96.55%
		Adjusted R Squared	97.86%	99.29%	98.05%	95.53%	96.26%
Test set	Backfilled	MAE	4.73	3.58	*1.63*	2.32	11.6
		RMSE	5.51	3.77	*1.88*	2.51	12.79
		Accuracy	97.78%	98.08%	*99.18%*	98.37%	95.63%
	Interpolated	MAE	*2.53*	2.25	1.84	3.74	18.81
		RMSE	*3.25*	2.34	2.2	3.91	19.5
		Accuracy	*98.82%*	98.79%	99.08%	97.38%	92.89%
Panel C: 12-month Lag			Boston	Dallas	New York	Chicago	San Francisco
Train set	Backfilled	MAE	2.1	1.99	1.92	2.69	6.98
		RMSE	2.6	2.46	2.27	3.27	8.44
		Accuracy	98.77%	98.46%	98.94%	97.99%	95.73%
		R Squared	97.29%	98.44%	97.95%	96.38%	95.51%
		Adjusted R Squared	97.06%	98.31%	97.78%	96.07%	95.13%
	Interpolated	MAE	1.51	1.3	1.28	2.67	5.9
		RMSE	1.93	1.75	1.62	3.28	7.02
		Accuracy	99.11%	98.98%	99.28%	97.99%	96.44%
		R Squared	98.51%	99.24%	98.96%	96.37%	96.90%
		Adjusted R Squared	98.38%	99.18%	98.87%	96.06%	96.64%
Test set	Backfilled	MAE	5.04	*1.06*	1.66	3.95	*3.4*
		RMSE	5.51	*1.18*	1.82	4.39	*5.62*
		Accuracy	97.64%	*99.43%*	99.16%	97.23%	*98.70%*
	Interpolated	MAE	3.73	6.18	1.7	4.63	15.43
		RMSE	4.41	6.99	2.38	5.43	19.65
		Accuracy	98.24%	96.69%	99.14%	96.76%	94.20%

This table summarizes the Mean Absolute Error (MAE), Root Mean Square Error (RMSE), accuracy, R squared, and adjusted R squared of the thirty linear regression models built. The MAE, RMSE and accuracy of the test sets are bolded to distinguish from those of the train sets. Panel A, B and C show three different time lag conditions studied: no lag, 6-month lag and 12-month lag, correspondingly. The second column shows the data imputation method used in building the model: backfilling and interpolating. To backfill, the endpoint value was filled in for all the points before it, up to the previous endpoint. To fill by interpolation, values in between the two known endpoints were linearly regressed. The models with the smallest MAE and highest accuracy for each of the five areas are italicized.

Figure 1: Mean Absolute Error (MAE) of Linear Regression Models with Different Time Lags and Data Imputing Conditions: (a) MAE of Models Using Backfilled Datasets, and (b) MAE of Models Using Interpolated Datasets

(a) MAE of LR Models for Studiedd Areas, Backfilled, Predict 2018

□ Boston   ⊞ Dallas   ⊟ New York   ◪ Chicago   ▨ San Francisco

(b) MAE of LR Models for Studied Areas, Interpolated, Predict 2018

□ Boston   ⊞ Dallas   ⊟ New York   ◪ Chicago   ▨ San Francisco

This figure compares the Mean Absolute Error (MAE) of the thirty linear regression models with different time lags and data imputing conditions using test datasets. Panel (a) compares the MAEs of models using backfilled datasets, and Panel (b) compares MAEs of models using interpolated datasets. Within each panel, five models with same time lag conditions for five areas are grouped for comparison. There were three different time-lag conditions: no lag, 6-month lag, and 12-month lag.

Table 3: Summary of T-test Results of The Backfilled, 12-Month Lag Linear Regression Models for Studied Areas

Panel A: Boston, Dallas, and New York

Variables	Boston			Dallas			New York		
	Coeff	T	P	Coeff	T	P	Coeff	T	P
Constant	172.02	757.066	0.000	137.312	671.632	0.000	182.898	984.598	0.000
Mortgage Rate (30 years)	-1.616*	-1.818	0.071	-1.923***	-2.925	0.004	2.079***	3.009	0.003
Personal Income	-4.188	-0.730	0.467	1.374	0.663	0.508	10.812***	4.182	0.000
Resident Population	-8.262***	-2.775	0.006	15.065***	7.846	0.000	0.402	0.306	0.760
Unemployment Rate	3.2847***	3.658	0.000	2.900***	3.886	0.000	5.158**	3.459	0.001
GDP	28.271***	4.061	0.000	-0.299	-1.068	0.287	-5.008	-1.630	0.105
Crime Rate	4.191**	2.178	0.031	8.342***	6.338	0.000	-0.511	-0.924	0.357
Median Debt	-0.924*	-1.955	0.053	0.779*	1.826	0.070	-8.883***	-8.828	0.000
New Structures	-0.380**	-1.171	0.244	0.780*	1.941	0.054	0.679***	3.026	0.003
Economic Conditions Index	1.552***	4.731	0.000	-1.769***	-4.165	0.000	-0.771	-0.173	0.863
CPI less shelter	-2.338*	-1.682	0.095	-3.025**	-2.482	0.014	-4.496***	-3.873	0.000
Percent With Mortgage Debt	-5.425***	-5.783	0.000	-12.176***	-8.107	0.000	-4.414***	-4.572	0.000
Percent With Severely Delinquent	-10.094***	-7.424	0.000	-3.361***	-2.796	0.006	-8.891***	-4.428	0.000

Panel B: Chicago and San Francisco

Variables	Chicago			San Francisco		
	Coeff	T	P	Coeff	T	P
Constant	134.138	484.181	0.000	185.823	267.425	0.000
Mortgage Rate (30 years)	2.420*	1.965	0.051	-0.583	-0.221	0.826
Personal Income	19.952***	4.069	0.000	52.731***	4.465	0.000
Resident Population	-1.517**	-2.249	0.026	-24.531***	-3.096	0.002
Unemployment Rate	-0.958	0.905	0.367	3.893	0.856	0.393
GDP	-19.563**	-3.250	0.001	-5.884	-0.39	0.697
Crime Rate	-0.985	-1.517	0.131	3.778**	2.355	0.020
Median Debt	-14.589***	-7.946	0.000	-18.454***	-7.739	0.000
New Structures	2.866**	3.407	0.001	0.240	0.223	0.824
Economic Conditions Index	-2.062**	-3.475	0.001	-8.851***	-6.573	0.000
CPI less shelter	-8.248***	-6.025	0.000	-13.123**	-2.298	0.023
Percent With Mortgage Debt	6.251***	3.008	0.003	-12.911***	-2.936	0.004
Percent With Severely Delinquent	-4.683***	-2.980	0.003	-12.058**	-2.170	0.032

*This table summarizes some of the regression results of the five backfilled, 12-month-lag models for five areas. As observed previously, backfilled, 12-month lag condition resulted in low MAE and high accuracy in models for all five areas. *, **, *** indicate significance at the 10, 5, and 1 percent levels, respectively. A P-value larger than the common alpha level of 0.05 was considered in this study to indicate that the variable was not statistically significant.*

Overall, LR performs well in predicting HPI. All LR prediction models for 2018 had accuracy above 92.89%. Among all the results, backfilled 12-month-lag condition generated good model performance across different markets, with the accuracy of the models ranging from 97.64% to 99.42%.

T-tests were conducted to further understand the significance of each variable. Table 3 summarizes the T-test results of the backfilled, 12-month-lag LR models for five areas, since as shown in Table 1 and Figure 1, backfilled, 12-month-lag condition resulted in low MAE and high accuracy in models for all five areas. *, **, *** indicates significance at the 10, 5, and 1 percent levels, respectively. In this study, a P-value larger than the common alpha level of 0.05 was considered to indicate that the variable was not statistically significant. It was observed that, for different areas, different variables were not statistically significant. For example, for Dallas, personal income, GDP, median debt and new structures were not statistically significant. However, for Chicago, mortgage rate, unemployment rate, and crime rate were not statistically significant. It is well recognized that the real estate market is local. Each MSA has unique demographic and economic characteristics and different real estate market characteristics. Thus, variation in the influence of different input features in different areas is expected. Table 3 suggests that the percentage of severely delinquent debt and the percentage with mortgage debt were significant for all five models and were negatively associated with HPI. Residential population, the economic conditions index, and the CPI less shelter, were significant in four out of five models. Personal income was significant in three models, and when it was significant, it was positively associated with HPI. Unemployment rate, crime rate, and median debt were also significant in three models. GDP, mortgage rate, and new structures were not significant in three out of five models. It is worth noting that multicollinearity may exist in the models and may have contributed to the results in Table 3. Multicollinearity occurs when the independent variables in the model have correlations with each other (Vatcheva et. al., 2016), which is likely the case for demographic and macroeconomic features. For example, GDP, personal income and CPI may have correlation with each other. Multicollinearity does not have a negative impact on the reliability of the model; it affects the coefficients, but it does not influence the predictions and the precision of the predictions. In addition, when there is multicollinearity, the coefficients of the model may vary with a small change of data (Vatcheva et. al., 2016).

ANN

Table 4 summarizes the statistics for the performance of the ANN models that predict 2018 HPI of studied areas. The MAE, accuracy, RMSE and accuracy of the train datasets and test datasets of each metropolitan area are included in Table 4. The models with high accuracy also showed small MAE and RMSE. The model for each MSA with best accuracy and smallest MAE using the test datasets is italicized in Table 4. Figure 2 compares the MAE of the test sets in all the ANN models.

As shown in Table 4, like the LR method, six models of each MSA have been built for two data imputation methods and three time-lag conditions. The accuracy for prediction values of all train sets was very high (> 96.51%), and the MAE was small (<4.98). These results prove that the prediction results of train sets had high consistency with the true values. Thus, the success of the learning process was demonstrated.

Figure 2 and Table 4 again show that the method of filling in missing data makes a difference in the model's accuracy. For example, MAEs of the NY models using testing datasets varied significantly; there was a difference of ~9 points between the MAE for the backfilled 6-month-lag model and the interpolated 6-month lag model. Thus, the ANN study still suggested that an extension of this work could be a detailed study to determine the method used to compensate the missing data, to obtain reliable real-estate prediction models.

This study showed that LR performed better in long-term trend prediction in all five markets. The ANN technique was more suitable for short-term prediction. A few previous studies suggested that ANN

performed better than regression methods in predicting property price index (Abidoye, 2019, Lim, 2016). The difference in the characteristics of the studied areas, selection of input and output features, quality of the dataset used, and specifics in data preparation -- such as imputing missing values and time-lag choices -- in different studies may have contributed to the variation in the accuracy of obtained models by the ANN or regression methods in this study and in previous studies. This study suggests that an appropriate selection of features, data, data preparation conditions, and time lag could result in effective models by both the LR and ANN methods.

Table 4: Summary Statistics of ANN Models Predicting 2018 Home Price Index of Studied Areas

Panel A: No lag							
			Boston	**Dallas**	**New York**	**Chicago**	**San Francisco**
Train set	Backfilled	MAE	2.8	2.07	3.21	2.02	3.42
		RMSE	3.58	2.7	4.5	2.61	4.47
		Accuracy	98.35%	98.42%	98.24%	98.48%	98.17%
	Interpolate	MAE	2.17	1.63	2.4	1.89	2.51
		RMSE	2.77	2.13	3.42	2.48	3.26
		Accuracy	98.74%	98.71%	98.72%	98.63%	98.68%
Test set	Backfilled	MAE	*4.91*	5.62	4.09	5.53	*4.14*
		RMSE	*5.84*	6.44	5.09	5.87	*5.04*
		Accuracy	*97.69%*	96.98%	97.94%	96.12%	*98.43%*
	Interpolated	MAE	8.74	*4.83*	*2.48*	*2.92*	5.3
		RMSE	9.13	*5.49*	*3.22*	*3.36*	6.69
		Accuracy	95.91%	*97.41%*	*98.75%*	*97.96%*	98.00%
Panel B: 6-month Lag							
			Boston	Dallas	New York	Chicago	San Francisco
Train set	Backfilled	MAE	3.11	3.12	3.01	1.95	3.31
		RMSE	4.07	3.84	4.33	2.6	4.39
		Accuracy	98.17%	97.69%	98.35%	98.57%	98.13%
	Interpolated	MAE	2.39	1.88	2.4	1.66	2.34
		RMSE	3.11	2.46	3.52	2.26	3.05
		Accuracy	98.61%	98.58%	98.71%	98.81%	98.70%
Test set	Backfilled	MAE	9.84	11.84	3.33	3.24	9.42
		RMSE	10.3	14.69	3.99	3.58	10.14
		Accuracy	95.40%	93.64%	98.32%	97.72%	96.42%
	Interpolated	MAE	9.96	15.78	11.45	8	5.27
		RMSE	10.92	16.42	12.73	8.34	6.5
		Accuracy	95.35%	91.54%	94.22%	94.39%	98.00%
Panel C: 12-month Lag							
			Boston	Dallas	New York	Chicago	San Francisco
Train set	Backfilled	MAE	3.36	2.07	3.34	2.3	3.53
		RMSE	4.45	2.7	4.48	2.87	4.45
		Accuracy	98.05%	98.42%	98.17%	98.31%	98.06%
	Interpolated	MAE	2.39	1.95	2.41	1.91	3.01
		RMSE	3.11	2.51	3.15	2.53	3.84
		Accuracy	98.61%	98.49%	98.69%	98.57%	98.37%
Test set	Backfilled	MAE	12.09	14.78	5.56	3.7	8.5
		RMSE	14.3	15.24	6.45	4.45	10.55
		Accuracy	94.37%	92.07%	97.20%	97.41%	96.78%
	Interpolated	MAE	11.59	5.62	12.49	4.63	8.13
		RMSE	14.38	6.44	13.91	5.16	9.67
		Accuracy	94.61%	96.98%	93.73%	96.76%	96.91%

This table summarizes the Mean Absolute Error (MAE), Root Mean Square Error (RMSE), and accuracy, of the thirty artificial neural network (ANN) models built. The MAE, RMSE and accuracy of the test sets are bolded to distinguish from those of the train sets. Panel A, B and C show three different time lag conditions studied: no lag, 6-month lag and 12-month lag, correspondingly. The second column shows the data imputation method used in building the model: backfilling and interpolating. To backfill, the endpoint value was filled in for all the points before it, up to the previous endpoint. To fill by interpolation, values in between the two known endpoints were linearly regressed. The models with the smallest MAE and highest accuracy for each of the five areas are italicized.

Figure 2: MAE of ANN Models with Different Lags and Imputing Conditions (a) MAE of Models Using Backfilled Datasets, and (b) MAE of Models Using Interpolated Datasets
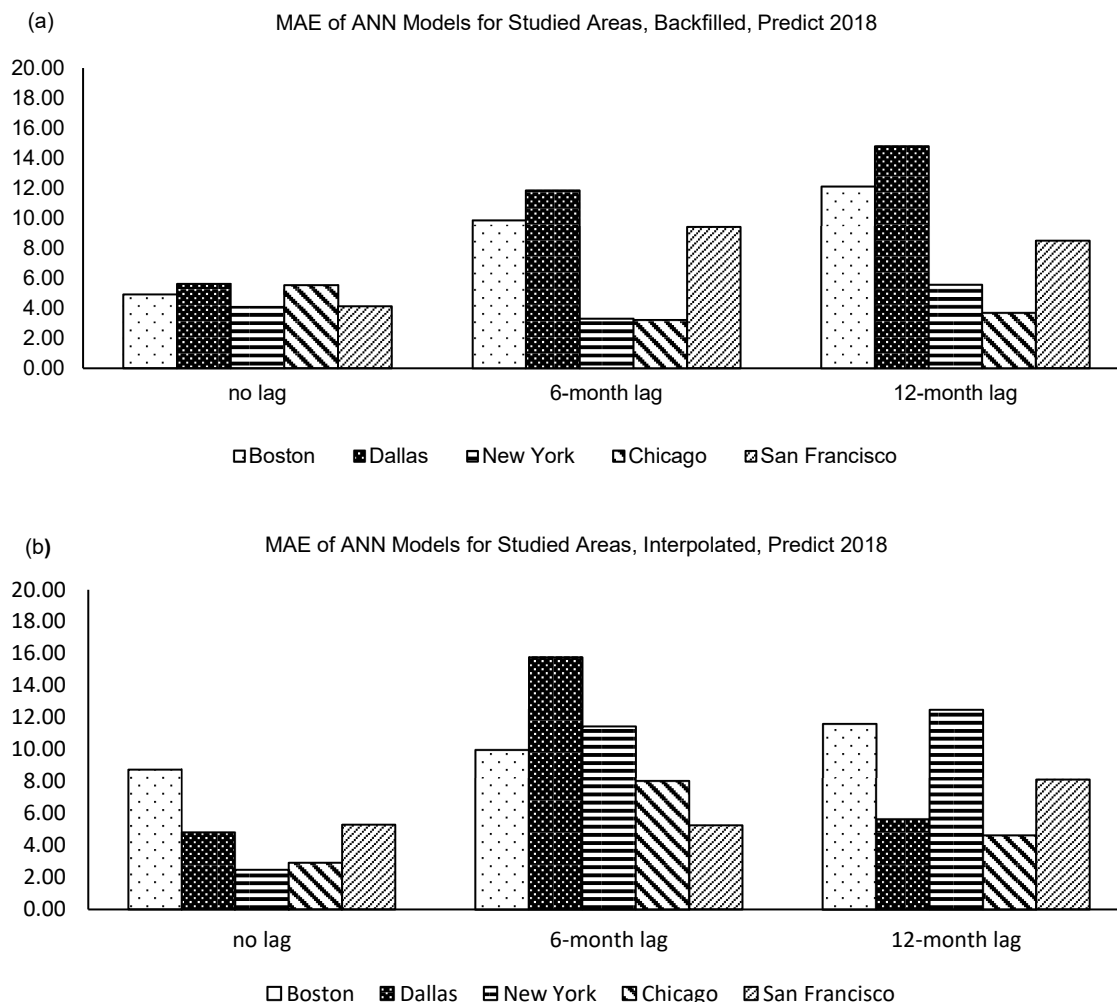
This figure compared the Mean Absolute Error (MAE) of the thirty artificial neural network (ANN) models with different time lags and data imputing conditions using test datasets. Panel (a) compares the MAEs of models using backfilled datasets, and Panel (b) compares MAEs of models using interpolated datasets. Within each panel, five models with same time lag conditions for five areas are grouped for comparison. There were three different time-lag conditions: no lag, 6-month lag and 12-month lag.

CONCLUDING COMMENTS

This work employed the LR and ANN techniques to achieve an accurate and reliable property price index prediction that could aid important, strategic planning and decision-making. Buying a house is often one of the most important personal financial decisions. Predicting real estate price trends will help buyers make cost-efficient decisions at an optimum time or location for them. Portfolio managers and investors will also have much to gain from accurate predictions of long-term real estate trends. Real estate is a key part of any diversified investment portfolio. By lessening managers' research workload and providing key insights about capital appreciation trends, a model that can predict property trends will allow portfolios to perform optimally. Such a model is useful to local and national governments as well. In the US, the federal government is heavily involved in real estate through mortgage institutions like Fannie Mae and Freddie Mac. Local governments often rely on property taxes to gather resources. Also, real estate constitutes a large portion of the American economy. Accounting for movements in the housing market gives

governments a better idea of projected property tax income, helps financial planning with mortgage programs, and may guide fiscal policy (Vargason, 2019).

In this work, data comprising twelve demographic and macroeconomic features and HPI that covered the period between March 2005 and December 2018 in five different metropolitan statistical areas were collected from institutes such as Federal Reserve Bank and the FBI. The five geographic areas represent four different home-price trends in the time period studied. Two methods to compensate the missing values in the data and three different time-lag situations have been analyzed, resulting in sixty total models established for the ANN and LR methods.

Evaluation of the forecasts generated by the models shows that ANN was suitable for short-term predictions and that LR performed better than ANN for long-term predictions. This study also shows that the technique to compensate missing values in the dataset and the implementation of time lag could have significant influence on the model's performance and requires further investigation.

Finally, even though real estate markets are local, this study shows that certain combinations of conditions resulted in high-performance models in all five areas, such as the five LR models with backfilled, 12-month-lag conditions, and the five ANN models using interpolated no-lag conditions. Future studies on multiple populated areas will be needed to generalize these conditions as starting points to creating a data-driven model, using different algorithms, for real estate price index prediction.

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BIOGRAPHY

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IBFR

THE INFLUENCE OF MANAGEMENT COMPENSATION ON DIVERSIFICATION STRATEGY

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ABSTRACT

The main purpose of this study is to examine the effects of managerial compensation on corporate diversification strategy. Managerial compensation is not only related to personal income but also closely linked to the firm's equity and long-term development strategies. In the pursuit of self-interest by the principal and the agent, both parties seek to maximize their benefits. Previous studies have indicated that related diversification is better for resource sharing and synergy, leading to a category economy. This study uses valid sample observations to analyze narrative statistics, and then uses ordinary least square linear regression analysis. This leads to the following conclusions: First, the compensation system for manager rights and interests is positively correlated with the overall degree of diversification. Second, the system of cash compensation for managers is relatively irrelevant to the overall degree of diversification. Third, the size of the company is positively correlated with the degree of overall diversification.

INTRODUCTION

The main purpose of this study is to examine the impact of managerial compensation characteristics (in-kind and cash) on corporate diversification. Managerial compensation is not only related to personal income, but also closely related to equity and strategies for the long-term development of the firm. The agency theory proposed by Jensen and Meckling (1976) shows that when decision-making and risk-taking are separated, agents tend to pursue self- interest rather than maximize firm value. When the principal and the agent pursue self-interest, both parties seek to maximize their utility. So, how can the principal design a compensation system and balance the goals of maximizing the interests of both parties through effective incentive and control mechanisms? This has become a system design to which companies attach great importance. In 2010, Microsoft Corporation's compensation system was primarily focused on providing equitable compensations and designing total compensations that are commensurate with performance. A competitive compensation system is about considering the best interests of shareholders to motivate managers to execute their business. For example, Apple Inc.'s compensation system used restricted stock units as a payment method for long-term incentives and Apple Inc.'s compensation system used restricted stock units, cash bonuses, and three compensation instruments for base compensation. As business models and environments change, companies often shift their compensation to equity-based compensation. Frederic W. Cook and Co, Inc. conducted a survey of Standard and Poor's 250 long-term compensation instruments and found that the Standard and Poor's 250 most common long-term compensation instruments are stock options (stock options), stock appreciation rights (stock appreciation rights, SAR), restricted stock, performance shares (performance shares), and performance units (performance units).

With internationalization, globalization and rapid technological innovation in Taiwan, the business environment of enterprises has changed drastically. In order to create more benefits, a diversification strategy has been developed. Companies use various methods to expand their assets and production capacity and integrate resources, capital and technology. Therefore, more and more companies are choosing to implement diversification strategies. Anderson, Bates, Bizjak, and Lemmon (1998) found that CEOs of diversified firms have, on average, lower stock ownership, higher income, and a lower link between compensations and performance. The different characteristics of compensations lead managers to develop a business strategy that is related to the long-term development direction of the company. Hence, this study will investigate how the different compensation characteristics affect the diversified business strategy of firms. The main purpose of this research is to explore how companies should formulate a compensation system for managers and use compensations as incentives to align the interests of managers and investors and devote themselves to pursuing business strategies to maximize the company's benefits.

This research focuses on whether different incentives lead managers to pursue different strategies to diversify the firm. Research on corporate diversification strategies shows that from a resource-based view of the firm (resource-based view of the firm), the synergy that firms achieve by sharing internal resources and transferring capabilities among themselves improves the overall profitability of the Group. Shared resources within the group include: Tangible, intangible, and financial resources (Chatterjee and Wernerfelt, 1991). Lang and Stulz (1994) found that the value of diversified companies is lower than that of single-division companies. Diversification could reduce the firms' value, and the nature of diversification is more moderate (Berger and Ofek, 1995), which shows that diversification of firms could reduces shareholder value. However, Palia (1999) highlighted that the phenomenon of diversification is absent when the design of the corporate manager's compensation system is highly correlated with performance or the size of the board of directors is small. Carpenter and Sanders (2004) used Standard and Poor's 500 as a sample of 224 U.S. multinationals that meet Stopford's (1992) definition of multinationals and have complete data. They found that the compensation of high-level management teams and the subsequent development of multinational corporations. Their research also showed that the focus of high-level management team compensation has shifted from cash compensation system to the long-term incentive compensation system, and that long-term incentive compensation also positively influences the subsequent corporate performance of multinational corporations. As for the characteristics of compensation, stock compensation is long-term incentives. Based on agency theory (Jensen, 1986), which assumes that managers seek personal gains or more control, personal compensations, and personal prestige this study empirically shows that stock compensation has a positive effect on firms' diversification strategies, while cash compensation has a smaller effect on firms' diversification strategies. The reason may be that the synergy of corporate diversification strategies is the long-term accumulation effect and the cash compensation system cannot be used. Encourage managers to focus on formulating long-term corporate strategies.

Our findings o can serve as a benchmark for investors (principals) and regulators to determine whether the compensation system is consistent with the most appropriate configuration of the company's strategy, and it can also serve as a reference for companies when designing compensation systems. If you want to diversify, you should believe that long-term equity compensations are the main compensation system that motivates managers to conduct operational planning for corporate diversification strategies, achieve long-term operational synergies, and diversify operational risks. This study can also be used as a reference by the current compensation committee for corporate compensation system planning related to operational strategy, so the research contribution of this study is to enable corporate investors and compensation committees and other corporate governance institutions to formulate or review the rationality of the compensation system and the relevance to operational strategy. This study is organized as follows: Section 2 introduces the literature and reviews. Section 3 describes the testing models and variables. Section 4 empirically tests the predictions and reports the results. Section 5 presents the conclusions and suggestions for future research.

LITERATURE REVIEW

Theoretical Basis of Manager's Compensation Characteristics

Jensen and Meckling (1976) posited agency theory and defined the agency relationship as "a principal commissioned and empowered by an agent to represent the principal to perform certain acts within the scope of the principal's authority. The contractual relationship between them is called agency relationship." According to agency theory, the way to solve the agency problem between the agent (agent) and the principal (principal) is the compensation system. The principal determines the agent's incentives and contract structure based on agency costs and the most appropriate contract design, and encourages the agent to make decisions that maximize the principal's value. However, if ownership of the firm is separated from management rights, then the manager has no residual claim (residual claim) and does not have to bear the risk of bad decisions (Fama and Jensen, 1983). Thus, the manager no longer pursues the goal of maximizing the firm's profit. It is the pursuit of maximizing his own utility. In this structure, if the principal and the agent pursue different goals, there may be potential conflicts of interest that lead to agency problems. Therefore, the question of how to formulate the most appropriate compensation contract has always been an issue in modern academia and industry.

Compensations could motivate managers to make and implement decisions related to the best possible performance of the company. By increasing thier equity exposure (Jensen and Meckling, 1976) and increasing dividend payments (Easterbrook, 1984) to solve the agency problem, the manager's compensation should be appropriately related to output to induce the manager to exert the greatest effort (Holmstrom, 1979); moreover, managers (shareholders) should be able to measure the their level of effort against output. Lambert, Lance, and Larcker (1989) pointed out that companies' implementation of stock option policy encourages managers to engage in high-return and high-risk investments, as this can enhance corporate performance and relatively increase the value of managers' stock options. Larcker (1983) believes that the performance-based pay system can reduce managers' risk aversion behavior. Mehran (1995) also pointed out that the closer the relationship between managers' wealth and shareholders' wealth, the closer managers' risk appetite is to shareholders' risk appetite.

Manager compensation is often performance-based and designed to influence managerial decision-making behavior, stock options, and other long-term incentive tools so that managers are inclined to pursue the long-term interests of the firm (Shleifer and Vishny, 1997). Long-term incentive compensation is usually in the form of stock. Short-term incentive payments are in the form of cash. Incentive compensation is used to indirectly control managers' decision-making behavior and execution. Bergmann and Scarpello (2002) believe that long-term compensation can be used to create long-term incentives. Operational performance is the prerequisite for ensuring that managers' self-interested behavior does not jeopardize shareholders' interests. If the manager's compensation system is not properly designed, it is easy for managers to avoid failure of the business strategy under risk-averse conditions (Watts, 2003). If the strategy is successful but fails to verify future cash inflows, it is important to avoid the problem of cash compensation being paid up front and causing losses later. Therefore, corporate profits should not be immediately reflected in the manager's cash bonuses. Research findings on the correlation between executive compensation and corporate performance are easily influenced by the manager's business motivation and the corporate environment. Chen (2005) believes that family firms have special agency relationships because they can directly supervise senior managers. Such companies are less likely to adopt a performance-based compensation model. In general, managers prefer accounting-based performance evaluation standards because they can manipulate accounting-based performance through related-party transactions, reduction of R&D expenditures, asset replacement, etc., and then market large personal gains; and for shareholders who are not involved in the business (investors). Gormez-Mejia and Balkin (1992) believes that external market factors can better assist them in monitoring the decision-making behavior of high-level managers.

The interests of the (investors) are usually unified. The annual dividend plan, which relies solely on the financial base, is often criticized because it leads managers to focus on short-term financial returns and hinders long-term investment (Kaplan and Norton, 1992). Therefore, Fitzgerald et al. (1991) and Banker et al. (2000) advocated nonfinancial indicators that can increase the long-term impact of managers' commitment to decision-making and help companies increase competitiveness and create value investing. Bushman et al. (1996) suggested that managerial performance evaluation increases with product development, product life, and growth opportunities. Abowd (1990) examined the relationship between cash compensation and future firm performance and predicts that future firm performance will be better if managers respond more positively to the stronger link between pay. Crystal (1993) also examined the relationship between stock performance and sensitivity to future performance, and found that sensitivity to future stock performance was not correlated with the salary performance of the previous manager. Banker et al. (2000) showed that after the introduction of nonfinancial performance measures in the compensation program, the future financial and nonfinancial performance of the company is significantly improved. Compared to the financial performance base, the measurement of the nonfinancial performance base is more suitable to increase the information content of the management decisions of the relevant managers of the company (incremental information content). Patent rights (Sougiannis, 1994) and product returns (Nagar and Rajan, 2001) have all confirmed that nonfinancial performance measurement is helpful for the future profitability of companies. In summary, research shows that the managerial system is usually linked to nonfinancial fundamental measurement indicators. Shareholders expect managers' pursuit of large self-interests through long-term incentive compensation contracts to be consistent with the long-term performance of the firm and to improve future firm performance.

Enterprise Diversification Strategy

Rumelt (1974) found that the proportion of affiliated firms and unaffiliated diversified firms among the 500 largest U.S. firms increased substantially between 1949 and 1969, while the proportion of individual firms increased substantially. This tremendous decline has attracted considerable attention in strategic management scholarship. Rumelt (1974) defined diversification as entering new industries, adding new products and entering new markets, and proposed the types of diversification as vertical integration, related diversification and unrelated diversification, and his definition is the so-called related The diversification department business fields are divided into different functional areas, and the different business units that constitute diversification have a common product market combination; Non-related diversification means that there is no common product market combination between the various business entities that constitute diversification. Aaker (1984) redefines the terms "relevant diversification" and "unrelated diversification." Relevant diversification is defined as diversification that has some commonality among several business units that can generate synergies or reach through asset exchange or technology transfer. Economies of scale; non-relevant diversification means that there is no commonality between the different business units of diversification, whether it is the market, production technology, distribution channels, or special capabilities in research and development, there is no commonality, and no resources can be reallocated. Technology transfer has a broad impact. This strategy is born for financial reasons and aims to achieve the maximum profit of the company.

Gort (1962) referred to the increase in the number of product markets as diversification. The definition of products is limited to the low flexibility of mutual substitution between products, or the inability to share production and distribution resources, and prefers unrelated diversification. Motivation for diversification among different theoretical viewpoints, the resource-based view of the firm is the most prevalent, focusing on the importance of diversification. Hofer and Schendel (1978) believed that by sharing resources within the group, firms can achieve synergies and thereby increase overall group profits. Markides and Williamson (1994) also suggested transferring and sharing core competencies within the group, which creates new strategic assets more economically and improves the overall performance of the group. When the resources used in diversification production are firm- specific and unlimited (Lippman and Rumelt, 1982), a unique

competitive advantage of the firm is created, which can explain the better performance of the associated diversification. Several studies examined the rationale for diversification in terms of improving the efficiency of production factors, reducing overall operating risks and agency costs.

