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PERFORMANCE EVALUATION IN A TRADITIONAL COST SYSTEM: A CASE STUDY

Leslie Kren, University of Wisconsin-Milwaukee
Barbara L. Kren, Marquette University

CASE DESCRIPTION

This case provides an integrated discussion of several cost and management accounting topics in a realistic setting, including cost behavior, incremental decision making, performance evaluation, and output variances. The case is flexible so it can be used over one 75-mimute class session cost or managerial accounting course or expanded to two class sessions for a more in-depth discussion with optional questions, as described in the teaching notes. For a first course in cost or management accounting, this case can be used as a capstone near the end of the term. In an advanced course in cost or management accounting, the case can be used early in the term to review these topics before moving on to more advanced topics.

JEL: M410

KEYWORDS: Performance Evaluation, Cost Variances, Decision Making, Cost systems

CASE INFORMATION

During January, 2018, Janice Reardon, President of Voyager Tents Inc. (VTI), met with Charlie Anderson, Executive Vice President, to discuss the performance of the management team. At issue today was the plant manager, Gail Hammond. Reardon and Anderson preferred to evaluate Hammond's performance on objective measures with an emphasis on achievement of budget targets. Neither manager had sufficient first-hand knowledge of Hammond's control of the production process to enable a subjective evaluation of her performance based on her effort and the appropriateness of her decisions.

Company Background

James A. Alfred founded VTI in 1890 using his military experience to design a tent for the leisure market. He successfully directed the company for over 40 very prosperous years. By the 1980s, camping as an outdoor social activity was in full stride in North America and VTI expanded and modernized their facilities to keep up with growing demand for tents. The company is now lead by an ownership team with a long history at VTI. Some members of the ownership team began as summer help in the factory and in distribution departments. Their dedication to building and maintaining a company with honesty and integrity has earned them the trust and respect of the industry. Their knowledge and leadership the industry is well-known.

Located in Michigan's upper peninsula, VTI operates in a state-of-the-art 240,000 square foot factory that includes a 10,000 square foot steelworks facility to ensure continuous quality control over all product components. VTI provides many local job opportunities and remains committed to supporting the neighboring communities. VTI has shown excellent growth and profitability over the past several years producing and selling a very successful tent model called the BackCountry, which sold for $20.00 wholesale. Plans to expand the line were on the drawing board, but at this time, only one model was sold.

Business was highly seasonal for VTI, with over half of sales occurring from mid-August to mid-November. Budgeted sales for the year were $40.0 million with a standard full-cost gross margin of 33.0 percent. Management had decided that even though sales were seasonal, production would be level throughout the year to stabilize employment. Current production was at full capacity, using one shift per day, five days per week. Sales exceeded expectations this year and had almost resulted in orders being rejected due to insufficient inventory. In fact, by year-end, only 44,000 units (at a cost of $672,000) were left in stock. There were no work-in-process inventories at the beginning or end of the year.

Budgeting

The budgeting process began in late September and by mid-December the management team presented a complete budget to the Board of Directors for the next year. Reardon typically made the budget presentation and focused on quarterly sales, production cost estimates, and capital spending proposals. Following a question-and-answer period with Reardon and some discussion, the Board authorized the budget. The firm's progress against the budget was monitored at subsequent Board meetings. At the January meeting, the Board also voted on management bonuses and pay raises for the prior year and validated officer promotions. The Board typically followed Reardon's recommendations.

Production Manager

Hammond had been with VTI just over a year and this was the first time she has been evaluated for a bonus. Reardon and Anderson admired Hammond and felt that she was an innovative manager who had improved the production process. One improvement, introduced at the beginning of the third quarter, resulted in a reduction in the average material content of each tent from 5.0 lbs. to 4.5 lbs. This provided a substantial cost savings and an improvement in the perceived performance of the gear in the field.

In evaluating Hammond's performance, Reardon and Anderson felt that some adjustment was necessary because 2017 had been a turbulent year. The factory had closed due to the "Great Blizzard" which had caused a partial roof collapse under the weight of three feet of snow. In all, the factory remained closed for 20 working days in February and March. Employees did general maintenance during this period and received half pay.

To make up for lost production, a four-hour Saturday shift was soon added. Additional overtime was also required in the fourth quarter when the sales department managed to gain a $750,000 order from a catalog sales company in October for an extra 50,000 units. To accommodate this and other orders, overtime was increased for six weeks to 16 hours per week. Employees were paid time-and-a-half for all overtime hours. Sales for 2017 were 2,094,000 units and there were no finished units in ending inventory.

Reardon and Anderson started with the summary budget and actual cost report shown in table 1. Reardon also called the inventory control department and requested the data on direct material inventory. He received the information shown in table 2. Finally, Anderson called payroll and requested data on labor cost and received the information shown in table 3. Hammond was responsible for negotiating all labor contracts. Both tables 2 and 3 show actual, period-end, data. Once this data was received, Reardon and Anderson settled down to work.

Table 1: Budget and Actual Cost Report for 2017 (All Amounts in Thousands)

	Quarterly	Actual Results				
	Budget	Q1	Q2	Q3	Q4	2017
variable cost						
direct material (DM)	$1,800	$1,410	$1,775	$2,190	$1,880	$7,255
direct labor (DL)	3,850	4,010	4,480	4,350	5,045	17,885
indirect labor	300	250	558	572	950	2,330
office supplies	75	50	100	50	90	290
power-factory	375	270	420	410	450	1,550
sales and distrib.	250	220	210	320	120	870
fixed cost						
factory maint	300	130	120	500	280	1,030
sales and distrib.	750	850	600	450	275	2,175
depr-factory	700	700	700	700	700	2,800
misc. office	250	252	231	260	260	1,003
total cost	$8,650	$8,142	$9,194	$9,802	$10,050	$37,188
units produced	500	350	550	550	600	2,050

This table shows the budget and actual cost and unit output for the year. The first column shows the quarterly budget for the year and the following columns show the actual results for each quarter. Direct material is budgeted at 5.0 lbs. per unit and direct labor hours (DLH) is budgeted at 0.962 DLH per unit.

Table 2: Direct Material Inventory for the Year (All Amounts in Thousands)

	Weight in Pounds	Total Cost
beginning inventory	718	$500
purchased	10,000	7,255
issued to work in process	9,570	6,891
ending inventory	1,148	$864

This table shows direct material inventory balances, purchases, and the direct material issued to work in process.

Table 3: Direct Labor for the Year (All Amounts in Thousands, Except Headcount)

	Average	Regular Time		Overtime	
	Headcount	Hours	Cost	Hours	Cost
quarter 1 (13 weeks)	960	494	$4,010	0	$0
quarter 2 (13 weeks)	970	552	4,480	52	212
quarter 3 (13 weeks)	980	559	4,350	54	208
quarter 4 (13 weeks)	990	645	5,045	135	490
total		2,250	$17,885	241	$910

This table shows direct labor headcount, hours, and cost for the year. Quarter 1 includes 153,000 hours at half pay when factory was closed. Overtime hours are included in regular time hours.

During a break, Reardon remarked to Anderson, "Clearly some of this information is not relevant to Hammond."

"I agree."

"There is one thing that is bothering me," said Reardon.

"What is that?"

"Hammond made a comment about those special catalog sales we made in October. She thinks we lost money on the deal because we sold them below cost."

"Well, did you explain to her about contribution analysis? asked Anderson. As long as we sold above variable cost, income would increase since fixed cost is unchanged."

"I did. She said she knew all about that but she was sure we lost money anyway. Unfortunately, we haven't had a chance to discuss it further."

QUESTIONS

Executive managers at Voyager Tents, Inc. (VTI) are evaluating the performance of the company's production manager. Information is available on output and cost control. Some of the events occurring during the year are controllable by the manager and are relevant to her performance and some are not. Use your understanding of decision rights and performance expectations. You will need to calculate production variances and assign responsibility for them.

1-Prepare a cost of goods manufactured statement and a GAAP income statement for VTI for the year, in good form. Use actual cost (not applied) in the statements.

2-How useful are these GAAP reports for managers to make decisions about the company and evaluate managers' performance (i.e., to address the questions that follow)? If you do not find these GAAP reports useful, then who should find value from these reports?

3-Was the special catalog sale made to the catalog company profitable?

4-Should the production manager, Hammond, be held responsible for the special catalog sale?

5-How would you evaluate the performance of the production manager in 2017? Be prepared to meet with her to explain the positive and negative aspects of her performance. Discuss the factors out of her control as well as the factors she could control. Be specific. The manager will expect that you have calculations ready to support your performance evaluation. Consider both the short-term and the long-term. Variances should be calculated. In your evaluation, it's useful to separate 'other factors', such as the catalog sale and the storm.

6-Comment on Reardon and Anderson's goal to evaluate the manager's performance on objective measures, with an emphasis on achievement of budget targets. What other approach could be taken?

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PERFORMANCE EVALUATION IN A TRADITIONAL COST SYSTEM: A CASE STUDY

TEACHING NOTES

Leslie Kren, University of Wisconsin-Milwaukee
Barbara L. Kren, Marquette University

CASE DESCRIPTION

This case provides an integrated discussion of several cost and management accounting topics in a realistic setting, including cost behavior, incremental decision making, performance evaluation, and output variances. The case is flexible so it can be used over one 75-mimute class session cost or managerial accounting course or expanded to two class sessions for a more in-depth discussion with optional questions, as described in the teaching notes. This case can be used successfully at the undergrad and graduate levels. For a first course in cost or management accounting, it can be used as a capstone near the end of the term. In an advanced course in cost or management accounting, the case can be used early in the term to review these topics before moving on to more advanced topics.

SOLUTIONS

Question 1: Prepare a cost of goods manufactured statement and a GAAP income statement for VTI for 2017, in good form. Use actual cost (not applied) in the statements.

Solution 1: At this point, most students will understand that the cost of nonproductive direct labor cost should probably not be reported as direct labor for GAAP statements and will include the cost in production overhead. Some students, however, will realize that the GAAP disposition of the nonproductive labor cost depends on what the workers were doing. If they were working in the factory, doing tasks such as repairs, or other maintenance, then nonproductive direct labor cost would be included in production overhead. If the workers were doing nonproduction (non factory) tasks, then it would be a period cost.

An interesting question that generates active class discussion at this point is whether senior managers would prefer that the cost of nonproductive time be listed in cost of goods sold or in operating expenses (sales and administrative). In general, senior managers prefer to put as much cost into manufacturing as possible, since administrative cost appears inconsistent with 'lean' operations and it's easier to justify higher production cost to board members. Thus, most senior managers would prefer that the nonproductive time be included in production cost (overhead). For responsibility accounting (internal reporting), it's irrelevant since GAAP cost categories are not relevant for internal purposes (decision support and performance evaluation).

The cost of Goods Manufactured statement is shown in table 4. The assumption in the statement is that the nonproductive time was spent on production-related tasks. The adjustment for the actual cost of nonproductive time is $621,000, calculated as nonproductive hours times the actual pay rate in quarter 1 times 0.5, (153,000*(4,010,000/494,000)*0.5). The cost system would then charge regular hours to direct labor and overtime hours to overhead. The cost system would directly-trace direct labor to production and assign the overhead according to the overhead rates and the cost driver (direct labor hours) in the routing (plan production sequence). Note that manufacturing cost and cost of goods manufactured are not the same. The former is current period cost and the latter is the cost transferred to finished goods inventory from work in process.

Table 4: GAAP Cost of Goods Manufactured Statement

VTI Cost of Goods Manufactured (All Amounts in Thousands) 2017	
direct materials used	$6,891
direct labor ($17,885,000-$621,000)	17,264
overhead:	
indirect labor ($2,330,000+$621,000)	2,951
power-factory	1,550
factory maint	1,030
depreciation-factory	2,800
manufacturing cost	$32,486
begin work in process	0
end work in process	0
cost of goods manufactured	$32,486

This is a GAAP cost of goods manufactured schedule for the year. The assumption is that the nonproductive time was used for production related tasks so it is included in overhead. The actual cost of nonproductive time is $621,000, calculated as nonproductive hours times the actual pay rate in quarter 1 times 0.5, (153,000(4,010,000/494,000)*0.5).*

A GAAP income statement is shown in table 5. There were 2,044,000 regular units sold, calculated as actual unit sales units less the units in the special catalog sale (2,094,000 units-50,000 units). The sales revenue is then $41,630,000, calculated as revenue from regular units sold plus special catalog sale revenue (2,044,000 units*$20.00 per unit + $750,000).

Table 5: GAAP Income Statement

VTI Income Statement (All Amounts in Thousands) 2017		
sales		$41,630
begin finished goods inventory	$672	
cost of good manufactured	32,486	
available for sale	$33,158	
end finished goods inventory	0	
cost of goods sold		33,158
gross margin		$8,472
office supplies		290
sales and distrib.		3,045
miscellaneous office		1,003
income before tax		$4,134

Table 5 shows a GAAP income statement. There were 2,044,000 regular units sold, calculated as actual unit sales less the units in the special catalog sale (2,094,000 units-50,000 units). The sales revenue is then $41,630,000, calculated as revenue from regular units sold plus revenue from the special catalog sale (2,044,000 units$20.00+$750,000).*

Question 2: How useful are these GAAP reports for managers to make decisions about the company and evaluate managers' performance (i.e., to address the questions that follow)? If you do not find these GAAP reports useful, then who should find value from these reports?

Solution 2: Most students will realize that the GAAP reports are not useful to evaluate the special catalog sale and to evaluate Hammond's performance. This question provides an opportunity for a discussion about the relative objectives of GAAP and responsibility accounting reporting. GAAP is intended for investors to allow estimates of firm value (stock price which is the market's estimate of future cash flow). Thus,

GAAP reports provide little value for managers who need information for decision support and performance evaluation.

GAAP reporting is functional, because cost categories in the statement are shown by function. That is, production cost is separated from sales and administrative cost (period cost). For GAAP, production cost includes direct material, traced through the bill of materials, direct labor, traced through the routing (plan production sequence), and overhead (all production cost not directly traced). GAAP functional cost categories are not useful for internal purposes (decision support and performance evaluation) since all cost required to get output to customers is relevant, included sales and administrative cost. Another point to discuss here is related to allocated cost. Arbitrary allocations are required for GAAP because GAAP requires full absorption cost for inventory valuation. However, allocations should be avoided for responsibility accounting (internal reporting). Only cause and effect cost drivers should be used to assign cost to output (or any cost object) for responsibility accounting.

Question 3: Was the special catalog sale made to the catalog company profitable?

Solution 3: Most students will have no trouble evaluating the profitability of the sale using budget data. This calculation is shown below in table 6. This analysis shows that the sale was profitable. However, it's important to understand that, even based on budget data, the sale was profitable only if we assume there is excess capacity available because then fixed cost is not relevant since it won't change. Moreover, the actual results at the time of the sale differed considerably from the budget. Thus, two issues need to be considered for an analysis of the profitability of the special catalog sale. First, we need to know whether there was excess capacity was available in the budget to evaluate whether we should have accepted this sale based on budget data (before we knew there would be a storm). Second, we need to evaluate the special catalog sale given the actual costs incurred at the time of the sale. Actual costs differed considerably from the budget.

Table 6: Evaluation of Special Catalog Sale Based on Budget Data (All Amounts in Thousands, Except Per Unit Cost)

	Total (50,000 Units)	Per Unit	Per Unit Cost Based on Quarterly Budget
incremental revenue	$750,000	$15.00	
variable cost			
direct materials	180,000	$3.60	$1,800/500 units
direct labor	385,000	7.70	$3,850/500 units
indirect labor	30,000	0.60	$300/500 units
power - factory	37,500	0.75	$375/500 units
office supplies	7,500	0.15	$75/500 units
sales and distrib	25,000	0.50	$250/500 units
incremental income	$85,000	$1.70	

Table to calculate incremental income from special catalog sale based on original budget cost. The table shows that the sale was profitable based on the original budget, assuming that there was excess capacity available.

The excess capacity available in the budget is calculated in table 7. This shows that VTI's excess capacity in the budget is very limited. Thus, the sale was very risky, even based on the budget (before the storm). Selling their limited excess capacity at marginal cost is a risky decision. Students can now be asked about the value of the excess capacity. Most students will argue that it would have been more valuable as a buffer against uncertainty, which VTI ultimately needed, or to meet potential increases in full price sales.

Table 7: Calculation of Excess Capacity Available in the Original Budget

hours available (50 weeks*40 DLH per week*about 960 workers)	1,920,000	DLH at capacity
units at capacity (1,920,00 DLH/0.962 DLH per Unit)	1,995,000	units at capacity
budget sales	2,000,000	
excess production capacity in units (approximate)	5,000	
from beginning finished goods inventory	44,000	
units available (excess capacity)	49,000	

This table shows the calculation for excess capacity available in the budget for the year. This table shows that VTI had very limited excess capacity in the budget. The sale was very risky, even based on the budget before the storm.

The second issue to evaluate the special catalog sale and the obvious follow-up question is whether the sale was profitable given the actual results at the time of the special catalog sale. Most students have a difficult time with this question. When confronted with the question of whether the sale was profitable given the actual results, student's first reaction is typically to calculate the average cost of fourth quarter production to compare to the incremental revenue from the sale. However, to evaluate the profitability of the sale, we need to consider the costs that were incremental only for the order. Five adjustments to the plan/budget are needed to adjust for the conditions present when the order was accepted.

1-Direct material per unit dropped from 5 lb. to 4.5 lbs.
2-Material cost was rising during the year (see table 2).
3-Low labor efficiency in quarter 4 (likely due to new employees).
4-Labor rates are running below standard (likely due to new employees).
5-Most important, all marginal labor hours for this order are on overtime. 48,100 labor hours were needed (50,000 units*0.962) and 135,000 hours of overtime were worked in Q4.

The first two adjustments in the list above are related to the incremental direct material cost. There were two offsetting factors in quarter 4. Less direct material was used per unit but at rising unit cost. Direct material cost calculations show that unit costs for material were rising through the year so a fair estimate of incremental cost per pound of material was the closing balance cost (FIFO value) of $0.75 per lb. ($1,148,000/864,000 lbs.). In addition, Hammond's innovation to reduce material in output had been implemented by the time of the special catalog sale so 4.5 lbs. of material was used in each unit (compared to 5.0 lbs. in the budget).

The final three adjustments in the above list are related to direct labor. Efficiency of direct labor was down in the fourth quarter. Dividing direct labor hours per unit by units of output shows that each unit required 1.075 hours (646,000/600,000), compared to 0.962 hours per unit in the budget. In contrast, direct labor cost per hour decreased from the budget. Dividing direct labor cost by hours worked shows that cost per hour was $7.8217 ($5,045,000/645,000) compared to $8.00 per hour in the budget. In addition, direct labor cost for the order were all on overtime so labor cost must be multiplied by 1.5.

After these calculations, we can determine the incremental variable cost per unit in quarter 4. This is shown in table 8. Direct labor and direct material cost is adjusted as calculated above and other variable cost is shown at budget. Note that the incremental cost is significantly higher than the budget incremental cost and higher than the average cost of output in the fourth quarter. Thus, after adjusting quarter 4 for the actual events, the special catalog sale was a loser at the margin. Moreover, there is no evidence that long term benefits will accrue from the special catalog sale.

Table 8: Evaluation of Special Catalog Sale Based on Actual Incremental Cost of Output

	Total (50,000 Units)	Per Unit	
incremental revenue	$750,000	$15.00	
variable cost			
direct material	169,000	$3.38	$0.75 per unit*4.5 lb.
direct labor	630,500	12.61	1.075 hours per unit*$7.8217 per hour*1.5
indirect labor	30,000	0.60	$300,000/500,000 units
power - factory	37,500	0.75	$375,000/500,000 units
office supplies	7,500	0.15	$75,000/500,000 units
sales and distrib	25,000	0.50	$250,000/500,000 units
incremental income	$-149,500	$-2.99	

This table shows calculations for the incremental income from the special catalog order based on the incremental cost given the actual events in quarter 4. The incremental cost of material was the closing inventory balance cost (FIFO value) of $0.75 per lb. At the time of the special catalog sale, 4.5 lbs. of material was used in each unit (compared to 5.0 lbs. in the budget). For direct labor, efficiency of direct labor was down in the fourth quarter to 1.075 hours (compared to 0.962 hours per unit in the budget) and direct labor cost per hour decreased to $7.8217 (compared to $8.00 per hour in the budget)/ Since direct labor hours for the special catalog order were all on overtime, the hourly cost of labor is multiplied by 1.5.

Question 4: Should Hammond be held responsible for the special catalog sale?

Solution 4: The answer is probably yes, for two reasons. First, she is at least partially responsible for the loss since she controls production cost. More importantly, if she is not held responsible, it is likely that this will happen again. The lesson from this sale is that production and sales must communicate and work together. If Hammond is held responsible this time, she will be motivated to better communicate with the sales department to avoid similar future problems.

This question can lead to an optional discussion of the "controllability principle", often cited in text books, which suggests that managers should be held responsible only for factors they can control (Hansen and Mowen, 2018). However, strict adherence to the controllability principle leads to 2 problems. First, if managers are not held responsible, they will do little to mitigate the effects of uncontrollable factors even when able to do so. The classic example is the manager of a Florida marina who realizes that his or her performance evaluation will not be affected by a hurricane that is 'uncontrollable'. Thus, the manager does little prior to the storm. However, if the manager realizes that he or she will be held responsible, he or she would pull on rain gear and work to mitigate storm damage to the marina. Furthermore, since 'uncontrollable' factors tend to be subjective, performance discussions can lead to subordinates arguing about factors they could not control, and the performance evaluation discussion can devolve into a litany of excuses, preventing the superior from effectively focusing on the subordinate's job performance.

Question 5: How would you evaluate the performance of the production manager in 2017? Be prepared to meet with her and explain the positives and negatives in her performance. Discuss the factors out of her control as well as the factors she could control. Be specific. The manager will expect that you have calculations to support your evaluation.

Solution 5: This is an opportunity to evaluate performance in a traditional cost system. This approach to performance evaluation has been criticized in the literature (Cheatham and Cheatham, 1996), however, Clinton and White (2012) find that the vast majority of firms continue to use traditional standard cost accounting systems. Similar results about the prevalence of standard cost systems have been reported in prior literature (Fry and Fiedler, 2011) and echoed in surveys of Asian firms (Zoysa and Siriyama, 2007). For example, a field study by Bowhill and Lee (2002) finds that manufacturing innovations are not accompanied by wholesale cost system changes. Thus, predictions of the demise of the standard cost system have not materialized and it continues as the dominant cost management system in manufacturing firms.

To evaluate the production manager, students easily recognize that she is not responsible for period cost (sales and administrative cost). Students will also recognize that a simple comparison to the static (original) budget is not appropriate. Because the original budget is based on the budget cost driver which differs from the actual cost driver that occurred. For performance evaluation, we need a performance report to compare the flexible budget to actual results. The flexible budget is calculated by adjusting the original budget for the actual cost driver (direct labor hours (DLH)). Besides preparing a flexible budget, the following four additional factors must be considered to evaluate Hammond's performance.

1-Planned production was exceeded by 50,0000 units.
2-There were two unplanned events, the February blizzard, and the special catalog sale.
3-We need to separate the effects of material reduction of 5.0 to 4.5 lbs. per unit from efficiency of material usage.
4-Hammond is charged for material purchases, not usage. This is an optional factor that some instructors may decide to be too 'tricky' and leave out of the case. However, I have found that it can be used positively as a reminder to students about the importance of paying attention to details in accounting.

