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**THE INFLUENCE OF ORGANIZATIONAL CULTURE
ON THE SUSTAINABLE COMPETITIVE ADVANTAGE
OF SMALL & MEDIUM SIZED ESTABLISHMENTS.**

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Objective

- To fill existing gaps in the business literature by providing an analysis of the relationship between the objective aspects of a business's organizational culture & objective measures of the outcomes of sustainable competitive advantage.

Introduction

- Three types of capital resources can be identified as the sources of a business competitive advantage: organizational resources, human resources and physical resources.
- The organizational culture of a firm is composed of both organizational resources and human resources (Barney & Wright, 1998).

Introduction (Cont'd)

- Barney (2008) defines competitive advantage as being sustainable if competitors are unable to imitate the source of advantage or if no one conceives of a better offering.

Introduction (Cont'd)

- Culture is the most critical component in moving a company from being good to great. The only asset that firms cannot buy is their organization's culture (Panico 2004)
- Di Stifano (2007) also argues that a prerequisite for achieving competitive advantage is having the right corporate culture in place.

Introduction (Cont'd)

- Denison (1990) identified four basic components of organizational culture that are translated into four hypotheses about the connection between culture & performance:
 - 1) the consistency hypothesis
 - 2) the mission hypothesis
 - 3) the involvement/participation hypothesis
 - 4) the adaptability hypothesis
- The involvement & consistency hypotheses test the associations between employee participation, training and talent management with the organization's performance.

Table I: Definitions Of Variables & Ordinal Scales

Competitive Advantage Dependent Variables	Productivity Growth	Ordered dependent variable, defined as the percentage improvement in productivity over the past three years, and is scaled on a five level ordinal scale: level one being 0-25%, level two 26-50%, level three 51-75%, level four 76-99%, and level five >100%.
	Supply- Chain Efficiency	Ordered dependent variable, defined as the percentage of reduction in the total value of inventory throughout the supply chain for the primary product over the last three years, and is scaled on a four level ordinal scale: level one being <10%, level two 10-25%, level three 26-50%, and level four >50%.
	New products	Ordered dependent variable, defined as the percentage of annual sales derived from new products introduced in the past three years, and is scaled on a four level ordinal scale: level one being <5%, level two 5-25%, level three 26-50%, and level four >50%.