Leff (1978) started from the perspective of market imperfection and believed that in the case of market failure, group companies can efficiently increase production input factors while avoiding market risks and uncertainties; in this case, the group's diversified operations are distinguished by simultaneous activities. Professional managers' pursuit of diversification is not the same as that of investors. Their main objective is to reduce employment risk. Amihud and Lev (1981) showed that the degree of diversification of companies managed by professional managers is significantly higher than that of nonprofessional managers. The firm is operational and professional managers are more likely to enter new businesses through mergers and acquisitions, suggesting that professional managers are willing to take more operational risks in return for potential growth and reputation. Berger and Ofek (1995) found that corporate diversification can lead to greater market power through predatory pricing and cross-subsidization among subsidiaries; it can also make capital raising more flexible through financing and lending among subsidiaries (Meyer, Milgrom, and Roberts, 1992). Markides (1992) believed that the excess capacity of the firm's exclusive assets is not consumed when used. Through diversified resource sharing and sharing in other areas, there should be a continuous increase in profits. Therefore, he believes that the profitability of the group and diversification. The degree is proportional. However, some scholars believe that diversification should have an optimal point that is not absolutely proportional to infinite expansion. Markides and Willamson (1994) highlighted that once a company enters a highly diversified business, the sharing of resources and capabilities is limited and the benefits no longer exist. Instead profitability declines. Close cooperation among the group's subsidiaries can provide benefits to the group, but the degree of diversification is too high. When the costs of cooperation and coordination among the group' subsidiaries far exceed profits, the internal capital market becomes uneconomic (Grant, Jammine, and Thomas, 1988).

Cao, Jin, and Lu (2011) compiled previous research literature and explained that diversification can be divided into product diversification and international diversification. The benefits that product diversification brings to the firm includes: increasing the utilization rate of the remaining resources (Reed and Luffman, 1986) and diversifying the firm's investment risks (Chatterjee and Lubatkin, 1990). The benefits of international diversification of firms include: diversification of investment and management risks and use of local national resources to develop their own competitive advantages (Kogut, 1986; Deeds and Hill, 1999). Hoskisson and Hitt (1990) and Markides and Williamson (1994, 1996) believed that a firm's diversification strategy is to reflect or use the firm's special resources to create value and generate profits. The special resources include the technical resources of the company (Miller, 2004).

<u>The Influence of Top Management's Compensation on Firm Diversification</u>

The literature on agency theory shows that managers tend to pursue private interests rather than the motive of maximizing firm value and make diversified investments. Operational uncertainty and complexity of managers' work increase, leading to serious information asymmetry between shareholders and managers. Managers actively pursue diversified investment strategies because of their own increase in power or higher compensations (Denis et al., 1997). Managers may also diversify to reduce personal risk or increase their value in the workplace. Denis et al. (1997) showed that manager's equity ownership can affect the performance of diversified investments because higher manager's equity ownership can reduce agency costs and manager's equity ownership. There is a significant positive relationship with diversification investment performance. In family firms, managers are often held by family members. In terms of management resources, the development of business growth is slightly limited in the long-term. There is a shortage of internal management talent in the company. Family businesses often use family members as professional managers instead of appointing external professional management talents. Ahlstrom et al. (2004) suggested

that the reason for this is to maintain the family's relationship with the group company. Therefore, the large investment in family resources may limit the growth of family firm diversification strategies.

The level of managerial compensation has a significant impact on the firm's uniqueness risk, especially the higher the long-term incentive compensation, the higher the firm's uniqueness risk. It shows that managerial compensation system induces managers to take the unique risks of the firm, and it can significantly increase shareholders' wealth and firm performance. Denis, Denis, and Sarin (1997) showed that the manager's participation rate is inversely related to diversification motivation, i.e., the lower the manager's participation, the greater the loss of diversification. Jiraporn et al. (2006) sampled American corporate managers. The results of the study show that American corporate managers may pursue self-interested motives rather than the motive of maximizing corporate value, and then make diversified investments (managers tend to be self-interested). Investment in product diversification is more likely than investment in international diversification. However, if shareholders have more rights or a firm has a more concentrated shareholder structure, managers' self-interested behavior can be monitored and the loss of diversification reduced. The incentive of stock options puts managers and shareholders in the same interest position (Oviatt, 1988), and as stock ownership increases, managers' wealth lacks the function of diversification and risk spreading and becomes concentrated, so managers will demand higher compensations (Jensen and Meckling, 1976). Pavilk and Riahi-Belkaoui (1993) indicated that managers' compensations are usually determined by the firm's operational performance. The content of compensations affects the strategies formulated by the company. In order to effectively implement the diversification strategy, the different compensation strategies usually need to work together (Gomez-Mejia, 1992), which is the executive power of managers. This argument was also confirmed in Hill and Snell's (1988) study of external control, corporate strategy, and corporate performance in R&D-intensive industries. They showed that R&D-intensive industries are high-risk, and high-compensation industries, and that their managers are risk averse. However, the investment and operating strategy that is beneficial to shareholders is a limited diversification strategy, suggesting that managers are building a personal business empire or reducing personal risk. The diversification strategy will increase their own utility rather than maximize corporate profits. The entrenchment hypothesis posited by Jensen and Ruback (1983) assumes that if high-level managers have sufficient control and voting power, they can consolidate their positions and disregard other shareholders or outside controlling forces, leading to an exacerbation of agency problems.

To increase their compensations and enhance their own importance and power, managers often pursue self-interest through diversified business decisions, mergers and acquisitions, higher the degree of diversification of the company's implementation, and the manager's dividend share of total pay (Napier and Smith, 1987). To achieve personal benefits and reduce the particular risks of the company, managers will pursue diversification strategies (Aggarwal and Samwick, 2003), while shareholders use appropriate corporate governance mechanisms, such as the board of directors and the establishment of a managerial compensation system, to limit excessive managerial diversification. Gaver (1993, 1995) confirmed that the compensations for managers of companies with high growth opportunities are higher than those of companies with low growth opportunities, and the proportion of long-term incentive compensations for managers with high growth opportunities is higher, so the growth opportunities are higher. To pursue growth opportunities, companies choose to enter another new industry. Stimpert and Duhaime (1997) found that the higher the profitability of the industry, the lower the degree of diversification. Firms in low-profit industries tend to adopt a diversification strategy. Firms tend to shift the focus of the managerial compensation system from cash payments to long-term incentive payments in response to higher-level and complex firm-related conditions and environments (Henderson and Fredrickson, 1996; Finkelstein and Boyd, 1998; Sanders and Carpenter, 1998). Carpenter and Sanders (2004) examined how the distribution of cash and long-term incentives affects information processing and insight ability capabilities, as well as the increasing importance of compensation structures. The results also show that long-term incentive compensations are cross-national. Future firm performance is relevant.

Sanders and Carpenter (1998) pointed out that companies will pay CEOs higher salaries and increase the share of long-term incentive awards for CEOs. By adjusting the compensation structure, CEOs are encouraged to pursue international diversification strategies. The compensation system affects managers decision-making behavior in terms of environmental perceptions (Gomez-Mejia, 1994), risk-taking (Jensen and Murphy, 1990), willingness to engage in interdepartmental collaboration (Kim and Mauborgne, 1991), and teamwork among upper management (top management team) and teamwork (Hambrick, 1995), so that a compensation system will encourage managers to take the risks necessary to execute international diversified business strategies. Larker (1983) hypothesized that long-term incentives and compensation schedules increase capital investment, and capital investment tends to reflect managers' operational decisions that are long-term and beneficial to multinational companies (Prahalad, 1990; Weick and Van Orden, 1990). Sanders (2001) showed that cash and long-term incentives and compensation systems have a large impact on managers' subsequent operational behavior and decision-making; Carpenter and Sanders (2002) found that compensation predictors and CEO compensations are for high-level management teams. Carpenter and Sanders (2004) explored the correlation between the compensation structure and international diversification, and studied the impact of senior management team's compensation structure on the performance of international diversification. The results showed that the total compensation level of senior management team is positively correlated with the subsequent performance of multinationals; that is, giving managers higher compensations and increasing the proportion of their awards in the medium and long-term remuneration have better performance for the firm's international diversification.

The above study examines the relationship between the compensation system and diversification, but there is limited literature on the direction of the effect of the cash and stock compensation system on firm diversification. Jensen and Meckling (1976) stated that increasing managers' share of stock could solve the agency problem and induce managers to do their best and bear the unique risks of corporate activities. Companies usually choose to enter new businesses and pursue diversification strategies. Extend the life of the business and diversify operational risks. The CEO's personal investment in the enterprise is relatively high, and he will be more inclined to implement the enterprise diversification strategy (May, 1995). Cao, Jin and Lu (2011) investigated the relationship between ownership structure and diversification, and the empirical results are consistent with Jensen and Meckling (1976) argument that higher managerial involvement can reduce agency costs. They found that managerial participation is associated with diversification. The performance of diversified investment shows a significant positive relationship. Sanders and Carpenter (1998) showed that a higher CEO salary and a higher proportion of long-term incentives in his compensation system effectively motivate the CEO who pursues an international diversification strategy. Carpenter and Sanders (2004) also found that in the compensation structure of CEOs and senior management teams, long-term incentives have a high proportion of compensation, which can motivate the management team more to conduct long-term operational planning over several periods and help to improve the follow-up of multinational companies. The problem leads the manager and the principal to pursue the goal of profit in the same direction, and the manager is willing to pay more complex information processing capabilities for the expected returns on equity in the future to realize the diversified business strategy of the company. Therefore, the first hypothesis is as follows:

Hypothesis 1: The compensation system for managers' rights and interests will positively influence the diversification strategy.

Jensen and Meckling (1976) pointed to the agency problem and argued that low managerial stock ownership exacerbates the equity agency problem. Bebchuk and Fried (2003) believed that the salary of high-level managers is part of the agency problem and managers tend to avoid risk. Chen, Wang, and Lin (2011) showed that cash compensations are not significantly associated with uniqueness risks. The results show that the higher the manager's cash compensation and base salary, it has no influence on inducing managers to take on uniqueness risks. On the contrary, it can actually reduce the uniqueness risk of the company. Therefore, cash compensations cannot motivate managers to work hard for the company's long-term

strategy, nor can it make managers take unique risks, such as business diversification strategies, so that managers do not follow the company's long-term business concept. Cash compensations make managers short-sighted and seek personal gains. They seek only current surplus, track financial performance indicators, or manipulate accounting gains and losses. Therefore, the second hypothesis is as follows:

Hypothesis 2: The managerial cash compensation system does not affect the company's diversification strategy.

DATA AND METHODOLOGY

In this study, the degree of diversification is used as the contingency number, the managerial compensation characteristics are used as the independent variable, and other related control variables are added as follows:

<u>Dependent Variable</u>

The entropy index mentioned above is more objective and can calculate the direction of diversification (whether the diversification carried out by the company is contiguous or unrelated) and the degree (the extent of relevant or non-contiguous diversification of the company). The diversification calculation indicates whether a company's product line spans several different industries. This research uses the classification of "Taiwan Institute of Economic Research" to define the industry category the company has entered; the sub-category confirms the product category the company has entered; and calculates the overall diversification degree of the company according to the following formula.

A company's total diversification index (PDT) is the sum of the company's relevant diversification (PDR) and non- relevant diversification (PDU). The PDR is used to calculate the degree of relevant diversification of a company in an industry. Since the company operates in n industries, the weighted average of the company's relevant diversification in all industries is calculated to obtain the company's product- relevant diversification (PDR); and the company's non- relevant diversification (PDU) is the weighted average of the company's total sales revenue, which is used to measure the extent to which the company's products have entered different industries. The corresponding formula is as follows:

$$PDR_S = \sum_{r=1}^{m} P_r^s \ln (1/P_r^s) \tag{1}$$

$$PDR = \sum_{s=1}^{n} PDR_s P^s \tag{2}$$

$$PDU = \sum_{s=1}^{n} P^s \ln (1/P^s) \tag{3}$$

$$PDT = PDR + PDU \tag{4}$$

s = Industry category, "Industry Classification" of Taiwan Economic Research Institute's Industrial Economics Database.

m = The number of products that the company has stepped into in the s industry.

r = "Sub-category" product sales revenue

$$P_r^s = \frac{\text{r product sales revenue}}{\text{r Total sales revenue of the s industry to which the product belongs}}$$

Independent Variables

Independent variables: Cash compensation system for managers (C_COMP), managerial rights and interest compensation system (S_COMP) The independent variable in this study is the characteristics of managerial compensations, based on the research of Henderson and Fredrickson (1996) and Duru and Reeb (2002), which divide compensations into cash compensations and equity compensations. The corresponding models and formulas are as follows:

1-The manager's cash compensation system (C_COMP) refers to the current year's manager's cash dividend deflation of total assets.

$$C\_COMP = \frac{\text{Manager cash dividend for the year}}{\text{Total assets}}$$

2-The manager's equity compensation system (S_ COMP) refers to the current year's manager's dividend allotment to flatten the total assets.

$$S\_COMP = \frac{\text{Manager bonus allotment for the year}}{\text{Total assets}}$$

Control Variables

This research refers to the diversification research of scholars in the field of corporate governance and strategy management, considers other factors that may affect the diversification strategy of the company, and lists them as control variables for control in the model. The control variables are described as follows:

(1) Family Business (Family)

Taiwan's early enterprises were mostly small and medium-sized enterprises. The family business is a common form of business organization in Taiwanese society. Barnes and Hershon (1976) assumed that the ownership of the enterprise with the ability to control the enterprise is controlled by a particular family. This business is referred to as a family business. Handler (1989) discusses the family business at four levels: multiple conditions, ownership and management rights, transfer of power between generations, and the degree of interdependence between subsystems and the depth of the family's involvement in the business. Domestic scholars define that a family holding company must meet the definition of a business group and satisfy one of the following conditions: (1) family members provide more than 50% of the seats on the main board of the company; (2) the family member or the investment company established by the family member controls more than 10% of the equity of the company and has a seat on the board of the controlling company. Sirmon and Hitt (2003) believed that the resources and capabilities of the family firm's unique value system will influence its strategic decisions in pursuing business growth. The development process of Taiwan's economy is closely related to the diversification course of large family businesses and their entry into emerging industries (Chung, 2006). If it is a family business, the variable is set to 1 and otherwise 0.

(2) Return on Total Assets Ratio (ROA)

It is generally accepted that financial statements may contain information that is not reflected in stock prices. However, accounting performance is separable, so it is often used to measure business performance indicators. ROA is used to measure the efficiency of the company's operations in order to use return on assets. It is defined as ratio of the net income before interest to average total assets. The business performance of a company affects the choice of diversification strategies and types. Therefore, in this study, ROA

is included as a proxy variable for financial performance in the control variable (Ramanujam and Varadarajan, 1989). The corresponding calculations are described below:

$$ROA = \frac{\text{Net profit before tax}}{\text{Average total assets}} \times 100\%$$

(3) Return of Investment (ROI)

RET can represent changes in the wealth of corporate shareholders. If managed effectively, corporate value will be reflected in stock prices (Coughlan and Schmidt, 1985). Therefore, in this study, RET is used as a proxy variable for market performance, and the corresponding formula calculations are described below:

$$RET = \frac{(P_t \times (1 + \alpha + \beta) + D)}{(P_{t-1} + \alpha \times C) - 1} \times 100\%$$

P_t: Closing price of period t (index)
α: Current ex-rights subscription rate
β: Current ex-rights free allotment ratio
C: Current ex-rights cash subscription price
D: Cash dividends paid in the current period

(4) Business Age (AGE)

It presents the age of the company. The longer they are established, the more competitiveness they build and also the better they can borrow and build supply chains and banking relationships. Therefore, young companies tend to be less able to enter new industries. When firms have the opportunity to enter new industries (Bernado and Chowdhry, 2002) and gain production and operational experience over time, they are more likely to engage in diversified activities. Therefore, the age of the firm and the degree of diversification should be positively correlated. In this study, the age of the company is listed as a control variable and the research year minus the year the company was founded is used as the measurement method.

(5) Firm Size (SIZE)

When resource allocation fails, the company will adopt a diversification strategy (Teece, 1980), that is, if the company has excess resources and cannot trade these resources in the market, the company can use these resources to diversify to make profits Managers should have a high level of responsibility and must have a high level of technical competence. They are more likely to use complex operating strategies in large companies. The research results of Singh, Mathur, and Gleason (2004) indicated that larger companies have higher motivation for diversification strategies, and it is implied that companies have more industry sectors (Denis et al., 1997), so it is concluded that the size of the company also has a multilevel influence on the variables of transformation. In this study, the total sales of the company are considered as a natural logarithm and are used as a substitution variable for company size.

(6) Debt Ratio (LEV)

Financial leverage is related to systemic risk, and under the condition of high financial leverage, firms have greater pressure to pay and repay their debt contracts. Therefore, the liabilities may push companies to use their own cash flow to be more valuable. In terms of investment, it influences firms' diversification activities (Jensen, 1986; Barton, 1988). Therefore, it is also considered as a control variable in this study, which is defined as the ratio of long-term liabilities to total assets.

$$LEV = \frac{\text{Long-term liabilities}}{\text{Total assets}}$$

(7) CEO Duality (DUALITY)

The dual role of the CEO is one way to reduce information asymmetry (Anderson and Anthony, 1986; Sanders and Carpenter, 1998). CEOs who are both corporate managers and supervisors can quickly bring business information to the board. They do not have to wait for outdated information in financial statements to obtain operational information, which can speed strategy formulation. In addition, the CEO's share ownership can align the interests of shareholders, which will also affect the diversification strategy. In a company, if the general manager is also the chairman of the board, the dummy variable (Sanders and Carpenter, 1998) must be used for measurement. If the general manager is also the chairman, the variable is 1 and otherwise 0.

Empirical Model

This research adopts the ordinary least square (OLS) equation which are designed as follows:

$$PDT_{i,t} = \alpha_0 + \alpha_1 S\_COMP_{i,t-1} + \alpha_2 C\_COMP_{i,t-1} + \alpha_3 FAMILY_{i,t-1} + \alpha_4 ROA_{i,t-1} + \alpha_5 RET_{i,t-1}$$

$$+ \alpha_6 AGE_{i,t-1} + \alpha_7 SIZE_{i,t-1} + \alpha_8 LEV_{i,t-1} + \alpha_9 DUALITY_{i,t-1} + \sum_{j=1}^{4} \beta_j YEAR_j + \sum_{k=1}^{19} \beta_k IND_k + \varepsilon_{i,t} \quad (5)$$

Where i is the industry and t is the year. PDT = the overall degree of diversification of the enterprise, calculated by Entropy index

Data Selection

This study examines listed companies from Taiwan and OTC (with the exception of the financial industry with special industry characteristics). No distinction is made between the broader research aspects of the industry, and the listed and OTC companies have higher incentives to carry out diversification strategies and thus the size of the economy. The data are taken from TEJ's basic company information, financial information, corporate governance variables, and stock prices. The original data used to calculate the diversification ratio is classified and subdivided in the "Institute of Economic Research, Taiwan Economic Research Institute." Table 1 shows the sample selection process and present that the sample period is from 2017 to 2020, when the number of original samples obtained by this research is 5,882 companies-the annual sample and deleted the unavailable observations. The annual report provides information on the remuneration of managers, a total of 702 samples; after subtracting those who cannot obtain relevant control variables and incomplete financial information, a total of 82 samples remain. After the sample screening mentioned above process, the final effective sample number is 5,098 observations.

Table 1: Sample Selection

2017-2020 Listed Companies (Excluding Financial) Disappeared:		**5,882**
Unable to Obtain or Not Revealing in the Annual Report.	**702**	
Incomplete financial information	82	(784)
Number of effective samples		5,098

This table shows the sample selection process.

After obtaining valid sample observations, controlling for year distribution and industry characteristics may introduce errors in the regression analysis. Therefore, control for the year and industry category, and also control for variables by industry category to obtain a clearer understanding of managerial compensation characteristics and firm diversity across industries. The annual distribution status is shown in Table 2. The number of samples in each year is evenly distributed, and there is still a slight increase from year to year. The development strategy is consistent. The annual control variables in this study cover a total of 4 years.

Table 2: Sample Distribution by Year

Year	Frequent	Percentage (%)	Cumulated Percentage (%)
2017	1,227	24.07%	24.07%
2018	1,254	24.60%	48.67%
2019	1,286	25.23%	73.89%
2020	1,331	26.11%	100.00%
Total	5,098	100.00%	

This table shows the sample distribution per year.

RESULTS

Descriptive Statistical Analysis

Table 3 shows the narrative statistics of each variable. In this study, the average value of the total diversification index (PDT) of the parent company is 0.3648, the maximum value is 1.7743, and the minimum value is 0. The higher the value of the total diversification index of the company, the more relevant or irrelevant the diversification of the company is, and there may also be a significant amount of relevant and irrelevant diversification. A value of 0 indicates that the company has not diversified. The main independent variables are the manager's cash compensation system (C_ COMP) with an average value of 0.0040, where the maximum and minimum values are 0.0240 and 0.00003, respectively; the manager's equity compensation system (S_ COMP) has an average value of 0.0122, where the maximum and minimum values are 0.1514 and 0, respectively, indicating that the compensations of the sample companies are very different.

Regarding the control variables, family firms (FAMILY) accounted for about 61.61% of the firms in the sample, suggesting that family firms accounted for the majority of the observations in the sample. This may be closely related to the history of Taiwan's economic development. In Taiwan's early days, most of them were family businesses. Therefore, small and medium-sized enterprises, have become a widespread enterprise form in Taiwan's economic development in the course of long-term development. Therefore, the family enterprise form is the normal state of Taiwanese enterprises in the sample.

As for the control variables for the financial information of the companies, the debt ratio (LEV) is about 6.5542% on average, that is, the medium- and long-term debt of the sample companies accounts for 6.5542% of total assets; the return on assets of the sample companies (ROA) is the average net income before taxes before interest. The ratio of total assets is 1.5061% on average; and the average ROA of sample companies (RET) is 32.4729%. As for the control variables of the basic characteristics of enterprises, the agency variable of enterprise size (SIZE) is the natural logarithm of sales revenue, with a standard deviation of 1.5492; the number of years of establishment of sample enterprises (AGE) is 24 years on average, and the oldest enterprises are in 57 years, the youngest enterprise is four years old; moreover, approximately 34% of the sample companies have the CEO and the chairman of the board (DUALITY), which reveals that managers hold two positions simultaneously in the listed companies.

Table 3: Descriptive Statistics of Key Variables

Variable	Mean	Median	Std. Dev	Min	Max
PDT	0.3648	0.0000	0.5959	0.0000	1.7743
C_COMP	0.0040	0.0025	0.0044	0.0000	0.0240
S_COMP	0.0122	0.0030	0.0243	0.0000	0.1514
FAMILY	06161	1.0000	0.4864	0.0000	1.0000
LEV	6.5542	2.3700	8.8135	0.0000	38.4200
ROA	1.5061	1.2200	2.5385	-6.6200	9.3200
RET	32.4749	2.2665	99.7324	-78.8884	465.0978
SIZE	14.9560	14.8310	1.5492	11.0059	19.4876
AGE	24.4859	22.0000	12.2788	4.0000	57.0000
DUALITY	0.3427	0.0000	0.4747	0.0000	1.0000

This table shows the descriptive statistics of all testing variables. PDT represents the overall degree of diversification of the enterprise; C_COMP represents cash compensations for managers; S_COMP represents equity compensations for managers; FAMILY represents a family business, 1 if the business is a family business, 0 otherwise; LEV stands for corporate debt ratio, long-term debt divided by total assets; ROA represents the return on assets of the company; RET represents the return on stock of the company; SIZE represents the scale of the enterprise, which is the natural logarithm of the sales revenue of the enterprise; AGE represents the number of years of establishment of the enterprise, which is the research year minus the establishment year; DUALITY represents the general manager and concurrently serves as the chairman, and the concurrent position is 1, otherwise it is 0.

Regression Analysis

The main regression results of the relationship between managerial compensation characteristics and corporate diversification are presented in Table 4, which provides the empirical basis for this study. The empirical evidence from Table 4 shows that the R-squared is 8.06% and the F-value is 20.62 (p-value is 0.000), which means that the model fits well.

Table 4 presents a significant positive correlation between the manager's equity compensation system (S_COMP) and the company's overall diversification strategy (PDT), and confirmed the hypothesis 1. This shows that this research is supported by Hypothesis 1. That is, if managers' compensation design tends to be a long-term incentive in the form of rights and compensations system, managers' pursuit of private interests and corporate profits will be promoted. The goal is largely consistent with the direction, and the agency problem is reduced. Managers are more willing to pay a higher level of processing power for the predictable equity compensations in the future, and seek the long-term business success of the firm and the business strategy of diversified operations. This is consistent with the findings of Sanders and Carpenter (1998, 2002 and 2004) and Zhao (2002) and other domestic scholars.

The manager's cash compensation system (C_COMP) has no significant effect on the firm's overall diversification strategy. The coefficient is 5.8403 and the t-statistic is 1.51. This means that if the manager's compensation is the short-term visible cash compensation system, the manager will pursue his own personal gain, rather than take operational risks and will not engage in the diversification strategy of complex information processing. Similar to Chen et al. (2011), the empirical results show that the higher the manager's base salary and the higher the cash compensation, the higher the manager's base salary and the higher the cash compensation. The results are consistent with managers' inability to take unique risks.

The empirical results of the control variables show that the family business (FAMILY) has a negative impact on the overall diversification index of the business, suggesting that the family business may be less inclined to diversify or diversify its strategy. The strategy should be based on consideration of the family as a whole. Discuss the diversification strategy in terms of resources. The family business is based on family interests

that take precedence over business interests in decision-making and operational direction. If the family's private resources are limited exclusively to a particular industry or are valuable strategic resources, the family business will be diversified. The strategy will also tend to be conservative, so the degree of diversification may be less than for non-family businesses (Carney, 1998). In terms of financing, a family business that wants to maintain operational control will use its own funds conservatively. Therefore, family businesses are also less inclined to vary their operating strategies due to limited financial resources.

Return on assets (ROA) has a negative impact on the company's overall diversification strategy, which means that the higher the ROA, the less the company tends to diversify. Higher efficiency may indicate good resource allocation, as there is no need to reorganize resources and utilize idle assets through diversification. Higher ROA may also indicate better profitability, which is consistent with Stimpert and Duhaime (1997). The results of the study are consistent. The empirical results show that the higher the profitability of the industry, the lower the degree of diversification, and that companies in industries with low profitability tend to adopt diversification strategies; the larger the company (SIZE), the more positive the company's overall diversification strategy Directional influence, that is, the larger the company, the higher the motivation for diversification strategy, which is consistent with the research findings of Denis et al. (1997) and Singh, Mathur and Gleason (2004).

The empirical results of the other control variables debt ratio (LEV), firm market performance (RET), firm age (AGE), and CEO duality (DUALITY) have no significant correlation with firm's diversification strategies. The effect of CEO duality on diversification has been assessed differently in the literature in the past. It is concluded that CEO duality contributes to diversification strategy. Research suggests that the simultaneous exercise of both powers facilitates the formulation of corporate and goals, and can also be effective. Diversification through resolutions: Research concluding that the dual role of the CEO is detrimental to diversification strategy draws on agency theory, which suggests that the board of directors should have independent oversight and control to avoid management self-interest. Therefore, the chairman should not also be the chief executive officer and should not have the decision-making authority. Management and control rights (Fama and Jensen, 1983). Zheng (2013) investigated the influence of board characteristics on diversification in Taiwan's listed electronics industry. He concluded that the board chairman and chief executive officer can easily control and manage the board's agenda, and they can also effectively utilize resources based on their understanding of business operations.

The empirical evidence shows that CEO duality has a positive relationship with product diversification. CEO duality in this study is positive for diversification coefficient, but there is no significant correlation. Perhaps it is because the National Council of the Republic of China amended the "Code of Practice for the Governance of Listed Companies" in 1991 to flexibly regulate the board of directors of listed and unlisted companies. It is not appropriate for the CEO to serve as the general manager at the same time in order to strengthen the function of the board of directors and implement the corporate governance mechanism. Therefore, the ratio of duality between listed and counter CEOs is not high. Moreover, we use the VIF to determine if there is a serious collinearity problem between each variable. The VIF value of each variable in the model of this study ranges from 1.06 to 2.13, so there is no obvious collinearity problem between the independent variables.

Table 4: Impact of Manager Compensation on Corporate Diversification

Independent Variable	Coefficient	t Statistic	VIF
CONS	−0.6333	−3.23	
C_COMP	5.8403	1.51	1.50
S_COMP	1.2187**	2.29	1.15
FAMILY	−0.0817**	−2.50	1.11
LEV	0.0005	0.31	1.17
ROV	−0.0123**	−2.22	1.27
RET	−0.0001	−0.27	2.13
SIZE	0.0403***	3.49	1.66
AGE	0.0004	0.28	1.68
DUALITY	0.0175	0.55	1.03
R-squared	0.0806		
F statistic	20.620		
N	5,098		

This table shows the results of the impact of managers' compensation on corporate diversification. *** means reaching the 1% significant level; ** means reaching the 5% significant level; * means reaching the 10% significant level. In this study, the explanatory variables with extreme values were winsorized in the two-tailed 1% sample. In order to control the impact of extreme values on the analysis conclusions. Each variable is defined as follows: PDT represents the overall degree of diversification of the enterprise; C_COMP represents cash compensations for managers; S_COMP represents equity compensations for managers; FAMILY represents a family business, 1 if the business is a family business, 0 otherwise; LEV stands for corporate debt ratio, long-term debt divided by total assets; ROA represents the return on assets of the company; RET represents the return on stock of the company; SIZE represents the scale of the enterprise, which is the natural logarithm of the sales revenue of the enterprise; AGE represents the number of years of establishment of the enterprise, which is the research year minus the establishment year; DUALITY represents the general manager and concurrently serves as the chairman, and the concurrent position is 1, otherwise it is 0.

Robustness Tests

The Influence of Managerial Compensations in Electronic Industry on the Diversification of Firms

Based on the distribution of industries in the sample, which is based on the observed values of the valid samples, it can be seen that 2,948 companies in the electronic industry account for 57.83% of the total number of companies in the sample. The electronics industry is the most important industry the most important and is closely related to economic development. In addition, the electronic industry is concerned about cost reduction and has a high motivation to implement diversification strategies. Therefore, this study focuses on the effects of the characteristics of the compensation of managers in electronic industry on the diversification of enterprises. The annual distribution of the sample for the electronics industry only is shown in Table 5 below. Table 5 shows that it is consistent with the total sample and the number of samples in each year is evenly distributed, which also means a slight increase from year to year.

Table 5: Sample Distribution in Electronic Industry by Year

Year	Freq.	Percent (%)	Cum. (%)
2017	706	23.95%	23.95%
2018	724	24.56%	48.51%
2019	745	25.27%	73.78%
2020	773	26.22%	100.00%
Total	2,948	100.00%	

This table shows the sample distribution in electronics industry per year.

The main regression results for the relationship between managers' compensation characteristics and firm diversification are presented in Table 6. The manager's equity compensation system (S_COMP) has a

positive correlation with the company's overall diversification strategy, while the manager's cash compen-sation system (C_COMP) has no effect on the company's overall diversification strategy (PDT). As for the control variables, with the exception of the diversification strategy "PDT" of the family business "FAM-ILY", the remaining control variables range from a negative correlation to no correlation with the empirical results of the entire industry.

Table 6: The Impact of Manager Compensation on Corporate Diversification in Electronic Industry

Independent Variables	Coefficient	t Statistics	VIF
CON	-0.1617	-0.6	
C_COMP	5.6926	1.22	1.46
S_COMP	1.3087**	2.05	1.15
FAMILY	-0.0499	-1.19	1.07
LEV	-0.0026	-1.15	1.11
ROA	-0.0139**	-2.04	1.28
RET	-0.0002	-1.25	2.54
SIZE	0.0385**	2.29	1. 58
AGE	0.0020	0.83	1.12
DUALITY	0.0124	0.28	1.04
R-squared	0.0139		
F statistic	2.750		
N	2,948		

This table shows the results of the impact of managers' compensation on corporate diversification in electronic industry. *** means reaching the 1% significant level; ** means reaching the 5% significant level; * means reaching the 10% significant level. In this study, the explanatory variables with extreme values were winsorized in the two-tailed 1% sample. In order to control the impact of extreme values on the analysis conclusions. Each variable is defined as follows: PDT represents the overall degree of diversification of the enterprise; C_COMP represents cash compensations for managers; S_COMP represents equity compensations for managers; FAMILY represents a family business, 1 if the business is a family business, 0 otherwise; LEV stands for corporate debt ratio, long-term debt divided by total assets; ROA represents the return on assets of the company; RET represents the return on stock of the company; SIZE represents the scale of the enterprise, which is the natural logarithm of the sales revenue of the enterprise; AGE represents the number of years of establishment of the enterprise, which is the research year minus the establishment year; DUALITY represents the general manager and concurrently serves as the chairman, and the concurrent position is 1, otherwise it is 0.

