BEST BUSINESS PRACTICES FOR ACHIEVING WORLD-CLASS STATUS

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ABSTRACT: Intense global competition and rapid changes in technology have enticed many manufacturers into adopting best business practices for achieving world-class status. Objective measures of organizational culture are associated with the subjective self-assessment by manufacturing establishments about their progress toward achieving world-class status in customer-focused innovation; human-capital acquisition, development and retention; and supply-chain management and collaboration. The evidence presented in this research recommends that firms invest in the number of training hours devoted annually to each employee and increase the percentage of production employees participating in empowered work teams.

Introduction

Intense global competition and rapid changes in technology have enticed many manufacturers into adopting business practices that are said to help them achieve world-class status. The twin forces of globalization and technology continue to transform the world of work and as organizations become more virtual than physical, workers become more closely linked to customers across a country than to co-workers across a hall while products' shelve-lives become ever-shorter (Schwandt and Marquardt, 2000).

Firms need new strategies to overcome the challenges to their industries (Hill, 2008). Innovations in manufacturing will continue to pour forth. Amid all of this commotion firms need a guiding path that will move them forward confidently; step by step (Schonberger, 1996).

The objective of this research is to fill existing gaps in the business literature by providing an analysis of the relationship between objective aspects of a business's organizational culture and subjective measures of its world-class status in specific aspects of its operations. World-class status is defined as the self-reported assessment of a firm measured by the rate of organizational progress toward world-class customer-focused innovation; the rate of organizational progress toward world-class human-capital acquisition, development and retention; and the rate of organizational progress toward world-class supply-chain management and collaboration. These three dependent variables are used because it is assumed that businesses with world-class customer-focused innovation, world-class human-capital acquisition, development and retention and world-class supply-chain management and collaboration will be among the most competitive, and, therefore, among the most successful.

The three objective aspects of a business organization's culture considered are employee training hours, employee participation and talent management. These three independent variables are used because it is assumed that businesses with high levels of employee training, participation and talent management will also be businesses with higher levels of involvement, sense of ownership and responsibility. Involvement and ownership are key measures of organizational culture. Ownership creates a greater organizational commitment, a lesser overt control system and therefore improves business effectiveness (Denison, 1990).

These three objective aspects of a business organization's culture capture two sources of competitive advantage: human resources and organizational resources. The links between the three observed dependent variables and organizational effectiveness are the basis of the model of Denison(1990) used in his research. Denison (1990) argued that business effectiveness is a function of policies and practices used by the organization. His theory of organizational culture and effectiveness is used in this work to link the influence of organizational culture to an establishment's performance. This research develops a conceptual framework that associates three objective aspects of organizational culture with three self-reported subjective measures of a firm's world-class status in three operational areas. The cross-sectional Wisconsin Next Generation Manufacturing Study survey that was developed and administered by the Manufacturing Performance Institute (MPI) in Wisconsin during 2008, is used. The hypotheses about the relationships between organizational culture and world-class performance are tested with proportional odds logistic regression models.

Toyota has become the largest car manufacturer in the world, in recent years by differentiating itself as world-class leader in quality and customer service, while automobile manufacturers headquartered in the United States have had operational problems with improving efficiency and quality and in reducing their inventory costs (Palmer, 2007). It

should be relatively easy for firms such as Ford, Chrysler and General Motors to imitate particular system capabilities of Toyota or Honda and probably these firms are trying to do so. However, it seems that these firms are unable to imitate the root source of advantage of the Honda-Toyota business model.

This research begins with an introduction where the objectives and contribution of the research are described. A description of relevant studies, theoretical model, research variables, Denison's model of organizational culture and effectiveness and a suggested framework that illustrates the interactions between the dependent and the independent variables follow in the next section. The research question and three hypotheses are then described. The statistical models follow. They test the hypothesized relationships between organizational culture and the self-reported assessment of the establishments progress toward world-class status in three operational areas. The variables are also defined and operationalized in this section. The final section contains a discussion of the results followed by conclusions.

Theoretical Model
      Organizational Culture

Denison (1990) defines organizational culture as:

> The underlying values, beliefs, and principles that serve as a foundation for an organizational management system as well as the set of management practices and behaviors that both exemplify and reinforce those basic principles (Denison, 1990, p. 2).

Four hypotheses about organizational culture were then derived from Denison (1990): 1) the consistency hypothesis, 2) the mission hypothesis, 3) the involvement/participation hypothesis and 4) the adaptability hypothesis. Baker (2002) interprets these four hypotheses as:

> The consistency hypothesis – the idea that a common perspective, shared beliefs and communal values among the organizational participants will enhance internal coordination and promote meaning and a sense of identification on the part of its members. The mission hypothesis – the idea that a shared sense of purpose, direction, and strategy can coordinate and galvanize organizational members toward collective goals. The involvement/participation hypothesis – the idea that involvement and participation will contribute to a sense of responsibility and ownership and, hence, organizational commitment and loyalty. The adaptability hypothesis – the idea that norms and beliefs that enhance an organizational ability to receive, interpret, and translate signals from the environment into internal organizational and behavioral changes will promote its survival, growth, and development (Baker, K.A. 2002).