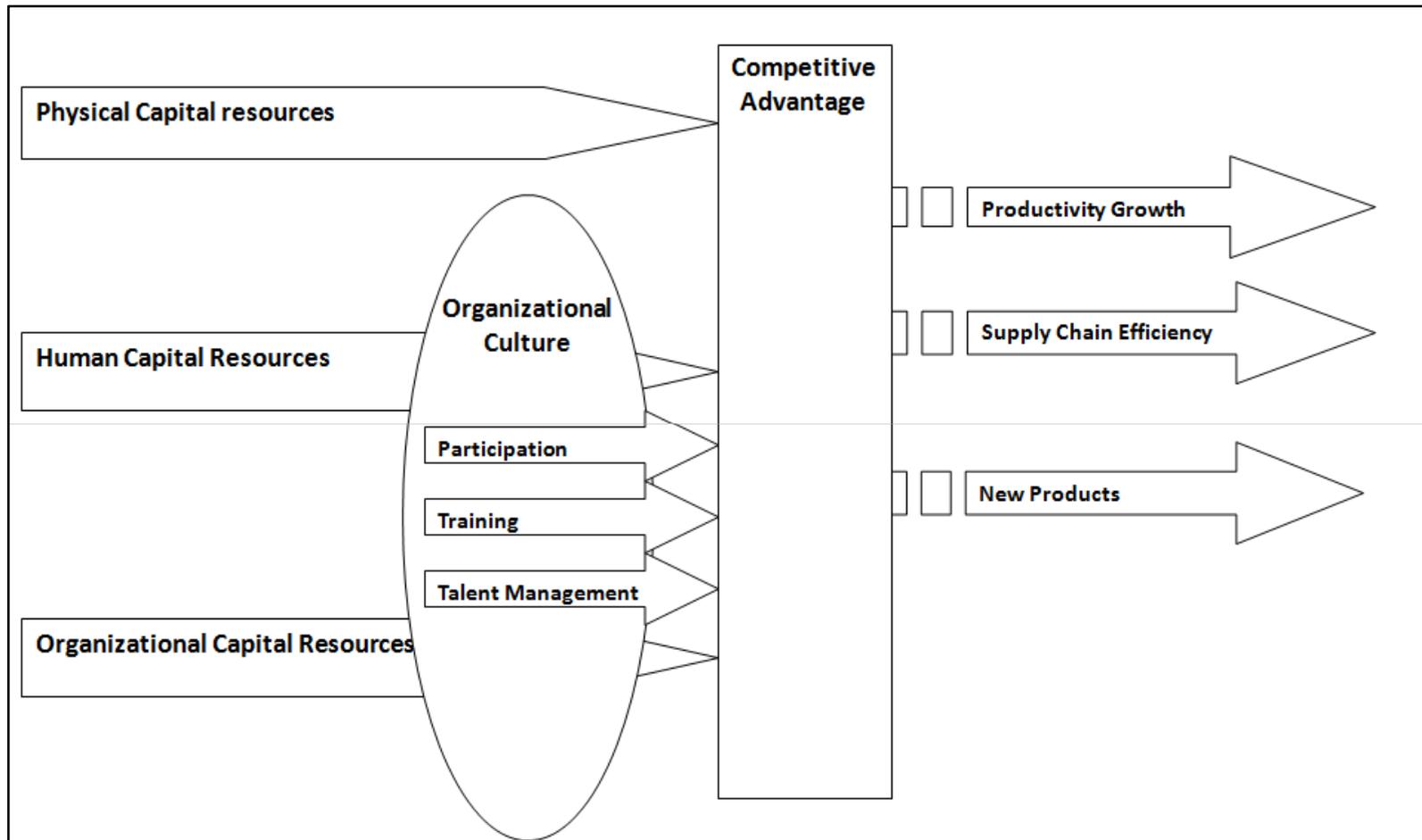
Table I: Definitions Of Variables & Ordinal Scales (Cont'd)

Organizational Culture Independent Variables	Participation	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	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.
	Talent Management	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%.

Table I: Definitions Of Variables & Ordinal Scales (Cont'd)

Control Variables	log(SIZE)	Control variable, defined as the log of the number of full time employees.
	log(AGE)	Control variable, defined as the log of the number of years the organization has been in operation.
	GREEN	Control variable, defined as the percentage of workforce dedicated to reducing energy, or emissions in operations.
	NAICS	Control variable, defined as the North American Industry Classification System (NAICS).

Figure 2: The Interactions Between Organizational Culture Variables & Sustainable Competitive Advantage Outcomes



Research Question

- The research question 1 explores the influence of organizational culture on sustainable competitive advantage (SCA):

Does organizational culture affect the sustainable competitive advantage of an SME?

Table II: Hypotheses Sets For The Independent Variable Participation

RH 1	H ₀	The percentage of production employees participating in empowered or self-directed work teams has no effect on the percentage improvement in productivity over the past three years.
	H ₁	The percentage of production employees participating in empowered or self-directed work teams does affect the percentage improvement in productivity over the past three years.
RH 2	H ₀	The percentage of production employees participating in empowered or self-directed work teams has no effect on the percentage of reduction in the total value of inventory throughout the supply chain for the primary product over the last three years.
	H ₁	The percentage of production employees participating in empowered or self-directed work teams does affect the percentage of reduction in the total value of inventory throughout the supply chain for the primary product over the last three years.
RH 3	H ₀	The percentage of production employees participating in empowered or self-directed work teams has no effect on the percentage of annual sales derived from new products introduced in the past three years.
	H ₁	The percentage of production employees participating in empowered or self-directed work teams does affect the percentage of annual sales derived from new products introduced in the past three years.

Table III: Hypotheses Sets For The Independent Variable Training

RH 4	H ₀	The number of training hours devoted annually to each employee has no effect on the percentage improvement in productivity over the past three years.
	H ₁	The number of training hours devoted annually to each employee does affect the percentage improvement in productivity over the past three years.
RH 5	H ₀	The number of training hours devoted annually to each employee has no effect on the percentage of reduction in the total value of inventory throughout the supply chain for the primary product over the last three years.
	H ₁	The number of training hours devoted annually to each employee does affect the percentage of reduction in the total value of inventory throughout the supply chain for the primary product over the last three years.
RH 6	H ₀	The number of training hours devoted annually to each employee has no effect on the percentage of annual sales derived from new products introduced in the past three years.
	H ₁	The number of training hours devoted annually to each employee does affect the percentage of annual sales derived from new products introduced in the past three years.