The Impact of Managers' Compensations on the Related Diversification of Enterprises

The exploration of diversification strategy can be divided into related diversification and unrelated diversi-fication (Palich, Cardinal, and Miller, 2000). Enterprises that implement related diversification strategies can effectively activate and strengthen the utilization of unused assets by restructuring resources to form a composite economy, so that different companies or departments in the group can share resources, thereby improving enterprise performance. If the enterprise implements unrelated diversification strategies, the re-source allocation will exceed the core capacity of the group, resulting in additional communication and coordination costs beyond the optimal point, so that enterprises can benefit far less than the cost of cooper-ation and coordination between enterprises. On the contrary, the internal market becomes inefficient as a result and operating performance declines.

Hill and Snell (1988) also pointed out that R&D-intensive industries are high-risk, high-compensation in-dustries. In this situation, risk-averse managers may choose unrelated diversification strategies to generate agency behavior, but it is beneficial to shareholders. It is a limited related diversification strategy. Whether different compensations can motivate managers to engage in future firm growth and performance, should matter in the discussion of relevant diversification strategies, according to this study. Therefore, the

sensitivity analysis is conducted using with the relevant diversification strategy (PDR) of the firm as the contingency number. The main regression results of the relationship between managers' compensation characteristics and the associated diversification of the firm are presented in Table 7.

Table 7 shows that the main variable manager's equity compensation system (S_COMP) is positively correlated with corporate-related diversification strategies (PDR). The use of company- based diversification indicators for sensitivity testing was also supported. This result is also consistent with the convergence of interest hypothesis proposed by Jensen and Meckling (1976). This hypothesis states that the higher the concentration of the manager's equity, if the manager's excessive investment in non-value maximization and privileged spending preferences cause the value of the firm. Most of the losses will be borne by the managers themselves. Therefore, an increase in managerial equity ownership will cause managers' interests to be more aligned with those of, to make prudent decisions, and to seek to maximize the value of the firm. Therefore, they are more likely to adopt relevant diversification strategies that can exercise synergies and enhance shareholders' interests.

The manager's cash compensation system (C_COMP) does not affect the firm-specific diversification strategy. The coefficient is 3.8524 and the t statistics is 1.29. Taking the relevant diversification index of the company as the contingency number, the empirical result H2 of the sensitivity test is also supported. Cash compensation may not align managers' pursuit of personal gains with shareholders' interests and can easily lead to agency problems and lead managers to pursue only personal gains. This is consistent with Hill and Snell (1988), who believed that risk-averse managers may choose irrelevant actions. The diversification strategy pursues personal gains and is usually inconsistent with the outcomes of related diversification strategies that are consistent with the interests of the firm.

Regarding control variables, the family business (FAMILY) has a negative impact on the company's overall diversification index (the coefficient is -0.07, and the p-value is 0.004); the higher the ROA, the more negative the impact on the company's overall diversification strategy (the coefficient is -0.01, the p-value is 0.021); the larger the size of the enterprise (SIZE), the positive influence on the overall diversification strategy of the enterprise (the coefficient is 0.03, the p-value is 0.001), both of which are consistent with this research based on the overall diversification of the enterprise The result of the index (PDT) will be the strain number that is similar, and the other control variables are insignificant.

The empirical results confirm that the manager's compensation system is different, which affects the manager's willingness to commit to the future of the company. If managers are offered long-term incentive compensations, managers will be willing to take higher risks and information processing capacity, and commit to the overall business strategy and diversified development of the company to ensure the sustainable survival of the company and huge profits; and compensations If the design of the system emphasizes cash compensations, it will be less able to induce managers to bear the unique risks of the enterprise, and it will be impossible to observe clearly observe whether the cash compensation system induces managers to engage in business diversification strategies.

Table 7: The Impact of Manager Compensation on Related Diversification

Independent Variables	Coefficient	t Statistics	VIF
CON	-0.4196	-2.95	
C_COMP	3.8524	1.29	1.50
S_COMP	0.9647**	2.44	1.15
FAMILY	-0.0696***	-2.89	1.11
LEV	0.0004	0.35	1.17
ROA	-0.0096**	-2.31	1.27
RET	-0.0001	-0.30	2.13
SIZE	0.0286***	3.38	1.66
AGE	-0.0001	-0.06	1.68
DUALITY	0.0064	0.27	1.06
R-squared	0.0139		
F statistic	2.750		
N	2,948		

This table shows the results of the impact of manager compensation on related diversification. *** means reaching the 1% significant level; ** means reaching the 5% significant level; * means reaching the 10% significant level. In this study, the explanatory variables with extreme values were winsorized in the two-tailed 1% sample. In order to control the impact of extreme values on the analysis conclusions. Each variable is defined as follows: PDT represents the overall degree of diversification of the enterprise; C_COMP represents cash compensations for managers; S_COMP represents equity compensations for managers; FAMILY represents a family business, 1 if the business is a family business, 0 otherwise; LEV stands for corporate debt ratio, long-term debt divided by total assets; ROA represents the return on assets of the company; RET represents the return on stock of the company; SIZE represents the scale of the enterprise, which is the natural logarithm of the sales revenue of the enterprise; AGE represents the number of years of establishment of the enterprise, which is the research year minus the establishment year; DUALITY represents the general manager and concurrently serves as the chairman, and the concurrent position is 1, otherwise it is 0.

CONCLUSION COMMENTS

This study examines the effects of managerial compensation characteristics on firm diversification and conducts an empirical study of whether the different compensation characteristics that firms offer their managers induce managers to pursue diversified operating strategies. In this study, manager's cash compensation and manager's equity compensation are used as independent variables and firm's total diversification index is used as a contingency number. After the empirical regression analysis, the main conclusions, we find the managerial rights and interests compensation system is positively correlated with the overall diversification of the company. First, we find that the more company's managerial compensation system focuses on long-term incentives, such as stock ownership, the higher the degree of diversification of the firm. The sensitivity analysis for the electronics industry as a sample also leads to the same result. It shows that an equity- based compensation system aligns managers' interests with the goal of maximizing corporate profits, reduces the problems of capital intermediaries, and supports the firm's overall strategy and future development performance. The empirical results are consistent with previous literature (Jensen and Meckling, 1976; Carpenter and Sanders, 2004; Zhao, 2002; Cao, Jin and Lu, 2011). Moreover, the results of the sensitivity test also show that the corporate equity compensation system will make managers more inclined to corporate-related diversification strategies. Second, the empirical results show that when the managerial compensation system tends to pay cash bonuses, managers are less willing to engage in complex information processing and decision-making, so they are less able to motivate managers to engage in enterprise diversification, etc., which requires higher risks.

As for the operation strategy, the sensitivity of the electronics industry and the characteristics of compensations to the relevant diversification of the company was tested separately, and the second hypothesis was also supported. The empirical investigation of this study is consistent with previous literature (Jensen and

Meckling, 1976; Chen, Wang, and Lin, 2011). This study shows that cash compensation has no effect on managers to take on unique risks and pursue diversified corporate strategies. Third, the empirical investigation of this study shows that the higher the ROA, the less inclined firms are to implement diversification strategies. The higher the efficiency of the firm's ROA, the better the capitalization of firm's assets. Stimpert and Duhaime (1997) found that the higher the firm's profit, the lower the firm's degree of diversification level. The longer the firm has been in existence, the higher the probability of diversification.

The empirical results also show that companies that have good profitability in their industry focus more on their own businesses and do not to spend additional costs or resources on diversified businesses to avoid profit dilution. The contributions are shown as follows: First, the findings can serve as a benchmark for investors and regulators to determine whether the compensation system is consistent with the most appropriate configuration of the company's strategy, and it can also serve as a reference for companies when designing compensation systems. Second, this study can also be used as a reference by the current compensation committee for corporate compensation system planning related to operational strategy, so it enables corporate investors and compensation committees and other corporate governance institutions to formulate or review the rationality of the compensation system and the relevance to operational strategy. Third, previous studies have different views on the relationship between family business and business diversification strategies. This study finds that family characteristics are an important factor for firms that do not tend to diversify, indicating that family firms take into account the combination of personal wealth and business interests and therefore focus on lower-risk industries, so there is no need to spread business risks through diversification strategies. Another avenue for future research is to extend the analysis by studying the link between different modes of diversification (i.e., internal, acquisition, and cooperation) and firm strategies, such as financial and internationalization strategies. It can also provide direct evidence on the investigation of non-pecuniary decision-making drivers in companies, especially for second-generation family firms.

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FACTORS AFFECTING USERS COMMENTS, INTENTION TO SHARE, AND SHARING ATTITUDE: EVIDENCE FROM THE FACEBOOK PLATFORM

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ABSTRACT

Billions of people use Facebook sites as active users every day. Moreover, the number of users increases daily. Hundreds of millions of adds, messages, stories, and comments are placed each day as well. Few studies have examined why Facebook users share their views and study the factors that affect such intentions. A set of factors were used to study Facebook users' intention to share. We considered entertainment, informativeness (information sharing), socialization, peer friend effect, and self-efficacy. Further, this study adds value to the literature by investigating if the intention to share influences users' sharing attitude. A quantitative approach was used to collect primary data from 253 users. Smart partial least squares were used to test the primary data suitability. Evidence shows the proposed study model fit the proposed study hypotheses. The study found that all factors studied affect Facebook users' intention to share information.The study results also support the proposed hypotheses and found a positive influence of intention to share on sharing attitude. Additional information explains theoretical and empirical applications and proposes future research areas.

JEL: M30, M31

KEYWORDS: Social Media, Facebook, Entertainment, Intention To Share, Information Sharing, Entertainment, Social Influence –Socialization, Friends, Peer Friends, Self-Efficacy

INTRODUCTION

This study explores the main factors that affect and influence facebook users' intention to share and sharing attitudes' as revealed in an emerging markets setting. Social media opinion sharing and participation has become a popular phenomenon and people tend to share their opinion in different aspects of life including social, economic and even politics. Individuals tend to increase their participation and can produce and diffuse news on the global virtual community more than ever before (Lee & Ma, 2012). One report notes that people share more than 30 billion pieces of information each month and has increased widely (Evans et al., 2014). It seems that we are living in the digital era. Thus, to understand social media use, it is important to examine related issues. Globally there were 5.11 billion mobile users, 4.39 billion internet users, 3.48 social media users in addition to 3.26 billion people who use social media on their mobile devices as of January 2019 (Kemp, 2019). Knowledge about the attitude and factors behind sharing behavior and intention to share an individual s' opinions, knowledge, insights and other content through the social media platform is limited (Lee & Ma, 2012).

This study sheds light on why youth tend to share their comments on social media platforms and what drivers influence their attitude toward sharing. This issue is essential because a large number of youths spend hours using social media platforms each day. Pempek, Yermolayeva, & Calvert (2009) study 92 undergraduate students by reporting how much time they spend using the popular social media network platform, Facebook, followed by a self-survey. The study reported the approximate average time that

students spend using Facebook was 30 minutes daily. Further, little research exists on how youth express their idea and how interests attract other users to participate and interact.

Social interaction helps in creating common sharing values and trust and pushes fans to have continuous intention to use social media platforms (Lin & Lu, 2011). Youths intention to discuss or to share their opinions and generate views towards organizations' products has been discussed by many scholars such as Phang, Zhang, & Sutanto (2013). A set of factors were used to study Facebook users' intention to share causes. The factors include entertainment, informativeness (information sharing), socialization, peer friend effect, and self-efficacy as explained in the following sections. This paper is organized as follows: The next section discusses the literature review that includes factors that affects Facebook users' intention to share and sharing attitudes. Second, data and methodology used in the research is discussed. Third, analysis and results are reported and a detailed discussion of the development of the research framework is formulated. Finally, we provide some concluding comments and discussion of opportunities for future research.

LITERATURE REVIEW

This study examined factors that affect and influence Facebook users intention to share and sharing attitudes'. In addition, the relationship between intention to share and sharing attidudes is discussed. These factors will be explained in details in the following sections.

Entertainment

Studies find that people tend to share their opinions, experiences, emotions, knowledge, and entertainment to others via social media platforms (Al Kurdi, Alshurideh, Salloum, Obeidat, & Al-dweeri, 2020; Alshurideh, Salloum, Al Kurdi, Monem, & Shaalan, 2019; Sheth, 2013; Sheth & Kim, 2017). Leong, Ooi, Chong, & Lin (2011) studied a set of factors that influence the intention to adopt mobile entertainment within the Malaysian setting. The factors used are perceived usefulness (PU), perceived ease of use (PEOU), and individual characteristics. The authors employ the Technology Acceptance Model (TAM) in the mobile entertainment context. The study found that PU, PEOU, past adoption behavior and academic qualification affects mobile entertainment adoption. Other studies find that individuals tend to share entertainment in different forms using videos, text messages, drawings, figures, etc. (Choi et al. 2018). The study found the branded nurture of videos is pre-determinant of viewing the visual content in addition to knowledge even if it is conceptual or attitudinal. The study shed more insight into the mechanism of interaction among individuals and highlighted the mediating effect of attitudinal persuasion knowledge. Entertainment effect on the intention to share via social media platforms can be drawn below as:

H1: *Entertainment will have a positive effect on the intention to share.*

Information Sharing

Social network platforms have been widely used for information sharing and the number of users is rapidly increasing. Such platforms have been seen as a means to attract users and youth. Many scholars confirmed the idea that information exposure, sharing information and knowledge sharing among users are the main reasons for social networks use especially via Facebook (Acquisti & Gross, 2006; Alshurideh, Salloum, Al Kurdi, Monem, & Shaalan, 2019; Alshurideh, Al Kurdi, Abu Hussien, & Alshaar, 2017; Alshurideh, Al Kurdi, et al., 2019). Sharing opinions, attitudes, and behaviors via social media sites is a critical phenomenon needing more investigation. Jansen, Sobel, & Cook (2010) found that some users tend to participate in different social media networks and platforms, have more tendency to share their opinions, seek opinions and act on these opinions. The type and quality of information, information control and even the source of such information and source credibility affect information sharing behavior (Alshurideh,

2010; Ha & Ahn, 2011; Hajli & Lin, 2016). Sharing information within social network platforms effect on the intention to share can examined as:

H2: *Information sharing will have a positive effect on the intention to share.*

Social Influence

Consumer socialization is not a new phenomenon. The term socialization explains how somebody fits with others in society. But in a later stage, it denotes how an individual learns to develop his behaviors, attitudes, and values (Moschis & Smith, 1985). Psychologists and anthropologists' scholars study socialization. Communication scholars use the term to describe how to contact and influence other(s) to lead and form behavior and cognition. Social online comments begin with the users' and organization's interests and reacts to them from a more business perspective view especially negative perspectives (Obeidat, Z., Alshurideh, M., Al Dweeri., R. and Masa'deh, n.d.; Pantano & Corvello, 2013). Individuals' responses that appear on social media are seen as valuable to organizations. Reactions to products, or issues can be collected, analyzed, summarized and some extractions can be elicited to know and study attitude directions. Such richness and valuable information in information collected can be used to determine and develop values structures and strengths (Jang, Sim, Lee, & Kwon, 2013). Social effects on the intention to share via social media platforms can be drawn below as:

H3: *Social influence will have a positive effect on the intention to share.*

Friends and Peer Friends Influence

Friends and peer influence has been tackled in different contexts. Many of these studies found that social influence is high among friends especially concerning choice and motivation to buy and even sharing attitudes (Al-Dmour & Al-Shraideh, 2008; Al-Duhaish, Alshurideh, & Al-Zu'bi, 2014; Alshurideh, 2016; Muhammad Alshurideh, 2018; Coggans & McKellar, 1994). Accordingly, peer social context is important especially within the virtual context. Some scholars such as Alexandrov, Lilly, & Babakus (2013) argue that individuals tend to share their social information because they want to help others to socialize in online communities and in return they try to observe and witnessed their friends' reactions or how they behave towards their opinions. Thus, friends' effect has been tested properly and sharing attitudes among friends via social media platforms is critical to be searched. However, it gets little attention from scholars. The effect of friends and peer friends' effect on intention to share via social media platforms can be stated as:

H4: *Friends will have a positive effect on the intention to share.*

Self-Efficacy

The concept of knowledge sharing intention and information security issues within the influence of self-efficacy, trust, reciprocity, and shared language has been studied by Tamjidyamcholo, Baba, Tamjid, & Gholipour (2013). The study found that self-efficacy and reciprocity are key factors affecting the attitude of knowledge sharing. Shared knowledge does not influence intention or attitude to share. Another study conducted by Van Acker, Vermeulen, Kreijns, Lutgerink, & Van Buuren (2014) confirms the effect of self-efficacy in the Netherlands' by exploring factors affecting teachers' sharing behavior using Open Educational Resources (OER). Information shared relates to knowledge management system, organizational climate, attitude, intention to share and self-efficacy. The study confirmed that self-efficacy is upheld and was able to explain some of both the sharing behavior variation and the intention to share among the Dutch teachers. The effect of self-efficacy on intention to share via social media platforms can be stated as:

H3: *Self-efficacy will have a positive effect on the intention to share.*

<u>Intention to Share</u>

Youth share and intention to share towards any post on social media are important. There exist hundreds of billions of social media data (messages, videos, news, pictures…etc.) shared among social media platforms per day (Manovich, 2018). The intention has been used widely as the best indicators of prospect behavior (Al-dweeri, Obeidat, Al-dwiry, Alshurideh, & Alhorani, 2017; Al Dmour, Alshurideh, & Shishan, 2014; Alshurideh, 2010; M Alshurideh, Masa'deh, & Al kurdi, 2012). An individual's emotions can be influenced positively or negatively by others' statements or comments posted on social media sites. Intention to share and actual sharing attitude concepts are rarely discussed within opinion sharing that distributes via the social media platforms. There exists published literature about knowledge sharing. For example, Tamjidyamcholo, Baba, Tamjid & Gholipour (2013) found a positive link between knowledge sharing intention and sharing attitude concerning the influence of both self-efficacy and reciprocity. Kolekofski & Heminger (2003) found that beliefs and attitudes influence employees' intention to share and sharing organization information. However, scholars rarely discuss social media users' comment sharing and intention to share. Thus, it is important to identify the type of message that need to be shared, news information utility, and how opinion leaders and sender's personality attributes affect online news sharing (Al-Dmour, Alshuraideh, & Salehih, 2014; Alshurideh, Shaltoni, & Hijawi, 2014; Muhammad Alshurideh, 2018; Ammari, Al kurdi, Alshurideh, & Alrowwad, 2017; Bobkowski, 2015). The intention to share via social media platforms effect on sharing attitude can be stated as:

H6: *Intention to share will have a positive effect on sharing attitude.*

Based on the literature review discussed above, the conceptual model can be derived as shown in Figure 1. Figure 1 explains the relationships between a set of factors used to study Facebook users' intention to share including entertainment, informativeness (information sharing), socialization, peer friend effect, and self-efficacy. In addition Figure 1 explains the relationship between intention to share and sharing attitude.

Figure 1: Conceptual Model
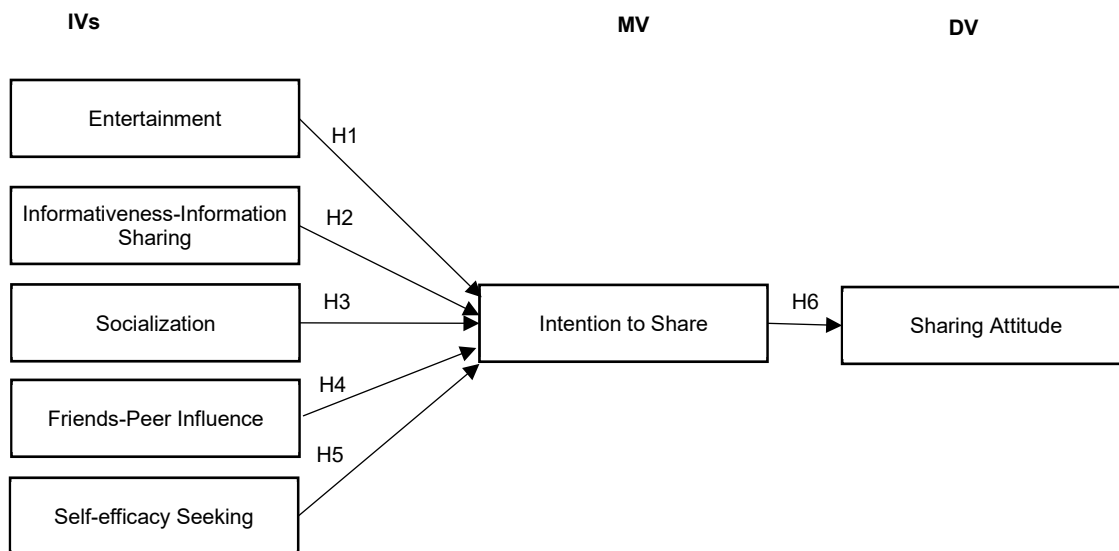
Figure 1 explains the relationships between a set of factors used to study Facebook users' intention to share causes including entertainment, informativeness (information sharing), socialization, peer friend effect, and self-efficacy. Figure 1 also explains the relationship between intention to share and sharing attitude.

DATA AND METHODOLOGY

The researcher circulated a questionnaire survey to the study population that includes students at Jordan University in Amman and students at the Hashemite University in Zarqa. Students were handed a hard-copy of the questionnaire. A total of 300 questionnaires were distributed evenly to each university during the first semester of 2020/2021. The main instrument used for data collection was the questionnaire, which allowed examination of the research hypotheses. A total of 26 items were included in the questionnaire including "Social Influence -Socialization", "Perceived Enjoyment", "Self-efficacy", "Perceived Playfulness", "Perceived Usefulness", "and Intention to share", and "Sharing attitude". Some 253 respondents completed the questionnaire implying a response rate of 84% within a two months period (131 from Jordan University and 122 from the Hashemite University). In all, 47 surveys were uncompleted, and so these questionnaires were not considered. Krejcie & Morgan, (1970) approach was used determined that the valid responses were used to create a sample size of 253 responses. For a population of 460, the sampling size should approximately be 210 respondents. A conceptual model was used to analyze the responses. Analysis of the sample size is carried out using structural equation modeling. A sample size of 253 is considered high in comparison to the requirements of analysis for the hypotheses in this study (Chuan & Penyelidikan, 2006).

The questionnaire survey consisting of three sections as follows: The first section concentrates on the personal data of the participants. The second section discusses twenty items that are related to the general queries about the factors that affect intention to share The final section consists of two items that signify the actual intention.

 All items within the questionnaire are measured using a five-point Likert Scale, which comprises the following scales: strongly agree (5), agree (4), neutral (3), disagree (2), and strongly disagree (1). The survey included 62% female and 38% male students. Almost 59% of the students had ages in the range of 18 to 29 years, while 41% of the students were more than 29 years old. In terms of education level, students pursuing Business Administration major constituted 41% of the total students with 23%, 17%, 11%, and 8% of the students pursuing Engineering, Mass Communication and Public Relations, Arts, Social Sciences & Humanities, and Information Technology, respectively. Most respondents were well-educated with the majority of them having acquired university degrees. A bachelor's degree had been obtained by 52% of the respondents, 36% had acquired a master's degree, 12% had a doctoral degree. The rest of the participants had obtained a diploma education. According to (Al-Emran & Salloum, 2017), when respondents show a willingness to volunteer, and when they can be reached easily, the "purposive sampling method' is good to use. Students from distinct colleges are part of this study sample. They are pursuing different programs at distinct levels, with varying ages. To measure the demographic data, IBM SPSS Statistics Ver. 23 was used.

ANALYSIS AND RESULTS

Data analysis was carried out using the partial least squares-structural equation modelling with the help of the SmartPLS computer program (Ringle, Wende, & Becker, 2015). A two-step assessment method was used to examine the data, which included the structural model and the measurement model (Hair, Hollingsworth, Randolph, & Chong, 2017). There are reasons why PLS-SEM was used in this paper. First, the most appropriate choice when considering the points mentioned to develop an existing theory is PLS-SEM (Urbach & Ahlemann, 2010). Second, at present, PLS-SEM can examine exploratory problems most appropriately including the case of complex models (Hair Jr, Hult, Ringle, & Sarstedt, 2016). Third, PLS-SEM examines the complete model as a single unit, rather than dividing it into parts (Goodhue, Lewis, & Thompson, 2012). Finally, both measurement and structural models are analyzed concurrently by PLS-SEM, which offers more precise values (Barclay, Higgins, & Thompson, 1995). Hair et al., 2017 found that construct reliability (comprising of Cronbach's alpha and composite reliability) and validity (comprising of convergent and discriminant validity) should be analyzed if researchers wish to evaluate a

measurement model. Table 1 shows that the range of values of Cronbach's alpha is between 0.710 and 0.943, all of which exceed the threshold value of 0.7 (Nunnally & Bernstein, 1994). Table 1 also shows that composite reliability (CR) has values in the range of 0.729 and 0.823, all of which exceed the threshold value of 0.7 (Kline, 2015). These findings show that construct reliability is confirmed, and the constructs are free from errors.

Table 1: Convergent Validity Results Which Assures Acceptable Values (Factor Loading, Cronbach's Alpha, Composite Reliability ≥ 0.70 & AVE > 0.5)

Constructs	Items	Factor Loading	Cronbach's Alpha	CR	AVE
Social Influence - Socialization	SOC1	0.778		0.798	0.510
	SOC2	0.775	0.943		
	SOC3	0.768			
	SOC4	0.700			
Perceived Enjoyment	PENJ1	0.798		0.811	0.678
	PENJ2	0.773	0.705		
	PENJ3	0.804			
	PENJ4	0.787			
Self-efficacy	SELEF1	0.832		0.821	0.743
	SELEF2	0.814	0.710		
	SELEF3	0.904			
	SELEF4	0.877			
Perceived Playfulness	PPLAY1	0.770		0.729	0.701
	PPLAY2	0.893	0.853		
	PPLAY3	0.707			
	PPLAY4	0.875			
Perceived Usefulness	PUSE1	0.877	0.816	0.738	0.619
	PUSE2	0.756			
	PUSE3	0.766			
	PUSE4	0.744			
Intention to share	ISHAR1	0.875	0.836	0.772	0.750
	ISHAR2	0.791			
	ISHAR3	0.723			
	ISHAR4	0.806			
Sharing attitude	SHARATT1	0.822	0.788	0.823	0.625
	SHARATT2	0.909			

This table shows the range of values of Cronbach's alpha is between 0.710 and 0.943, all of which exceed the threshold value of 0.7. It also shows that composite reliability (CR) has values in the range of 0.729 and 0.823, all of which exceed the threshold value of 0.7.

Measurement of convergent validity should involve obtaining the factor loading and average variance extracted (AVE) (Hair et al., 2017). It is evident from Table 1 that all factor loadings have values more than the suggested threshold of 0.7. Further, the table shows that AVE values are in the range of 0.510 to 0.750, which exceed the threshold value of 0.5. Keeping in view these findings, convergent values for all constructs are sufficiently satisfactory. Two criteria should be measured while measuring discriminate validity, the Cornell-Barker criterion and the Hetero traditionalism proportion (HTMT) (Hair et al., 2017). The data presented in Table 2 shows that the Cornell-Barker measure confirms the square roots of all AVEs are more significant in comparison to its correlation with the rest of the constructs (Fornell & Larcker, 1981).

Table 2: Fornell-Larcker Scale

	SOL	PENJ	SELEF	PPLAY	PUSE	ISHAR	SHARATT
SOL	0.789						
PENJ	0.257	0.787					
SELEF	0.369	0.582	0.878				
PPLAY	0.367	0.350	0.220	0.848			
PUSE	0.525	0.268	0.469	0.268	0.892		
ISHAR	0.268	0.269	0.368	0.198	0.144	0.847	
SHARATT	0.635	0.369	0.287	0.187	0.298	0.398	0.795

Table 2 shows that Cornell-Barker measure that the square roots confirms all AVEs are more significant in comparison to its correlation with the rest of the constructs.

The HTMT ratio is shown in Table 3, which shows the value of every construct is not more than the threshold value of 0.85 (Henseler, Ringle, & Sarstedt, 2015). Consequently, the value of HTMT ratio is confirmed. These outcomes reveal the presence of discriminant validity. The analysis shows no problems were present in the reliability and validity of the measurement model. As a result, the structural model can be examined using the data gathered.

Table 3: Heterotrait-Monotrait Ratio (HTMT)

	SOL	PENJ	SELEF	PPLAY	PUSE	ISHAR	SHARATT
SOL							
PENJ	0.332						
SELEF	0.720	0.368					
PPLAY	0.258	0.469	0.440				
PUSE	0.287	0.369	0.272	0.578			
ISHAR	0.217	0.248	0.133	0.444	0.339		
SHARATT	0.434	0.240	0.419	0.200	0.208	0.505	.049

Table 3 shows the HTMT ratio for every construct is not more than the threshold value of 0.85 which confirm the presence of discriminant validity

Assessment of the structural model is often performed using the coefficient of determination (R^2 value) (Dreheeb, Basir, & Fabil, 2016). Predictive accuracy of the model is measured by the coefficient, which is the squared correlation between the actual and predicted values of the endogenous construct (Joseph F Hair Jr, Hult, Ringle, & Sarstedt, 2016; Senapathi & Srinivasan, 2014). The coefficient shows the combined effect of the exogenous latent variables on an endogenous latent variable. The squared correlation between the actual and predicted values of the variable is indicated by the coefficient. The additional meaning of variance was subsequently included, referring to the value of endogenous constructs. Every exogenous construct does not show the precise value, because it is difficult to differentiate. According to (Chin, 1998), the value is considered to be high when it exceeds 0.67, suggesting that the qualities ranging from 0.33 to 0.67 are coordinate. Qualities in the range of 0.19 to 0.33 are weak values. The value is inadmissible when it is less than 0.19. Table 4 and Figure 2 show the simple linear regression results indicating a moderate predictive model. The percentage of variance for the Intention to share and sharing attitude are almost 63% and 57%, respectively.

Table 4: R2 of the Endogenous Latent Variables

Constructs	R^2	Results
Intention to share	0.627	Moderate
Sharing attitude	0.569	Moderate

Table 4 shows the results of the simple linear regressions. There is a moderate predictive model of the model, suggesting that the percentage of variance for the Intention to share and sharing attitude are almost 63% and 57%, respectively.

Figure 2: Results of Structural Model
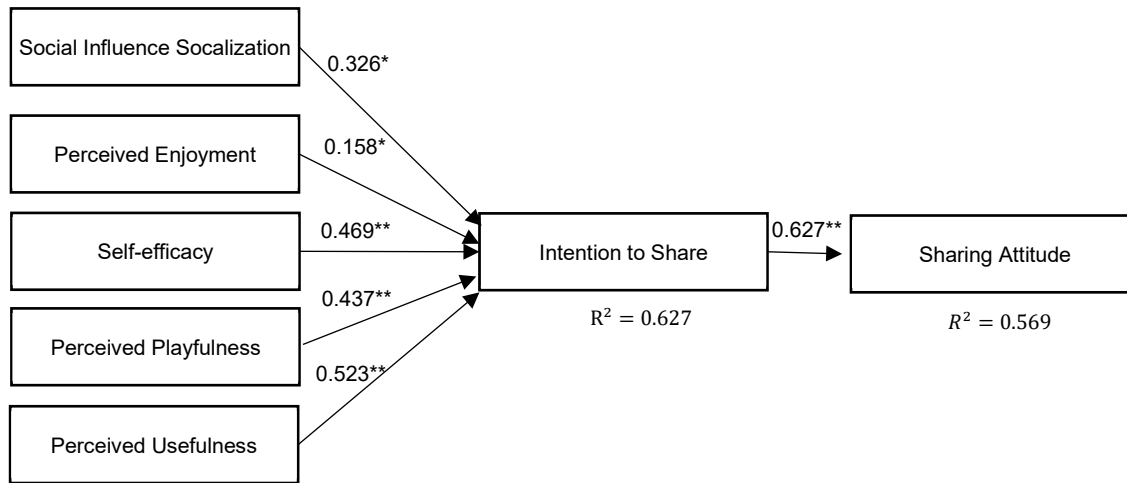
This figure shows the results of the simple linear regressions that there is a moderate predictive model. The percentage of variance for the Intention to share and sharing attitude are almost 63% and 57%, respectively.