These hypotheses address the relationship between a business organization and its internal and external environments. These hypotheses address and encourage stability and control on one hand and change and adaptation on another. For example, the participation and involvement hypotheses encourages change and flexibility and addresses the relationship of the organization with its internal environment. This research is interested in two of these four hypotheses due to the structure of the MPI survey. The involvement/participation hypothesis and the consistency hypothesis are tested.

Denison (1990) provided empirical support for the participation/involvement hypothesis. He found that an increase in employee participation is correlated with an increase in organizational performance. Schein (1990) also argued that formal and informal training, coaching, mentoring and role modeling are critical mechanisms for changing and managing culture. Schein (1990) defined organizational culture as:

> A pattern of shared basic assumptions that the group learned as it solved its problems of external adaptation and internal integration that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems (Schein, 92).

This research uses three objective aspects of organizational culture as independent variables: 1) participation: measured by the percentage of employees regularly participating in empowered work teams, 2) training: measured by the number of formal training hours devoted annually to each employee and 3) talent management: measured by the percentage of employees dedicated to assessing and upgrading the organization's talent pool.

Best Business Practices And World-Class Status

Best business practices are defined both quantitatively and qualitatively, and definitions of what is really meant by a best practice vary widely. Best practices and business success can be defined as the best ways for doing anything from generating new products to providing after sales service. For example, Schonberger (1996) defined business success as: sustained bottom-line success follows when 1) customers are well served 2) employees are fully involved, and 3) actions are based on systematic data about processes, customers, competitors, and best practices.

The purpose of this research is to test the association between objective actions that are commonly associated with best business practices and the business establishments' self-assessment of their practices. In other words, if a business establishment states that they are world-class in a specific business practice are they correct?

This research uses three subjective measures of a firm's world-class status as dependent variables. These are: 1) world-class customer-focused: measured by the rate of organizational progress toward world-class customer-focused innovation, 2) world-class human-capital: measured by the rate of organizational progress toward world-class human-capital acquisition, development and retention, and 3) world-class supply-chain: measured by the rate of organizational progress toward world-class supply-chain management and collaboration. Figure 1 illustrates the proposed model of the interactions between organizational culture and world-class variables that is tested in this chapter.

Control Variables

Storey (1994) shows that firm characteristics such as size, age, and sector are important factors that influence SMEs' success. Based on Storey (1994), the size of the business establishment is used as a control variable, and is measured by the number of full time employees. A small and medium sized establishment is defined as one that employs 500 or fewer employees in the MPI survey. The age of the establishment is measured by the number of years the establishment has been in operation. The industry that the firm is a part of is also entered into the equation to control for industry-specific fixed effects. This is done with the establishment's North American Industry Classification System (NAICS) assignment.

Martin (2008) argues that developing global strategic relationships is a key to a firm's global effectiveness therefore, global is used as a control variable and is measured by the establishment's self-assessment of its progress toward becoming a world-class global player. Porter (2006) maps the relationship between a firm's operations in Figure 1 with emissions and waste containment, therefore, the establishment's environmental awareness, or green, is used as a control variable and is measured by the percentage of the workforce dedicated to reducing energy, or emissions in operations.

The theoretical model, dependent variables, independent variables and control variables were defined in this section. The association between the objective aspects of organizational culture and the self-assessment of an establishment's world-class were also provided in this section. The next section provides the research questions. The definitions of variables used in the statistical models ordinal scales are provided in Table I.

Figure 1: The Interactions Between Organizational Culture Variables & World-Class Status Variables.
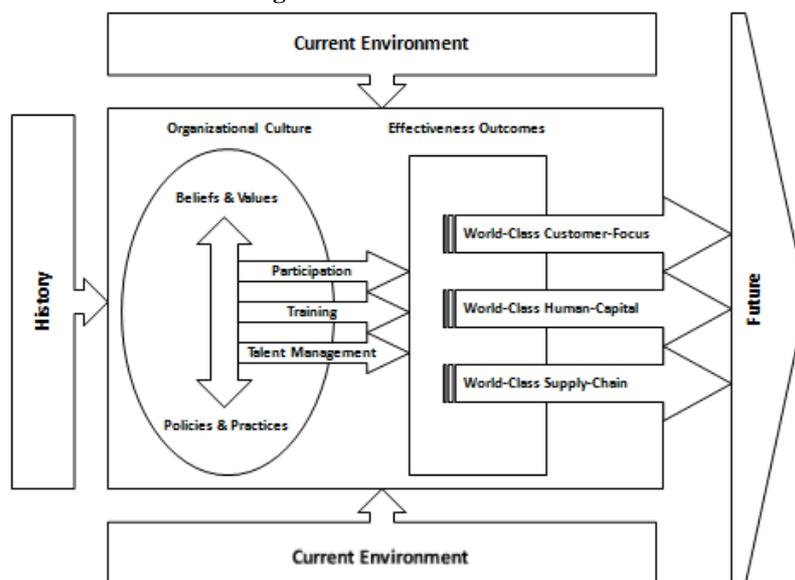
(Developed & Modified by the Researcher Based on Denison (1990)).

