

A cross-sector analysis of the interaction between aggregate expenditure and job creation in South Africa

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DECLARATION

I, Thomas Habanabakize, hereby declare that this dissertation entitled:

**A cross-sector analysis of the interaction between aggregate expenditure and job
creation in South Africa**

is entirely my own work with the exception of resources and quotations that are recognised by means of complete references, and I have never submitted neither a part nor entire work to any other university for obtaining any form of qualification or degree.

Date: -----

Signature: -----

Thomas Habanabakize

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Praise and glory be to the Almighty God who is the source of any good possession of mine. Lord, you are all I am; without you I am and I have nothing.

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DEDICATIONS

This work is dedicated to:

- My family members be it the living or the ‘departed’ ones.
- My two nieces Mugisha Grace and Mahoro Delphia, with the intention of inspiring you to go beyond any constraint.

ABSTRACT

The entire world is facing high rates of unemployment and policymakers and macroeconomists are in thorough search for the best way of creating sustainable jobs. In the South African context, the rate of unemployment increases each year and it has become the major concern of the whole country. Among different strategies that can lead to job creation include increase in government spending on job creation, boost investment spending and enhance trade; however, the choice of the appropriate sector in which these strategies can work remains a puzzle. The theory behind the job creation is that more jobs can be created if the right approaches are applied into the right economic sectors. The literature review in this study focussed on the Keynesian model of employment in which spending and demand growth lead to the production and creation of employment. Although Keynesian theory faced some criticisms, it is still relevant and applicable in various countries' economy.

In this study, attention was given to the short and long-run analysis of interaction between the components of the aggregate expenditure and job creation across sectors of the South African economy. Thus, the empirical objectives were: (1) to compare the attribution to job creation in different South African economic sectors; (2) to determine the effects of components of aggregate expenditures namely, consumption, government expenditure, investment and net export on job creation in each sector; and (3) to compare the effects of aggregate expenditure on job creation across different economic sectors.

The sample period was 21 years; that is from the first quarter of 1994 to the fourth of 2015. Among the major South African economic sector, five sectors namely business enterprises, construction; financial, manufacturing and mining were selected. In analysing the relationship between aggregate expenditure and job creation in different sectors, the Autoregressive Distributed Lag (ARDL) model or bound test of co-integration, Granger causality test and Error Correction Model (ECM) were employed.

The long-run analysis found that aggregate expenditure can create long-term jobs in business enterprises, construction, manufacturing and mining sectors, but there was no long-run relationship between aggregate expenditure and job created in financial sector. The short-run relationships exist between aggregate expenditure and job creation in two sectors namely manufacturing and business enterprises. There was no evidence of short-run job creation in mining and financial sectors.

Testing the causality among times series, the results revealed that jobs created in one sector stimulate and influence job creation in the other sectors. In addition, jobs created in those different sectors through aggregate expenditure enhance and boost the future spending. Investment spending, consumption and government spending appeared to be the engine of job creation in South Africa, while a net export has a nil effect on job creation. Besides its contribution on the literature, the study provided key sectors with information on the aggregate expenditures components that make a good combination in favour of job creation.

Based on findings of this study the South African economic authorities and policymakers should empower manufacturing sector and encourage consumption of domestic products for this can increase the number of new jobs. In addition, South Africa needs to create enabling and sustainable environment for small and medium businesses by providing equal support for young/small and mature/large business. Finally, a link or network among economic sectors should be established for the success of one sector impacts on other the sectors success and employment.

Keywords: Job creation, employment, aggregate expenditure, economic sectors, South Africa

TABLE OF CONTENTS

DECLARATION.....	I
ACKNOWLEDGEMENTS.....	II
DEDICATIONS.....	III
ABSTRACT	IV
TABLE OF CONTENTS	VI
LIST OF FUGURES	XII
LIST OF ACRONYMS	XV
CHAPTER 1: INTRODUCTION AND BACKGROUND OF THE STUDY.....	1
1.1 INTRODUCTION	1
1.2 PROBLEM STATEMENT	4
1.3 OBJECTIVES OF THE STUDY	5
1.3.1 Primary objective.....	5
1.3.2 Theoretical objectives.....	5
1.3.3 Empirical objectives	5
1.4 RESEARCH DESIGN AND METHODOLOGY	6
1.4.1 Literature review.....	6
1.4.2 Empirical study	6
1.4.2.1 Data collection	6
1.4.3 Data analysis	7
1.5 ETHICAL CONSIDERATIONS	7
1.6 IMPORTANCE OF THE STUDY	7
1.7 CHAPTER CLASSIFICATIONS	7

CHAPTER 2: THEORETICAL AND EMPIRICAL LITERATURE REVIEW	9
2.1 INTRODUCTION	9
2.2 CONCEPTUALISATION AND DEFINITIONS OF EMPLOYMENT AND JOB CREATION.....	10
2.2.1 Jobs, job creation and employment	10
2.2.2 Employment	11
2.2.3 Informal versus formal employment	11
2.2.3.1 Measurement of employment.....	12
2.2.4 Aggregate expenditure (AE)	13
2.2.4.1 Household consumption spending (C)	13
2.2.4.2 Government spending (G)	14
2.2.4.3 Investment spending (I)	14
2.2.4.4 Net exports (X-M).....	15
2.3 THE DIFFERENCE BETWEEN THE KEYNESIAN AND CLASSICAL THEORY OF EMPLOYMENT	15
2.3.1 Keynesian school of thought and its motivation	16
2.3.2 Criticism of Keynesian theories	18
2.3.3 Theories advocating Keynesian theory	19
2.3.4 Relevance of Keynesian theory in current economy	20
2.4 REVIEW OF EMPIRICAL STUDIES ON AGGREGATE EXPENDITURE AND JOB CREATION.....	22
2.4.1 Household consumption expenditure and job creation	23
2.4.1.1 Positive relationship between consumption spending and job creation	23
2.4.1.2 Negative relationship between consumption spending and job creation	24
2.4.2 Total net-exports and job creation	25
2.4.2.1 Positive effects of net-exports and job creation	25
2.4.2.2 Negative effects of exports on job creation.....	26
2.4.3 Government spending and job creation	28
2.4.3.1 Positive relationship between government spending and job creation.....	28

2.4.3.2	Negative relationship between government spending and job creation.....	29
2.4.4	Investment spending and job creation.....	31
2.4.4.1	Positive effects of investment spending on job creation	31
2.4.4.2	Negative effects of investment spending on job creation	33
2.5	THE EFFECT OF AGGREGATE EXPENDITURE ON SECTORIAL EMPLOYMENT	33
2.5.1	Aggregate expending and job creation in infrastructure sector	34
2.5.2	Aggregate spending and job creation in manufacturing sector	35
2.5.3	Aggregate expenditure and job creation in construction sector.....	36
2.5.4	Aggregate Expenditure and job creation in mining sector	37
2.5.5	Aggregate expenditure and job creation in financial sector	38
2.5.6	Aggregate expenditure in business enterprises sector and job creation	39
2.6	SUMMARY AND CONCLUSION.....	40
CHAPTER 3:	RESEARCH DESIGN AND METHODOLOGY	42
3.1	INTRODUCTION	42
3.2	DATA SOURCE, SAMPLE PERIOD AND VARIABLES DESCRIPTION.....	43
3.2.1	Description and measurement of dependent variables.....	43
3.2.2	Description and measurement of independent variables	46
3.2.2.1	Final expenditure by households.....	46
3.2.2.2	Final expenditure on consumption by general government	47
3.2.2.3	Investment spending (real gross fixed capital formation)	47
3.2.2.4	Total net exports of goods and services.....	47
3.3	ECONOMETRIC MODELLING.....	48
3.3.1	Autoregressive Distributed Lag (ARDL) Model	48
3.3.2	Granger Causality Model	52
3.3.3	Unit root and Stationarity tests.....	53
3.3.3.1	Augmented Dickey-Fuller (ADF) and Phillip-Peron (PP) tests.....	53
3.3.3.2	Kwiatkowski-Phillips-Schmidt-Shin (KPSS) stationarity test	54

3.3.3.3	Structural break unit root test.....	55
3.3.4	Lag length and model selection.....	56
3.3.5	Diagnostic tests.....	56
3.4	SUMMARY AND CONCLUSION.....	57
CHAPTER 4: RESULTS AND DISCUSSION	58	
4.1	INTRODUCTION	58
4.2	GRAPHICAL ANALYSIS OF SECTORAL EMPLOYMENT.....	58
4.2.1	Analysis of South African Employment trend	58
4.2.1.1	Trends of employment in business enterprises sector.....	58
4.2.1.2	Trends of employment in construction sector.....	59
4.2.1.3	Trends of employment in financial sector.....	60
4.2.1.4	Trends of employment in manufacturing sector.....	61
4.2.1.5	Trends of employment in mining sector	61
4.2.2	Graphical analysis of aggregate spending components.....	63
4.2.2.1	Household's consumption spending	63
4.2.2.2	Government spending.....	64
4.2.2.3	Investment spending	65
4.2.2.4	Net exports.....	65
4.3	RESULTS OF UNIT ROOT TESTS	67
4.4	BREAKPOINT UNIT ROOTS TESTS ANALYSIS	70
4.5	THE EFFECT OF AGGREGATE EXPENDITURE ON JOB CREATION IN MANUFACTURING SECTOR	71
4.5.1	Descriptive and correlation analyses of manufacturing sector	72
4.5.2	Estimation of ARDL model for manufacturing sector	73
4.5.3	Long-run analysis of job creation in the manufacturing sector	74
4.5.4	Short-run relationships between aggregate expenditure and job creation in the manufacturing sector	76
4.5.5	Analysis of causal relationships between aggregate expenditure and job creation in the manufacturing sector.....	77

4.5.6	Residual diagnostic tests for the manufacturing ARDL model.....	78
4.6	THE EFFECT OF AGGREGATE EXPENDITURE ON JOB CREATION IN BUSINESS ENTERPRISES SECTOR	79
4.6.1	Descriptive and correlation analyses for Business Enterprises sector	79
4.6.2	Lags and model selection for Business Enterprises sector.....	80
4.6.3	Analysis of the long-run relationship for Business Enterprises sector.....	80
4.6.4	Short-run relationships and error correction model in business sector	82
4.6.5	Analysis of causal relationships between aggregate expenditure and job creation in the business enterprises sector	84
4.6.6	Residual diagnostic tests for the business enterprises ARDL model	84
4.7	THE EFFECT OF AGGREGATE EXPENDITURE ON JOB CREATION IN CONSTRUCTION SECTOR	85
4.7.1	Descriptive and correlation analyses for construction sector	85
4.7.2	Lag selection and model specification.....	85
4.7.3	Co-integration results interpretation in construction sector	86
4.7.4	Short-run relationships between aggregate expenditure and job creation in the construction sector	87
4.7.5	Analysis of causal relationships between aggregate expenditure and job creation in the construction sector.....	88
4.7.6	Residual diagnostic tests for the construction ARDL model	89
4.8	THE EFFECT OF AGGREGATE EXPENDITURE ON JOB CREATION IN FINANCIAL SECTOR	90
4.8.1	Descriptive and correlation analyses for financial sector.....	90
4.8.2	Lags and model selection for the financial sector	90
4.8.3	Co-integration test and results interpretation.....	91
4.8.4	Short run relationship between aggregate expenditure and job creation in financial sector.....	92
4.8.5	Analysis of causal relationships between aggregate expenditure and job creation in the financial sector	92
4.8.6	Residual diagnostic tests for the financial ARDL model	93
4.9	THE EFFECT OF AGGREGATE EXPENDITURE ON JOB CREATION IN MINING SECTOR.....	94

4.9.1	Descriptive and correlation analyses for mining sector.....	94
4.9.2	Lag and model selection	95
4.9.3	Co-integration analysis and results discussion	96
4.9.4	Short-run relationships between aggregate expenditure and job creation in the mining sector.....	97
4.9.5	Analysis of causal relationships between aggregate expenditure and job creation in the mining sector	98
4.9.6	Residual diagnostic tests for the mining ARDL model	99
4.10	CAUSAL RELATIONS ACROSS-SECTORAL EMPLOYMENT	101
4.11	CHAPTER'S SUMMARY AND CONCLUNDING REMARKS	102
CHAPTER 5: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS		104
5.1	INTRODUCTION	104
5.2	SUMMARY OF THE STUDY	104
5.2.1	Summary of background and theoretical review.....	105
5.2.2	Review of empirical studies on aggregate expenditure and job creation.....	107
5.2.3	Summary of the methodology and findings	108
5.2.3.1	Summary of Findings of the study.....	109
5.3	ACHIEVEMENT OF THE STUDY OBJECTIVES	110
5.4	CONCLUSIONS	111
5.5	POLICY RECOMMENDATIONS	112
5.5.1	Empowering manufacturing sector and consumption of domestic products	112
5.5.2	Create enabling and sustainable environment for small and medium businesses	112
5.5.3	Provide equal support for young/small and mature/large business.	113
5.5.4	Empowering construction sector	113
5.5.5	Establish the link among economic sectors.....	113
5.6	LIMITATION AND SUGGESTIONS FOR FURTHER RESEARCH	114
BIBLIOGRAPHY		ERROR! BOOKMARK NOT DEFINED.

LIST OF FUGURES

Figure 4-1: Employment growth in business enterprises sector from 1994 to 2015.....	59
Figure 4-2: Employment growth in construction sector between 1994 and 2015	60
Figure 4-3: Employment growth in financial sector between 1994 and 2015	60
Figure 4-4: Employment growth in manufacturing sector between 1994 and 2015	61
Figure 4-5: Employment growth in mining sector between 1994 and 2015	62
Figure 4-6: Sectorial employment growth between 1994 and 2015	63
Figure 4-7: Growth in households' consumption spending between 1994 and 2015.....	64
Figure 4-8: Growth in government spending between 1994 and 2015	64
Figure 4-9: Growth in investment spending between 1994 and 2015.....	65
Figure 4-10: South African net exports growth between 1994 and 2015	66
Figure 4-11: South African Aggregate expenditure's growth between 1994 and 2015	67
Figure 4-13: ARDL model summary selection for manufacturing sector	73
Figure 4-14: ARDL model summary selection for the construction sector	86
Figure 4-15: ARDL model summary selection for mining sector	95
Figure 4-16: Bounding co-integration test for mining sector.....	96

LIST OF TABLES

Table 3-1: Percentage growth in sectoral employment between 1994 and 2015	46
Table 4-1: Results of ADF and PP Unit root test	68
Table 4-2: Results of the KPSS stationarity test	69
Table 4-3: Breakpoint unit root test results	71
Table 4-4: Results of correlation coefficients for manufacturing sector	72
Table 4-5: Results of bounding co-integration test for manufacturing sector	75
Table 4-6: Short-run relationship and the error correction results	77
Table 4-7: Pairwise Granger causality results	78
Table 4-8: Results of diagnostic tests	78
Table 4-9: Correlation coefficient results	79
Figure 4-10: ARDL model summary selection for business enterprises sector	80
Table 4-11: Bounding co-integration test for Business sector	81
Table 4-12: Short-run relationship and error-correction results in business sector	82
Table 4-13 Pairwise Granger causality tests for business sector	83
Table 4-14: Results of diagnostic tests for business sector	84
Table 4-15: Correlation coefficient results	85
Table 4-16: Bounding co-integration test in construction sector	87
Table 4-17: Short run relationship and the error-correction results for construction sector	88
Table 4-18: Granger causality results for construction sector	89
Table 4-19: Results of diagnostic tests for construction sector	89
Table 4-20: Pairwise correlation coefficients for financial sector	90
Table 4-21: ARDL model summary selection a for the financial sector	91
Table 4-22: Bounding co-integration test for financial sector	92
Table 4-23: Short run relationship results for financial sector	92
Table 4-24: Granger Causality results for financial sector	93
Table 4-25: Results of diagnostic tests	94
Table 4-26: Pairwise correlation coefficients for mining sector	95

Table 4-27: Short run relationship and the error-correction results for mining sector	98
Table 4-28: Granger causality results for mining sector's employment	99
Table 4-29: Results of diagnostic tests for mining sector	100
Table 0-30: Aggregate expenditure components and their contribution towards job creation.....	101
Table 4-30: Causal relationship among sectors' employment	102

LIST OF ACRONYMS

ADF	:	Augmented Dickey-Fuller
AE	:	Aggregate Expenditure
AIC	:	Akaike Information Criterion
AR	:	Autoregressive
ARDL	:	Autoregressive Distributed Lag
BEA	:	Bureau of Economic Analysis
CIDB	:	Construction Industry Development Board
CONS	:	consumption
EBUS	:	employment in business enterprises
ECM	:	Error Correction Model
ECT	:	Error Correction Term
ETI	:	Employment Tax Incentive
GDP	:	Gross Domestic Product
H0	:	Null hypothesis
H1	:	Alternative hypothesis
IDC	:	Industrial Development Corporation
ILO	:	International Labour Organisation
IMF	:	IMF – International Monetary Fund
KPSS	:	Kwiatkowski–Phillips–Schmidt–Shin
LM	:	Lagrange Multiplier
OECD	:	Organisation for Economic Co-operation and Development
PP	:	Phillip-Peron
SARB	:	South African Reserve Bank
SEDA	:	Small Enterprises Development Agency
STATS SA:	:	Statistics South Africa

UECM	:	Unrestricted Error Correction Model
USA	:	United States of America
VAR	:	Vector Autoregressive
VAT	:	Value Added Tax
VECM	:	Vector Error Correction Model

CHAPTER 1: INTRODUCTION AND BACKGROUND OF THE STUDY

1.1 INTRODUCTION

A healthy and stable economy of any nation is based on quality and sustainability of its jobs (World Bank, 2013:2). However, many nations around the world are currently facing high rate of unemployment and as a result, job creation has become one of major concerns for macroeconomic authorities and other economic stakeholders. According to the International Labour Organization (2015:16), within a single year, (from 2014 to 2015) the global unemployment increased by 0.7 million and reached a total of 197.1 million unemployed people in 2015. The increase in global unemployment especially in countries with higher income or in developed countries is due to the different factors such as decline in capital spending, weak factors of productivity growth, weakening global trade and a slowdown in working population. In developing countries, with lower income, high unemployment keeps escalating against small scale of economic growth (World Bank, 2015:03).

In South Africa, unemployment has been a daunting challenge since 1994 to today's democratic government. From 1994 to 2015, the official narrow unemployment increased from 22 percent to 26.6 per cent respectively and the expanded unemployment was 35 percent at the end of the third quarter of 2016 (StatsSA, 2016). This increase in joblessness affects not only those people who are unemployed but also those who are employed and the whole society. In fact, according to Schussler (2013), in 2013 only 60 percent of South African households were able to provide for their families by the means of earned income; whilst the remaining 40 percent depended on government supports. This demonstrates how joblessness is a serious issue in South Africa and how job creation is crucial for current South African economy. In order to tackle the issue of unemployment, job creation should be taken as a major focus either globally or/and nationally. This is achievable by having a good and a deep understanding of job creation (employment growth) and unemployment dimension or interplay (Rodrik, 2008:781). Broadly, unemployment refers to the total number of persons who are actively looking for jobs but who currently are not employed.