The structural model follows affirming the measurement model. This requires assessing the coefficient of determination (R^2) and the path coefficients employing a bootstrapping method of 5,000 re-samples (Hair et al., 2017). Table 5 shows the path coefficient, t-values, and p-values for every hypothesis. All hypotheses are supported. The results showed that Intention to share significantly influenced Social Influence – socialization (β= 0.326, P<0.05), Perceived Enjoyment (β= 0.158, P<0.05), Self-efficacy (β= 0.469, P<0.001), Perceived playfulness (β= 0.437, P<0.001), and Perceived usefulness (β= 0.523, P<0.01) supporting hypothesis H1, H2, H3, H4, and H5 respectively. The relationships between Intention to share and Sharing attitude (β= 0.627, P<0.001) was statistically significant, and thus, Hypotheses H6 is generally supported. A summary of the hypotheses testing results is shown in Table 5.

Table 5: Results of Structural Model - Research Hypotheses Significant at p**=<0.01, P* <0.05)

H	Relationship	Path	*t*-value	*p*-value	Direction	Decision
H1	Social Influence –socialization -> Intention to share.	0.326	2.573	0.017	Positive	Supported*
H2	Perceived Enjoyment -> Intention to share.	0.158	1.197	0.035	Positive	Supported*
H3	Self-efficacy -> Intention to share.	0.469	15.223	0.000	Positive	Supported**
H4	Perceived playfulness -> Intention to share.	0.437	26.183	0.000	Positive	Supported**
H5	Perceived usefulness-> Intention to share.	0.523	22.890	0.004	Positive	Supported**
H6	Intention to share. -> Sharing attitude	0.627	30.297	0.000	Positive	Supported**

Table 5 shows the path coefficient, t-values, and p-values for each hypothesis. All hypotheses are supported since p-values for all factors are less than 0.05. (p <0.05) for all Hypotheses(H1 – H6).*

DISCUSSION

The study found that social influence affects Facebook users' intention to share. This finding is supported by Alshurideh, Al Kurdi, & Salloum (2020) who studied main mobile learning system drivers and found that social influence is one of the key drivers of using such applications. Also, study results denoted that perceived enjoyment and usefulness influence intention to share. This result is declared by Moghavvemi et al. (2017) who found that perceived enjoyment and perceived reciprocal benefits affect students' intention to share knowledge through Facebook. Lee & Paris (2013) found that perceived enjoyment influences attitude toward using Facebook and denoted the intention results from users' attitude toward technology use and promoting local events and festivals through Facebook. Moroever, in similar studies, Alshurideh et al. (2020) and Al Kurdi et al. (2020) found that perceived usefulness affects attitude to use, continuous

intention to use and intention to use e-learning and mobile learning systems and applications. The study also found that self-efficacy influence users's intention to share. The results come in line with what other scholars found. For example, Baba et al. (2013) found that self-efficacy influences users' intention to knowledge share while Lu & Hsiao (2007) found that self-efficacy influences users' intention to share knowledge on weblogs. Also, information self-efficacy was found to be the most significant factor that influence product and service information-intention sharing on Facebook as found by Cho, Park, & Kim (2015)

One notable finding of this research is a positive influence of perceived playfulness on the intention to share. This result is not common in the literature. Many scholars have employed playfulness in different contexts such as the influence of playfulness on brand engagement on Twitter (McShane, Pancer, Poole, & Deng, 2021), as mediators of the relational effect of website quality on customer satisfaction, as purchase intention (Hsu, Chang, & Chen, 2012), and in the role of informativeness and playfulness on shaping consumers purchase decisions (Kang, Shin, & Ponto, 2020). However, measuring the effect of playfulness on the intention to share, in this study, adds new light to literature. To add more, this study found a positive influence of intention to share on sharing attitudes through the Facebook platform. Similar results were found in different contexts such as (Y.-I. Lee, Phua, & Wu, 2020) who found a marketing health brand effect on Facebook on users' comments, brand attitude, trust, and purchase intention. Also, Kim, Lee, & Oh (2020) examined and approved of how the intention to knowledge sharing mediates both personal characteristics and knowledge sharing.

CONCLUSION AND FUTURE WORKS

The study examines the main causes of Facebook users' intention to share their opinions in addition to their sharing attitude. The study's main focus was to examine factors that affect and influence Facebook users intention to share and sharing attitudes'. A questionnaire survey is used to collect primary data from the study population which included students at Jordan University in Amman and students at Hashemite University in Zarqa. Data analysis was carried out in this study using partial least squares-structural equation modeling with the help of the SmartPLS computer program. A two-step assessment method was used to examine the collected data, which included the structural model and the measurement model.

The study found a set of causes that influence sharing intention: socialization, perceived enjoyment, self-efficacy, perceived playfulness and perceived usefulness. Enjoyment and Playfulness are tested for the first time within the Facebook users' intention to share comments. The study found that all factors studied affect Facebook users' intention to share information. In addition, results support the proposed hypotheses and found a positive influence of intention to share on sharing attitude. One of the main findings in this study is the effect of usefulness on Facebook users' intention to share. Benefits that might be gained by Facebook users is an important area for future study including targeting psychological and reinforcements benefits that users might gain. Also, targeting how to use types of benefits and perceived value by users such as (e.g.; psychological, self-efficacy and powers) are potential avenues for future research. This research opens a new gate to use factors to enhance Facebook usage especially in a Facebook marketing context by individuals and managers. The results are essential for scholars and practitioners especially with regard to how to increase enjoyment and playfulness within a Facebook promotion. Time and effort were the main limitations to conducting the survey in more universities and on a bigger scale. This research represents a start point for another research.

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CROSS-BORDER INDUSTRIAL EXCHANGES AND COOPERATION: EVIDENCE FROM JAPAN AND TAIWAN

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ABSTRACT

Taiwan and Japan have successively initiated industrial collaboration policy and incentive measures since 2011. Japanese local governments place Taiwan as a key globalization area. They wish to enhance their exchanges and cooperation with Taiwan, leading to significant effects on trade and investment between two countries. Specifically, Tokai region (Tōkai-chihō) and Taiwan have had a close relationship in trade, investment and tourism. After the 2011 Northeastern Great Earthquake in Japan, Tokai region actively promoted industry collaboration and exchanges with Taiwan. This study completes an in-depth interview and questionnaire survey of six companies in Tokai region to investigate the current status and viewpoints of development and topics of bilateral industrial collaboration after 2011. This study finds that collaboration plays a complementary role of industrial advantages for Japanese companies and matches the visions and goals of bilateral collaboration plans. Taiwan and Japan intensively interact to solve the topics faced and identify countermeasures to adapt to the variable situations during the collaboration.

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KEYWORDS: Tokai Region, Japan, Taiwan, Taiwan-Japan Industrial Collaboration

INTRODUCTION

To promote bilateral collaboration, Taiwan and Japan signed the Taiwan-Japan Investment Security Agreement in September 2011 and the Taiwan-Japan Industrial Collaboration Bridging Plan (hereafter 2011 Bridging Plan) in December 2011. Further, the Taiwan-Japan Tax Treaty was signed and effective since 2017. The gross industrial output of Tokai region exceeds that of other Japanese areas. According to the Chubu Bureau of Economy, Trade and Industry, five prefectures in the Tokai region (Tōkai-chihō), including Aichi, Mie, Gifu, Shizuoka, and Nagano, actively exchange and cooperate with Taiwan to market their local products and tourism.

The main industrial structure of Japan is similar to Taiwan and focuses on small and medium-sized enterprises (SMEs) which are also the key companies intending to expand overseas investment. The Japanese 2012 Taiwan-Japan industrial collaboration policy places SMEs as a priority target for counselling. Successfulness of bilateral industrial collaboration constitutes an important implication for the governments and SMEs. Hence, this study takes Tokai region as an example to investigate the effects of industrial collaboration on Japan. We first investigate the background, status quo, and direction of the 2011 Bridging Plan to check the results of industrial collaboration. Then, we examine operating strategies, topics faced, and future development direction from the perspectives of Japan. Six companies in Tokai region are investigated, including Haneda & Co. Ltd., Chubu Medical Co. Ltd., Gifu Sanken Kogyo Co., Ltd., Bankyo Pharmaceutical Co. Ltd., CloudMaster Co., Ltd., and Nomura Unison Co., Ltd. Few prior studies examine the effects of industrial collaboration on Japan by interview and survey. To fill the gap of literature, this

study took an in-depth interview and questionnaire survey over four companies and questionnaire survey over two companies between 2013 and 2017.

Our findings indicate that industrial collaboration plays a complementary role of industrial advantages for Japan. Industrial collaboration matches the visions and goals of 2011 Bridging Plan, including cooperative pattern, industrial competitiveness, and expansion of oversea market. Partners of Taiwan and Japan intensively interact to solve topics faced during the collaboration. They identify countermeasures and dynamically modify them to adapt to the variable situations. Further, we find that human resources, particularly the CEO in Taiwan, plays a critical role in the success of bilateral industrial collaboration. With the results of qualitative information, this study fills the research gap and contributes knowledge to the literature of Taiwan-Japan industrial collaboration. The remaining structure of this study is organized as follows. First, we describe current state of Taiwan-Japan industrial cooperation in detail. Next, a literature review and hypothesis development are established. Then, we present the in-depth interview and survey results. In a path forward section, this study addresses how the firms, and the respective governments might move forward in a positive way. We conclude in the final section.

Current State of Taiwan-Japan Industrial Collaboration

Taiwan signed ECFA with mainland China in June 2010. Liberation of cross-strait trade and investment enhances the advantages of Taiwan to be a fortified point for export to and investment in mainland China. This advantage creates the best opportunity for Taiwan to attract foreign investors. Further, Japan is the most important trade and investment partner of Taiwan and the fourth largest export and import country in 2019. Japan ranked the number four and number one of foreign investment dollars and items in Taiwan during the 1952 to 2019 period. Japan is the largest trade deficit country of Taiwan. Taiwan expects to balance the deficit from Japan. Heavy dependence on Japanese advanced technology, precision parts and equipment produces a large long-term trade deficit. To reduce the deficit, Taiwan successively establishes incentive measures to introduce Japanese capital and technology (Ministry of Economic Affair, 2017). After ECFA, Taiwan imports from mainland China, which impacts some local industries. To reduce/mitigate the impacts and promote the transformation/upgrade of industry, Taiwanese companies cooperate with foreign companies to enhance their competitive advantages. Mainland China participated WTO in 2001. Cooperating with Taiwan, Japan has more successful cases and is more likely to expand the Chinese market, compared to collaborations with European or American countries. As a result, Taiwanese industrial collaboration policy will develop a new tendency for bilateral collaboration.

Japan encounters the operating topics of "six-fold hardship" after the 2011 Northeastern Great Earthquake. Increasing companies adjusted their business strategies in production, supply-chain and overseas investment (Lin, 2015). Japanese companies incurred the third upsurge of overseas investment in 2010. Mainland China is the first targeted area, but many failed cases appear. Japan gradually exited mainland China after anti-Japanese sentiment soared in 2012. Because of the similarity in language and living habits between Taiwan and mainland China, Japan is more likely to succeed in expanding the market of mainland China if it cooperates with Taiwan. The growth of domestic market demand slowed down due to fewer children and aging society in Japan. More companies transform their market from long-term dependence on domestic markets to Asian overseas markets. Small and medium-sized enterprises (SMEs) are on the mainstream of this wave but have less experience in overseas investment and insufficient resources. To cooperate with Taiwan is one of the shortcuts for SMEs to expand overseas markets because of the long-accumulated business resources in internationalization and globalization by Taiwan (Lin and Chen, 2020).

Japan confidently cooperates with Taiwan because it owns advantages of a complete investing environment, such as high reliability and many Japanese talents. After the global financial crisis, Japan actively pushed policies on foreign investment promotion and overseas investment assistance to revitalize its local industry. Japan aggressively held seminars and exchange conferences to promote investment, tourism, trade, and

culture in Japan. After the 2011 Northeastern Great Earthquake, local governments exchanged and cooperated with other countries to sell products, expand air route and flight bases, and promote the tourism industry (Lin and Chen, 2020). For example, five prefectures in the Tokai region take the lead in exchange and cooperate with Taiwan.

Based on the above background of industrial collaboration, Taiwan took some actions to promote the bilateral relationship and aimed at the expansion of global markets. First, Taiwan and Japan signed the Taiwan-Japan Investment Security Agreement in September 2011 and the Taiwan-Japan Industrial Collaboration Bridging Plan in December 2011(hereafter 2011 Bridging Plan). Further, a Taiwan-Japan Tax Treaty was signed and effective in the beginning of 2017. Responding to the promotion of industrial collaboration by Taiwan, Japan signed the MOU of Enhancement of Taiwan-Japan Industrial Collaboration Bridging Plan in 2012. The MOU, not limited to manufacturing or service industry, selects 11 industries as the target to jointly strengthen economic exchange in SMEs and local governments (TJPO, 2020). The policy and specific measures of 2011 Bridging Plan are as follows.

Taiwan sets the Negotiation Task Force of Taiwan-Japan Industrial Collaboration in the Executive Yuan and the Taiwan-Japan Industrial Collaboration Promotion Office (TJPO) in the Industrial Development Bureau, Ministry of Economic Affairs. TJPO is the single service counter and platform with Service Team, Project Team, and Japan Window. In addition, Taiwan sets a Japan Window in Japan for service provisions and to promote the progress of industrial collaboration. Pushing procedures include division of labor from vertical to horizontal, and from large-scaled enterprises to SMEs. Patterns of industrial collaboration are composed of business administration, R&D design, production and manufacturing, and marketing. In inception, the rewarded targets include six strategic industries, such as aero-space, semi-conductor machinery, green energy, biotechnology, digital content, and hand tool machine (International Strategic Comprehensive Special Zone New Plan, 2020). To match with the 5+2 industries promoted by Taiwan, the target industries rewarded change to digital content, green energy, information and communication technology, biotechnology, and precision machinery.

Taiwan-Japan Industrial Innovation Park (TJ Park), Tainan Technology Industrial Park, and Pin-Tung Agricultural Biotechnology Park offer the assistance of plant sites for Japan. For capital assistance, Taiwan-Japan SMEs Venture Capital Foundation was established. To cooperate in skill, production, marketing, brand name, and joint venture, SMEs were encouraged to finance from the Execution Plan for Enhancing Investment in SMEs (NT$ ten billion) and the International Cooperative Investment Project-SMEs Development Foundation (NT$ 900 million). In addition, each SMEs of Taiwan and Japan are offered an upper limit of financing guarantees of NT$ 200 million. Japanese companies establishing R&D centers and innovation research in advanced skills and products are financially supported to encourage their R&D in Taiwan. For marketing, Taiwan and Japan have common demand for developing a third market to match with Taiwanese 2016 New Southbound Policy. Bureau of Foreign Trade, Ministry of Economic Affairs, entrusts Taiwan External Trade Development Council (TAITRA) to initiate a cooperative plan to do it. TAITRA invites JETRO to jointly push the plan with a hope to match enterprises in both countries for developing a third market (Shinya 2012).

The 2011 Bridging Plan sets two visions in 2020. One is exerting the complementary industrial advantages to upgrade industrial dominant position and added value. Another is pushing resource integration and exchange in the Asia-Pacific area to create a paradigm of global innovation integration and application. Next, in terms of pushing objectives set in 2016, the 2011 Bridging Plan establishes a task force to push industrial collaboration to fully integrate all resources and to construct a perfect environment. In addition, Taiwan takes advantage of the benefits from ECFA to promote the bilateral industrial collaboration and to develop a global new market (Lin, 2018). Since 2011, Taiwan has hosted a series of seminars or workshop for local and Japanese-affiliated companies to promote the exchanges and collaboration. It includes

Promotion of the 2011 Bridging Plan, Technology Collaboration between SMEs of Taiwan and Japan, or Introduction of Investing Environment in Taiwan.

Based on the background above, Taiwan drafted the 2011 Bridging Plan in November and the Executive Yuan approved it one month later. The 2011 Bridging Plan promotes the exchanges and collaboration between Taiwan and Japan for expanding the market in mainland China with a hope to form a "golden triangle collaboration model" between Taiwan, Japan, and China. Under the 2011 Bridging Plan, Taiwan establishes an organizational pushing system to assist in capital raising, R&D, and acquisition of plant sites (Lin, 2018). To strengthen the exchanges and propaganda with Japan, TJPO signed MOU with eight Japanese local governments between 2011 and 2019, including Mie, Kagawa, Ehime, Kochi, Akita, Kagoshima, Wakayama, and Osaka. Furthermore, TJPO establishes communication channels with more than forty local units in Japan. Through conference, matchmaking, and seminars, TJPO establishes organizational connections with Taiwanese companies by use of complementary industrial advantages to closely accumulate bilateral industrial collaboration relationships. In addition, TJPO facilitates Japanese Ministry of Economy, Trade and Industry (METI) to prepare budgets to support exchanges and collaboration for local enterprises between 2013 and 2019. METI supported 32 exchanges between Japan and Taiwan, creating 2,084 business talks for 580 Taiwanese companies.

LITERATURE REVIEW, METHODOLOGY AND HYPOTHESIS DEVELOPMENT

Taiwan sighed ECFA with mainland China in 2010, enhancing its competitiveness in exports to China. Since 2011, Taiwan and Japan initiated an industrial collaboration policy. As a result, research on Taiwan-Japan industrial collaboration mushroomed after ECFA and can be classified into four types. Type one investigates the industrial collaboration incentives to companies, their experience in mainland China, and the new trend of development in Taiwan. Researchers includes Overseas Research Department of Japan External Trade Organization (2010), Nomura Research Institute (2011), Maie (2012), and Li (2012). They find Taiwanese companies have flexible decision-making processes in investment and administration, and quick market responding capabilities. Japanese companies own superior technology skill and strong brand name image. As a result, both countries benefit each other. Type two examines the industrial collaboration model and case study. Lin and Chen (2011) investigate both successful and failed cases in Taiwan. Wen and Chen (2013) illustrates three models of industrial collaboration and related cases. After Taiwanese New Southbound Policy, Li (2018) investigates the development, opportunities, and cases of Taiwan-Japan service industrial collaboration. Main findings show that 2010 ECFA lowers trade barriers between Taiwan and mainland China and enhances the competitiveness of Taiwan to expand market in China. Japan took advantage of the situation through the 2011 Bridging Plan and facilitated more successful market expanding cases in mainland China. Type three focuses on the background, status quo, topics, and performance of industrial collaboration in Taiwan. This stream of research includes Sato and Morinaga (2013), Lin (2013), Lin (2014a), Lin (2015a), Lin (2015b), Lin (2016), and Weng (2017). Their findings indicate that industrial collaboration cases grew quickly after the 2011 Bridging Plan. The main reasons behind for this growth are incentives with mutual benefits and complements for both countries.

Taiwan possesses some unique merits, such as international marketing, business administration and skill, and more Japanese talent. This fills the gap of Japanese insufficient experience in overseas investment. Japan takes Taiwan as an overseas touchstone and base for expanding to the third market. Accordingly, industrial collaboration becomes extremely active after 2011. The three types of research above focus on Taiwan to investigate the industrial collaboration. All of them examine the incentives, background, current status, topics faced, and future development from the perspectives of Taiwan. Instead, type four investigates the effects, countermeasures, and viewpoints of the industrial collaboration from the perspectives of Japan. This line of research focuses on either a region or an area to investigate the effects of industrial collaboration on Japanese central, local governments, and industries. Japanese Tokai region is a good example of areas examined by prior research. Gross industrial output in the Tokai region exceeds other areas. Five prefectures

in the region, including Aichi, Mie, Gifu, Shizuoka, and Nagano, actively exchange and cooperate with Taiwan after Japan's Northeastern Great Earthquake on 11 March 2011. More and more prior researchers investigate the five prefectures after 2011. For example, Sawada and Lin (2012) investigates the investment incentive policy and the trend of foreign companies in Tokai region.

Lin (2015a) and Lin (2016) compared the viewpoints of industrial collaboration in Mie and Achi, while Lin (2014b) and Lin(2015b) and Lin, Li and Nishinmura (2016) examine industrial collaboration between Mie and Taiwan after ECFA. Comparisons of viewpoints from Gifu and Shizuoka appear in Lin (2017a) and the countermeasures of Shizuoka to promote industrial collaboration are examines by Lin (2017b). The effects and countermeasures of collaboration policy on Gifu and Tokai region are investigated by Lin (2018a) and Lin (2018b), respectively. Focusing on the five prefectures in Tokai region, Lin and Chen (2020) compare the effects of the collaboration policy on them, their willingness to cooperate with Taiwan, and the topics they face. The above researchers find that Japanese SMEs lack overseas investment experience. In contrast, Taiwan meets their demand due to pro-Japanese attitudes, more talent in Japanese, rich experience in overseas investment, international marketing and business administration. As a result, Taiwan is the best overseas partner of Japanese SMEs. However, only six strategic industries are promoted by the 2011 Bridging Plan. Inclusion of more industries is suggested to match the industrial development policy and industrial competitiveness. This study examines six companies in Tokai region between 2013 and 2017. They are Haneda & Co. Ltd., Chubu Medical Co. Ltd., Gifu Sanken Kogyo Co., Ltd., Bankyo Pharmaceutical Co. Ltd., CloudMaster Co., Ltd., and Nomura Unison Co., Ltd. We conduct an in-depth interview and questionnaire survey of the companies. Basic information of the case companies is displayed in the Table 1.

Table 1: Fundamental Data of Six Case Companies

Companies	Haneda	Chubu	Gifu	Bankyo	Cloud Master	Unison
Industry	Merchandising	Medical equipment manufacturing	Caster manufacturing	Pharmaceutical	Information	Machine manufacturing
Partner in Taiwan	tmsuk Formosa	NanoRay	Hong-Yi	Chung Mei	TOKAI	NCT
Size (number of employees)	89	60	36	130	16	400
Year founded	1951	1950	1973	1960	2013	1954
Place founded	Nagoya	Mie	Gifu	Kobe	Shizuoka	Nagoya
Survey Time (day/month/year)	05/07/2013, 04/08/2013, 29/08/2014, 06/07/2015.	09/2015	24/07/2015, 23/08/2015.	02/2017	05/04/2017	29/08/2017
Methodology	In-person interview	Emails	In-person interview	Questionnaire survey	In-person interview	In-person interview

Note: Table 1 summarizes the information of six case companies, including the industry, partner in Taiwan, size, year founded, place founded, survey time, and methodology used.

In-depth interview is a repeated and flexible design that interviewers can modify their issues continuously during the process (Babbie 1991; Marshall and Rossman 1995). As a purposive and interactive dialogue, in-depth interview is a means and an end as well. Both the interviewers and interviewees can construct new or innovative implications in the interview (Fontana and Frey 1994; Babbie 1991). Through the in-depth interview, the interviewers acquire deep, detailed, and comprehensive information (Rubin and Rubin 1995). Entering the mindset of interviewees to comprehend their mental activities and thinking, the interviewers deeply understand the background of behavior and determinants affecting the behavior (Wimmer, Landerl, Linortner and Hummer 1991; Wimmer and Hartl 1991). Hence, the interviewers have more opportunities to capture the interviewees' viewpoints, belief, experience, and lexicons on issues (Fontana and Frey 1994). Based on the previous literature and official statistics, this study expects that industrial collaboration agrees with the pattern, competitive advantage, and Japanese aim of overseas market expansion. Further, it

complements the industrial advantages for Japan. Accordingly, this study establishes the following hypotheses.

H1: *Industrial collaboration matches the cooperative pattern, competitiveness, and expansion of Japanese oversea market.*

H2*: Industrial collaboration plays a complementary role of industrial advantages for Japan.*

IN-DEPTH INTERVIEW AND QUESTIONNAIRE SURVEY RESULTS

Haneda & Co., Ltd.

Haneda & Co., Ltd (hereafter Haneda) was set up at Nagoya in 1951 with overseas branches in Thailand, China, Indonesia, Singapore, and Taiwan (Haneda & Co., Ltd., 2020). It imports and sells domestic and foreign machinery equipment (machine and tools). Its customers include industries such as automobile, work machinery, aero-space, construction machinery, robot, and semi-conductor. Automobile manufacturing industry, in particular, is one of its major customers. Its sales amount follows the production trend of Toyota. For example, the number of cars produced by Toyota reached its peak of 422 million in 2007. Because of the 2008 global financial crisis and the 2011 Northeast Great Earthquake, the car production number in Toyota dropped to 276 million in 2011. The sales amount of Haneda was JP$ nine billion in 2008 and was substantially reduced to JP$ six billion in 2012. Haneda thus predicted that growth of domestic car production in Toyota will slow down.

We visited Haneda three times, 5 July 2013, 4 July 2015, and 6 August 2017. We also visited an affiliate of Haneda in Taiwan, tmsuk Formosa, on 29 August 2013.   All of the visiting was conducted by an in-person interview with executives of the company. Due to the slower growth of Japanese domestic car production, Haneda adjusted its operating strategy to maintain its continuous growth in businesses and revenues. It expanded business fields into automobile parts, semi-conductor manufacturing equipment, medical and nursing machine production. Accordingly, to expand business fields into medical and nursing machines, Haneda engaged in industrial collaboration with tmsuk Formosa, a company with technology in producing robots (tmsuk Formosa Company Limited, 2020). The tmsuk Formosa was established in October 2011 and its parent company has accumulated over twenty years of experience in the R&D of OEM and ODM of service robots. It invested in Indonesia in 2013 to manufacture the same robots as that of tmsuk Formosa. Eighty percent of the Indonesian robots are delivered to Japanese electric car companies.

Haneda is interested in investing Taiwan due to the following niches. Taiwan owns more talent in Japanese and production skill, higher technology in production and manufacturing, lower production cost, conducive to the development of the China market. This occurs because of the similar lifestyle between Taiwan and China and higher sense of trust in Japan. Also, Taiwan has more complete infrastructure than Southeast Asia countries. Further, the law and regulations change frequently in Southeast Asia countries which produces a secret worry for Japanese companies investing there.

When conducting joint ventures, Haneda and tmsuk Formosa have a division of their operating strategies. Haneda is responsible for capital raising and utilizes its capital from Singapore branch to invest the tmsuk Formosa. The tmsuk Formosa takes charge of the production skill, and R&D. Its authorized capital was JP$ 240 million on May 2017 and its president is Yuji Kawakubo. The tmsuk Formosa hires 12 Taiwanese employees and one Japanese employee, the president. The tmsuk Formosa takes an ODM model on the production of machinery products and the manufacturer is Taiwan Machinery Corporation. The main medical and nursing products of tmsuk Formosa include pre-hospital care robots, universal vehicle ROOEM, and dental robots DENTAROID. In 2017, it expanded business into a new product line, including ceiling-construction robots and new idea electric vehicles.

In terms of market target, the main target markets of tmsuk Formosa are Europe and USA. For example, the selling price of a universal vehicle ROOEM is JP$ five hundred thousand and a dental robot DENTAROID is JP$ twenty million. Currently, they are exported to USA, Saudi Arabia, and Thailand. From the perspectives of investing pattern and target market, H1 receives support. The industrial collaboration between Haneda and tmsuk Formosa matches the cooperative pattern, competitiveness, and expansion of overseas markets for Haneda. Haneda is good at the export and sale of machine and machinery tools. It invested in the business field of medical and nursing machines in 2011. However, Haneda does not acquaint itself with the production skill of these machines. Haneda transferred its equity holding in tmsuk Formosa to tmsuk Co., Ltd. in Japan in 2015 and held 5-10% equity of the tmsuk Co., Ltd (Tmsuk Company Limited, 2020). Haneda has no further investment in Taiwan because of the higher production cost compared to Southeast Asia. After the successful investment in Indonesia, Haneda currently engages in investment in Thailand. Because of its expertise in the sale of machinery equipment, Haneda assists tmsuk Formosa in marketing its products. The merit of Haneda is marketing and tmsuk Formosa is production. Through the industrial collaboration, both companies assist and benefit each other. Hence, H2 is supported, that is, industrial collaboration plays a complementary role of industrial advantages for Haneda.

Chubu Medical Co., Ltd.

Chubu Medical Co., Ltd (hereafter Chubu) was originally established as a medical electrical company in Yokkaichi-shi, Mie, Japan, in 1950 (Chubu Medical Co. Ltd., 2020). It was renamed as Chubu Medical Co. Ltd. in 1969. After acquiring the medical production license from Ministry of Welfare in 1994, Chubu increased its capital from original JP$ two hundred and fifty thousand to JP$ thirty million in 1995 with 36 employees. Its main businesses began from sale and maintenance of X-ray equipment and later expand to produce advanced medical machine, general diagnostic medical machine and long-term care medical machines. The Taiwanese partner of Chubu is NanoRay Biotech Co., Ltd (hereafter NanoRay) (NanoRay Biotech Co. Ltd., 2020). Established in 2007, NanoRay had authorized capital of NT$ four hundred and fifty million and 45 employees (22 in R&D department). NanoRay is a large-scaled company in terms of its authorized capital. Its production technology comes from Nanodynamics-88, Inc. Laboratory in USA. Former president of Uthe nited States National Academy of Sciences, Dr. Frederick Seitz, and the physicist, Dr. C.G. Wang established the Laboratory in 1988. NanoRay jointly develops technology with research institutions and medical or engineering colleges in Taiwan, successfully producing the first made-in-Taiwan X-ray machine. As a young company, NanoRay actively engages in R&D and won the 23rd Taiwan SMEs Innovation Award.

We interviewed Chubu by emailing the executives on September 2015 and summarize the following results. Chubu actively looks for domestic companies with the technology to apply X-ray skills to non-destructive inspections, such as quality control, foreign material detection and structure analysis. However, the searches were in vain. After 2002, both the college of biological resources and college of technology, Mie University, helped Chubu with technology.

To respond to the Taiwan-Japan industry collaboration policy promoted by Mie government and Mie University, Chubu takes part in an interchange goodwill visit hosted by Mie government. The visit is a match-making seminar, Chubu has an opportunity to cooperate with NanoRay. In contrast, NanoRay is eager for expanding overseas markets and consulted with Taiwanese Health Care and Life Science Team of Industrial Development Bureau, Ministry of Economic Affairs. Accepting suggestions from the Team, NanoRay participated in a meeting and contacted with Chubu. Since then, Chubu communicated through mail with NanoRay on 11 September and 14 December 2015. Further, Chubu visited NanoRay in October and signed an industrial MOU in December 2015. Chubu and NanoRay serve as agents for each other and sell products of counterparts in respective home countries. In terms of R&D, Chubu adopts the N-series X-ray source module of NanoRay. The module possesses some characteristics, such as: (1) a core component of non-destructive testing equipment or a customized inspection system; (2) high light-emitting efficiency,

wide light-emitting angle and low power consumption. Japanese companies are unable to produce it. As a result, their collaboration pattern is NanoRay provides technology and Chubu assembles.

The Desktop X-ray Inspection System was successfully produced by Chubu in November 2014. It has six attributes: (1) wide light-emitting angle to shorten the distance of irradiation and the largest effective sensing area (145.4 x 114.9 mm); (2) small, light and easy to move; (3) savings of over 75% power of the traditional reflection-type X-ray inspection equipment; (4) low power consumption and operational by the household AC 110V power supply; (5) high perspective and high resolution; and (6) unique transmission lighting equipment. Chubu sold the Desktop X-ray Inspection System for the first time in Japan in March 2015. Its costs about JP$11 million and its major customers are post office and official product inspection agencies. Regarding the target market of the X-ray Inspection System, Japan was the first market to be expanded, followed by Taiwan, Mainland China and Southeast Asia. NanoRay takes charge of the market expansion in areas other than Japan. The Chubu case indicates that they established a division of technology and marketing. This provides support to H1, industrial collaboration matches the cooperative pattern, competitiveness, and expansion of overseas markets between NanoRay and Chubu.