Research Question and Hypotheses
Research Question
The primary research question in this study explores the association between objective actions that are commonly associated with best business practices and the business establishments' self-assessment of their practices. As

described in previous sections three subjective measures of world-class status are used: customer-focused, human-capital, and supply-chain (see Figure 1 above). The research question (RQ) addressed in this chapter is: Do management practices foreshadow world-class status?

Hypotheses

Schonberger (1996) defines business success as that which follows when customers are well served, employees are fully involved, and actions are based on systematic data about processes, customers, competitors, and best practices (Schonberger, 1996). Panico (2004) argues that culture is the most critical component in moving a company from being good to great. Panico (2004) also argues that the only asset that firms cannot buy is their organizational culture.

As noted above, Denison (1990) identified four basic components of organizational culture that are translated into four hypotheses about the connection between culture and performance: 1) the consistency hypothesis, 2) the mission hypothesis, 3) the involvement/participation hypothesis and 4) the adaptability hypothesis. The involvement and consistency hypotheses test the association of employee participation, training and talent management with organizational performance. This research uses objective measurements of participation, employee training, and talent management to capture these critical aspects of organizational culture.

1) Employee participation is measured by the percentage of employees regularly participating in empowered work teams. 2) Training is measured by the number of formal training hours devoted annually per employee. 3) Talent management is measured by the percentage of employees dedicated to assessing and upgrading the organization's talent pool. These three independent variables are used because it is assumed that businesses with high levels of employee training, participation and talent management are businesses with higher levels of employee involvement, sense of ownership and responsibility. Involvement and ownership are key measures of an employee-involved organizational culture. Ownership creates a greater organizational commitment, a less overt control system which is expected to improve business effectiveness (Denison, 1990).

Three self-assessments of a firm's world-class status are the study's dependent variables: 1) world-class customer-focus: measured by the rate of organizational progress toward developing, making, and marketing new products and services that meet customer's needs at a pace faster that the competition, 2) world-class human-capital: measured by the rate of organizational progress toward securing a competitive performance advantage by having superior systems in place to recruit, hire, develop, and retain talent, and 3) world-class supply-chain: measured by the rate of organizational progress toward developing and managing supply chains and partnerships that provide flexibility, response time, and delivery performance that exceeds the competition. These three dependent variables are used because it is assumed that businesses with world-class customer-focused innovation, world-class human-capital acquisition, development and retention and world-class supply-chain management and collaboration are best at meeting Schonberger's definition of business success.

Based on the hypotheses developed by Denison about the connection between organizational culture and business effectiveness it is reasonable to propose three sets of hypotheses that explore the effects of objective aspects of organizational culture on subjective measures of a firm's world-class status. This research defines three dependent variables and three independent variables, therefore nine hypotheses are defined to explore the link between organizational culture and world-class status.

The research hypotheses are organized into three sets as provided in Table II, Table III and Table IV respectively. The dependent variables are defined in Table I. The first set of hypotheses is given in Table II; these are Research Hypotheses RH1, RH2 and RH3.

These three hypotheses explore the effect of employee participation on the three dependent variables: world-class customer-focus, world-class human-capital, and world-class supply-chain.

The second set of hypotheses is provided in Table III and it includes Research Hypotheses RH4, RH5 and RH6. These three hypotheses explore the effect of the independent variable training on the three dependent variables mentioned above.

The third set of hypotheses is provided in Table IV and include Research Hypotheses RH7, RH8 and RH9. These three hypotheses explore the effect of the independent variable talent management on the three dependent variables.

These three sets of hypotheses are statistically tested using the proportional odds ordered logistic regression model as explained in the next section.

Research Model and Data

The statistical models used for testing these three sets of hypotheses are structured according to the following equations, where $f()$ is used to signify the proportional odds logistic regression function:

4

Table I: Definitions Of Variables & Ordinal Scales.

