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***The moderating factors that influence retail
productivity.***

By

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ABSTRACT

Retail is a labour intensive industry and strategically, retail productivity can be used to differentiate retail stores and provides the foundation to develop strategies for growth and diversification in retail stores (Dubelaar, Bhargava and Ferrarin, 2002).

This study used historical data to identify the drivers of retail productivity, measured as units per man-hour worked.

Prior literature has suggested that sales mix, retail gross, basket size, shrinkage, services, managers' experience, staff compliment, workforce flexibility, number of people employed and the number of units sold could contribute to retail productivity.

Of all these variables all except shrinkage and the number of store managers' years experience proven to be significant.

DECLARATION

I declare that this research project is my own work. It is submitted in partial fulfillment of the requirements of the degree of Master of Business Administration at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before for any degree or examination in any other University.

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Carl Knauff

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Date

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CHAPTER 1 : INTRODUCTION TO THE RESEARCH PROBLEM

The aim of this research is to produce a list of moderating factors that influence the way that productivity is measured within retail stores, and for this list to be used as a tool to benchmark and assist with the opening of new retail stores.

According to Porter (1996), the only meaningful concept of competitiveness is productivity.

Figure 1, illustrates the way in which Pick 'n Pay measures their productivity. It illustrates the average units sold, per hour worked, within all Pick 'n Pay stores in Gauteng.

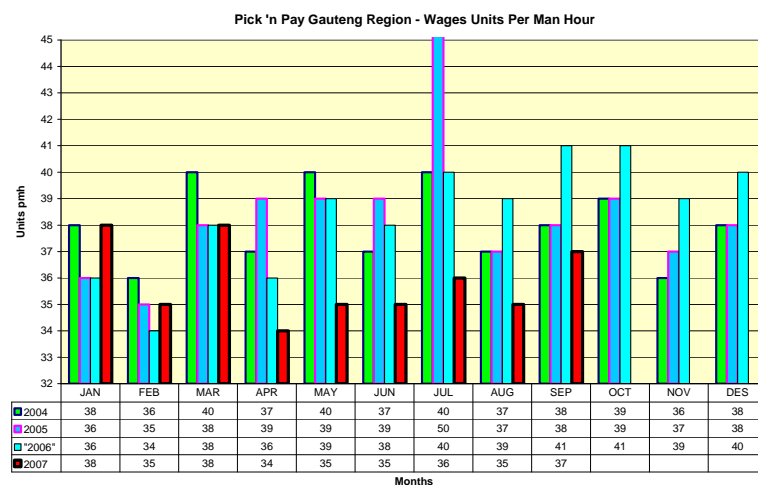


Figure 1: Pick 'n Pay Gauteng units per man-hour worked.

One can see that there has only been an improvement in productivity within the last six months of the 2006 year and that the year 2007 is already showing a dramatic decline in productivity. This decline was caused by a change in strategy, whereby Pick 'n Pay tried to increase customer satisfaction and sales by having all tills open from 3pm in the afternoons during week days and for the whole day over weekends. Today, the all important question is: Could productivity be better? If so, what factors could influence productivity?

After a visit to the Pick a Pay Head office in Kensington, where an interview was conducted with the Financial Director, Mr. Petrus Steyn, it was clear that labour contributed up to 60% of the total expenses for Pick 'n Pay Retailers Gauteng.

Ratchford and Stoops (1988) also confirms that retailing is a labour-intensive service that is difficult to control and improve, and productivity gains can be hard to achieve.

This however raises the question on why it is so difficult to achieve productivity gains. Porter (1996, p. 40) sheds more light on this matter by stating that, "ultimately all

differences between companies in cost or price derive from the hundreds of activities required to create, produce, sell and deliver their products and services, such as calling on customers, assembling final products, and training employees. Cost is generated by performing activities, and cost advantage arises from performing particular activities more efficiently than competitors. Similarly, differentiation arises from both the choice of activities and how they are performed.

Activities, then, are the basic units of competitive advantage”.

Therefore, measuring and improving productivity are important tasks both for society (customers) and for the individual retail stores in that it could lead to larger profits and/or lower prices. Productivity gains in retail stores that lead to lower prices for the consumer would benefit virtually everybody in the economy, particularly the very poor people in South Africa who spends a relatively high share of their income on food.

Dubelaar, Bhargava and Ferrarin (2002) define productivity at its most basic level, as the ratio of the

output divided by the inputs required to produce the outputs.

Dubelaar, Bhargava and Ferrarin (2002, p. 417) state that “retail productivity measurement has commonly used ratios of outputs, such as sales, and input factors like capital and labour to measure different facets of productivity. However, these store specific ratios are likely to be influenced by other context-specific factors affecting the reliability and validity of these measures”.

This however has led to the question, of, “Could it be that retail stores with more or less the same turnover and value and staffing numbers have different levels of productivity? And if so, what could be the underlying moderating factors that affect productivity positively or negatively within these retail stores?”

Therefore, it seems as if the valid methods of productivity measurement for retail stores need further development seeing that Dubelaar, Bhargava and Ferrarin (2002) confirms that retail productivity can be used to differentiate stores and provide the foundation to develop strategies for growth and diversification.

The next chapter will take a look at what other potential moderating factors there might be that could influence productivity and that might assist us, or even change the way one would measure productivity in retail stores.

CHAPTER 2 : LITERATURE REVIEW

2.1 INTRODUCTION

According to Mathis and Jackson (2000), the more productive an organization, the better its competitive advantage, because it's cost to produce a unit of output is lower. However, better productivity does not necessarily mean more is produced; perhaps fewer people (or less money or time) was used to produce the same amount.

Therefore it is important to measure productivity accurately.

Grobler, Warnich, Carrell, Elbert and Hatfield (2006, p. 146) states "An accurate measure of productivity is vital to any organizational improvement effort. For businesses the prime objective of productivity measurement is to gain the competitive advantage. The idea is to establish the prevailing productivity levels and then to improve these ratings by systematic organizational or technological steps so that the business performs better than its competitors".

Therefore it is not only important to measure productivity accurately, but one should also insure that one fulfill in the requirement for sound productivity measurements.

According to Grobler et al. (2006) there are a number of requirements for sound productivity measurements. The requirements as suggested by Grobler et al. (2006) are:

- Measurements should be understood and trusted by those being measured.
- The results should indicate who or what is being measured.
- The result must give clear signals to management of the action that should be taken to improve productivity and profits.
- All the operations within the business (in this case retail stores) should be included.

This third point is extremely important and Grobler et al. (2006) state that unless the role of productivity in achieving corporate goals can be identified, productivity measurement and improvement will not be achieved.

According to Dubelaar *et al.* (2002), “a central theme of the research on retail productivity has been on issues of measurement”.