Conversely, employment represents the total number of people who are presently working, either full-time or part time (Krugman & Wells, 2013:214). In other words, the overall view of the word "employment or jobs" is that diverse people are working and earning some income in the form of wages or salaries to satisfy their daily needs (Maqbool *et al.*,

2013:192). Moreover, according to Davis and Haltiwanger (1992), job creation is the provision of new chances for waged employment, principally for persons who are currently jobless. In contrast, unemployment growth, in the view of neo-Keynesian theory, is an economic phenomena resulting from weak fiscal policies, in which economic growth does not positively impact on the level of employment or job creation (Máté, 2010:70).

Creation of jobs can be achieved by employing different strategies. One of those strategies that serve to overcome the challenge of unemployment is to exploit wisely macrocosmic tools such as boosting aggregate expenditure (Cray *et al.*, 2011: 6). In this regard, the relationship between employment and aggregate expenditure can thoroughly be understood and analysed under Keynesian aggregate expenditure model to determine how total spending can influence and enhance job creation.

Keynesian aggregate expenditure plays a major role in macroeconomic growth throughout consumption, investment, government expenditure and net export (Dornbusch *et al.*, 2014). The role of economic growth towards job creation is supported by Okun's Law (Okun, 1962) hypothesising that the higher economic growth is, the lower unemployment rate (or the higher employment rate). The aggregate expenditure (AE) is defined as the sum of spending on consumption, government goods and services, investment, and imports/exports (net export) at any level of income (Dornbusch *et al.*, 2014:108). The focus of this study is the planned aggregate expenditure which comprises four key components namely; consumption, government, investment and net exports expenditures (Cogan *et al.*, 2010:283).

From the Keynesian perspective, there is a positive and strong link within aggregate expenditure's components. Consumption from households and government spending create income for firms. When households increase their demand for goods and services, firms have to increase quantity supplied, in response to that increased demand. In other words, this would increase production, leading to higher demand for labour, *ceteris paribus*. Keynes (1936:236) defines effective demand as the combination of expected consumption and expected investment that affects people's ability and willingness to buy.

Thus, effective demand determines the actual demand that firms should take into consideration when planning for production. In the New Keynesian theory, effective demand is more prioritised than the nominal (real demand plus expected demand) aggregate demand; the reason being that effective demand is the one that determines the level of employment

(Tcherneva, 2008:06). The wages paid to the employees will also increase future consumption and investment for households, which return revenue for firms (Ciarli *et al.*, 2008:16). A high demand for goods and services creates supply. Moreover, an increase in supply requires more workers, and while other factors remain constant, jobs are created (Chamley, 2013). The relationship between consumption and job creation explains why Japanese policymakers in 2011 decided to increase households demand in order to create more new jobs, henceforth reducing the level of unemployment (Jones & Yoo, 2011:6).

The brief explanation of aggregate expenditure towards job creation as hypothesised by Minsky and Papadimitriou (1994:392) is that: if firms are selling a higher quantity of products, government will receive more income from tax. Increase in government revenue facilitates government's spending on government services. As a result, more jobs are created. In addition, if governments have enough resources and their citizens are able to provide for their needs, the amount of money that could be used by the government to support poor and unemployed citizens will be allocated to firms that are less competitive in global markets in the form of government subsidies. Government subsidies will then allow firms to produce at lower costs. Consequently, a higher quantity of good and services will be supplied by domestic firms into international markets. In other words, an increase in exports will require more labour; thus, more jobs will be created.

Although these two previous paragraphs explain how the four components of aggregate expenditure are linked and concomitant to affect job creation, in some instances, an increase of aggregate expenditure might not contribute to the job creation, rather to job losses. Different studies (Autor *et al.*, 2013; Emilia, 2008; Loku & Deda, 2013; Postlewaite *et al.*, 2008; Toossi, 2002) have found that jobs can be destroyed within domestic industries if increase in consumption is as a result of population growth (high increase in birth rate or immigration) or lower cost of imported goods and services. This consumption growth may rather create employment in exporting country (supplying country) at the expense of consumers' countries.

Moreover, an increase in exports accompanied by prolongation of working hours will have no effect on job creation. This was the case of Egypt and Japan where when the demand for more exports increased the number of working hours (Kiyota, 2011:19; Said & Elshennawy, 2010:155). In addition, an increase of investment and government expenditures within sectors

that require more technology use than labour productivity destroy jobs (Rotman, 2013). Thus, aggregate expenditure create job only when it is well managed and allocated.

1.2 PROBLEM STATEMENT

In 2015, South Africa was ranked eighth on the list of countries with high unemployment rate (News24, 2015) and broad youth unemployment rate keeps fluctuating between 35 and 37% (Stats SA, 2015). This high number of unemployed citizens should be contributing more to the nation's wealth and individual well-being. However, despite their skills and willingness to work, they are sitting idle due to lack of access to employment opportunities. The seriousness of the joblessness manifests in different ways including economic instability, higher rate of social problems, the rates of strikes, and pressure of labour unions on South African government to create new and sustain existing jobs (Kingdon & Knight, 2004:402). In addition, the problem of high rate of unemployment is the root of many other challenges in the South African economy regarding growth and development (Kingdon & Knight, 2004:403). The South African government allocated more resources to assist the poor and unemployed people, but this is a quick short-term solution that leaves the problem of jobless, poverty and inequality unsolved (Tcherneva, 2008:18). There is a need of more jobs to enhance economic independency, social welfare, and national economy.

With regard to employment growth or job creation, different policies and programmes, such as The National Development Plan, youth subsidies (introduced by National Treasury in 2011 to facilitate companies to employ youth), and Employment Tax Incentive (ETI), have been employed in South Africa. However, the study conducted by Ranchhod & Finn (2016) found an inverse relationship between youth employment growth and ETI. Henceforth one should ask the following questions: Why, despite furnished efforts, does South Africa still face a high rate of unemployment? What went wrong? If the implemented strategies did not provide the satisfying results what else can be done to curb unemployment rate? In which sectors should the government and private sector put more efforts to increase economic and employment growth?

Although Blumenfeld (2013:64) suggested that South African issue of high unemployment rate would be solved by increasing economic growth in tackling the challenge of demand and supply sides, he did not specify sectors that could be more effective than others. In the same context, the studies of Faulkner *et al.* (2013); Habanabakize and Muzindutsi (2015) on South

African job creation found that more jobs could be created in South African if more attention is given to investment and government spending. Nevertheless, this does not mean that investment and government spending create jobs in every economic sector. Thus, determining sectors in which each component of aggregate expenditure can create more jobs than in the other remains a challenge and a motivation for any researcher aiming at the improvement of South African economy in general and employment in particular. If the major sectors of job creation were elucidated to South African policy-makers and economic authorities, the issue of unemployment could effortlessly be addressed. The need to identify those sectors and strategies contributing to employment growth within them, through various components of aggregate expenditure is the core motivation of this study.

1.3 OBJECTIVES OF THE STUDY

The following objectives have been formulated for the study:

1.3.1 Primary objective

The aim of the study was to analyse the interaction between aggregate expenditure and job creation in different sectors of the South African economy.

1.3.2 Theoretical objectives

In order to achieve the primary objective, the following theoretical objectives were formulated for the study:

- To explain the theoretical aspect of the job creation across different sectors
- To explain different components of factors (concepts) of aggregate expenditure;
- To discuss the link between aggregate expenditure and job creation; and
- To review empirical studies that investigated job creation and aggregate expenditure.

1.3.3 Empirical objectives

In accordance with the primary objective of the study, the following empirical objectives were formulated:

- To compare the attribution to job creation in different South African economic sectors;

- To determine the effects of components of aggregate expenditures namely, consumption, government expenditure, investment and net export on job creation in each sector; and
- To compare the effects of aggregate expenditure on job creation across different economic sectors.

1.4 RESEARCH DESIGN AND METHODOLOGY

1.4.1 Literature review

Secondary sources such as journals, thesis, books, academic and commercial abstracts, bibliographic databases and the internet search engine were used to access necessary information resources. The literature review included both theoretical literature as well as empirical literature to help explain the relationship that exist between aggregate expenditure and job creation across sectors (mining, manufacturing, banking, construction, business enterprises and tourism) in South Africa.

1.4.2 Empirical study

1.4.2.1 Data collection

Job creation analysis requires the availability of employment and aggregate expenditure data of a specified timeframe. This study was based on quarterly time series data over the period from 1994 to 2015. The choice to use data was based on the fact the pre 1994 data, especially on export, could be affected by the economic embargo on South African economy during apartheid area. Therefore, using such data may lead to inaccurate results. Thus, a total of 84 quarterly observations (21 x 4) were employed and these provided enough sample size to determine the relationship between aggregate expenditure and job creation in the selected sectors. Data used was available from South African Reserve Bank (SARB). Five economic sectors (mining, manufacturing, financial, construction, business enterprises) were subjected to the study. These sectors were selected based on the major role they play in South African economic growth and availability of data. In addition, these sectors have proved to be jobs creation engines in some other countries. The variables included employment rate in each of the five sector and the four components of aggregate expenditure namely; consumption, government, investment and net export.

1.4.3 Data analysis

The empirical objectives of the study were achieved using various econometric models, which allowed determining the short-run and long-run relationships between job creation across sectors and aggregate expenditure variables. In addition to descriptive analysis, Autoregressive Distributed Lag (ARDL) model was used as starting point to capture the linear relationship among the variables. To determine the long-run relationship of variables, a bound test of co-integration was required. The use of Autoregressive Distributed Lag (ARDL) model depended on the results from unit root, these results revealed that variables had a mixture of order of integration I (0) and I (1). Granger-causality test was used to determine the causal relationship among variables.

1.5 ETHICAL CONSIDERATIONS

Given that the study used secondary data available in the public domain, the ethical clearance from data provider (the South African Reserve Bank) was not needed. Nevertheless, the North West University ethical considerations were followed in conducting this study.

1.6 IMPORTANCE OF THE STUDY

In developing countries such as South Africa, it is very important that the interaction between aggregate expenditure and job creation within different sectors is studied and scrutinised. The major contribution of this study to the existing theories is to provide up-date knowledge on how components of aggregate expenditure can create jobs in different sector. The study will inform on good combination of a right sector and a right aggregate expenditure's component to promote employment growth in a specific economic sector.

The findings of this study will assist policymakers, economic authorities and other economic stakeholders in tackling the burden of unemployment issue in South Africa.

1.7 CHAPTER CLASSIFICATIONS

Chapter 1: Introduction and background of the study: This chapter provides a brief outlay of what the study was about and also includes the objectives, problem statement, contribution and scope of the study.

Chapter 2: Theoretical and empirical literature review: This chapter reviewed the theoretical and empirical aspects of job creation across sectors and the aggregate expenditure

components. In this chapter, the relationship between each of the selected sectors and job creation in South Africa is also discussed.

Chapter 3: Research design and methodology: This chapter explains the sample period, data collection, data description and different models used in the study to achieve the empirical objectives of the study. Employment rate in South Africa has been fluctuating between the period of 1994 and 2015. Thus, this chapter provides tools used to analyse those alterations.

Chapter 4: Results and discussions: This chapter presents the results and discusses the findings of the empirical analysis in relation to theories and previous studies.

Chapter 5: Summary, conclusions and recommendations: Finally, chapter 5 is composed of summary of the study, provides conclusions of the findings, suggests recommendations and provides propositions for future research.

CHAPTER 2: THEORETICAL AND EMPIRICAL LITERATURE REVIEW

2.1 INTRODUCTION

Job creation and employment growth are interchangeably used in labour markets and labour force movement. Employment is one of the macroeconomic indicators that play a major role into individual countries or/and global economy. Employment growth is the source of social and economic development, thus the high rate of unemployment in the country remains a serious constraint to any form of development (World Bank, 2013). However, different theories from different schools of thoughts suggest application of various models to achieve full economic employment. Keynesian theory for instance asserts that increase in total demand and spending may result in jobs creation, while Classical theory argue that new jobs can be created through wages and price adjustments (Solow & Stiglitz, 1968). Though the main focus of this study is to analyse the effect of aggregate expenditure on sectorial job creation in South Africa by exploring Keynesian theory of aggregate expenditure, it is important to provide a synopsis of the Keynesian general theory of employment and why Keynes had to introduce a new theory contradicting the precursor theories such as classical theory.

This chapter is structured as follows: the chapter starts with an introduction followed by conceptualisation and definitions of key terms used to describe employment and job creation. It then proceeds with a discussion of the difference between Keynesian and other theories of employment. In the next section, weaknesses that stimulated many criticisms against Keynesian model will, in short be provided. After presentation of the weaknesses of the Keynesian model and some of economic theories that judged the Keynesian model as a failure; some of the Keynesian model defenders and their theories will be presented. In addition to the theoretical framework that analysed the pros and cons regarding the Keynesian theory, some of empirical studies will be used to describe how Keynesian aggregate expenditure model has been employed in different countries and economic sectors.

Some empirical studies and findings are provided to illustrate how aggregate expenditure components can create and destroy jobs in different economic sectors. Finally, the chapter is concluded with short summary.

2.2 CONCEPTUALISATION AND DEFINITIONS OF EMPLOYMENT AND JOB CREATION

Jobs are the backbone of any form of economic activity and the term job is mostly used as synonym of the term employment (World Bank, 2013). In this study, the two terms were interchangeably used where job creation means employment growth and vice versa. Copious theories and empirical studies such as Galí *et al.* (2005); Chamley, (2010); Autor *et al.* (2013); Loku and Deda (2013) and Afonso and Sorolla (2012) have been conducted to determine the linkage between job creation and aggregate expenditure and they reached various conclusions. Terms such as aggregate expenditure (consumption, government spending, investment and net export), employment, job creation, economic sector and Keynesian model are often mentioned in the discussion of employment and as a result each of these terms is explained in this section.

2.2.1 Jobs, job creation and employment

Although job creation is a difficult concept to define, measure and evaluate; the International Labour Organisation (ILO, 2012:11) defines job as “a set of tasks performed or to be performed by a person for his/her employer or for self-employment in the exchange of remuneration or profit”. In addition, to this definition, Job creation is described by Cray *et al.* (2011:5), as a provision of new employment to jobless people without relocating any other economic activity. In other words, job creation means employment growth and this explains why these two terms (job creation and employment growth) are used interchangeably in this study. Notwithstanding, in the view of Harvey (2012), these presented definitions seem to be unfitted routine explanations of the term job. In his view, jobs would be considered as any activity that generates income. Henceforth, he suggested a neutral definition of the term job which is “any routine activity for which people earn income”. Although Harvey sought to differentiate his definition of job creation from his peers, both his definition and those aforementioned meet on this statement: “job generates income.”

In the context of this study, job creation is considered as a provision of task or any activity that can generate income be in short term or long term.

2.2.2 Employment

The definition of the term “employment” encounters many variances depending on the context in which it is taken. It can either refer to the activity or to the person performing that activity. Thus, Black *et al.* (2013:129) define employment as any activity performed by a person for himself/herself or for his/her employer in exchange for payment, wage or profits. Referring to the person, Krugman and Wells (2013:214) defined employment as the sum of people in economy, who currently have either full-time or part-time jobs. Employment can also be defined as a state of a person who is in workforce performing an economic activity, over a specified period of time, which generates income or benefits in form of cash, salary or profit (Husmanns, 2004:8). This definition refers to the paid employment and self-employment.

In South African context, an employed person is the one whose age is between 15 and 64 years working at least an hour per day aiming remuneration or running his/her own business (StatsSA, 2015). Employment can be categorised into two groups, namely public employment and private employment (Lewis, 2016). Public employment refers to those jobs that are related and provided by government institutions and/or government agencies; whilst private employment refers to those other jobs provided by individuals and/or companies/corporates (Lewis, 2016). In the third quarter of 2016, employment in some sectors increased while in other sectors declined. For instance, in mining, manufacturing and financial sector employment declined by 6.5percent, 1.4percent and 0.05percent respectively. Notwithstanding, employment has increased by 1.3percent in construction and 1.9percent in business sector (StatSA, 2016). From these two categories of employment; employment can also be subdivided into two groups, namely formal and informal employment.

2.2.3 Informal versus formal employment

The formal and informal employment forms two subgroup of the term employment. According to the Statistics South Africa (2015), informal employment describes individuals who work in informal sector without a written agreement or contract from their employers. Consequently, employees do not have access to some benefits such as medical aid, and pension from their employer’s contributions. Inversely, employees in formal sector have access to secured jobs and all of those benefits lacking in informal employment (Gallin, 2001: 537). These two forms of employments (informal and formal) can be provided either

by public or private sector. For instance, in sub-Saharan countries around 80 percent of employments in private sector are informal. Some cases such as graduate internships are considered as informal employment for they do not follow full procedures required for the formal employment (Johannes & de Laiglesia, 2009).

2.2.3.1 Measurement of employment

Mohr *et al.* (2015:244) describes unemployment and employment as economic indicators that are easily measured as employment level is simply known by counting the number of people with jobs at the time of measurement and then counting the number of people who are willing and able to work but without jobs during the assessment period to obtain the number of unemployed people. This measurement ascertains the level of unemployment or jobless. Hall and Taylor (2007:71) suggest two measures of employment. The first measure consists of surveying households to determine the number of people that are employed during the survey; while the second measure is based on the survey from employers' side. The later survey consists of interviewing employers to determine the number of individuals that are employed in each sector or workplace. This measurement, unfortunately, tend to exclude self-employment. Furthermore, Mohr *et al.* (2015) asserted that the difficult part in measuring [employment/unemployment] is to determine the total employment or unemployment for it is not easy to measure when a person is fully employed, unemployed or discouraged.

Although the main focus of this study is to analyse the effect of aggregate expenditure, it is important to define unemployment for a relationship exists between employment and unemployment. The general definition of unemployment refers to a situation in which a person who is able and willing to work cannot find a job (Kingdon & Knight, 2007). In other words, unemployment signifies joblessness. Besides this general definition of normal employment, Keynes in his theory discussed about involuntary unemployment. This type of unemployment arises when a person is able and willing to work for the current wage yet he/she cannot find a work.

The difference between involuntary and voluntary employment is that with the latter a jobseeker refuses employment because the current wage is less than what he/she needs, while in the former a person is unemployed because of job scarcity (Keynes, 1936).

2.2.4 Aggregate expenditure (AE)

The role of aggregate expenditure on total employment is one of the major focuses of Keynesian theory. Keynes stated that it could be difficult, if not impossible, to solve the issue of unemployment in economy if the aggregate expenditure is not considered (Keynes, 1936). In Keynesian view, the level of demand and spending in the economy determines the level of production which in turn, influences the number of jobs to be created. The higher is the quantity to be produced the more labour is demanded, *ceteris paribus* (Hicks, 1936).

The aggregate expenditure, which in Keynesian model is denoted by the letter AE, is the total of economic spending within a definite time. Moreover, aggregate expenditure is composed by households' consumption (C), government spending (G), investment (I) and net-exports (NX). In Keynesian model, economic equilibrium is reached when real GDP or total output is equal to the planned total spending ($GDP = \text{planned } C+G+I+NX$) (Mohr, 2015:314). In South African context, the real total domestic spending comes from GDP components contribution namely; final consumption spending (households and general government), gross fixed capital formation (change in inventory) and net exports (real exports minus real imports) (South African Reserve Bank, 2015:7).