Begin by evaluating prime cost variances. For direct material variances, it is necessary to adjust for the value of material savings in quarter 3 and quarter 4. Hammond's material savings provided a 10.0% (5.0-4.5)/5.0)) savings in material. This leads to a cost savings of $414,000, which can be calculated as units in third and fourth quarters times budget cost per unit times the 10.0% saving (1,150,000 units*3.60*10.0%). Hammond is thus responsible for a $414,000 annual annuity for the future.

The direct material price variance (DMPV) on purchases and the direct material quantity variance on issuance can be calculated as shown in table 9. Note that the standard quantity issued must be adjusted for the material savings. The adjusted standard quantity of direct material is 9,675,000 lbs., which is the standard quantity less direct material saved in quarter 3 and quarter 4, calculated as (2,050,000 actual units for the year*5.0 lb. per unit)-(1,150,000 units in quarter 3 and quarter 4*0.5 lbs.). The favorable DMQV suggests that Hammond may have experimented with methods to reduce material content throughout the year and/or purchase of higher quality materials (as suggested by the DMPV).

Table 9: Direct Material Price Variance (DMPV) and Direct Material Quantity Variance (DMQV)

Panel A: DMPV = Actual Quantity Purchased*(Actual Price-Standard Price)	
actual price*actual quantity purchased ($7,255,000/10,000,000 lbs.)*10,000,000 lbs. $0.7255 per unit*10,000,000 lbs.	$7,255,000
standard price*actual quantity purchased $0.7200 per unit*10,000,000 lbs.	7,200,000
DMPV	$55,000

Panel B: DMQV = Standard Price*(Actual Quantity Issued-Standard Quantity Issued)	
standard price*actual quantity issued $0.7200 per unit*9,570,000 lbs.	$6,890,400
SP*adjusted SQ issued $0.7200 per unit*9,675,000 lbs.	6,966,000
DMQV	$75,600

*This table shows the direct material price variance (DMPV) on purchases and the direct material quantity variance on issuance. The standard quantity issued must be adjusted for the material savings in quarter 3 and quarter 4. The adjusted standard quantity of direct material is 9,675,000 lbs., which is the standard quantity less direct material saved in quarter 3 and quarter 4, calculated as (2,050,000 actual units for the year*5.0 lb. per unit)-(1,150,000 units in quarter 3 and quarter 4*0.5 lbs.).*

The direct labor rate variance (DLRV) and the direct labor efficiency variance (DLEV) can be calculated as shown in table 10. It is necessary to adjust for the cost of blizzard and unplanned overtime. The cost of

overtime following the blizzard was $612,000 (153,000 direct labor hours*$4.00 per hour). The cost of the unplanned overtime was $910,000 (shown in the last line and last column of table 3). The calculations show two offsetting variances. Unfavorable labor efficiency may reflect fatigue from heavy overtime in quarter 3 and quarter 4 and labor rate may reflect hire of new, presumably less skilled, workers in quarter 3 and quarter 4.

Next is the calculation for overhead (OHD) variances. The overhead variances are shown in the overhead performance report in table 11. Budget, actual, and allowed (standard) labor hours must be calculated. Budget direct labor hours (DLH) were 1,924,000, which is budget units times budget labor hours per unit (2,000,000 units*0.962 DLH per unit). Actual direct labor hours were 2,097,000, which is actual recorded hours less un-productive hours (2,250,000 DLH-153,000 DLH). Finally, standard hours (allowed) were 1,972,100, which is actual units produced times standard hours per unit (2,050,000 units*0.962 DLH per unit). For indirect labor in overhead, the overtime premium for nonproductive hours must be added, $2,942,000 (2,330,000+(153,000*4.00)). Calculations for each flexible budget item are shown below the performance report in table 11.

Table 10: Direct Labor Variances, Showing Direct Labor Rate Variance (DLRV) and direct Labor Efficiency Variance (DLEV)

Panel A:		
DLRV = actual direct labor hours (DLH)*(standard rate-actual rate) = (actual DLH*standard rate) - (actual DLH*actual rate)		
productive DLH at standard ((2,250,000 DLH-153,000 DLH)*$8.00)	$16,776,000	
plus overtime premium at standard (241,000 DLH*$4.00)	964,000	
total standard DLH	$17,740,000	(actual DLH*standard rate)
actual DLH less nonproductive DLH (17,885,0000 DLH-(153,000 DLH*$4.00))	17,273,000	(actual DLH*actual rate)
rate variance	$467,000	F
Panel B:		
DLEV = standard rate*(actual DLH - standard DLH)		
recorded DLH (table 3)	2,250,000	
less: nonproductive DLH	-153,000	
actual productive DLH	2,097,000	
DLH allowed (2,050 units*0.962 budget DLH per unit)	-1,972,000	
DLEV in hours	125,000	U
DLEV ($8.00 budget rate*125 hours)	$1,000,000	U

This table shows the calculation for direct labor rate and efficiency variances.

Overhead variances show large indirect labor variance due to the overtime hours plus nonproductive time. Not much in fixed OHD variances. Some repairs and maintenance were not done, which could be a problem in the long run, but the factory was very busy in quarter 3 and quarter 4. At this point, most students will agree that Hammond did a credible job under difficult conditions. Hammond produced the output needed to meet demand. In fact, she exceeded the original budget of 2 million units by 50,000 units in a year when the roof fell in (literally). Production variances show adequate operating efficiency in the short-term under difficult conditions.

In the discussion of Hammond's performance, a difficult question that typically generates a lot of student interest and participation is: What are the characteristics of a good manager? Most students have only a vague idea about this question. At the minimum, we expect managers to achieve short term goals. For Hammond, in the short term, we expected her to produce output to meet demand and to operate efficiently.

Short-term efficiency was evaluated with production cost variances. However, the characteristics of a good manager are elusive concepts to most students. Fundamentally, managers need to demonstrate innovation. Innovation is the essential characteristic that distinguishes management quality. Good managers develop ways to improve task efficiency. They must ensure that tasks done today are done more efficiently (better) than the tasks were done yesterday.

Table 11: Overhead Performance Report with Overhead Variances for the Year

VTI
Overhead Performance Report (All Amounts in thousands)
2017

	Actual (1)	Flex Budget (2)	Spending Variance (1-2)		Applied (3)	Efficiency/Volume Variance (2-3)	
indirect labor (IL)	$2,942	$1,308	$1,634	U	$1,230	$78	U
power	1,550	1,635	85	F	1,537	98	U
VOHD	$4,492	$2,943	$1,549	U	$2,767	$176	U
maintenance	1,030	1,200	170	F	$1,230	$30	F
depreciation	2,800	2,800	--	-	2,869	69	F
FOHD	$3,830	$4,000	$170	F	$4,099	$99	F

$flexible\ budget\ (indirect\ labor) = budget\ rate\ for\ indirect\ labor * actual\ cost\ driver\ (DLH)$
$= (4\ quarters * 300{,}000)/1{,}924{,}000\ DLH * 2{,}097{,}000\ DLH$
$= 0.6237 * 2{,}097{,}000$
$= 1{,}307{,}899$
$flexible\ budget\ (power) = budget\ rate\ for\ power * actual\ cost\ driver\ (DLH)$
$= (4\ quarters * \$375{,}000)/1{,}924{,}000\ DLH * 2{,}097{,}000\ DLH$
$= 0.7796 * 2{,}097{,}000$
$= 1{,}634{,}821$
$applied\ cost\ (indirect\ labor) = budget\ rate * standard\ hours\ (DLH)$
$= 0.6237 * 1{,}972{,}100$
$= 1{,}229{,}999$
$applied\ cost\ (power) = budget\ rate * standard\ hours\ (DLH)$
$= 0.7796 * 1{,}972{,}100\ DLH$
$= 1{,}537{,}449$
$applied\ cost\ (maint) = budget\ rate * standard\ hours\ (DLH)$
$= (4\ quarters * 300{,}000)/1{,}924{,}000\ DLH * 1{,}972{,}000\ DLH$
$= 0.6237 * 1{,}972{,}100$
$= 1{,}230{,}000$
$applied\ cost\ (depr) = budget\ rate * standard\ hours\ (DLH)$
$= (4\ quarters * \$700{,}000)/1{,}924{,}000 * 1{,}972{,}100\ DLH$
$= 1.455 * 1{,}972{,}100$
$= 2{,}869{,}406$

This table shows an overhead performance report for 2017. Variances shown are fixed and variable overhead spending, variable overhead efficiency, and fixed overhead volume. The table show flexible budget calculations for each line item and the (standard) applied cost for each line item.

Question 6: Comment on Reardon and Anderson's goal to evaluate the manager's performance on objective measures, with an emphasis on achievement of budget targets. What other approach could be taken?

Solution 6: This is another topic that generates active student interest. It can be an optional discussion focused on Reardon and Anderson's intent to evaluate Hammond based on 'objective' factors rather than subjectively. The question is whether objective evaluation, with a strict emphasis on achievement of outcome goals, should be used rather than an alternative approach of subjective evaluation based on effort and appropriateness of Hammond's decisions. This discussion can lead to well-known agency theory results about the role of information in performance evaluation (see, for example, Kren, 2012).

The class could discuss the relative costs of subjective and objective control. For subjective control, a sophisticated and costly information system and a flatter organizational structure are needed so superiors can monitor and evaluate subordinates' options and actions. In contrast, objective control requires little evaluative information. Either outcome targets are met and rewards are offered or targets are missed and rewards are withheld. However, the cost of objective control is risk transfer to subordinates. The risk of an uncertain environment will motivate overly cautious decision making in subordinates, who are inherently risk averse relative to owners who are able to diversify risk in the capital market (Kimmel et al., 1995).

BIOGRAPHY

Leslie Kren is an associate professor in the Lubar School of Business at the University of Wisconsin-Milwaukee. He may be reached at Sheldon B. Lubar School of Business, 3202 N. Maryland, Milwaukee, WI 53201.

Barbara L. Kren is an instructor at Marquette University. She may be reached at Marquette University, 1250 W Wisconsin Ave, Milwaukee, WI 53233.

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INVENTORY COSTING: A COMPREHENSIVE CASE STUDY

Peter Harris, New York Institute of Technology
Umapathy Ananthanarayanan, New York Institute of Technology

ABSTRACT

Under Accounting Standards Update (ASU) 330, Inventory requires an entity to measure inventory at lower of cost or market. Market value can be determined in three methods: replacement cost, net realizable value or net realizable value less profit margin. The Federal Accounting Standards Board (FASB) received comments from users that the current guidance on the measurement of inventory is unnecessarily complex because there are three potential outcomes to determine market. In response to these concerns, FASB issued ASU 2015-11 to simplify the measurement of inventory as part of the FASB's Simplification initiative. In this paper, we outline the new mechanism proposed by FASB for measuring inventory and how it would impact entity's financial statements. We provide a series of comprehensive questions relating to Lower of Cost and Net Realizable Value, and Lower of Cost or Market at the end of the paper. This case study is best suited for the Intermediate Accounting 1 course.

JEL: M48, M49

KEYWORDS: ASU 2015-11, ASC 330, Lower of Cost or Market, Lower of Cost or Net Realizable Value, Net Realizable Value, FIFO, LIFO, Replacement Cost, Inventory Floor

INTRODUCTION

The (FASB) issued final guidance that simplifies the subsequent measurement of inventory requiring inventory to be measured at the lower of cost or net realizable value (NRV). Entities will continue to apply existing impairment models to inventories that are using Last In First Out (LIFO) and Retail Inventory Method (RIM).

Currently Generally Accepted Accounting Principles (GAAP) rules require reporting organizations to measure inventory at the lower of cost or market. Market is generally the replacement or reproduction cost of the inventory; however, market cannot exceed net realizable value, which is the selling price less the cost to complete, dispose, and transport the inventory item (referred to as the "ceiling") and cannot be lower than net realizable value less a normal profit margin (referred to as the "floor").

Proposed guidance would require inventory to be measured at the lower of cost or net realizable value. Thus, under the proposed ASU "market" would be replaced with "net realizable value". GAAP defines this concept as the "estimated selling prices in the ordinary course of business, less reasonably predictable costs of completion, disposal and transportation." Once implemented, with the exception of LIFO and retail Inventory methods, one will no longer have to consider replacement cost or net realizable value less a normal profit margin when measuring inventory.

This paper will first discuss the key considerations and changes per ASU 2015-11. We will next discuss the application of the lower of cost or net realizable value per the new standard. The tax rules for lower of cost or market is addressed next. A set comprehensive examples of the lower of cost or net realizable

method is addressed next with a flavor of IFS accounting introduced in these examples. This case study is suitable for an intermediate accounting class and can be part of an individual as well as a group case study project.

KEY CONSIDERATIONS

For inventory covered within the guidance of ASU 2015-11, organizations would be required to compare the cost of ending inventory with only one measure (i.e. the net realizable value), and not the three measures required by today's guidance. When evidence exists that the net realizable value of inventory is less than the cost due to damage, deterioration, changes in price, obsolescence, etc., entities will recognize the difference as a loss in earnings in the period in which it occurs.

For raw materials and work in progress, companies will still need to perform an extra step as they do today. Manufacturer's using First In First Out (FIFO) or Average cost method to value their inventory will face challenges while applying the ASU because the computation foundation is the lower of cost or net realizable value. Performing the test is done in total for the entire inventory, either by segment or in total. Performing a lower of costs and net realizable value on an individual item basis is not possible if there are raw materials.

The prime reason is because replacement cost is no longer used in computation. Thus, an entity must compute net realizable value. To determine the net realizable value for these inventories, entities will need to consider the costs to complete and sell finished goods, including direct selling costs such as transportation costs and sales commissions.

Given the operational difficulty in measuring the net realizable value for raw materials, the larger question is whether a manufacturer can ignore the test of lower or cost or net realizable value on raw materials if those materials are immaterial? At the outset, it is essential to understand that test of raw materials of cost or net realizable value may not be required when those materials will be ultimately part of finished goods inventory. Going further, there are two possible scenarios which could be envisaged here:

(a) Materials cost is not significant in comparison to the total inventory as a whole; or
(b) Materials cost is significant in comparison to the total inventory as a whole.

In scenario (a) above, a company should be able to test lower of cost of net realizable value for finished goods and work in process inventory only and exclude any raw material inventory in that test. The assumption here is that if raw materials are not significant, any possible write down would not be significant.

In scenario (b) above, wherein the value of raw material is significant - a company would need to apply the test to raw materials of cost or net realizable value except an evidence exists that the finished goods and work-in-process inventory has no write-down when tested. The reason here is that if an entity first tests work in process and finished goods inventory for lower of cost or net realizable value and there is no write-down that would suggest that a component of that inventory (raw materials) should have no impairment as well.

FASB has excluded inventories accounted for using LIFO and RIM from the scope of this guidance because it could result in significant transition costs, produce outcomes that are not intended, would not increase comparability improvements, and provide limited benefits due to the complexity inherent in these methods. Interestingly, the guidance does not amend the measurement of cost of inventory and

hence, the companies may continue to apply LIFO, FIFO or average cost to determine the cost of inventory.

From a tax perspective, there are specific requirements with respect to the valuation of inventory. Generally, normal goods may be value at lower of cost or market, with market determined based on reproduction or replacement cost or actual offering price in some cases. Subnormal goods are measured at genuine selling prices less cost of disposition in a manner similar to the concept of GAAP net realizable value. Despite similarity of the tax rules, for normal goods with the current GAAP rule and the tax rules for subnormal goods to the proposed GAAP rule, there are further qualifications within the GAAP and tax rules. These qualifications generally prevent a tax payer from following the GAAP market valuation for those goods for tax purposes. As such, any change in inventory valuation for GAAP purposes will likely impact only the determination of book tax differences and deferred taxes.

Application of Lower of Cost and Net Realizable Value

Under the new US GAAP rules, the lower of cost and net realizable value can be calculated, and presented by the following three valuation calculations:

1-By the lower of cost and net realizable value on a Total Inventory basis
2-Directly to each individual inventory unit, and
3-To the total of the components of each major inventory category; i.e. groupings of inventory by homogeneous factors.

Of the three approaches, the total inventory lower of cost and net realizable value method will present the highest inventory amount, while the unit per unit approach will present the lowest inventory amount. Under US GAAP, when a loss / write-down occurs due to a lower inventory net realizable value, this new value becomes the new cost of the inventory purposes. Further, under Staff Accounting Bulletin (SAB) 5.BB-Inventory Valuation Allowance (ASC 330.10-S99-2), specifically states that there cannot be a reversal of this loss, regardless as to whether the net realizable value increases in a subsequent period. IFRS however, allows for a reversal of such losses; up to the amount of the inventory's original cost. The journal entry to record the Lower of Cast and Net Realizable Value Loss will be:

Dr. Cost of Goods Sold (inventory-write-down)
Cr. Allowance for inventory write-down

If reversed, under IFRS only, the journal entry is:

Dr. Allowance for inventory write-down (limited to the amount of the original cost)
Cr. Cost of Goods Sold-inventory write-down

Tax treatment of Lower of Cost or Market

IRC Regulation 1.471-4 permits but does not require an entity to use the lower of cost or market to value its inventory. Lower of cost or market however is not allowed for the LIFO inventory method. Further, if an entity chooses to use the Lower of Cost or Market (LCM) for tax purposes, the IRC requires that a unit per unit inventory application of LCM be applied. The IRC defines market differently than US GAAP and IFRS. Under the IRC 471.4, market is defined as the aggregate of the current bid prices prevailing at the date of the inventory valuation.

US GAAP and IFRS use the Lower of Cost and Net realizable Value in its reporting basis. Net realizable Value defines as the sales price of the inventory item less the cost of completion, disposal, and

transportation. Thus, the difference in the lower of cost vs. a market-based matrix differs between the tax code and accounting regimes, which may result in a tax timing difference on the balance sheet. Finally, if a company uses LIFO for tax purposes, under the mandatory tax compliance rule, it is also required to use LIFO for financial reporting purposes.

EFFECTIVE DATE, TRANSITION AND DISCLOSURE

The guidance is effective for public business entities for fiscal years beginning after December 15, 2016, and interim periods within those fiscal years. For all other entities, it is effective for fiscal years beginning after December 15, 2016, and interim periods within fiscal years beginning after December 15, 2017. Early adoption is permitted. The new guidance must be applied prospectively after the date of adoption. An entity that has recorded a lower of cost or market adjustment in a previous period will use the adjusted amount as the new cost basis of that inventory when it adopts the new guidance. An entity that adopts the new guidance in an interim period will not be able to reverse interim adjustments during the same fiscal year as otherwise allowed under ASC 270-10-45-6.5 Therefore, any net realizable value test applied in subsequent periods would compare the lower of cost or market adjusted amount to net realizable value. The only new disclosures required at transition are the nature of and reason for the change in accounting principle.

WHAT NEXT?

While doubts still exist as to whether the ASU actually simplifies the measurement of inventory, there a few inherent positives such as elimination of three outcome approach, avoiding the determination of floor based on a normal profit margin and the new model simplifies the test for the non-manufacturers who now can easily compute net realizable value instead of replacement cost and normal profit.

On the other hand, the ASU results in creation of two different approaches for measuring inventory (one for LIFO and RIM), while another one for FIFO and average cost. The split approach also is inconsistent with the international standards which apply the net realizable value approach to all inventories. The FASB defends this two-tier approach on the basis that application of the Lower of Cost and Net realizable Value Method for companies utilizing LIFO and the Retail Inventory Methods would be too costly to conform, as well as the overwhelming complexities involved in estimating the write-downs. Additionally, the FASB has stated that such a move would not help comparability in any meaningful way.

As a practical matter, except in very few rare cases, one would expect that the Net Realizable Value will exceed the LIFO inventory costing methods, making the application of the Lower of Coat and Net Realizable method impractical for LIFO. Further, as previously discussed, LIFO is not an allowable method under IFRS. The new model relies on selling price which is subject to internal manipulation and subjectivity, especially for items sold in inactive markets. This can be the focus of a recommended future paper concerning the Lower of Cost and Net Realizable value rule.

COMPREHENSIVE QUESTIONS

Tables 1 through 6 Presents three comprehensive questions which are recommended for class use. The solutions presented are recommended, and there may be other, acceptable solutions to the questions.

Table 1: Comprehensive Question 1

Panel A: Question Information	
Corp. X started selling widgets (one product only) on January 1, 2017. They are unsure which inventory method it will choose to report their financial reporting; however, they will use the periodic method to account for its inventory. During 2017 it made purchases of inventory as follows:	
January 2,2017	1000 units at $5 per unit
June 19,2017	2,000 units at $5.05 per unit
December 1,2017	500 units at $5.10 per unit
At year end, an inventory count reveals that there are 800 units of inventory left. Additionally, the replacement cost of inventory is $4.95 per unit. The company can sell the units at $6.00 per unit and expects a 5 percent cost of selling/disposing each item. The normal gross profit margin on each unit sold in 10 percent.	
Panel B: Required for Question 1	
1	Calculate the following per inventory unit: A) Net Realizable Value, B) Replacement Cost, C) Floor Value=NRV Less normal profit margin.
2	Assume that Corp. X adopts the Lower of FIFO and Net Realizable value method to account for its inventory costing, what is the December 31, 2017 inventory value for financial reporting purposes?
3	Prepare the journal entry to record the loss-if any.
4	Assume that Corp. X adopts the Lower of LIFO or Market Value to account for its inventory costing, what is the December 31, 2017 inventory value for financial reporting purposes?
5	Prepare the journal entry to record the loss-if any.
6	Which method would you recommend Corp to choose? What factors should be taken into account?
7	Assume that in year 2, the inventory value increases above its original cost. What is the IFRS versus US GAAP position treating this reversal? Prepare journal entries, if required

Table 2: Recommended Answers for Comprehensive Question 1

1	A) Net realizable value=Selling price less costs to sell/dispose=$6-5 percent cost to sell/dispose= 6-0.30=$5.70 B) Replacement cost =given at $4.95 C) Floor=NRV-normal profit margin=5.70 less 10 percent of sales price=5.7-0.60=$5.10.
2	Lower of cost and net realizable value under FIFO; FIFO cost= 800 units; comprised of 500 units at5.10 plus 300 units at 5.05 (per unit). This will equal 500 times 5.1 plus 300 times 5.05=$4065. NRV=800 times $5.70 per unit-per 1A above=$4560. Thus, Lower of cost and net realizable value=$4065==cost. No inventory loss/write-down.
3	No entry as there is no loss
4	LCM for LIFO=market value will equal the floor value of $5.10 per unit. Cost under LIFO will be 800 units at $5 per unit. Thus, cost under LIFO is $4,000 and market value is 5.10 times 800=-4080. LCM thus equals cost of $4,000. Thus, no loss
4	No entry as there is no loss/write-down.
6	In this case LIFO is preferable as the ending inventory is lower resulting in a lower taxable income amount; thus saving Corp. X income tax payments. The difference in income before tax will be FIFO vs. LIFO ending inventory=4065-4000=65.This lower income will have to also be reflected in the financial statements of Corp. X by virtue of the LIFO tax compliance rule. If the tax rate is low, or the company will generate a Net Operating Loss, the tax savings may be immaterial; thereby reducing any advantage of LIFO use.
7	Since there is no write-down/loss in year 1, the fact that inventory value increase in year 2 will have no effect on financial reporting in year 2. In year 2, Cop X has to still utilize a lower of cost or market/NRV value. Given the facts, in year 2 , coat will continue to be the presented inventory value.