According to Dubelaar *et al.* (2002) “at a tactical level for multi-unit firms, a managers’ control and expansion strategies begin with a assessment of the relative store productivity level”.

Ratchford (2003) investigated the changes in the mix of services offered by food stores that are not reflected in the output measure employed. Ratchford (2003, p. 180) states that “while the official productivity measures may accurately measure the ratio of physical output to labour input, our results indicate that they do not provide a accurate overall picture of the performance of the food retail industry. Attention must be paid to exactly what the official indexes measure, and to whether these measures accurately capture the conditions of a given industry”.

Multiple output and input factors have therefore been used to investigate retail productivity (Dubelaar *et al.*, 2002).

Dubelaar et al. (2002), provide a list of variables such as number of transactions, sales, selling space, number of checkouts, gross margin, total number of people employed, total number of part-time employees etc. that have an impact on productivity.

Table 1 below (see next page) gives a summary of the factors that will be discussed in the following section, as moderating factors that influence productivity in the retail sector.

Moderating Factor	Literature	Key Points
Service area sales participation, sales mix and gross profit	Ratchford (2003) Griffith and Harmgart (2005)	<ul style="list-style-type: none"> - The mix in services offered by retail stores affects productivity - Service areas are labour intensive and the more they contribute to a stores sales mix, the less productive the store will be - The loss in productivity could mean a gain in profitability
Shrinkage	Bailey (2006) Snocken (2003)	<ul style="list-style-type: none"> - Theft by employees is a significant source of shrinkage in retail - Employees are so busy stealing that they neglect their duties and the store becomes less productive OR employees are scared of being caught stealing and they perform their duties very well in order not to draw attention to themselves
Basket size	Gartner (2004)	<ul style="list-style-type: none"> - The shopping basket can tell us a lot about how customers shop - Different basket sizes reflects different shopping patterns and customer needs - which reflects different activities that needs to be performed in store - and activities have a affect on productivity.
Staff Complement and workforce flexibility	Green and Leeves (2004) Natti (1990)	<ul style="list-style-type: none"> - The more flexible the workforce, the better it can be adjusted to business needs and the better productivity will be. - Casual positions could be used as a screening test and only the most productive casuals could be employed as full timers. This in turn will improve productivity.
Management Experience	Mathis and Jackson (2000) Byars and Rue (1994)	<ul style="list-style-type: none"> - The more years of experience a retail store manager has, the more productive he will manage his workforce. - However, years experience without the proper management development techniques may not deliver the expected productivity gains

Table 1: Moderating factors of retail productivity

2.2 THE MODERATING FACTORS OF RETAIL PRODUCTIVITY

2.2.1 Service area sales participation, sales mix and gross profit

According to Garrison, Noreen and Brewer (2006, p. 147-148), “a processing department is part of an organization where work is performed on a product and where materials, labour or overhead costs are added to the product”.

Ratchford (2003) indicated that the changes in the mix of services offered by food stores were largely responsible for the decline in retail productivity.

Ratchford (2003, p. 172) states that “a decomposition of the BSL index of labour productivity in food retailing indicates that, increases in amenities and breadth of assortment were largely responsible for the measured decline in the index. Measured labour productivity would have increased if the mix of services had been held constant. In general, our results indicate that productivity in food retailing did grow in a way that one might expect given the adoption of the scanning technology during the

period of our study, and that the BLS index gives potentially misleading results because it fails to capture the growth in services provided to customers that took place in this industry over the period of this study”.

Griffith and Harmgart (2005) then later state that “ when firms are offering differentiated products (in this case different retail propositions – for example, super store versus convenience store) then they may use quite different inputs in making the offering”. Griffithe and Harmgart (2005) then go ahead by giving an example of convenience stores that may be more labour intensive, while supermarkets may use more automation.

According to Garrison, Noreen and Brewer (2006), gross margin percentage is the difference between the selling price and the cost price of a product – expressed as a percentage of the selling price. Garrison, Noreen and Brewer (2006, p. 793) state that “the gross margin percentage should be more stable for retail companies than for other companies since the cost of goods sold in retailing excludes fixed costs”.

According to McLeary (2000), “In a pure retail undertaking an increase would simply indicate that the undertaking

had decided to increase the markup on goods sold, or possibly that there had been more efficient buying, which had eliminated spoilage”.

The above would suggest that the more labour intensive services retailers add to their sales mix, the less productive the stores productivity would be. The question then arises as to whether the loss in productivity could be made up by the additional sales that were generated from these services and if so, is the decline in productivity such a bad thing then?

2.2.2 Shrinkage

According to Bailey (2006, p. 802), “inventory shrinkage is financial loss attributable to a combination of employee theft, vendor fraud, shoplifting, and administrative or process error”.

According to Bailey (2006, p. 812), “repeated surveys of retail managers in the USA and elsewhere continue to show that theft by employees is a significant source of shrinkage in retail establishments”.

Snocken (2003, p. 52) added to this argument and indicated that “fraud usually starts with a single, small incident. When the employee gets away with it, the second strike soon follows. Typically greed kicks in after a few incidents and the activity skyrockets, costing the employer thousands”.

This would suggest that the employees are so busy stealing that they neglect their duties and therefore they are less productive. It could also be that the employee does not want to draw any attention to himself and is therefore performing his or her duties exceptionally well, which will imply higher productivity.

2.2.3 Basket Size

Gartner (2004), states that by analyzing the shopping basket of customers, retailers can identify how products are purchased together. By analyzing this data, retailers can become more aware of customer insights that can help retailers to better promote, assort and design their stores.

According to Gartner (2004), there are many different ways in which the analysis of the basket can be used, for

example, customer segmentation. For instance, a very high occurrence of prepared meal baskets would indicate that a store is likely shopped by customers whose shopping trip is focused on a single meal.

Gartner (2004) then concludes by stating that it is not the basket analysis itself that produces business value, but rather the way it improves retail operations. Therefore the basket insight must result in a change in store layout and better service to the customer.

This implies that for a retail store like Pick 'n Pay, different basket sizes could mean different customer needs. These different customer needs could call for different activities that need to be performed in stores. Therefore, the different activities could have an affect on retail productivity.

2.2.4 Staff Complement and Workforce flexibility

According to Nel, VanDyk, Haasbroek, Schultz, Sono, and Werner (2004) there are two factors that generally determine the quality of a workforce, one is labour productivity, and the other is the flexibility of the workforce.

One of the main focus points of the flexibility debate has been the growth of atypical employment (Natti, 1990). According to Natti (1990), the most common forms of atypical employment are part-timers and temporary workers.