Recently, some differences and conflicts arose between Chubu and NanoRay, including language, organization culture, product specification accreditation, and mutual trust. Both companies actively took countermeasures to overcome tissues faced and establish a fiduciary relationship. For example, during the beginning of industrial collaboration, NanoRay communicated with Chubu in English by its Japanese technicians in the USA. Because of impaired verbal communication, Chubu communicates with NanoRay in Chinese by its Chinese technicians in Japan. Chinese communication goes better than English and makes the industry collaboration progress easier. In addition, both companies successfully complement advantages and disadvantages with each other, resulting in the development of a new product, Desktop X-ray Inspection System.   For future development, cost to produce the Desktop X-ray Inspection System will be 30% lower if it is manufactured in Taiwan with the same quality. Hence, it is more likely to produce in Taiwan in the future. Both companies jointly develop and manufacture industrial inspection equipment. Production of medical inspection equipment and joint marketing are in their future plans. To maintain good industrial collaboration development, both companies must foster talents with Chinese, Japanese, and English capabilities. Further, to increase the competitive advantage for both companies, talents with business administration, international trade, and R&D capabilities are also required to overcome and respond to the topics faced. In conclusion, the industrial collaboration between NanoRay and Chubu plays a complementary role of industrial advantages and supports H2.

Gifu Sanken Kogyo Co., Ltd.

Gifu Sanken Kogyo Co., Ltd (hereafter Gifu) was established in Gifu with authorized capital of JP$ two million in 1973 (Gifu Sanken Kogyo Co., Ltd., 2020). Authorized capital was substantially increased to JP$ sixty million and the number of employees was 60 in February 2019. Major businesses of Gifu include the production and sales of casters, plastic moldings, and gifts, accounting for 30%, 20% and 50% of total revenues, respectively. Gifu focused on the domestic market. Casters are extensively applied to a variety of industries and products. To maintain sustainability, Gifu and Taiwanese Hong-Yi Trading Company (hereafter Hong-Yi) established Shanghai Ukai Industrial Vehicle Co., Ltd. (hereafter Shanghai Ukai) to diversify its businesses in 2000 (Honyi Trading Co., Ltd., 2020). The parent company established a caster division to manufacture casters in 2002. Casters supported revenues of other products. The authors had an in-person interview with executives of Gifu Sanken in Japan on 24 July 2015. Following the interview, we personally visited the CEO of Hong-Yi in Taiwan on 23 August 2015. Responding to the fierce market competition, Gifu actively conducts R&D to upgrade product quality, leading to a high profitability ratio and stable sale revenues. Gifu cooperates with its long-term partner, Hong-Yi. Because of the established fiduciary relationship, both companies jointly established Shanghai Ukai in 2000. The accumulated

investment in production facilities of Shanghai Ukai was over US$ three million, an indicator of smooth and successful industrial collaboration.

In terms of the division of businesses in Shanghai Ukai, Gifu provides technical support by assigning a technician to stay in Shanghai for 2-3 years. Because Hong-Yi is familiar with the China market and application of Chinese language, Gifu does not intervene the administrative affairs. Hong-Yi takes charge of the administration and marketing businesses. Currently, Shanghai Ukai has 60 employees, 50 field operators and 10 administrative staff. The person in charge of Shanghai Ukai is the president of Hong-Yi. To manage Shanghai Ukai, he actively takes measures in marketing, technology and quality, and facilities update. As a result, profitability has risen year by year with annual sales over US $6.7 million. Annual earnings are distributed to Gifu and Hong-Yi. Both companies have recovered their contributed capital. Hong-Yi is fully responsible for marketing and development of overseas markets and hires Chinese to do the business. Gifu requires the quality of casters manufactured by the subsidiary company be equal to that of the Japanese parent company. Casters parts are from parent company. About 30% of products manufactured by Shanghai Ukai are sold back to Japan. In addition, 70% of products are sold in China and Southeast Asia. Specifically, the major customers are Japanese companies in China. Gifu provides technical supports and Hong-Yi is responsible for marketing and management which lends a support to H2: industrial collaboration plays a complementary role of industrial advantages for Gifu.

Although Shanghai Ukai turned its financial performance from deficit to positive earnings since its start-up in 2000, some operating issues remained. Weak consciousness of product quality by Chinese employees and high turnover lead to difficulties in quality control. Second, appreciation of Renminbi (CNY) and rises of labor cost and taxes in China pushed production costs up. Third, the president of Shanghai Ukai used to stay in Shanghai and Taiwan for half month. However, he reached the age of retirement and informed Gifu Sanken of his desire to appoint a new president for Shanghai Ukai. However, we expect difficulty in hiring a new president with as much experience in management and good connections as the current president. Despite the administrative issues noted, Gifu Sanken went on to expand overseas markets by preparing to invest in Vietnam and Thailand. Gifu Sanken asked an Osaka company to search for a partner with the hope of obtaining the same collaboration pattern as that of the Shanghai subsidiary. Gifu Sanken also decided to use the same pattern of venture capital as that of its Taiwanese partner. However, desired ownership is over fifty percent to obtain management power. If the market in Southeast Asia expands successfully, Gifu Sanken will adopt the consignment sale and focus on Japanese companies in the initial stage. Further, if the businesses goes well, OEM (Original Equipment Manufacturing) will be followed.

Bankyo Pharmaceutical Co., Ltd.

Bankyo Pharmaceutical Co., Ltd (hereafter Bankyo), a pharmaceutical plant for external use medicine, was established at Kobe in 1960 (Bankyo Pharmaceutical Co., Ltd., 2020). The plant was destroyed by the 1995 Great Hanshin Earthquake. It moved to Mie on November 1996 and produced skin care products. It expanded to ODM (Original Design Manufacture) in ointment, face cream, topical liquid, nasal spray and rhinitis capsules. Both soft and hard products pass the accreditation of GMP. Its registered capital was JP¥ 40 million and had 130 employees in 1960. Total revenues grew to JP¥ 2.3 billion by March 2015. Its businesses also include manufacture and sale of class II medicine and cosmetics, production of medical appliances, and the sale of medicine. Its Taiwanese partner is Chung Mei Pharmaceutical Co., Ltd (hereafter Chung Mei) established in 1936 (Chung Mei Pharmaceutical. Co., Ltd., 2020). The eighty-year-old company has expanded to a pharmaceutical group (Chung Mei Group) and is the fifth largest pharmaceutical company in Taiwan. Chung Mei obtained the 2011 National Biotechnology and Medical Care Quality Award of western medicine. It expanded business to the manufacturing of medicine, dietary supplement food and healthy food. We sent a questionnaire to Bankyo in 2017 and collected the background and history of two companies by an examination of the company websites.

Chung Mei contacted with Bankyo through the Exchange Goodwill Visit Group of Mie in 2012 (Medical Engineering Institute, Inc. 2020). President of Chung Mei, Ben-Yuan Lin, visited Bankyo through the assistance and support of Mie University and TJPO on 15 June 2015. An Industrial collaboration MOU was signed on 21 July 2015 in Taipei. The cooperative product is ointment in prefilled disposable applicators for medicine and hemorrhoids Currently, the pattern of industrial collaboration includes OEM, sale agent and expansion of sales channels. Cung Mei produces some Bankyo's products (ointment in prefilled disposable applicators) by Chung Mei. However, the collaboration of production or techniques is not yet done. It is currently considering whether to authorize Chung Mei to produce cosmetics. If implemented, collaboration of technique will be possible. In terms of marketplace, Bankyo takes Taiwan as its Asian market expansion base. Yet, Bankyo does not sell its products to Taiwan because medicine must be approved before going to market in Taiwan. It takes over one year from application to approval.

In general, medicines cannot go to market without official approval which involves many variables. The hidden uncertainties constitute a major concern of bilateral industrial collaboration. However, through collaboration, Bankyo expanded markets and understands the current situation of the medicine administration system in Taiwan, benefiting its expansion in the medical area. For development of industrial collaboration, Chung Mei desires to overcome difficulties with Bankyo. Overcoming differences in regulations between Taiwan and Japan either in the approval or mutual development of new medicine is an important step. The closeness of geography, climate, and culture between Taiwan and Japan leads to significant opportunities.

Cloud Master Co., Ltd.

Cloud Master Co., Ltd (hereafter Cloud Master) is a Taiwanese subsidiary of TOKAI Communications Corporation (hereafter TOKAI) in Shizuoka, Japan (Cloud Master Co., Ltd., 2020; TOKAI Communications Corporation, 2020). It was jointly founded by TOKAI and Taiwanese SYSCOM Computer Engineering CO. (hereafter SYSCOM) in 2013. TOKAI is a subsidiary of Tokai Holdings. The Taiwanese Ministry of Economic Affairs actively promotes the Asian Silicon Valley Project to integrate the development of software and hardware. The collaboration between TOKAI and SYSCOM meets the "5+2 Innovative Industry" plan in the Project. We had a deep in-person interview with executives of Cloud Master on 5 April 2017. After the interview, we keep in touch with Cloud Master by a series of Q&A emails. Two companies have been trade partners since 2003 and SYSCOM is the agent of TOKAI since 2011. Information technology products of TOKAI are sold on consignment with SYSCOM by the tradename of "ATHELAS" in Taiwan. Located in Shizuoka, TOKAI focuses on local markets and has less experience of overseas investment. In contrast, SYSCOM has much experience in overseas investment and has many marketing bases in China, Thailand, Vietnam, USA, and UK. Through industrial collaboration, TOKAI utilizes personal connections and sale networks established by SYSCOM to expand its overseas market. Based on the conditions above, TOKAI visited and discussed collaboration with SYSCOM on December 2011.

Both companies signed MOU in 2012 and formed the Cloud Master in 2013. TOKAI and SYSCOM individually invested 50% ownership, about JP¥ four hundred million (NT$ one hundred and thirty million), to form Cloud Master. The main businesses include information software, information processing and provision of electronic information. On May 2017, the total number of employees equaled 16, including 3 Japanese and 13 Taiwanese individuals. The President of Cloud Master is Senoo Masakatsu from TOKAI. In terms of marketing, both companies serve as agents mutually, but the target clients of Cloud Master are those of SYSCOM. In terms of production, Cloud Master further develops and sells information software or systems of TOKAI and SYSCOM, but differentiates its products from parent company. For example, SYSCOM develops a series of software systems from registration to cashier in a hospital. Cloud Master offers the soft system and service is not provided by SYSCOM.

Currently, services of Cloud Master include cloud system, medical, database, electronic transmission, and system integration. Regarding the target market, Cloud Master focuses on Taiwan and its clients are those of SYSCOM, such as banks, government agencies and hospitals. It is scheduled to expand into markets of China or Southeast Asia with SYSCOM and develop information systems to meet the demand of China. Further, Cloud Master established the Could Master Japan Co., Ltd in Tokyo. The division of businesses and target markets supports H1, industrial collaboration matches the cooperative pattern, competitiveness, and expansion of oversea market for Cloud Master. SYSCOM is a well-known company in Taiwan. Cloud Master focuses on the clients of SYSCOM. As Taiwanese companies have the image of good quality to Japanese products, this benefits the marketing of Cloud Master in Taiwan. Mutual respect and aggressive exchange of opinions between two companies turned Cloud Master from an operating loss to profit since 2016. In addition, SYSCOM and Cloud Master mutually support and exchange skills and technologies. Because of active R&D, Cloud Master won the Taiwanese 2016 System Integration Output Award and 2016 Cloud IoT Innovation Award.

TOKAI has difficulties in understanding the operating policy of Cloud Master. Being a subsidiary, Cloud Master should have consistent management style and direction with its parent company, TOKAI. Although high-level executives of the parent company understand the situation, basic-level employees still face difficulties. There is an insufficiency of talent with technology and Japanese capabilities. Cloud Master is an information selling and service company. In addition to the experts of information software and computers, talents with technology and Japanese capabilities are demanded. Third, the accounting system differs between TOKAI and Cloud Master. For example, installment sales are popular in Taiwan but lump-sum payment prevails in Japan. Faced these issues, the president of Cloud Master communicates with basic-level employees from TOKAI to ensure their understanding. Further, the demand for talent with technology and Japanese capabilities urges Cloud Master to enhance employees' Japanese capabilities. It placed advertisements of recruitment in the Taiwanese job bank. The analyses above indicate that Cloud Master actively takes the operating strategies to overcome the aforementioned business topics. As a result, its operating results turned from losses to profits. Hence, the H2 receives support because industrial collaboration plays a complementary role of industrial advantages for Cloud Master.

Nomura Unison Co., Ltd.

Nomura Co., Ltd. was established in Nagoya in 1954 (Nomura Corporation of Taiwan, 2020). It merged with Sun Seiki Co., Ltd. and was renamed Nomura Unison Co., Ltd. (hereafter Unison) at its 50th anniversary. Because of the expansion of business items and size, the company was again renamed to be the Nomura Unison Group (Nomura Unison Group, 2020). The initial registered capital of Unison was JP¥ 50 million. Sale revenues and number of employees are JP¥ 12.5 billion (entire group is JP¥ 20 billion) and 403 (entire group is 530), respectively. Its production bases, business offices and branch offices are located around the world. Manufacturing bases include five local and one oversea plants in Taiwan. Business offices have two local and one overseas location. Business expanded from material processing (precision hallow forging) and model design to the manufacturing of industrial machines and OEM, import and sale of wine, manufacturing and sale of grape wine, and production of medical machinery. Faced with an increasingly competitive market, Unison aggressively develops new technology to enhance its competitive advantage. In 2015, Unison won the Endeavour Award of Small and Medium-sized Enterprise by the Ministry of Economy, Trade and Industry in Japan. It also won the NAGOYA Award of the Manufacturing Industry in the same year. We visited and interviewed the executives of Unison on 29 August 2017. Through the in-depth interview, more valuable and implicative information is available to us.

Manufacturing cost in Taiwan were lower than that of Japan in 1980's. Unison was invited by its upstream company, KIZI, to establish Nomura Corporation of Taiwan (hereafter NCT) at the Kaohsiung Nanzi Export Processing Zone in 1987. NCT facilities were 3,300 square feet and started to sell valves. Production capacity of the Kaohsiung plant grew from 500 to 2,000 units before the Japanese bubble economy. NCT

is a Japanese sole proprietorship. The high-level executives, such as president, vice-president and general manager, are from Japan and basic-level employees are from Taiwan.

Registered capital of NCT was JP¥ 238 million and the number of employees was over 100 in September 2017. Because of active environment protection concerns, NCT won a series of awards in environment protection, such as Special Excellence Award, Outstanding Plant Award, High Distinction Award, Excellent Environmental Protection Company Award, and the 9th Environment Protection Award of the Republic of China. After establishment in 1987,

NCT actively adjusted its business products in response to the industrial structure and economy changes in Taiwan. The first adjustment was to stop the production of valve. After 1987, it became increasingly difficult to hire labor due to the rise of human capital and labor consciousness in Taiwan. Further, the affiliate company, KIZI, transferred its production base to Southeast Asia (Thailand). NCT, hence, stopped the production of valves and sold the manufacturing equipment to the Thailand plant of KIZI. Taking advantage of the opportunity, NCT transformed the production to liquid crystal equipment. Machines used to produce liquid crystal were imported from Japan. Production of liquid crystal equipment was expanded to manufacture related semi-conductor equipment, dedicated devices, and delivery equipment. Meanwhile, NCT continuously promoted international accreditations and obtained the ISO9001: 200 and ISO14001: 2004 certifications. Currently, NCT has an office in the Taipei World Trade Center.

The second adjustment was construction a plant in Taichung Processing Export Area in 2005. Expansion of related equipment for producing liquid crystal led to insufficient room for the Kaohsiung plant to accommodate the equipment. Entering into a new business area is the third adjustment. Major reasons include the: (1) increase in salaries; (2) increase in labor consciousness and increase in labor issues; (3) difficulties in personnel adjustment and deployment due to special social networks in Taiwan; (4) difficulties in recruiting employees and technicians because of competition with large-scale enterprises, and (5) an unwillingness of employees to transfer from Kaohsiung plant to Taichung plant and the uncoordinated labor force between two plants.

Faced with the operating issues noted here, NCT took the following countermeasures. First, in response to the culture, habits and customs in Taiwan, the Japanese general manager was replaced by a Taiwanese manager to facilitate efficient human resource management. Second, NCT stepped into other new business areas, such as the production of wine, automobile parts and electronic vacuum cleaners. The parent company, Unison, and a French company, Eno connection, formed Domaine de la senechaliere winery to produce and sell grape wine in 2008. As a result, NCT became the agent of Domaine de la senechaliere in 2012. Third, NCT integrated the Kaohsiung and Taichung plants in 2016. It moved the 3,300 square feet Kaohsiung plant to the 19,800 square feet Taichung plant. Kaohsiung plant sells equipment to the upstream company KIZI. One third of the employees in Kaohsiung plant were transferred to Taichung plant and the remaining un-transferred employees were introduced to other enterprises.

Unison expanded its market to Taiwan through the NCT. Responding to the industrial structure and economy changes in Taiwan, NCT adjusted its business production from valve to liquid crystal, increasing its competitiveness. Hence, H1 receives support as the industrial collaboration between Unison and NCT matches the competitiveness and expansion of overseas market of Unison. Instead of exiting Taiwan market, NCT responded to the changes in industrial structure and economic development. It took active operating strategies and countermeasures to match the local and global economy. No significant changes in the production of grape wine and B-pattern electronic vacuum cleaners were undertaken since. The company increased the output of automobile parts and materials but decreased that of liquid crystal equipment. In addition, business items quickly and flexibly responded to the demand of customers. The company plans to upgrade of product quality and the reduce of production costs.

A PATH FORWARD

The main industrial structure of Japan is similar to Taiwan and focuses on small and medium-sized enterprises (SMEs). These companies are also the key companies to expand overseas investment. The Japanese 2012 Taiwan-Japan industrial collaboration policy places SMEs as a priority target for counselling. Hence, this study takes Tokai region as an example to investigate the effects of industrial collaboration on Japan. We first investigate the background, status quo, and direction of the 2011 Bridging Plan examine industrial collaboration. Then, we examine the operating strategies, issues faced, and future development direction from the perspectives of Japan. We find that industrial collaboration plays a complementary role of industrial advantages for Japan. Industrial collaboration matches the visions and goals of the 2011 Bridging Plan, including cooperative patterns, industrial competitiveness, and expansion of overseas markets. Both Japan and Taiwan governments can take advantage of the successful experience in industrial cooperation to expand the scope of bilateral collaboration, such as in the service industry. Partners of Taiwan and Japan intensively interact to solve issues faced during the collaboration. They identified countermeasures and dynamically modified them to adapt to various situations. Further, we find that human resources, particularly the CEO in Taiwan, plays a critical role in the success of bilateral industrial collaboration. SMEs of Japan and Taiwan are strongly advised to cooperate further in more areas and fields.

CONCLUSION

After interviewing the six companies in Tokai region, we found that industrial collaboration matches the cooperative pattern, competitiveness, and expansion of Japanese overseas markets. Industrial collaboration plays a complementary role in the industrial advantages for Japan. Further, in-depth interviews indicate that motivations of Japan to cooperate with Taiwan includes maintaining existing operating scales, to expand international markets and to lower manufacturing costs. Because of insufficient experience in overseas investment and marketing, Japan takes advantages of Taiwanese specialization in multi-national business administration and marketing. Meanwhile, Taiwan and Japan promote the policy to push the opportunities of bilateral collaboration, resulting in some successful cases. We summarize our findings of the six cases in the following Table 2.

Table 2: Summary of Results

Companies	Haneda	Chubu	Gifu	Bankyo	Cloud Master	Unison
Main results	Industrial collaboration matches both sides' investing patterns and target markets. Industrial collaboration plays a complementary role of industrial advantages for Haneda.	Industrial collaboration matches both company's work division of marketing and target market and plays a complementary role of industrial advantages.	The division of businesses between Gifu and Hong-Yi corroborates that industrial collaboration enhances mutual industrial advantages.	Bankyo expands markets and understands the current situation of medicine administration systems in Taiwan. Chung Mei desires to overcome difficulties with Bankyo in the differences of regulations over new medicine between Taiwan and Japan	Industrial collaboration matches both companies work division of marketing and target market. Cloud Master actively utilized the operating strategies to change its operating results from losses to profits.	Unison expands market to Taiwan and NCT adjusts its business items from valves to liquid crystal, increasing its competitiveness.
Hypotheses supported	H1 and H2	H1 and H2	H2	None	H1 and H2	H1

Note: Table 2 presents our in-depth interview and survey results of the six case companies in Japanese Tokai region.

Small and medium-sized enterprises (SMEs) are the major targets of industrial collaboration. This property is consistent with the direction of overseas investment policy promoted by Japan to push SMEs going abroad. Most cooperative patterns are ODM (Original Design Manufacture) and sale on consignment. Joint ventures are common, leading to more win-win cases due to the infusion of bilateral capital. The target market focuses on Taiwan in the initial stage but will expand to mainland China and Southeast Asia. Industrial collaboration faces some issues because of differences in culture, institution, law and regulations, standards and language. Most difficulties are overcome as long as both countries mutually understand and resolve them with sincerity. Insufficient talent and how to foster talents are a question faced by both countries. High-level executives play a key role in sustainable development of industrial collaboration. Both Taiwan and Japan are advised to establish a management succession plan.

This study examines enterprises in the Tokai region by interview and questionnaire survey. As a foreigner, we are subject to the available time in Japan, budget limitations and social connections with companies. This limits the number of companies interviewed. Companies avoid or reserve some questions related to business secrets or core capabilities and the interviewing time with companies is a few hours. Some Japanese official statistics are not available on web pages of government agencies. Further, some information appears in hard copy or in non-government web pages. Difficulties in data collection constitute our third limitation. In addition to Tokai region, Japanese Shikoku region is an active region in promoting industrial collaboration with Taiwan. Shikoku region has four prefectures and three of them, Kagawa, Kōchi and Ehime have signed industrial collaboration MOUs with Taiwan. To examine the current state and topics of bilateral industrial collaboration is an avenue for future study. Further, comparing differences in industrial collaboration between Tokai region and Shikoku region is another fruitful and implicative research.

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CRITICAL SUCCESS FACTORS FOR BUSINESS DISTRICT OPERATIONS IN TAIWAN

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ABSTRACT

This study examined the Dakeng Business District in Taichung, Taiwan in terms of the critical success factors for business district operation. Three dimensions, namely spatial design, service quality, and marketing and promotion, and 17 evaluation criteria were used, and a simple regression analysis was performed to identify the relationship between tourist loyalty and critical success factors. The results indicated that the critical success factors used in this study can serve as a reference for the Dakeng Business District, related municipal government agencies, and scholars researching business districts and their development. In terms of academic contributions, this study developed an evaluation framework for critical success factors for the operation of business districts.

INTRODUCTION

With the effects of department stores, shopping malls, and nonstore selling, traditional stores have transformed into business district brands characterized by agglomeration and the new trend of urban tourism marketing. A business district is a nonprofit organization. Business districts value the ideals advocated by the public, and well-organized, well-managed business districts can influence public affairs and transform society.

The Dakeng Business District in Taichung, Taiwan was registered in 2003. Located at the entrance to the Dakeng Scenic Area, the Dakeng Business District was formed by combining adjacent shops and stores. It is a major rest stop in the Dakeng Scenic Area. According to survey data from the Tourism and Tourism Bureau of Taichung City Government, visitors to business district and its turnover have increased each year. Therefore, this study investigates why the Dakeng Business District remains unaffected by certain changes from the perspective of its service quality, organization, operation, management, marketing, promotion, and spatial design. This study also identifies the advantages of developing the Dakeng Business District and the critical success factors for its operation to ensure its future success.

LITERATURE REVIEW

The literature review of this study is divided into three parts, namely business districts, business management, and critical success factors, to investigate the formation of a benign system of interactions between business districts and business management. This study creates a questionnaire based on critical success factors and distributes it to consumers who frequent the Dakeng Business District during their leisure time. The responses to questionnaire are analyzed to create a weighted ranking of the critical success factors for the software and hardware of the business district. The results can serve as reference for the

development of business management models of the Dakeng Business District and other enterprises, and the literature review and data can serve as reference for future research.

Scholars have suggested that a business district is a geographical area (Huff, 1964; Qiao & Peng, 2016) comprising several main streets and neighboring areas (Geisman, 2004; Osano & Languitone, 2016; Peng et al., 2020). A business district is a geographic area in which two or more retail stores converge and consumers shop (Berman & Evans, 1995; Brooks & Young, 1996; Osoba, 2012). The geographical area of a business district houses local residents who share their shopping spaces with tourists (Snepenger et al., 2003; Furlan et al., 2019). A business district attracts the public for consumption and entertainment (Lewison, 1991). The main factor affecting the development of a business district is the ability of its stores to provide products and services that satisfy the needs of consumers in the area as well as those in neighboring areas, thereby benefitting the economy (Pearce, 2001) and promoting cultural trends and urban activity. The conglomeration of small and medium retail businesses (including certain service industries) in a certain area compounds the effect of attracting customers (Thomas & Bromley, 1995).

By synthesizing these definitions, a business district can be defined as a geographical area in which a group of shops conglomerate. In addition, business districts can be integrated into their environment to create a culture in a geographical area with a stable consumer base and potential customers with similar consumption habits, causing the business district to fulfill many roles. Business districts continue to flourish, and their impact is growing stronger. Because this study investigated a business district in Taichung City, the definition of a business district is primarily based on the Taichung City Government's definition (Autonomous Regulations of Taichung City Shopping District Management and Guidance), that is, a block formed organically or through planning that comprises clusters of various types of stores and has received the approval of the Economic Development Bureau. Scholarly discourses serve as reference for this study.

The Dakeng Business District contains hot spring restaurants, theme restaurants, specialty restaurants, traditional markets, snack bars, catering, and households, with catering as the main industry. The Dakeng area offers an abundance of natural tourist attractions and has been developed through governmental guidance and planning. In addition to its beautiful landscapes, Dakeng offers several popular dishes. The area has become a modern tourist attraction and represents a focal point for leisure and recreation in Taichung.

This section presents the factors adapted from related studies that are used to evaluate the operation and management of the Dakeng Business District and form the framework of this study. Chen and Hung (2008) indicated that organizing autonomous committees, planning public facilities, cleaning and maintaining the environment, developing identification systems, and offering guidance to stores are positively correlated with the performance of a business district (Chen & Hung, 2008, Yu et al., 2015). Hsieh (2005) demonstrated that the supervision of attractive business districts can be assessed in terms of the following: professional management and implementation of counselors, local organization and operation, commercial space design, operators in the business district, law and policy integration, administrative resource integration, and public–private collaboration and integration. Wang (2008) used four dimensions, namely natural resources, environmental facilities, management and marketing, and stakeholder participation, to evaluate the critical success factors of the Jia Xian Shopping District; the study revealed that stakeholder participation is the critical success factor and that tourist participation and satisfaction were the most crucial evaluation criteria (Wang, 2008). Yu (2010) divided the critical success factors for business district operations in Taiwan into six dimensions, namely spatial design, management, service quality, marketing and promotion, project assistance, and organization and operation, for a total of 42 critical factor indicators (Lee et al.,2010). Hsieh (2012) divided the critical success factors of the business district of Keelung Miaokou into three dimensions, namely hardware, software, and engagement of public and private organizations, for a total of 12 critical factor indicators (Hsieh, 2012). In "Identifying And Using Critical

Success Factors," Leidecker & Bruno (1984) identified the following seven methods of identifying critical success factors: (1) environmental analysis; (2) analysis of industrial structure; (3) analysis of competition; (4) analysis of dominant firms in the industry; (5) industry and business experts; (6) temporal and intuitive factors; and (7) company assessment.

This study uses the six dimensions created by Yu (2010), namely spatial design, management, service quality, marketing and promotion, project assistance, and organization and operation, to survey and analyze the stores in the Dakeng Business District and evaluate the critical success factors. This study also refers to these factors to identify organizational needs and create future plans. The analysis is focused on the critical success factors of business district management; such factors indicate the competitiveness of a business district and must be identified for proper management and development. Five dimensions relevant to the Dakeng Business District are used, namely spatial design, service quality, marketing and promotion, customer satisfaction, and customer loyalty.

DATA AND METHODOLOGY

This study develops hypotheses through statistical analysis and empirically analyzes the hypotheses by designing and distributing a questionnaire. The questionnaire is based on the variables affecting the critical success factors of the business district summarized in Section 2. The questionnaire is used to collect statistical data, which serve as the basis for the subsequent empirical analysis.

Research Framework and Hypotheses

The literature review is used to identify the critical success factors for business district operations, and the weights of the factors are then determined. This study then identifies the participants and research tools and proposes a framework based on the questionnaire and a regression analysis to accomplish the research objectives.

The questionnaire serves as the basis of the investigation. The results of the questionnaire are summarized to determine the critical success factors of the Dakeng Business District, and the business district is analyzed using a weighted ranking of the critical success factors to provide reference for companies and develop innovative marketing models. Questionnaires are used by researchers to gather objective data. Properly designed questionnaires allow the data to be standardized, which facilitates subsequent analysis and comparisons and increases the accuracy of the analysis.

This study proposes the following hypotheses:

(1) H_1: Tourists' enjoyment of the spatial design of the district is significantly and positively correlated with loyalty.

(2) H_2: Tourists' enjoyment of the service quality of the district is significantly and positively correlated with loyalty.

(3) H_3: Tourists' enjoyment of the marketing and promotion of the district is significantly and positively correlated with loyalty.

(4) H_4: Tourists' satisfaction is significantly and positively correlated with loyalty.

Participants

The expert questionnaire is distributed to operators in the Dakeng Business District, the public sector, academia, and the team implementing the counseling project. The consumer questionnaire is distributed to consumers who have visited Dakeng for leisure or walking tours.

Questionnaire Design

The questionnaire in this study is based on the literature. The official version of the questionnaire is distributed, and the returned questionnaires are submitted for statistical analysis. The research procedure is as follows:

Step 1: Four main evaluation dimensions and 20 secondary evaluation factors are extracted from the literature review and used as the contents of the questionnaire. In the first stage, a total of 20 expert questionnaires are issued to industrialists, experts, and scholars. The questions are scored on a scale from 1 to 5.

Step 2: A total of 300 consumer questionnaires are issued to consumers who have been to the Dakeng Business District for leisure or walking tours. The questions are scored on a scale from 1 to 5.

RESULTS

This chapter is divided into four sections. The first section presents the sample analysis of the respondents' personal data and consumption behavior. The second section describes the reliability analysis of the critical success factors of business district operations, customer satisfaction, and customer loyalty. The third section presents the analysis of the validity of the critical success factors. The fourth section presents the descriptive statistics–based analysis. The fifth section presents the correlation analysis and the regression analysis.

Sample Structural Analysis

The participants are individuals who have been to the Dakeng Business District. The questionnaires are issued between March 10 and April 15. A pretest is administered from March 10 to March 15, and a total of 30 responses are collected. The reliability and validity analyses confirm that the pretest can be used as the official questionnaire. The formal test is conducted from March 16 to April 15, and an online questionnaire is issued using a Google form. The respondents are recruited using snowball sampling. During the survey period, a total of 300 questionnaires are collected, and 20 invalid questionnaires with incomplete answers are excluded. A total of 280 valid questionnaires are returned, and the valid response rate is 93.3% (Table 1). The equation is as follows.

$$Loyalty = \alpha + \beta\_1 (Spatial\ Design) + \beta\_2 (Service\ Quality) \beta\_3 (Marketing\ and\ Promotion) + \beta\_4 (Satisfication) \tag{1}$$

Table 1: Overview of Returned Questionnaires

Item	Count
Number of returned questionnaires	300
Number of invalid questionnaires	20
Number of valid questionnaires	280
Valid response rate	93.3%

This shows the number of returned questionnaires and valid respond rate.

Demographic Data

Among the 280 participants, men (57.5%) outnumber women (42.5%); the majority are aged between 45 and 54 years, accounting for 37.1%, and the smallest age group is those aged between 15 and 24 years (n = 1), accounting for 5.36%. In terms of education, 235 participants (Table 2) hold a bachelor's degree or higher, constituting the highest percentage (83.9%). A total of 203 participants are married (Table 2), accounting for 72.5%. In terms of occupation, 196 participants are merchants, constituting the highest percentage (70%); 127 participants have an average monthly income of more than NT$100,000, constituting the highest percentage (45.4%). In terms of residence, 258 participants live in Taichung City, constituting the highest percentage (92.14%).