Table 3: Comprehensive Question 2

Panel A: Question Information	
Corp. X started selling widgets (one product only) on January 1, 2017. They are unsure which inventory method it will choose to report their financial reporting; however, they will use the periodic method to account for its inventory. During 2017 it made purchases of inventory as follows:	
January 2,2017	1000 units at $5 per unit
June 19,2017	2,000 units at $5.05 per unit
December 1,2017	500 units at $5.10 per unit
At year end, an inventory count reveals that there are 800 units of inventory left. Additionally, the replacement cost of inventory is $4.95 per unit. The company can sell the units at $6.00 per unit and expects a 5 percent cost of selling/disposing each item. The normal gross profit margin on each unit sold in 15 percent.	
Panel B: Required for Question 2	
1	Calculate the following per inventory unit: A) Net Realizable Value, B) Replacement Cost, C) Floor Value=NRV Less normal profit margin.
2	Assume that Corp. X adopts the Lower of FIFO and Net Realizable value method to account for its inventory costing, what is the December 31, 2017 inventory value for financial reporting purposes?
3	Prepare the journal entry to record the loss-if any.
4	Assume that Corp. X adopts the Lower of LIFO or Market Value to account for its inventory costing, what is the December 31, 2017 inventory value for financial reporting purposes?
5	Prepare the journal entry to record the loss-if any.
6	Which method would you recommend Corp to choose? What factors should be taken into account?
7	Assume that in year 2, the inventory value increases above its original cost. What is the IFRS versus US GAAP position treating this reversal? Prepare journal entries, if required

Table 4: Recommended Answers for Comprehensive Question 2

1	A) Net realizable value=Selling price less costs to sell/dispose=$6-5 percent cost to sell/dispose= 6-0.30=$5.70 B) Replacement cost =given at $4.95 C) Floor=NRV-normal profit margin=5.70 less 15 percent of sales price=5.7-.60=$4.80.
2	Lower of cost and net realizable value under FIFO; FIFO cost= 800 units; comprised of 500 units at5.10 plus 300 units at 5.05 (per unit). This will equal 500 times 5.1 plus 300 times 5.05=$4065. NRV=800 times $5.70 per unit-per 1A above=$4560. Thus, Lower of cost and net realizable value=$4065=cost. No inventory loss/write-down.
3	No entry as there is no loss
4	LCM for LIFO = market value will equal the replacement value of $4.95 per unit. Cost under LIFO will be 800 units at $5 per unit. Thus, cost under LIFO is $4,000 and market value is 4.95 times 800 = -$3960. LCM thus equals market value of $3,960. Thus, there is a loss of $40, resulting in the following journal entry: Dr. Cost of Goods Sold 40 40 Cr. Inventory 40 40
5	No entry as there is no loss/write-down.
6	In this case LIFO is preferable as the ending inventory is lower resulting in a lower taxable income amount; thus saving Corp. X income tax payments. The difference in income before tax will be FIFO vs. LIFO ending inventory = 4065-3960=105. This lower income will have to also be reflected in the financial statements of Corp. X by virtue of the LIFO tax compliance rule. If the tax rate is low, or the company will generate a Net Operating Loss, the tax savings may be immaterial; thereby reducing any advantage of LIFO use.
7	Since there is no write-down/loss in year 1, under FIFO use, the fact that inventory value increase in year 2 will have no effect on financial reporting in year 2. However, this will affect LIFO use as LIFO has presented its inventory valuation under the LCM rule. Under US GAAP, such losses are never reversed; as such this increase in market value will not affect inventory reporting in year 2 under US GAAP. Under IFRS, this loss of $105 can be reversed (up to the amount of the write-down) in a subsequent period. As such, in year 2 under IFRS Corp. X can reverse this loss in by the following journal entry: Dr. Inventory 105 105 Cr. Cost of Goods Sold105 105 Note that Inventory under IFRS (with few industry exceptions) can never be recorded above cost.

Table 5: Comprehensive Question 3

Panel A: Question Information	
Corp. X started selling widgets and electric outlets (two different products on January 1, 2017; thus, two major inventory categories). They are unsure which inventory method it will choose to report their financial reporting; however, they will use the periodic method to account for its inventory. During 2017 it made purchases of inventory as follows: Product number 1-Widgets	
January 2,2017	1000 units at $5 per unit
June 19,2017	2,000 units at $5.05 per unit
December 1,2017	500 units at $5.10 per unit
Product Number 2-electric outlets	
January 2,2017	1000 units at $10 per unit
June 19,2017	2,000 units at $10.05 per unit
December 1,2017	500 units at $10.10 per unit
At year end, a periodic inventory count reveals that there are 600 units of widgets, and 800 units of electric outlets. Additionally, the replacement cost of inventory component number 1-widgets is $4.95 per unit. The company can sell these units at $6.00 per unit and expects a 5 percent cost of selling/disposing each item. The normal gross profit margin on each unit sold in 15 percent.	
The replacement cost of inventory component number 2-electric outlets is $9 per unit. The company can sell each electric outlet unit for $11, before incurring a 5 percent selling/disposal cost. The normal gross margin on each unit sold is 10 percent.	

Panel B: Required for Question 3	
1	Calculate the following –per inventory component number 1- widgets and number 2-electrical outlets: A) Net Realizable Value, B) Replacement Cost, C) Floor Value=NRV Less normal profit margin.
2	Assume that Corp. X adopts the Lower of FIFO and Net Realizable value method to account for its inventory costing. What is the December 31, 2017 inventory value for financial reporting purposes? Assume that this is applied on: A) To the total inventory approach, and B) to the total of the components of each major category approach (i.e. two major -1-widgets, and 2-electrical outlets).
3	Prepare the journal entry to record the loss-if any under case A, and under case B above.
4	Assume that Corp. X adopts the Lower of LIFO or Market Value to account for its inventory costing. What is the December 31, 2017 inventory value for financial reporting purposes? Assume that this is applied on: A) To the total inventory approach, and B) to the total of the components of each major category approach (i.e. two major -1-widgets, and 2-electrical outlets).
5	Prepare the journal entry to record the loss-if any, under case A, and under case B above.
6	Which inventory accounting method would you recommend Corp to choose? What factors should be taken into account?
7	Assume that in year 2, the inventory value increases above its original cost. What is the IFRS versus US GAAP position treating this reversal? Prepare journal entries, if required.

Table 6: Recommended Answers for Comprehensive Question 3

1 **Unit 1-Widgets**
A) Net realizable value=Selling price less costs to sell/dispose
=$6-5 percent cost to sell/dispose= 6-0.30=$5.70

B) Replacement cost =given at $4.95

C) Floor=NRV-normal profit margin=5.70 less 10 percent of sales price=5.7-0.60=$5.10.

Unit 2: Electrical outlets
A) Net realizable value=Selling price less costs to sell/dispose
=$11-5 percent cost to sell/dispose= 11-.55=$10.45

B) Replacement cost =given at $9.00

C) Floor=NRV-normal profit margin=10.45 less 10 percent of sales price=10.45-1.1=$9.35.

2 Lower of cost and net realizable value under FIFO;

To the total Inventory approach:

FIFO Ending Inventory Cost for Inventory 1-widgets plus Inventory 2-electrical outlets =

FIFO cost inventory 1-widgets = 600 units; comprised of 500 units at5.10 plus 100 units at 5.05 (per unit). =500 @5.10 plus 100 @5.05=$3,055.

FIFO Ending inventory cost For Inventory 2-electrical outlets =800 units; comprised of 500 units at $10.10 plus 300 units at 10.05 , which equals 8065.

As such, FIFO ending inventory-cost is 3050 plus 8065= $11,115. NRV=800 ending inventory of widgets times $5.70 (NRV per widget unit) =$4560 plus 800 units of ending inventory of electrical outlets times 10.45 (NRV per electrical outlet unit) =8,360= The total net realizable value of the total inventory is $12,920 (4560+8360).

LCM total inventory is cost of 11,115 vs market value of 12,920=Cost of 11,115. Thus-No loss. LCM per the total of the components of each major category is 3050=cost of widgets plus 8065 –cost of electrical outlets=$11,115=Cost. Thus, No Loss.

3 No entry as there is no loss

4 LCM for LIFO=market value. This will equal the floor value of $5.10 per unit-for inventory group 1-widgets. For Inventory group 2-electrical outlets, the market value is the floor value of 9.35.Cost under LIFO will be 600 units at $5 per unit for inventory 1-widgets , and 800 units at $8 per unit for inventory 2-electrical outlets .Thus we have the following:

A: LCM Total Inventory

Inventory Category	Cost		Market	
1-widgets	600 times $ 5 per unit=	$3,000	600 times $5.10 per unit =	$3,060
2-outlets	800 times $10 per unit =	$8,000	800 times $9.35 per unit=	$7,480
Total		$11,000		$10,540

The write -down is as follows:

Inventory at cost	$11,000
Inventory at Market –Total Inventory Basis	$10,540
Write-down	$ 460

LCM= $10,540; resulting in a Loss of $460.

B: LCM per the total of the components in each major inventory category:

Inventory Major Category number 1-widgets	=	$3,000 (cost)
Inventory Major category number 2	=	$7,480 (market)
Total LCM-Components of each Major Inventory Category Classification	=	$10,480

The write down is as follows:

Inventory at cost	$11,000
Inventory at Market-total of the components of each major category	$10,540
Write-down	$ 520

LCM= $10.480; resulting in a loss of $520

5 Journal Entry:

A: Total Inventory Method -LCM

Dr.	Cost of goods sold -inventory write-down	460	
Cr.	Allowance for inventory mark-down		460

B: Components of Major Category Method-LCM

Dr.	Cost of goods sold-inventory mark-down	520	
Cr.	Allowance for inventory mark-down		520

6 In this case, LIFO, is preferable, when compared to FIFO, as the ending inventory is lower resulting in a lower taxable income amount; thus saving Corp. X income tax payments. For tax purposes, LCM cannot be adopted if LIFO is the chosen inventory method under IRC 471. As such, inventory will have to be valued under LIFO cost. Other inventory methods such as FIFO may utilize the lower of cost or market method for tax purposes; in which case the LCM has to be applied on an inventory unit by inventory unit basis. utilize the lower of cost or market method, for tax purposes.

In this situation, LIFO cost is $11,000. The difference in income before tax will equal the FIFO vs. LIFO ending inventory amounts:= $11,115 -11,000= $115

On the Income Statement, the Lower of Cost or Market will need to be utilized. This will reflect a LIFO LCM inventory valuation of $10,540 (Part A) or $10,480(Part B); creating an income before income tax loss when compared to FIFO by $575, and $635 respectively

The difference in taxable income and accounting income under LIFO use in the amounts of $460 (part A), and $520 (part B) will create a timing tax difference in the balance sheet. This will result in a Deferred Tax Asset-Current Balance Sheet Account.

The question remains whether LIFO should be adopted? Generally, if the LIFO would be chosen if we expect an inflationary pattern of inventory pricing-i.e. commodities; and non-LIFO methods (in order to obtain the LCM tax benefit) for deteriorating in value and use inventory items, i.e. food, flowers.

7 Since there is no write-down/loss in year 1 under FIFO, the fact that inventory value increases in year 2 will have no effect on financial reporting in year 2. In year 2, Corp X has to still utilize a lower of cost or market/NRV value. Given this fact, cost will continue to be the presented inventory value in year 2.

Regardless of whether there is a loss/write-down of inventory value below cost, US GAAP does not allow for a reversal of such write-downs in subsequent periods. However, IFRS does allow for a reversal up to the amount of the original inventory cost. In no case (absent some specific industry cases) may inventory be reflected above cost. Finally, in this case, IFRS reversals for LIFO inventory amounts do not apply as IFRS prohibits the use of LIFO.

For information purposes, the journal entry to reflect a reversal of an inventory loss/ write-down under IFRS, in a subsequent period will be:

Dr. Allowance for inventory write-down
Cr. Cost of goods sold-inventory write-down.

This aspect of IFRS can lead to income management and potentially manipulate the timing of income (losses). US GAAP prohibits any reversal of inventory write-downs.

CONCLUSION

This paper gave an overview of the new inventory reporting valuation reporting standards per ASU 2015-11. The result is the simplification of the lower of cost or net realizable reporting amounts for all acceptable inventory methods with the exception of LIFO. This new standard is now consistent with current IFRS requirements. The paper then introduces a number of comprehensive problems to help illustrate the new reporting requirements, which are recommended for classroom student assignments. Going forward, the question as to whether LIFO will continue as an acceptable US accounting method remains a controversial issue and may potentially add another layer of change to inventory reporting in the future.

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BIOGRAPHY

Peter Harris is a Professor of Accounting at the New York Institute of Technology. He can be contacted at: School of Management, 26, 61st West Street, School of Management Building, Manhattan, New York, 10023.

Dr. Umapathy Ananthanarayanan is an Assistant Professor of Accounting at the New York Institute of Technology. He can be contacted at: School of Management, 26, 61st West Street, School of Management Building, Manhattan, New York, 10023.

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THE IMPORTANCE OF PLANNING FOR SUCCESSION IN THE FAMILY BUSINESS BEFORE IT IS TOO LATE: A CASE STUDY OF A SMALL MANUFACTURING FIRM

Francisco W. Johnson, Universidad Michoacana de San Nicolas de Hidalgo
Jorge Pelayo Maciel, Universidad de Guadalajara
Marco Valenzo Jiménez, Universidad Michoacana de San Nicolas de Hidalgo

CASE DESCRIPTION

The family business discussed in this paper was founded in 1932 and had sustained growth during the first two decades of operation. It had transformed itself from a local to a national business and started to venture into international markets. The founder of the company had one daughter, an only child, who never worked in the company. When the founder died in 1955, the spouse of the only child took control of the business but never owned stock in the company. At the end of the 80's the company was run by the third generation. The oldest and only of several siblings to work in the business. The oldest son was responsible for managing the business for more than 40 years. His main concern was always the efficiency of day-to-day operations. He never planned the succession process for the fourth generation. The CEO is ready to retire and at present there are no candidates among the family willing and able to succeed the leader of the company. This case requires two hours out of class preparation by students in small groups and one hour in class discussion among individual groups with teacher assistance. The case is intended for undergrad students in business, marketing or finance.

JEL: M1, M10

KEYWORDS: Family Business, Succession, Family Protocol

CASE INFORMATION

A common problem among small family businesses arises when the founder of the company, or the CEO in later generations, needs to retire. In family business the administrator´s main concern is with the day-to-day operation and with having the necessary liquidity to cope with the company's economic responsibilities to its employees, suppliers, authorities and its customers. During the first generations of the business, the manager of the company, and/or the owners if they are different persons, do not have the inclination to think about what will happen when the CEO retires. They therefore seldom elaborate a plan for the selection and training of a successor. However, in every family business the time for succession comes sooner or later. In the worst case circumstance an illness or unexpected death forces the decision to select a successor in an improvised and hastened fashion. The possibilities range from a situation where not a single member of the family is willing or able to assume the responsibility, to the other extreme where there are several members of the family desiring to be the successor and no clear set of rules and conditions exist to guide in the choice of a suitable candidate. The problem can be compounded if property in the company is not well defined or if there is a lack of planning for the transfer of this property to future generations. The author proposes the case study methodology to illustrate this situation in a small manufacturing family firm that has been in existence for more than 80 years and is currently managed and owned by the third generation of the same family.

LITERATURE REVIEW

Case Study

Case studies are a form of qualitative research. In a quantitative research numbers, usually in the manner of statistics, explain a situation. In qualitative research words are used to describe trends or patterns in a particular situation, which in some cases can lead to theory or at least to applications in similar situations (R., Hancock Dawson, 2017). "Doing case study research remains one of the most challenging of all social science endeavors" (Yin, 2014). Case study can be defined as the intensive study of a single situation where the purpose of the study, in part, is to explain a greater number of cases (population). Among qualitative methods, case studies play a key role. Case studies represent one of the most utilized of the qualitative methods in organizational studies (Eisenhardt, 1989). Moreover, the case study is the most prevalent methodology in research of family business. "We see the case studies as a powerful methodology that can be used with rigor, creativity and in a wide variety of ways to advance the research of family business" (Kotlar, Fang, De Massis, & Frattini, 2014)

Family Protocol

Family Protocol establishes a framework for common coexistence, which leads to achieving family unity and to maintaining commitment to the company, thus promoting the continuity of the joint family project. A good family protocol should be based on three pillars: persons, family and company. If you look at these three pillars, the family protocol may become a genuine road map, with concrete proposals, that allows the family to achieve a double objective. The objectives are to achieve happiness and well-being for family members, and ensure continuity of the family enterprise (IESE & ATRVIA, 2016). The Protocol must embrace as many issues as the family deems appropriate and which have been considered in the family assemblies and forums. Its content will depend on each family, their beliefs, their values, their culture, and the time at which it is carried out. It should consider specific wishes for the company and for the family. It should not be so short that it leaves aside important aspects of the family-business system or is so long and detailed that the members of the family have to adhere to it permanently, even for trivial matters.

Succession Planning

All owners and/or CEOs will, sooner or later, willingly or unwillingly, transfer company property and/or the direction of the company to other people. This may happen suddenly, or it may be planned. The challenge for family businesses is to survive more than one generation. To achieve this, family members must plan the succession of the 3 systems that make up the family enterprise: the family, the company and the property (Belausteguigoitia, 2012). To have continuity in family business requires that the succession process be successful. During this process there are four critical entities. These entities are the company, the family, the predecessor and successor. As soon as the predecessor decides that the company will continue in the family, it is necessary that he or she initiates the preparation of the successor. This preparation usually begins during the potential successors' childhood. In this way the person who takes the reins of the business in the future experiences entrepreneurship and can imagine that one day he or she will become an entrepreneur.

The preparation of the company for succession involves considering the predecessor's and the successor's leadership styles. However, in order to avoid personalized leadership styles, it is important to have a solid organizational structure and well-established management processes. In the family sphere, to ensure success implies the necessity of establishing structures and processes that ensure family cohesion and collaboration of all members with the project of the family business. These structures must also be able to resolve issues related to the struggles for power, decision rules as to who can work in the company, their

responsibilities, and possibilities for taking in-laws into the company operations (Balsmeier, Buchwald, & Zimmermann, 2013).

The beginning of the succession process does not imply the predecessor should definitely leave the company. Some CEO's may elect to remain with the firm. However, he or she can and must develop different activities to the ones he or she is responsible for as head of the company. The new activities should be focused on training and motivation of potential successors, while fully exercising his or her previous responsibilities. The succession should be a gradual process in which knowledge and responsibilities are constantly transferred until the successor is able to gain control and confidence in the management of the company (M. Martin Boyer Hernán Ortiz ‐ Molina, 2008).

The succession plan seeks permanence, growth and the continuity of the company over time, without disrupting the balance and the usual course of business. In the case of family enterprises, the succession plan should additionally safeguard the safety and harmony of its members and maintain leadership in the organization. Exclusive focus on daily operations, concern for the short term or the ignorance of the process of succession, may weaken the company fate in the medium and long term, so it is essential to consider it a strategic priority (Ansari, Goergen, & Mira, 2014). For family-owned enterprises, the succession process acquires greater relevance since they must consider other interests of the company related to such topics as family ties, emotional situations interwoven between members, their values, the company's culture, and the family and organization history.

THE COMPANY

The family business considered in this case was established in a small town in Mexico in the year 1932. At that time there was a great scarcity of manufactured products in the country due to a meager industrial infrastructure and the limitations of imports from North America and Europe. The founder of the company was an engineer with a production focus influenced by the old European style of management, where integration of the manufacturing method favored incorporating all the processes within the company with very little outsourcing of parts, except those which were standard; such as raw materials, packaging and fasteners. Another characteristic of this European style was the importance of final product quality at a reasonable price.

The founder chose to produce a measuring instrument which had a great demand and required a certain degree of difficulty in its manufacturing process. Due to the limited supply of these types of products by other local manufacturers, as well as recognition by consumers of the product´s quality, the instruments manufactured by the company were very successful in the market place. Sales were gradually increasing throughout the country. However due to the type of assembly employed by the company, it was not possible to increase production to sufficient volumes to meet the demand. This situation favored the emergence of new manufacturers who competed with a similar product at a lower price, although with lesser quality. The founder of the company had no male offspring only a daughter, who could not or did not want to get involved in the business. In 1949 when his first grandson was born, he saw the need to ask his son-in-law to help him in the management of the family business. The husband of his only daughter was an American, accustomed to systems of production in series where it is customary to outsource the manufacturing of parts that are not economically feasible to produce in house.

This characteristic allowed the company to increase its output at a low-cost while maintaining high quality. Since the business was now able to supply all the demand for its products at low cost and good quality, the competitors were partially displaced from the market and the company's market share grew considerably. The founder and his son-in-law made a good team and little by little the son-in-law took more responsibility. At the beginning he managed the production process, and when the founder died in 1955, he also took control of sales and finance. He continued the tradition of the founder of running the company in an

empirical manner, to manage with very little professional staff and with little investment in machinery. He felt it was not necessary to transform production systems that were working well. In 1960 the company acquired a small factory situated in the Capital of the country which manufactured other products than those produced at the original plant, but with similar production processes; casting, grinding, machining, painting. Due to continually increasing demand for the original measuring instrument products, and because the profit margin was higher for these items, similar products were introduced in the production of the new plant. By the end of the 70s this plant manufactured only products akin to the ones the original plant produced. The company continued to prosper and in 1968 the first export to Ecuador was made. During rest of the 70s the company continued exporting to Ecuador and later begin exporting to Cuba.

During the 60s and 70s the company´s share of the domestic market was around 75%. Only one other factory with the same type of products had a national presence. However, there was more competition from small family workshops with very little production capacity and low-quality products. The daughter and son-in-law of the founder had four sons and a daughter, they were the only grandchildren of the founder. The eldest son was pressured by his father to study mechanical engineering in the US. On completion of his studies in 1973 he had the intention of continuing to graduate school in the US. However, in the same year his mother died, and his father offered him work in the company. He felt pressured to return to Mexico and joined the family business in September 1973 at the new plant in the Capital. His early responsibility was engineering and product development.

In 1977 he decided to go back to the US to obtain a master's degree in mechanical engineering. Upon graduation in early 1979 he returned to the family business and took responsibility for production at the plant in the Capital. The founder of the company inherited all the shares in equal parts to his wife and only daughter. When his daughter died in 1973 his wife became the sole owner of the business. His wife died in December 1984. Upon the death of the sole owner, all the shares were divided equally among the five grandchildren. The son-in-law never owned shares of the original company, he only had shares in the new company. When his mother in law died he gave the totality of his shares to his five children, also in equal parts.

Upon receipt of the shares of the two companies the siblings decided to form a holding company to be the titleholder of all the family businesses. These businesses included a sales company, a materials supplier and a firm dedicated to fiscal, financial and technical counsel. All these firms were dedicated to service the group's manufacturing plants. Also, in 1984 the first export to the US was made which included a product specifically designed for this market at the new plant in the Capital. In the same plant two projects of import substitution were initiated, one with a US company and the other with a German company. The projects were based on an economic policy the Mexican Government implemented to encourage the manufacture of products that substituted those previously imported. The policy-restricted imports of a product when, through a project of import substitution, this product was manufactured in Mexico. Through this mechanism the family company manufactured and sold, in the domestic market, several products that were previously only accessible through importation.