According to Natti (1990), methods of obtaining flexibility in the use of labour, can be classified as either numerical or functional. Numerical flexibility means the ability of firms to adjust the number of workers, or the level of hours worked, in line with changes in the level of demand for casual and part-time work. Functional flexibility means the ability of firms to reorganize jobs so that the job holder can deploy his or her skills across a broader range of tasks (Natti, 1990). Natti (1990) also refers to this as multi-skilling.

According to Mathis and Jackson (2000, p. 254) “the use of temporary workers may make sense for an organization if its work is subject to seasonal or other fluctuations. Hiring regular employees to meet peak employment needs would require that the employer find some tasks to keep

employees busy during less active periods or resort to layoffs”.

Mathis and Jackson (2000, p. 254) also states that “some employers hire temporary workers as a way for individuals to move into full-time, regular employment. After 90 days or some other period as a temp, better-performing workers may move to regular positions when they become available”.

According to Green and Leeves (2004), casual labour has become increasingly common in the Australian labour market over the last few decades and the main reason for this is that due to the relative ease of dismissing casual employees, employers may use casual employment as a screening device. This enables employers to only appoint the most productive and best skilled casuals to full time positions.

This would suggest that retail stores like Pick 'n Pay should have a flexible workforce that can adapt to be fluctuations in the business requirements. Given a flexible workforce it is then likely that the more casual labour make up the staffing complement, the more flexible the store will be in providing for busy periods and scale down

for quite periods, thus making retail stores more productive.

2.2.5 Management Experience

According to Shetty (1982) it is managers– not the government nor the resources – that make an organization productive. Productivity is the ultimate responsibility of the manager. Shetty (1982, p.42) also states that “management of productivity at the organizational level has been neglected because few managers fully understand the concept of productivity and its measurement.”

According to Shetty (1982) management competency in defining and measuring productivity is generally assumed, while in reality, little effort is made to measure productivity systematically nor is there any systematic management program to improve it.

Common-sense logic tells us that the careful development of managers will have a positive influence upon organizational outcomes (Mabey and Ramiriz, 2005). According to Mabey and Ramiriz (2005), there are no off-

the-shelf quick fixes when it comes to developing managers effectively.

Mathis and Jackson (2000, p. 362) state that “development is important for all employees, but especially so for managers. Unless managers are appropriately developed, resources (including employees) throughout the organization may not be managed well. Management development should be seen as a way of imparting the knowledge and judgment needed by managers to meet the strategic objectives of the organization”.

Development of managers through experience is used in many organizations (Byars and Rue, 1994). However, according to Byars and Rue (1994, p. 244), “employees who are allowed to learn management only through experience can create serious problems by making mistakes. Serious difficulties can be avoided if the experience method is supplemented with other management developing techniques”.

According to Mathis and Jackson (2000), experience is a important part of management development because experience often contributes more to the development of

senior managers than class room training does, because much of the experience occurs in varying circumstances on the job over time.

Mathis and Jackson (2000, p. 363) state that “experience with varied circumstances and situations contribute to management development, and makes a manager more valuable”. However, Mathis and Jackson (2000) also acknowledge that few companies take the time to develop their own managers anymore. Mathis and Jackson (2000) also note that individual managers learn new methods and ideas in a developmental course and return to their work unit that is still bound by old attitudes and methods. Mathis and Jackson (2000), refers to this as encapsulated development. According to Mathis and Jackson (2000) the new knowledge remains encapsulated in the classroom setting and is a waste of time and money.

According to Mabey and Ramirez (2005, p. 1068),”it can be predicted with some confidence that if an organization carefully cultivates the development of its managerial cadre, this will, in time, lead to improvements in morale, motivation and corporate capability, which will in turn, and other things being equal, lead to a more productive organization”.

This implies that the more experience a Pick 'n Pay store manager has, the more efficient he will manage his workforce, which in turn should show improvements in productivity in that particular store. However, unless managers are appropriately developed, employees may not be managed well and productivity in the store may not improve.

CHAPTER 3 : HYPOTHESES

Having made the case for the proposed research, and having reviewed the existing literature, some specific hypotheses arising from the literature will now be formulated.

Ratchford (2003) indicated that the changes in the complexity in the mix of services offered by retail stores were largely responsible for the decline in retail productivity. Given that in Pick 'n Pay service areas are very labour intensive, one may assume that the more service areas contribute to the total stores turnover, the less productive the stores will be. Therefore the first hypothesis can be formulated as:

- *Hypothesis 1:* Service area sales contribution is negatively correlated with productivity in retail stores.

In other words the more service area departments contribute to the total stores turnover, the less productive the stores will be.

The gross margin of a store can be seen as a proxy for sales mix. Different items are sold at different margins and therefore stores will have different gross margins because of the sales mix in retail store. Therefore the second hypothesis can be formulated as:

- *Hypothesis 2:* The sales mix offered by retail stores, are positively correlated with productivity in retail stores.

According to Bailey (2006, p. 812), “repeated surveys of retail managers in the USA and elsewhere continue to show that theft by employees is a significant source of shrinkage in retail establishments”. It is believed that employees are so busy stealing from the retail store that they forget to perform their duties efficiently. Therefore the third hypothesis can be formulated as:

- *Hypothesis 3:* Shrinkage is negatively correlated to productivity in retail stores.

Gartner (2004), states that by analyzing the shopping basket of customers, retailers can identify how products are purchased together. By analyzing this data, retailers can become more aware of customer insights that can

help retailers to better promote, assort and design their stores.

Basket size has productivity implications because basket size depends on the customers shopping patterns, which in turn will affect the activities that needs to be performed in the retail store, which in turn affects productivity. Therefore it could be that the smaller the basket size, the more productive the store will be and the bigger the basket size gets the less productive the store will be; but only up to a point where the productivity will increase as the basket size increases. Therefore hypothesis four and five could be stated as:

- *Hypothesis 4:* The average shopping basket size (number of units per basket/transaction), is negatively correlated with productivity in retail stores.

- *Hypothesis 5:* The average shopping basket size square (number of units per basket/transaction), is positively correlated with productivity in retail stores.

According to Nel, VanDyk, Haasbroek, Schultz, Sono, and Werner (2004) there are two factors that generally determine the quality of a workforce, one is labour productivity, and the other is the flexibility of the workforce. The ability of retail stores to adjust the number of workers can be referred to as the flexibility of the workforce. This means that the more flexible the workforce of a retail store is the better productivity will be. Therefore hypothesis six and seven could be formulated as:

- *Hypothesis 6:* The flexibility of the workforce is positively correlated to productivity in retail stores.

- *Hypothesis 7:* The total hours worked by variable time employees is negatively correlated to productivity in retail stores.

Common-sense logic tells us that the more years experience a store manager has in retail will have a positive influence upon organizational outcomes.