2.2.4.1 Household consumption spending (C)

Consumption spending is one of the four components of total spending. It is a total sum of income spent by households on durable and non-durable goods, and it constitutes a higher share of income in any country's economy (Mohr, 2015:317). In Keynesian theory, number of new jobs to be created into the economy depends on the current and future expectation of consumption. An interdependent relationship exists between consumption level and employment level (Keynes, 1936). Households consumption spending is, according to Coulombe and McKay (2008:8), classified as follows: food expenditure, housing expenditure, other expenditure. Food expenditure refers to the amount of money that household spend in buying and producing their food commodities; whilst housing expenditures consist of total amount of money spent on rent or house maintenance.

Apart from these two categories households spend their income on services, durable and non-durable goods. In South African context, households' expenditure is one of the two factors of

final consumption spending. This part of spending is more affected by the households' income and there is a positive relationship between the two.

2.2.4.2 Government spending (G)

In Keynesian view, government plays an indispensable part into economic growth and employment equilibrium. Decisions, intervention, and policies established by the state determine economic welfare and the level of employment (Keynes, 1936). Government spending is one of four components of total spending referring to the amount of money spent on government purchasing of goods and services. Government spending is also considered as one of expansionary policies that drive firms and consumers' behaviour with regard to production and consumption (Dornbusch *et al.*, 2014). Government spending includes expenses such as purchasing goods and services, paying salaries, transfers and subsidies.

In South African context, the national government expenditure is divided into two main categories namely; voted amounts and statutory amounts. The voted amount is composed by transfers and subsidies, payments for capital assets and payments for financial assets. The statutory amounts refer to the extraordinary payment which includes also the interest paid on debts (SARB, 2015:70). Nonetheless, with the components of government expenditures presented in this section, the study will only be interested in analysing the total government spending on goods and services, wage payment and the social transfers (grants).

2.2.4.3 Investment spending (I)

Investment spending is a part of GDP that play an important role in both short-run and long-run economic and business cycle. Keynes (1936) defines investment spending as a part of income that is invested for the future production. Because of the major influence of investment spending in the economy, most of economic alterations generally result from investment spending shocks. According to Mohr *et al.* (2015:322), investment spending is an autonomous component of GDP for it does not depend on the level of income. The aim of investment spending is to ensure a better future standard of life for individuals and higher standard of future production for firms (Mankiw & Taylor, 2008:540).

Investment spending can be categorised into three: residential investment, inventory investment and capital fixed formation. However, this study on employment creation focuses mainly on gross fixed capital formation.

2.2.4.4 Net exports (X-M)

Besides the three component of gross domestic expenditure, there are other factors that play a major role in country's economy. Imports (M) are the total quantity of goods and services purchased from foreign countries whilst exports (X) consists of total quantity of good and services sold to foreign countries (Krugman & Wells, 2013:128). The net export (X-M) determines the county's level of openness and it is the difference between exported and imported goods and services (Mohr *at el.*, 2015:348). The similar definition was given by the Bureau of Economic Analysis (BEA) stating that net exports of goods and services refer to the difference between the quantity of goods and services sold and bought in abroad markets. In other words, net export is a portion of GDP that differentiates county's demand and supply into international markets (BEA, 2015). Since the key terms are defined, the next section will focus on the difference between the Keynesian and classical theory of employment.

2.3 THE DIFFERENCE BETWEEN THE KEYNESIAN AND CLASSICAL THEORY OF EMPLOYMENT

The pillar of economic strength resides on employment growth. However, there is no economic growth when a country's demand and employment levels are straggling (Andrei *at el.*, 2009:321). The macro-economy is subjected to many different theories such as classical, new classical, Keynesian and new Keynesian. Classical theory is attributed to Smith, Ricardo, Stuart Mill, Marshall, Pigou and some others, as pioneers. The famous statement which ground classical view is linked to the "Say's Law of market" theory which states that supply (or production) creates its own demand (Baumol, 1977:160). Say's Law is a theory advocating primarily that economy operates always at full-capacity, thus a new activity does not add any value but substitute the existing activity (Keynes, 2007:8). Say's theory prefers, investment over savings as the former is a better tool for economic growth than demand, and together with innovation, investment create jobs in long-run (Baumol, 1999:196).

Moreover, classical theory believed the existence of two types of unemployment namely; voluntary and frictional. Therefore, unemployment issue would be solved if the following conditions were met: reduction of frictions into labour markets, reduction of labour marginal disutility, a rise of physical labour productivity and finally increase of price in non-wage products (Rees, 1969). Nevertheless, this theory was refuted by the Keynesian theory that asserts that employment level determines the level of wages (Keynes, 1936:7; Hayes,

2008:50). Higher number of jobless people would cause the fall in wage rate and the inverse is true.

The classical model advances also a theory of a self-interest seeking and self-markets clearing; meaning that economic does not need government interference to reach equilibrium level (Basu, 2008:81). This belief is known under the famous notion of “laissez-faire” by Adam Smith (Kittrell, 1966:612). Laissez-faire in this theory suggests that government should leave economy alone, for government intervention in the economy in crises may worsen the situation. Yet, this theory leads to an inefficient demand for goods and services which, consequently causes unevenness between production and demand “known as general glut” causation of low employment and outputs (Kittrell, 1966:614). Furthermore, the classical model claims that sale-proceeds from demand of good and services can offsets costs of production. Nonetheless, this was seen by Keynes as applicable and productive if only the personal total investment matches savings (Blinder & Snowdon, 1987). Therefore, the classical theory tends to be inconsistent towards macroeconomic problems especially in the instance where unemployment creates the gap. In summary, what differentiates Keynesian theory from the classical theory of demand is that in view of classical theory supply creates demand; whilst the Keynesian theory states that the demand creates its supply. Therefore, Keynes theory argued that increasing demand would have a positive effect on economic and employment (job creation); whereas for the Classical theory, employment would depend on productivity growth (Michaillat & Saez, 2013:28). Thus, this study is based on Keynesian view suggesting that spending affects job creations. Consequently, it is important to discuss the Keynesian theory in details.

2.3.1 Keynesian school of thought and its motivation

Classical model was described by Keynes as an economic theory that disregarded the value of the nominal price and money, and ignored the existence of involuntary unemployment (Hoover, 1995:655). He also considered it as the model in which demand results from supply, reason being that income is there to be spent with the thinking that wages can create employment regardless the level of involuntary unemployment (Hayes, 2008:150). Keynes defined involuntary unemployment as a situation that occurs when a number of people who are able and willing to work at existing wage is higher than the number of people demanded by labour markets due to the wage rigidity (Keynes, 1936:15). The classical theory did not

recognise the role of money wage or real wage utility when dealing with the unemployment issue. Keynes viewed this classical behaviour as “monetary illusion” (Edwards, 1959:409). Keynes judged classical economists to be confused with regards to the difference between risk and uncertainty; consequently they dealt with the present as they possessed all information of the future; whilst the future remains uncertain (Keynes, 1937:214; Wells, 1991:2). Subsequently, they could wrongly forecast the future.

Contrary to classical theory that gives much weight on production function, Keynesian theory advocate for spending and demand, reason being that in business cycle, higher production with low demand leads the economy into recession, whilst higher demand can result in economic and employment growth. Keynesian model of employment is a theory in which unemployment problem is solved by an increment in growth of domestic production and aggregate demand through a better management of fiscal policies (Tcherneva, 2008:2). Fiscal policies such tax cut, social grants and subsidies result in income growth and higher demand which consequently stimulate production and employment.

The mainstream of Keynesian theory was primarily to develop a theory that would explain factors of production, consumption, savings and investment (Keynes, 1936). He, in addition, wanted to rectify the common view from classical economists suggesting that markets clear themselves and that economic agencies maximise their utility (Sargent, 1977:2). In Keynes view, output and employment level in the economy would be determined by the link between aggregate expenditure and aggregate demand (Tcherneva, 2008:3). In his book “*The General Theory of Employment, Interest and Money*” Keynes highlighted the following ideas: first, the lack of sufficient demand harms the economy and increases involuntary unemployment; the economy’s automatic propensity to correct underperformances in demand, if it ever happens, functions slowly and painfully. Secondly, general government policies to boost demand are considered to be better solutions that make a quick solution towards unemployment issue. Finally, he asserted that the idea that a rise in money supply may increase spending was wrong. Increase in money supply will not be a sufficient reason to convince private sector to increase their spending. Henceforth, government has to stimulate demand and spending because government policies are able to contract or expand the economy (Keynes, 1936:86).

In the time of Keynes, his theories were new, unthinkable and even considered as the theory against revolution (Clower, 1965:286). Therefore, the great success of “*The General Theory of Employment, Interest and Money*” was surely to take his ideas to a thinkable and practicable level. Indeed, the book described how the great depression should easily be solved. The theory of involuntary unemployment was one of the new theories introduced by Keynes into macroeconomic world. This type of unemployment occurs when the marginal utility of wage exceeds the marginal disutility of labour (Dasgupta, 2003:2919). The Keynesian theory alleged that unemployment results in two economic situations: first, unemployment occurs if the economy is operating under full-employment and secondly, high unemployment may occur due to erroneous sales expectations (Edwards, 1959:422). Keynes argued that in the situation of general glut and deflation, the role of government’s fiscal policies is considered to be the most important in order to increase demand and thereafter rises the level of employment in keeping economy at its (or at least close to) equilibrium (Holcombe, 1999:232).

The tools that government should use to increase demand and stimulate economy consist of investment encouragement, interest rate reduction and tax cut, subsidies and income injection. Such tools boost production and rise up households spending and finally result in new job creation (Keynes, 1936:86). The full employment is only possible if production side is well functioning because increase in production requires an increase in labour demand and consequently more jobs are created (Moggridge, 1980:280). Keynesian theory supports the government intervention into economy because of incapability of private sectors and government to provide enough and satisfactory jobs during the hard times of the economy. Government intervention raises the level of demand and investment spending which increase employment level.

However, this can be achieved if a clear distinction between investment and savings is made (Keynes, 1936:25; Greenwald, 1987:121). Nevertheless, Keynesian theory was not welcomed, understood and accepted by all economists of his time. Henceforth, his theories underwent some attacks and criticisms.

2.3.2 Criticism of Keynesian theories

Keynesian theories presented in his famous book “*The General Theory of Employment, Interest and Money*” were refuted by various economists, be those of his generation or those

who came after. Regarding the relationship between wage and employment, Keynes agreed with classical theory that lower wages may lead to a higher employment, yet this theory was refuted by Dunlop (1938) asserting that a positive relationship exists between wages and employment. In addition, Hazlitt (1959) in his book “Analysis of the Keynesian Fallacies” stated that Keynesian model was far from being true. He, for example in chapter 20 of the book, argued that Keynesian theory of money, wage and employment was false and confusing because Keynes failed to give a clear linkage among these three elements. He also asserted that Keynes supported the existence of relationship between employment, effective demand and interest rate; yet he failed to prove it with tangible evidences. Regarding money, demand and employment, Hazlitt’s perception was that full employment could be reached whether more money is demanded or not and whether there is more money in economy or not. What matters, he added, is only the relationship between wages and prices (Hazlitt, 1959:291).

Keynesian theory was also criticised to be unfit when attempting to boost economic growth level. The reason given here was that in trying to stimulate economy using fiscal policy such as increase in government deficit to raise demand, the policy can lead to a higher wages, lower business profitability, reduction in government bonds’ price, and higher interest rate (Mitchell, 2005:3). Consequently, Keynesian strategy to boost economy through demand stimulation was judged by neoclassical economist as self-defeating strategies. Income injection aimed at achieving full employment is offset by increased general prices which causes imbalance between labour and capital (Tcherneva, 2008:9). This means that increase in demand resulting from increased government spending may cause inflation and the mismatch between labour and capital.

However, this criticism ignored that, according to Keynes (1936:286), what is more needed during an economic expansion is not boosting aggregate demand rather a fitting demand distribution, for a high domestic demand is more needed in economic slash than in booming periods.

2.3.3 Theories advocating Keynesian theory

Regardless of criticism, other economists such as Hazlitt (1959) and Tcherneva (2008) considered Keynesian thoughts as necessary and relevant to the economy. The first response to Keynesian theory criticism regarding distorting business productivity by government

intervention in the economy was that, government, public and private business would operate as complement and not as substitutes (Krugman, 2006). Government would intervene in economy to inspire markets for business products only if private spending is not enough (Keynes, 1937:215). Helping business to increase the outputs would favour the level of economic growth resulting in higher level of saving and investment. Government role of investing or providing basic services such as infrastructure, research development and public health tends to work in favour of private sector's growth and stimulate employment. Keynes theory agreed that government has the power to create economic peace or to promote war depending on how it is well or badly governed (Mankiw, 1989:81).

Contrary to classical theory that follows a dictum hypothesising that supply creates its own demand, Keynesian theory, coming after a great depression and higher level of unemployment, suggested that government should play a key role in solving unemployment issue by boosting demand which should lead to a higher production and labour demand. When the economy is slashed there is no better solution to the jobless challenge than government taking control of markets (Krugman, 2006:9). This Keynesian solution was also supported by many economists, from early 1950s, who tried to update Keynesian theory (Colander & Landreth, 1996).

2.3.4 Relevance of Keynesian theory in current economy

The major goal of Keynesian theory was stability of economy and economic growth. In respect with employment and job creation, these mentioned components are still relevant in economic development, for it is difficult, if not impossible; to increase the rate of employment and create jobs while a country is in economic malaise (Blinder & Snowdon, 1987:106). According to Krugman (2006:5), the Keynesian theory was and is still relevant despite criticisms from those who might not have read, misread or misunderstood the real message of Keynes. In his study on the effect of government spending shocks, Shoag (2010:25) found a positive relationship between government spending and jobs created in the economy. He argued that the more government spends, the more the jobs are created, *ceteris paribus*.

In support of Keynesian theory, Sargent (1977:2) argued that despite improvement and advanced mathematical tools employed, all modern macroeconomic models follow in one way or the other Keynesian theory. Prices play an important role in economy and stabilising

economy means stabilising prices. Moreover, there is no other methods that can be used to stabilise prices without changing aggregate demand and outputs (Skidelsky, 2011:3) thus, Keynesian theory is still alive in current economies (Howells, 2008:6). One of numerous successes of the Keynesian theory was that in his time, when “*The General Theory of Employment, Interest and Money*” was dominant, the level of employment was higher than it was before and in decades after when his theory was no longer considered as major economic guideline (Alexandru, 2013:5). Therefore, the Keynesian theory helped and still can help to improve economic conditions.

One of Keynesian theory advocates, Markwell (2009:6), argued that Keynesian theory has been indeed important for the macroeconomic authorities and policymakers, and is still currently playing its major role within the United State of America (USA) and into international relations. Krugman (2012:3) comparing the USA president Reagan to Obama and comparing crisis that the country faced in 1980 and 2007 asserted that, though the seriousness of economic situation might differ, the same remedies should be applied and this solution is not, other than increase in government spending as suggested in Keynesian theory. In the USA context under the strategy named “Recovery Act”; which was a 5 years plan of economic recovery was signed by President Barack Obama in 2009. Keynesian fiscal policies were applied and within these 5 years, at the end of 2014, 6 million full-time jobs were created and GDP increased between 2 and 3 percent between the year 2009 and 2011 (Xikang *et al.*, 2009). Analysing the relevance of Keynesian theory in current rich and poor countries, Thirlwall (2015:27) found that fiscal policies that are rooted in Keynesian model are one of the best solutions to reduce the level of unemployment in developing and poor countries especially in unconsidered and rural areas.

In addition, the study of Gaire (2014:92), on how Keynesian theory affected Nepal economy, found that the role of government expenditure to stimulate private investment and economic growth was a necessity between 1975 and 2012.

In nowadays, as seen in the paragraph, Keynesian theory allows economists and policymakers to distinguish the difference between risk management and uncertainty. The future holds uncertainty and our knowledge about the future is very minimal even insignificant; hence, it is an error to leave markets at self-regulating towards full-employment without government intervention (Skidelsky, 2011:3). The Keynesian theory of employment

is still relevant and applicable in both developing and developed countries because according to Thirlwall (2015:13), the level of demand remains a better measure of employment level and the number of jobs to be created. This makes sense with the statement of Tcherneva (2008:5) that the gap created by shortage of demand in economy can be filled using investment spending or government spending. However, the effect of fiscal policies to job creation can be left to individual interpretation. This is the reason why this study focuses on the analyses of the four components of aggregate expenditure in order to determine how these total spending factors (working with fiscal policies) can affect job creation in South Africa. Hence, it is essential to present findings of some studies that tested effect of the components of aggregate expenditure on job creation.

2.4 REVIEW OF EMPIRICAL STUDIES ON AGGREGATE EXPENDITURE AND JOB CREATION

Besides theories that are pro and anti-Keynesian model, numerous studies have been conducted to prove or disapprove the role of Keynesian aggregate expenditure's effect towards employment. Conclusions reached by such studies differ one from another. In this section, findings of some studies are represented to illustrate how Keynesian theory may leads to divergence findings and conclusions depending on the country in which the theory is applied. For instance, analysing what should be the solution to the Spain higher rate unemployment, Afonso and Sorolla (2012) found that implementation of Keynesian model could worsen the situation. Hence, the conclusion of their study was that classical model appeared to be the best approach in regards to job creation.

In addition, Coenen and Straub (2005), in their study to assess whether government spending could crowd consumption in private sector in European zone, found that a little fair effect from government spending could impact on private consumption. Furthermore, analysing the effects of government spending on consumption in the USA, Galí *et al.* (2005:23) found that government spending increased both wages and employment which led to consumption increase. These controversies are indication that Keynesian model may work in favour of employment in some countries while it might be a misfortune for others. The next section presents different findings obtained by applying Keynesian model on each of four components of aggregate expenditure to determine its link to total employment and job creation.

2.4.1 Household consumption expenditure and job creation

2.4.1.1 Positive relationship between consumption spending and job creation

In macroeconomics theories and especially in Keynesian model, household consumption plays an indispensable role on employment and job creation. In respect to the Keynesian theory, demand creates its own supply, henceforth the more goods and services demanded by households for consumption, the higher is the quantity produced and as consequence more labour is demanded *ceteris paribus* (Chamley, 2010:14). This hypothesis was supported by the study of Toossi (2002:12) which analysed the role of consumptions spending on job creation in the USA. The study found that more than 60 percent of job created in the USA economy in 2002 was coming from consumption spending.

Most, if not all of the economic and industrial activities turn around consumers' choices or behaviours. Hence, the short and long-run production plans will depend on households responsiveness to whatever quantity supplied into the markets and the number of new jobs to be created will depend on the elasticity of goods and services' demand (2007:21). Thus, there is a positive relationship between employment growth and household's consumption (Bentolila & Ichino, 2000:16) as households' consumption contributes more on economics growth which is the engine of job creation (Gurgul & Lach, 2011:43). This shows why, though many strategies can be employed to create more jobs, the studies by Bentolila and Ichino (2000); Toossi (2002); and Lamo *et al.*, (2007:21) gave more credit to households' consumption for its abilities to stimulate and create more jobs without causing other negative impacts on general economy. However, it is not always the case that spending on consumption creates jobs. In some instances, households' consumption might destroy jobs or have no effect on employment growth.

Apart from direct jobs created by household consumption spending, other jobs can be created through economic growth as a result of consumption spending. Since 2009 consumer spending was considered as backbone of South African economy and its contribution to GDP was growing around 66 percent. The final consumption increased during 2015 which might be the cause of job creation improvement at the end of the year 2015 (Stanlib, 2013). Thus, there seems to be a positive relationship between consumption growth and economic growth.