In 1987 the eldest son was appointed CEO of the Group and established headquarters in the Capital plant, centralizing consulting operations, purchasing and sales of the two plants. Due to health problems of his oldest daughter, caused by pollution in the Capital City, the CEO made the decision to move with his family to the city where the original plant was and to transfer the Group's headquarters to this city in August 1989. At this time the original plant was in a process of stagnation, due to the limited investment in machinery and equipment and to the lack of product development. This situation also contributed to the decision of the CEO to move his family and headquarters to this City. At the time he took direct responsibility for the original plant. The CEO proposed measures to modernize the production processes, and to foster the development of new products to make the operation more productive. Because the local trade union had obtained privileges for more than fifty years, the CEO faced fierce opposition by the trade union. After

several attempts to convince the workers and the union leaders of the necessary changes, the situation came to a critical point of confrontation. Finally, the CEO took the decision to close the plant temporarily and carry out a complete restructuring of the company. A month later operations resumed with staff selected from among the old workers and newly hired personnel.

During the 90s export to other companies in the US increased and later in that decade exports were made to a German company with sales around the world. All export projects were carried out from the plant in the Capital. To increase production at this plant and to limit pollution in the Capital City, the decision was made to transfer all smelting operations to the original plant, leaving the plant in the Capital with machining, stamping, painting and final assembly operations.

In the first years of the new millennium the plant at the Capital specialize in export, mainly in its star product for the German company. Production of this article came to constitute more than 50% of the total production of that plant. By the end of the 90's the German company was experiencing increasing competition from China, so it began to pressure the Mexican company to lower their prices and improve the quality of the article of high consumption. This prompted the family company to make improvements in the production processes at the same time it increased quality controls. Each time it became more difficult to compete with Chinese manufacturers until the German company took the decision to manufacture most of their products in China.

The German company gave notice of contract termination to the Mexican company with six months of grace, as it was stipulated in the contract between the two companies. After losing more than half of its sales in a sudden and unexpected manner, the Capital plant was forced to drastically reduce the staff and union workers, this situation caused a violent reaction by the trade union representing workers of that plant and they decided to go on strike that lasted a month. The CEO of the holding company took the decision to gradually close the Capital plant and move all operations to the original plant. At the beginning former workers from the Capital plant were hired at the original plant to manufacture the products they used to make in the Capital but gradually these workers went back to the Capital City, by then new workers hired in the old plant were learning to make the products for export and domestic sale that were manufactured in the extinct Capital plant.

The CEO reported to the members of the Board of Directors which included all siblings, the situation that the company was facing during all the periods of crisis and presented possible courses of actions to follow. The board delegated the decision to the CEO in all cases without a thorough analysis in each case. Once all the production operations were concentrated at the original plant, only a warehouse for distribution at the national level and for all exports remained in the Capital. At present the company faces sales stagnation because most of its products have exceeded their useful commercial life, mainly due to obsolescence caused by imported product substitutes with new technology that offers lower cost and higher benefits to the end user. The acting CEO, the only family member working in the business, has been in the company for more than forty years, more than twenty years as CEO, and has passed the official age of retirement. In addition, the CEO is tired and feels the company needs a new leader, a young person with new ideas and a renewed team of managers. At this time no family member is interested and able to take responsibility for management of the company. Like his grandfather the founder of the company, and his father who was responsible for the company for 40 years, the current CEO never formulated a written plan for the succession process of the CEO or the property of the company. The company does not have a Family Council or a Family Protocol. The CEO during the second generation always assumed that all his male offspring would come to work in the family business and that they would elect a leader among them.

QUESTIONS

Question 1: Could a family assembly and the appropriate organizational design, including a family protocol stipulating the procedures for succession, had prevented the crisis in which the company finds itself?

Question 2: What options does the family have in the selection and appointment of a new CEO?

Question 3: Are the only options appointing a CEO external to the family or selling the business?

Question 4: What measures should the company take to avoid a similar crisis when the fourth generational succession takes place?

Question 5: Did the family values and the company culture play an important part in the permanence of the organization? Could these have been used to develop a succession plan?

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THE IMPORTANCE OF PLANNING FOR SUCCESSION IN THE FAMILY BUSINESS BEFORE IT IS TOO LATE: A CASE STUDY OF A SMALL MANUFACTURING FIRM

TEACHING NOTES

Francisco W. Johnson, Universidad Michoacana de San Nicolas de Hidalgo
Jorge Pelayo Maciel, Universidad de Guadalajara
Marco Valenzo Jiménez, Universidad Michoacana de San Nicolas de Hidalgo

CASE DESCRIPTION

The family business discussed in this paper was founded in 1932 and had sustained growth during the first two decades of operation. It had transformed itself from a local to a national business and started to venture into international markets. The founder of the company had one daughter, an only child, who never worked in the company. When the founder died in 1955, the spouse of the only child took control of the business but never owned stock in the company. At the end of the 80's the company was run by the third generation. The oldest and only of several siblings to work in the business. The oldest son was responsible for managing the business for more than 40 years. His main concern was always the efficiency of day-to-day operations. He never planned the succession process for the fourth generation. The CEO is ready to retire and at present there are no candidates among the family willing and able to succeed the leader of the company. This case requires two hours out of class preparation by students in small groups and one hour in class discussion among individual groups with teacher assistance. The case is intended for undergrad students in business, marketing or finance.

QUESTIONS

Question 1: Could a family assembly and the appropriate organizational design, including a family protocol stipulating the procedures for succession, had prevented the crisis in which the company finds itself?

Solution 1: The Company faces two distinct complications. The first is its market position. Most products the company manufactures, and sells are obsolete. The second problem relates succession of the CEO and the transfer of property to the next generation. Both problems are intimately related. The lack of product development can be traced to the very long, more than 40 years, tenure of the CEO and his background as a mechanical engineer. He has guided the technological development along the lines of mechanical principles. The most up to date technology in the products it manufactures, as with most products today, is directed along electronic principles. The CEO could have hired engineers and technicians to develop new products and the current position of the company would probably be better. But the question remains, should one person remain as the CEO of an organization for such a long time? The problem of succession, both in the administrative arena, and in the transfer of property, is related to a mismatch between the organizational structure and the family structure. Although all three systems interacting in a family enterprise, family, property and business, must remain separate, there is always an area of intersection between two, or even the three systems (Tagiuri & Davis, 1996).

Question 2: What options does the family have in the selection and appointment of a new CEO?

Solution 2: The selection and eventual appointment of a CEO in a family business, especially if it is decided that he or she must be a member of the family, is a long process involving the current leader and possible successors. There must be a period of indoctrination, which should start when the members of the family are very young. This proselytization has the purpose of involving possible candidates in the operation of the business. It must make them feel part of the organization by fostering a love affair with the company.

Question 3: Are the only options appointing a CEO external to the family or selling the business?

Solution 3: At this time, it appears the only option is to appoint an external non-family member as a CEO. In the short run there are no family members that have the desire and the qualifications to take the leadership of the company.

Question 4: What measures should the company take to avoid a similar crisis when the fourth generational succession takes place?

Solution 4: The members of the fourth generation are teenagers or children; the current CEO together with the board members must assume the responsibility for indoctrinating and fostering them, both in their professional development and in their acquaintance with the family business, even if an outsider replaces him in his position as CEO. This will take time and a lot of effort, but it is the only way that some members of future generation will want to come into the business and be prepared to take the leadership.

Question 5: Did the family values and the company culture play an important part in the permanence of the organization? Could these have been used to develop a succession plan?

Solution 5: Family values and company culture in this organization are very solid in the forms of integrity, quality of workmanship, love of family etc. These values have been transmitted from generation to generation and are the must important reason why the business has survived to this day. Whether they could have played a part in the development of a succession plan is irrelevant at this time. It is however, important that they become part of the Family Protocol, which should include a succession plan so that the current crisis can be avoided in the future.

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BIOGRAPHY

Francisco Johnson is a doctoral candidate in management science at the Universidad Michoacana de San Nicolas de Hidalgo. He has a master's degree in mechanical engineering and an MBA. He has been working in the family business since 1973.

Jorge Pelayo Maciel is a Dr. in International Business and a current professor at the Universidad de Guadalajara.

Marco Valenzo Jiménez is a Dr. in International Business and a current professor at the Universidad Michoacana de San Nicolas de Hidalgo.

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THE BENEFITS OF EXPERIENTIAL LEARNING IN MBA PROGRAMS

Sim Jonathan Covington, Jr., Finger Lakes Community College
Rafael Romero, SUNY Polytechnic Institute

ABSTRACT

The purpose of this article is to explore the benefits of experiential learning for students enrolled in MBA programs. As applied learning complements a student's academic curriculum, internships serve as an opportunity for practical experience that cannot be obtained theoretically in a classroom-based setting. The paper makes an argument for the recommendation of experiential training in MBA programs. The definition of experiential learning, past research relevant to the topic on the graduate level, and recommendations for future inquiry are provided.

JEL: M1, I230

KEYWORDS: MBA, Experiential Learning, Higher Education, Globalization

INTRODUCTION

All across the world students are enrolling in MBA programs looking to gain a competitive advantage in the corporate arena. Whether an individual has the desire to become an entrepreneur or move up the corporate ladder, these three letters tend to hold a significant amount of weight for those who have ambitions for the corner office in the executive suite. The competitive nature of MBA programs is alive and well in the Unites States and beyond. This is evidenced by School of Business having single name recognition, complementing the academic institution in which they are housed. From Hass at Berkeley, Tuck at Dartmouth, Booth at the University of Chicago, Stern at NYU and Rotman at the University of Toronto, the competitive nature of the B-School is a force to be reckoned with.

Every year U.S. News and World Report publishes America's Best Graduate Schools, which generates scrambling of the masses to investigate how institutions rank. Enrollment in a quality MBA program can lead to excellent networking opportunities, access to quality alumni, growth and knowledge acquisition, and a degree from a prestigious institution held in high regard by employment recruiters. To utilize a business jargon, for many students the "return on investment" in a MBA program will definitely be worth the time, effort, and energy that it will take to complete the program at hand. As mentioned earlier, the world of the business student is becoming so competitive that name recognition is pivotal to success. It's not only if you have the degree/three letters, but who provided you with your training is also held in high regard. In addition to the notoriety of MBA programs, the quality of the academic curriculum is also of utmost importance. As these programs are preparing the business leaders of tomorrow, the training one receives will play an integral role in their success. Regardless of a strong theoretical foundation, one's ability to apply their knowledge is imperative for practical achievement. To this end, an institution's offering of experiential learning opportunities becomes very important in this regard. Providing students a chance to apply their knowledge in a workplace setting has real-world value that cannot be dismissed.

Upon graduation from a solid MBA program, the rubber meets the road when the individual has the opportunity for practical application. In the areas of Accounting, Supply Chain Management, Finance,

Marketing, Human Resources, Information Systems, Management and Taxation, the ability to transition to the employment landscape as change agents is imperative. Leadership in the real world is not only about what you know, but more importantly what you can do. An individual's ability to enter an organization and hit the ground running with insight and recommendations is not only welcomed with the obtaining of an MBA, but more importantly is expected by employers. To this end, the purpose of this paper is to explore experiential learning as part of an MBA program. The authors will be addressing the definition of experiential learning, past research relevant to the topic on the graduate level, the gap in the research area, show a correlation between community development and internship opportunities, and provide recommendations for future inquiry.

LITERAURE REVIEW

Experiential Learning

There are several roles that are pertinent to the success of business faculty members in higher education today. First, as teachers, faculty members are charged with training the student body with a quality educational experience and a profound comprehension of the subject matter coupled in with intellectual inquiry. Excellent students are prepared to understand current phenomena, but also how to solve problems while strategizing toward new innovations in the future. Second, as researchers, faculty members are able to explore the world of business from a theoretical perspective with the end result of practical application. Many of the best practices taking place in the world of business today come as a result of scholar-practitioners who have investigated the phenomena and created significant research- based solutions. Finally, business faculty are enlisted as change agents. In an attempt to meet the demand of employment recruiter's expectations, business faculty are continuously striving to create cutting-edge curricula that adhere to the demands of the business world. Today, experiential learning receives greater attention as colleges of business are facing pressure from main stakeholder groups. Corporations are increasingly demanding better skills from students in MBA programs where the traditional lecture approach has been the dominant teaching mode for decades (Li, Greenberg & Nicholls, 2007).

Experiential learning is an opportunity for an individual to gain practical experience relevant to their academic training. Providing a great introduction to organizational culture, as students enter the world or work as para-professionals via internships and co-operative education, this provides a venue for learning and professional growth. Kolb (1984) defines experiential learning as "the process whereby knowledge is created through the transformation of experience" (p. 41). Knowledge results from the combination of grasping and transforming experience. As many considered Kolb the founder of the present concept of experiential learning theory and practice his work provides a strong base for current understanding and future research development. Based on research conducted by Kolb, for an activity to be classified as experiential learning, a student assignment must consist of four components: concrete experience, reflective observation, abstract conceptualization, and active experimentation.

Kolb (1984) asserts that having a concrete experience requires students to process stimuli, responses, and consequences via their senses and cognition. Students' reflective observation of their assignments requires their remembering aspects of the project and elaborating on the experiences. The application of theoretical principles to what they observe in their assignment comprises the abstract conceptualization aspect of experiential learning. In this phase, students apply in-depth thought processes and problem solving. With regard to active experimentation, learners must utilize trial and error to solve an assignment's problems so they may arrive at innovative solutions. Kolb's framework has been frequently used for developing and assessing experiential learning projects in business education (Wells, Lane, & Allen, 1991).

Other researchers have built upon Kolb's work, finding that students learn best when they are actively involved with concrete experiences (Gaidis and Andrews, 1990; Walters and Marks, 1981). Ives and

Obenchain (2006) concluded that experiential learning exercises should consist of the following three elements: the opportunity for learners to be self-directed, the chance for students to connect to "real world" environments, and a component in which students critically reflect upon their learning experience. According to Kickul et al., (2010), experiential learning must "go real, go deep and get feedback" while Harsell and O'Neill (2010) defined experiential learning simply as the process of students learning through experience (Hart and Mrad, 2013).

The incorporation of experiential learning is also known to impact both the student and the faculty member. Because of its innovative style, it alters the social behavior of adopters. In business and marketing education, experiential learning transforms the behavior of all involved. The professor's role evolves from that of a knowledge fact provider to a knowledge theorist and manager, and the student changes from a passive knowledge acquirer to an active learner (Celsi & Wolfinbarger, 2002, p. 69). Even on the undergraduate level, many employers are making practical experience a prerequisite to employment upon graduation. Regardless of experiential learning being a key component of the educational experience of business students, research has shown that in relatively few instances in established business schools is there is much clinical training or learning by doing – experiential learning where concrete experience is the basis for observation and reflection (Pfeffer & Fong, 2002, p. 85). In contrast, the current generation of business students, growing up in a social environment that is progressively interactive and communicative-intensive, expects a more stimulating educational experience to maintain interest, concentration level, and motivation (Ueltschy, 2001). Overall, a goal of this paper is to highlight the relevance of this expectation and the importance of schools of business addressing this need via practical learning opportunities. Through experiential partnerships with local, regional and national organizations, students can fine-tune their skill set for quality employment marketability.

Faculty Impact and University Value

Even though experiential learning has numerous benefits for the student body, including practical application, networking, employment opportunities and potential salary increases, it is also important to look at the impact incorporating such experiences in a MBA program has on business faculty. "Faculty members are facing increasing challenges in adopting innovative technologies to utilize in MBA programs because of the amount of risk and effort involved" (Li, Greenberg & Nicholls, 2007, p. 25). According to past research, the adoption of experiential learning is challenging because of the amount of effort required. Experiential learning typically involves dialectical modes of experiencing, reflecting, thinking and acting (Kolb, 1984; Kolb, Boyatzis, & Mainemelis, 2002). However, grasping a technology that allow students to go through the entire cycle can easily add hours to a faculty member's workload, and one or two semesters, if not years, are needed before an adopter feels comfortable with the tool.

Overall, in addition to assisting students in building their skills, business faculty must explore how the change in the curriculum is going to influence their professional role. Faculty advisors for MBA experiential learning opportunities are responsible for adherence to high academic and professional standards. This may entail the incorporation of a memorandum of understanding between the educational institution and professional organization, site visits to ensure quality assurance of the student experience, development of the student academic requirement within the curriculum, and monitoring of student progress. Finally, due to the benefits of experiential learning, MBA faculty can utilize this as a admission marketing tool to recruit the best and the brightest. Although reforms are definitely needed, most critics agree that business schools don't have to discard their whole approach. Instead, they need to balance the current scientific approach with practical skills and with values and ethics (Bennis & O'Toole, 2005). MBA programs are responding to the critics by developing fieldwork projects that assign students to work with real companies or nonprofit organizations solving real problems. These experiential, "learn by doing" programs have allowed students to observe real leaders in action as they confront complex issues (Hesseldenz, 2012).

Student Impact and Value

Individual Growth

The ability to gain profession experience in business before graduation has become imperative for undergraduate and graduate level students. Practical experience can positively contribute to a student's future marketability for employment and help the student develop a better understanding of how to apply their theoretical educational foundation. Though many organizations have adopted new employee orientation programs, these programs are aimed at learning internal processes and the organizational culture. In contrast, the competence level of the new hire is expected to meet organizational standards coupled with a self-starter frame of mind. The ability to work well independently as well as lead team efforts is crucial. In addition to the academic curriculum, experiential learning help business school students address the challenge of getting acclimated to their new work environment. Research has found that passive learning in the classroom rarely supports the development of adequate critical thinking and professional communication skills. Experiential learning assignments and projects in business education settings have been found to provide students the opportunity to develop these important skills, enabling them to better meet prospective employers' expectations (Clark and White, 2010).

Industry Respect/Acclaim

The importance of experiential learning has also been acknowledged by a premier accrediting body within business education, the Association to Advance Collegiate Schools of Business (AACSB). AACSB Accreditation represents the highest standard of achievement for business schools worldwide. Less than 5% of the world's 13,000 business programs have earned AACSB Accreditation. AACSB-accredited schools produce graduates that are highly skilled and more desirable to employers than non-accredited schools (2014). According to AACSB, "experiential learning is an increasingly important pedagogy for business school programs as deans, faculty, and executives increasingly recognize that critical aspects of managing and leading are learned most effectively through practice rather than through traditional classroom-based pedagogies. Experiential learning is a particularly effective element of the business school curriculum as it helps students to successfully manage implementation challenges that often involve influencing colleagues and getting things done in the context of hidden agendas, unwritten rules, political coalitions, and competing points of view" (2017).

Teamwork/Collaborative Skills

To support the development of students' team problem-solving abilities, business school faculty may introduce cooperative experiential learning assignments, where groups of students work together to solve business problems. This team-based approach emphasizes participative leadership styles among students as well as their relationships with their faculty leaders (Bobbitt et al., 2000; Holter, 1994). Because students from different disciplines and work experience backgrounds form the teams common in cooperative experiential learning activities, students are encouraged to be more creative and collaborative in their decision-making. They also learn to respect other team members' opinions and perspectives (Hart & Mrad, 2013). In a study recently conducted by Hart and Mrad (2013) at Barry University in Miami, Florida, analysis of student exam grades and information from course evaluations confirmed faculty members' anticipated improvements in student achievement, satisfaction, and self-efficacy from the addition of an experiential learning assignment to the traditional curriculum for this course. In fact, analysis of data verified improvement in three important areas, including: 1. higher levels of achievement on exams (including students' ability to apply key concepts to practical business situations), 2. higher levels of student satisfaction with the course and the professor, and 3. greater student self-confidence in their abilities to successfully perform in the business world (self-efficacy).

Professional Industry Impact

In 1988, an exhaustive study of MBA internships at Association to Advance Collegiate Schools of Business (AACSB) accredited programs was published (McCaskey, 1988). This study replicated and expanded on earlier work. Internships help to address the criticism that management education is frequently not practical and is removed from world realities (Calloway & Beckstead, 1995; Porter & McKibbon, 1988; Wilson, 1989). "More and present information is needed that assists MBA programs in determining what, if any, MBA internships to offer. For MBA students, the right internship often opens the door to a desirable full-time job after graduation" (Dillon, McCaskey, Blazer, 2011, p. 44; Hazelwood, 2004).

MBA programs are now under enormous pressure to reinvent and reposition themselves. Moore (2007) advised that with 120,000 MBA degrees awarded in the United States each year, business schools are scrambling to differentiate themselves from the pack. Butler University was a pricey, vanilla business school that needed to provide additional value to remain competitive. Butler therefore initiated two required for-credit internships to provide real life, real business experience (Williams & Fetter, 2009; Dillon, McCaskey, Blazer, 2011). Reinventing and repositioning an MBA program requires more than marketing hype and cosmetic differentiation (Danko, 2007). The modern MBA student may be entering the program at an earlier age, with less work experience and less formal business training. In many situations, the issue of the internship consistency across various positions, a suspected lack of sufficiently rigorous content, and limited academic supervision were given as reasons for not offering MBA internships (Dillon, McCaskey, Blazer, 2011). From an industry perspective, internships provide an employer an opportunity to conduct an assessment of an individual's skill set with the potential for future hiring opportunities. In addition, the student has an opportunity to get experience in a field that will support their future endeavors or provide a chance to change the course of their professional career. Also, student interns that are correctly placed are intrinsically motivated to succeed. Student interns provide organizations with inexpensive, competent support. If the internship is a paid position, it is usually at a much lower rate per hour and without the additional charge of fringe benefits.

GAP IN RESEARCH

The motivation for the current investigation is two-fold. First, to address the lack of exploration relevant to the field. "There continues to be a dearth of research into MBA internships, although historically there has been a large body of work in the literature with undergraduate internships. The majority falls into one of three types: (a) descriptive accounts of what individual schools had accomplished, (b) discussions of the pros and cons of internship programs in general, and (c) descriptive surveys, generally national in scope" (Dillon, McCaskey, Blazer, 2011, p. 44). Secondly, another goal for this research is to provide a personal perspective on how experiential learning has contributed to my experience as an MBA student in a northeastern university setting. As found, to best prepare millennial students to succeed in the business world, we need to involve students more directly in the "real world" of business (Nunamaker, 2007). Incorporating a greater focus on experiential learning has also occurred in business programs at other top universities around the world, including the London Business School, Columbia University, and the Harvard Business School where area businesses provide guest speakers and information for students to analyze. In fact, at Harvard recent curriculum changes include a redesigned first-year MBA level course called FIELD (Field Immersion Experiences for Leadership Development) in which case analysis is minimized in favor of more experiential learning, simulations, and field studies.

Overall, having the opportunity to apply classroom knowledge in a practical setting fine tunes a student's troubleshooting abilities and problem solving skills. As the research has indicated, with experiential learning projects, learners put into practice skills and concepts learned in different courses from their business curriculum, which strengthens their overall skill set and enables them to make better and more

robust decisions in the classroom and in the business world (McCarthy, 2010). To this end, a student's skills can increase significantly as a result of completing an internship.

Regional Impact

As mentioned, there tends to be a positive correlation that exist between participation in an experiential learning and a student's learning outcomes in an MBA program. Their also tends to be an positive impact of community progression on student experiences in higher education, and the opportunities available as a result of new and innovative economic development. An institution in which a student's MBA education and internship opportunities are plentiful is located in the Mohawk Valley region of New York State. This region has a rich history of manufacturing and development, as it was the home of one of the biggest United States Air Force bases in New York, Griffis Air Force Base. Due to lack of governmental funding, Griffis Air Force Base eventually closed. In addition, several manufacturing plants that were once house in the area eventually closed or relocated, including General Electric. As a result, the Mohawk Valley region experienced a decline in economic development as the community took a downward spiral as a result of these landmarks being shut down. Overall, these situation contributed to the limited number of opportunities in this area. After years of no progress, things in the Mohawk Valley have recently begun to look promising. Innovation and excitement are alive and well in the area, producing a positive economic impact, increasing community morale and attracting professional talent to the region.