In terms of frequency of visits, 50 participants visit the Dakeng Business District at least once a month, constituting the highest percentage (17.9%). In terms of time of visit, 95 participants visit from 8:00 a.m. to 12:00 a.m., constituting the highest percentage (33.9 %); 90 participants visit from 12:00 a.m. to 4:00 p.m., accounting for 32.1%; and 37 participants visit from 6:00 p.m. to 8:00 p.m., constituting the lowest percentage (13.2%). In terms of mode of transportation, 12 participants walk, accounting for 4.29%; 3 participants bike, accounting for 1.07%; 29 participants ride motorcycles, accounting for 10.4%; 231 participants drive their cars, constituting the highest percentage (82.5%); 1 participant takes public transportation, constituting the smallest percentage (0.4%); and 4 participants travel by other means, accounting for 1.43%. In terms of duration of visit, 249 participants stay for half a day (Table 2), constituting the highest percentage (88.9%), 25 participants stay for 1 day, accounting for 8.9%; and 6 participants stay for more than 2 days, constituting the lowest percentage (2.1%) (Table 2).

Spatial Design

Two statistical values, namely adjusted item-total correlation and Cronbach's α, are used to identify the items that increase the internal consistency (Cronbach's α) when removed. Regarding the adjusted item-total correlation, correlation coefficients were all of great value, indicating that the six items of this dimension need not be removed. When each item is removed, Cronbach's α remains <0.896, indicating that removing any of the items does not affect the overall reliability of this dimension (Table 3).

Service Quality

Cronbach's α for the service quality dimension is 0.896 (Table 3), indicating high reliability. In terms of adjusted item-total correlation, the correlation coefficients indicate that none of five items of this dimension should be removed. When each item is removed, Cronbach's α remains <0.896, indicating that removing any of the items does not affect the overall reliability of this dimension.

Marketing and Promotion

Cronbach's α for the marketing and promotion dimension is 0.921 (Table 3). In terms of the adjusted item-total correlation, the correlation coefficients indicate that none of the seven items of this dimension should be removed. When each item is removed, Cronbach's α remains <0.921, indicating that removing any of the items does not affect the overall reliability of this dimension.

Satisfaction

Cronbach's α for the satisfaction dimension is 0.919 (Table 3), indicating high reliability. In terms of the adjusted item-total correlation, the correlation coefficients indicate that none of the six items of this dimension should be removed. When each item is removed, Cronbach's α remains <0.919, indicating that removing any of the items does not affect the overall reliability of this dimension.

Loyalty

Cronbach's α for the loyalty dimension is 0.876 (Table 3), indicating high reliability. In terms of the adjusted item-total correlation, the correlation coefficients indicate that none of the five items of this dimension should be removed. When each item is removed, Cronbach's α remains <0.876, indicating that removing any of the items does not affect the overall reliability of this dimension.

Table 2: Frequency Distribution of Basic Demographic Data

Variable	Category	Frequency	Percentage	Cumulative Percentage
Sex	Female	119	42.5	42.5
	Male	161	57.5	100.0
Age	15–24 years old	15	5.4	5.4
	25–34 years old	25	8.9	14.3
	35–44 years old	57	20.4	34.6
	45–54 years old	104	37.1	71.8
	55–64 years old	66	23.6	95.4
	65 years old and older	13	4.6	100.0
Education	Junior high school	1	0.4	0.4
	Senior (or vocational) high school	31	11.1	11.4
	Junior college	13	4.6	16.1
	College	90	32.1	48.2
	Graduate school and higher	145	51.8	100.0
Marital status	Unmarried	77	27.5	27.5
	Married	203	72.5	100.0
Occupation	Soldier	1	0.4	0.4
	Government employee	10	3.6	3.9
	Teacher	5	1.8	5.7
	Merchant	196	70.0	75.7
	Farmer	5	1.8	77.5
	Student	13	4.6	82.1
	Worker	13	4.6	86.8
	Medical professional	5	1.8	88.6
	Legal professional	3	1.1	89.6
	Others	29	10.4	100.0

Table 2: Frequency Distribution of Basic Demographic Data (Continued)

Variable	Category	Frequency	Percentage	Cumulative Percentage
Monthly income	No income	1	0.4	0.4
	Less than NT$20,000	13	4.6	5.0
	NT$20,000–30,000	10	3.6	8.6
	NT$30,000–50,000	40	14.3	22.9
	NT$50,000–70,000	48	17.1	40.0
	NT$70,000–100,0000	41	14.6	54.6
	More than NT$100,000	127	45.4	100.0
Residence	Taichung City	258	92.1	92.1
	Outside Taichung City	22	7.9	100.0
Frequency of visits	At least once every week	48	17.1	17.1
	At least once every 2 weeks	30	10.7	27.9
	At least once every month	50	17.9	45.7
	At least once every 3 months	49	17.5	63.2
	At least once every 6 months	47	16.8	80.0
	At least once every year	41	14.6	94.6
	Others	15	5.4	100.0
Time of visit	8:00 a.m. to 12:00 a.m.	95	33.9	33.9
	12:00 p.m. to 4:00 p.m.	90	32.1	66.1
	4:00 p.m. to 6:00 p.m.	58	20.7	86.8
	6:00 p.m. to 8:00 p.m.	37	13.2	100.0
Mode of transportation	Walk	12	4.3	4.3
	Bike	3	1.1	5.4
	Motorcycle	29	10.4	15.7
	Personal car	231	82.5	98.2
	Public transportation	1	0.4	98.6
	Other	4	1.4	100.0
Duration of visit	Half day	249	88.9	88.9
	Full day	25	8.9	97.9
	2 days or more	6	2.1	100.0
Total		280	100.0	

This table shows the basic demographic data. The first column reports the collected variables. the second column reports the categories of each variable. Frequency, percentage, and cumulative percentage are shown in the third to fifth column.

Table 3: Reliability Analysis

Dimension	Item	Adjusted Item-Total Correlation	Cronbach's α When Item Is Removed
Spatial design	Overall layout of pedestrian zone	0.781	0.864
	Comfort of walking in the pedestrian zone	0.786	0.863
	Characteristics of stores and culture	0.747	0.872
	Overall cleanliness	0.683	0.886
	Atmospheric lighting at night	0.727	0.877
Cronbach's α		0.896	
Service quality	Stores' prices are open and transparent	0.715	0.879
	Stores' overall product quality is excellent	0.793	0.863
	Overall environment is safe	0.765	0.868
	Staff are knowledgeable and well mannered	0.802	0.860
	Staff voluntarily assist customers	0.656	0.894
Cronbach's α		0.896	
Marketing and promotion	Signage system in the tourist attractions is detailed	0.727	0.912
	Guide services are available at tourist attractions	0.739	0.910
	Guidebooks are available	0.722	0.912
	Information related to the Dakeng Business District can be found on the internet	0.662	0.918
	The Dakeng Business District appears often in media and advertisements	0.792	0.905
	Promotional materials about related activities are available	0.840	0.900
	Promotional materials about local events are available	0.804	0.904
Cronbach's α		0.921	
Satisfaction	Convenient parking is available	0.706	0.913
	Several hiking trails are available	0.713	0.912
	Pedestrian walking lanes are provided	0.802	0.900
	Store signs are well designed	0.794	0.901
	Convenient public toilets are available	0.809	0.899
	The district contains a large recreational area	0.795	0.901
Cronbach's α		0.919	
Loyalty	I would recommend the Dakeng Business District to relatives and friends	0.809	0.811
	I will visit the Dakeng Business District again	0.768	0.830
	I would like to participate in promotional activities	0.759	0.830
	The experience exceeded my expectations	0.622	0.819
Cronbach's α		0.876	

This table shows the reliability test for the questionnaires. The study proposes four hypotheses. The first column reports the testing hypothesis (dimension). The second column reports the designed questions for each dimension.

Validity Analysis

Validity refers to whether a tool can accurately measure what the researcher intends to measure. This study performs factor analysis to test the construct validity of the critical success factors scale. Construct validity

is divided into two types: convergence validity and discriminant validity. The greater the factor loading of an item in its own dimension (>0.5 is the general standard), the higher the convergence validity. The smaller the factor loading for an item outside its own dimension (<0.5 is the general standard), the higher the discriminative validity.

The factor loadings of the items pertaining to the dimensions of the critical success factors are >0.5, indicating that the items have convergent validity. The cumulative variance is 71.06%, indicating that the sample data from the questionnaire have a certain level of validity (Table 4).

Table 4: Validity Analysis

Dimension	Item	Factor Loading	Explained Variance
Spatial design	Overall layout of the pedestrian zone	0.852	27.17%
	Comfort of walking in the pedestrian zone	0.837	
	Characteristics of stores and culture	0.668	
	Overall cleanliness	0.540	
	Atmospheric lighting at night	0.727	
Service quality	Stores' prices are open and transparent	0.779	23.96%
	Stores' overall product quality is excellent	0.831	
	Overall environment is safe	0.746	
	Staff are knowledgeable and well mannered	0.776	
	Staff voluntarily assist customers	0.616	
Marketing and promotion	Signage system in the tourist attractions is detailed	0.673	19.92%
	Guide services are available at tourist attractions	0.699	
	Guidebooks are available	0.765	
	Information related to the Dakeng Business District can be found on the internet	0.657	
Marketing and promotion	The Dakeng Business District appears often in media and advertisements	0.840	
	Promotional materials about related activities are available	0.838	
	Promotional materials about local events are available	0.764	
Cumulative explained variance		71.06%	

This table shows the validity analysis. The first column reports the testing hypothesis (dimension). The second column reports the designed questions for each dimension.

Descriptive Statistics–Based Analysis

Three dimensions of the critical success factors, namely spatial design, service quality, and marketing and promotion, are used to measure the participants' satisfaction and loyalty.

The critical success factors in the spatial design dimension are "overall layout of the pedestrian zone," "comfort of walking in pedestrian zone," "characteristics of stores and culture," "overall cleanliness," and "atmospheric lighting at night." The participants' responses indicate that "overall cleanliness" (mean: 3.493) ranks first, "characteristics of stores and culture" (mean: 3.482) ranks second, and "overall layout of the pedestrian zone" (mean: 3.475) ranks third (Table 5).

Table 5: Means of Critical Success Factors in Spatial Design Dimension

Factor	Mean	Standard Deviation	Rank
Overall layout of pedestrian zone	3.475	0.8161	3
Comfort of walking in the pedestrian zone	3.357	0.8215	4
Characteristics of stores and culture	3.482	0.7758	2
Overall cleanliness	3.493	0.6981	1
Atmospheric lighting at night	3.350	0.8289	5

This table shows the values of mean and standard deviation for H1(Spatial Design). The last column is the rank of mean value.

The critical success factors in the service quality dimension are "stores' prices are open and transparent," "stores' overall product quality is excellent," "overall environment is safe," "staff are knowledgeable and well mannered," and "staff voluntarily assist customers." "Stores' prices are open and transparent" (mean: 3.893) ranks first, "staff voluntarily assist customers" (mean: 3.750) ranks second, and "staff are knowledgeable and well mannered" (mean: 3.718) ranks third (Table 6).

Table 6: Means of Critical Success Factors in Service Quality Dimension

Factor	Mean	Standard Deviation	Rank
Stores' prices are open and transparent	3.839	0.6872	1
Stores' overall product quality is excellent	3.714	0.6589	4
Overall environment is safe	3.714	0.7113	4
Staff are knowledgeable and well mannered	3.718	0.7252	3
Staff voluntarily assist customers	3.750	0.7632	2

This table shows the values of mean and standard deviation for H2(Service Quality). The last column is the rank of mean value.

The critical success factors in the marketing and promotion dimension are "signage system in the tourist attractions is detailed," "guide services are available at tourist attractions," "guidebooks are available," "information related to the Dakeng Business District can be found on the internet," "the Dakeng Business District appears often in media and advertisements," "promotional materials about related activities are available," and "promotional materials about local events are available." The participants' responses indicate that "information related to the Dakeng Business District can be found on the internet" (mean: 3.789) ranks first, "signage system in the tourist attractions is detailed" (mean: 3.629) ranks second, "relevant guidebooks are available" (mean: 3.718) ranks third, and "the Dakeng Business District appears often in media and advertisements" (mean: 3.368) ranks last (Table 7).

Table 7: Means of Critical Success Factors in Marketing and Promotion Dimension

Factor	Mean	Standard Deviation	Rank
Signage system in the tourist attractions is detailed	3.629	0.6862	2
Guide services are available at tourist attractions	3.536	0.7844	3
Guidebooks are available	3.429	0.8351	6
Information related to the Dakeng Business District can be found on the internet	3.789	0.7491	1
The Dakeng Business District appears often in media and advertisements	3.368	0.8699	7
Promotional materials about related activities are available	3.471	0.8334	4
Promotional materials about local events are available	3.450	0.8494	5

This table shows the values of mean and standard deviation for H3(Marketing and Promotion). The last column is the rank of mean value.

In terms of the critical success factors in the satisfaction dimension, "several hiking trails are available" (mean: 3.704) ranks first, "the district contains a large recreational area" (mean: 3.529) ranks second, "store signs are well designed" (mean: 3.479) ranks third, and "convenient public toilets are available" (mean: 3.30) ranks last (Table 8).

Table 8: Means of Factors in Satisfaction Dimension

Factor	Mean	Standard Deviation	Rank
Convenient parking is available	3.339	0.8774	5
Several hiking trails are available	3.704	0.8475	1
Pedestrian walking lanes are provided	3.468	0.8461	4
Store signs are well designed	3.479	0.8590	3
Convenient public toilets are available	3.300	0.8609	6
The district contains a large recreational area	3.529	0.8546	2

This table shows the values of mean and standard deviation for H4(Satisfaction). The last column is the rank of mean value.

In terms of the critical success factors in the loyalty dimension, "I will visit the Dakeng Business District again" (mean: 3.939) ranks first, "I would recommend the Dakeng Business District to relatives and friends" (mean: 3.825) ranks second, and "I would like to participate in promotional activities" (mean: 3.782) ranks third (Table 9).

Table 9: Means of Factors in Loyalty Dimension

Factor	Mean	Standard Deviation	Number
I would recommend the Dakeng Business District to relatives and friends	3.825	0.7145	2
I will visit the Dakeng Business District again	3.939	0.6666	1
I would like to participate in promotional activities	3.782	0.7422	3
The experience exceeded my expectations	3.525	0.8248	4

This table shows the values of mean and standard deviation for the Loyalty dimension. The last column is the rank of mean value.

Correlation Analysis

An analysis based on the Pearson correlation coefficient is performed to determine the relationship among the participants' loyalty, the three dimensions of the critical success factors, and satisfaction. Pearson's r ranges from −1 to 1, and a Perason's r greater than 0 indicates a positive correlation between two variables; a Pearson's r value less than 0 indicates a negative correlation between two variables. Table 10 presents the correlation analysis of loyalty, spatial design, service quality, marketing and promotion, and satisfaction.

The correlation coefficients among the variables are all positive and >0.5, indicating a moderate to strong positive correlation among the variables.

Table 10: Correlation Analysis

	Loyalty	Spatial Design	Service Quality	Marketing and Promotion	Satisfaction
Loyalty	1				
Spatial design	0.623	1			
Service quality	0.650	0.684	1		
Marketing and promotion	0.662	0.618	0.650	1	
Satisfaction	0.655	0.635	0.548	0.702	1

This table shows the correlation analysis of variables. The values in the table represent Pearson correlation coefficient.

Regression Analysis

Loyalty is a key factor for the sustainable operations of a business district. This study performs a regression analysis to explore the relationships between the three dimensions of critical success and satisfaction and loyalty. Table 11 presents the estimation results; the adjusted R^2 value is 0.573. The variance inflation factor of the independent variables (spatial design, service quality, marketing and promotion, and satisfaction) are all <10, indicating no problems of collinearity among these independent variables. The estimated coefficients of spatial design, service quality, marketing and promotion, and satisfaction are all positive and significantly greater than 0, indicating that the participants' enjoyment of the spatial design of the district has a significant positive correlation with loyalty; therefore, H1 is supported. The participants' enjoyment of the service quality of the district has a significant positive correlation with loyalty; therefore, H2 is supported. The participants' enjoyment of the marketing and promotion of the district has a significant positive correlation with loyalty; therefore, H3 is supported.

The participants' enjoyment of the critical success factors exhibits a significant positive correlation with loyalty. The higher their level of enjoyment of the critical success factors, the stronger the loyalty; the lower their level of enjoyment, the weaker the loyalty. In terms of the standardization coefficients, the effect of service quality is the strongest among the three dimensions, followed by that of marketing and promotion, and that of spatial design is the weakest. Satisfaction also exhibits a significant positive effect on loyalty. Therefore, H4 is supported, with a standardized coefficient of 0.274, which is the largest value among the four variables, indicating that the effect of satisfaction on loyalty is the strongest.

Table 11: Estimated Coefficients of Loyalty Regression Model

Variable	Unstandardized Coefficient		Standardized Coefficient	Significance		Collinearity Statistic	
	B	Standard Deviation	β	T	P	Tolerance	Variance Inflation Factor
Constant	2.829	0.658		4.299	0.000***		
Spatial design	0.101	0.045	0.133	2.227	0.027**	0.430	2.323
Service quality	0.229	0.049	0.271	4.638	0.000***	0.449	2.228
Marketing and promotion	0.137	0.040	0.212	3.436	0.001**	0.402	2.488
Satisfaction	0.159	0.034	0.274	4.643	0.000***	0.441	2.266
$\overline{R^2}$				0.573			

This table shows the result of regression analysis. The P value in each cell is the t-statistic. ***, ** and * indicate significance at the 1, 5 and 10 percent levels respectively.

CONCLUDING COMMENTS

The continuous elevation of living standards has caused rapid changes in lifestyle, business, and tourism. Therefore, the critical success factors for the sustainable development of business districts and the prosperity of the local economy must be identified. This section presents the conclusions of this study as well as suggestions.

This study examines the critical success factors for the operations of the Dakeng Business District from the perspective of tourism and analyzes their relationship with tourist loyalty. The participants are tourists who have visited the Dakeng Business District. A questionnaire is distributed as a Google form, and snowball sampling is used to recruit the participants. A total of 300 questionnaires are returned, 280 of which are valid. The reliability and validity analyses confirm that the items on the questionnaire have sufficient credibility and consistency to measure the critical success factors. The data from the questionnaire are submitted to a descriptive statistics–based analysis and a regression analysis. The findings are summarized as follows:

The participants are mostly male (57.5%). In terms of age distribution, the majority are aged between 45 and 64 years (60.1%). In terms of education, the majority have bachelor's degree or higher (83.8%). A total of 72% of the participants are married. In terms of occupation, the majority are merchants (70%), followed by other (10.36%). The average monthly income of the participants is over NT$70,000 (59.9%). A total of 92% of the participants live in Taichung City. In terms of the frequency of visits to Dakeng, the majority visit at least once every month (17.86%), followed by at least once every 3 months (17.5%) and at least once every week (17.14%). In terms of the time of the visit, the majority visit in the morning (33.93%). In terms of modes of transportation, the majority drive cars (82.5%). In terms of duration of visit, the majority stay for half a day (88.93%).

The Cronbach's α values for three dimensions, namely the spatial design, service quality, and marketing and promotion, indicate high reliability, suggesting that the critical success factors have good consistency and stability. In terms of validity, the construction validity of the critical success factor scale is tested through a factor analysis. The results indicate that the factor loadings of each item of the dimensions are >0.5, indicating convergent validity. The cumulative variance is 71.06%, indicating a certain degree of validity for the data from the questionnaire.

In terms of the critical success factors for business district operation, from the perspective of tourists, "overall cleanliness" is the most crucial factor in the spatial design dimension, followed by "store characteristics and culture" and "overall layout of the pedestrian zone." In terms of the service quality dimension, "stores' prices are open and transparent" is the most crucial factor, followed by "staff voluntarily assist customers" and "staff are knowledgeable and well mannered." As for the marketing and promotion dimension, "information related to the Dakeng Business District can be found on the internet" is the most crucial factor, followed by "signage system in the tourist attractions is detailed" and "guidebooks are available."

The regression analysis reveals that the three dimensions significantly and positively affect tourist loyalty; thus, H1, H2, and H3 are supported (Table 12). The standardized coefficients indicate that the effect of service quality on loyalty is the strongest, followed by that of marketing and promotion and that of spatial design. Satisfaction is significantly and positively correlated with loyalty; thus, H4 is supported.

Table 12: Research Hypothesis Verification Results

Hypothesis	Result
H1: Tourists' enjoyment of the spatial design of the district is significantly and positively correlated with loyalty.	Supported
H2: Tourists' enjoyment of the service quality of the district is significantly and positively correlated with loyalty.	Supported
H3: Tourists' enjoyment of the marketing and promotion of the district is significantly and positively correlated with loyalty.	Supported
H4: Tourists' satisfaction is significantly and positively correlated with loyalty.	Supported

This table shows the result of Research Hypothesis. The second column reports four supported hypotheses.

Because of the well-known Dakeng Trail near the Dakeng Business District, the majority of tourists visiting the business district are aged between 45 and 64 years. Prioritizing lifestyles of health and sustainability represents a potential direction to develop the Dakeng Business District into a location suitable for senior citizens. This approach can be implemented to address Taiwan's aging society and the business opportunities it entails.

According to the analysis of the critical success factors, tourists highly value information related to the district, the knowledge of the staff in its stores, and the services they provide. Therefore, the sustainable development of the Dakeng Business District depends on the enhancement and improvement of these three aspects.

In response to the transformation of domestic tourism, the Dakeng Business District can assume the role of a destination marketing organization, linking Dakeng with distinctive cultural and tourist attractions in neighboring areas to form a sightseeing corridor. The influx of tourists can fortify the consumer base of the Dakeng Business District, expand its commercial niche, and drive the overall development of Dakeng.

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BIOGRAPHY

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WEB3, HEGEMONY AND ANONYMITY: THE TRANSNATIONAL SOCIAL IDENTITY DYNAMICS OF GLOBALIZED NATIONAL POLITICAL ECONOMIC INTERDEPENDENCY

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ABSTRACT

This paper highlights that hegemony has its foundation in the authority of the nation state, manifested clearly in the community value consensually affirmed in the value of fiat currency. State authority permits the potential for the existence of the so-called rule of law, both in its explicit legal forms and in its habitual patterns of behavior on the basis of mutual expectations. State regulation in enforcing property rights is critical for the real functioning of markets the outcomes of which functionally reaffirm state authority. This reaffirmation emerges both by reinforcing its material resources and also by seeking exceptions that exploit state authority while circumventing transparency. The release of the Panama, Paradise and Pandora papers reveal the arena of technically, typically legal financial market transactions. Yet they appear to violate commonly, habitually held normative assumptions in national communities, particularly in so-called developed societies. The reaction of many participants in these lightly regulated and even criminal endeavors is to challenge the legitimacy of the state authority that attempts to impose these obligations. The value of Web3 blockchains includes anonymity as a reactionary resistance to this state authority and hegemony. Cryptocurrencies are dialectical creations of national rule of law in the interstate system.

INTRODUCTION

Persson and Povitkina (2017) analyze natural disaster preparedness and prevention as a public good. They acknowledge that in economics, so-called pure public goods are benefits from which no community members may be excluded. The benefit by one community member actor via the provided public good does not decrease provision of the good to the other community members, i.e., a public good is nonexcludable and non-rivalrous. The Covid-19 pandemic is a vast natural disaster. Public policy limiting the total costs of societal political, economic, psychological disruption in response to this public health crisis can be conceptualized as a public good. "Coping with natural disasters is one of the key functions of the state as a part of its task to provide security to its citizens. […] [G]overnments' ability to implement vulnerability reduction policies and their capacity to deliver public goods and services to all entitled recipients are also crucial for developing disaster preparedness" [*sic*] (Persson and Povitkina, 2017, 833-834). American internal political polarization regarding the necessity of Covid-19 vaccination mandates has been evident (Zhang et al., 2021). It illustrates that the effective provision of public goods, i.e., the so-called capacity to deliver them, ultimately depends upon the polity's subjective prevailing views of government policy. This prevailing view functionally holds that the state authorities are promoting the public welfare through the identified policy. American political polarization intensified in reaction to the US authorities' imposition with Covid-19 public health protection mandates (Prinski and Holyoak, 2022).

"The [US] government handling of the pandemic was heavily impacted by the feedback loops between the political polarization, media influence, systemic barriers, and pandemic fatigue" (Geisterfer-Black et al., 2022, 155). Provision of public goods is functionally synonymous with the public granting both the authorities, and the policy making process outputs they oversee, legitimacy.

Some policy obligations of the state authorities are less controversial than others. For example, comparatively fewer polity citizens reject the authorities' claim that the state in the form of the government should provide for the common defense against foreign threats. National security is a public good from which all citizens are perceived as benefitting, even while the cost of providing it may be unevenly distributed. Creation of public goods includes establishing and promoting the emergence of prevailing views and attitudinal beliefs. According to this collective cognition perspective, societal provision of universal access to identified resources in the form of government policy is part of essential national infrastructure. For example, US political figures have promoted US universal access to childcare services as "family infrastructure" while highlighting idiosyncratic American policy legitimation challenges (Cass, 2021). Elite commentary on the Warren and Sanders US presidential campaigns on the eve of the Covid-19 pandemic crisis noted that the FDR administration established a national network of childcare centers. Utilizing funds from "wartime infrastructure" legislation, it encouraged women to enter the wartime crisis labor force (Covert, 2020, para. 5). The Truman administration shut down the program after the Japanese surrender, but the concept continued to circulate leading to the Congress passing national legislation that the Nixon administration vetoed in 1971. Prominent US Congress members advocating the institutionalization of a national US childcare program point to the US military's childcare provision system for uniformed personnel as a "model" (Gupta, 2021, para. 8).

This cognitive perspective reflects the essential nature of institutions as consisting of actor roles and behavioral rules. They exist in the social perceptions and attitudinal beliefs and expectations held among societal actors. Public goods are national policy institutional infrastructure which the public has internalized as legitimate that societal actors utilize to seek social mobility and to engage in social creativity. Examples include public education provision. In so-called developed nation states, the authorities to whom the modal citizenry functionally grants representative legitimacy acquire additional capacity to generate influence over citizens' minds and actions. They utilize appeals to institutionalized stereotypes of achievement status ideals to legitimate policies, i.e., the engage in paternalistic "nudging" of the citizenry (Machan, 2016, 161). Threats of authority coercion do not end but they become tertiary. In Weberian ideal-typical, so-called developed nation states, the authorities are hegemonic. The modal citizenry functionally grants, if not necessarily consciously acknowledges, that the authorities have the moral and ethical right to be the authorities. They regulate the institutions for managing social identity creation and evolution.

Figure 1 shows the basic principles of social identity theory. Social identity theory underlines processes of societal change in terms of perceptions, attitudes and values of self and other amidst social interaction. Social identity theory is the theoretical foundation for the analysis in the paper. It highlights the significance of human in-group vs. out-group formation as actors strive via social interaction to satisfy their evolving motivations and needs. These needs include positive self-esteem through identity affirmation. In response to a negative comparison of one's self-identity in-group with a relevant out-group, the individual perceiver manages their social identity through management strategies. They include 1) competing with the out-group, i.e., social competition; 2) attempting to join the superior out-group if feasible, i.e., social mobility, and 3) reevaluating the in-group along alternative criteria, i.e., social creativity.

Figure 1: "Social Identity Definition"
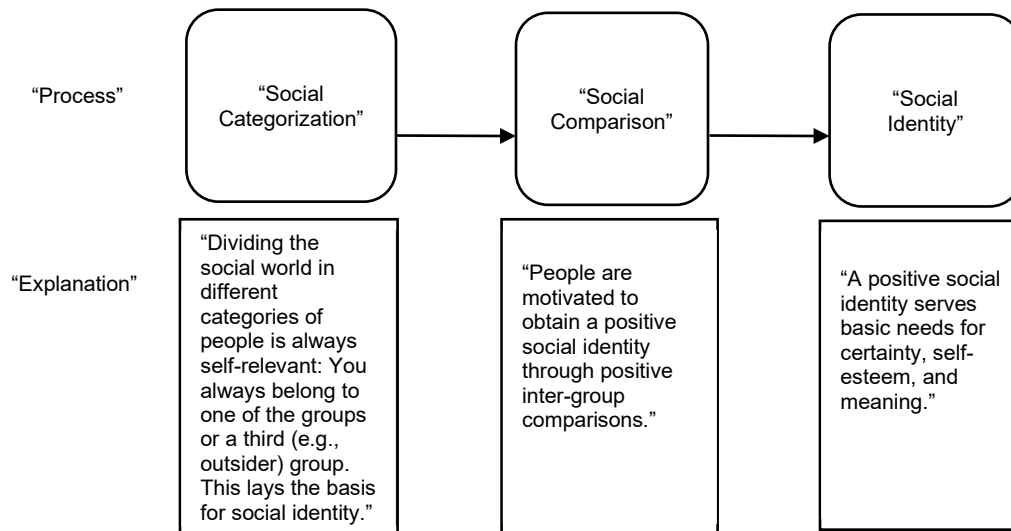
"Social identity theory's foundational motivational principles are that 1) an innate drive of the individual is to maintain a positive self-image, 2) individuals form ingroups versus outgroups, 3) individuals comparatively evaluate the social status of their ingroups with salient outgroups, 4) individuals tend to equate the comparative status of their ingroup with their self-image. If and when individuals comparatively evaluate themselves negatively within their societal contexts, then they will respond psychologically and socially, individually and collectively (see figure 2). Individuals have varying intensities of self-identification with a multitude of ingroups, but self-identification with a national ingroup is prevalent among homo sapiens and social competition can lead to violence (Fig. 1 from Scheepers and Ellemers, 2019, 8)." [sic] (DeDominicis, 2021c, 40).

"Upon comparing one's ingroup with another and perceiving one's own status as inferior and therefore one's self-image as negative, the perceiver can respond with three psycho-behavioral strategies. One strategy is social mobility, i.e., attempt individually to join the perceived superior status group. A second strategy is social creativity, i.e., the perceiver compensates by changing the evaluation criteria, selecting those on which the perceiver views their ingroup as superior over the outgroup. A third strategy is open intergroup conflict, i.e., social competition, in which the ingroup perceiver views the relationship with the outgroup as zero-sum. Any gain by the outgroup is perceived as coming at the cost to the ingroup. National self-determination movements by definition seek to break the relationship through secession to form their own sovereign community (Cottam and Cottam, 2001). Figure 2 [...] schematically summarizes a presentation of social identity theory precepts." (DeDominicis, 2021c, 41).

"This study elaborates on the identity management strategy of collective action as a form of political integration. In addition to collective action being employed in social competition, the collective action may be in the form of additional social creativity. Collective action may seek to supersede the relationship evaluation criteria upon which the zero-sum evaluation is based by fortifying new evaluation criteria. This new evaluation criteria may supplant the status quo institutional context by exploiting dynamic political opportunities." (DeDominicis, 2021c, 40).

Social identity theory highlights a critical societal process in the evolution of "imagined communities" (Anderson, 1983). Legitimate authorities oversee the construction and elaboration of complex infrastructure to facilitate functional pursuit of group social creativity and individual social mobility acquisition. They respond to the functional exploitation of expanding perceived transnational interdependency. It thus lays the foundation for elaboration of awareness of global interdependency and the construction of global infrastructure as a public good. The emergence of web3 reflects the emergence within national communities of entrepreneurs seeking new opportunities for utilizing digital globalization. They build upon the foundation of existing international system of nation states. Cryptocurrencies still rely upon national political economic systems as the building blocks to construct decentralized financial institutions, e.g., as

represented by so-called stablecoins. The latter peg their cryptocurrency to a "stable asset," e.g., the US dollar, and then utilize traditional financial assets as collateral to engage in financing activity utilizing cryptocurrencies (Yaffe-Bellany, 2022a, para. 4). They seek to exploit globalization for creating substantive opportunity structures for new routes towards group social creativity and individual social mobility (Manjoo, 2022). They seek to circumvent what their advocates view as increasingly surmountable obstacles to the pursuit of heretofore deviant group self-expression to achieve individual social development.