World-Class Dependent Variables	$WORLDCLASScustomerfocused_i$: Ordered dependent variable, defined as the self reported image by an SME as world-class status in customer-focused innovation, measured by the rate of organizational progress toward becoming a world-class player in developing, making, and marketing new products and services that meet customers' needs at a pace faster than the competition, and is scaled on a five level ordinal scale: level one being no progress, level two being 2, level three being 3, level four being 4, and level five being world-class.
	$WORLDCLASShumancapital_i$: Ordered dependent variable, defined as the self reported image by an SME as world-class status in engaged people, human-capital acquisition, development and retention, measured by the rate of organizational progress toward becoming a world-class player in securing a competitive performance advantage by having superior systems in place to recruit, hire, develop, and retain talent, and is scaled on a five level ordinal scale: level one being no progress, level two being 2, level three being 3, level four being 4, and level five being world-class.
	$WORLDCLASSsupplychain_i$: Ordered dependent variable, defined as the self reported image by an SME as world-class status in supply-chain management and collaboration, measured by the rate of organizational progress toward becoming a world-class player in developing and managing supply chains and partnerships that provide flexibility, response time, and delivery performance that exceeds the competition, and is scaled on a five level ordinal scale: level one being no progress, level two being 2, level three being 3, level four being 4, and level five being world-class.
Organizational Culture Independent Variables	$PARTICIPATION_i$: Independent variable, defined as the percentage of employees regularly participating in empowered work teams (i.e., make decisions without supervisor approval), and is scaled on a five level ordinal scale: level one being <25%, level two 25-50%, level three 51-75%, level four 76-90%, and level five >90%.
	$TRAINING_i$: Independent variable, defined as the number of training hours devoted annually to each employee, and is scaled on a four level ordinal scale: level one being ≤8 hours, level two 9-20, level three 21-40, and level four >40 hours.
	$TALENTMGMT_i$: Independent variable, defined as the percentage of employees dedicated to assessing and upgrading the organization's talent pool, and is scaled on a four level ordinal scale: level one being <1%, level two 1-5%, level three 6-10%, and level four >10%.
Control Variables	$log(SIZE_i)$: Control variable, defined as the log of the number of full time employees.
	$log(AGE_i)$: Control variable, defined as the log of the number of years the organization has been in operation.
	$GREEN_i$: Control variable, defined as the percentage of workforce dedicated to reducing energy, or emissions in operations.
	$NAICS_i$: Control variable, defined as the North American Industry Classification System (NAICS).
	$GLOBAL_i$: Control variable, measured by the rate of organization's progress toward becoming a world-class global player.
	ε_i: Statistical Error.

Table II: Hypotheses Sets For The Independent Variable Participation.

Ind	R	H_0	
			The percentage of production employees participating in empowered or self-directed work teams has no effect on the rate of organizational progress toward world-class customer-focused innovation of an SME.

H1	H_1	*The percentage of production employees participating in empowered or self-directed work teams does affect the rate of organizational progress toward world-class customer-focused innovation of an SME.*
RH2	H_0	*The percentage of production employees participating in empowered or self-directed work teams has no effect on the rate of organizational progress toward world-class human-capital acquisition, development and retention of an SME.*
	H_1	*The percentage of production employees participating in empowered or self-directed work teams does affect the rate of organizational progress toward world-class human-capital acquisition, development and retention of an SME.*
RH3	H_0	*The percentage of production employees participating in empowered or self-directed work teams has no effect on the rate of organizational progress toward world-class supply-chain management and collaboration of an SME.*
	H_1	*The percentage of production employees participating in empowered or self-directed work teams does affect the rate of organizational progress toward world-class supply-chain management and collaboration of an SME.*

Table III: Hypotheses Sets For The Independent Variable Training.

Independent Variable (Training)	RH4	H_0	*The number of training hours devoted annually to each employee has no effect on the rate of organizational progress toward world-class customer-focused innovation of an SME.*
		H_1	*The number of training hours devoted annually to each employee does affect the rate of organizational progress toward world-class customer-focused innovation of an SME.*
	RH5	H_0	*The number of training hours devoted annually to each employee has no effect on the rate of organizational progress toward world-class human-capital acquisition, development and retention of an SME.*
		H_1	*The number of training hours devoted annually to each employee does affect the rate of organizational progress toward world-class human-capital acquisition, development and retention of an SME.*
	RH6	H_0	*The number of training hours devoted annually to each employee has no effect on the rate of organizational progress toward world-class supply-chain management and collaboration of an SME.*
		H_1	*The number of training hours devoted annually to each employee does affect the rate of organizational progress toward world-class supply-chain management and collaboration of an SME.*

Table IV: Hypotheses Sets For The Independent Variable Talent Management.

Independent Variable (Talent Management)	RH7	H_0	*The percentage of employees dedicated to assessing and upgrading the organizational talent pool has no effect on the rate of organizational progress toward world-class customer-focused innovation of an SME.*
		H_1	*The percentage of employees dedicated to assessing and upgrading the organizational talent pool does affect the rate of organizational progress toward world-class customer-focused innovation of an SME.*
	RH8	H_0	*The percentage of employees dedicated to assessing and upgrading the organizational talent pool has no effect on the rate of organizational progress toward world-class human-capital acquisition, development and retention of an SME.*
		H_1	*The percentage of employees dedicated to assessing and upgrading the organizational talent pool does affect the rate of organizational progress toward world-class human-capital acquisition, development and retention of an SME.*
	RH9	H_0	*The percentage of employees dedicated to assessing and upgrading the organizational talent pool has no effect on the rate of organizational progress toward world-class supply-chain management and collaboration of an SME.*
		H_1	*The percentage of employees dedicated to assessing and upgrading the organizational talent pool does affect the rate of organizational progress toward world-class supply-chain management and collaboration of an SME.*

Model 1:

$$WORLDCLASScustomerfocused_i = f(\alpha + \beta_1 PARTICIPATION_i + \beta_2 TRAINING_i + \beta_3 TALENTMGMT_i + \beta_4 \log(SIZE_i) + \beta_5 \log(AGE_i) + \beta_6 GREEN_i + \beta_7 NAICS_i + \beta_8 GLOBAL_i + \varepsilon_i)$$