First, the abandoned Griffis Air Force base was reinvented into Griffis Technology Park, housed with numerous business organizations making a positive impact in the area with the creation of jobs and experimental learning opportunities for local college and university students via internships and co-ops. Second, as the result of a new initiative backed with the support of the current New York State Governor, Andrew Cuomo, the Mohawk Valley is now home to the new Computer Chip Commercialization Center, also referred to as QUAD-C. QUAD –C is a premier technological advancement initiative for the region in which nanotechnology inventiveness will take place. In additional to QUAD –C, the Marcy Nano Center, is also on its way to this area, which will lead to even more innovative advances in the nanotechnology industry. Overall, community develop opens the door to transformative opportunity for town/gown relations between area businesses and local colleges and universities. With the introduction of new industry efforts in a dismal economic region, this provides fertile ground for college and university students to apply their classroom learning in a professional setting. The development in the Mohawk Valley region provides a framework for success. Griffis Technology Park and QUAD-C both currently provide experiential learning opportunities for students. In addition, the forthcoming Marcy Nano Center will also have opportunities for students to gain experience via college and university-established partnerships.

Globalization

"The MBA is no longer an American concept" says University of North Carolina dean Robert Sullivan. "Collaboration has created a new standard for executive MBA education, redefining what it means to be a global business school (Bisoux,, 2011). Because of the rapid globalization of business, international business education has become a staple component of the business school curriculum. In particular, an oversea travel component is quite common in many of the EMBA (Executive Master of Business Administration) curricula (Cavusgil, 1991; Daniels, 1991; Hirsch, 1992). Such supplementation to the academic program is that participants will learn more by traveling to another country. By immersing oneself into a different culture, one will gain firsthand knowledge of that culture's business practices, overcome previous stereotypes, and become more sensitive to the inherent differences (Paul & Mukhopadhyay, 2003). Ken Steele, founder of educational consulting firm Eduvation, sees three standout trends in business education: specialized MBA programs, partnerships with industry, and experiential learning. "Schools recognize that business students want their education to prepare them for the real world, so they're always checking with industry to make sure their programs stay relevant" (Bauer, 2016). Today's

business students may find themselves "rolling up their sleeves" in a more literal than figurative sense. "Experiential learning" – a buzzword for education grounded in experiences, rather than didactic instruction – is all the rage in business schools (Bauer, 2016). When it comes to re-envisioning the MBA, educators gathered at a symposium to discuss how they can reinvent the MBA curriculum to satisfy the demands of global business. "Recruiters have made it clear that they expect certain skills from today's business school graduates. As reported, they want students with a deep understanding of global complexities, the creativity to think of innovative solutions to complex problems, the ability to recognize the ethical dilemmas that pervade business situations, and the willingness to speak and act according to their principles, even in the face of opposition" (Bisoux, 2011).

A major part of the reform of many MBA programs includes adding experiential learning programs. Experiential courses are different from non-experiential courses in that students are often required to be away from campus for extended periods of time and are often working under very tight deadlines (Dreyer, Jordan, & Wassertzug, 2006). For example, Kass and Grandzol (2012) examined the benefits of Outdoor Management Training for the leadership development of students enrolled in an MBA-level organizational behavior course. The quasi-experimental design indicated that students increased levels of self-efficacy, leadership motivation, and emotional intelligence over the course of the semester.

MBA program curricula have been the target of criticism since the financial scandals of the early 2000s, with the main focus being that many programs sacrificed the teaching of useful, real world skills in favor of impractical scientific research, while also neglecting areas such as ethics and social responsibility. The financial collapse prompted many MBA programs to implement reforms which include adding experiential learning programs (Hesseldenz, 2012). As MBA students prepare for transition into leadership positions at their respective current or future organizations, globalization is having a major impact on competitiveness regarding selectivity for professional vacancies as well as organizational necessity. To this end, the business school was inspired to make changes at the urging of employers who have indicated that traditional, lecture-based MBA programs aren't meeting the needs of the market. "As action-based learning becomes more of a mainstay in higher education, business schools are designing more ways to integrate experiential learning into their courses" (BizEd, 2016).

The notion that colleges need to act more like businesses appeals to many people outside higher education and, especially in difficult financial times, to some institutional trustees and state leaders (Lederman, 2009). Career Services in higher education has evolved since its inception and continues to adapt to various models following economic conditions, trends and demands of the labor market, and needs of the university and society (Dey & Cruzvergara, 2014). As indicated in the research, senior leaders in higher education are beginning to recognize the direct link Career Services has to recruitment, retention, and revenue for an institution (Ceperley, 2013; Education Advisory Board, 2012). To this end, Career Services can act as a catalyst for the development of employer contacts to support experiential learning in MBA programs. Overall, "internships help to address the criticism that management education is frequently not practical and is removed from world realities" (Dillon, McCaskey, Blazer, 2011, p. 44; Calloway & Beckstead, 1995; Porter & McKibbon, 1988; Wilson, 1989).

For MBA students, the right internship often opens the door to a desirable full-time job after graduation (Hazelwood, 2004). MBA programs are now under enormous pressure to reinvent and reposition themselves. Moore (2007) advised that with 120,000 MBA degrees awarded in the United States each year, business schools are scrambling to differentiate themselves from the pack. Corporate recruiters' survey of the Graduate Management Admission Council advised that 37% of the 2007 MBA hires were interns at their companies (Murray, 2008). Relentless change in the business world has been accompanied by an equally dramatic need for business schools to revamp themselves. Business education is like any other marketable commodity and therefore requires continuous product improvement to meet the ever-changing needs of partner corporations (Moore, 2007).

Overall, when it comes to MBA programs, experiential education has been referred to as a pedagogical approach whereby educators "purposefully engage with learners in direct experience and focused reflection in order to increase knowledge, develop skills and clarify values" (Association for Experiential Education, 2010). Direct experience is the critical component of experiential learning, where "the learner participates in an authentic activity to gain personal meaning" (Hoban, 1999, p. 104). Experiential learning has received attention in MBA programs because of its benefits for developing skills, especially those that are critical for effective leadership (e.g Datar, Garvin, & Cullen, 2010; Pfeffer & Fong, 2002).

Despite experiential education's theoretical advantages, there is too little relevant experiential education in most MBA programs (Pfeffer & Fong, 2002). Yet business schools, especially MBA programs, are called upon to develop the specific capacities associated with leadership and managerial roles: leading in organizational situations, adapting and innovating to solve problems, coping with unforeseen events, and managing in unpredictable environments (Association to Advance Collegiate Schools of Business [AACSB], 2010). Leadership development appears to require an experiential component (e.g., Malick & Stumpf, 1998; Pfeffer & Fong, 2002; Whetten & Cameron, 2007) because experience has long been regarded as important in the honing of leadership skills (Datar et al., 2010, p. 124).

A PATH FORWARD

Given the benefits of applied learning that have been presented in this paper, it would be wise for higher education institution to at least offer an experiential learning option in their MBA curriculum. As the delivery of a MBA education can be orchestrated in various formats, including face-to-face, online, or hybrid, monitoring and validity of experiential education also becomes crucial. As the world continues to be impacted by globalization, an individual's training, skill set, perspective, and marketability becomes significantly improved through the practical application of their academic knowledge. Experiential learning on the graduate level is a wonderful opportunity to build a graduate student's professional portfolio, as well as contribute to the brand recognition and reputation of the institution.

FUTURE RESEARCH AND CONCLUSION

The purpose of this paper was to explore experiential learning as part of a MBA program. The definition of experiential learning, past research relevant to the topic on the graduate level, the gap in the research area, regional impact, and globalization were all addressed. After conducting the literature review, more research needs to be focused on MBA programs that are located in more rural geographic areas. When it comes to recommendations for future inquiry, as institutions in more urban environments have access to a greater depth of employer/internship opportunities with marketable organizations, how does this impact student selection of MBA programs in different locales? In all, further research needs to be conducted on the impact of experiential learning as well as access to experiential learning in urban versus rural environments. Overall, this paper contributes to the body of research about the value of incorporating experiential learning in MBA education programs. As an avenue for students to gain professional experience, networking opportunities, building of self-confidence through practical application, and future marketability, experiential learning needs to become the rule of thumb for MBA programs. Institutions need to work with industry leaders to create internship sites and project opportunities for students to apply their professional skills. To this end, experiential learning improves student professional outcomes and satisfaction, and better prepares students to apply their theoretical knowledge from their MBA courses to real-world applications.

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BIOGRAPHY

Dr. Sim J. Covington, Jr. serves as the Chief Diversity Officer and Adjunct Professor at Finger Lakes Community College in Canandaigua, New York.

Dr. Rafael Romero serves as an Associate Professor of Finance and MBA Program Coordinator at SUNY Polytechnic Institute in Utica, New York.

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RAUL PREBISCH AND THE CURRENT STATE OF ECONOMIC DEVELOPMENT OF GUATEMALA

John Theodore, JDT Management Consultants

ABSTRACT

The author in this article compares the economic development of the Republic of Guatemala from 1945 to 2015 against the theories of the economic development of Latin America as promulgated by the famous Argentinian economist, Raul Prebisch. The obstacles against economic development in Guatemala were social, political, commercial and industrial. Guatemala is still experiencing uncoordinated technological applications in the economy, anti-competitive practices are extant, and a small percentage of the entire population controls most of the land. However, positive changes have been taking place in society, politics, commerce and industry supporting the economic development of the country.

JEL: F63, M00

KEYWORDS: Raul Prebisch, Economic Development of Latin America, la Comisión Económica Para La América Latina y el Caribe (CEPAL), Centros Y Periferias /Centers and Peripheries, Native and Alien Technologies, Republic of Guatemala, Economic Development, Diseconomies of Scale, Economies of Scale, Agricultural Industries, Mining, Extraction of Raw Materials, Anti-Competitive Practices, Productive Employment, Underemployment.

INTRODUCTION

The purpose of this article is to present the reasons for the economic underdevelopment of the Central American Republic of Guatemala by using the economic theories of the famous Latin American economist, Raul Prebisch. Prebisch indicated that the reasons for the economic underdevelopment in Latin America, including Guatemala, were resistance to accept foreign technology since domestic technology was either limited or did not exist; agricultural, mining and raw materials producers opposed industrialization; the inclination of the Guatemalan people to favor imports rather than domestically produced goods and services; the rapid increase of the population that demanded the same limited resources; emphasis on the extraction of raw materials and the production of mining and agricultural products for exportation purposes; limited finances and consumer credit; the ownership of the majority of the land by a small percentage of the population that controlled the economy of that nation; and underemployment. Fifty nine percent (59%) of the people between the ages of 15-29 do not complete secondary education and take menial jobs (Estudio económico de America Latina y Caribe, Anexos Estadísticos, 2015, 2016). Guatemala is one of the less developed nations in Latin America. During the last six years, the per capita percentage of the internal gross domestic product was 2.3 whereas that of Argentina—a developed Latin American state-- was 7.4 (Estudio económico de America Latina y Caribe, Anexos Estadísticos, 2015, 2016).

There is abundant literature pertinent to the writings of Raul Prebisch, the problems that have existed in the economies of Latin America, including Guatemala, and the efforts that are being made toward the economic development of all Latin American states. However, there is no literature that uses Prebisch's theories to examine the past and present performance of the economy of Guatemala. To re-iterate, the author has taken the theories of the famous economist Raul Prebsich and used them as an infrastructure to examine the past underdevelopment and the economic developmental progression of the Republic of Guatemala. This form

of study is new and adds to the existing body of literature; it also invites other researchers to use this method to examine additional micro and macroeconomic elements of the Guatemalan economy and the economies of other Latin American states. The remaining of this document includes the Literature Review, Data and Methodology, Results and Discussion, A Path Forward, Concluding Statements and References.

Raul Prebisch (1901-1986) was one of the best economic thinkers of the previous century and his works paralleled those of John Maynard Keynes. Being a Latin American (Argentine), Prebisch dedicated most of his work to the economic development of Latin America. He taught economics and economic development in various Latin American universities and became Director of *La Comisión Económica para la América Latina y el Caribe (CEPAL)* which is also known as the *United Nations Commission for Latin America and the Caribbean*, established in 1948. He wrote many articles and books and made innumerable presentations in conferences and symposia mostly dedicated to the economic development of Latin America.

Prebisch's Economic Philosophy on the Development of Latin America

In reference to economic development, Prebisch divided the countries around the world as *centros y periferias* or centers and peripheries. The centers were the developed nations, mainly the English-speaking ones, and the peripheries consisted of the underdeveloped and developing countries, with a strong emphasis upon Latin America (Prebisch, 1981). The precipitants and forces, according to Prebisch, that deterred the economic development of Latin America are being discussed in the following sections.

LITERATURE REVIEW

Prebisch witnessed the ever-developing technologies that appeared after the end of World War II and their applications in Latin America and emphatically presented the fact that such technologies were not *native* to Latin America but came from the developed centers and were based on different cultures that gave birth to those technologies. Therefore, *alien technologies* were not accepted, in most cases, by the cultural idiosyncrasy of Latin America and their applications caused turmoil and impeded emerging native technological developments (Mayobre, Herrera, and Prebisch, 1969).

Although alien technologies had found fertile ground in some sectors of the economy, such as in the sugar, bananas, coffee, raw materials and mining industries, in the remaining sectors of the economy they made limited inroads. On the contrary, in the developed nations technologies were well coordinated when applied to all sectors of the economy, from agriculture and the production of raw materials to advanced industrial production (Prebisch, 1963). Furthermore, there were insufficient funds in the economies of Latin America that could be used to meet the cost of imported technologies (Estay Reyno, 1990). Only those business organizations that had enough funds (and there were not many of them) were able to selectively buy the necessary technologies for the sustenance and development of their operations (Maragiños, 1991).

Another strong obstacle to the development of Latin America was the tendency of the people to imitate the way of life of the center nations in the demand and consumption of goods and services; such as, necessities, entertainment, education, and other products that resulted from the culture and the high economic standards of the center nations (Prebisch, 1970). Good examples include expensive imported foods, garments, vehicles, and vacations to expensive resorts in Europe or North America. Only the rich classes in the region (whose percentage in the economies of Latin America had been traditionally low) were able to benefit from such luxuries. The rapidly increasing number of the population was another strong impediment to the economic development of Latin America. According to Prebisch, such an increase did not allow for the economic development of the region since more and more people demanded the same scarce goods and services provided by the anemic national economies (Prebisch, Gatung and Iglesias, 1983). Furthermore, the rapidly growing population was engaged in underemployment, mainly in agriculture, domestic services,

and small businesses whose revenues were slightly over the cost of their operations (Prebisch, 1986). In other words, the working population was engaged in low productivity tasks because the imported technology was not accepted by most of the jobs engaged in the production and distribution of goods and services (Prebisch, 1974). In addition, firms engaged in agricultural, mining, and raw materials exports (on which all Latin American economies depended) were not capable of hiring more persons from the unemployed labor force that characterized their national economies (Prebisch, 1987).

The final obstacle to economic development was the opposition against it emanating from the large and medium classes of landowners who feared the loss of power and money caused by industrialization (Sotillo, 1986). For this reason, Prebisch supported the presence of the government in the economies of Latin America to regulate economic activities, spread technological development in all economic areas, and assist in overall development, both economic and social (Reyno, 1990). In continuing his research in the region of Latin America, the author of this work examined the extent to which Guatemala has overcome the impediments to economic development as specified by Prebisch in the previous sections of this article and noted the success (and non-success) this nation has made from 1945 to 2015 in economic development).

The Republic of Guatemala is in the northern part of Central America and has coastal areas facing both the Pacific Ocean and the Caribbean Sea. Guatemala was inhabited by the Mayas and became a Spanish colony in the middle of the 1500s and remained under Spanish control until its independence in 1821. It was a part of the United Provinces of Central America which were dissolved shortly after independence resulting in the creation of five states in the region, one of which is Guatemala. Since its independence, Guatemala has witnessed several uprisings, revolutions, and civil wars, the worse of which was the civil war of 1960-1996. Beginning with the turn of the current century, the country has experienced steady economic development under democratic administrations. It has the largest population for Central American standards and the largest gross domestic product in the region; the land is fertile and provides an abundance of agricultural products and raw materials (Schneider, 2014).

DATA AND METHODOLOGY

For the purpose of this article, the author collected secondary materials published in English and Spanish by Latin Americans and foreign Latin American experts pertinent to the works of Raul Prebisch and the economic development of Guatemala. The present author who has a doctoral specialization in Latin America Affairs has been observing and studying the economy of Guatemala since the early 1970s through personal visits in such country and consulting academic and government commensurate publications.

RESULTS AND DISCUSSIONS

The 1945-1999 Period

This period started with the end of World War II and the strong appearance of Prebisch's contributions to the economic development of Latin America and ended with his last publications, some of which were posthumously published. It also coincides with the end of the civil war in Guatemala. The entrance of limited technology in Guatemala appeared after the Industrial Development Law was finalized by the government at the end of the 1950s (Asociación para el Avance de las Ciencias Sociales en Guatemala, 1998). Imported technology was used by the small number of economically powerful elite in the sectors of coffee, bananas, sugar, raw materials, and mining. Such elite were familiar with the culture of developed countries. In the following decade, sizeable investments from the United States in the area of agricultural products augmented the entrance of related technology. On the other hand, individual farmers operated under strong diseconomies of scale due to the uderutilization of the limited land and capital and an over-supply of manual labor (Golas, 1972). In the remaining sectors of the economy—such as industrial

production-- any type of incoming technology was viewed with suspicion by the weak and underdeveloped stakeholders that characterized such sectors.

Guatemala received several assistance programs from international organizations, but only a small portion went to increase economic activities. There was practically no accumulation of savings in the private sector and very limited government funds were available to be used for paying for imported technologies conducive to the development of the country (Yañez, 1991). In this period, especially during the last decade of the previous century, the tendency of the Guatemalan people to imitate the life style of advanced nations increased (Rivadeneira, 2001). Only a small percentage of the buyers had sufficient disposable income to buy such expensive goods and services. The wealthiest 10% of Guatemalans earned, on average, 63 times more income per person than those among the poorest levels (Booth, Wade & Walker, 2010). Instead of purchasing less expensive domestic goods, even the poor, when they could, purchased imported goods and services (Nelson, 1999). The purchase of expensive imported goods and services inhibited the appearance and development of local industries from producing such products domestically (Yanez, 1991).

Between 1950 and 2000 the population of the country increased from three to eleven million inhabitants. Such an increase inhibited economic development and the needed quality of life because more and more people demanded goods and services from their limited availability on the market (Rivedeneira, 2001). The exportation of agricultural products slightly increased due to the addition of fruits, vegetables, and flowers that were exported to developed nations in North America and Europe. A small percentage of the labor force, especially in rural areas, was employed by the added agricultural exporters of the above-cited products (Hodara, 1987). Guatemala faced the increasing power of landowners who became the leading class in the economy and who had strong connections with international monopolies that also controlled the economy of the nation (Asociación para el Avance de las Ciencias Sociales en Guatemala, 1998). The people were deprived of having their own land to produce and sell agricultural products, either as proprietors or partners of small agricultural business enterprises. The 2000-2015 Period This period coincides with the initial recuperation of the nation after the bloody civil war that started in 1960 and with the strong signs of economic development. Lamentably, economic development did not take place in a coordinated effort in order to include all sectors of the economy (Romero and Gonzales, 2006).

Imported technologies continued to favor the agricultural industries— mainly coffee, sugar, and bananas -- that were controlled by powerful economic forces (Theodore, 2015). A good example was the additional development of the sugar industry, which in the previous period was characterized by low productivity and poor labor conditions, to a high productivity industry with vividly improved labor conditions (Fuentes, 2014). Another example was mining and the extraction of other raw materials that constituted 46.8% of the economic activities, whereas manufacturing—a highly important economic sector—remained low with 3.2% of the total economic activities ("Estudio económico de América Latina y Caribe, 2015. Anexos Estadísticos", 2016). Guatemala did not receive sufficient assistance from foreign governments whose large business organizations engaged in anticompetitive practices in the country (Grandia, 2013). Guatemala could not reduce or eliminate such practices that militated against the interests of national organizations that were attempting to develop their technologies and thus provide domestic products for domestic and exported consumption at competitive rates (Romero and Gonzales, 2006).

Foreign investment has increased since 2006 and the average salaries have gone up by 6.0% since 2010, thus increasing the propensity to save (Comisión Económica para América Latina y el Caribe (CEPAL) (2015). *Balance preliminar de las economías de América Latina y el Caribe, 2016*). The availability of internal credit increased since 2011 and maintained its stability with minimal fluctuations (Way, 2012). Consumer prices have declined since 2011 and maintained their stability with minimal variations, thus increasing the consumption of higher quality domestically produced goods and services at competitive prices leading to the reduction of the consumption of their imported counterparts ("Estudio económico de

América Latina y Caribe, 2015. Anexos Estadísticos," 2016). Despite the increase of the population, the gross domestic product showed a continuous and steady increase from 2006 to 2015.

Productive employment has also increased since 2006 in the sectors pertinent to domestic consumption and to exports whose volume had shown a large increase due to the high demands from developed nations ("Estudio económico de América Latina y Caribe, 2015: Guatemala", 2016). Unemployment in the last two years of this period was 3.0%. Internal consumption, the availability for credit in the private sector, and household earnings increased, too (Estudio económico de América Latina y Caribe, 2015. Anexos Estadísticos 2016). Despite the fact that foreign, private national, and national governmental institutions with investments and financial interests in Guatemala have continuously demanded the realignment of land ownership, a small percentage of the population has controlled two thirds of the arable land, thus opposing the national government's efforts for land distribution that was initiated with the *Economic and Social Reactivation Program of 2004* "Balance preliminar de las economías," 2016). Furthermore, small landowners sold or were forced to sell their land to African-palm planters, cattle ranchers, and to other powerful economic forces in the economy (Fuentes, 2014).

A PATH FORWARD

Guatemala can go forward in a positive way in its economic sectors specified by Raul Brebisch's theories. To begin with, both the government and the private sector need to encourage large, medium and small enterprises to accept and utilize technology, preferably domestically produced technology. Local and national chambers of commerce and business associations must continue convincing and supporting enterprises to accept and use modern technology. Although Guatemala has to continue producing agricultural products and raw and miming materials for exportation purposes, it profoundly needs to accelerate its industrial development which is sponsored by the government, the private sector and Latin and Central American economic and trade organizations.

The government of the country and foreign economic assistance programs must continue contributing to the increase of the availability of finances and consumer credit which enable the population to better satisfy its basic needs through financial support and easy access to credit and to accelerate the support to business organizations to receive financial assistance/loans and easy access to credit. The government and international assistance programs must continue aiding the nation's educational system in all levels starting with the primary one and ending with university education in order to better prepare the people to enter into the labor market and reduce underemployment. The pressure upon the government by the national private sector and international governments and organizations needs to continue for the implementation of the redistribution of the land for private and commercial/industrial uses. Both the government and the private sector need to continue making every effort to convince the Guatemalan people to support local and national industries that produce goods and services for them.

CONCLUDING COMMENTS

The purpose of this article was to present the reasons for the economic underdevelopment of Guatemala by using the economic theories of the famous Latin American economist, Raul Prebisch. Prebisch indicated that the reasons for the economic underdevelopment in Latin America, including Guatemala, were resistance to accept foreign technology; the inclination of the Guatemalan people to favor imports rather than domestically produced goods and services; the rapid increase of the population that demanded the same limited resources; emphasis on the production of raw materials, mining, and agricultural products for exportation purposes; limited finances and consumer credit; the ownership of the majority of the land by a small percentage of the population that controlled the economy and opposed industrialization; and underemployment. For the purpose of this article, the author collected secondary materials published in English and Spanish by Latin Americans and foreign Latin American experts pertinent to the works of Raul

Prebisch and the economy of Guatemala. The present author who has a doctoral specialization in Latin America Affairs has been observing and studying the economy of Guatemala since the early 1970s through personal visits in such country and consulting academic and government commensurate publications.