2.4.1.2 Negative relationship between consumption spending and job creation

Contrary to the aforementioned studies that support household's consumption as strategy to increase job creation, there are other different studies that found a negative relationship between consumption spending and job creation. In this regard, the study by Emilia (2008), on the effect of final consumption on Roman employment, found an inverse relationship between consumption spending and employment growth. The study by Schettkat and Salverda (2004) argued that the link between job creation and households' consumption depends on many factors. Therefore, depending on a specific factor, household's consumption might create or destroy jobs; or there might be no any relationship between the two. Having job does not necessarily imply consumption growth as in some cases an employee might choose to increase saving over consumption spending (Emilia (2008:21)). Thus, a person tends to decide to consume more or less based on the type of employment is having. Findings by Postlewaite *et al.* (2008), on the relationship between employment and consumption, asserted that people with permanent and secured employment tend to consume more; while those with part-time and unsecure jobs opt to invest their income for a future consumption. Beyond the explained positive relationship between employment (job creation) and some dilemma about that relationship, Loku and Deda (2013:37) findings exhibited that consumption might increase, especially in developing countries, due to the higher population growth rate. Consequently, consumption growth will have no effect on job creation at all.

Beside the type of job that a person might have, there are other factors that can upsurge consumption with job destruction, such as technological production growth and consumption of imported goods and services (Autor *et al.*, 2013:2130). When households increase consumption of imported goods and services, domestic production declines, while higher demand creates more jobs within exporting country. Therefore, some domestic industries may have to lay down some workers, resulting in job loss caused by consumption of imported goods and services (Toossi, 2002). Analysing the influence of consumption on employment in Romania, Emilia (2008:874) found that consumption increase on imported products led to joblessness. These findings insinuated that households' consumption increases job creation only if the consumed product are locally produced and also support positive relationship between job creation and net exports. Henceforth, the linkage between net exports and job creation is discussed next.

2.4.2 Total net-exports and job creation

2.4.2.1 Positive effects of net-exports and job creation

Net export is another component of aggregate expenditure that plays an important role in job creation. In Keynesian context, Job (employment) creation depends on the market demands. If quantity demanded is higher than the productivity capability of existing labour; new workers are hired to facilitate equilibrium between demand and supply (Tcherneva, 2008:6). Consequently, more demand from foreign markets leads to more supply which involves more labour other factors held constant (Dizaji & Badri, 2014:81; Bobeica *et al.*, 2016). One of the exports' contributions on jobs creation resides in its power to boost the level of competitiveness. The study by Aswicahyono *et al.* (2014:16), on the relationship between exports and employment in Indonesian economy, asserted a positive relationship between these two economic indicators (net exports and employment). The outcome of their study revealed that growth in exports level increased the level of economic growth as well as employment rate in Indonesian economy.

In addition, similar results were found in Iran by Dizaji and Badri (2014:85) study which found that one percent increase in exports level resulted in 1.6 increases in employment rate. Furthermore, if a country's economic production is labour-intensive oriented; increasing exports will mean boosting job creation. This hypothesis is supported by a positive relationship found by Sousa *et al* (2012:11) in the study on the linkage between extra - EU exports and employment. There was a reciprocal relationship between exports growth and job creation within EU county members that focuses more on labour production than capital intensive production.

The role of exports in the economy is not only limited to create direct job but it also stimulates new jobs and protects existing ones. Countries with the higher level of exports are less likely to face unemployment growth (jobs loss) for beyond job creation exports sustain the existing jobs. In California, exports are considered as the engine for growing and sustaining jobs (Tschetter, 2010:2). The job created by manufacturing exports affect not only manufacturing sectors but also other sectors employment such agriculture, mining, and construction sectors (Nguyen, 2015:16). Consequently, there is a positive linkage between the manufacturing export growth and job creation within the manufacturing sector and in some other sectors where a decline in net exports level results in falling of employment rate

(Athukorala & Santosa, 1996:17). Thus, exports related manufacturing products plays a key role in increasing the number of jobs, even for low or unskilled job seekers as well as in the informal sector (Fukase, 2013:322).

2.4.2.2 Negative effects of exports on job creation

Although the aforementioned studies denoted a positive relationship between exports and job creation, Feenstra and Hong (2007:22) argued that in Chinese economy, between 2000 and 2005, domestic demand created more jobs than total exports. Moreover, exports increase may have an inverse relationship with job creation if production increase results into capital intensive. In other words, exports growth from technology evolution might destroy more jobs than it creates since productivity is capital-intensive. The case of Finland economy serves as an example where exports increase led to a decline in job creation from 13 percent to 11.6 percent in 2000 and 2007, respectively (Sousa *et al.*, 2012:12). Contrary to Sousa's (2012) findings, Ezell (2012:1) argued that technology improvement leads to higher productivity, higher exports and economics growth which are the engine of employment growth. This is because technology facilitates trade among countries and drives innovations. Consequently, a country intending to boost job creation through exports growth should not ignore the technology factor. This shows that improving capital intensive jobs in one sector may be the good start to labour intensive jobs in the other sectors though the general theory asserts that technology may destroy jobs instead of creating more jobs (Casey, 2004). Furthermore, Voulgaris *et al.* (2005), in their study on job creation and destruction in Greek manufacturing sector, found that more jobs are created by technological and capital-intensive sectors than labour intensive ones.

The exports growth might not necessarily mean a rise in number of jobs created as asserted by Berger and Martin (2011:21) that exports do not create jobs in all sectors. That is due to the fact that exports may create jobs in some sectors while destroying employment in other sectors. For instance, if exports increase results from increased number of working-hours per labour, the effect of that increase exports on job creation will be insignificant. A practical example was found in Kiyota's study (2011:13), on employment and trade in Japan, which found that an increase in exports demand led to an increase in working hours from exports while working hours from domestic consumption workers declined. Henceforth, the exports growth had no significant effects on local employment. Working-hours increase is not the

only negative results from exports towards job creation. When total exports growth leads to labour wages and per capita productivity growth, demand labour remains constant (Said & Elshennawy, 2010:155).

Shockingly, the negative effects of exports growth may not be only the cause of direct declining in employment level but also on physical, psychological and social life of employees and become an indirect cause of job loss. The study of Hummels *et al.* (2015), on the effects of exports on employees' injury and sickness in Danish, found that an increase in exports demand required enhancement in workers effort, increases working-hours, stress, and work related diseases, reduction in sick-leave leading to the future inability to work, and thus unemployment growth. Workers are pressurised to become more productive in short-run to meet required high quantities of exports demanded. Yet, they eventually loose productivity capacity resulting into job losses in the long-run.

Besides positive and negative effects of exports on job creation, the study by Los *et al.* (2015:26), on export and employment in China, found that exports might increase and leave employment or unemployment levels unaffected. The study revealed that if foreign demand rises together with the existing domestic labour productivity, the effect of exports growth on employment remains unchanged. In addition, Xikang *et al.* (2009) found that the jobs created by exports growth depend on economic sectors and their link to the foreign demand. This same study found that in some sectors, increase in exports has a huge significance on employment. In other sectors, the effect of exports on job creation might be minimal; whilst in some others exports growth has no effect on job creation at all.

Moreover, the share of imported goods and services, though minimal and sometimes not considered, can somehow contribute to job creation. For example, if a firm imports non-finished parts, it can increase employment by hiring new workers to transform those unfinished parts into finished products ready to be sold into foreign market (Tombazos, 1999). Therefore, spending on imports has its contribution to job creation, depending on what types of products are imported.

In the South African context, though there are some findings providing a nexus between job creation and exports in general, there is a shortage of studies providing information on how exports create jobs within different economic sectors. Therefore it is with imperative

importance to analyse how exports affect jobs creation in South Africa as it does in other countries.

2.4.3 Government spending and job creation

Numerous studies such as that by Kenyon (1997), Levine (2009), Hassen (2000), Cray (2011), Leigh and Neill *et al.* (2011) Estache *et al.* (2012), Maisonnave *at al.* (201) have been conducted and others are still being conducted to determine the relationship between job creation and government spending. Findings reached by different authors differ ones from another, depending on the study location (country) and/or the methodology employed by each study. If a study is conducted in developing country, its findings may differ from a study conducted in developed country, for in the latter county the focus might be investment while the former could be on consumption. Moreover if the methods used tests a one way relation relationship, its results will differ from the methodology that tests the interaction between total spending and job creation. Government spending creates more jobs in developed countries than in developing because n latter countries a higher amount of money is spent on other social issues. In addition, given that there multiple econometric approaches to analyses time series, one method might reach different results from other.

2.4.3.1 Positive relationship between government spending and job creation

Government spending is one of expansionary policies that drive firms and consumers' behaviour with regard to production and consumption (Dornbusch *et al.*, 2014). To increase a number of new jobs, government can employ different strategies trough fiscal policy depending on current economic situation of the country (Mayer *et al.*, 2010). Studies of Amjad (2005) and Holden and Sparrmany (2016), on how government expenditure's decisions affect employment, found that an increase in government spending led to economic growth which thereafter increases the level of employment. The more government spends, the lower is the unemployment rate and the higher is the number of new jobs created (Ramey, 2012:18).

To stimulate job creation, government must determine the right sector for resource allocation. Various studies conducted in different countries within different time periods (Kenyon, 1997; Levine, 2009; Hassen, 2000; Cray, 2011; Leigh & Neill *et al.*, 2011; Estache *et al.*, 2012; Maisonnave *at al.*, 2013; Houseman, 2014) found that government spending on infrastructure

should be key, to create more jobs. Consequently, government spending in this sector is considered to be one of better strategies to grow employment. Government spending on infrastructure and subsidies to domestic firms tend to improve investments and create more and durable jobs. If domestic firms are supported by government, the cost of production and distribution of good and services will be lower compared to the non-government interventions in business operations (Girma *et al.*, 2007; Beard *et al.*, 2011; Boushey & Ettlinger, 2011).

Beside infrastructure sector, manufacturing, construction and mining sectors hold their big share towards South African employment growth (Dlamini, 2012:4; Maia, 2013:6). These three sectors have a common characteristic which is to create direct and indirect jobs. Direct jobs are created by increasing hiring within the respected sectors; while indirect jobs are created by stimulating employment in other sectors (Houseman, 2014:2; Atkinson &, 2015:49). However, these sectors differ one from the other in sense that, manufacturing employs people with advanced skills and academic qualification, whilst construction and mining (being labour intensive sector) can hire even a large number of non-skilled or semi-skilled and less qualified individuals (Saks, 2008:185; StatsSA, 2016). Therefore, by increasing government spending in two later sectors of more less-educated and less-skilled jobseekers can boost employment.

Further, the three aforementioned sectors, other sectors such as financial institutions and business enterprises, also contribute more to the economic growth and to the job creation through increased government spending. Studies conducted by OECD, 2015; Neumark *et al.*, 2009; and International Labour Conference, 2015) found that the role of business enterprises in job creation is of high importance and consideration. Business enterprises create jobs for skilled, semi-skilled and lower skilled job seekers. In the rural areas, apart from agriculture sector, small businesses are the source of income and development.

2.4.3.2 Negative relationship between government spending and job creation

Although government may spend more on subsidies or support in different sectors to create more jobs, the contribution of young small and medium enterprises differs from maturity with large firms. The former can create and destroy more jobs at the same time, while the latter create and sustain jobs even during economic crises (Kerr *et al.*, 2014:2; OECD, 2015:6).

Without financial institutions, job creation in other different economic sectors is almost impossible. Similar to manufacturing, mining and construction, financial sector hires a certain number of employees and stimulates jobs within other economy's sectors. Through financial institutions, financial sector become a channel of money circulation or cash flows (Asmundson, 2011:46). Henceforth, government can increase jobs within various sectors via financial sector. In addition, financial sector in macro-economy plays other two important roles namely; job stimulation and job preservation in private sector (Botha, 2015:11; Praveen, 2011:7). Nevertheless, the weak-side of financial sector is that, it is easily affected during the economic crises' period. Thus, negative effect of crisis on financial sector reduces employment not only in financial sector but also its ability to create jobs in other sectors that depends on financial service (International Labour Organization, 2009).

Discussion in the above sections mostly supports the hypothesis that increase of government spending can create employment. However, findings of Afonso and Sousa (2012:5) stated that the government expenditure does not contribute more towards economic growth, which is the engine of employment growth. He asserted that what matters should not be how much government spend, rather where government spends the money. If government spending is not targeting economic growth, the relationship between job creation and government spending become negative. Moreover, as practical example, Mahmood and Khalid (2013:379) found that Pakistan government spent more resources on the war, and as a result unemployment increased. Furthermore, government spending on job creation is more effective during the sluggish economic conditions than when the economy is booming (Beard *et al.*, 2011). Therefore, the outcome of government spending on job creation is subjected to the economic cycle.

Whenever the country's economy is at peak, the level of government spending on employment or job creation declines and the government has a possibility to support other economic sectors. However, during the economic crisis government has to increase its budget on job creation and unemployment support (Bertolis & Hayes, 2014:82). When unemployment is high, as it is the current case of South Africa, government spending should also increase in order to support unemployed people and to create more jobs for job seekers (Loizides & Vamvoukas, 2005:146). Although Kenyon (1997), Levine (2009) and Maia (2013) asserted that government spending stimulates and creates jobs in private sectors, Ramey (2012:2) argued that government spending creates only direct employment not

otherwise. This is because job creation result from spending and government spending does not increase private spending, rather, in many cases government spending causes private sector's spending to decline.

2.4.4 Investment spending and job creation

2.4.4.1 Positive effects of investment spending on job creation

Job creation is one of the government's major duties. However, private and public sectors' investments play also a key role in creating new and sustaining existing jobs. Henceforth, job creation becomes possible as a result of good cooperation between public and private sectors. Keynesian theory asserts that the level of country employment depends on various fiscal policies and one of them is its ability of investment spending (Keynes, 1937:221). Given that economy can reach the equilibrium even when it is not operating at full capacity, Keynesian theory attests that the only strategy to create the balance between the economic equilibrium and full-employment should be a better management of aggregate expenditure because constant total spending leads to steady state of employment and/or unemployment (Levine, 2009:5). Therefore, real investment being one of the aggregate expenditure's components plays an indispensable role in job creation. The section below provides studies that support the relationship between job creation and investment spending.

Investment spending, which is regarded as gross fixed capital formation in the South African nomination, should not, in macroeconomic perspective, be treated as just a process of improvement in capital accumulation, but rather as one of four aggregate expenditure components which is effective to job creation (Munnell, 1992:191). Yet, the level of return on investment spending plays a crucial role in decision making about investment spending. The higher the return on investment spending; the more the people or companies become willing to invest. Therefore, a positive correlation exists between jobs creation and investment spending. The reason behind this positive relationship is that investment is deployed to create more employment as earnings from employment creates future investment (Heintz, 2000:4). This hypothesis of a positive relationship between job creation and investment spending was also proved to be right by the study of Psaltopoulos *et al.* (2011) on the relationship between investment and employment in the EU. The finding of the study was that in the EU rural regions more jobs were created throughout private investments spending. Consequently, there is a close link between investment spending and job creation.

The study of Michelitsch and Shi (2013:14), on the role of manufacturing on employment within 100 countries, proved that more jobs are created through investment spending. In the same context, the study conducted by Tschetter (2010), on the benefits of jobs in manufacturing, found that employees are less likely to abandon their jobs in manufacturing sector than in other sectors. Moreover, the study by Byiers *et al.* (2015) found that enhancement of quality and quantity of job in Sri Lanka from 2010 to 2012 was boosted by increased investment spending in manufacturing sector. Furthermore, investments spending from financial sector support the new small and medium entrepreneurs that are the engine and promoter of rural areas' job creation and local economic development (Denfeld, 2012:3). The role of investment spending in some economic sectors is not only limited to creating jobs, but it also rescues jobs lost during the economic crises by backing up the firm's competitive advantage (Atkinson & Stiglitz, 2015:49).

There is a tight cause-effect relationship between investment spending and employment as the former is one of the paramount strategies to create jobs whilst the latter can cause the former. The alteration of each of the two (employment and/or investment) causes a direct and mutual effects. The study conducted by Iacovoiu (2012) in Romania found that investment fluctuations in Romania between year 2004 and 2012 was associated with oscillations in employment rate. Thus, low level of investment spending leads to high joblessness and vice versa. In addition, Adelino *et al.*, (2014:25) attested that a better way to create more and durable jobs, is to invest in new or starting-up firms. New firms come with innovation within enterprises and create new opportunities for labour market; though such new firms require a higher investment spending in research and development.

Dinh *et al.*, (2012:46) asserted that for South Africa as well as other Sub-Saharan countries, more jobs could be created if the degree of investment spending in manufacturing sector increased. This is because a strong manufacturing sector would help to boost exports and competitiveness of developing countries rather than exporting raw materials and increasing imports that create jobs in foreign countries. The growth in manufacturing sector has been considered by Makgetla (2014:3) as the rescue of South African economy and as a solution to the chronic problem of unemployment, poverty and inequality. Additionally, applying vector autoregressive model in the study on the interaction between aggregate expenditure and job creation in South Africa, Habanabakize and Muzindutsi (2015) found that a better approach to create more jobs in the South African economy could be to increase investment and

government spending. Nevertheless, in this study the issue was to identify the appropriate sector in which investment can boost job creation. In this regard, Heintz (2000:11) had recommended that investment spending would be a good strategy to overcome the issue of joblessness in South Africa.

2.4.4.2 Negative effects of investment spending on job creation

Contrary to the aforementioned studies that recognise a positive relationship between investment spending and employment, the study by Maisonnave *et al.*, (2013:19) on the effect of investment spending on job creation, found that investment spending in some cases could not be a better solution for the joblessness issue. The reason behind this idea is that investment spending that creates jobs in one sector might be done in expense of the development (or job destruction) in other sectors. Moreover, the study by Nicholson and Noonan (2014:14) argued that investment spending might have small effects on employment in some sectors taking manufacturing as an example because of its higher level of employment turnover caused by technology improvement which somehow reduces labour demand. Therefore, technology can work as a double edged sword between firms and employees.

Investments spending on technology in local manufacturing sector improve competitiveness and productivity on one side. However, it also destroys jobs on the other side because it replaces or reduces a number of labour demanded (Rotman, 2013). Notwithstanding, the weak-side of financial sector is that it is easily affected during the economic crises period. The negative effect of crisis on financial sector reduces employment not only inside of financial sector but also its ability to create jobs in those sectors that depends on financial service (International Labour Organization, 2009).

2.5 THE EFFECT OF AGGREGATE EXPENDITURE ON SECTORIAL EMPLOYMENT

Although jobs might be created, each factor of aggregate expenditure has individual effects in a specific sector. There is a possibility that the jobs created in one sector may affect employment in other sectors. This section analyses the relationship between jobs created by aggregate expenditure in each sector, and how jobs created in one sector stimulates jobs in other economic sectors.

2.5.1 Aggregate expending and job creation in infrastructure sector

Spending on infrastructure improvement is one of decent strategies to create jobs (especially for youth) and to grow long-term overall employment (South Africa, 2011:61). The effect of spending on infrastructure on job creation and economic growth had been supported throughout the economic history. The study by Aschauer (1989), on whether public expenditure is effective towards employment, found that the money spent in constructing streets, highways, and mass transit system serves as a good strategy to create more jobs through increased productivity and economic growth. However, findings of Aschauer (1989) were criticised by Munnell (1992:193) who argued that infrastructure investment is subjected to the economic growth not otherwise.