Therefore it can be predicted with some confidence that if an organization carefully cultivates the development of its managerial cadre over a few years, this should lead to

improvements in morale, motivation and corporate capability, which will in turn, and other things being equal, lead to a more productive workforce. Therefore hypothesis eight could be formulated as:

- *Hypothesis 8:* The number of years experience of a store manager, is positively correlated with productivity in retail stores.

It can be argued that the more units you sell through the tills, the more productive your workforce will be, given that you do not increase your workforce as the number of units sold increases. Most retailers just increase the amount of labour needed to compensate for the extra units that need to be produced and do not think of producing these units more productively.

This means that in order for productivity to benefit from the additional units sold, no or very little additional staff should be utilized. Therefore hypothesis nine could be formulated as:

- *Hypothesis 9:* The number of units sold, are positively correlated with productivity in retail stores.

CHAPTER 4 : RESEARCH METHODOLOGY

4.1 THE POPULATION

According to Zikmud (2003) the target population is the complete group of specific population elements relevant to the research project. This research project is relevant to stores that are listed under the food and drug sector on the Johannesburg Stock Exchange (JSE).

Pick 'n Pay was the only company at the time listed under the food and drug sector on the JSE and therefore the population can be defined as all the Pick 'n Pay Corporate stores.

According to Zikmud (2003) it is vitally important, to carefully define the target population so that the proper source from which the data are to be collected can be identified.

Zikmud (2003, p. 373) states that “tangible characteristics should be used to define the population”. Therefore it is important to mention that Pick 'n Pay Franchise and Mini-Market stores were not included in the population because these stores are managed by the owner of the store and

not by a manager that was selected and appointed by directors of the company. These stores also do not have the resources of a head office which provide additional services like human resource personal, accountants, administration, buying teams and operation departments. Therefore, these stores have a different structure and different operational activities that can not be compared with that of a normal Pick 'n Pay Corporate store.

The population can therefore be identified as all Pick 'n Pay Corporate Supermarkets that are administered by the Pick 'n Pay Gauteng regional offices in Kensington, Johannesburg that are selling a combination of groceries, perishables, general merchandise and textiles within the geographical area of Gauteng.

4.2 SAMPLING

According to Zikmud (2003), a sampling frame is the list of elements from which the sample may be drawn. For the purposes of this research the sampling frame will be all Pick 'n Pay Corporate Supermarkets that are administered by the Pick 'n Pay Gauteng regional offices in Kensington, Johannesburg that are selling a combination of groceries, perishables, general merchandise and textiles within the

geographical area of Gauteng. For the purposes of this research, this can be referred to as the working population.

The Pick 'n Pay Gauteng region is the biggest region in the Pick 'n Pay group. Pick 'n Pay Gauteng has the most corporate stores, the most employees and is doing the highest turnovers of all the regions in Pick 'n Pay.

Pick 'n Pay Gauteng consist of 52 stores which is more than the minimum of 30 stores that are required for normal distribution.

Therefore, the findings for this research should not be different from those of the other Pick 'n Pay regions if this research should be performed on some of the other regions.

4.3 SAMPLING UNIT

Zikmud (2003, p. 375) states that “the sample unit is a single element or group of elements subject to selection in the sample.” For the purposes of this research the sampling unit was Pick 'n Pay Corporate Supermarkets as described in the definition of the population.

4.4 SAMPLING SIZE

The research looked at data over a period of three years, with special reference to the financial year of February 2007. During each year new stores opened and some existing stores closed, which made the sampling size or population different for each period that was investigated. For the purposes of this research the February 2007 financial year end was chosen as the primary period to analyze. Data from other financial year end periods February 2006 and February 2005 were also analysed to test for the robustness of the results.

The potential sample sizes or population of Pick 'n Pay Corporate Stores for each financial year are illustrated below.

Financial Half year End	February 2007	February 2006	February 2005
Number of Stores	52	49	47

Table 2: Pick 'n Pay Corporate Store Population

4.5 DETAILS OF HOW THE DATA WAS COLLECTED

The research report seeks to identify whether the independent variables are statistically significant drivers of the productivity in retail stores.

The dependent variable was defined as units per man-hour worked, which is a proxy for productivity in Pick 'n Pay.

The independent variables are the moderating factors selected for this study, and they are:

- Service area sales participation percentage – which express the service area sales, as a percentage of total store sales. Service area sales are the sales that were generated from departments like, deli, cheese shop, fish shop, bakery, fresh poultry, butchery, etc.
- Shrinkage percentage – which represents the total rand value shrinkage per store, expressed as a percentage of sales.
- Buyers gross percentage – which can be seen as a proxy for product sales mix, because it can be seen

as the total sum or outcome of all the gross profits for each item in the store that makes up part of the sales mix.

- Basket size – which represent the average number of units per transaction at the till points at Pick 'n Pay.
- Basket size square – which represents the squared basket size value for each store.
- Units sold – which represents the total units sold for each Pick 'n Pay store within the financial year ended February 2007 irrespective of rand value.
- Managers' experience – which represents the average number of years experience as a store manager that the store manager has.
- Variable time employee staff complement – which express the number of variable time employees as a percentage of the total workforce per Pick 'n Pay store.
- Variable Time Employee Hours Worked – represents the total number of hours worked, for the financial

year ended February 2007 for variable time employees.

All the data in this study was chosen to be as objective as possible. It was deemed most appropriate to use original data about store performance and related factors. The next section covers all the independent variables that were collected and calculated.

4.5.1 Turnover

Turnovers for each store were collected from the audited financial statement of the Pick 'n Pay, Gauteng region. Turnover is measured excluding Vat and other third party transactions.

4.5.2 Buyers Gross

The buyers gross for each store was collected from the audited financial statements of the Pick 'n Pay, Gauteng region. Buyers gross are made up of direct gross and point of sale gross.

Direct gross, is applicable to all bar coded items that are received by the store and have a cost price and a selling price attached to it. For example, KOO baked beans may have a cost price of R4-00 and a selling price of R4.50. Therefore the direct gross margin on this item is 11.11%. This means that this item will be sold through the tills at a price of R4.50 and a direct gross margin of 11.11% will be realized.

Seeing that buyers gross is the sum of all the products gross profit percentages, buyers gross could be seen as a proxy for product mix.

Point of sale gross is applicable to all items that are received by the store on random weights. These products have a cost price per kilogram and a selling price per kilogram. These products are service area products and need to be prepared. Therefore, it is not possible to know how much of this product will go to waste and how much will actually be sold. For example, a slab of two kilogram cheese will be cut up in a few smaller pieces, priced and sold through the tills. The actual gross margin on the cheese will only be realized when the items are sold through the tills. Therefore, point of sale gross is a better proxy of productivity than of product mix, because of the

human elements involved and the labour intensiveness of these departments.