Model 2:

$$WORLDCLASShumancapital_i = f(\alpha + \beta_1 PARTICIPATION_i + \beta_2 TRAINING_i + \beta_3 TALENTMGMT_i + \beta_4 \log(SIZE_i) + \beta_5 \log(AGE_i) + \beta_6 GREEN_i + \beta_7 NAICS_i + \beta_8 GLOBAL_i + \varepsilon_i)$$

Model 3:

$$WORLDCLASSsupplychain_i = f(\alpha + \beta_1 PARTICIPATION_i + \beta_2 TRAINING_i + \beta_3 TALENTMGMT_i + \beta_4 \log(SIZE_i) + \beta_5 \log(AGE_i) + \beta_6 GREEN_i + \beta_7 NAICS_i + \beta_8 GLOBAL_i + \varepsilon_i)$$

The first model explores the association between organizational culture and the establishment's self-assessment of its customer-focused innovation. The second model explores the association between organizational culture and the establishment's self-assessment of its progress toward human-capital acquisition, development and retention. The third model explores the association between organizational culture and the establishment's self-assessment of its progress toward world-class supply-chain management and collaboration.

The organizational culture variables that are used are: participation, training and talent management. The participation variable is measured by the percentage of employees regularly participating in empowered teams. The

participation variable is measured by the number of formal training hours devoted annually to each employee. The talent management variable is measured by the percentage of employees that are dedicated to assessing and upgrading the organization's talent pool.

Each of the three statistical models is tested under different conditions. Each model is tested using the North American Industry Classification System (NAICS) code under different fixed effects at the three, four and five-digit levels of industry identification. The variables used in these statistical models are defined in Table I.

There are twenty manufacturing sectors represented in the sample, based on the NAICS 2007 classification of the manufacturing sector. The number of establishments representing the Fabricated Metal Product Manufacturing sector in the sample constitutes 24.2% of the sample, and the number of establishments representing the Machinery Manufacturing sector in the sample constitutes 21.9% of the sample. These two manufacturing sectors represent 46% of the sample and the remaining eighteen sectors represent 54% of the sample. MPI reports that the research sample accounts for about 6% of Wisconsin's manufacturing establishments. Census 2007 manufacturing data reports that Wisconsin has 12% of its manufacturing establishments in the Machinery Manufacturing sector and 21% of its manufacturing establishments in the Fabricated Metal Product.

The distribution of SMEs in the sample is roughly parallel to the distribution of SMEs in Wisconsin but it is slightly skewed in some sectors. However, the NAICS fixed effects variables correct for biases introduced by the skewed distributions of establishments by industry in the sample. Therefore, the sample is concluded to be roughly parallel to the universe, assuming that the relationship between dependent and independent variables is constant across industries.

Data Source and Method

The data are from the Wisconsin Next Generation Manufacturing Survey of manufacturing establishments in Wisconsin conducted by the MPI for the Wisconsin Manufacturing Extension Partnership (WMEP) during 2008. The purpose of the MPI survey was to identify best management practices in the state's manufacturing establishments. The universe of the study was all manufacturing establishments in Wisconsin. The sample size is 492 establishments representing a 6% of the universe.

Since the dependent variables in this research are discrete, ordered and not continuous, and since they are scaled on either four or five-level ordinal scales proportional odds logistic regression models are used in this research.

Validation of the appropriateness of the proportional odds ordered logistic regression model is required (Vani, 2001). The proportional odds assumption is statistically tested using a Chi Square test. The ordered logistic model assumes that the model errors are logistically distributed, as contrasted with ordered probit models where the model errors are assumed to be normally distributed. Either model can be used for our tests. However, the ordered logistic model was selected because its results are easier to interpret than ordered probit models.

The goodness of fit of the estimated statistical models is measured using the Akaike Information Criterion (AIC) statistic where $AIC = 2k - 2\ln(L)$, where: L is the maximized value of the likelihood function of the estimated model and k is the number of parameters in the statistical models (Vani, 2001). AIC is a model selection tool where the model with the lowest AIC value is determined to be the best. A low AIC value is interpreted as identifying the model with the lowest level of information inaccuracy.

Although ordered logistic regression models do not have an R^2 value as an overall gauge of the model's goodness

of fit, they do have an analogous measure, the $Pseudo\ R^2$. The $Pseudo\ R^2$ is calculated using the following formula:

$$Pseudo\ R^2 = 1 - (\ln L_{(Multinomial)} / \ln L_{(Ordered)})$$

Where: $\ln L_{(Multinomial)}$ is the loglikelihood value of the multinomial regression model and $\ln L_{(Ordered)}$ is the

loglikelihood value of the ordered logistic regression model. The $Pseudo\ R^2$ is a rough indicator of the goodness of

fit, where a value equal to zero means that all coefficients are zero and a value equal or close to 1 means that the model is very good (Vani, 2001).