With regards to the job creation, Cray (2011:2) hypnotised that among different ways of boosting employment growth, spending on infrastructure could play a considerable role. He stated that as it could not be possible to improve infrastructure without increasing labour demand. Likewise, Hassen, (2000:1); Cray *at al.* (2011:8) and Maisonnave *at al.* (2013:2) proved that in addition to creation of new jobs, spending on infrastructure also sustains the existing jobs because jobs created through infrastructure are generally durable. This means that new jobs are created during the construction of infrastructure and prolonged to maintain the new and existing infrastructures. The argument presented by Carew and Mandel (2014) to support that point of view is that the presence of adequate infrastructure reduces business costs and thereafter stimulates and eases job creation in other different sectors.

In 2014, the United States Congress, decided to increase spending on transportation infrastructure with the aim of boosting employment, creating more jobs and enhancing the country's competitiveness. Consequently, a number of jobs were created. The weight and power of infrastructure spending was proved by the fact that around 21,671 [jobs] resulted in each billion spent on transport infrastructure (Brun, *et al.*, 2014:02). Nevertheless, Estache *et al.* (2012) stated that, though the role of infrastructure spending cannot be denied, its success depends on individual's country policies. Consequently, the number of jobs created within infrastructure sector may differ from one country to the other. Developed countries and those with the advanced technology benefit more from manufacturing than the developing countries. The best side of spending on job creation in manufacturing is that employment

created in this sector stimulate and create jobs in other sectors such as business and manufacturing sectors (Estache *et al.*, 2012:3).

2.5.2 Aggregate spending and job creation in manufacturing sector

Jobs created in the infrastructure sector (specifically construction) affect positively job creation in manufacturing because developed infrastructure facilitates easy access of manufacturing inputs and distribution of outputs. The study by Shi & Michelitsch (2013:14) analysed the share of manufacturing role towards employment creation within 100 countries and proved that the manufacturing sector seconded infrastructure sector in creating more jobs. In the same context, the study conducted by the Langdon and Lehrman (2012), on the benefits of jobs in manufacturing, found that employees are less likely to abandon their jobs in manufacturing than in other sectors. Moreover, enhancement of quality and quantity of jobs in Sri Lanka from 2010 to 2012 was boosted by increase in investment spending in the manufacturing sector (Byiers *et al.*, 2015:17). Moreover, manufacturing investment spending does not only create jobs, but it also comes to rescue jobs lost during the economic crises by backing up firms' competitive advantage (Atkins *et al.*, 2015:49).

However, Gavin (2013:1) argued that employment turnover in manufacturing seems to be higher than in other sectors due to improvement of technology. When new technology comes into place, some workers become incompetent given that they do not have capacity and knowledge required by the new technology; and other employees leave firms seeking a better employment. Therefore, technology can work as a sword of two edges between firms and employees. Spending on technology in domestic manufacturing firms improves competitiveness and productivity on one side, but can also destroy jobs on the other side because it replaces some workers (Rotman, 2013). This idea of job destruction by technology in the manufacturing sector appears to be false to Williams *et al.* (2015) whose findings proved that technology and innovation improvement lead to firms' higher productivity and higher labour demand. In addition to Williams *et al.* (2015) findings, Houseman (2014) attested that not only manufacturing growth creates job within industry, it creates jobs in other sectors too. Therefore, increasing spending in the manufacturing sector allows creation of direct and indirect jobs.

In the South African context, the manufacturing sector generally plays an indispensable role in economy and particularly in job creation. However, according to Maia (2013), the growth

in the South African manufacturing faced a decline since 1970 to 2010 due the strong local and international competition. He stated that the slow growth in GDP affected not only the general economy but also the employment growth. Henceforth, in order to tackle unemployment issue, spending on manufacturing could have increase at least by 10 percent yearly (Maia, 2013:1). Such increase in spending on manufacturing would lead to a reduction in long-term jobless (Roux & Abedian, 2011:9). Moreover, for South Africa as well as other Sub-Saharan countries, more jobs can be created by increasing spending on the manufacturing sector. The stronger the manufacturing sector the higher would be the quantity of exports from these developing countries. This would help those countries to export final products and reduce imports that create jobs in foreign countries at the expense of domestic employment (Dinh *et al.*, 2012:46). The growth in the manufacturing sector has been considered by Makgetla (2014:3) as the rescue of South African economy and solution to the chronic problem of unemployment, poverty and inequality.

Although in many countries jobs are created in the manufacturing sector, there is a barrier limiting low skilled people and less educated people to be employed in the manufacturing sector; because generally jobs in this sector require higher qualifications and developed skills (Levinson, 2015:6). In contrast to the manufacturing, construction sector is seen as the sector that employs more labour regardless of their skills and academic qualification (CIDB, 2015). Hence, it is important to devote the next section to the analysis of interaction between spending on construction and job creation.

2.5.3 Aggregate expenditure and job creation in construction sector

Construction sector, in many countries, plays a major role in nation's economic growth and affect positively the level of job creation (Dlamini, 2012:4). As mentioned in the previous sections, construction is one of the important sectors in job creation in South Africa. The role of the construction sector in employment creation resides into its capacity to employ low-skilled persons who tend to dominate the South African workforce. Besides, a big share of aggregate spending in the construction sector comes from private sectors whose power to create more jobs is significant (Altman *et al.*, 2003:4). An increase in construction rate influences labour demand especially in local labour market because the construction sector is regarded as one of a labour intensive production sectors. Thus, there is a positive relationship between construction and labour demand. The more new buildings and houses are needed,

the higher is the demand for labour (Saks, 2008:185). This idea is supported by the fact that besides direct jobs created within the sector; the construction sector stimulates and influences job creation in other sectors such as manufacturing, real estate and business enterprises.

The construction sector differs from manufacturing sector, for spending in the former sector creates direct jobs in formal and informal sectors. In 2014, from the total number of job created either in formal or informal sector in South Africa, construction sector contribution was 9 percent (CIDB, 2015:4). Unfortunately, the report from Statistics South Africa (2016) indicates a decline of employment rate in the fourth quarter of 2015 in respect to the construction sector. This decline did not affect only construction but also mining sector which is the subject of the next discussion.

2.5.4 Aggregate Expenditure and job creation in mining sector

The mining sector is one of the key sectors that tend to contribute to employment creation worldwide. The reason being that mining sector contributes to the economic growth which is the cornerstone of employment growth. Maia (2013:6) stated that in Australia, more than 10 percent of country's GDP came from the mining sector and that the mining sector employed more than 2 percent of the total work force. Beside from job created internally; the mining sector created more jobs in other industries such manufacturing, transportation, warehousing, construction and technology services (Australian Government, 2014). Manufacturing sector transforms mining products from raw materials to final products; these products have to be transported from producers to retails and consumers. In meantime, they need to be stored in warehouses. All these activities require labour to be accomplished, thus job creation.

Employment in the South African mining sector has been affected by different situations such as labour unrest and the decline in commodity prices. Although the South African mining sector was facing serious challenges, the study of Malherbe (2000:2), on the contribution of the mining sector on South African economy, stated that over the time the South African mining sector had the highest number in regard to the total South African exports as its share covered a half of total exports. This study revealed that in 1996 one out of seven black male working in formal sector was hired in the mining sector. Despite a feasible declining in real investment into the South African mining sector in 2013, the contribution of the mining sector investment was 5.8 percent on total sales; and in 2015, the mining sector's contribution to the total South African employment was 38 percent (Chamber of Mines of South Africa,

2014:4). This could explain why the mining sector needs a special attention because of its role in the South African economy, especially with regard to the employment growth.

2.5.5 Aggregate expenditure and job creation in financial sector

Job creation in the abovementioned sectors is almost impossible if financial sector is ignored. Financial sector is an important sector whose role affects job creation within other economic sectors. Financial sector provides financial services which refer to the involvement of the financial institutions to mediate in acquirement and money circulation (Asmundson, 2011:46). Henceforth, investment and spending in other sectors is almost impossible when financial sector is not well functioning. That is why, according to the South African finance minister Pravin Gordhan (2011:1), the role of financial sector is broadly to support all the levels of economy in order to bring better life for the society. In other words, financial sector is not limited only to the stability of financial institutions. In the context of macro-economics, a stable financial sector enables economic growth, facilitates job creation in different sectors and eventually reduces poverty and inequality (Government of South Africa, 2011a).

The financial sector is the basis of direct and indirect employment. It creates direct employment by increasing the number of employees within the sector and indirect employment by allowing other sectors to create more jobs (Rao, 2015:6). Furthermore, the financial institutions create jobs in formal sector as well as in informal sectors. This can explain why in countries where financial institutions are unstable and weak, the rate of unemployment is very high. It has been stated by the South African government (2011b:3) that a positive relationship exists between the financial sector and employment growth in South Africa where the financial sector is classified among the faster growing-employers (Asmundson, 2011). Financial sector, by improving the micro-finance, increases the number of jobs created by the start-up businesses.

In addition, the financial sector plays other two important roles namely job stimulation and job preservations in the private sector (Botha, 2015:11; Praveen, 2011:7). The financial sector eases access to financial funds that allow business growth and self-employment (IFC, 2010:34). Boosting investment spending in the financial sector enhances productivity in other economic sectors.

A cashless country is a job loser country because the financial sector facilitates the monetary movement among private, public sectors and individuals (Denfeld, 2012:1). Therefore, most of economic decisions, especially decision with regard to the job creation are influenced by the state of the financial sector. Spending on the financial sector supports new small and medium entrepreneurs who are the engine and promoter of rural area's job creation and local economic development (Denfeld, 2012:3). The financial sector creates enabling environment that eases job growth in manufacturing and infrastructure. With the ease access to finance productivity in other sectors increases leading to economy growth and job creation, especially when financial institutions reduce the cost of saving and borrowing (Rao, 2015:6).

Notwithstanding, the weak-side of the financial sector is that it is easily affected during the crises period. The negative effect of crisis on financial sector reduces employment not only inside of financial sector but also its ability to create jobs in those sectors that depends on financial service (ILO, 2009). Strength or weakness of the financial sector is mostly measured through job created in the business enterprises sector. Hence, the link between job creation and spending on business sector is discussed next.

2.5.6 Aggregate expenditure in business enterprises sector and job creation

The idea about job creation through business enterprises was generated into the early work of David Burch (1979) raising the issue of how the USA was losing jobs in the manufacturing sector to the benefit of foreign countries' employment. David raised the concern that lack of employment growth was due to lack of sufficient information with regard to the job creation process. His aim was to distinguish whether new and small firms create more jobs than large and old firms and vice versa. The result of his study showed that between 1969 and 1976, more than 2/3 of net employment created, resulted from small firms and small firms hired more youth than large firms (Birch, 1979:17). Birch (1981, 1987) provided the evidence of the role of small and medium enterprises in creating jobs in the US economy. Therefore, based on these findings small firms deserves a special attention in promoting economic growth and job creation.

The business enterprises sector due to its ability of innovation is one of the most important sectors in creating jobs. The study conducted in 18 countries of OECD, on how employment was affected by business enterprises between 2001 and 2011, found that around 75 percent of total employment was coming from new employment generated by small business (OECD,

2015). In addition, though in developing countries the small medium enterprises have a lower productivity compared to large firms, the study by Neumark *et al.* (2008:16) highlighted the important contribution of those small and medium enterprises to the total employment and job creation. He stated that small business increase jobs, especially with informal employment, because they do not require someone to have higher qualification to be employed in business sector. In the other words, few entrepreneurs are enough to move large communities towards employment. In addition, Haltiwanger *et al.*, 2010:4; Freund (2011); Kerr *et al.* (2014:2) and Criscuolo *et al.* (2014:6) asserted that business sector creates jobs.

Despite challenges that can be faced by the business sector, the balance of success and failure of this sector was revealed by Page and Söderbom (2015) who analysed the impact of a firm's size on job creation. Their finding was that in early age of firm more jobs are created; however the likelihood of firms' growth goes together with the probability of failing hence leading to job destruction. Henceforth, more jobs are created and destroyed in small enterprises. The net job created by the small and medium enterprises become as lower as the firm expands, while large and mature firms create and sustain jobs.

2.6 SUMMARY AND CONCLUSION

The aim of chapter two was to review different theories that concern this study. This chapter commenced by providing definitions of key terms, differences between Keynesian theory of employment and other theories that consider unemployment and job creation issues as their first priorities. The classical theory argues that more jobs can be created by increasing the level of production and that supply creates its own demand. In contrast, the Keynesian theory of employment however, suggests that boosting employment should depend on total spending that results in demand increase for demand creates its own supply and a higher demand requires a hire number of workers, *ceteris paribus*. Thus, demand stimulates job creation. Although these two theories received praises and criticisms, they are still playing an important role in the current macroeconomic arena.

The chapter referred to some empirical studies to provide current evidence that illustrate the vital and applicability of the Keynesian theory on nowadays' economy. The typical example was how the United States' government applied this theory by using government spending to overcome different economic crises and positive results were obtained.

Government spending was not the only component aggregate expenditure found to be beneficial towards job creation. The study presented different findings from different studies that proved that by increasing spending using one of four aggregate expenditures namely consumption, investment, government spending and net export, employment level is affected in one way or the other. Furthermore, this chapter provided theories and empirical results from different studies that revealed the effect of total spending on job creation within different economic sectors. Most of these studies found that sometimes the four components of aggregate expenditure impact on economic jobs creation.

Then level of job created into the economy depends on how much money is spent on which sector. Spending on business sector allows job creation for different people with different skills as business enterprises can accommodate any kind of skills. Supporting construction and manufacturing sector through aggregate expenditure creates short-term and long-term employment. Jobs created in these two sectors stimulate employment in other sector. Growing mining sector improves foreign trade, and this boost country's exports which play an important role in domestic job creation. Financial sector has the ability to create internal jobs and also to create indirect jobs in other sectors by enabling funds access in other sectors.

Different researchers proved that even in the South African context, job creation can also be affected by Keynesian theory. Increment of aggregate expenditure has the ability to curb the rate of unemployment. In addition, there is an interaction between job created and job loss in one sector towards other economic sectors. In regards to how the South African major economic sectors are affected by total spending, there not enough theories and empirical studies to illustrate it. This supports this study which aims to contribute in knowledge on aggregate expenditure and job creation in South Africa. The next chapter focuses on econometrics modelling and methods used to analyse the effect of aggregate spending on job creation in different South African economic sectors.

CHAPTER 3: RESEARCH DESIGN AND METHODOLOGY

3.1 INTRODUCTION

The previous chapter was dedicated on giving a meaningful and concise explanation of Keynesian theory of employment. The Keynesian theory encountered numerous praises and criticisms from different economists in different times. From the reviewed empirical studies, one might not be wrong to assert that the Keynesian theory remains relevant and applicable today in attempt to solve the issue of unemployment. Different methods and models were employed by studies (Yazdanfar and Salman (2012); Lawless (2013)) in analyzing the determinants of job creation. Some studies (Andrei (2009); Afonso and Sousa (2012) and Adelino *et al.* (2014) had used the multivariate approaches such as VAR, Johansen co-integration and VECM, to analyze the relationship between job creation and aggregate expenditure; while others studies (Pinn (2011) and Irpan (2016)) employed other techniques with single equation such as Engle Granger and Autoregressive Distributed Lagged (ARDL)

This chapter aims to achieve four objectives. First, variables used to determine the relationship between aggregate expenditure and job creation are described in details. Secondly, this chapter presents the basic theory of the adopted methodology. Thirdly, a specification and a buildup of the model are provided. The last, objective is to present and justify the economic reasons behind the choice of the model and the other techniques employed in this study. In light of empirical studies presented in chapter 2, the vector autoregressive (VAR) model was the predominant method employed by many other researchers to determine the relationship between each component of aggregate expenditure and job creation in different economic sectors. Consequently, this chapter will provide a synopsis of this method and its techniques, in order to present the benefits and limitation of this model. In addition, this chapter will present the ARDL model as these two models can be used mutually exclusive depending on the nature of time series (variables) to be analysed.

The chapter is further subdivided in three main parts. The first part focuses on the source, description and measurement of economic variables subjected to this study. The second section discusses the model specification and other econometric approaches maintaining the focus on the ARDL and the VAR approaches and their characteristics. The last section provides summaries and concluding remarks of the chapter.

3.2 DATA SOURCE, SAMPLE PERIOD AND VARIABLES DESCRIPTION

In order to determine the effect of aggregate expenditure and sectorial jobs creation in South Africa, this study employed a secondary and quarterly time series that covers the timeframe of 21 years. The data starting date is 1994 first quarter and the ending date is 2015 fourth quarter. The choice of starting date was motivated by the fact that the data of pre 1994 period might be affected by the economic sanctions imposed on the apartheid government. Therefore, the use of this data might lead to an erroneous conclusion. The closing date was chosen based on the availability of the most current data. The employment was used as a proxy for job creation in five economic sectors namely business enterprises, construction, financial, manufacturing and mining sector. The used seasonal adjusted data was procured from the South African Reserve Bank (SARB).

Before the analysis of any kind of relationship between dependent and independent variables, all variables were transformed into natural logarithm. This was done with the intension of determining the elasticity of job creation within five economic sectors in response to the change in aggregate expenditure. Notwithstanding, since there is no logarithm of negative numbers (values), the net export could not be transformed as some of its series are negative. Based on their indispensable role in South African economy, five economic sectors (business, construction, financial, manufacturing and mining sector) were selected and analysed.

3.2.1 Description and measurement of dependent variables

The South African employment comprises with different sectors and each sector plays its own indispensable role in job creation. Since it would be difficult to analyse the contribution of all of South African economic sectors in this study, the focus was given to five sectors namely business enterprises, construction, financial, manufacturing and mining sectors. This section describes, in concise way, each of the selected sectors and provides the measurement of employment in that sector. The table comparing the employment growth in those five sectors is provided at the end of this section.

- Business sector is one of the prominent sectors in South African GDP and employment. It comprises small, medium and large enterprises; and hires an important number of labours from South African labour force. The contribution of business sector towards the GDP increased from 18 percent to 22.8 between 1980

and 2012 respectively (IDC, 2013). The index of employment in business enterprises sector declined from 202.8 in 1994 to 1201.3 in 2015 (SARB, 2015).

- Construction sector was chosen in this study based on its capacity to create short and long term employment. Construction sector is one of the South African major economic sectors that generate direct and indirect employment (StatSA, 2014). It creates direct employment because it has a hiring capacity and indirect employment because it can stimulate employment in other sectors such business enterprises and manufacturing (SARB, 2015). During the period of 21 years, from 1994 to 2015, the index of employment in construction grew from 89 in 1994 to 115 in 2015.
- Financial sector is another sector that plays an important role in economic growth and employment in particular. This sector includes the South African Reserve Bank, commercial banks and other financial institutions and services (SARB, 2012). The major role played by financial sector is to facilitate financial transactions between banks, individuals, business institutions and other sectors. Between 1994 and 2015, financial employment shows a remarkable improvement, from 10.9 in 1994 to 113.1 in 2015 (SARB, 2012). This growth can explain why this sector was considered to be a part of this study analysis. The level of employment growth or job creation in this sector is measured using index of total employment.
- Manufacturing sector is also one of the South African major economic sectors. It refers to the process of employing labour and some other tools to produce semi-finished (intermediaries) and final goods that can be sold within domestic or international markets (SEDA, 2012:19). The South African Statistics (2014) distinguish three types of products in manufacturing sector: Food and cloth products, beverages and tobacco; secondary production of furniture and N.E.C (which is a set of sport products, jewellery, and stationary and music instruments). Employment in this sector is measured using the index of total employment (SARB, 2015). Similar to the other sectors, employment in manufacturing sector is measured using index.