4.5.3 Wages

The actual rand value on wages for each store, was obtained from the audited financial statements of the Pick 'n Pay Gauteng region. Wages are paid to unit producing employees and salaries are paid to employees with fixed permanent positions like, management and supervisors. The figures for wages include wages that were paid to permanent and casual employees. Wages rather than salaries were seen as the better measure to use, because Pick 'n Pay see salary positions as fixed and mandatory to the business, no matter what the business requirements are, these positions will still have to be fulfilled, e.g. store manager.

4.5.4 Average basket size

The average units per basket for each store were obtained by dividing the total units sold for each store by the total customer count for each store, for the financial statement period.

Basket size-square were used because of a possible U-shaped relationship between basket size and productivity. Meaning that if the basket size increases, productivity will decrease to a point where productivity will increase as basket size increases.

4.5.5 Customer counts

The customer counts for each financial period were obtained from the daily customer count report that prints at store level and which are sent to Pick 'n Pay Gauteng support office to be captured on Microsoft Excel spreadsheets for analysis.

4.5.6 Units sold

The units sold for each financial period were obtained from the daily units sold report that prints at Pick 'n Pay Gauteng support office and which are captured on Microsoft Excel spreadsheets on a daily basis for analysis.

4.5.7 Management year's experience

The number of years experience as a store manager (for each store manager) was obtained from the salaries department. The number of years experience was taken from date of appointment as a store manager.

The Pick 'n Pay Gauteng region rotate some of the store managers after every six months and therefore it was necessary to contact each store manager to find out in which store he or she was for which financial period. Each store manager was contacted by phone and the responses were recorded on a spreadsheet that displays the different financial periods in this research.

4.5.8 Staff Complement

The wage staff-complement between permanent and casual employees were obtained from the payroll for each month.

An average staff complement for permanent and casual employees, was obtained by calculating an average staff complement for each financial period. The permanent and

casual staff complement was expressed as a percentage of total units producing staff complement.

4.5.9 Units per man-hour worked

Units per man-hour were obtained by dividing the total units sold for the financial period by the total hours worked by all unit producing staff for the financial period.

This was done for each store. The total hours worked were obtained from the monthly payroll printouts.

Productivity within Pick 'n Pay is measured and expressed as units per man-hour.

4.5.10 Service area sales participation

Service area sales participation percentage was obtained by dividing the service area sales by the total sales for each of the individual stores.

4.6 STATISTICAL ANALYSIS

4.6.1 Multiple regression

Albright, Winston and Zappe (2003, p. 548) state “regression analysis is the study of relationships between variables. It is one of the most useful tools for business analysis because it applies to so many situations”. For the purposes of this study we would like to know how one single variable (specifically units per man-hour worked) depends on other relevant variables (e.g. basket size, staff complement, service area sales participation etc.). The one type of regression analysis that will be used in this research is multiple regressions.

According to Albright *et al.* (2003), “when we include several explanatory variables in the regression equation, we move into the realm of multiple regression”.

This means that we are no longer fitting a line to a set of points (Albright *et al.*, 2003). If there are more than two explanatory variables, then we can only imagine a regression plane and drawing in four or more dimensions is impossible (Albright *et al.*, 2003).

4.6.2 Ruling out multicollinearity

According to Black (2004, p. 583), “multicollinearity is when two or more variables of a multiple regression model are highly correlated”.

According to Black (2004), this relationship causes several other problems, particularly in the interpretation of the analysis. For instance: inordinately small t-values for the regression coefficients may result; the standard deviation of regression coefficients are overestimated and the algebraic sign of estimated regression coefficients may be the opposite of what would be expected of a particular predictor variable.

According to Black (2004), the variance inflation factor technique could be used to control the problem of multicollinearity. Black (2004, p. 585) states that the variation inflation factor could be used to “predict an independent variable by the other independent variable. In this case, the independent variable being predicted becomes the dependent variable. As the process is done for each of the independent variables, it is possible to determine whether any of the independent variables are a function of the other independent variable, yielding

evidence of multicollinearity. By using the results from such a model, a variance inflation factor (VIF) can be computed to determine whether the standard errors of the estimates are inflated. Some researchers follow a guideline that any variance inflation factor greater than 10 for the largest inflation factor indicates a severe multicollinearity problem". For the purposes of this research, a variance inflation factor of 10 will be used.

A multicollinearity diagnostics was performed and all variance inflation factors below 10 were removed. Variance inflation factors of the remaining variables are reported in the model.

4.6.3 R-square

According to Albright *et al.* (2003), "R-square can only increase when extra explanatory variables are added to an equation. This can lead to "fishing expeditions" where we keep adding variables to an equation, some of which have no conceptual relationship to the response variable, just to inflate the R-square value. To penalize the addition of extra variables that do not really belong, an adjusted R-square value is typically listed in regression outputs. Although it has no direct interpretation (as

percentage of variation explained), it can decrease when extra explanatory variables that do not really belong, are added to an equation”.

Therefore the adjusted R-square was monitored every time a variable was added to the model.

According to Albright *et al.* (2003), the ANOVA model can be used as a screening device. Albright *et al.* (2003, p. 633) states that “if the explanatory variable does not explain a significant percentage of the variation in the response variable, then we can either discontinue the analysis or search for an entirely new set of explanatory variables”.

For the purpose of this statistical analysis, the ANOVA model was used to see if the regression equation provided a good enough fit for practical use.

4.7 LIMITATIONS TO THIS STUDY

The limitations to this study will be discussed in chapter 6.

CHAPTER 5 : RESULTS

5.1 INTRODUCTION

Building on this pattern of relationships, a multiple regression analysis was conducted to discover what more could be learnt about the explanation of productivity.

5.1.1 Overall Model

Figure 2 illustrates the model summary of the multiple-regression analysis that was conducted.