Table IV: Hypotheses Sets For The Independent Variable Talent Management

RH 7	H ₀	The percentage of employees dedicated to assessing and upgrading the organization's talent pool has no effect on the percentage improvement in productivity over the past three years.
	H ₁	The percentage of employees dedicated to assessing and upgrading the organization's talent pool does affect the percentage improvement in productivity over the past three years.
RH 8	H ₀	The percentage of employees dedicated to assessing and upgrading the organization's talent pool has no effect on the percentage of reduction in the total value of inventory throughout the supply chain for the primary product over the last three years.
	H ₁	The percentage of employees dedicated to assessing and upgrading the organization's talent pool does affect the percentage of reduction in the total value of inventory throughout the supply chain for the primary product over the last three years.
RH 9	H ₀	The percentage of employees dedicated to assessing and upgrading the organization's talent pool has no effect on the percentage of annual sales derived from new products introduced in the past three years.
	H ₁	The percentage of employees dedicated to assessing and upgrading the organization's talent pool does affect the percentage of annual sales derived from new products introduced in the past three years.

Research Models

Model 1:

$$\begin{aligned} \text{PRODUCTIVITYGROWTH}_i &= f(\alpha + \beta_1 \text{PARTICIPATION}_i + \beta_2 \text{TRAINING}_i \\ &+ \beta_3 \text{TALENTMGMT}_i + \beta_4 \log(\text{SIZE}_i) + \beta_5 \log(\text{AGE}_i) + \beta_6 \text{GREEN}_i + \beta_7 \text{NAICS}_i + \varepsilon_i) \end{aligned}$$

Model 2:

$$\begin{aligned} \text{SUPPLYCHAIN}_i &= f(\alpha + \beta_1 \text{PARTICIPATION}_i + \beta_2 \text{TRAINING}_i \\ &+ \beta_3 \text{TALENTMGMT}_i + \beta_4 \log(\text{SIZE}_i) + \beta_5 \log(\text{AGE}_i) + \beta_6 \text{GREEN}_i + \beta_7 \text{NAICS}_i + \varepsilon_i) \end{aligned}$$

Model 3:

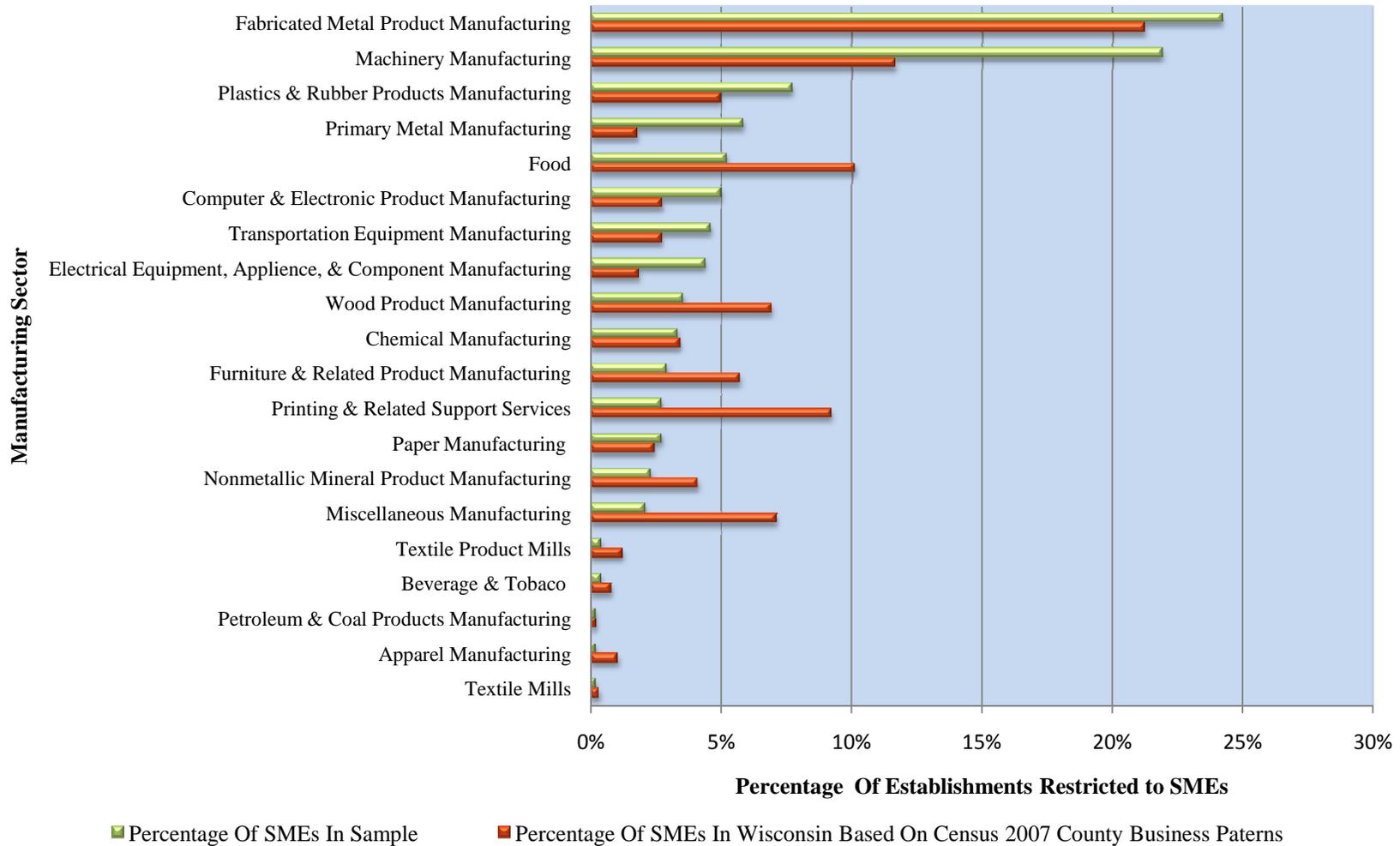
$$\begin{aligned} \text{NEWPRODUCTS}_i &= f(\alpha + \beta_1 \text{PARTICIPATION}_i + \beta_2 \text{TRAINING}_i \\ &+ \beta_3 \text{TALENTMGMT}_i + \beta_4 \log(\text{SIZE}_i) + \beta_5 \log(\text{AGE}_i) + \beta_6 \text{GREEN}_i + \beta_7 \text{NAICS}_i + \varepsilon_i) \end{aligned}$$

Where: $f()$ is used to signify the proportional odds logistic regression function

Data Source

- 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.

Figure 3: The Generalization Of The Research Sample By Manufacturing Sector To Wisconsin.



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Method

- Proportional odds logistic regression models are used for the statistical analysis because the dependent variables are ordinal variables and not continuous
- OLS is not appropriate to use because the dependent variables are not continuous

Table V: Descriptive Statistics

Dependent Variables	Percentage improvement in productivity over the past three years			Percentage of reduction in the total value of inventory throughout the supply chain for the primary product over the last three years			Percentage of annual sales derived from new products introduced in the past three years		
	Scale	Number of Establishments	Percentage of Establishments	Scale	Number of Establishments	Percentage of Establishments	Scale	Number of Establishments	Percentage of Establishments
	<25%	230	48%	<10%	285	59%	<5%	132	27%
	26-50%	155	32%	10-25%	138	29%	5-25%	224	46%
	51-75%	64	13%	26-50%	46	10%	26-50%	93	19%
	76-99%	26	5%	>50%	10	2%	>50%	36	7%
	>100%	5	1%						
	480	100%		479	100%		485	100%	
Independent Variables	Percentage of employees regularly participating in empowered work teams (i.e., make decisions without supervisor approval)			Number of training hours devoted annually to each employee			Percentage of employees dedicated to assessing and upgrading the organization's talent pool		
	Scale	Number of Establishments	Percentage of Establishments	Scale	Number of Establishments	Percentage of Establishments	Scale	Number of Establishments	Percentage of Establishments
	<25%	194	40%	≤8	141	29%	<1%	133	27%
	25-50%	148	30%	9-20	215	44%	1-5%	240	49%
	51-75%	72	15%	21-40	85	17%	6-10%	74	15%
	76-90%	50	10%	>40	48	10%	>10%	43	9%
	>90%	26	5%						19
	490	100%		489	100%		490	100%	