The only limitation this study has is the absence of similar studies in order for the author to compare them for the purpose of gaining additional information and providing increased knowledge in the related literature. In summary, the findings of the study are presented in this and the following paragraphs of the Concluding Statements. During the 1945-1999 period in Guatemala, imported technologies were accepted by the powerful stakeholders of the coffee, banana, sugar, mining and raw materials industries; the remaining sectors of the economy, that were weak, considered such technologies as alien to the cultural idiosyncrasy of the Guatemalan people. Savings in the private sector were limited and consumers, with the exception of the rich, had limited or no access to credit. All economic stratifications of the Guatemalan people had the tendency to buy imported goods and services, a tendency that caused tremendous financial strain upon the poor people and inhibited the formation and development of domestic industries producing such products. The rapidly increasing population participated in the consumption of the already scarce goods and services, thus adding an additional burden to the constrained economic development. Finally, economic development was further inhibited by landowners who considered such development as threatening to their economic and political security and power in the country.

During the 2000-2015 period, economic development did not take place in a coordinated effort in order to include all sectors of the economy. Imported technologies continued to favor the agricultural industries, mining, and those of the extraction of raw materials that were controlled by powerful economic forces. Anti-competitive practices by foreign business organizations, whose presence and exports had increased, continued to militate against the interests of national organizations producing similar products. On the other hand, foreign investment, availability of internal credit, and the consumption of domestically produced goods and services increased. Industrialization increased; the gross domestic product was augmented due to the rapidly increasing productive manpower; and employment showed gains due to increased industrialization, exportation of agricultural products, raw materials and minerals. Internal consumption, the availability for credit in the private sector, and household earnings increased, too. Finally, landowners who have been a small percentage of the population, still controlled two thirds of the arable land and continued to oppose the government's efforts for land redistribution conducive to economic development. Therefore, it has been detected that Guatemala's economic development, based on Raul Prebisch's economic concepts, has made progress in certain sectors and that it is still being inhibited by a number of deficiencies that are specified in this article. The present author highly recommends other Latin Americanists or persons interested in Latin American studies, to conduct similar research in the region, especially in the other Central American states of El Salvador, Honduras, Nicaragua and Costa Rica that have similar cultural and socioeconomic characteristics with Guatemala.

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BIOGRAPHY

John Theodore is the holder of a Ph.D. degree in Administration and Latin American Studies from the University of Kansas; a Ph.D. in Management from the Aristotelian University in Greece, European Union; and a D.B.A. in International Business from the University of South Africa. He has been teaching and consulting for over four decades domestically and internationally. He is a visiting professor in various foreign universities. Dr. Theodore is the president of JDT Management Consultants in Clearwater, Florida, specializing in management, organization, strategy, international business, human resources, organizational development, and educational administration. He is a certified management consultant (CMC) certified by the Institute of Management Consultants in Washington, D.C.

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DEVELOPMENT OF AN ENTREPRENEURIAL ECOSYSTEM IN ROWAN COUNTY, NORTH CAROLINA

Colin Pillay, Livingstone College
Mohammed Shariff, Livingstone College

ABSTRACT

The Rowan County Board of Commissioners created the Rowan Idea Center, housed in the West End Plaza, in Salisbury, North Carolina with the purpose of serving as a hub for the development of an Entrepreneurial Ecosystem in Rowan County, North Carolina. The Innovation Quarter, an Entrepreneurial Ecosystem in Winston Salem serves as a model for these efforts. However, the resources in these two areas are not the same. In addition, there may be some aspects of the Entrepreneurial Culture, such as the embrace of diversity that may prove difficult to emulate and community acceptance and willingness to participate may not be the same. Given these circumstances, what would be the best course of action to develop an Entrepreneurial Ecosystem in Rowan County? We show that gradual changes toward successful Entrepreneurial Ecosystems and Leadership Development can assist with these efforts.

JEL: A10, D2, M1, O3

KEYWORDS: Entrepreneurship, Entrepreneurial Ecosystem

INTRODUCTION

Recently the Rowan County Board of Commissioners purchased the Salisbury Mall in Salisbury, North Carolina due to fact that many of the stores that occupied this mall had closed. The Salisbury Mall was renamed the West End Plaza. The Rowan County Board of Commissioners is to seeking to revitalize the economy of the local area through the development of an Entrepreneurial Ecosystem in the Salisbury area. Rudimentary components of this system have been developed in the Salisbury area. This contrasts with a well-developed and successful Entrepreneurial Ecosystem in Winston-Salem which is in Forsyth County just 40 miles to the north. The challenge facing the Rowan County Board of Commissioners is to duplicate this success in the Salisbury area. The population of Rowan County is 138,694 and the population of Forsyth County is 371,511. The median household income in Rowan County is $44,494 and the median household income in Forsyth County is $ 48,271. The median property value in Rowan County is $130,500 and the median property value in Forsyth County is $153,200.

The first phase of intended revitalization has already begun with the opening of the IDEA Center in the West End Plaza. The IDEA Center represents Innovation, Development, Acceleration and Entrepreneurship. Currently the IDEA center, in Phase 1, is offering Entrepreneurship Education programs. In Phase 2, a co-working space will be developed. Office and cubicle space, conference rooms, and basic office services will be available on a monthly rental basis and on a per usage basis. In addition, a Prototype space will be allocated and equipped to facilitate prototype development, model construction and light manufacturing. The Idea Café, a coffee and gathering place, is a potential future development. It will be like the Venture Café concept in which random encounters with a diverse group of people may spark profitable business ideas.

Previous research on Entrepreneurial Ecosystems has identified the need to understand Business Plan basics, the development of professional skills, the holistic and integrative nature of Entrepreneurship, the development of students through involvement in real world problems and simulations, identifying sources of seed funding, the importance of embracing diversity, the transmission of culture through involvement with seasoned entrepreneurs and expanding the resources available to Entrepreneurs through tapping into a virtual community of Entrepreneurs. In this paper we discuss the creation of an Entrepreneurial Ecosystem in Salisbury, North Carolina by implementing these ideas. In addition, we suggest that excellence in both technical and professional skills is required for potential entrepreneurs and this can be developed through involvement in student organizations such as Phi Beta Lambda. We offer suggestions for leadership development, which is required to facilitate cooperation between members of a diverse group of individuals. The desired goals could be accomplished faster through the continual search for best practices from other Entrepreneurial Ecosystems. We recommend greater cooperation between well developed and early stage Entrepreneurial Ecosystems located in the same geographic region.

In the next section, we review the relevant existing literature on Entrepreneurial Ecosystems. We discuss the components of the Winston-Salem Entrepreneurial Ecosystem and compare it to the Entrepreneurial Ecosystem in Salisbury, North Carolina. We then discuss how these ideas may be used to design Entrepreneurship programs at Colleges and Universities and how the success of these programs may be assessed. We conclude with some suggestions as to how the success of the Entrepreneurial Ecosystem in Winston-Salem may be duplicated in Salisbury.

LITERATURE REVIEW

Entrepreneurs that use shared working spaces to reduce costs can also benefit from the assistance of students from local universities that complete internships with the Entrepreneurs. For students to work effectively as interns with Entrepreneurs in shared working spaces, they must be prepared appropriately. Yusuf and Huda M. Atassi (2016) discuss the role played by Universities as part of the Entrepreneurial Ecosystem. Universities promote Entrepreneurship through establishing centers for Entrepreneurship, Technology Transfer Centers, providing courses in Entrepreneurship and developing Entrepreneurial skills such as creativity, problem solving, conflict management, communication and negotiation. Business simulation games, in addition to lectures are used to convey the material. Stanford University utilizes an approach to Entrepreneurship which they refer to as “Design thinking”. Design thinking develops the students’ awareness of people’s needs and wants and provides methods to match these needs with products that are technologically feasible and can be profitably commercialized. Babson College emphasizes holistic and integrative learning as part of the culture of Entrepreneurship.

Secundo et.al. (2016) consider the benefits of involving students in the research problems of corporations. Companies looking for innovative solutions to project questions would normally involve customers and suppliers because of their familiarity with the products of the corporation. However, if students are involved, the benefits to a company would be new perspectives that students develop, networking with students and developing the interest of students in specific companies or industries. In turn, students would benefit from practical experience, developing their competencies, acquiring new knowledge and developing entrepreneurship awareness.

Entrepreneurs will require seed funding to start working on their ideas. Wright, et.al. (2017) discuss several funding mechanisms. Funding could be secured from the alumni of the universities in the geographic area. Some alumni might be willing to provide seed funding for entrepreneurial ventures as a gift. Others might make an investment in an entrepreneurial venture in the hope of obtaining a sufficient return on their investment. Crowdfunding is an alternative way to raise startup funds. Entrepreneurs make their pitches on a website to investors who have signed up for the website. There are several types of crowdfunding mechanisms: donation, lending and equity sharing. Donation websites secure donations, lending websites

secure funds from lenders in return for interest payments, equity sharing websites secure funds in exchange for an equity interest in the startup company.

An Entrepreneurial ecosystem has the potential to grow rapidly. This is because of the concept of cumulative entrepreneurship as discussed by Brown and Mason (2017). Seasoned entrepreneurs act as a source of inspiration and role models for budding entrepreneurs. They can nurture new entrepreneurs through demonstrating appropriate social behavior, formal mentoring and tacit knowledge sharing. Entrepreneurs who have sold off their businesses and/or who are no longer involved in the day to day operations seek to invest as business angels in new and young businesses and provide hands on support. They tend to favor businesses that are in close geographic proximity. Consequently, past successes breed future successes through this process of cumulative entrepreneurship. Individuals known as dealmakers are deeply involved in the business community and have valuable social capital. These assets are used to facilitate the formation of new firms.

Entrepreneurs thrive in a culture that supports their mindset. Brown and Mason (2017) recognize the importance of entrepreneurial culture as a key component of an entrepreneurial ecosystem. If societies do not value the societal contribution of entrepreneurs, if their social status is low, their financial success resented and if failure is viewed negatively, it will have a negative impact on entrepreneurial development. The desired culture must support diversity because it is through interaction with a diverse group of people that ideas are generated. Mehta et. al. (2016) discuss entrepreneurship learning in a multi-cultural environment. Students from the University of Massachusetts visited BVB College of Engineering & Technology in Hubli, India and subsequently the Indian students visited the University of Massachusetts at Lowell for several weeks. Following their educational program, students continued their relationships through social media networking through tools such as Facebook, Snap Chat, LinkedIn and WhatsApp. This resulted in greater friendships and collaboration for current and future projects.

Social media creates a virtual community. Hegde and Catherine Demangeot (2017) discuss the value provided to an Entrepreneurial Ecosystem by Virtual Communities. People who are part of a virtual community may access the different forms of knowledge possessed by people in the network. In these communities, idea combinations can be found and these ideas can be refined through discussion and feedback.

COMPONENTS OF THE WINSTON SALEM ENTREPRENEURIAL ECOSYSTEM

Venture Café was an initiative of the Cambridge Innovation Center (CIC) in 2009. The Cambridge Innovation Center was founded in 1999 by Massachusetts Institute of Technology (MIT) graduates Timothy Rowe and Andrew Olmsted. CIC realized that it was supporting companies who had passed the startup phase of the business. They realized that they needed to focus on the initial stages of entrepreneurship, which are generating and refining ideas, raising money, mentorship, connection to deep knowledge, and general collaboration opportunities. This led to the Venture Café concept. The name Venture Café was inspired by the book Venture Café by Teresa Esser. The theme was inspired by the first chapter of the book which proposes a regular gathering for founders to talk with experienced executives and others community members.

Flywheel Coworking offers shared and private working spaces for entrepreneurs. In addition, Flywheel hosts Startup Grind, Swerve and TechStars Startup Weekend. Swerve provides meetings for those individuals working in the Creative Arts field. They meet once a month. Startup Grind partners with Google for Startups to provide periodic talks by successful entrepreneurs. These talks are open to the community and are also available on YouTube. They have over 500 chapters and operate in 125 countries. This event is held periodically at Flywheel Coworking. TechStars Startup Weekend is held periodically at Flywheel Coworking. It takes place over a weekend, starting on Friday. The event begins at 5PM with

social networking. This is followed by a dinner and a short talk on some aspect of starting a company. Subsequently participants have 60 seconds to pitch their business ideas. Attendees vote on the best ideas and teams form that will work throughput the weekend to prepare for their presentation on Sunday afternoon. The presentation takes 5 minutes plus 2-3 minutes for Q&A. The top teams are chosen by the judges and prizes are awarded.

New Ventures is a business accelerator program based at Flywheel Coworking. After completing an application, eight teams are selected for special training that Mixxer is a facility which allows potential entrepreneurs to experiment with the manufacture of various objects. Special tools such as 3D Printers, laser cutters, computers with special design software and an electronics lab are available to create these objects. Forsyth Tech hosts the Small Business Center and provides access to mentors for startup companies. There is a Small Business and Technology Development Center at Winston-Salem State University for existing companies that want to increase the growth of their businesses. 100watt is a business incubator located in Winston-Salem that helps with brand development, the creation of a business plan, and feasibility studies. They provide mentoring from experts in sales, marketing, technology and operations and assist with fundraising. Colleges and Universities include Forsyth Tech, Piedmont International University, Salem College, Wake Forest University and Winston-Salem State University. Angel Groups and Venture Capitalists include Five Points Capital, Piedmont Angel Network, Piedmont Venture Capital and VentureSouth Piedmont. Newsletters include Business North Carolina, newsletters from the Winston-Salem Chamber of Commerce, Piedmont Local and the Triad Business Journal.

A COMPARISON OF TWO ENTREPRENEURIAL ECOSYSTEMS

The Rowan Idea Center located in the West End Plaza was created with the intention of offering workshops in Entrepreneurship, developing co-working spaces, a business incubator, a maker space and a café where entrepreneurs could meet each other. Currently only the workshops have been implemented and are held at City Tavern in downtown Salisbury. The content of these workshops like that of a first course in entrepreneurship with a different topic covered every month.

Colleges and Universities in the area include Catawba College, Livingstone College and Rowan Cabarrus Community College. Both Catawba College and Livingstone College have programs in Entrepreneurship. There is a Small Business Center at Rowan Cabarrus Community College. The Salisbury Business Center provides a monthly newsletter. The Rowan County Chamber of Commerce provides several events for Chamber members every month such as Business After Hours, the Power in Partnership breakfast, the Young Professionals Group meeting, Women in Business and the Minority Business Council. Catawba College has a business incubator for their students.

THE ROLE OF THE PROGRAM IN THE UNIVERSITY

Both Livingstone College and Catawba College currently have Entrepreneurship programs. These should be periodically revised to reflect best practices which would be determined by a Business Advisory Board. College courses at local institutions should be made available to residents of the future co-working space or future business incubator at substantial discounts. This could be facilitated by grants or government programs.

Students should be trained in the relevant technical and professional skills so that they could obtain internships at startup companies. The Entrepreneurship program should be performance based and should emphasize the integration of knowledge. Simulation games are an excellent way to give students real world experience. At Livingstone College students play the CAPSTONE Business Simulation game in the Business Policy which integrates knowledge from various Business disciplines. Colleges should seek grants to offset the cost of these games.

An Entrepreneurial Ecosystem requires extensive social networking. Students may not have the skills to adequately participate in these activities. The Business student organization Phi Beta Lambda trains students to be effective at social networking through the development of soft skills. This is accomplished through monthly meetings, projects, social events and workshops at local, State and National conferences. Phi Beta Lambda has active chapters at Livingstone College, Catawba College and Rowan Cabarrus Community College. Similarly, chapters of other National Business student organizations should be initiated to cater to different student interests. Faculty should be given time to attend events sponsored by the student organizations and there should be a budget for student conferences. A course in the development of Professional Skills should be incorporated as part of the Business Core offering.

Livingstone College has alliances with Invertis University and with Lovely Professional University in India. Every semester, students from these Universities come to study at Livingstone College. These alliances form a bridge between the faculty, entrepreneurs and investors in the Salisbury area and those in the community around the Indian Universities. The diversity that these students bring will benefit the Entrepreneurial Ecosystem. These students should be placed in Student Business Organizations and given the chance to participate in the activities of the Entrepreneurial Ecosystem in the Salisbury and Winston-Salem areas. When they return to India, they could continue relationships they developed at Livingstone College through Facebook, LinkedIn and WhatsApp. Collaboration with the Universities in India could be increased through joint participation in the Capstone Business Simulation game and through joint case competitions.

ASSESSING THE UNIVERSITY PRODUCT

In May 2018, the Rowan Idea Center organized the first Business Pitch competition. There were two categories in this competition, one for the high school students and one for the rest of the Rowan County Community. The first prize was set at $1000. This competition should become an annual event and will motivate people to participate in the Entrepreneurial Ecosystem so that they will be able to adequately prepare for the competition. It should also be adequately advertised and promoted. Doing well in this competition will be a measure of the success of the Entrepreneurship program.

Phi Beta Lambda has State competitions in about sixty different fields of business and CIS in April of every year. The topics for a particular field of Business are not based on a particular textbook, so students prepare by reading a variety of textbooks. Judges are chosen from professionals that are not academics. Hence the students can expect questions that reflect a blend of academic knowledge and experience. The rigorous nature of the competition ensures that students develop a deep and broad understanding of the subject matter. This will prepare them to serve as interns for the Entrepreneurs who will potentially be housed in the future co-working space at the West End Plaza. They will also be prepared to aid the Entrepreneurs in a Business Incubator if a decision is made to develop one. Students should look for opportunities to participate in case competitions as this gives them a chance to integrate theory and practice. Case competitions are offered at the State Level competitions of Phi Beta Lambda and also at the annual meetings at IACBE.

Professors should consider assigning students projects based on problems that businesses in the local area are trying to solve. Students will benefit from the integration of theory and experience. This will require cooperation from the local Business Community and a committee should be formed at the Rowan County Chamber of Commerce that will facilitate this. The benefits that businesses will derive would be the fresh perspectives that students would bring and solutions using innovative theories learned in the classroom. In addition, businesses would also be able to promote their products and services and recruit candidates for internships and future employees. Placement in these internships would be a measure of the success of the Business Program.

As the Business School Accrediting organizations focus on the demonstration of acquired skills, the Colleges should work towards receiving accreditation. Achieving accreditation will be a measure of the success of the Business program. Faculty should be given funding to attend accreditation conferences so that they may learn about best practices used by other universities.

CONCLUDING COMMENTS

Efforts to duplicate the success of the Winston-Salem Entrepreneurial Ecosystem in Salisbury, North Carolina are in progress. This is expected to take several years. As funding for these efforts may present challenges, we offer some suggestions to accelerate the development of the Entrepreneurial Ecosystem. This is the result of discussions with people in key roles in both Ecosystems and through involvement in the activities of these Ecosystems. The decision makers should visit other areas in the Country which are thriving Entrepreneurial Ecosystems and transfer those best practices back to the Rowan County area. Progress reports should be provided to an advisory board so that appropriate guidance could be provided. Consultants should be brought in to provide feedback. Funding should be provided for professors to attend academic and practitioner conferences so that they develop an understanding of the models and theories that may guide this process.

As this effort requires the cooperation of the community, educational institutions, local government and businesses, committees consisting of persons from the above entities should be formed to guide the development of the Entrepreneurial Ecosystem. These committees should consist of a diverse group of people so that different perspectives could be brought to bear on the development of the Entrepreneurial Ecosystem. There should be sufficient representation of people across generations. Potential entrepreneurs want to hear from successful entrepreneurs in an environment where they can spend substantial time socializing with other entrepreneurs. A culture that values and promotes diversity should be developed. Leadership theory can unite people from diverse backgrounds and the development of leadership skills should be considered an essential component of the Entrepreneurial Ecosystem.

Presentations should be made to funding providers concerning the progress taking place so that adequate financial support is received for the development of the Entrepreneurial Ecosystem. Accomplishments should be reported to the local news media so that the community is also informed of the progress taking place. Through pitch contests, workshops and interactions with successful entrepreneurs, persons in the community may choose to become Entrepreneurs or become more supportive of the project.

These events should be promoted through social media, the Rowan County Chamber of Commerce, the local newspapers and on the websites of Colleges and Universities. Student Business organizations should announce these events to their members and set up carpools to facilitate transportation. When guests arrive, they should be asked to register and their email addresses collected in order that they may be informed of future events.

As many components of the Entrepreneurial Ecosystem available in Winston-Salem are not available in Rowan County, potential Entrepreneurs should travel to Winston- Salem to participate in the activities of the Entrepreneurial Ecosystem there. Over time, this process will lead to the duplication of the culture of the Winston-Salem Entrepreneurial Ecosystem in Rowan County. To facilitate this process, the Rowan Idea Center should have links on its website to the activities in the Winston Salem Innovation Quarter. A cellphone app could be created to simplify the process.

The Educational Institutions in the area, philanthropic organizations, businesses and local government entities should provide seed funds for those Entrepreneurs who were selected to participate in a Business Accelerator program when this Accelerator program is developed.

We have offered suggestions for the accelerated development of the Entrepreneurial Ecosystem in Rowan County. Greater integration is needed between the Entrepreneurial Ecosystem in Rowan County and that in Winston-Salem. In addition, the embrace of diversity and securing the cooperation of diverse individuals could be accomplished through a focus on Leadership Development. Student organizations such as Phi Beta Lambda place an emphasis on Leadership Development, but getting students to join and participate in these organizations could present a challenge. Future research could identify how the various components of the Entrepreneurial Ecosystem are integrated and how they would be used by people at different stages of Entrepreneurial development.

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BIOGRAPHY

Dr. Colin Pillay is an Associate Professor at Livingstone College, advisor to the Phi Beta Lambda student organization and IACBE primary representative. He teaches the upper level Business classes. He holds a M.S. in Computer Science from Iowa State University, an MBA from Texas A&M University and a DBA from Louisiana Tech University. He has taught Entrepreneurship at Invertis University in Bareilly, India.

Mohammed Z. Shariff, Ph. D., is an Associate Professor – Accounting at Livingstone College, Salisbury, North Carolina. His teaching career started in 1985. His teaching interests are in the areas of Accounting

and Finance. His research interests are in the areas of Neuro-Finance, Investor Behavior, and Financial Institutions. His administrative expertise is related to accreditation process (AACSB and IACBE) and Computerize Accounting Systems. He is fellow of the World Business Institute, Australia, and member of editorial board of a peer- reviewed international academic journal.

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ANALYSIS OF MANUFACTURING METHODS USING MARKET DEMAND DYNAMICS

Adenike A. Moradeyo, Augustine University, Lagos, Nigeria

ABSTRACT

This study analysed manufacturing strategy based on market dynamism. It showed how the knowledge of price and demand changes of products can be used as a tool to identify appropriate manufacturing processes and strategies for production. Using a qualitative methodology, specifically, a case method, the plausible alignment between the different product categories, manufacturing process and strategies are established. The contingency theory and the perspective of the theory of swift, even flow (TSEF) are used as the theoretical bases for this study. The result shows an alignment of the product type with the process and strategy types for the functional-necessity product category and some deviations for the innovative-functional product category.