Results and Discussion

Before the results are discussed in this section, validation of the appropriateness of the proportional odds ordered logistic regression model is required (Vani, 2001). The proportional odds assumption holds for all the models tested. The results for the small and medium sized establishments (SMEs) models are generally superior to the results for the other models that include observations on establishments of all sizes. The superior results for the SME models are identified by the low AIC values and the high association

8

statistics are displayed in Table VI and Table VII. The lowest AIC result is for Model 3 where AIC = 1111. This means that the goodness of fit is best for the statistical model testing the regression of the ordered dependent variable world-class supply-chain that includes 4-digit NAICS fixed effects variables and where the sample is restricted to SMEs.

This research is exploratory. F-tests for each model are similar to maximum likelihood tests and are more effective and appropriate to address the research question than are individual t-tests of the coefficient. This is true for two reasons: first, research is exploratory and sample is biased, second, the joint effect of three independent variables is of interest. Therefore, this research focuses on F-tests rather than coefficient tests. Table VI and Table VII, summarize the statistical results. The F-tests show significant results, as displayed in Table VI.

The research results show a strong association between participation and training with an establishment's self-assessment of world-class customer-focus, and training with world-class human-capital at the 1% critical level. The association between participation and training with an establishment's self-assessment of world-class human-capital is significant at the 5% critical level.

The first model displayed in Table VII explores the association of organizational culture with an establishment's self-assessment world-class customer-focus. The model shows strong and statistically significant association of participation and training with world-class customer-focus, and weak associations between talent management with world-class customer-focus. These associations are only significant at the 10% critical level.

The dummy variable participation at level four (where between 76% and 90% of employees regularly participate in empowered work teams) is positive and statistically significant at the 1% critical level. Holding all else constant, when between 76-90 percent of employees regularly participate as members of empowered work teams, then the odds of the establishment's envisioning itself as being world-class customer-focus are multiplied by 2.78 times what they are when less than twenty five percent of employees participate in empowered work teams. This is a very strong indicator of the connection between high levels of work-force participation and world-class customer-focus.

As the percentage of the workforce that is involved in employee participation gets larger, the difference from the omitted dummy variable participation 1 in the regression model, as provided in Table VII, also gets larger. This indicates that the percentage of employees regularly participating as members of empowered work teams is strongly associated with an establishment's self-assessment of world-class customer focus.

The second model in table VII explores the association between organizational culture and the establishment's self-assessment as being world-class in recruiting, hiring, developing, and retaining talent. The model shows strong and statistically significant association between participation and world-class human-capital. This is at the 1% critical level. Model three explores the association between the attributes of organizational culture with the establishment's self-assessment as being world-class in developing and managing supply chains and partnerships. These would be supply chains that are flexible and where response time and delivery performance exceed the competition. The model shows no significant associations between the organizational culture variables and world-class supply-chain.

There is evidence of a relationship between the organizational culture variables and the establishment's self-assessment as being world-class measures in two of the three models. These models are model 1 and model 2 that are provided in table VII. There are three strong relationships that are significant at the 1% critical level, two that are significant at the 5% critical level, and one weaker relationship that is significant at the 10% critical level. The results show that the percentage of employees regularly participating in empowered work teams is positively associated with an establishment's self-assessment as world-class customer-focus and world-class human-capital at the 1% critical level. The average number of training hours devoted annually to each employee is positively associated with an establishment's self-assessment of world-class customer-focus at the 1% critical level, and with world-class human-capital at the 5% critical level. The percentage of employees dedicated to assessing and upgrading the organization's talent pool is positively associated with an establishment's self-assessment as world-class human-capital at the 5% critical level. The consistency of the results is evident when the statistical models tested are examined. The models were tested with different NAICS code fixed effects using three-digit, four-digit and five-digit NAICS fixed effects. The model restricted to SME size and four digit NAICS defined industry dummy variables to capture industry fixed effects proved to be the superior model, having the lowest AIC value of 1111. The SME models show higher t-values and larger odd ratios compared to the other models that included the full sample of all manufacturing establishments; manufacturing establishments of all sizes.

Results show that there are strong associations between objective actions that are commonly associated with best business practices and the business establishments' self-assessment of their practices. In other words, if a business establishment states that they are world-class in a specific business practice they are correct. Participation in empowered work teams and investing in training have strong associations with an establishment's self-assessment of

9

world-class customer-focus and with world-class human-capital management. Talent management has strong associations with an establishment's self-assessment of world-class human-capital management. Furthermore, it is also evident from our results that the relationship between the objective aspects of organizational culture and an establishment's self-assessment of world-class status is stronger when the sample is restricted to SMEs.

Conclusion

Organizational culture is associated with an establishment's self-assessment of its world-class and, more importantly status in world-class customer-focus and world-class human-capital. This study provides empirical evidence on the links between objective aspects of organizational culture and an establishment's self-assessment of world-class. This study shows that employee training, employee participation in empowered or self-directed work teams and talent management are objective aspects of organizational culture that are strongly associated with the subjective measures of a firm's world-class customer-focus status, and world-class human-capital status.