Model Summary										
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate						
1	0.868	0.753	0.702	3.028						
a	Predictors: (Constant), Tot VTE Hours Worked, Buyers Gross, Managers Experience, VTE Compl., Shrinkage %, Basket size squared, Serv Area Part%, Units Sold, Basket Size									
ANOVA										
Model		Sum of Squares	df	Mean Square	F	Sig.				
1	Regression	1204.695	9.000	133.855	14.603	0.000				
	Residual	394.140	43.000	9.166						
	Total	1598.834	52.000							
a	Predictors: (Constant), Tot VTE Hours Worked, Buyers Gross, Managers Experience, VTE Compl., Shrinkage %, Basket size squared, Serv Area Part%, Units Sold, Basket Size									
b	Dependent Variable: UPMH									
Coefficients										
Model		Unstandardized Coefficients		Standardized Coefficients		t	Sig.	Collinearity Statistics		
		B	Std. Error	Beta				Tolerance	VIF	
1	(Constant)	1.438	11.229		0.128	0.899				
	Serv Area Part%	-0.472	0.270	-0.173	-1.745	0.088	0.581	1.722		
	Shrinkage %	-1.456	1.504	-0.085	-0.968	0.338	0.748	1.337		
	Buyers Gross	1.753	0.763	0.262	2.299	0.026	0.442	2.264		
	Basket Size	-3.546	1.726	-1.074	-2.054	0.046	0.021	47.639		
	Basket size squared	0.204	0.105	0.985	1.942	0.059	0.022	44.869		
	Units Sold	0.000	0.000	2.139	9.172	0.000	0.105	9.489		
	Managers Experience	-0.191	0.135	-0.117	-1.415	0.164	0.837	1.194		
	VTE Compl.	0.619	0.092	0.782	6.718	0.000	0.423	2.364		
	Tot VTE Hours Worked	0.000	0.000	-2.018	-8.536	0.000	0.103	9.752		
a	Dependent Variable: UPMH									

Figure II: The Multiple Regression Model

5.1.2 The dependent variable

The dependent variable for the model is units per man-hour (UPMH). Units per man-hour represent the units sold through the tills for every man-hour worked in the store and are also the way in which Pick 'n Pay determines productivity.

5.1.3 The independent variables

The number of independent variables used in this model was 9. The independent variables in the model were:

- Service area participation percentage – which express the service area sales, as a percentage of total store sales.
- Shrinkage percentage – which represents the total rand value shrinkage per store, expressed as a percentage of sales.
- Buyer's gross percentage – which can be seen as a proxy for product mix.

- Basket size – which represent the average number of units per transaction at the till points at Pick 'n Pay.
- Basket size square – which represents the squared basket size value for each store.
- Units sold – which represents the total units sold for each Pick 'n Pay store within the financial year ended February 2007.
- Manager's experience – which represents the average number of years experience as a store manager that the store manager has.
- Variable time employee staff complement – which express the number of variable time employees as a percentage of the total workforce per Pick 'n Pay store.
- Variable time employee hours worked – which represents the total amount of hour worked for the financial year ended February 2007 for variable time employees.

5.1.4 General

The N of the sample was 52. Given that 30 is the minimum for normal distribution this provides adequate degrees of freedom for statistical analysis.

The beta values could not be interpreted for the coefficients, because the independent variables were not standardized. Thus the relative importance of each variable could not be determined. However, the sign in front of the beta value can be used to interpret whether there is a positive or negative correlation.

According to Albright *et al.* (2003) the t-value can be used in an important hypothesis test for the corresponding regression coefficient. Significance levels are discussed in the next section.

5.2 RESULT FINDINGS

The R-square value for the model is 0.753, which means that 75.3% of the variance in units per man-hour can be explained by the variables in this model. This represents a very satisfactory model fit.

The ANOVA model reflects a significance level of 0.000 and a F-value of 14.603, which means that the model is very highly significant. The overall model is therefore accurately specified.

5.2.1 Non significant variables

The following variables were not significant if the norm of 10% as signal of marginal significance is used.

Shrinkage as a percentage of store turnover had a t-value of 0.968 and significance value of 0.338. The negative beta value suggests that shrinkage as a percentage of store turnover is inversely correlated with units per man-hour worked.

This means that hypothesis 3 cannot be supported. In other words shrinkage as a percentage of store sales does not meaningfully contribute to store productivity.

The average years experience for each manager in Pick 'n Pay (Managers experience) had a t-value of -1.415, and a significance value of 0.164. The negative beta value suggests that the average years experience as a store

manager is inversely correlated with units per man-hour worked.

This means that hypothesis 8 cannot be supported. In other words the average number of years experience a store manager has does not meaningfully contribute to store productivity.

5.2.2 Marginally significant variables

The following variables were marginally significant if the norm of between 5% and 10% as signal of marginal significance is used.

Service area sales participation percentage of total store sales had a t-value of -1.745 and significance value of 0.088. The negative beta value suggests that service area sales participation percentage of total store sales is inversely correlated with units per man-hour worked.

This means that hypothesis 1 can be supported. In other words service area sales participation percentage of total store sales does marginally contribute to store productivity.

5.2.3 Significant variables

The following variables were significant if the norm of between 1% and 5% as signal of significance is used.

Buyer's gross percentage (which acts as a proxy for sales mix) had a t-value of 2.299 and a significance value of 0.026. The positive beta value suggests that sales mix is positively correlated with units per man-hour worked.

This means that hypothesis 2 can be supported. In other words sales mix does contribute significantly to store productivity.

5.2.3 Highly significant variables

The following variables were highly significant if the norm of between 0% and 1% as signal of significance is used.

Units sold had a t-value of 9.172 and a significance value of 0.000. The positive beta value suggests that units sold are positively correlated with units per man-hour worked.

This means that hypothesis 9 can be supported. In other words the number of units sold does contribute significantly to retail store productivity.

The average number of variable time employees as a percentage of total staffing in a store (VTE Compl.) had a t-value of 6.718, and a significance level of 0.000. The positive beta value suggests that the average number of variable time employees as a percentage of total staffing in a store is positively correlated with units per man-hour.

This means that hypothesis 6 can be supported. In other words the average number of variable time employees as a percentage of total staffing in a store, contribute significantly to store productivity.

The total amount of variable time employee hour worked (Tot VTE hours Worked) had a t-value of -8.536 and a significance value of 0.000. The negative beta value suggests total hours worked by variable time employees is inversely correlated with units per man-hour worked.

This means that hypothesis 7 can be supported. In other words the number of hours worked by variable time employees contribute significantly to store productivity.

5.2.4 Significant and marginally significant variables

Basket size had a t-value of -2.054, and a significance value of 0.046. The negative beta value suggests that the average basket size is inversely correlated with units per man-hour worked.

This means that hypothesis 4 can be supported. In other words the average basket size contributes significantly to retail store productivity.

Basket size squared had a t-value of 1.942 and a significance level of 0.059. The positive beta value suggests that the average basket size squared is positively correlated with units per man-hour worked.

This means that hypothesis 5 can be supported. In other words the average basket size squared contributes significantly to store productivity.

CHAPTER 6 : DISCUSSION OF RESULTS

6.1 INTRODUCTION

The high R-square (more than 75%) suggests that the model is a powerful predictor of retail store productivity, specifically when productivity is measured in units per man-hour worked.

6.2 SERVICE AREA SALES PARTICIPATION

The effect of service area sales participation is statistically highly significant with a negative beta value that, imply that the more service area sales contribute to the total store turnover, the lower levels of productivity can be expected. The t-value indicates that service area sales participation will affect units per man-hour (productivity).