JEL: M1, L1, L6

KEYWORDS: Manufacturing method, Product-Process Matrix, Functional-Necessity Products, Innovative-Luxury Products, Price Elasticity of Demand

INTRODUCTION

Manufacturing methods in this context denote the production process and strategy alignment or combination of products. This study assessed manufacturing methods in the context of the product life cycle and the manufacturing process in relation to price elasticity of demand. In essence, this study links the concept of manufacturing strategy with the concept of price elasticity of demand. This work builds on the works of Hayes and Wheelwright (1979a) and Fisher (1997). Hayes and Wheelwright introduced the concept of the product-process matrix (PPM) as a tool for analyzing the relationship between the product life cycle and the manufacturing process. Fisher, on the other hand, classified products into two major categories; functional and innovative products.

The attribute of demand certainty or uncertainty of goods could be applied to functional and innovative products respectively and this could serve as a good tool for manufacturers in planning production. This could also help in determining the kind of production strategy or in general the supply chain strategy to employ. This study emphasizes the use of the TSEF which is related to the productivity of plants, the concept of price elasticity of demand from the microeconomic theory of supply and demand and the concept of "fit" in contingency theory in determining manufacturing strategy choices of firms.

While this study builds on existing research in manufacturing strategy, it deviates from prior research based on several critical dimensions. First, this study adds to existing literature because it incorporates the economic concept of price elasticity of demand in the manufacturing processes. Hull (2005) provided a theoretical justification for the use of elasticity concept from microeconomic theory for analysing supply chain performance. Second, this study helps to bridge the gap between the fields of operations management and economics by making use of the concept of price elasticity of demand and its implications in manufacturing strategy. Okhuysen and Bonardi (2011) emphasized the need for researchers to use combinations of ideas or blends of theories to advance new insights and develop novel hypotheses that can

ultimately be tested empirically. Similarly, in order to achieve a more coherent and progressive body of knowledge, it has been suggested that researchers should develop inter-or-intradisciplinary perspectives in research studies (Cornelissen and Durand, 2014, Hillman, 2009). This study thereby integrates the two fields of operations management and economics. Third, this study further analyses the framework of the product-process matrix (Hayes and Wheelwright, 1979a) by incorporating the concept of price elasticity of demand and the product types (Fisher, 1997) to develop a new framework.

One of the objectives of this study is to help operations/production managers to establish the link between the knowledge of economics' concept of price elasticity of demand and its implications in determining efficient manufacturing strategies for products. In addition to the aforementioned, this study helps to bring more insight into how the knowledge of market demand and product characteristics can help in determining manufacturing strategies suitable for different product types. Hence, it is important for firms to make complementary market-manufacturing choices (Hayes and Wheelwright, 1979a, Mellor, Hao and Zhang, 2014; Sardana, Terziovski and Gupta, 2016, Stavrulaki and Davis, 2010). Another objective of this study involves building on the already established link between the product types, relevant production strategy and production process while introducing the concept of price elasticity of demand. Hence, the performance implications of the different linkages are also analysed.

Product-process matrix has been a useful tool for product-process alignment in extant literature (Gualandris and Kalchschmidt, 2013, Helkiö and Tenhiälä, 2013). Furthermore, another objective of this work is to use the product-process matrix concept to further analyze the effect of product attribute in the context of "price elasticity of demand" on the production process. This leads to the establishment of a "product-process-price elasticity matrix (PEM) " to account for product type-price elasticity of demand link. The work is a build upon the already well-established framework of the product-process matrix which has already been validated in extant literature (Safizadeh, Ritzman, Sharma, and Wood, 1996).

Subsequently, this study provides a theoretical justification for the relationships between innovative and luxury goods also functional and necessity goods. That is, the link between innovative products and luxury goods likewise the relationship between functional products and necessity goods are theoretically established. Also, this study developed research propositions that were qualitatively analysed based on the case study. Hence, the research questions, First, "what are the relationships between the product types and manufacturing strategies' choices? Second, " what are the performance implications of these choices?"

The remainder of this study concentrates on some other critical aspects such as the literature review, theoretical foundation, methodology, and analysis. Finally, the study concludes with implications for managers, research limitations and future research directions.

LITERATURE REVIEW

It has been emphasized in extant literature how manufacturing processes provide strategic roles to support companies' competitive advantage by giving an edge in the market place (Hill 1993, Voss 1995). Manufacturing strategy has attracted the attention of many scholars, different research methodologies and has been defined in different ways by various scholars (Chatha, Butt and Tariq, 2015, Hayes and Wheelwright, 1979a, Helkiö and Tenhiälä, 2013, Safizadeh et al.,1996; Skinner,1969)

One of the interesting works in the area of manufacturing strategy is the work by Hayes and Wheelwright (1979a,1979b) on the product-process matrix. The authors suggested in their landmark work on the product-process matrix, that product plans and process choices should be linked together and that this linkage ensures better production performance and competitive advantage. Similarly, several extant literatures have asserted that the choice of the type of manufacturing strategy has impact on performance (Jayaram et al.,

2014, Safizadeh et al.,1996, Safizadeh, Ritzman and Mallick., 2000, Safizadeh and Ritzman, 1997, Kim et al., 2013, Ward and Duray, 2000).

According to Spenser and Cox (1995), many researchers have used the product-process matrix to postulate relationships among physical characteristics, policy and procedures, and production planning and control systems in the study of the product lifecycle. The product-process matrix shows a movement from the jumble flow (job shop) with a low volume-low standardization product structure to a continuous flow with a high volume-high standardization product (Helkiö and Tenhiälä, 2013, Safizadeh et al., 1996). Hayes and Wheelwright (1979b, p.129) proposed that the "product-process matrix was an excellent vehicle for understanding why manufacturing problems occur and how they can be minimized". Moreover, the distinction of the product lifecycle concept from the process lifecycle aspect elaborates the different product-process options available to manufacturing outfits (Hayes and Wheelwright, 1979a). Product-process matrix helps in investment decisions, new market entry decisions and market opportunities that are consistent with different product-process options (Hayes and Wheelwright,1979a, Stark, 2015).

This study builds on the foundation that product-process matrix accounts for the production strategies that suits the different product categories. This exposition is an interesting approach to the usefulness of the matrix. Products have been categorised into two major classes which are functional and innovative products (Fisher, 1997). Functional products are staple products that people buy in a wide range of retail outlets, characterised by relatively predictable demand, they satisfy basic needs and are otherwise classified as necessity goods in this study. Necessity goods are goods characterized with low responsiveness of demand to changes in price because they are needed anyway (Arnold, 2007, Baumol and Blinder, 1979, Mankiw, 1998, McConnel, Brue and Barbiero, 2005) and have high demand predictability. The aforementioned attributes of functional products are however in contrast to those of luxury goods or innovative products because they are goods you can do without (Arnold, 2007, Wagner, Grosse-Ruyken and Erhun, 2012). In extant literature, it has been emphasized that the knowledge of price elasticity of demand could help managers to find the optimal product-mix solution (Guo and Ma, 2014, Tsai et al., 2010).

Theoretical Foundation

This study makes use of the contingency theory and the TSEF to analyse the relationships between product types, process types and the concept of elasticity of demand. With the combination of the concepts of fit in contingency theory and the degree of variability from the TSEF, an efficient manufacturing strategy's choice can be made by managers in manufacturing firms.

Contingency Theory

According to Van de Ven (1979), the fit notion which originated from the contingency theory and the population ecology theory has become an important abstraction for other management theories. The concept of fit has served as an important building block for theory construction in several areas of research (Sousa and Voss, 2008, Venkatraman, 1989). Venkatraman (1989) established a conceptual framework and identified six perspectives of fit as fit as moderation, fit as mediation, fit as matching, fit as gestalts, fit as profile deviation and fit as covariation.

The perspective of fit as matching and moderation are the perspectives we are interested in this study. This matching and moderation perspectives are otherwise known as the selection and interaction approaches respectively (Drazin and Van de Ven, 1985, Venkatraman, 1989). The interaction approach sees "fit as the interaction of pairs of organisation context and response variables which affects performance" (Souza and Voss, 2008, p.703). These perspectives are important in this study because the goal is to align different manufacturing strategies with product types and to also analyze their performance implications.

From extant literature, the concept of fit can be found to be embedded in the product-process matrix which signifies that congruence between the product types and the production process results in the ideal manufacturing process (Hayes and Wheelwright,1979a). Safizadeh et al. (1996) in their study on 144 manufacturing plants in the U.S empirically established that there is an improvement in performance of on-diagonal plants as they progress from job shops to continuous flow shops and that manufacturing performance suffers when there is a mismatch between product plans and process choices. Pekka and Antti (2013) using survey from 151 manufacturing plants analysed the product-process matrix model from the contingency theory perspective and its performance implications. Similarly, Sohel and Schroeder (2002) empirically verified and found a significant relationship between the product and process structure using data collected from 1287 plants.

Theory of Swift, Even Flow

TSEF by Schmenner and Swink (1998, p.102) states that "the more swift and even the flow of materials through a process, the more productive is the process". This theory implies that productivity rises with the speed by which materials flow through a process and falls with increase in variability in demand and process's operations (Schmenner and Swink, 1998).

Schmenner and Swink (1998) proposed a variant of the product-process matrix with the implication of TSEF based on the productivity of plants. Schmenner and Swink (1998) argued that TSEF redefines the horizontal axis of the product-process matrix as demand variability by moving from high variability to low variability (from highly customized products with irregular demands to commodities with steady demands). This theory also redefines the vertical axis of the matrix as the speed of flow, from slow to swift. This redefinition implies that the lower right portion of the matrix represents those operations that combine low demand variability with swift materials flow, a combination that according to TSEF is the most productive and has the most output per unit of input resource (Schmenner and Swink, 1998). This confirms the study by Schmenner (2004) that the variability of a process affects performance in quality, quantities and timing.

The perspective of TSEF has been used in several studies both theoretically and empirically (Bendoly and Keafer, 2004, Frendendall et al., 2009, Schmenner, 2001, Seuring, 2009). TSEF has been used to analyse the impact of variability from the perspective of risk to performance (Chen, Sohal and Prajogo, 2013). TSEF has also been used to access the effect of information technology on streamlining health operations (Dewaraj, Ow and Kohli, 2013).

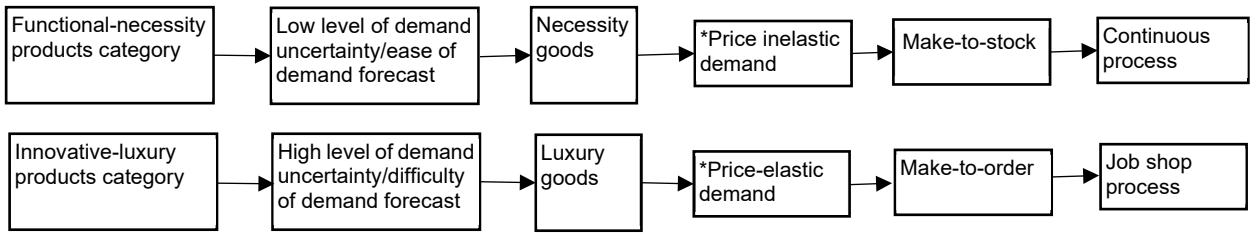
Functional and Innovative Products

Fisher (1997) divided products into two categories namely; functional and innovative products. Functional products are the staples that satisfy basic needs with stable predictable demand. The predictable demand of these products makes market mediation to be easy because the nearly perfect match between supply and demand can be achieved. Innovative products, on the other hand, are products characterized by short lifecycles, many varieties, high customization, low volume and volatile demand (Mankiw, 1998, McConnel, Brue and Barbiero, 2005, Mellor, Hao and Zhang, 2014).

The supply chain for the functional products have attributes such as efficiency, inventory minimization and high average utilization rates (Fisher, 1997). However, innovative products require supply chains that are characterized by responsive processes coupled with strategic stocks for meeting fluctuating demand (Fisher, 1997). In essence, functional products require efficient processes while innovative products require responsive processes (Fisher, 1997). Hence, the efficient production process for functional products is the continuous process combined with the make-to-stock strategy (Figure 1) as its corresponding production strategy (Fisher, 1997). Figure 1 shows the link and the expected alignment between the product types, the microeconomic classification of goods, the price elasticity of demand, the production strategy and the

production process. The process choice for innovative products is a responsive process which is the job shop or jumbled flow process (Figure 1) with a corresponding make-to-order strategy (Aitken, Childerhouse and Towill, 2003).

Figure 1: Theoretical Model



This figure shows the link and the expected alignment between the product types, the microeconomic classification of goods, the price elasticity of demand, the production strategy and the production process. Source: Author

The extension of the product-process matrix (Table 1) with the incorporation of the concept of price elasticity of demand based on the concept of "fit'' can be used for analyzing the two product types (functional and innovative products) with the respective production strategies. Table 1 shows the addition of the price elasticity of demand in the product-process matrix without the inclusion of the intermediate columns for the assembly lines for higher volume, standardized products and batch process for low volume, multiple products. Lee (2002) emphasized that the characteristics of functional products include; low demand uncertainty, stable demand, long product life, low product variety, high volume per stock keeping units among others whereas the innovative products exhibit contrasting attributes of the functional products.

Table 1: An Extension of the Product-Process Matrix to create the Product-Process-Price Elasticity Matrix (PEM)

Types of Products	**Price Elasticity of Demand**	**Process Structure & Process Lifecycle Stage**	**Low Volume, Low Standardization, One of A Kind Commodity**	**Very High Volume, Very High Standardization Commodity (Commodity Products)**
Innovative-luxury products category	**Ep>1**	Jumbled flow (Job Shop)	Product A	-
Functional-necessity products category	**Ep<1**	Continuous flow	-	Product B

Adapted from Hayes and Wheelwright (1979a) This table shows the incorporation of the price elasticity of demand in the product-process matrix without the inclusion of the intermediate columns for the assembly lines for higher volume, standardized products and batch process for low volume, multiple products.

Similarly, Safizadeh et al. (1996) segregated process types suitable for products based on the demand characteristics. The use of job shop process for standardized or homogenous products is characterised as a misalignment (Safizadeh et al., 1996). These authors categorized the job shop process as a suitable option for products with demand characteristics that are uncertain, heterogeneous, with high variance, low volume, frequent supply changes and shorter lifecycle. Emphasis is placed on flexibility and quality for job shop process (Hayes and Wheelwright, 1979a). On the contrary, the continuous process is proposed viable for products with demand characteristics which are certain, homogenous in nature, with low variance, high volume, slow design change and longer life cycle. Reliability, predictability and cost are the focus for a continuous process (Hayes and Wheelwright, 1979a). Interesting inferences and linkages could be drawn from the attributes of the functional products, innovative products, job shop processes and continuous processes.

Hull (2005) quantified the impact of economic forces on the performance of a supply chain using the concept of elasticity by adapting a supply chain to the market characteristics of its products. He proposed

that the supply and demand considerations create a direct link to economics. Furthermore, using the concept of elasticity, a high elasticity is associated with flexible manufacturing, short lead times and strategic uses of inventory. However, low elasticity is associated with long lead times, fixed manufacturing schedules, and operating near capacity with limited ability to expand or store inventory (Hull, 2005).

The alignment of the product types, process types and elasticity concept (Figure 1) based on the discussed attributes from extant literature is the basis of the links made between products-process-strategy in this study. Therefore, functional products that are characterized by a stable and predictable demand aligns with the economic concept of price inelastic demand (low elasticity) while innovative products which are characterized by unstable and variable demand exhibit price elastic demand (high elasticity). Price inelastic demand based on the degree of necessity means that product's demand by consumers does not really change with changes in price (Arnold, 2007, Baumol and Blinder, 1979, Cai, Chen, Xiao, Xu and Yu, 2013, Li, Zhu and Huang, 2009, Mankiw, 1998). This translates into a kind of predictable demand for the producer while the contrast, unpredictable demand is the attribute of innovative products. This distinguishing attributes of stability and predictability of demand for functional products make it possible to establish a link between necessity goods and functional products. In contrast, the unpredictable demand characteristics of innovative products align with the concept of luxury goods.

The elasticity measure, specifically the price elasticity of demand establishes a link between manufacturing strategy and the existing microeconomic theory (Hull, 2005). Necessity goods as defined by nature of the goods or based on the degree of necessity have inelastic demands and luxury goods have elastic demands (Baumol and Blinder, 1979, Mankiw, 1998, McConnel, Brue and Barbiero, 2005). In view of these extant literature studies, the researcher proposes the following:

Proposition 1: A functional product that is characterised by price inelastic demand is a necessity good, hence, the functional-necessity product category.

Proposition 2: An innovative product that is characterised by price elastic demand is a luxury good, hence, the innovative-luxury product category.

Similarly, the relationship between the product and process life cycles indicates a path from the jumble flow (job shop) with a low volume-low standardization product structure to a continuous flow with a high volume-high standardization product (Hayes and Wheelwright, 1979a). Aitken, Childerhouse and Towill (2003) established a link between the continuous production process and make-to-stock production strategy while a job shop process is linked to the make-to-order production strategy. Safizadeh et al. (1996) established an alignment between the job shop process as a viable production process for products characterized by high level of uncertainty of demand, short life cycles, low level of standardization (heterogeneous nature) while the continuous process is viable for the category of products that are characterised by high demand certainty. This unique attributes of "standardization" in volume production and the "demand pattern" of a product could be used to determine the production strategy and the production process of each category of goods based on the knowledge of the price elasticity demand. This leads to the research propositions that:

Proposition 3: The functional-necessity products category are best produced using the continuous production process and make-to-stock production strategy.

Proposition 4: The innovative-luxury products category are best produced using the job shop production process and make-to-order production strategy.

Wagner, Grosse-Ruyken and Erhun, (2012) have analysed the impact of supply chain-fit on financial performance. According to Safizadeh et al. (1996), a mismatch between a production process and strategy

will reduce manufacturing performance. Similarly, using the idea of TSEF, increased variability between processes will affect performance in quality, timing and quantity (Chen, Sohal and Prajogo, 2013, Schmenner, 2004).

Previous studies have emphasized quality, cost efficiency, delivery and flexibility as the major competitive capabilities for manufacturing firms (Ferdows and De Meyer, 1990, Wong, Boon-itt S. and Wong, 2011). These measures of operational performance are the four traditional competitive capabilities required by manufacturing firms in determining their performance levels (Ferdows and De Meyer, 1990). Hence, a mismatch between production processes and strategies will affect cost, quality, delivery and flexibility of a manufacturing firm negatively. The traditional perspective of operational performance cuts across four indicators, in the order delivery, cost, quality and flexibility (Daniel et al., 2012, Wong, Boon-itt. and Wong, 2011). The first criterion for determining operational performance which is the order delivery is the focused operational performance indicator in this study. Therefore, the researcher proposes the following:

Proposition 5: A match between functional-necessity products, continuous production process and make-to-stock production strategy will improve operational performance.

Proposition 6: A match between innovative-luxury goods, job shop production process and make-to-order production strategy will improve operational performance.

METHODOLOGY

The case study design is used for this study. Specifically, a single case is adopted for in-depth analysis of this study since situational representativeness is more important than demographic representativeness (Dorothy, 2003; Eisenhardt and Graebner, 2007; Eisenhardt, 1989; Siggelkow, 2007; Yin,1994; Yin, 2009). The case study method fits the exploratory nature of this study by giving a rich and robust analysis of the research subjects (Miles and Huberman, 1994, Yin, 1994, Yin 2003). The case is analysed by using pseudonyms (Creswell, 2009). The product SANFUNC is the pseudonym given to the functional-necessity product in SAN manufacturing firm. The product SANINNOV is the pseudonym given to the innovative-luxury product category in SAN manufacturing firm. There are two types of SANINNOV products named SANINNOV 1 and 2.

Firm SAN is an indigenous manufacturing firm which is into the production of feminine hygiene products. Specifically, the firm is into the production of women and baby products. The indigenous brands are popular in the country and are of high quality. This firm is chosen as the case study because it is one of the rare firms in Nigeria that is into the production of both functional and innovative products.

The informants from firm SAN include the operations/production manager, sales/marketing manager, assistant marketing manager and the quality assurance manager. Each informant was interviewed for an average of one hour. The informants were allowed to express themselves when interrogated. However, the interview guide (Appendix 1) contains the open-ended questions used for carrying out the interviews (Kotzab, 2005). Also, an archival data which showed prices and quantity demanded from the year 2013 to 2017 of SANFUNC, SANINNOV 1 and 2 is given as an additional document by sales/ marketing manager in SAN firm for the purpose of triangulation (Eisenhardt, 1989). Several observations were made during the visit to the factory with the operations/production manager.

RESULTS AND DISCUSSIONS

Functional products are staples required by the majority of people for personal use or consumption. The operations/production manager emphasized the following attributes of the product SANFUNC which includes:

"the demand is relatively constant, highly predictable and it is available everywhere nationwide because it is demanded by regular people".

Innovative products are highly customised products characterised by unpredictable demand and short life cycle. The operations/production manager emphasized the following attributes of the products SANINNOV 1 and SANINNOV 2 which include:
" the products are not for everybody and used mostly among elites and younger women"
"……..they are not for general public"

Based on the established proposition, the case study shed more light on whether the research propositions in this study should be accepted or refuted.

Linking Products to Price Elasticity of Demand

The price elasticity of demand attribute is analysed based on the proxy that shows the level of demand reduction based on price increase (Baumol and Blinder, 1979, Mankiw, 1998, McConnel, Brue and Barbiero, 2005). A product is inelastic when the price elasticity of demand coefficient is less than 1. That is, the percentage change in price is more than the percentage change in quantity demanded. This shows that the good is a necessity good and the price elasticity of demand is inelastic. Hence, the demand is relatively predictable. On the other hand, a product is elastic when the price elasticity of demand coefficient is greater than 1. That is, the percentage change in price is less than the percentage change in quantity demanded. This shows that the good is a luxury good and the price elasticity of demand is elastic. Hence, the demand is highly unpredictable. The propositions 1 and 2 are analysed based on the archival data on the percentage reduction in demand given a price increase.

Proposition 1: A functional product that is characterised by price inelastic demand is a necessity good, hence, the functional-necessity product category.

The result showed that there is no significant reduction in demand for SANFUNC when there is an increase in price. The marketing manager confirmed these statements:
" we have about an average of 7.5% reduction in the demand for SANFUNC whenever there is about 30% increase in price"
"……it is a necessity good because people need it"

Hence, we had the price elasticity of demand coefficient of 0.25 which is lower than 1. The low percentage reduction in demand for SANFUNC because of increase in price showed that this product is a necessity good. The degree of responsiveness to changes in price is very low. Hence, SANFUNC's price elasticity of demand is inelastic. SANFUNC combines the attributes of a functional product and necessity good which include high demand predictability and low price elasticity of demand. This analysis supports the established proposition that a functional product that is characterised by inelastic demand is a necessity good.

Proposition 2: An innovative product that is characterised by price elastic demand is a luxury good, hence, innovative-luxury product category.