- South African mining sector is one of the key sectors that contribute on economic growth and especially on the country's exports. A large quantity of South African exports comes from mining sector. South African mining sector is composed of gold mining, coal mining and other minerals (StartSA, 2015). Employment in this sector is measured in the form of index. The choice of this sector for analysis on job creation was motivated by its contribution on South African economic growth between 1994 and 2015. Employment in manufacturing sector was 10.9 index in 1994 and grew to 113.1 in 2015.

Job creation or employment index within the aforementioned sectors appears to have faced shocks from 1994 to 2015. As it is indicated by values presented in Table 3.1, the only sector that encountered minimal challenges to growth of jobs during the considered period was financial sector. The results depicted in Table 3.1, indicate that in all sectors employment increased in 2006 and 2007. In 2013, employment growth was higher in business enterprises and construction sectors growing by 11.31percent and 13.38 respectively. Financial sector reached the highest employment growth of 61.23 in 2003. In addition, in 2006 manufacturing sector reached its higher employment growth of 9.48 percent and in the following year 2007, mining sector reached its highest employment growth at the rate of 8.13percent.

Table 3-1: Percentage growth in sectoral employment between 1994 and 2015

Date	Business enterprises	Construction	Financial	Manufacturing	Mining
1995	-0.75%	-2.82%	4.59%	0.62%	-2.14%
1996	-1.51%	-8.13%	6.14%	-3.71%	-4.70%
1997	-3.16%	-4.17%	1.65%	-4.10%	-3.44%
1998	-4.26%	-9.89%	-0.81%	-3.27%	-15.97%
1999	-5.88%	-16.40%	-5.74%	-2.60%	-5.97%
2000	-8.52%	-4.73%	-3.48%	-1.51%	-3.70%
2001	-9.13%	-1.84%	-1.80%	-2.62%	-2.28%
2002	-13.90%	28.84%	23.12%	-0.65%	1.35%
2003	-12.64%	7.12%	19.23%	-0.28%	3.15%
2004	-5.42%	-0.95%	13.43%	-0.28%	7.28%
2005	-5.43%	41.92%	23.68%	-4.97%	-2.63%
2006	5.53%	8.01%	14.30%	9.48%	3.71%
2007	3.26%	2.86%	7.24%	1.71%	8.13%
2008	-0.48%	0.00%	3.57%	-1.60%	4.31%
2009	-0.29%	-8.08%	-4.75%	-6.67%	-5.38%
2010	-3.47%	-5.48%	-2.25%	-3.47%	1.52%
2011	1.10%	3.50%	2.50%	-1.40%	3.40%
2012	8.41%	1.84%	0.78%	-0.30%	1.26%
2013	11.31%	13.38%	6.87%	0.71%	-2.87%
2014	2.13%	2.01%	1.00%	-1.52%	-2.95%
2015	-0.72%	5.09%	4.30%	0.72%	-2.84%

Source: Compiled by author

3.2.2 Description and measurement of independent variables

The study employed the aggregate expenditure's components as independent variables. In the Keynesian theory, the aggregate expenditure (AE) is set of four factors which are consumption (c), government spending (G), investment (I) and net export (NX). Therefore, symbolically, the aggregate expenditure is expressed as follow:

$$AE = C + G + I + NX$$

These four components, their composition and measurement are described in the next paragraphs.

3.2.2.1 Final expenditure by households

The final expenditure on consumption by households was used in the model as a macroeconomic variable. Under South African National Account, this type of spending

encompasses two main components namely spending on durable goods, semi-durable goods, non-durable goods, and spending on service. The final expenditure includes also the spending of non-profit organisation on household's consumption (SARB, 2015). Considering total spending on domestic and foreign goods and services, final expenditure by households holds a large share of total spending for it fluctuates between 60 percent and 63 percent of the aggregate spending in South African economy (IDC, 2016). The final consumption expenditure by households in South Africa is a component of aggregate expenditure and it is measured in millions Rand.

3.2.2.2 Final expenditure on consumption by general government

Government expenditure is another component of aggregate expenditure which plays a major role in macroeconomic policies. In South African context, government expenditure enfold the spending on current wages and salaries, spending on goods and services of non-capital nature, and spending on different governmental departments (SARB, 2015). The government spending being one of gross domestic product (GDP) is sourced from different types of taxes and international transactions, and it is measured in billions of Rand (SARB, 2015:73).

3.2.2.3 Investment spending (real gross fixed capital formation)

Another economic variable used by this study to determine the relationship between aggregate expenditure and job creation was investment spending. Investment spending known as gross fixed capital formation plays an important role in South Africa in general economy and in job creation in a special way. It is a function of income and it is measured in billions of Rand (SARB, 2015). Investment spending remains the main cause of variation in other economic activities (Mohr *et al.*, 2015:322), meaning that the higher volatility in job creation might be a result of shocks in investment spending. The South African gross fixed capital formation is enfolded by investment spending from public corporations, private business enterprises and the general government (SARB, 2015). Investment spending value is measured in millions of Rand.

3.2.2.4 Total net exports of goods and services

Apart from those three macroeconomic variables discussed, the net-exports play a big role in economic growth. The net export captures the difference between total quantity exported and the total quantity imported. It is measured in millions of Rand (SARB, 2015). In Keynesian

theory, as explained in chapter two, exports increase is one of the key factors that generate job creation. However, in South African context, within the period from 1994 to 2015, the net exports faced a dramatic slowdown. In 1994 the value of South African net exports was 1,116,540 rand and from time to time it declined down to 0. 297680 million, in the fourth quarter of 2015.

3.3 ECONOMETRIC MODELLING

It has been revealed that the use of Ordinal Least of Square (OLS) approach when analysing econometric time series may sometimes lead to a spurious outcome and thereafter lead to the wrong conclusion and wrong policies (Mina, 2011:202-218). This explains why many time series studies are currently relying on robust and sophisticated research approach and models such as Vector Autoregressive (VAR) and Autoregressive Distributed Lag (ARDL) approaches. In addition, the use of the strong econometrics tools helps to identify and avoid different problems such as data unit root or non-stationary data, heteroscedasticity, autocorrelation, and multicollinearity (Arodoye & Iyoha, 2014:127-129). In regard to this study, the autoregressive model was selected based on the fact that variables were stationary at different order of integration.

Since the series employed in this study consists of different order of integration, the ARDL model was chosen as better approach to determine the long run relationship or co-integration among variables.

3.3.1 Autoregressive Distributed Lag (ARDL) Model

The analysis of the linkage between aggregate expenditure and job creation in five selected sectors included the use of autoregressive distributed lag modelling. The Pesaran (2001) ARDL was used in this study as it was employed in other similar studies (Ibrahim *et al.*, 2009; Maqbool & Mahmood, 2013; Pesaran *et al.*, 2001) to determine the long-run relationship between time series. One of the benefits of Autoregressive Distributed Lag Model is that it can be used when variables are integrated at order zero [I (0)], at order one [I (1) or even when a mixture of order zero and order one {I (0) and I (1)} is found in variables (Pesaran & Shi, 1998:371). However, this approach cannot be employed if variables are integrated at order two [I (2)]. Moreover, the ARDL approach assists in overcoming the issue of mixture and non-stationary series (Dube & Zhou, 2013:204).

Furthermore, the benefit of the Autoregressive Distributed Lag model is that it can be employed on both small and large sample (Pesaran & Shin, 1999). Besides that advantage the ARDL model has other different advantages. Contrary, Engle and Granger (1988), Johansen (1988), and Stock and Watson (1988) argued that variables under the study must be integrated at the same order.

Pesaran, Shin and Smith (2001) asserted the ability of ARDL approach to analyse variables that are stationary (integrated of order zero) or I (0), variables that are stationary at the first difference (integrated of order one) or I (1) and even the mixture of I(0) and I(1). Therefore, the Pesaran (2001) bound test is useful even when the knowledge of independent variables order is uncertain, because the outcome or results of unit root test are not always certain (Belke & Polleit 2006). The long run estimated coefficients are asymptotically normal regardless of the integration order of variables, whether they are I (0), I (1) or a mixture of both orders (Pesaran & Shin 1999).

Notwithstanding, the bound test of co-integration is based on the single co-integration and similar to the other approaches that use a single equation. They ignore that there might be more than one co-integration equations (Muchapondwa & Pimhidzai 2011). This is one of weaknesses of ARDL model. In addition, ARDL model cannot be employed if variables are co-integrated of order two, I (2).

In this study the ARDL approach or bound test of co-integration approach was used as follows:

$$TEMP_t = f (AE_t) \quad (3.1)$$

With AE having 4 components this function is expressed as follows:

$$TEMP_t = f (CONS_t + GOV_t + INVE_t + NEXP_t) \quad (3.2)$$

Where, $TEMP_t$ = total employment at time t

$CONS_t$ denotes households' consumption spending at time t

$GOVS_t$ denotes government spending at time t

$INVES_t$ denotes investment spending at time t

$NEXP_t$ denotes the net export at time t

Since the aim of the study is to analyse sector based employment, employment in each individual sector is presented as a function of the components of aggregate expenditure and represented as follows:

$$EBUS_t = f(CONS_t + GOVS_t + INVES_t + NEXP_t) \quad (3.3)$$

$$ECONS_t = f(CONS_t + GOVS_t + INVES_t + NEXP_t) \quad (3.4)$$

$$EFIN_t = f(CONS_t + GOVS_t + INVES_t + NEXP_t) \quad (3.5)$$

$$EMAN_t = f(CONS_t + GOVS_t + INVES_t + NEXP_t) \quad (3.6)$$

$$EMIN_t = f(CONS_t + GOVS_t + INVES_t + NEXP_t) \quad (3.7)$$

Where, $EBUS_t$ = employment in business enterprises at time t

$ECONS_t$ = employment in construction sector at time t

$EFIN_t$ = employment in financial sector at time t

$EMAN_t$ = employment in manufacturing sector at time t

$EMIN_t$ = employment in mining sector at time t

All variables were converted into a logarithmic form. Converting variable into natural logarithm allows for the analysis of growth or elasticity. The effect of components of aggregate expenditure on job creation in five selected sectors was achieved using the following the Autoregressive Distributed Lag models:

$$\begin{aligned} \Delta LEMP_t = & \alpha_0 + \sum_{j=1}^k \beta_j \Delta LEMP_{t-j} + \sum_{j=1}^k \gamma_j \Delta LCONS_{t-j} + \sum_{j=1}^k \delta_j \Delta LGOVS_{t-j} \\ & + \sum_{j=1}^k \tau_j \Delta LINVES_{t-j} + \sum_{j=1}^k \vartheta_j \Delta LNEXP_{t-j} + \varphi_1 LEMP_{t-1} + \varphi_2 LCONS_{t-1} + \varphi_3 LGOVS_{t-1} \\ & + \varphi_4 LINVES_{t-1} + \varphi_5 LNEXP_{t-1} + e_t \end{aligned} \quad (3.8)$$

Where LEMP denotes the natural log of total employment (representing the sum of job created), LCONS is the natural log of households consumption, LINVES represent the natural log of investment spending, and LNEXP indicates the natural log of the net exports. Coefficients β_j , γ_j , δ_j , τ_j , ϑ_j indicate the short-run relationship in the model; while φ_1 , φ_2 , φ_3 , φ_4 and φ_5 indicate the long run relationship among variables, and e_t represents error term.

The following hypotheses are used to test the co-integration among variable:

$$H_0: \varphi_1 = \varphi_2 = \varphi_3 = \varphi_4 = \varphi_5 = 0: \text{(variables are co-integrated)}$$

$$H_1: \varphi_1 \neq \varphi_2 \neq \varphi_3 \neq \varphi_4 \neq \varphi_5 \neq 0: \text{(variable are not co-integrated)}$$

The F-statistics is compared to the critical values provided in Pesaran *et al.* (2001) Table V. these critical values are divided into two groups. The first group represents a lower bound (F_L) suggesting that all variable are integrated of order one I (0). The second group represents the upper bound (F_U) suggesting that all variables are integrated of order one I (1). If the calculated F-statistics is lower than the lower bound ($F_{calc} < F_L$), the null hypothesis is not rejected and this implies the absence of co-integration among variables. On the other hand, if the calculated F-statistics is greater than the upper bound ($F_{calc} > F_U$), the null hypothesis is rejected indicating the presence of co-integration among variables. Nonetheless, if the calculated F-statistics falls between the two bounds ($F_L < F_{calc} < F_U$), without further information, the test results are inconclusive and the order of integration of the variables under the study need to be examined for further steps of analysis.

The bound test or long-run relationship is achieved comparing Wald or estimated F-statistics to the critical values. The presence of long-run relationship automatically suggests the error correction model (ECM). In regards to this study, the following equation was estimated:

$$\begin{aligned} \Delta LEMP_t = & \alpha_0 + \sum_{j=1}^k \beta_j \Delta LEMP_{t-j} + \sum_{j=1}^k \gamma_j \Delta LCONS_{t-j} + \sum_{j=1}^k \delta_j \Delta LGOVS_{t-j} \\ & + \sum_{j=1}^k \tau_j \Delta LINVES_{t-j} + \sum_{j=1}^k \vartheta_j \Delta LNEXP_{t-j} + ECT_{t-1} + e_t \end{aligned} \quad (3.9)$$

Where ECT represents the error correction term used to measure the adjustment speed towards long run equilibrium.

In the next step (third), the Error Correction Model (ECM) in equation (3.9) is repeated with each dependent variable (employment in business enterprises, employment in construction

sector, employment in financial sector, employment manufacturing sector, and employment in manufacturing sector) with the aggregate expenditure components (consumption, government spending, investment, and net exports) to test the joint significance.

The number of co-integration vectors is determined by the number of the significant F-statistics. The estimation of ARDL is preceded with the equations 8 to 12, testing the co-integration between employment in each economic sector and the aggregate expenditure. The step that follows the co-integration test, short-run relationship analysis and error correction term is the causality test which is described below.

3.3.2 Granger Causality Model

The Granger Causality test is a tool used to analyse the directional causal relationship among variables and it provides the basic information to predict the future of one time series based on the knowledge obtained from the other series (Weiner, 1956). If the series Y “Granger causes the series Z, it can be concluded that the knowledge about previous value of the series Y possess the helpful information to forecast the possible behaviour of the series Z (Granger, 1969). The mathematical formulation and application of this model are mostly subjected to the types of variables under the study; hence the causal factors represented in the model depend on the selected variables (Seth, 2007).

Though the Granger Causality Model is used as one of the major model in forecasting, it has its limitations. Predicting a future behaviour of one variable based on only one order in the system and ignoring others, influences that might come from other variables can in some cases lead to a bias conclusion (Gujarati, 1995). Since the causality test depends on the number of lags included in the model, the result might differ depending on the number of lags selected and this appears as the weak side of the model (Gujarati, 1995). In addition, Granger causality uses the times series in nature and mostly these series are not stationary, which may lead to the spurious outcome and false prediction (Huang *et al.*, 2004:34).

If the co-integration, short-run relationship, Error Correction Model and Granger Causality are performed with non-stationary data or data with unit root, there is a higher probability that the obtained results are false. Henceforth the unit root test and lag selection must precede the other aforementioned econometric tests and analysis.

3.3.3 Unit root and Stationarity tests

Since a non-stationary data analysis results in spurious conclusion, the unit root test remains the first step to be conducted when dealing with time series analysing (Gujarati and Porter 2010). The aim of unit root and stationarity test is to bring the series mean, variance and auto-covariance to steady state over time (Brooks, 2014:318). Henceforth, it is imperative to commence any kind of time series analysis at the unit root test. Two approaches namely parametric and non-parametric are generally used for stationarity test. The parametric is mostly used in studies that focus on time domain such as economics while non-parametric approaches are usually employed in the studies focusing on frequency domain such as electrical engineering (Bethea & Rhinehart, 1991). Different econometrics techniques namely Augmented Dickey-Fuller (ADF), Phillip-Peron (PP) and Kwiatkowski, Phillips, Schmidt, and Shin (KPSS) stationary were applied to detect the unit root and stationarity of data. Due to the different shocks faced by South African economy, multiple structural breaks were found in series and this required the study to conduct the structural break unit root test. The causality among variables was determined using Granger Causality test and the accuracy of findings was tested using residual diagnostic tests. These are the tests used in this study to determine the integration order of the observed series.

3.3.3.1 Augmented Dickey-Fuller (ADF) and Phillip-Peron (PP) tests

The OLS estimation is the foundation of ADF test; the test is performed using intercept, trend, or both at the same time. The assumption of unit root test using ADF test is that the regressed variable(Y) follows autoregressive of the order AR (p) and consider the effect of lag in series. The following is the general estimation of the model:

$$\Delta Y_t = \alpha Y_{t-1} + \varphi x_t + \lambda_1 \Delta Y_{t-1} + \lambda_2 \Delta Y_{t-2} + \dots + \lambda_n \Delta Y_{t-n} + v_t \quad (3.10)$$

Where x_t denotes exogenous variables which might be a constant, or a constant with trend; φ and λ symbolise estimated parameters and v_t denotes the white noise. Based on the equation 3.10 the hypotheses for unit root test under ADF are the following:

H_0 : The variable has a unit root (is not stationary)

H_1 : The variable has no unit root (is stationary)

The null hypothesis (H0) is rejected in favour of alternative; if the tested variable has a unit root, otherwise the alternative hypothesis (H1) is rejected if the variable has a unit root. This process is repeated until the null hypothesis is rejected. The procedure of ADF to test of unit root is similar to PP unit root test (Brooks, 2014:331).

However, the Phillips and Peron (1988) unit root test is mostly useful for series with structural breaks and it assumes that residuals are not normally distributed. The ADF and PP tests usually reach the same results and encounter the same limitation (Brooks, 2014:331). The representation of PP procedure is the simple form of AR (1) as follow:

$$Y_t = \alpha Y_{t-1} + \varphi x_t + u_t \quad (3.11)$$

$$y_t = \beta_0 + \beta_1 t + \beta_2 y_t + u_t \quad (3.12)$$

Where β_0 designates a constant and t designates a trend. If $\beta_1 = 0$, then the series has a unit root. If however, $\beta_1 < 0$, the series has no unit root.

The weakness of these two tests is the difficulties in determining when to include constant and trends in the model. In addition, these tests lead to doubtful results when the sample size of data is small, and when the root in series is very close to the non-stationary boundary (Brooks, 2014:334). Moreover, if irrelevant variables are included in the model, the power of ADF test declines and the null hypothesis might not be rejected while variables contain unit root. Henceforth, the graphical analysis should follow the ADF and PP tests to ensure the accuracy of the outcome (Verbeek, 2004). Therefore, KPSS become important in time series analysis as it plays the role of a confirmatory of ADF and PP results.