Table VI: Estimation Results For The Model That Uses 4-Digit NAICS Fixed-Effects For Small & Mid-Sized Business Establishments

Model 1 Dependent Variable (PRODUCTIVITYGROWTH)			Model 2 Dependent Variable (SUPPLYCHAIN)		Model 3 Dependent Variable (NEWPRODUCTS)	
Variable Name	Value	EXP(Coef)	Value	EXP(Coef)	Value	EXP(Coef)
	Std. Error	t value	Std. Error	t value	Std. Error	t value
PARTICIPATION2	0.676	1.965	0.502	1.651	-0.109	0.897
	0.281	2.400**	0.291	1.720*	0.267	-0.409
PARTICIPATION3	0.208	1.231	0.510	1.665	-0.060	0.942
	0.347	0.599	0.361	1.410	0.341	-0.176
PARTICIPATION4	1.041	2.833	0.338	1.402	-0.419	0.658
	0.428	2.440**	0.459	0.737	0.407	-1.030
PARTICIPATION5	0.529	1.697	-0.770	0.463	-0.054	0.947
	0.600	0.881	0.682	-1.130	0.578	-0.094
TRAINING2	0.642	1.901	0.953	2.594	0.059	1.061
	0.292	2.200**	0.316	3.020***	0.277	0.213
TRAINING3	0.714	2.041	1.300	3.671	0.491	1.633
	0.361	1.977*	0.385	3.380***	0.347	1.410
TRAINING4	0.881	2.413	1.035	2.816	0.987	2.683
	0.428	2.060**	0.477	2.170**	0.413	2.390**
TALENTMGMT2	0.530	1.699	-0.081	0.922	0.335	1.397
	0.302	1.750*	0.310	-0.262	0.288	1.160
TALENTMGMT3	1.283	3.606	0.281	1.325	0.674	1.962
	0.394	3.260***	0.406	0.692	0.377	1.790*
TALENTMGMT4	1.349	3.853	-0.744	0.475	0.113	1.119
	0.473	2.850***	0.604	-1.230	0.482	0.234

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

Table VII: Summary of the Proportional Odds Logistic Regressions Results

		p-value		
		Model 1	Model 2	Model 3
		Dependent Variable		
		PRODUCTIVITYGROWTH	SUPPLYCHAIN	NEWPRODUCTS
Independent Variable	PARTICIPATION	0.0539 *		
	TRAINING	0.0825 *	0.0031 ***	0.0573 *
	TALENTMGMT	0.0028 ***		
	df	108	107	107
	AIC	1069	869	1119
	Pseudo R^2	0.2717	0.2280	0.2609
	Proportional Odds Test "Pchisq"	0.9997	0.9973	0.8644

*significant at the 0.10 confidence level **significant at the 0.05 confidence level

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

Findings

- Models restricted to SME size & 4-digit NAICS fixed effects have superior results than other models
- The number of formal training hours devoted annually to each employee are strongly associated with the percentage of reduction in the total value of inventory throughout the supply chain for the primary product over the last three years
- The percentage of employees dedicated to assessing & upgrading the organization's talent pool is strongly associated with the percentage improvement in productivity over the past three years

Findings (Cont'd)

- The association of organizational culture outcomes with new products is very weak, almost non-existent. It is possible that the structure of an establishment's organizational culture will change at different stages of a product's life cycle.
- A supply chain includes all the internal and external activities and facilities. Participation and talent management can only be applied to the internal portions of a supply chain and, therefore, may not have a strong association with a supply chain that extends to include external activities and facilities.

Conclusions

- Organizational culture forms a basis for creating a framework for understanding and, more importantly for investing in a firm's sustainable competitive advantage.
- Business establishments & top managers are advised to invest in empowering their employees, providing sufficient annual training in addition to managing their organizational talent pool