This can possibly be explained by the fact that the service areas in a retail store, being the deli, fish shop, bakery, butchery, cheese bar etc., requires a tremendous amount of labour in order to prepare, process and pack the products to be sold, compared to the normal groceries,

general merchandise and textiles that can be sold off the shelves.

Although service areas seems to be a lot more labour intensive, and affects the productivity in a store negatively, it is also true that these product are being sold at a higher gross margin than normal groceries in the retail store. Therefore there could be a trade-off between productivity and profitability in the retail stores. This implies that the store could actually be more profitable, at the expense or loss of productivity.

In this case it might just be more important for the retail store to produce the services required at the cost of productivity to ensure the long term sustainability and improvement in profitability of that retail store. Store managers are advised to consider this trade-off in determining the optimal point.

6.3 SHRINKAGE AS A PERCENTAGE OF SALES

Seeing that the shrinkage percentage is not significant, it implies that there is no significant level of confidence that if replicated, similar results will be achieved. In other

words shrinkage as a percentage of sales does not meaningfully contribute to store productivity.

This is in contrast with hypotheses 3 which state that shrinkage is negatively correlated with productivity in retail stores.

However, seeing that according to Bailey (2006, p. 812), “repeated surveys of retail managers in the USA and elsewhere continue to show that theft by employees is a significant source of shrinkage in retail establishments”, one cannot help to think that shrink could have an effect on productivity. Especially given the South African context and high crime, this is a surprising finding.

One could probably argue this point in three ways. The first would be to assume that employees are so busy thinking and stealing from the company, that they lose focus of the job that needs to be done, and are less productive.

The second would be to assume that the employee is stealing from the company and is too scared to draw any attention to him and, because of that he performs his task exceptionally well and he appears to be very productive.

The third argument why productivity is not significantly correlated to the shrinkage percentage could be the involvement of non-unit producing salaried employees (management and senior staff as described in the methodology section) in stealing from the company. As stated in the methodology, productivity as measured by Pick 'n Pay only apply to unit producing employees (wages) and not to non-unit producing salaried employees. Non-unit producing employees fall under the category of management and senior staff in fixed positions. These positions represents job titles like, frontline supervisors and receiving managers; the two most important employees on the front-door and back-door of the retail stores.

The back-door can be defined as the place where the inventory from the supplier enter the retail store and is received by the receiving manager. The front-door can be referred to as the till-points in the retail store where the inventory leaves the store and transactions on the tills are being authorized and monitored by frontline supervisors (till supervisors).

Therefore, if it is the salaried employees who are taking up the opportunity to steal from the company, there will be no correlation between productivity and the shrinkage percentage of that Pick 'n Pay store.

Although the above points could not be proven from the research that was conducted, it is suggested that additional analysis and research be done to determine if the findings was indeed accurate, and if so, what the drivers into this counter intuitive findings are.

6.4 BUYERS GROSS

There is a positive correlation between the gross margin (proxy for sales mix) and productivity. Seeing that the sales mix of a retail store is significant, it implies that there is a significant level of confidence that if replicated, similar results will be achieved.

Therefore the findings are in support of the hypothesis 2 that retail store sales mix does contribute significantly to store productivity.

This can possibly be explained by looking at the product mix which consists of groceries, perishables, general

merchandise and textiles. Groceries and perishables are being sold in high volumes at low margins, whereas general merchandise in the form of appliances, and textiles are being sold in lower volumes and higher margins.

The lower volumes on general merchandise and textiles implies that less labour are required to get these items packed on to the shelf and sold off the shelf to constitute a given percentage to the overall margin.

This then implies that the higher the gross margin of the product mix being sold in a retail store, will mean that the more general merchandise and textiles are being sold in the retail stores, which in turn requires less labour, and would make the retail store appear more productive.

Another possible explanation would be that larger stores would have a bigger range of general merchandise and textiles than smaller stores, where in some cases smaller stores only have a very small range of general merchandise and no textiles.

However, not covered in this research, it could be a possibility that store size and floor space, also influence product mix, which in turn influence productivity.

6.5 MANAGERS' EXPERIENCE

Seeing that the number of years of experience a store manager has is not significant, it implies that there is no significant level of confidence that if replicated, similar results will be achieved.

Therefore the findings are in contrast with hypothesis 8 and means that the number of years experience a store manager has does not meaningfully contribute to retail store productivity.

The non-significance of this variable may appear surprising, however, it supports the views of Shetty (1982, p.42) that stated that “management of productivity at the organizational level has been neglected because few managers fully understand the concept of productivity and its measurement.”

Seeing that it could not be proven that the experience of managers does have a positive influence on productivity,

Mathis and Jackson (2000, p. 362) might just summarize it for us by stating that “development is important for all employees, but especially so for managers. Unless managers are appropriately developed, resources (including employees) throughout the organization may not be managed well. Management development should be seen as a way of imparting the knowledge and judgment needed by managers to meet the strategic objectives of the organization”. In retail stores, productivity is definitely one of the strategic objectives of the organization.

Byars and Rue (1994) suggests that development of managers through experience is used in many organizations. However, according to Byars and Rue (1994, p. 244), “employees who are allowed to learn management only through experience can create serious problems by making mistakes. Serious difficulties can be avoided if the experience method is supplemented with other management developing techniques”.

This study failed to provide evidence that the more experience a store manager has, the better he will manage his workforce, which will influence productivity positively.

Therefore it can be suggested that retailers should re-evaluate their training programs and techniques that they use to develop management in order for management and the years experience they have to be identified as a key factor that can have a positive influence on productivity.

6.6 UNITS SOLD

Although the beta value is close to zero, the effect of units sold is statistically highly significant and the high, positive t-value, imply that there is a high correlation between units sold and productivity. This implies that, if more units are sold through the tills, it will have a positive effect on productivity.

Although selling more units will have a positive effect on how productivity is measured, it does not necessarily reflect an improvement in profitability, depending on how these additional units were generated. For example, by running an aggressive promotions/advertising campaign where items are sold at cost or even below cost price should have a dramatic increase on the amount of units sold. However, these additional units will come at the expense of profitability.

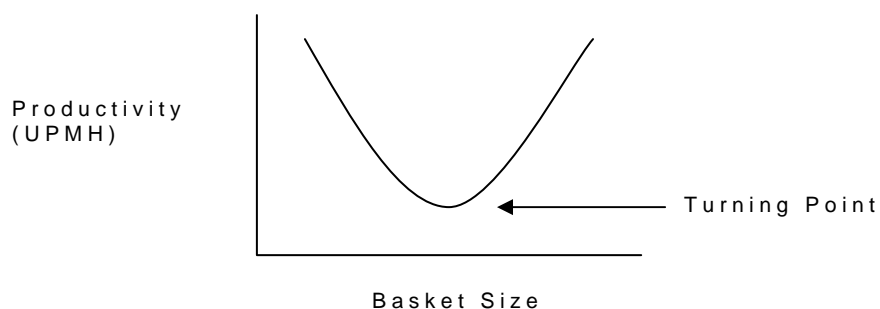
It is therefore important to note that there could be a trade-off between productivity and profitability that needs to be monitored.