3.3.3.2 Kwiatkowski-Phillips-Schmidt-Shin (KPSS) stationarity test

To overcome the limitation of the ADF and PP tests, Kwiatkowski *et al.* (1992) suggested the alternative way to ensure that the data is stationary. Contrary to ADF and PP that test whether variables have a unit root, KPSS tests if the series is stationarity or not. The null hypothesis suggests that the data is stationary I (0), while the alternatives suggests that the data is not stationary I (1). The failure of rejection of null hypothesis in KPSS test corresponds to the rejection of null hypothesis in ADF and PP tests. The following is the model estimation in KPSS:

$$Y_t = \varphi_0 + \varphi_{1t} + u_t \quad (3.13)$$

$$\mu_t = \mu_{t-1} + \epsilon_t \sim iid(0, \sigma_\epsilon^2) \quad (3.14)$$

Where φ_0 a constant, t symbolises a trend, and μ_t symbolises a random walk. The null hypothesis is set to test if the variance of the error term in random walk is zero. Henceforth, in KPSS the null hypothesis is expressed as follow:

$$H_0 : \sigma_\epsilon^2 = 0$$

$$H_0 : \sigma_\epsilon^2 \neq 0$$

Unlike the ADF and PP that are limited to the size data (lower power with a large sample size, and overpower when the sample size is small); the KPSS test does not depend on the sample size of the data (McCarthy, 2015:5).

3.3.3.3 Structural break unit root test

If the times series contains the structural breaks, testing unit root and stationary using the techniques aforementioned may lead the spurious results (Peron, 1988:13). Because of lower power of ADF and PP tests, the null hypothesis might be rejected while variables are not stationary. There are two different types of structural breaks namely; single known breakpoint and the single unknown breakpoint (Peron, 1988). In addition to these single breakpoints there exist also the multiple breakpoints. Those two types of single breakpoints were analysed by Perron (1989 and 1997). These different types of structural breaks may be classified as endogenous or exogenous; thus, various models can be used to detect and test these breaks (Perman & Byrne, 2006).

In regard to this study, though multiple breaks were found within the series, the test of a single common and known break point unit root test was employed, following the model B introduced by Perron (1998). This model allows exogenous shocks to influence elasticity of the observed time growth series. The null and the alternative hypothesis are as follows:

$$H_0 : y_t = u_1 + y_{t-1} + (\mu_2 - u_1) DU_t + e_t \quad (3.15)$$

$$H_1 : y_t = u + \beta_1 t + (\beta_2 - \beta_1) DT_t + e_t \quad (3.16)$$

Where y_t symbolises a given series; μ_1 , μ_2 and β_1 , β_2 denote parameter changes during the time break (TB). D denotes the dummy variable.

In order to avoid biased results that might come from other tests that ignored the presence of structural breakpoint, the outcome of breakpoint unit root test was conducted and compared to ADF, PP and KPSS tests.

3.3.4 Lag length and model selection

The number of lags or the optimum number of lags to be included in the study is important. Apart from the traditional and manual way of lag selection, the ARDL model, when using EViews 9, has its automatic way of combining lags and selecting a better model for the study. These two methods were employed in the study with the option of choosing the one which is relevant. However, the automatic one performed better than the manual method.

3.3.5 Diagnostic tests

In econometrics, especially in time series analysis, the validity of results from the estimated model depends on the outcome of diagnostic tests (Sibanda, 2012:57). Various diagnostic tests were introduced in the field of econometrics for the possible existence of pitfalls that may affect the quality of findings obtained from regression analysis. Diagnostic tests comprises of testing for normality, heteroscedasticity, serial correlation, and a diversity of others (Zeileis & Hothorn, 2002). According to Gujarati (2014:99), the serial correlation is one of econometric problems that occur over a period of time when the error terms of observed variable appear to be correlated. However, the heteroscedasticity denotes the absence of homoscedasticity in error terms. In other words, there is a heteroscedasticity in residual if the variance of the error terms is not constant (Gujarati & Porter, 2010:276). Moreover, normality test, is one of the most popular test in statistics and the most known is the Jarque-Bera test. This test is used to determine whether the error terms are normally distributed or not. If in performing the Jarque-Bera test the obtained probability is higher than 5 percent the greater is the evidence to maintain the null hypothesis suggesting that the error terms are normally distributed (Gujarati & Porter, 2010:536). For the purpose of this study, those aforementioned tests namely structural breaks, normality, heteroscedasticity and autocorrelation will be employed and discussed. These tests were conducted to ensure the accuracy of the results obtained from analysis of the study. The test for stationarity and unity roots aimed to ensure that none of variable is integrated at the second order [I (2)].

3.4 SUMMARY AND CONCLUSION

The main focus of this chapter was the model specification. The appropriate model to analyse the relationship between aggregate expenditure and job creation in five of major economic sectors was the Autoregressive Distributed Lagged model (ARDL).

It was discussed that the ARDL model become useful when the series to be analysed are not of the second order and that the single relationship is tested among variables. Prior the choice of model five economic sectors and four component of aggregate expenditure were described and the measurements of aggregate expenditure's component were described. The time frame of the data used that from 1994 to 2015 as it was explained in this chapter. In addition, the conversion of the data into logarithm was justified by the fact that data in logarithm allows to determine the elasticity or growth of one variable in response to the change in the other variable.

Different analysis methods were discussed and the choice of the ARDL model was motivated by its power to analyse the mixed orders of co-integration if none of them was $I(2)$. To ensure that none of these variables was $I(2)$, the different approaches such as the Augmented Dickey-Fuller (ADF) and Phillip-Peron (PP) tests, Kwiatkowski-Phillips-Schmidt-Shin (KPSS) stationarity test and Structural break unit root test were presented and explained. Furthermore, the clarification on other econometrics tools used in the study namely the Error Correction Model (ECM), Granger causality test and diagnostic tests, was provided in this chapter. The advantage of using error correction model is the ability to determine the time it takes for the system to regain its equilibrium aftershocks, while Granger Causality indicates the causal relationship among variables. Since the methodology and models are outlined, the next chapter of the study provides the data analysis, results and discussion of findings.

CHAPTER 4: RESULTS AND DISCUSSION

4.1 INTRODUCTION

Having discussed the different models and approaches employed to achieve the empirical objective of the study, the main objective of this chapter is to present, discuss and interpret findings. The chapter is composed of four sections that incorporate four components of aggregate expenditure and five economic sectors. The first section presents introduction of the chapter. The second section includes a descriptive and graphical analysis, whilst the next section provides tests and discussion of variables stability. Using ARDL model analysis, the study presents the results in the following way: the test of co-integration (or bound test approach) is presented first, followed by short-run relationship and error correction model for co-integrated variables and Granger causality tests. To insure the accuracy of findings, the study provided the result from diagnostic tests namely serial correlation, heteroscedasticity and stability tests. A summary of these diagnostic tests is provided after the analysis of each economic sector. The last section of the chapter provides a summary and a concise conclusion of the findings.

4.2 GRAPHICAL ANALYSIS OF SECTORAL EMPLOYMENT

4.2.1 Analysis of South African Employment trend

4.2.1.1 Trends of employment in business enterprises sector

Graphical analysis is done as preliminary investigation of data, before any formal analysis is conducted; all variables were converted into natural logarithm to allow the analysis of growth in each variable. However, there was no natural log of net exports for it contains negative values and the logarithm of negative number does not exist. The dependent variables are presented in Figure 4.1. Employment in business sector was at its highest level in 1994 with the growth of 5.31 percent, then it declined gradually down to 4.55 percent in 2005 second quarter, then it stabilized. From 2016 first quarter it increased, yet this increase lasted only for one quarter, and then became stable. From 2011, it increased from 4.60 percent to 4.83 percent in 2014second quarter. At the time the data for this study was collected, employment growth in business sector was at 4.79 percent.

This fluctuation in business sector's employment is supported by the economic theory, as explained in chapter two of literature, suggesting that in this sector, more jobs are created and destroyed due to the new firms' lack of competitiveness and financial constraints.

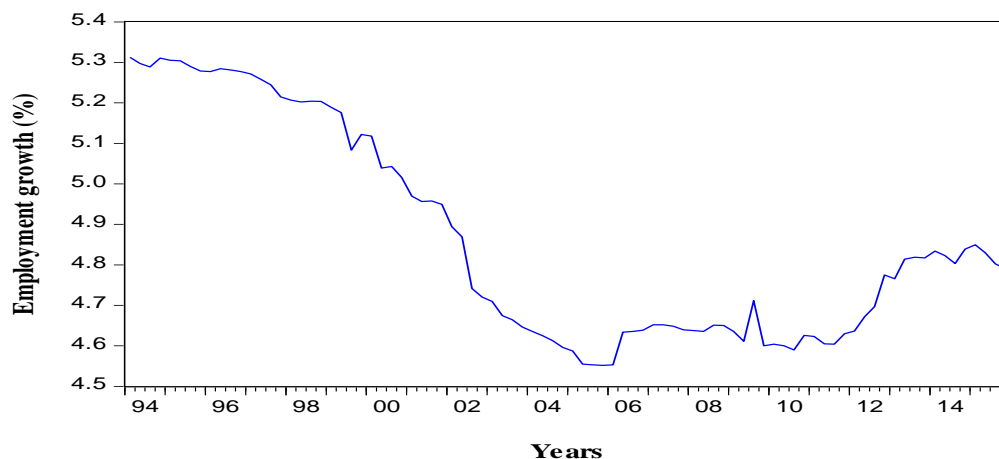


Figure 4-1: Employment growth in business enterprises sector from 1994 to 2015

Source: Compiled by author using data from SARB

4.2.1.2 Trends of employment in construction sector

The index of employment in construction sector was 4.48 in 1994 and it declined to 3.95 in 2001, then stabilises until 2002 second quarter. A great improvement occurred between second quarter and fourth quarter of 2002 where employment increased from 3.96 to 4.45 percent respectively. From fourth quarter of 2000, employment in construction sector went down and reached the level of 4.18 in 2004 first quarter, and then it started rising in 2008 fourth quarter, employment in this sector was 4.75 index, yet because of economic crises it started fluctuating.. From 2013 first quarter, to 2013 second quarter, employment rose from 4.66 to 4.83 respectively. After that improvement in 2013, employment started declining and in 2015 fourth quarter, employment growth in this sector was 4.74 percent. From this analysis, it seems that employment in construction sector depends on economic cycle. Whenever, the country's economy is doing well, more jobs are created in this sector; otherwise jobs are lost or destroyed. People tend to build when the level of income increases, and when income level fluctuates, the shocks impact on construction capacity, thus employment in construction sector declines.

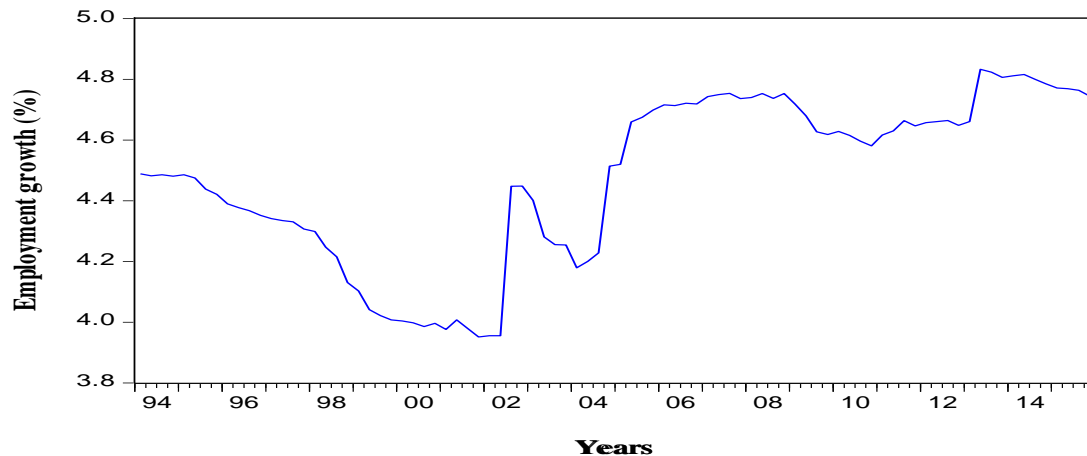


Figure 4-2: Employment growth in construction sector between 1994 and 2015

Source: Compiled by author using data from SARB

4.2.1.3 Trends of employment in financial sector

Despite some minor fluctuation, employment in financial sector was almost stable from 1994 to 2002 second 2nd quarter. In a single quarter of 2002, employment in financial sector shifted from 2.35 to 4.17 between second quarter and third 3 quarter and then it went down in 2003. From 2004, it started improving slightly and gradually until 20015. Based on this graphical analysis, employment in financial sector seems to have a growing trend and face slight shocks compared to business and construction sectors analysed before. Job loss rate is lower in this sector compared to others economic sectors in South African economy.

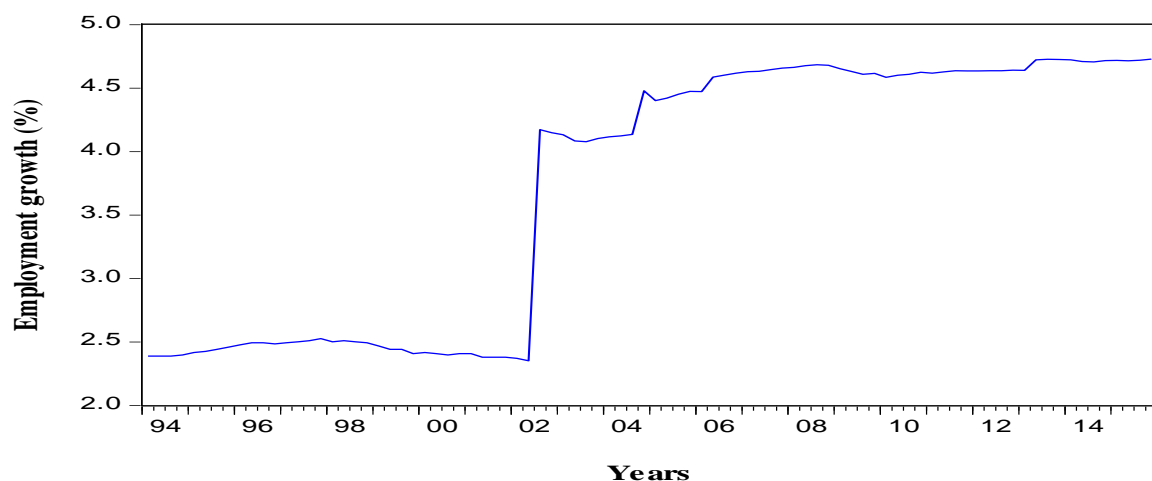


Figure 4-3: Employment growth in financial sector between 1994 and 2015

Source: Compiled by author using data from SARB

4.2.1.4 Trends of employment in manufacturing sector

The highest level of employment in manufacturing sector was reached in 1995 second quarter. At this period, it counted 4.87 percent. After this improvement, employment in this sector declined gradually and reached the growth level of 4.66 percent in 2003 second quarter. Thereafter, it started increasing up to 4.69 percent in 2004 third quarter and then dropped down again. It increased from 4.61 to 4.736 percent between 2005 and 2006. From 2006 employment in manufacturing sector dropped gradually and went down in 2015 to 4.57 percent. These result show that South African manufacturing sector might have faced challenge in technology advancement which made competitors more efficient and effective leading them to lower cost of production and selling prices. This was and is still a threat to South African manufacturing sector for it cannot compete with products from countries with advanced technology.

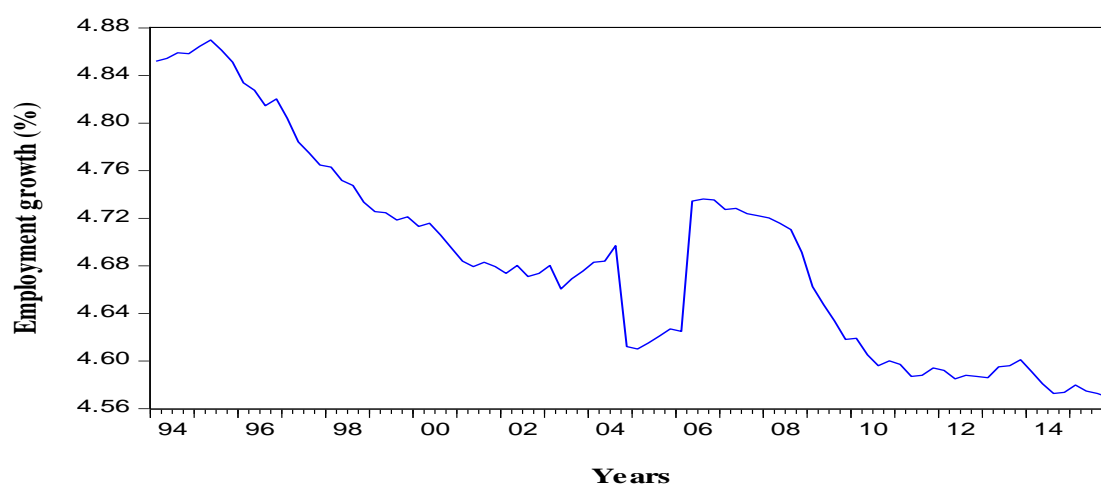


Figure 4-4: Employment growth in manufacturing sector between 1994 and 2015

Source: Compiled by author using data from SARB

4.2.1.5 Trends of employment in mining sector

Looking at mining employment on the Figure 4-5, one can see that from 1994 first quarter to 2001 fourth quarter, employment in mining sector faced a downward movement. However, from 2002 first quarter to 2008 third quarter, employment in mining sector was gradually increasing. This increase in employment was affected by the 2008 economic crisis where job index shifted from 4.67 in 2008 to 4.58 in 2009 fourth quarter. The growth in mining employment revived in 2010 first quarter and reached the level of 4.67 percent in 2014

second quarter where it started declining to 4.53 in 2015 fourth quarter. As seen in previous sector, employment in mining sector is subjected to the economic cycles or condition and its higher level was reached in 1994 where it was 4.81 percent. Since then it has been a mixture of shocks, meaning that jobs were created and destroyed overtime.

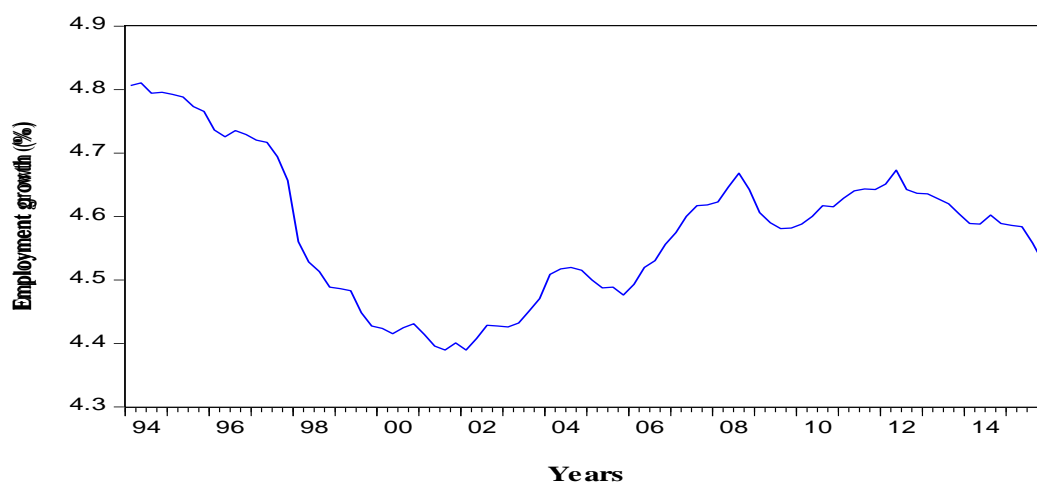


Figure 4-5: Employment growth in mining sector between 1994 and 2015

Source: Compiled by author using data from SARB

In summary, besides employment in financial sector that grew overtime, all other dependent variables faced downward trends in job creation since 1994, and it never went back to the original level of employment. Jobs lost in these sectors justify South African unemployment growth between 1994 and 2015. In 1994, the official unemployment rate was 22% compare to 25.5 in the fourth quarter of 2015 (Stats SA, 2015). Looking at the Figure 4-5, the compiled employment growths correspond with the individual employment growth discussed above. As South Africa is faced with higher rate of unemployment in 2015, the Figure 4-6 exhibits a higher decline in employment during the year 2015. In all five sectors, jobs were lost than ever before between 1994 and 2015.