The result showed that there is a significant reduction in demand of SANINNOV 1 and SANINNOV 2 when there is an increase in price because of the high coefficients of price elasticity of demand of 2.5 and 1.5 respectively. The marketing manager confirmed this in his statements:

" we have up to an average of 75% reduction in the demand for SANINNOV 1 whenever there is about 30% increase price"
"we have up to an average of about 45% reduction in demand for SANINNOV 2 whenever there is about 30% increase in price because it has local substitutes that are relatively cheaper as such only the elite customers still purchase it when the price goes up"

Other attributes of these products that align with the characteristics of innovative products are given by the sales manager such as:

"……it is not for everybody"
" SANINNOV 1 and SANINNOV 2 are not necessity goods and we do not have much demand for them compared to SANFUNC"
"both SANINNOV 1 and SANINNOV 2 are sometimes prescribed by doctors to users"
" when the price of SANINNOV 2 increases a lot of buyers go for substitutes"

This high percentage reduction in demand for SANINNOV 1 and SANINNOV 2 because of the increase in price showed that these products are luxury goods. The degree of responsiveness to changes in price is high. Hence, SANINNOV 1 and SANINNOV 2 have their price elasticity of demand as elastic. SANINNOV 1 and SANINNOV 2 combine the attributes of innovative products and luxury goods which include low demand predictability and high price elasticity of demand. This analysis supports the established proposition that an innovative product that is characterised by elastic demand is a luxury good.

Linking Price Elasticity of Demand to Production Process and Production Strategy

It is pertinent that the price elasticity of demand concepts in the forms of necessity goods and luxury goods should be linked to the production strategy and production process. Since the scope of this research is focussed on the two extremes of the product-process matrix, the job shop process and continuous process in alignment with the make-to-order strategy and make-to-stock strategy respectively. These alignments between the processes and strategies were analysed based on the case and the propositions.

Proposition 3: The functional-necessity products are best produced using the continuous production process and make-to-stock production strategy.

It was confirmed that SAN manufacturing firm used a continuous process for the production of SANFUNC. The production unit is one with continuous production process from the time the raw materials are added to the machinery and the movement from one sub-unit to another. The finished good is accessed at the end of the line with little or no human intervention. The entire production process is automated. The operations/production manager's statement supported the aforementioned:

"we have only one SKU for SANFUNC and we produce in large quantities continuously"

This characteristic of SANFUNC as stated by the operations/production manager aligned with the high volume per SKU for necessity good-functional product form. The availability of only one SKU for SANFUNC also aligns with the low product variety and high standardization of functional-necessity product form. SANFUNC product is demanded by people even if the price is increased and excess production can be made since there will always be demand for the product. This is the rationale for the make-to-stock strategy for SANFUNC. Hence, the use of continuous process and make-to-stock strategy for the production of SANFUNC is verified based on the previous analysis. The high demand certainty of necessity-functional product form aligns with the continuous production process and make-to-stock strategy (Aitken, Childerhouse and Towill, 2003, Safizadeh et al., 1996). Therefore, the proposition that

functional-necessity product should be produced using the continuous process and make-to-stock strategy is verified based on SANFUNC's demand predictability and standardized feature.

Proposition 4: The innovative-luxury products are best produced using the job shop production process and make-to-order production strategy.

SAN firm used a continuous process per batch for the production of both SANINNOV 1 and SANINNOV 2. Just like SANFUNC, the production unit is one, continuous and automated for SANINNOV 1. However, SANINNOV has seven production units. The operations/production manager's statement supported the aforementioned:

"we have seven strategic key units (SKUs) for SANINNOV 2 whereas SANINNOV 1 has only one strategic key unit"

"we produce in small quantities per-ordered batch using a continuous process for both SANINNOV 1 and SANINNOV 2.

The attributes of SANINNOV 1 given by the operations/production manager do not align with the low volume per SKU for innovative-luxury product form. However, only SANINNOV 2 had seven SKUs which aligns with the product varieties, low volume per SKU and low standardization attributes of innovative products. SANINNOV 1 had one SKU just like SANFUNC and this does not align with the high product varieties and low standardization of functional-necessity product form. There is also a misalignment of the production process for SANINNOV 1 and SANINNOV 2. The production strategies for SANINNOV 1 and SANINNOV 2 are make-to-stock and make-to-order respectively. Although SANINNOV 2's production strategy is aligned with the make-to-order strategy, there is a misalignment of production strategy for SANINNOV 1 due to the use of make-to-stock instead of the make-to-order strategy by SAN firm. This is because the low demand certainty of luxury-innovative product form is supposed to align with the job shop production process and make-to-order strategy based on extant literature (Aitken, Childerhouse and Towill, 2003, Safizadeh et al., 1996).

However, the archival data obtained from SAN firm showed that the percentage efficiency is high for the 5-year period reviewed from 2013-2017 with 89.6% and 90.3% for SANINNOV 1 and SANINNOV 2 respectively. This measure is based on the ratio of actual output to the standard output required for delivery to customers (Bozarth, Handfield and Chandiran, 2013). This result showed that despite the misalignment of the production process and strategy for SANINNOV 1, the efficiency level is still relatively high. Likewise, SANINNOV 2 despite the deviation from the job shop process by using the continuous process, the efficiency is also high. Therefore, the proposition that innovative-luxury products should be produced using the job process and make-to-order strategy is not verified. This means that there are certain instances when the views of Aitken, Childerhouse and Towill (2003) and Safizadeh et al. (1996) about certain process-strategy fit do not hold. Specifically, this situation could arise when the products of interests are consumables, not bulky types of machinery or furniture (Bozarth, Handfield and Chandiran, 2013) that have many different small to heavy parts that require independent fabrication.

Linking Price Elasticity-Process- Strategy Alignment With Performance

Based on the archival data from SAN firm, the proxy which shows the efficiency of the percentage quantities delivered given the ordered quantities as at when due to customers is used. Therefore, the result is analysed based on the highlighted propositions below.

Proposition 5: A match between functional-necessity products, continuous production process and make-to-stock production strategy will improve operational performance.

SANFUNC product had the effectiveness of 54.8% which showed a good average percentage efficiency of quantities of goods supplied given the ordered quantities for the 5-year period, 2013-2017 considered in this study. This means that the demands for SANFUNC are met 54.8% of the standard time. This result showed that the alignment of the necessity good type with the continuous production process and make-to-stock production strategy is good for the operational performance of consumables such as the body products examined in this study. Therefore, it is established in this study that goods that have inelastic demand, should be produced using the continuous production process and make-to-stock strategy.

Proposition 6: A match between innovative-luxury product, job shop production process and make-to-order production strategy will improve operational performance.

The data showed that the performance of SANINNOV 1 and 2 are high based on the 89.6% and 90.3% average percentage quantities of products supplied given the ordered quantities respectively for the five-year period analysed. This result showed that the use of the other production strategy and process apart from make-to-order and job shop process respectively for the production of innovative-luxury products is still effective based on the result. This is because orders from customers were met 89.6% and 90.3% of the standard time for SANINNOV 1 and SANINNOV 2 respectively. The feasible explanation for this is that the full compliance to the product-process-strategy type linkage could be strictly for some products such as the production of machinery or furniture with several small to bulky components. Hence, deviations from the proposed link between luxury goods, production strategy and production process are acceptable for certain products. Especially, this deviation could still be effective in the production of less bulky products which include body hygiene products such as those identified in this study. The reason for this is that some innovative-luxury products that are not machinery with smaller parts are easier to coordinate by using the continuous production process despite having elastic demand. That is, production could be carried out using a continuous process by batch based on the different SKUs. One practical way of doing this is to accommodate orders of different SKUs of the innovative-luxury product on a weekly or monthly basis for the purpose of continuous production in order to meet the orders collectively.

CONCLUSION

In this study, the link between product types, process types, production strategy types and the price elasticity of demand has been established empirically. However, for products characterised by inelastic demand, some deviations for innovative-luxury products forms were observed. Based on extant literature, the fit concept of the contingency theory and TSEF have been used for the integration of the product-process-price elasticity framework for functional-necessity products. Specifically, functional products that are characterised by predictable demand (Wagner, Grosse-Ruyken and Erhun, 2012) would exhibit price elastic demand just as necessity goods. Hence, there exists a link between functional products also referred to as necessity good from the microeconomics theory, continuous production process and make-to-stock production strategy from extant literature. Therefore, a misfit in any of the links established will increase variability and impede flow, thereby reducing operational performance, that is, the timely delivery of products based on the scope of this study.

Furthermore, there are deviations between the links comprising of innovative-luxury product form, job shop production process and make-to-order production strategy. However, the use of the continuous production process and make-to-order production strategy for the innovative-luxury products are also found to be effective. This exposition is based on the fact that the innovative-luxury products examined in this study are consumables, not heavy types of machinery or furniture. Hence, the production of innovative products that are consumables could still accommodate the deviations from the established link in theory but may not be so for bulky products, equipment or heavy machinery with many components because of the difficulty of coordination.

The theoretical implication of this work includes the use of the TSEF as part of the theoretical perspectives of this study. This study fulfils the call for more use of TSEF in empirical studies (Schmenner, 2004). In addition, the product-process matrix has been extended to incorporate the microeconomic concept, price elasticity of demand. Hence, the product-process matrix extension known as the product-process-price elasticity matrix has been established.

The major goal of this study is to help operations/production managers understand how the price elasticity of demand could be used as a viable tool in determining effective manufacturing strategies for products. The establishment of the links between the necessity good and functional product likewise luxury good and innovative product respectively has made this possible. Hence, this study has been able to integrate operations management and economics concepts in this area of manufacturing strategy.

The implication of this for managers is that they can now use their knowledge of market demand to determine the efficient manufacturing strategy for their respective products. This study has emphasized the fact that different manufacturing strategies are suitable for different products. Therefore, the nature of the market demand could help in determining the suitable manufacturing strategies for products and this has performance implications. The relationships between the links have been established for functional-necessity products category while there are some deviations for innovative-luxury products category.

The limitation of this study includes the use of only a manufacturing firm in Nigeria. The use of multiple cases that feature diverse products apart from those used in this study would be interesting. Future research studies should carry out the research in other countries for the purpose of comparison. Also, further studies should consider the use of a mixed method which contains both the case and research methods.

APPENDIX

Appendix 1: Interview Guide

Interview Guide
Brief Introduction
Please introduce yourself Informants were asked to give a brief introduction of themselves**.**
Questions
What are the attributes of SANFUNC, SANINNOV 1 and 2? What happens to the demands of these products when prices increase? Are these products demanded by different classes of people? How many SKUs do you have for each product? Do you always know the quantities of each product to produce based on trend? How are the products produced? Are the demands of these products met as at when due?

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BIOGRAPHY

Moradeyo Adenike A. (PhD) is an academic with research interests in areas such as operations management, supply chain management, production economics, and innovation management. Her research appears in the International Journal of Risk and Contingency Management (IJRCM) and Journal of Operations and Supply Chain Management (JOSCM).

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TEACHING STUDENT RESEARCHERS IN HIGHER EDUCATION: A BUSINESS PERSPECTIVE

Sylvia L. Flores, South Texas College

ABSTRACT

Research for undergraduates has been a focus for researchers for quite some time. The purpose of this study is understanding the variables involved that may increase research skills among the student population in higher education. This literature review includes peer-reviewed articles between the years 2008-2017. Time and money were a limitation. Future researchers should use different methodologies to better understand these ever-changing dynamics. Literature results include the instructor's support inside and outside of class, partnerships with external organizations to increase student innovation, and conferences should be provided for students to present their data.

JEL: I2, M1

KEYWORDS*:* Research, Undergraduate, Latino-Ethnic Group

INTRODUCTION

Researchers have found a connection between research and business/employer success (Andreassen, Grinenko, & Makarova, 2016; Sabir, Thomas, & Willison, 2017). Many successful contributing factors show an increase in the student's research knowledge (Andreassen etal., 2016; Banister, 2017) that may increase success rates (Andreassen etal., 2016; Morreale & Shostya, 2017). The purpose of this study is to understand the variables involved that may increase research skills among the student population in higher education. The goal is to increase higher education success rates of graduate students through mastering research skills at the undergraduate level. This research study will include a literature review as a method to further understand the variables involved in increasing the successful completion of a research study. Functional theory will be included to better understand student's research success rates in higher education.

LITERATURE REVIEW

The purpose of this study is to understand the variables involved that may increase research skills among the student population in higher education. The goal is to better prepare undergraduate students with research skills to support graduate research and attain successful outcomes. Student researchers not only master research projects but business partners benefit from the success rates of student researchers (Andreassen etal., 2016; Andreassen etal., 2016). Specifically, undergraduate, and graduate researcher's success rates contribute to business partner success rates (Andreassen etal., 2016; Andreassen etal., 2016). However, undergraduate researchers need more support to increase success rates (Buff & Devasagayam, 2016; Homes, 2017). In the past, case studies (Andreassen etal., 2016; Andreassen etal., 2016; Banister, 2017; Bergamini & Navarro, 2014; Buff & Devasgayam, 2008; Buff & Devasagayam, 2016; Charlton-Robb etal., 2013; Holmes, 2017; Luke, 2013; Morreale & Shostya, 2017), surveys (Abdulraouf, Khalifa, & Mouselli, 2016; Laker etal., 2013), and interviews have been conducted to understand contributing factors for research success rates in students in higher education (Sabir etal., 2017). This research study will be using a literature review between the years 2008 to 2017 to better understand the variables already known

to contribute to student researcher's success rates in higher education. Literature reviews are used to thoroughly review all the literature and primary data gathered on a topic and problem (Bry etal., 2017). This research study will try to exhaust the literature review to comprehend how or why the variables involved in influencing success rates among student researchers in higher education are involved.

In the past, research has focused on better understanding what helps student researchers succeed (Abdulraouf etal., 2016; Sabir etal., 2017). Environments that support research and supply needed resources are sought out by student researchers (Abdulraouf etal., 2016; Sabir etal., 2017). Student researcher's success rates were influenced by teachers (Banister, 2017), partnerships with outside organizations (Charlton-Robb etal., 2013), and conference opportunities (Buff & Devasagayam, 2008). Regardless of the influences on success rates, further research is needed to better understand the success rates of student researchers in higher education (Holmes, 2017). The varying influences on student researcher's success rates will be reviewed thoroughly.

Research was conducted on graduate (Andreassen etal., 2016; Luke, 2013) and undergraduate student researcher's success rates (Andreassen etal., 2016; Charlton-Robb etal., 2013). Many variables influence the success rate of student researchers (Holmes, 2017; Laker etal., 2013). Undergraduate research has been found to be influenced by organizational partnerships (Andreassen etal., 2016; Andreassen etal., 2016), efforts provided by teachers (Banister, 2017; Holmes, 2017), conferences provided to present the research conducted (Buff & Devasagayam, 2008; Buff & Devasagayam, 2016), and overall support (Laker etal., 2013). On the other hand, graduate student researcher's success rates in higher education were influenced by organizations that support research conducted outside of the academic environment (Abdulraouf etal., 2016; Luke, 2013; Sabir etal., 2017). Although, data proves student researcher's success rates were influenced by external variables, research in this field is still needed (Holmes, 2017). This paper will now elaborate how teachers, organizations, and conferences influence student researcher's success rates.

Teachers play an important role in the student researcher's success in higher education (Banister, 2017; Holmes, 2017; Morreale & Shostya, 2017). Collaboration between the college, students, faculty, and industry partners is key (Holmes, 2017). Collaboration contributes to the creation of new innovative ideas through research (Holmes, 2017). Morreale and Shostya (2017) found faculty who aided students in studying abroad contributed to the research experiences needed to successfully conduct research studies. Conducting research while studying abroad increased the knowledge gained about international data (Morreale & Shostya, 2017). Lastly, a scaffolding approach that describes the research process as a puzzle helped students with the research process by allowing teachers to work with students that had different mindsets about research (Banister, 2017). The mindset shift allows the teacher to decrease the stress related impact on students as they take on the research process for the first time (Banister, 2017). Along with teachers, partnerships are another influential factor contributing to student's research success rates in higher education (Andreassen etal., 2016; Charlton-Robb etal., 2013; Holmes, 2017).

Student researcher's success is also dependent on organizational partnerships (Andreassen etal., 2016; Charlton-Robb etal., 2013; Holmes, 2017). Partnerships between organizations and colleges increase student researcher's skills and are needed (Andreassen etal., 2016; Charlton-Robb etal., 2013; Holmes, 2017). Work integrated learning (WIL) connects students with research projects in partner organizations to enhance the learning opportunities for students (Charlton-Robb etal., 2013). Connecting students with organizational partners not only provides students with opportunities to learn about research in their field but also increases the skills needed to work in their field (Charlton-Robb etal., 2013; Holmes, 2017). Business partners benefit from the research applied by students as well (Andreassen etal., 2016; Holmes, 2017). An improved research competence is gained among student researchers who take part in research conducted in the organizational partner's facilities (Andreassen etal., 2106; Holmes, 2017). The benefits from knowledgeable students are shared with other similar companies who hire research competent students

(Andreassen etal., 2016). Lastly, conferences were found to influence student researcher's success rates in higher education as well (Buff & Devasagayam, 2008; Buff & Devasagayam, 2016; Laker etal., 2013).

Student researchers should be encouraged to present their research at a conference (Buff & Devasagayam, 2008; Buff & Devasagayam, 2016; Laker etal., 2013). Conferences are opportunities that allow students to approach faculty members about research and select a mentor for future research projects (Buff & Devasagayam, 2016). Conferences also supply opportunities to view current research studies and encourage other students to conduct their own research (Buff & Devasagayam, 2008). Based off successful research programs, student researchers should be encouraged to present their data or publish (Laker etal., 2013). Additionally, presenting and/or publishing should be rewarded (Laker etal., 2013). Student research influences may be better understood and explained through a functional theoretical perspective.

Theoretical perspectives are used to better understand social phenomenon (Bry etal., 2017). Functional theory will be used to understand the variables involved that may or may not increase research skills among the student population in higher education. Functional theory uses the macro-level of analysis to understand how groups work together to serve a function in society (Bry etal., 2017). In this study, partnered organizations, teachers, and college administration help student researchers by providing services and opportunities that serve a function for student researcher's success (Bry etal., 2017). Functional theory best applies to this study because it analyzes patterns in macro groups and focuses on functions that derive between the macro groups (Bry etal., 2017). Since the purpose of this study is to understand the variables involved that may or may not increase research skills among the student population in higher education, functional theory best applies (Bry etal., 2017).

Discussion and Recommendations

The overall literature review revealed variables do influence student researcher's success rates in higher education (Andreassen etal., 2016; Charlton-Robb etal., 2013). The goal is to assist undergraduate students to gain research skills so they may be better prepared for graduate school. Teachers (Banister, 2017; Holmes, 2017; Morreale & Shostya, 2017), partnerships (Andreassen etal., 2016; Charlton-Robb etal., 2013; Holmes, 2017), and conferences (Buff & Devasagayam, 2008; Buff & Devasagayam, 2016; Laker etal., 2013) were specifically found to increase student researcher's success in higher education. Thus, implications are faculty or higher education institutions should dedicate more time and money to create faculty-student mentorship opportunities, higher education institutions should be attempting to build partnerships with local research organizations that would willingly assist with research based internship opportunities, and faculty or higher education institutions should provide local conferences that is all inclusive. Most researchers used case studies as a methodology (Andreassen etal., 2016; Andreassen etal., 2016; Banister, 2017; Bergamini & Navarro, 2014; Buff & Devasagayam, 2008; Buff & Devasagayam, 2016; Charlton-Robb etal., 2013; Holmes, 2017; Luke, 2013; Morreale & Shostya, 2017).

Thus, the researcher recommends more surveys and interviews. Specifically, more students, faculty, administration, and employers need to be interviewed and surveyed to better understand their perspective on influences on student researcher's success rates in higher education. Overall, undergraduate student researchers were found to need more supportive resources (Andreassen etal., 2016; Banister, 2017; Buff & Devasagayam, 2008; Buff & Devasagayam, 2016; Charlton-Robb etal., 2013; Holmes, 2017; Laker etal., 2013) than do graduate researchers (Abdulraouf etal., 2016; Luke, 2013; Sabir etal., 2017). Higher education institutions are recommended to allot funding for student researchers, which may provide incentive to continue with such demanding programs. Graduate researchers needed organizational partners to provide a nurturing environments that may increase their research skills needed in the graduate student's future employer's environment (Abdulraouf etal., 2016; Luke, 2013; Sabir etal., 2017). Recommendations are to actively involve faculty and organizational partnership. Such partnerships should be regularly evaluated and assessed annually to assure a nurturing and supportive environment is maintained to the

increase research skills needed by future employers. Literature has indicated the research process comes with many learning obstacles (Banister, 2017) along with student needs (Andreassen etal., 2016; Abdulraouf etal., 2016) that may not always be met by every higher education institution. Essentially, closing the student researcher's knowledge gap may assist graduate and doctoral programs by providing undergraduate and graduate students with the research foundation needed to address thesis and dissertation challenges. To better understand influential barriers for graduate researchers, future researchers should focus on different ethnic-group research success rates and contributions, difference research success rates and influences between genders, different research success rates between upper and lower class levels, differences between research success rates among undergraduate researchers in community colleges compared to universities, and measure the past research experiences in successful graduate and doctoral students to compare experiences between successful graduate researchers.

Assessment

Faculty and higher education institutions are recommended to assess students' progress, skills, and needs to better address student researcher's knowledge gaps. Banister (2017) used a scaffolding exploratory approach to teach student researchers. A scaffolding approach may be applied through a qualitative assessment, and is recommended. Assessing students' research progress and research assignments may be dependent on student's submissions and struggle levels. In other words, the qualitative assessment should target struggling students to adjust the assignments to further scaffold the teaching material. Partnerships between faculty and organizations is also recommended to be assessed because it is crucial to understand future employer's needs for hiring purposes (Andreassen etal., 2016). The researcher recommends a qualitative assessment to understand the employer's needs. Some qualitative assessments may include a survey with open ended questions to capture employer's needs throughout the research process. Additionally, student's undergraduate needs and graduate needs in the research process differ (Andreassen etal., 2016; Luke, 2013). Faculty should be looking for feedback from undergraduate student researchers to eliminate stressful barriers and to understand how to better support students throughout the research process. Another qualitative assessment that may best assess student needs and faculty interventions may include surveys with open ended questions. Lastly, faculty are also recommended to assess the skills gained in the field as graduate student researchers conduct their research projects. A qualitative approach using a reflection paper is recommended. The reflection paper assessment should measure the student's knowledge gained and faculty should compare this knowledge gained to the employer's needs.

CONCLUDING COMMENTS

The purpose of this study is to understand the variables involved that may increase research skills among the student population in higher education. The goal is to assist student researchers to prepare them for graduate and doctoral programs. The literature review methodology was used to best understand this phenomenon. The literature review revealed various variables influence student researcher's success rate in higher education (Andreassen etal., 2016; Charlton-Robb etal., 2013). Overall, student researchers need faculty mentorship (Holmes, 2017), need more resources to conduct successful research projects at the undergraduate level (Laker etal., 2013), need field research experiences at the graduate level (Sabir etal., 2017), and conference opportunities must be provided to allow students to share their results (Buff & Devasagayam, 2008). Recommendations were made to further interview and survey students, administration, faculty, and organizational partners to better understand research barriers. Limitations for this research study included lack of time and funding for some articles. Functional theory was used to best understand how macro groups contributed to student researcher's success rates in higher education (Bry etal., 2017). Lastly, future researchers should focus on different cultural groups, differences between genders, differences in groups between social economic backgrounds, differences between undergraduate researchers in community colleges compared to universities, and measure the past research experiences in successful graduate and doctoral students.

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BIOGRAPHY

Sylvia Flores, Paper writer, is Assistant Professor of Sociology at South Texas College. She also serves as Board Secretary for Alpha Delta an Honors Sociology Society for 2-Year Colleges. She is the winner of National Institute for Staff and Organizational Development (NISOD) Excellence Awards. Her research appears in journals such as *Journal of Learning in Higher Education and International Journal of the Academic Business World.*

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Mercedes Jalbert, Managing Editor
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