Figure 2: "Social-Structural Variables and Identity Management Strategies"
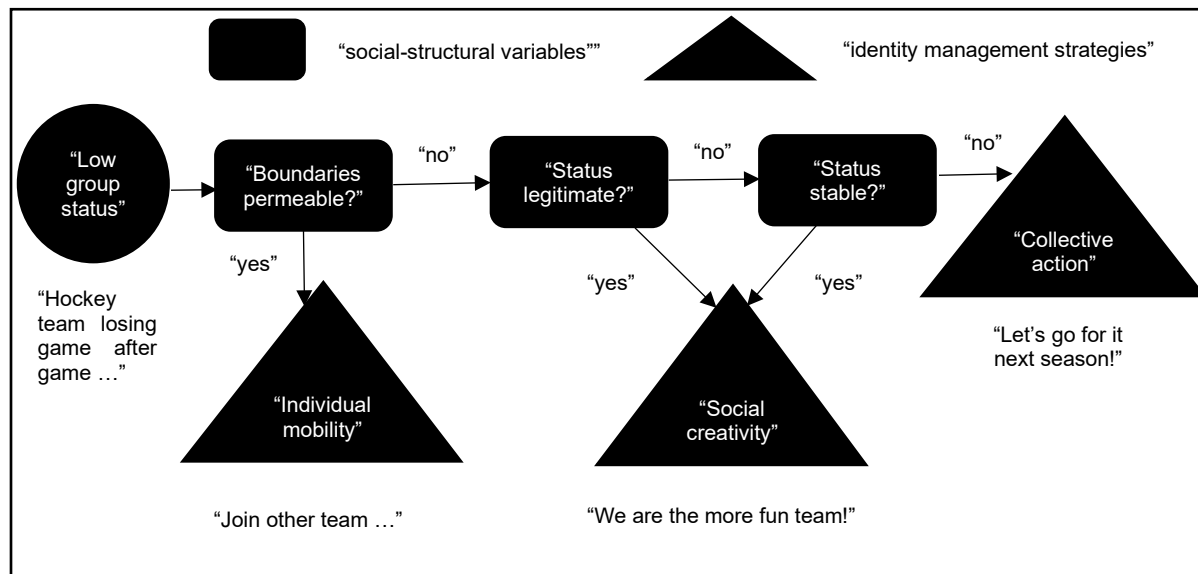
"Upon perceiving an ingroup negative social status self-evaluation, an individual member may choose three different response strategies. Individual social mobility seeks to join the superior status group if the boundaries are permeable, e.g., "in the United States, [...] classes are permeable but races, in most cases, are not" (Cottam and Cottam, 2001, 92). Social creativity involves compensatory reconfiguration of the comparison criteria to reconstitute the individual perceiver's positive self-identity ingroup evaluation. If dynamic interactive contexts destabilize social-structural features of intergroup status relations, then social competition, i.e., collective action by the ingroup to supersede the outgroup along the same status evaluation criteria, may be the social strategy response (Fig. 2 from Scheepers and Ellemers, 2019, 12)." [sic] (DeDominicis, 2021c, 41).

The New York Times has described "web3" as "a utopian vision of a more democratic internet controlled by regular people rather than giant tech companies" (Yaffe-Bellany, 2022b, para. 10). These "giant tech companies" are subject to government regulation. At the heart of the blockchain global ledger of cryptocurrencies is "decentralized finance" (Roose, 2022b, para. 3). Its alleged qualities are the absence of banks functioning as financial system "gatekeepers" (Yaffe-Bellany, Griffith and Livni, 2021, para. 12). They circumvent indirect government influence via surveillance and regulation of traditional financial institutions, i.e., banks undertaking their so-called due diligence function. As multitudes of early investors in cryptocurrencies lose their outlays, their rhetorical appeals for legitimation within the global community include appeals to a brighter future for humankind:

> *"It's possible to imagine a future where you might look up the fate of every tax dollar you've paid, and government corruption becomes all but impossible; where beautiful and important stories and music, games and art would never disappear from the internet; where, instead of being forced to rely on a big power company, you might buy and sell surplus solar energy from or to your own neighbors, and never face another blackout. Wherever tamper-proof, independent record-keeping is needed, blockchain could keep all the receipts, available and safe, for anyone to see"* (Bustillos, 2022, para. 18).

Bustillos acknowledges that the creation of this desired future requires integration of emerging blockchain technology with the existing national and global political economy. Social justice and equity issues focus

on human rights protection, which incentivizes creation, provision and promotion of public goods as institutional infrastructure, e.g., social capital. State authorities to whom the modal citizenry grants legitimacy oversee a political regime in which habitual obedience to mobilizational cues manifests itself, e.g., in voluntarism. One comparative study of Japanese, South Korean and Chinese civil societal responses to the Covid-19 pandemic highlighted the sui generis nature of national political authority. These three polities received global media spotlight attention regarding their comparatively effective earlier stage Covid-19 responses. Researchers "identified" […] "multisectoral collaboration as a key factor in comprehending civil society's impact" (Cai et al., 2021, 131).

This paper's approach to public goods utilizing the social identity dynamics of nationalism amidst complex global interdependency incorporates the cognitive revolution in international relations theory. Neo-corporatist state leadership for accommodating and exploiting global interdependency emphasizes the recognition of identity through acquisition of positive status heretofore denied via marginalization (DeDominicis, 2021a). It incorporates the importance of identity and status as a collective motivation dynamically shaping the contours of bounded rationality in policy making processes (Herrmann, 1988, Hafner-Burton, Hughes and Victor, 2013). This perspective approaches the concept of public goods in relation to nationalism's political psychological impacts concerning the institutional evolution of a particular state. It contributes to the elaboration of the nature of the "sociotropic preferences" in worldwide social justice movements, e.g., Black Lives Matter, that shape political behavior. The "cognitive revolution" in international relations theory has highlighted the focus on factors shaping both individual and collective perceptual pattern tendencies determining policy behavior (Hafner-Burton et al., 2017, S21).

The processes for the creation, provision and expansion of public goods as institutional infrastructure features the role of social justice movements. They reflect and accelerate the disintegration of prevailing formal and informal institutionalized stereotypes of self and other. These stereotypes justify hierarchical relations which determine differential access to resources, e.g., the stereotype of the male breadwinner and the female housewife/homemaker performing unpaid labor. They also include segregation and marginalization which people of color and women had internalized and accepted via coercion and hopelessness. Nwabara (2018, 76) underscores that "[t]he power of imposition has created not only a desire to move towards White expectations of Blackness, but for one to renounce" their African racial dignity. They also include that ascriptive assumption that achievement is material, i.e., money, and commodification of the enslaved represented the apotheosis of superiority. "Rooted in histories of colonialism, slavery, and Jim Crow, and continuing on today in de facto discrimination, racism, and violence, whiteness has come to signify supremacy and mastery […] whiteness and the slaves it subjugated became intertwined signs of the master's wholeness, completeness, and conquest …" (Coble, 2019, 568).

By bringing so-called private societal relations into the public domain, social justice movements push the state authorities to adopt and reform policies that enforce behavioral change. Changes in behavioral patterns reinforce changes in behavioral attitudes and perceptual stereotypes. They functionally aim to expand opportunity structures for dialectical engagement in group social creativity and individual social mobility. The latter emerge from opportunities that polities construct by authorities responding with public policy to convert and institutional heretofore social deviance into social creativity. It thereby opens routes for individual social mobility. Examples include the legalization cannabis and the validation of the culture components associated with it including, commercial popular culture fashion and music market niches that consequently emerge.

This paper begins with a review of selected relevant scholarly literature on the political psychology of political regime development and construction within the context of the nation state. It applies the insights from social identity theory to conceptualize the functional harnessing of the appeal of nationalism to the creation and manipulation of markets to increase state power capability. It illustrates how the effective construction of Gramscian hegemony is evident in the emergence and function of a national fiat currency.

The significance of corruption is then analyzed from the perspective of social deviance transformed into social identity management strategies of social creativity and social mobility. It shows that the institutionalization of state authority is a public good that facilitates the creation, regulation and transformation of social deviance into social creativity and competitive mobility. The paper highlights the impact of the emergence of global complex interdependency on the construction of a world community that incentivizes web3 blockchain technology. The global digital community serves as an arena for the emergence of new opportunity structures for engaging in substantive global group social creativity and hence individual social mobility strategies. Cryptocurrencies dialectically build upon the foundational keystones of nation state great power fiat currency regulation. Their utilizers seek functionally to transform social deviance into social creativity and social mobility.

LITERATURE REVIEW

Development

In so-called, developed nation states, these sociological processes of so-called state building have proceeded to create statewide institutions. They are amenable to the creation of monetary currencies through facilitation of commodification for consumption. Variations in "labor commodification" was one measure postwar welfare regime analyses used to typologize capitalist national political economic diversity (Peck and Theodore, 2007, 738). This paper adds that commodification and stereotyping/archetyping are closely interrelated because they involve categorization and simplification that is institutionalized within the national polity. Its internalization is encouraged through the individual consumer's focus on parochial utilitarian gratification of participation and economic status needs. The normative habitual, prevailing view within society is that price equates with the value of goods and services. As Marx highlighted, the role of domination in society is shifted from interpersonal relations to "the domination of things" over individuals (Musto, 2009, 393, Zizek, 2021, Mutakalin, 2014). "[V]alue becomes known as the mode of existence of the alienated consciousness of the private producer, a 'socially valid', therefore objective, form of thought" (Starosta, 2017, 123). This hegemony of what Marx labelled "commodity fetishism" is not a cognitive error, e.g., "false consciousness," but a human adaptation to functioning and survival within capitalist society (Andrews, 2018, 744).Hopkin (2017, 467) references Polanyi's concept of a dialectical "double movement" in modern capitalism. Market relations progressively permeate all aspects of society, undermining traditional relations of status and authority. They generate a resistance countermovement to apply the authority of the state to regulate and defend against this commodification of all social relations. This paper conceptualizes the emergence of the welfare state after the turmoil of the interwar period as an outcome of this dialectical interaction of these two movements. Institutionalization of global capitalist economic national interdependency, e.g., the Bretton Woods framework, was a concomitant of the developing welfare state within the Cold War nuclear setting (Obinger and Petersen, 2017).

This paper's conceptualization of political economy views it as the application of state capabilities to generate and regulate social competition, social mobility and social creativity capacities. The postwar welfare state, to enhance political regime stability, functionally regulates these three fundamental self-identity management strategies for evolving societal actors. Ideally, "[h]igh degrees of inclusiveness, universality, and fairness create a reliable environment in which personal security is assured and status anxiety is reduced. […] A major implication […] is that these integrative institutional qualities provide a 'top-down' path to breaking out of the vicious circle of a lack of tolerance and conflict that is based upon this deficiency" (Kirchner, Freitag and Rapp, 2011, 220). Effectiveness functionally equates with regime stabilization and authority maintenance by the ruling elite.

Within this political economy, the authorities can utilize price signals as means by which to control society through utilitarian incentives. Government agencies within capitalist market economies orient their guidance of society within this prevailing system of price signals. The need to avoid excessive

commodification emerges when the excessive commodification produces so-called market failures. For example, the relative American lack of universal health insurance coverage during the Covid-19 pandemic may be conceptualized as a "market failure" in terms of its "social cost" (He et al., 2022, 7). This assessment stands in comparison to the perceived performance of other national polities. These so-called market failure outcomes can threaten regime stability, not to mention individual and community wellbeing.

The authorities intervene to modify the opportunities structures. One aim is to limit the intensification of perception of intra-societal intergroup relations in zero-sum terms, i.e., as predominantly one of social competition. The state through its legitimation efforts in the form of normative active rhetorical/ethical appeals by its leaders attempt to coral these trends. One tactic is to counteract them with social creativity attractions by associating nationalism with liberal values. Also relevant is social mobility opportunity structure expansion through welfare state programs, i.e., public goods. Coercion as a response to regime authority challenges risks reinforcing social competition. The coercively deployed resources of the state can also cause the oppressed to disintegrate into anomic, desperate individuals and small groups. Their motivations may shift towards a focus on survival and security, the most basic of Maslow's hierarchy of needs, in an environment of perceived overwhelming contingency (Marie and SaadAdeen, 2021). The political regime control system type relies upon coercion beyond a tertiary level for authority maintenance. It is not most effective for mobilizing for generating effective external international diplomatic bargaining leverage instruments, ceteris paribus (Cottam and Gallucci, 1978). In the nuclear setting, great power international influence competition is increasingly indirect. This appeal includes perceived support for self-determination of subordinated national groups as a source of soft power appeal. Minimizing domestic reliance upon coercion for control is desirable to avoid if an actor has pretentions to being a great power in international relations. It accords with "the realist proposition that ideologies only prevail in international relations when they are associated with power" (Mendelski, 2018, 263). State authorities that rely upon terror as a crucial component of their domestic regime control formula are likely to display a power mobilizational disadvantage in terms of international appeal.

The increasingly political salience of so-called post-material values reflect the evolution of so-called developed nation states. The modal citizenry functionally assumes their safe and secure participatory national membership via citizenship in the polity's core cultural community as a given (Diakoumakos, 2105). The state as a system of ethical and coercive authority norms dynamically evolves as individuals and in-groups strive to satisfy their evolving needs concurrently with the evolution of society (DeDominicis, 2021d). As Trompenaars and Hampden-Turner (2020, 30) note, a community must share a set of norms and values in order for those norms and values to evolve. "It takes shared meanings of norms [i.e., "how I normally *should* behave] and values [i.e., "how I *aspire* or *desire* to behave] that are stable and salient for a group's cultural tradition to be developed and elaborated." Sociological processes result in these norms and values: "Over time, the habitual interactions within communities take on familiar forms and structures, which we will call the *organization of meaning*" [*sic*] (Ibid., 32).

For the assimilated citizenry in these so-called developed, industrialized societies, self-expression values emerge, i.e., what some of the literature labels post-material values. These self-expression values show comparatively less of a correlation with liberalism in East Asia (Zhang, Brym and Andersen, 2017). This study suggests that individuals and groups engaging in social creativity respond to material threats, e.g., environmental degradation, by acquiring new status vehicles. They include in-group formation and membership in so-called new left social movements, as a motivation, but not the only motivation, for environmentalism (Mayeral and Best, 2018). Rising levels of literacy and education, along with increasing media access, facilitate in-group identification and communication. "[T]he application of social identity theory (Tajfel and Turner, 1979) to the study of movements suggests that support to protest groups is predicted by perceived closeness to that group (e.g., workers' rights of one's own same category), by social identification with that group, and by not perceiving it to be threatening or in competition with the in-group" (Passini and Morselli, 2015, 11).

Figure 3 shows in schematic form the relationship of institutionalization to social identity evolution. Social movements are one form of this dynamic, dialectical interdependent process of state institutional development and social in-group evolution. Polities are more or less effective in constructing social opportunity structures for individuals to form in-groups that achieve social creativity affirmation leading to individual social mobility facilitation. The international system of sovereign nation states reflects the role of the nation in providing the most salient and affectively attractive opportunity structures. These opportunities are functionally assumed to be for individuals perceiving themselves as belonging to shared primary, terminal self-identity communities, i.e., nations (Cottam and Cottam, 2001). Their respective publics functionally evaluate them in terms of their efficacy in generating these opportunities. Those institutions that become ineffective in providing the opportunities for social status acquisition in developing society will be increasingly condemned as, in effect, parochial and corrupt. Digital globalization facilitates and accelerates in-group vs. out-group formation with varying degrees of institutionalization.

Figure 3: "A Schematic Diagram of Social Identity Theory's Basic Principles" (Figure 3 image: Mor Barak, 2009, 247)
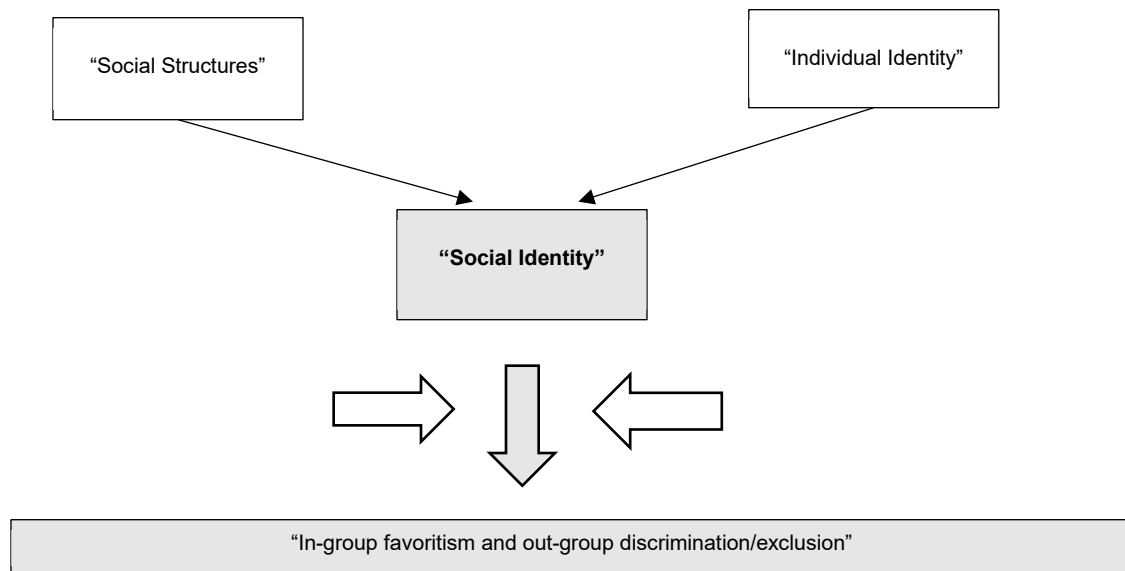
Social identity theory postulates that actors are predisposed to form in-groups displaying a predisposition to institutionalize. A function of this institutionalization is to create out-groups. The substantive significance of these in-groups depends upon this institutionalization. Social deviance is functionally defined as behavior perceived by the authorities of the in-group as outside the realm of acceptable in-group member behavior, thus leading to derogation and punishment of the offender. Derogation and punishment equate with exclusion from full membership from the in-group through, e.g., prosecution and incarceration for so-called illegal or criminal behavior. Social identity management strategy responses by the coerced may be to search for new in-group identities, e.g., transnational cryptocurrency investor community membership.

This paper argues that liberal democratic nation state polities encourage social creativity opportunity structure creation and exploitation. In sum, social deviance is comparatively less likely to receive a collective societal social competition response, i.e., to provoke functionally a response that view the deviance in zero-sum terms. Insofar as the functional collective response reaffirms the public's functional granting of legitimacy to the polity authorities, then this response reinforces the authority norm system as a public good. To rephrase, it remains a shared ethical community that is greater than the sum of its constituency parts in the prevailing worldview of the modal citizenry. Globalization of the economy increasingly incentivizes the marriage of post-material values with diversification of organizational culture. The functional aim is to promote effective individual social mobility and group social creativity strategies. These organizations are more competitive within the international business community (Trompenaars and Hampden-Turner, 2020). So-called developed nation states as vast organizations are relatively less reliant on coercion as a control mechanism to enforce existing, ascriptively assigned authority norms of status and

behavior. They therefore allow social deviance a greater potentiality to acquire increased status in a globalizing environment via progressive social movements. Foundational work in modern sociology included a focus on the functional aspects of social deviance to facilitate social integration (Osrecki, 2017).

This analysis suggests that globalization increases the potential for acquisition of diaspora consciousness and coordination as part of these progressive social movements. As the global resonance of the US Black Lives Matter protests illustrated, transnationalism facilitates mobilizing against perceived national ascriptive status challenges (Zukin and Torpey, 2020). The dialectical relationship with social mobility is evident in the transracial, global consumer appeal of Black diaspora popular culture artifacts. For example, Rap music, is part of "what may be called a global hip-hop empire" (Watkins, 2010, 25). Liberalism supports development of social creativity opportunity structures that facilitate the undermining of institutionalized stereotypes/archetypes. The latter are an inherent aspect of commodification and institutionalization. Conceptualizing these opportunity structures for social creativity pursuit as complex institutional infrastructure captures the essence of neo-corporatism amidst global complex interdependency. In the abstract, developed liberal democratic nation state polities would enjoy a mobilization base advantage in supporting competitive creativity, e.g., so-called thinking outside the box. It would in theory be more amenable to competitive creativity than authoritarian polities, ceteris paribus.

In comparatively stable, i.e., so-called developed nation states the governing authorities of these normative habitual obeisance-based regimes can display mobilizational capacity. During crises, the functionally assumed equation of the governing apparatus of the nation state as symbolic representation of the latter provides the former the capacity to mobilize the public (Cottam and Cottam, 2001). This effective manipulation of symbols that generates an intensely affirmative response from the attentive public has been called the rally around the flag effect. This affirmation of support for the chief executive derives from the collective attitudinal belief that the chief executive represents the nation. In the author's state location, "nationalist sentiments can easily mobilize people and boost internal solidarity around political leadership in Korea, as the rally-round-the-flag effect theory explains" (Hwang, Cho and Wiegand, 2018, 705).

Despite overextension, the functional equation of the nation with the executive makes acceptance of blatant major diminution of the government's foreign influence politically difficult for (Cottam and Cottam, 2001). "The precariousness of national prestige […] is at the root of the RRTF [rally round the flag] phenomenon, which emerges when that national prestige is challenged […] more than any other aspect of international conflicts, public opinion in the United States is concerned with national honor and the country's international reputation for political resolve" (Feinstein, 2016, 308). The political difficulty of US administrations to extract the US military from Afghanistan illustrates this threat of negative domestic public opinion reaction to threats to American national prestige.

Figure 4 outlines in schematic form social identity theory's conceptualization of the consequences of a perceiver's comparative negative status appraisal of the perceiver's in-group to relevant out-groups. It diagrams the change process in perceptions, attitudes and values that characterize local, national and global community development. It reflects the outcome of social interaction leading to in-group versus out-group status comparisons. Digital globalization facilitates this interaction among evolving so-called imagined communities. Social deviance including condemnation of heretofore taboo social activity, e.g., the cannabis trade and non-traditional gender roles, can evolve through legal reforms into social opportunity structures. These structures, in this Weberian ideal-typical model, provide concrete group social creativity options which in turn provide new individual social mobility paths. Social movements play a critical role in prodding the state to respond to certain forms of traditional social deviance into legitimated forms of social identity practice and behavior. Digital globalization enhances and accelerates the opportunities for the transformation of conflicting values heretofore rhetorically targeted as corrupt to transform into social creativity and social mobility. The reconciliation of conflicting national cultural values becomes an opportunity to generate transnational social capital. The latter facilitates the pursuit and satisfaction of group

social creativity options and individual social mobility paths. "[E]thical behavior in a multicultural environment can only be achieved when we integrate value orientations at a higher level" (Trompenaars and Hampden-Turner, 2020, 383). The authorities in sovereign state institutions that fail to satisfy these group and individual social status needs in a globalizing context increasingly lose their perceived legitimacy. Failure to adapt the regime can lead to authority and regime change.

Figure 4: "Paths to Address the Negative Consequences of Exclusion" (Figure 4 image: Mor Barak, 2009, 249)
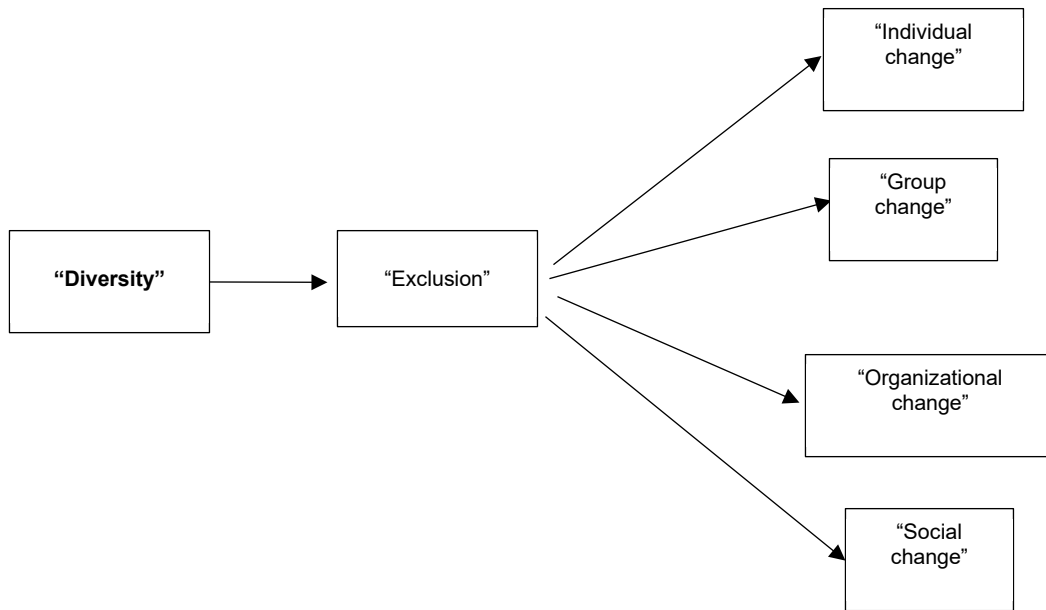
Social actors experiencing derogation in their self-assessment through in-group authority condemnation of their behavior as deviant exploit complex interdependency including digital information facility to seek and gain out-group member support to form compensatory in-groups. Responses and reactions to complex interdependency as a consequence of broadening and intensifying globalization incentivize social creative responses that exploit globalizing interaction opportunities and facilities, e.g., the dark web. Social mobility opportunities concomitantly emerge that incentivize cognitive and affective reinforcement of in-group membership identity by the so-called successful actor operating outside of direct, immediate control of the state regulation. This successful actor exploits legal international limitations on state sovereignty.

Social deviance includes challenges to traditional, ascriptive marginalizing norms comprising those which progressives subsequently labelled as xenophobia, homophobia and misogyny. Progressive social movements seek and exploit social creativity opportunities by efforts at legitimation seeking self-identification with a supranational self-identity community (Baider and Kopytowska, 2018). Feminist movements aim to acquire greater national influence through "women's lobbies" integrating Europeanization into their political strategies (Saurugger, 2020, 355). This legitimation can facilitate its utilization in a major power's soft power narrative in international relations. This supranational self-identity community option has to provide concrete benefits which construction of a European internal market regulated by progressive law can provide. It encourages and supports group social creativity and therefore, dialectically, individual social mobility (DeDominicis, 2020). "Commodification of identity politics" within this process appears to be unavoidable, e.g., "gender mainstreaming" as a form of "career feminism" within capitalist societies (van Heerden, 2016, 7207).

European integration strategy functionally serves to encourage this social creativity by creating greater opportunity structures. EU leaders rhetorically articulated and ethically justified these policies in terms of Europeanization. Calls for sympathy towards Muslim immigrants include rhetorical appeals to recognize the "European dream" as a counterpart to the American dream that sustained earlier European emigrants (Frunză, 2017, 126). Europeanization creates significant practical material and status benefits through the

elaboration of the supernational EU policy representations of the supranational European community (Noversa, 2022). "[D]ue to the greater attention devoted by supranational bodies to career-related aspects of encouraging gender equality and hence, more Europeanized countries are more likely to associate having a supranational attachment with the need to support gender equality in matters of career and work-life balance" [*sic*] (Zapryanova and Surzhko-Harned, 2016, 562-63).

Social Identity and In-group vs. Out-group Formation

A necessary cognitive function exists in organizing the environment for an individual, and social identities serve this cognitive function. The role of social identities includes creating and defining the individual's place in society. They provide a system of orientation for self-reference. Social identity has an intimate connection with a person's self-image. People strive for a positive self-image, generally. The foundation of social identity-oriented behavior, according to social-identity theorists, is an individual's "knowledge of his membership of a social group (or groups) together with the value and emotional significance attached to that identity" (Tajfel, 1978, 63). For the purposes of this paper, an important point which social-identity theorists make is that membership itself in a group is not sufficient to produce group behavior by a collection of individuals. Rather, the central glue which inspires what we call "group behavior" is identification with the group. Nationalism is one form of in-group behavior.

The foundational assumptions of the political psychology of social identity of in-group formation are the following: 1) both the creation and the destruction of groups is possible; 2) collapsing smaller identities into a new identity is one way to create them; 3) members can adopt roles which relate to a group's existence and thereby identify with the group to reinforce a group identity and behavior; 4) the articulation of a group's political norms of behavior can reinforce group identification; 5) perceiving the in-group as clearly distinct from other groups in society, thereby enhancing self-esteem and loyalty, will reinforce group identity and behavior; 6) the existence of a common enemy; 7) the members of a group share common goals (Cottam and Cottam, 2001, 122 fn.). Groups can also successfully merge under conditions when: 1) the perceptual individuation of an out-group member who the in-group group is bringing in can permit the admittance into an existing group; 2) the encouragement of cross-cutting organizational schemes can also assist; 3) when the context removes the cues which the community members associate with old group membership (Cottam and Cottam, 2001).

The socialization process as well as learning transmit social categories and images of others across the generations, and the community commonly recognizes and accepts them. This activity of categorization of oneself and of others is a psychological process. It is important to people, despite the fact that the categorization may not reflect the actual interactions between individuals. It contrasts individual experience versus group categorization (Ullrich, 2020). Social structure outside of the psychological realm is also important in determining these social categories. The broader social structure creates and provides the groups with which people self-identify. It also plays a significant role in providing the values, i.e., motivations, with which they evaluate themselves and others. Social structure also provides the real context for social movements such as national liberation struggles, conflict between groups, and collective action, i.e., action by groups. Cottam and Cottam (2001) note that social comparison is intrinsic to this process of social categorization, and self-esteem tends to be significantly dependent upon this social comparison. 1) Complementation and satisfaction of the individual's values would have to occur from membership in a group in order for self-identification with a group to enhance self-esteem. 2) Self-esteem also receives enhancement from perceptions that the perceiver's group is better than other groups in important ways, while being distinct and different from other groups. These perceptions can, but not necessarily, lead to stereotyping and discrimination, as well as in-group favoritism. Often, the members of the ingroup view it as immeasurably better than out-groups. In terms of personal and physical characteristics, people find members of the ingroup to be more attractive. They tend to be more helpful towards members of the ingroup than towards members of the out-group. They also tend to remember more about the in-group members.

In the case of attributing bad behaviors and outcomes as a result of in-group activity, the in-group will attribute cause to external pressures. Conversely, members will attribute successes and positive characteristics of members of the in-group to internal, long-term characteristics. In-group members will exaggerate the differences between the in-group and other groups. They will assume that members of out-groups share characteristics which the in-group members will overly generalize. In attitudes towards out-groups, people vary greatly. People will despise some, dislike others, regard others with indifference, and even like others. The social distance which they perceive, in other words, will vary. Digitization and social media have facilitated these processes of in-group vs. out-group formation.

Fiat Currency and Complex Interdependency

States have a monopoly on fiat currency creation. They gain the rentier benefits of sovereignty for the community to the extent that the fiat currency has international value, i.e., does not manifest comparatively high inflation that leads to its "debasing" (Tavlas, 2021, 16). The authorities employ the diplomatic influence leverage benefits from the status allocation by the so-called international community of representing and utilizing sovereign national authority. The reality of interdependency has undermined the sovereignty ideal of ultimate right of control over everything within the state's territory. Government policy aims often require prudent international cooperation, coordination and compromise to maintain the functioning of the international financial system for respective national benefit. Epistemic awareness of this reality becomes more widespread due to globalization and the emergence of global finance and investor participation within it. To continue to preserve it, functionally decision making is increasingly at an international level, even while de jure sovereignty remains with states. The EU is the leading exemplar of this trend, e.g., the "pooled sovereignty" of the member states, to realize economic and monetary union (Kassim and Buth, 2020, 304).

Exploiting increasing interdependency is at the foundation of digital blockchain technology and cryptocurrencies. The creation and sale for purchase on international financial markets of Eurobonds illustrates the political effectiveness of this coordination. Insofar as a fiat currency is based on the belief of the existence of a sovereign state, the success of the EU in selling Eurobonds on financial markets is a significant development. It indicates that the belief prevails in the substantive existence of Europe. In 2021, "[N]early a year after European leaders decided to launch a massive, jointly financed recovery program to deal with the consequences of the Covid-19 pandemic, the European Union on Tuesday finally issued the first bond of what will amount to a total EUR800 billion ($970 billion) borrowing spree over the next five years." Equally significant was the market demand level low price yield for the Eurobonds, indicating strong confidence in the substantive credibility of the EU as an actor: "The result didn't disappoint: Demand for the 10-year, EUR20 billion bond reached EUR142 billion, according to bankers, and it was priced at a yield of 0.086% -- compare this to the minus 0.23% yield on German bunds of the same maturity" [*sic*] (Briançon, 2021, para. 1-2).