The association of the objective aspects of organizational culture is strongest between employee training and employee participation in empowered or self-directed work teams and between an establishment's self-assessment of world-class customer-focus, and world-class human-capital.

This research highlights the importance of the objective actions that are commonly associated with best business practices and the business establishments' self-assessment of their practices. Therefore, if business establishments state that they are world-class in a specific business practice then they are correct. This research leads to recommendations for firms to consider business models that emphasize worker involvement and investment in training. Business establishments and top managers are advised to invest in empowering their employees, providing sufficient annual training in addition to managing their organizational talent pool by their continuous dedication to assess and upgrade the organizational talent pool.

Table VI: Summary of the Proportional Odds Logistic Regressions Results.

		p-value		
		Model 1	Model 2	Model 3
		Dependent Variable		
		World-Class customer-focus	World-Class human-capital	World-Class supply-chain
Independent Variable	PARTICIPATION	0.0037***	1.5e-05***	0.6661
	TRAINING	0.0069***	0.0110**	0.2257
	TALENTMGMT	0.0862*	0.0447**	0.4800
Proportional Odds Test "*Pchisq*"		0.9174	0.9389	0.7337
Pseudo R^2		0.1883	0.2553	0.2304
AIC		1148	1265	1111
Df		105	106	112

*significant at the 0.10 confidence level **significant at the 0.05 confidence level ***significant at the 0.01 confidence level.
N=492

Table VII: Summary of the Results of the N4digSME Models.

Variable Name	Model 1 Dependent Variable (World-Class Customer-Focus)		Model 2 Dependent Variable (World-Class Human-Capital)		Model 3 Dependent Variable (World-Class Supply-Chain)	
	Value	EXP(Coef)	Value	EXP(Coef)	Value	EXP(Coef)
	Std. Error	t value	Std. Error	t value	Std. Error	t value
PARTICIPATION2	0.54	1.71	0.37	1.44	0.01	1.01
	0.26	2.04**	0.26	1.41*	0.28	0.04
PARTICIPATION3	1.02	2.76	1.06	2.90	-0.39	0.68
	0.34	2.99***	0.33	3.23***	0.34	-1.12
PARTICIPATION4	1.02	2.78	1.61	4.98	-0.08	0.92
	0.35	2.91***	0.36	4.43***	0.38	-0.22
TRAINING2	0.73	2.07	0.80	2.22	-0.05	0.95
	0.27	2.68***	0.27	2.96***	0.28	-0.18
TRAINING3	0.09	1.09	0.42	1.53	-0.46	0.63
	0.30	0.29	0.30	1.42*	0.31	-1.48
TALENTMGMT2	0.31	1.36	0.31	1.37	0.10	1.10
	0.26	1.17	0.26	1.20	0.27	0.36
TALENTMGMT3	0.69	1.99	0.77	2.15	0.37	1.45
	0.31	2.20**	0.31	2.46***	0.32	1.15

*significant at the .10 confidence level **significant at the 0.05 confidence level ***significant at the 0.01 confidence level.
N=492

Bibliography:

Babbie E. (1990). *Survey Research Method, 2nd Ed.* Wadsworth Publishing Company, California.

Baker, K. A. (2002). *Organizational Culture*. Research 11.

Barney, J. B. (1986). *Organizational Culture: Can it be a Source of Sustained Competitive Advantage?* Academy of Management Review, 11, 656-665.

Borstorff , P., Moran F. & Palmer D.(2007). *The Relationship between National Culture, Organizational Culture, Causal Ambiguity and Competitive Advantage in an International Setting: An Exploratory Analysis*, Jacksonville State University.

Brandt, J. (2007). *Ohio Auto Supplier Benchmark Study: Continuously Improving But facing Challenges,* Manufacturing Performance Institute (MPI).

Brown, S. (1996). *Strategic Manufacturing for Competitive Advantage,* Prentice Hall Europe, Hertfordshire.

Burt, D. N., Dobler, D. W., and Starling, S. L. (2003). *World Class Supply Management, Seventh Edition,* McGraw-Hill, Irvine.

Carson, D., Gilmore, A. and MacLaran, P. (1998). *Customer or profit focus: an alternative perspective.* Journal of Marketing Practice: Applied Marketing Science, 4, 26–39.

Chen, J., Paulraj, A. (2004). *Understanding Supply Chain management: Critical Research and A Theoretical Framework,* International Journal of Production Research.

De-Castro, G. M., Lopez, J. E., Lopez, P.,& Salzar, A. E. (2006). *Organizational capital as competitive advantage of the firm.* Journal of Intellectual Capital, 7(3), 324-337.

Denison, D. R. (1990). *Corporate Culture And Organizational Effectiveness.* John Wiley & Sons.

Di Stefano, L. (2007). *Warning to SME's: Integrate Corporate Culture for Competitive Advantage or Risk Losing Market Share,* Mettle Group.

Dimancescu, D., Dwenger, K. (1996). *World-Class New Product Development*, The American Management Association, New York.