6.7 BASKET SIZE AND BASKET SIZE-SQUARE

The effect of basket size on units per man-hour is statistically significant with a negative beta value that, imply that the bigger the basket size get the lower units per man-hour (productivity) will be.

When the basket size were squared, the effect of basket size-square remained statistically significant with a beta value that changed to a positive, which implying that the bigger the basket size gets, the more productive the store will be.

This can be graphically drawn (not to scale) as:



This however implies that the bigger the basket size gets, the smaller units per man-hour (productivity) will get, but only up to a point, where productivity levels will increase as the basket size increases.

Gartner (2004), states that by analyzing the shopping basket of customers, retailers can identify how products are purchased together. By analyzing this data, retailers can become more aware of customer insights that can help retailers to better promote, assort and design their stores.

From the data that was collected one can see that one Pick 'n Pay store has an average basket size of 5 units per basket whereas another branch had an average basket size of 12 units per basket.

What can be implied from this different basket sizes are that, one Pick 'n Pay store serves as a convenience store where customers quickly pop in to purchase some products for a single meal, and would probably not mind at the checkouts to pack the 5 items in the shopping bag themselves. In this case you would probably only need a packer at every alternative checkout.

Whereas the other branch would be a destination store where customers go for example to buy their month-end shopping. Here customers would probably mind at the checkouts if they need to pack their own shopping bag and would probably need a packer at every checkout. However, the larger amount of units, more than makes up for the extra labour required.

However for a store that falls somewhere between those two extremes an increase in basket size will either negatively or positively influence productivity in that retail store, depending on which side of the turning point the current basket size of that particular retail store is.

6.8 VTE STAFF COMPLEMENT AND VTE HOURS WORKED

The effect of variable time employee staff complement on units per man-hour is statistically highly significant with a positive beta value that, imply that the more variable time employees you have in the retail stores the more productive the retail store will be.

This finding supports the views of Mathis and Jackson (2000, p. 254) that stated that “the use of temporary

workers may make sense for an organization if its work is subject to seasonal or other fluctuations. Hiring regular employees to meet peak employment needs would require that the employer find some tasks to keep employees busy during less active periods or resort to layoffs”.

This means that retail stores should look at employing just enough permanent employees to fulfill the business requirements during the quietest week of the year, while making use of casual labour to fulfill in the extra business requirements for the rest of the weeks during the year.

The maximum number of variable time employees that needs to be available for work would be the number of employees required during the busiest week of the year.

However finding reliable casual workers could be difficult, seeing that they could work anything from 60 to 196 hours per month. For those that are scheduled to work only a few hours a month (60 hours) it would become not worthwhile to come to work. Then there might be those that work 196 hours per month on average, for whom it might be much more worthwhile to come to work.

Seeing that casual labour are normally paid a higher rate than permanent employees, because casuals do not qualify for benefits, it could become very expensive for the company if the variable time employee hours are not very well controlled.

Therefore it is important for retail stores to consider the average number of hours per variable time employee worked, in order to create a reliable casual workforce where both parties can benefit from.

An analysis of the total VTE hours worked per retail store, revealed the following results.

The effect of variable time employee hours worked on units per man-hour is statistically highly significant. The beta value on total hours worked by variable time employees is extremely small (approximating zero) but non the less highly significant. Interestingly the sign of the t-value is negative, suggesting that the positive relationship found in variable time employee staff compliment does not hold.

These results again imply the hours worked by variable time employees need to be controlled and managed in

order not to have a negative influence on productivity. If controlled and managed effectively it could have a positive effect on productivity.

Overall, however, these findings, support the literature that a flexible workforce could have a positive effect on productivity in retail stores.

6.9 LIMITATIONS TO THIS RESEARCH

The research conducted in this study had certain limitations, which include the following:

- The potential differences in market conditions and consumer types faced by different retail stores were not considered.
- The local effects like average disposable income were not considered.
- The population growth and density in the geographical areas of the retail stores were not considered.
- The competition growth and density in the geographical areas of the retail stores were not considered.
- The different demand characteristics and customer profile of the market served were not considered.
- It is only based on the retail stores in the geographical area of Gauteng, South Africa.
- The skill levels of the workforce were not considered.

CHAPTER 7 : CONCLUSION

7.1 Introduction

The results of this research suggest that future research in productivity should explore the issue of including moderating factors in the assessment of retail store productivity. The methodology that was used in the collection of the data could be time consuming, but not expensive nor difficult to collect.

7.2 The relationship between productivity and profitability

There is a general believe that the more productive retail stores are, the more profitable they will be, seeing that retail is such a labour intensive industry.

However, this research suggests that there might be a trade-off between productivity and profitability. By selling more labour intensive inventory like deli, bakery and butchery products, could result in lower productivity for the retail store. However, these products are sold at a

much higher gross margin that will make the store more profitable at the expense of productivity.

What the net-value-add between productivity and profitability is will have to be researched in more detail. Further research is therefore suggested.

7.3 Productivity measurement

For many years productivity has been on the minds of CEO's of companies and according to Dubelaar *et al.* (2002), "a central theme of the research on retail productivity has been on issues of measurement".

It is believed that all retail stores are monitoring productivity in some way, however the question arises as to whether productivity is being measured correctly and if there aren't any other moderating factors that need to be considered.

What was found was that productivity is measured, and that not all factors that affect productivity have been taken into account in the measuring and analysis of productivity.

From the research that was conducted, it became clear that there is definitely a need to consider some moderating factors in the management of retail productivity.

Some of the moderating factors that were found to be significantly correlated with productivity were the sales mix in retail stores, the average shopping basket size in units, the flexibility of the workforce and the staffing complement between variable time and full time employees in a retail store.

These factors do influence productivity and by including them in the way that productivity gets measured, could add a lot of value in the evaluation and management of a retail stores' productivity.

It is pertinent to mention that business should find it necessary to consider these variables before a new store is opened.

7.4 The reliability of these results

Although the results pertain to only one chain of retail stores, they contribute additional evidence to the

understanding of the moderating factors that effect productivity within the retail sector.

More importantly, the approach presented here uses readily available data, and should not be difficult to apply in other retail stores.

This methodology is a potential useful tool for retail store managers to use in factors to consider in the process of measuring retail productivity in their stores.

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