Sovereign governments may run national fiscal budget deficits which contribute to national GDP. They also may attempt to avoid accelerating macroeconomic imbalances. The global financial community may perceive inflationary imbalances as indicating a decline in state regime domestic control capacity to meet future debt obligations. The collective confidence of the global financial community in this sovereign debtor's capacity may change. This increase or decrease manifests itself in the changing interest rate on offer for the sale of its sovereign debt bonds. Soaring national fiscal deficits in Spain and Italy to respond to the Covid-19 pandemic economic crisis did not produce depreciation of the euro. "The presence of countries with balanced accounts, such as Germany, generates greater confidence in the common currency" (Jorge-Vázquez and Francisco, 2021, 11). Were they not in the eurozone, efforts by their respective national central banks to "monetize their fiscal deficits" would have caused their national currencies to "depreciate on the international markets" (Ibid.). The upshot is that these effective Europeanization processes construct supranational, i.e., EU, social opportunity structures that incentivize group social creativity and individual

social mobility strategies. Conservative nationalists are more prone to perceive these supernational institutions representing supranational identities as threats to national sovereignty. To build supernational institutions for a supranational community that potentially become intense in terms of self-identification with it requires utilizing the non-corrupt nation states as building blocks. The effective strategic utilization of these building blocks may potentially create supernational institutions and a supranational community that is more than the mere sum of its parts, e.g., the EU (DeDominicis, 2020).

Corruption vs. Hegemony

Creation of hegemony and the de facto functional, habitual belief in the authorities' provision of public goods requires functional community in-group membership self-identification by policy targets. The imagined community exists, including its system of authority norms, and institutions subjectively identified define this community. According to Scholl and Shermuly (2018, 185-86), "institutional schemes, perse, do not affect behavior, but rather an experienced institutional reality shaped by ideas and interpretations." When the representatives of this system of institutionalized authority norms appear corrupt, it is more or less a threat to the modal citizenry that self-identifies at a primary intensity level with the community. Wullweber (2019, 151) writes that institutionalization can equate with public habituation towards public obedience towards state authorities through a process of "sedimentation." "The more a discourse becomes sedimented, the more social meanings and practices become stabilized and taken for granted, and the more difficult it becomes for change to take place. Sedimentation does not happen passively but because of political struggles that seek to universalize particular interests." Sedimentation thus equates with control through Gramscian hegemonic institutionalization. The prevailing view within society assumes the universality of the interests which particularistic "intersubjective understandings support" (Mello, 2022, 15). Functionally in such conditions, the output of the state policy making process is presumed to be a public good. This paper aims to conceptualize the notion of sedimentation in terms of social identity theory. It adopts the perspective of the institutionalization through commodification and monetization of state authority control regimes. As Wullweber later notes, "Social sedimentation—the naturalization of relations of domination—involves the process of habit formation through repetition" (Wullweber, 2019, 152). This paper conceptualizes this normative habitual acceptance of existing status hierarchy as conforming with insights from Trompenaars and Hampden-Turner (2012). They highlight the continuing reality of ascription of actor social status to actors within an organization versus status acquisition via achievement as the ideal-typical archetype of so-called modernity.

In this ideal-typical model, a corrupt leadership or administrator is by definition exercising authority to which the modal citizenry does not grant legitimacy. The power and "control" exercised is therefore viewed as "restrictive" and unjust, i.e., corrupt (Scholl and Schermuly, 2018, 186). This authority is viewed as exercised for particularistic, corrupt ends, i.e., ends that serve private gain at the expense of the public good. For Kant's "categorical imperative" to operate, a necessary condition is that the modal citizenry must grant legitimacy to the authorities (Pitts, 2020, 237). The United Nations claiming to speak for the world community in claiming legitimacy to authorize deadly force comparatively lack persuasiveness with legitimate national authorities domestically. In sum, the target public must view the authorities as representing their primary intensity self-identity community, according to this Weberian ideal-typical model. A prerequisite for this condition to emerge is the public's view that the authorities became the authorities through indigenous means. In sum, they come to power without perceived external imperial intervention violating national self-determination.

Corruption is concomitant with subjectively perceived parochiality, i.e., utilizing public authority for so-called private gain, often despite rhetorical universalistic, public good claim obfuscations. Increasing corruption correlates with increasing contingency and insecurity. Corruption exists when strong state institutions are not perceived as hegemonic within the prevailing view of the modal citizenry. Corruption may be conceptualized as the reconciliation of achievement with ascriptive parochiality. To the extent that

statewide institutions are perceived to exist, then the comparative evaluation of status occurs with more collective self-confidence.   Commodity smuggling due to social deviance identification/illegal consumption intensifies this parochiality in the form of incentivizing the creation of organized crime structures. The illegal becomes more profitable as it becomes more perilous, incentivizing the creation of informal cooperation and support networks, e.g., organized crime in-groups. If they intersect with preceding normative habitual traditional parochial structures, they become organized crime so-called families and cartels. Organized crime structures have become highly salient in Latin American states. They emerged within a social environment of contingency and insecurity in pursuit of social mobility. The profitability of drug smuggling derives directly from its illegality amidst rural poverty and ethno-class/de facto class stratification. In Eastern Europe, they become more like corporations as extensions of the polity (DeDominicis, 2021c, 2021c).

Corruption can be conceptualized as requiring the lack of (imagined) community consensus on what constitutes morally and ethically right and wrong behavior. The public interest is represented by the policy output of the government which represents the state. Rule of law implies creating, implementing and enforcing the rules by which to regulate and guide dialectical social competition and social creativity strategies to achieve social mobility. Actors engaging in comparative self-evaluation encompass individuals and in-groups, including enterprises. Failure to provide legitimate regulation associates with fraud and corruption. Concomitantly, the existence of a community consensus on norms and values is necessary to determine behavior that is ethically and rhetorically idealized as unethical and illegal. State ineffectiveness or superficiality associates with corruption in terms of shaping individual community member behavior. It can undermine coordination of the national social creativity innovation and individual mobility mechanisms. It ultimately undermines the power potential base of the state. Investment firms engaging in fraudulent charades in claiming their innovations will generate large future profits to attract significant investments pocketed by executives are in effect "Ponzi schemes" (Goldstein and Kelly, 2021, para. 13-14). Statewide institutions must emerge and exist in order to have corruption. Giving gifts to superiors is not corruption if and when it is the predominant normative habitual expectation. No representative body for the community that has been legitimately tasked with regulating statewide institutions whose output speaks functionally in the imperative voice has declared it corrupt and illegal.

The prevalence of use of cash in the GDP of an economy correlates with the extent of corruption. A "negative relationship" exists between the strength of the so-called rule of law as a measure of governmental ineffectiveness and the proportion of cash to national GDP (Pietrucha, 2021, 11-12). Pietrucha (2021, 6) also notes that "The fact that cash is used (and its modern cryptocurrency alternatives) in illegal transactions and in the shadow economy is beyond doubt." Gonzálvez-Gallego and Pérez-Cárceles (2021, 22) find that "that those countries with weaker institutions, quality of government and more tolerance towards corruption have a larger percentage of population that declares to use cryptocurrencies." The recent interest in special-purpose acquisition companies (SPACs) illustrates economic liberalism's foundations in converting social deviance into social creativity and social mobility. It functions amidst market social competition (Kelly, 2021). SPACs are suspect because of their purportedly vulnerability to serve as vehicles for fraud. They also increase opportunities for market participation by new investors and for start-up firms to obtain financing. Social deviance here refers to the challenging formal and informal norms rules of behavior to achieve economic success, i.e., Merton's social strain theory (Burnham, Hyo and Zeng, 2018, 248). This social deviance may acquire legitimation from other members of the business, national and global communities as in fact a creative and profitable innovation. Examples include cryptocurrency products and new participatory investment applications. The latter include Robinhood and stock trading vehicles which initially received negative, not to mention skeptical, initial publicity within the business media (Hurt and Stancil, 2022). Their defenders characterized them as innovative business models contributing to national and global economic innovation and development (Hiltzik, 2022). In sum, they as business models become a component of the marketplace framework public good. The social deviance has become social creativity in addition to social mobility vehicles for status advancement. The reliance upon

ascriptive status, i.e., Silicon Valley startups utilizing young entrepreneurs with Stanford University pedigrees, leads to assumptions for significant social creativity potential. This ascriptive authority can also lead to corruption through failure of regulation via adequate due diligence. In coverage of the trial of "Elizabeth Holmes, the founder of the failed blood-testing start-up Theranos," charged with defrauding investors with false claims of breakthrough medical technology capacity, Ovide notes,

> *"Whether she is found guilty or not, Holmes is right about the nature of start-up investing. It is about believing in a fantasy. Sometimes that yarn becomes Tesla, and lots of people get rich. And sometimes that fantasy evaporates. It's part of the package"* (Ovide, 2021, paras. 3, 15).

The labelled criminal is stereotyped and derogated for engaging in shameful behavior in the ideal-typical nation state, aside from being illegal. Engaging in criminal international trade activities, like drug smuggling, to help fund a self-determination movement is a regular behavior pattern. For example, the Taliban funded its effective resistance partly through drug smuggling. Legalizing illicit international trade and commerce, would be part of a global strategy of conflict resolution through international human rights promotion. It would require a diagnosis of the sources of the criminality in systemic oppression of marginalized groups. International criminality by its very nature exploits the opportunity structures created by the state. In sum, consumption that is illegal becomes both more dangerous and therefore more profitable for suppliers (Barnett, 2009). Self-determination and national liberation movements engaging in smuggling to fund their struggle are utilizing the state system-created status quo (Labrousse, 2005).

DATA AND METHODOLOGY

The public record is utilized to highlight the analysis of corruption in relation to public goods as so perceived. It engages in process tracing to explain the development of group global social creativity strategies within the environment of the rapidly evolving global internet. Given this importance of public social status acquisition, the reliance of the public record is necessary. It utilizes triangulation with recent selected published scholarly literature in a predominantly deductive analysis to illustrate elements of the significance of the rise of web3.

RESULTS AND DISCUSSION

Creating Public Goods

A facet of regime stabilization via public goods creation is transforming social deviance into group social creativity and individual social mobility to circumvent coercive and violent social competition. This transformation occurs through policies and laws. Dynamic processes of legitimation of authority amidst change involves continuing adaptation for public goods provision. Elites providing the public good of peaceful conflict resolution as a Weberian ideal type to escape the Hobbesian state of nature succeed in having the public grant legitimacy to their authority. This conception provides an elaboration on the meaning of the continuing provision of "order" as a "public good" beyond the rational actor model (Saetra, 2022, 2). Choe and Yun (2017) argue that defining public goods and this concept's derivative, common pool resources, has emphasized the absence of excludability and rivalry from their provision. They argue that the identification of goods as excludable and rivalrous derives not from the physical nature of the goods, but rather according to their social construction as having such attributes.

This paper aims to illustrate how the socio-political psychological processes by which construction of public goods occurs. It emphasizes that the provision of the latter derives from the effective functional construction of legitimacy in the collective eyes of the national public by the state authorities. In the Weberian ideal-typical sense, the security and order they provide are a public good to the extent that their policy making authority is viewed as normatively ethical. The notion of excludability implies the contested

notions of boundary delineation of community in-group whose members may ethically share in the public good. Among the infinite set of imagined community in-groups to which actors belong, national in-groups are among the most salient and intense. Their functional construction has been an extensive research focus as has the construction of increasing salient and intense transnational and cosmopolitan self-identity in-groups. Having the authority to provide international financial system stability is a global public good. On that basis, international standards for evaluating achievement and status emerge. Participation for status acquisition becomes more feasible for the mass public due to the global internet infrastructure. It produces web3 opportunity structures for social creativity in global market interaction to create new market niches through regulated social competition. It thereby provides opportunities for social mobility nationally for individuals through the capital accumulation/wealth and international influence that organizations and individuals achieve. Participation includes economic participation. For example, the provision of valuable non-fungible tokens (NFTs) through the global internet generates global opportunities for their creation and sale for collectors and investors. In sum, they constitute a luxury good, that, like fine art, can be an investment. The owner of fine art gains status, i.e., "bragging rights," while also making a profitable investment:

> *"It's true that most NFTs aren't valuable because they're useful. And at the high end of the market – like the Bored Ape Yacht Club, or the NFT collections being auctioned off by Sotheby's for millions of dollars – a lot of the value boils down to speculation and bragging rights"* (Roose, 2022c, para. 19).

The digital economy facilitates this global process of status acquisition via social mobility through wealth accumulation. It facilitates social creativity strategies by shifting the status criteria from a national to a global level. The creation, provision and expansion of public goods as institutional infrastructure features the role of social justice movements. They reflect and accelerate the disintegration of prevailing formal and informal institutionalized stereotypes of self and other (DeDominicis, 2021a). These stereotypes justify hierarchical relations which determine differential access to resources, e.g., the stereotype of the male breadwinner and the female housewife/homemaker performing unpaid labor. They also include segregation and marginalization of people of color, which people of color and women had internalized and accepted. They also include that ascriptive assumption that achievement is material, i.e., money. Thus, those individuals who are wealthy, even if they inherited the money, are higher status, even genetically superior. By bringing so-called private societal relations into the public domain, social justice movements push the state authorities to adopt and reform policies to enforce policies that reflect and institutionalize behavioral change. Changes in behavioral patterns reinforce changes in behavioral attitudes and perceptual stereotypes to expand opportunity structures for dialectical engagement in group social creativity and social mobility.

Commodification and monetization is congruent with institutionalization. Commodification is essential for the utilization of utilitarian participation and economic incentives to control, organize and direct individuals formed into in-groups called organizations. Production of desirable consumables to generate organizational and therefore individual benefits in a socially competitive environment can lead to searches for externally appealing social creativity options. They include creation and occupation of new market niches. Success generates social mobility. Market research and marketing are in part also about expanding dynamic opportunity structures in the market for social creativity engagement by consumers. To create these new market niches requires elaboration of the institutional structure of organizations (Trompenaars and Hampden-Turner, 2020). Organizations develop and evolve institutionally to facilitate the utilization of the most effective resources that each individual within them can potentially apply. The development of educational institutions facilitates the development of the human resources available upon which to draw by all organizations, at least at a national base level. The organizations themselves also offer internships and in-house training building upon this base, e.g., literacy, numeracy, multilingual capacities. At a fundamental level, a resource, including labor, has to be commodified in order to utilize utilitarian economic and political control incentives. Poetry and other forms of art engage in the rhetorical/aesthetical appeal to

legitimize social deviance as social creativity within a pluralizing national polity. The appropriation of ascriptive social deviance via commodification, creates market aesthetic styles as forms of social creativity. It constitutes a critical feature of market-based capitalism, with its foundation in the legal, moral and ethical norm of private property, as a critical component of the polity's control system. For example, cultural products commodified and labelled as "cool" reflect appropriation and marketing appeal that coopts citizens as economic agents to regulate their social activity.

> *"In a 1966 article, "An Aesthetic of the Cool: West African Dance," [the late] Professor [Robert Ferris] Thompson set out what he considered a basic distinguishing element of Afro-Atlantic art and culture: cool, as a descriptor of ethics, attitude and style." ""These are the canons of the cool," he told Frederick Iseman, one of his former students, in a 1984 Rolling Stone interview. "There is no crisis that cannot be weighed and solved; nothing can be achieved through hysteria or cowardice; you must wear and show off your ability to achieve social reconciliation. Step back from the nightmare. It is a call for parlance, for congress and for self-confidence."" ""In African art and aesthetics, he said, 'balance is the name of God'"* (Cotter, 2021, paras. 17-19).

At the international level, the collective self-perception of the national in-group as functioning as a benign hegemon providing international public goods like order is likely to be self-serving. It is a rhetorical form of nationalistic universalism (Morgenthau, 1948). For the national groups seeking alliance with the purported benign hegemon against the formers' perceived adversaries, their socially deviant activities may be perceived as a form of social creativity. Positive ally stereotypes allow for social creativity to justify internally and externally strategies and behaviors against the shared common enemy (Cottam and Cottam, 2001). Effectiveness in accommodating these trends is significantly reflected in trends in comparative fiat currency valuations, i.e., trends in prices for goods and services. The provision of a currency is in effect a provision of a public good in the form of a national medium of exchange universally accepted. The provision of this universally fungible public good sets a critical parametric resource for commodification, organization and mobilization. It facilitates the regulation of societal interaction in terms of the dialectical relationships among social competition, social creativity and social mobility.

Cryptocurrencies

The significance of blockchain is that it both builds upon effective state enforcement of property rights and facilitates transfers ownership of private property from a national legal system to a global system. Transfers of ownership becomes globally transparent and permanently recorded while anonymity is maintained through its "distributed ledger technology" in a "non-centralised" global network (Perera et al., 2021, 1). The corruption aspect of cryptocurrencies has a critical connection to their lack of central issuance and regulation by a national government, as is essential in fiat currencies. State regulation of these transparent, anonymous transactions by national government is critically difficult, which enhances their appeal. It incentivizes "the use of cryptocurrencies for illicit transactions associated to illegal funds" (Gonzálvez-Gallego and Pérez-Cárceles, 2021, 14). Cryptocurrencies have acquired a journalistic association with corruption because they initially circumvented being legally subject to the sovereign law of a national regulator. In sum, they supposedly lack the public approbation of representing the common or public good which a national government ideally claims to represent and articulate. Yet, "defining corruption is complex" due to differing societal norms and values. Gonzálvez-Gallego and Pérez-Cárceles (2021, 14) focus empirically on the conceptualization of corruption as behavior that "erodes core values of democracy, including decision-making that emerges from public processes established accordingly to well-known rules and equal access" [*sic*]. Cryptocurrencies are superstructures constructed on the foundation of the international financial system, which in turn has its foundation in the fiat currencies of the great powers. Observers have characterized a fiat currency as "a group delusion" upon which a national monetary system exists as "a leap of faith. […] Money is useful because others find it useful" (Coy, 2021, paras. 10-11). Characterizing money as a delusion detracts from the fact that from an ontological viewpoint, nation states

are delusions as well. They are very real in terms of people's thinking, and their power capacities underlie the great power fiat currencies whose interdependencies create the international monetary system. Power is defined here as "the *exercise of influence over the minds and actions of others*" [*sic*] (Cottam and Gallucci, 1978, 4). The governments of nation states occupy a central role in people's understanding of cause and effect in the world. Fiat currencies have their basis in this overwhelming pervasive and, at times, ruthlessly enforced shared ontology. The construction of new, transnational ontological edifices while utilizing these nation states as building blocks is the evident in the emergence of cryptocurrencies.

Cryptocurrencies commodify and monetize interdependency because they are built upon an internet that relies upon fiat currencies of nation states which regulate the global financial system. A conceptualization of cryptocurrencies is that they are the commodification and monetization of the awareness of interdependency. They are the emerging manifestation of a global polity through their reliance upon the global internet. They are a global ledger and the mining of them requires vast resources that produce utilitarian results that can enhance overall global efficiencies. As global ledgers they extrapolate the ownership of private property to the global polity level. National banks redeem cryptocurrencies because they gain profitable business from targets that see cryptocurrencies as facilitators. Libertarians romanticize cryptocurrencies as antidotes to the surveillance state (Edelman and Ruckner, 2022).

Cryptocurrencies are fiat currencies built amidst the regulated social competition between the national polities creating national fiat currencies. The global internet facilitates communicatory sensitivity of the emerging global trends in market niches. They exploit the institutional status quo while promoting the legitimation by utilitarian interest of social deviance through facilitating national social creativity and mobility options. By facilitating the translation of social deviance into individual social mobility and national group social creativity, it incentivizes cooperation. The Chinese leadership has banned cryptocurrency mining because it cannot readily control it (Qin and Livni, 2021). Cryptocurrencies emerged out of, or were seen to emerge out of, illicit international trade activity. They were useful circumventing sanctions and national oversight. They have moved into the mainstream. For their integration into so-called legitimate business transactions such as in real estate, one study calls for central bank of a state issuing a "fiat-collateralised stable cryptocurrency" (Perera, et al., 2021, 18). It would be a prerequisite, if only to reduce cryptocurrency volatility.

Acquisition of status is also acquisition of the right to generate more influence, i.e., authority. The acquisition of status in a Weberian ideal-typical so-called developed, i.e., nationally standardized nation state, may be substantively equivalent to this right. In sum, the modal citizenry in such a state functionally accepts, if not consciously acknowledges, that the authorities have the normative right to be the authorities. It is the right to increasing influence, i.e., to leadership responsibility, within the national community, or rather within the context of the national community. Ownership of something, including an NFT, becomes a mark of status, like owning other properties or even sums of money, i.e., a trophy asset. Even stolen or looted or illegally acquired antiquities become markers of status. They may indicate a claim to an aesthetic higher than national law. They also indicate a willingness to traverse national laws in order to bring something into the global marketplace for self-enrichment. Ownership of a trophy asset indicates social creativity because the owner has something that others do not. The owner acquired it in particularly creative, even illegal ways but still succeeded in converting it into his or her private property (Bourne and Knowles, 2021). Even their repatriation begins a global polity-level discussion regarding history, imperialism, changing ethics, nationalism and national self-determination (Marshall, 2022).

The modern era right to ownership of private property is the right to rise in status through achievement. States that are effective regulate and enforce property rights effectively to produce efficiently value through differentiation and integration. They generate effective opportunity structures for group social creativity that dialectically provide opportunities for individual social mobility. In sum, these state enforcement institutions integrate those heretofore derogated for social deviance (DeDominicis, 2022). Regarding NFTs

and cryptocurrencies, a crypto currency is an internet blockchain, i.e., a "distributed ledger system" (Wakabayashi and Isaac, 2021, para. 2). It acknowledges and certifies ownership of property in the digital universe, or metaverse. NFTs manifest this status through acquisition of items mutually desired, or acknowledged, as having and thereby marking status. The declared aims of crypto, or web3 more broadly as its proponents now label it, include its functional aim to "decentralize power and decision making" (Ibid., para. 29). It relies upon the building blocks of nation states underpinning the global economy, namely the global fiat currency providers.

The niche metaphor from ecology provides comparative insights because human collective and individual actors can create niches and then exploit them. It is an essential feature of power amidst interdependency. Human social identity management patterns are similar: other living organisms can shape the environment to affect competitors for resources. Positive self-identity status evaluation is a critical motivator for human social interaction behavior. Creating the niches that generate income and firm survival and prosperity require appealing to evolving consumer demands that are in turn shaped by market actor activity. These consumer preferences are endogenously created. They may be assumed as exogenous in a snapshot in time but strategy is about shaping this context which includes consumer preferences. Social media's dysfunction is that it is undermining the public good of state regime authority legitimacy via algorithmic intensification of in-group vs. out-group polarization. State hegemonic legitimacy necessary to regulate effectively social competition to maximize national power potential base and therefore influence. This power potential base is always comparative, in regard to other states.

A PATH FORWARD

<u>The Value of Anonymity</u>

Cryptocurrencies have value because they are an "idea" that people "believe in," i.e., a "belief" (Roose, 2022a, para. 33). In sum, believers view them as having significance for behavior by significant actors. Cryptocurrency therefore has value. That value includes circumvention or rejection of state authority and international hegemony. Cryptocurrencies provide a layer of anonymity, i.e., circumventing government oversight and regulation. Cryptocurrency users are paying for the value of identity obfuscation. Banks will buy cryptocurrency units from their holders and give them national currencies. Banks exchange these cryptocurrencies because many business actors want this value of anonymity. A large volume of business in the world economy that a state or group of states view at least skeptically, labelling it as part of the grey if not the black economy. Banks that redeem cryptocurrencies by converting them into national currencies are arguably complicit in supporting and facilitating illicit business. This indictment depends upon the particularistic point of view of one or another actor. The Pandora, Panama and Paradise Papers indicate how valuable obscuring identity to outsiders is highly valued to engage in so-called "money laundering" (Yeh, 2022, 1). For example, grave ethics issues surrounding access to Saudi funds continue to be tolerated by state authorities because of questionable government and individual objectives and conflicts of interest (Kirkpatrick and Kelly, 2022, Whitson, 2022). Commentators have noted apparent double standards by the governments of leaders of the so-called rules-based international order towards Russian versus other oligarchs (Varoufakis, 2022). They place economic sanctions on Russia for its responsibility for systemic violations of international humanitarian law in Ukraine. They continue their own apparent complicity in violations by Saudi Arabia in Yemen and economic sanctions on Afghanistan (Ghosh, 2022). Social deviance can become social creativity if the state authorities agree to grant legitimacy to it.

Ambiguity as a value, e.g., paying for the service of what some call money laundering, may be romantically rephrased as freedom or liberty. If decentralized autonomous organizations (DAOs) can coordinate their political efforts as an interest group, then they can lobby to limit state intervention against their anonymity/freedom/liberty. The desire for obscurity means that the existence of illegality must also continue. State regulation and surveillance continue so that anonymity has value. "A political system the

purpose of which is the fostering of human life and community must be organized so as to protect the rights to life, liberty, and their implementation, private property" (Machan, 2016, 179). The perception of the hegemony of the rule of law in an (imagined) community is necessary to have social achievement as basis for relative status acquisition. It stands in dialectical relationship to parochiality and normative habitual authority as corruption. Examples of the latter include rentier capitalism. For example, commodity traders respond to state-sponsored sanctions and embargoes on trade by creatively working to find workarounds, technically legal or otherwise, for which they charge rentier fees (Blas and Farchy, 2021). A modern economy cannot function without statewide institutions. Corruption is the breakdown of institutional attitudinal and emotive consensus. A hegemon can begin to impose these standards. Community loyalty as a reservoir of political resources allow for reform and revolution to rebuild statewide institutions, i.e., justice. Blockchain begins to build upon national parochiality to generate transnational status. For example, entrepreneurs smuggle profits out of corrupt Afghanistan. US aid fostered corruption, invidious comparison, i.e., perceptions of unfairness and corruption (Whitlock, 2021).

In sum, public policy should aim to facilitate the inclusion of "economic, social and governance principles" (E.S.G.) principles in corporate boardrooms and business school curricula (De La Merced, 2021, para. 7). The explicit commitment to corporate social responsibility is in effect the institutionalization of diversification to profit from globalization. In this vein, E.S.G. principles should include a commitment to national self-determination. Leadership guidance on national self-determination should rely on institutionalized non-governmental organizations that have a formal advisory relationship with United Nations human rights bodies. Such organizations include Amnesty International and Human Rights Watch. Blockchain and web3 more broadly provides opportunities to increase the salience and formation of common global transparency standards. Figure 5 summarizes the benefits to performance that arise from the pursuit of superordinate goals, e.g., global sustainable development, for actor performance. Web3 blockchain technology may increase global transparency of social interaction. It can thereby promote global superordinate institutionalization of in-group actor pursuit of group social creativity and individual social mobility.

As highlighted above, a desired future in which corruption and bribery becomes increasingly difficult through blockchain payment transparency can occur if the world community adopts it. As more government bodies adopt blockchain fund transfer technology, those that do not become increasingly subject to more questioning as to their hesitation. The Taliban regime in Afghanistan, for example, has ample reasons to continue to permit the illegal drug trade as long as it is subject to American sanctions. These sanctions forbid banks from transacting with American dollars as gatekeepers with entities doing business with the Taliban, including humanitarian aid organizations. Blockchain's transparency would facilitate its use by relief organizations by alleviating American concerns of payments going to undesirable actors. The upshot is that cases of systemic corruption tend to serve a political actor's particular policy aims; political authorities may desire and promote the existence of corruption. The question of who is undesirable and why remains a political issue in which human rights non-governmental institutions must play a leadership role. As non-state actors, their rhetorical appeals are less likely in abstract to be received as a smoke screen for particularistic state foreign policy aims, cloaked in universal human rights verbiage (Cottam and Cottam, 2001). They need to provide leadership to lobby on behalf of the dispossessed, the marginalized and the suffering. Again, blockchain ledger payment technology will only promote common transparency standards if people and organizations push for it as a new tool in their anti-corruption toolbox.

Figure 5: "Overview of the Three Characteristics of Superordinate Goals and the Related Processes That Foster Successful Goal Pursuit." (Höchli, Brügger and Messner, 2018, 5, Quoted in Dedominicis, 2021b, 27).
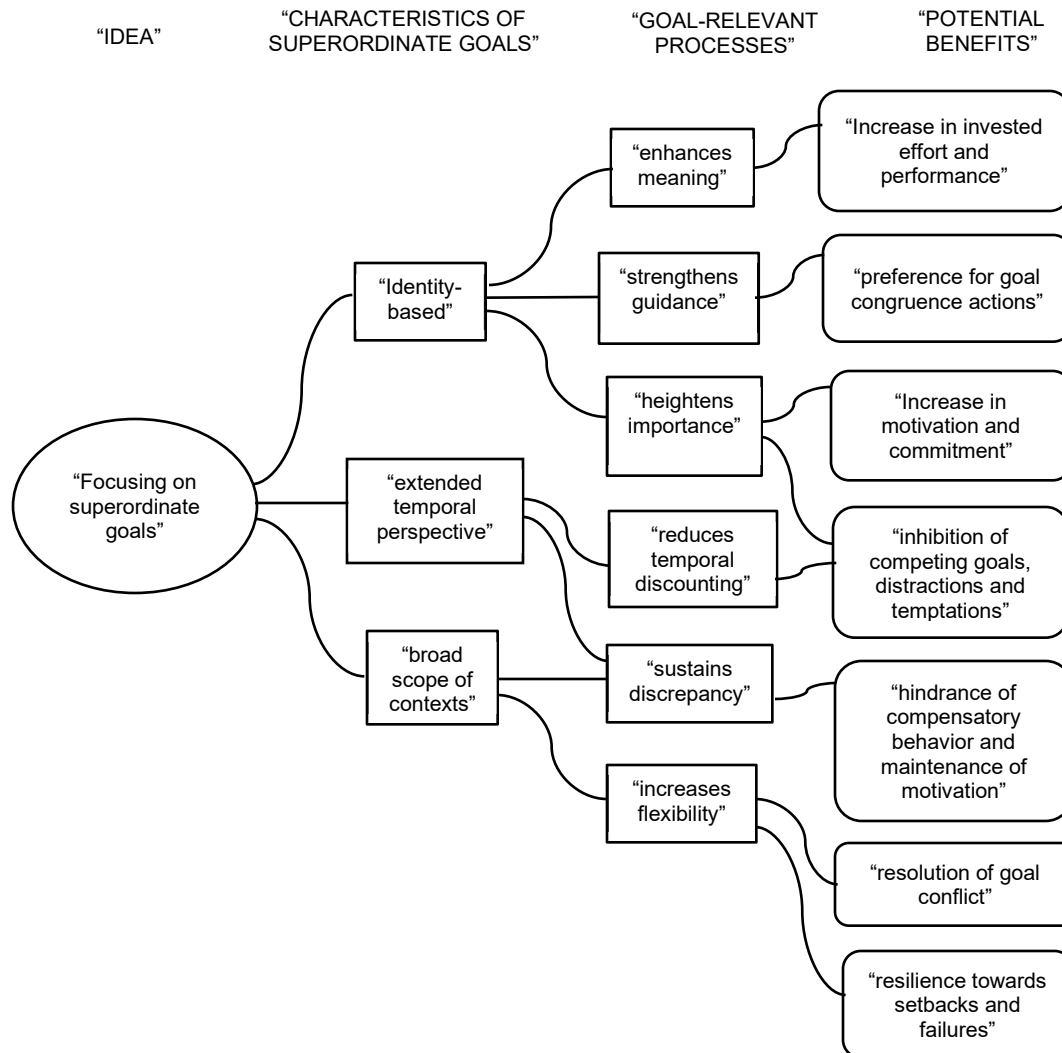
"If perceived as substantively and realistically proffered, then the "superordinate goals" in Figure 5 produce concrete benefits in terms of individual and group status advancement, while in traditional societies, status is ascribed at birth. For an imagined supranational community to be politically feasible, it must not be substantively vulnerable to the suspicious perception that it is a mantle for the particularistic nationalist agenda of one or subgroup of national members. As Hans J. Morgenthau noted, constituency leaderships will tend to cloak and legitimate their respective particularistic policy recommendations in broadly appealing ideological or religious symbols. It justifies a tendency he described as "nationalistic universalism," defined in foreign policy as "for one nation and one state the right to impose its own valuations and standards of action upon all other nations" (Kagan,106, quoting Morgenthau 1948, 256)." [sic] (DeDominicis, 2021b, 27).

CONCLUDING COMMENTS

The paper highlights the globalization of social mobility and social creativity behavior with the expansion of global markets. The ineluctability of globalization implies that the widening and intensifying awareness of interdependency continues with intensifying international conflict. This conflict itself encourages greater degrees of social deviance that state actors functionally aim to utilize. Global actors seek to develop in-group social creativity opportunity structures as well as individual social mobility opportunities. The paper has shown that the web3 is thus both a creature of state domestic and international hegemony while simultaneously resisting it. They thus are evidence of the globalization of opportunity structures for group

social creativity and individual social mobility activity in a dialectic process. Ideally, these processes should be encouraged in order to lessen the predisposition to engage in social competition that can escalate and intensify to mutually perceived zero-sum outcomes.

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