Dwivedi, A., Butcher, T., (2009). *Supply Chain Management and Knowledge Management*, Palgrave Macmillan, UK.

Gonzalez, A. & Nieto, A. M. (2005). *Protection and internal transfer of technological competencies: The role of causal ambiguity.* Industrial Management & Data Systems.

Hill, E. W., & Samuel F.S. (2008). *Driving Ohio's Prosperity: A Two-Job Strategy for Growing the Value of Automotive and Advanced Manufacturing".* Compete Columbus.

Hill, E.W. (2009). *The Ohio Urban University Program UUP. National Perspective on State and Local Finance in an Economic Crisis.* Columbus, Ohio.

Hill, E.W. and Brenan, J. (2000). *A Methodology for Identifying the Drivers of Industrial Clusters: The Foundation of Regional Competitive Advantage.* Economic Development Quarterly, 14(1): 65-96.

Hill, E.W. and Brenan, J. (1999). *Measuring Metropolitan Manufacturing Competitiveness.* Economic Development Commentary, 23(2): 33-38

King, A. W., & Zeithaml, C. P. (2001). *Competencies and Firm Performance: Examining the Causal Ambiguity Paradox.* Strategic Management Journal, 22, 75-99.

Kleindl, B. (2001). *Competitive Dynamics and New Business Models for SMEs in the Virtual Market,* Journal of Development Entrepreneurship, no.1.

Martin, J. W. (2008). *Operational Excellence: Using Lean Six sigma to Translate Customer Value through Global Supply Chain*, Auerbach Publications, New York.

Mentzer, J. T. (2004). *Fundamentals of Supply Chain Management*, Thousand Oaks, CA: Sage Publications.

Nelson, R. R., Winter, S. G. (1982). *An Evolutionary Theory of Economic Change.* Harvard University Press: Cambridge, MA.

Ouchi, W. G. (1981). *Theory Z: How American Business Can Meet the Japanese Challenge.* Reading MA: Addison-Wesley Publishing Co.

Parvatiyar, A., Sheth, J. N., (2001). *Customer Relationship management: Emerging Practice, Process, and Discipline.* Journal of Economic and Social Research.

Pascale, R. and Athos, A. (1982). *The Art of Japanese Management: Application for American Executives.* New York: Simon & Schuster.

Payne, A., Holt, S. (1998). *Diagnosing Customer Value: A Review of the Literature and a Framework for Relationship Value Management*, Cranfield Working Paper Series.

Perterson, Albaum, & Kozwtsky. (1986). *The Public's Definition of Small Business*, Journal of Small Business Management.

Porter, M. & Kramer, M. (2006). *Strategy & Society: The Link Between Competitive Advantage and Corporate Social Responsibility*, Harvard Business Review.

Porter, M. (1985). *Competitive Advantage – Creating and Sustaining Superior Performance,* New York: Free Press.

Porter, M. (1980). *Competitive Strategy - Techniques for Analyzing Industries and Competitors,* New York: Free Press.

Rashid, Z. A, Sambasivan, M., & Johari, J. (2003). *The influence of corporate culture and organizational commitment on performance.*

Schein, E. H.(1980). *Organizational Psychology.* Englewood Cliffs, NJ: Prentice Hall.

Schein, E. H. (1985). *Organizational Culture and Leadership: A Dynamic View.* San Francisco: Jossey-Bass Publishers.

Schein, E H. (1992) *Organizational Culture and Leadership.* San Francisco: Jossey-Bass Publishers.

Schein, E. H. (1995). *Kurt Lewin's Change Theory in the Field and in the Classroom: Notes Toward a Model of Managed Learning.* MIT Sloan School of Management.

Schein, E. H. (1999). *The Corporate Culture Survival Guide: Sense and Nonsense about Cultural Change.* San Francisco: Jossey-Bass Publishers.

Schonberger, R. J. (1987). *World Class Manufacturing Casebook, Implementing JIT and TQC*, the Free Press, New York.

Schonberger, R. J. (1996). *World Class Manufacturing The Next Decade*, The Free Press, New York.

Schwandt, D. R., Marquardt, M. J. (2000). *Organizational Learning: From World-Class Theories to Global Best Practices,* CRC Press, Florida.

Stalk, G. (1998). *Time-The Next Source of Competitive Advantage*, Harvard Business Review.

Steinhoff & Burgess. (1989). *Small Business Development*, McGraw Hill, Singapore. Stevenson, W.J. (2009). *Operations Management*, 10th Edition, McGraw Hill.

Storey, D.J. (1994). Understanding the Small Business Sector, ITP, London.

Song, J., Yao D. (2002). *Supply Chain Structures, Coordination, Information and Optimization*, Kluwer Academic Publishers, Massachusetts.

Van Gils, A. (2000). *Cooperative Behavior in Small and Medium-Sized Enterprises: The Role of Strategic Alliances,* Doctorate Dissertation, University of Gronongen.

Vani, K. B. (2001). *Logit and Probit: Ordered Multinomial Models*, Sage Publications, Inc., California.