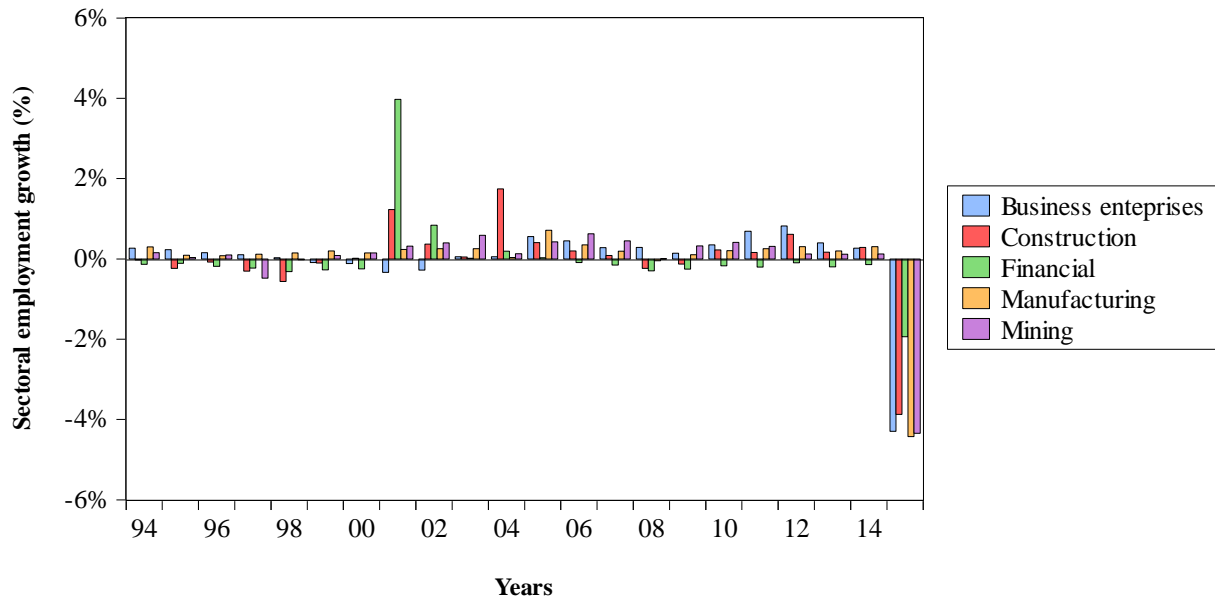


Figure 4-6: Sectorial employment growth between 1994 and 2015

Source: Compiled by author using data from SARB

4.2.2 Graphical analysis of aggregate spending components

The study employed the aggregate expenditure's components as the explanatory variables of employment in five economic sectors selected as dependent variables. Those components of aggregate expenditures transformed in logarithms are: households' consumption spending (LCONS), government spending (LGOVS), investment spending (LINVES) and net exports spending (LNEXP). Each of these components is analysed graphically in next paragraphs.

4.2.2.1 Household's consumption spending

The Figure 4-7 exhibits the growth in households spending. The results in this graph show that since 1994 up to 2007, the consumption has been increasing and declined slightly in 2008. This dropping down of consumption might have been influenced by the economic recession that the whole world encountered. From 2009 till 2015, households increased their consumption. Grounded on Keynesian theory which argues that demand creates supply and that more supply requires more production, this should result in job creation, *ceteris paribus*.

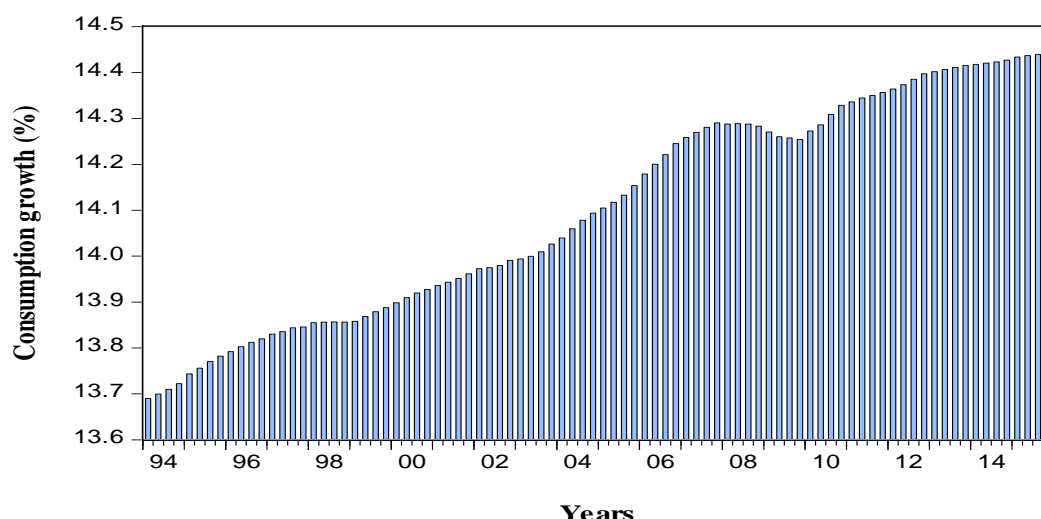


Figure 4-7: Growth in households' consumption spending between 1994 and 2015

Source: Compiled by author using data from SARB

4.2.2.2 Government spending

Government spending on expansionary policies in macro-economy is considered as one of engines of job creation. Outcome of elasticity in South African government spending is depicted in Figure 4-8. In 1994, government spending was 12.78 percent and then declined to 12.7 million in 1995; it then recovered and reached 12.8 percent in 1998. After a slight decline in 1998, government spending increased gradually up to 13.34 percent in 2015. Government spends on different sectors of economy, however if a big share of South African spending were allocation to job creation, this result would be indicating an increase in job creation from 1994 to 2015 *ceteris paribus*.

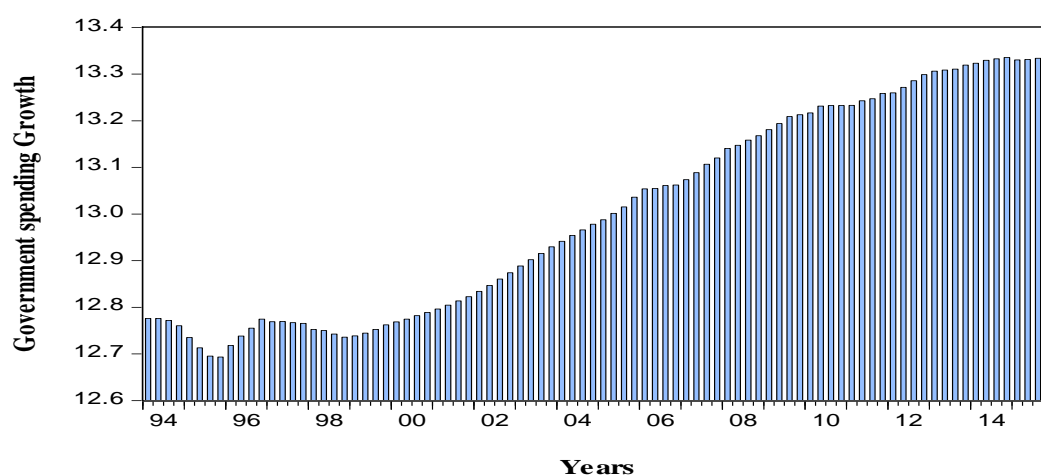


Figure 4-8: Growth in government spending between 1994 and 2015

Source: Compiled by author using data from SARB

4.2.2.3 Investment spending

It was discussed in literature that investment spending plays a major role in the economy, especially in job creation. Looking at the South African investment spending as illustrated by Figure 4-9, it has been increasing since 1994, though it fluctuated between 1998 and 2000. From 2001 it increased and reached a level of 13.34 percent in 2008 before it was affected by economic recession. After the global recession, investment level regained its pace of increment and reached the level of 13.36 percent in 2015. The general view of this result suggests that job creation would have been growing from 1998 to 2011 in spite of some minor shock that would cause some individual to lose their jobs. What is obvious is that if increase in investment spending increases employment rate, employment rate in South African economy would be dramatically higher than it was in 1994, other factors held constant.

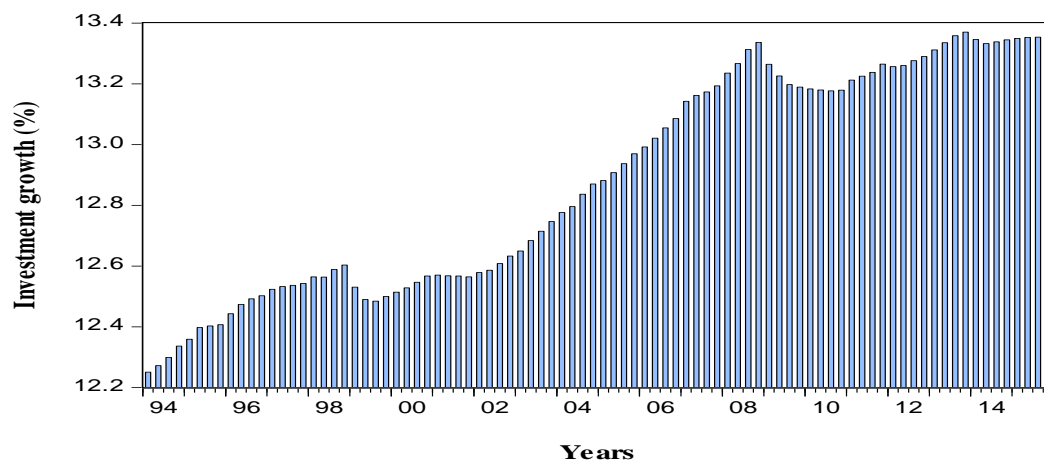


Figure 4-9: Growth in investment spending between 1994 and 2015

Source: Compiled by author using data from SARB

4.2.2.4 Net exports

Countries with higher level of exports face less challenges of job creation. This is because if the exported goods and service are being produced using labour, there is need for many employees to meet the demand by foreign buyers; hence more jobs are created, *ceteris paribus*. The Figure 4-10 shows the fluctuations in South African net exports. From 1994 to 2011, though it faced more trends, South African export was positive. The highest level of exports within this period was archived in the second quarter of 2001. From the second quarter of 2011 to the third quarter of 2013, South Africa imported more than it exported, then in the last quarter of 2013 exports regained and rose.

The whole year of 2014, South African net export was down. The first three quarters of 2015 net export was positive and dropped again in the fourth quarter of 2015. Linking this result to job creation in South African economy, one can argue that it is hard to expect a positive effect of net export on South African employment.

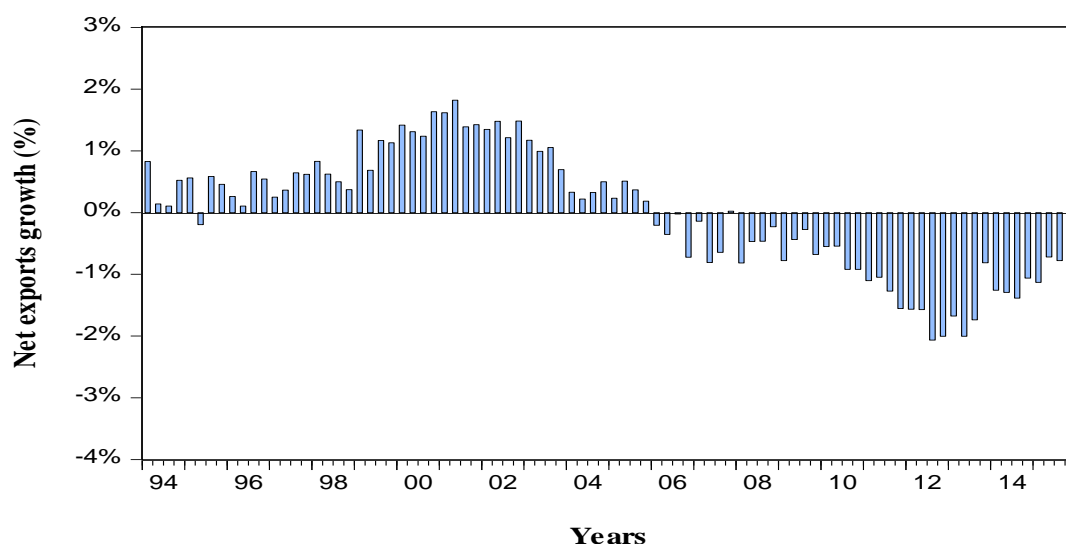


Figure 4-10: South African net exports growth between 1994 and 2015

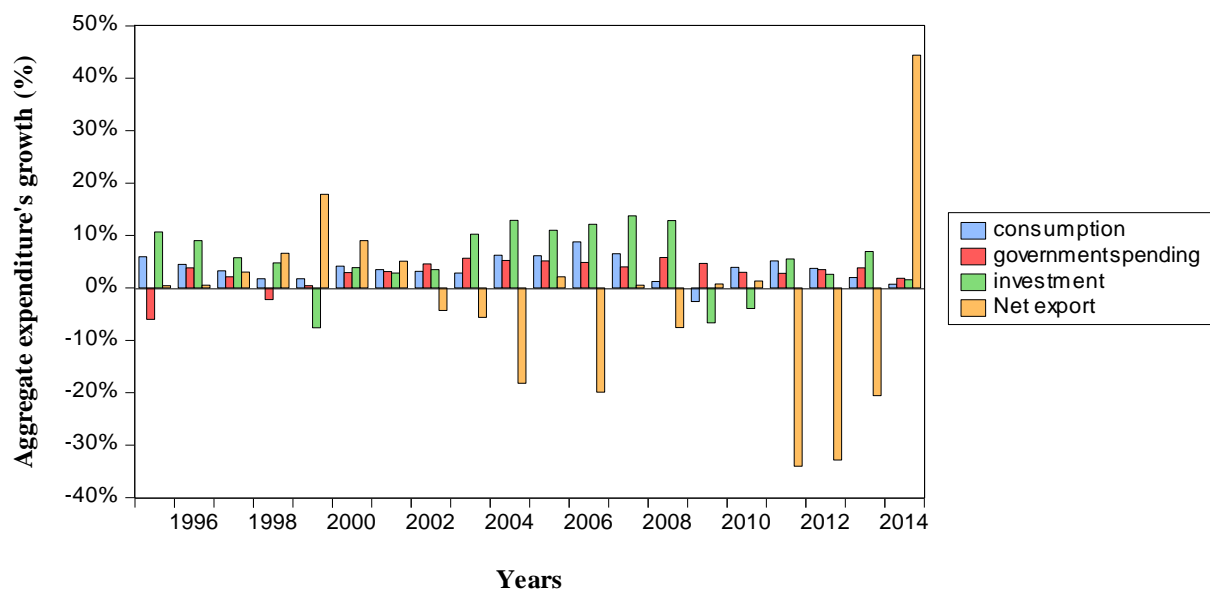
Source: Compiled by author using data from SARB

Based on the results from graphical analysis of dependent and independent variables, it is possible to confirm that many economic variables, including those subjected to this study can be affected by economic cycle factors. Looking at the graphs above, variables seem not to be stationary as some of them contain trend while other seem to portray major breaks in patterns. This could be due to different crises that affected the world economy in general, and South Africa in particular, between 1994 (the starting date) and 2015 (closing date of analysed variables 2015). Those crises could affect total spending and thereafter employment and job creation in different sectors, as it described in the previous section. However, this hypothesis could not be accepted without test. Hence, formal unit root test are conducted in the next section after the graph representing aggregate expenditure growth.

The Figure 4.11 illustrates the growth of aggregate expenditure's components. Over the period between 1994 and 2015, the net export appears to face higher changes. Apart from 1995 and 1997, government remained positive and this explains why consumption remained

positive over the 20 years analysed. Investment spending also did not fluctuate much over the period under the consideration.

This stability of investment spending is considered to justify why South African economy kept moving. The reason to justify this hypothesis is that if consumption remained positive over time, while employment was exalting, then higher portion of government spending was allocated to the household support and the few jobs created resulted from investment spending *ceteris paribus*.



Source: Compiled by author

Figure 4-11: South African Aggregate expenditure's growth between 1994 and 2015

Source: Compiled by author using data from SARB

4.3 RESULTS OF UNIT ROOT TESTS

The unit root or stability test should be the first step in time series analysis because the use of non-stationary variables results in spurious results. This study employed unit root test before any other step of estimation and analysis, to determine the stability and the integration order of variables. The stationarity was performed using the Augmented Dickey-Fuller (ADF) approach, Phillip-Perron (PP) test and lastly Kwiatkowski, Phillips, Schmidt and Shin (KPSS). The first difference between KPSS and those other tests (ADF and PP) is that the former determines the series stationary whilst the latter test if the series contains a unit root or not (Lee & Amsler, 1997:151). The second benefit of KPSS test is that KPSS outcome is

used as confirmatory of ADF and PP results (Maddala & Kim, 1998:126). The results of all these three tests are presented in Table 4.1 and 4.2, and thereafter interpreted.

Table 4-1: Results of ADF and PP Unit root test

Variable	Model specification	ADF	PP	ADF	PP	Integration order
		Levels	Levels	1 st difference	1 st difference	
LCONS	Intercept	0.714	0.693	0.009**	0.007**	I(1)
	Intercept & trend	0.375	0.789	0.031*	0.038*	I(1)
LGOVS	Intercept	0.959	0.989	0.004**	0.001**	I(1)
	Intercept & trend	0.098	0.108	0.018*	0.006*	I(1)
LINVES	Intercept	0.716	0.680	0.000**	0.000**	I(1)
	Intercept & trend	0.689	0.825	0.000**	0.000**	I(1)
NEXP	Intercept	0.805	0.648	0.000**	0.000**	I(1)
	Intercept & trend	0.580	0.433	0.000**	0.000**	I(1)
LEBUS	Intercept	0.370	0.417	0.013*	0.000**	I(1)
	Intercept & trend	0.991	0.987	0.000**	0.000**	I(1)
LECONS	Intercept	0.751	0.726	0.000**	0.000**	I(1)
	Intercept & trend	0.548	0.518	0.000**	0.000**	I(1)
LEFIN	Intercept	0.713	0.721	0.000**	0.000**	I(1)
	Intercept & trend	0.697	0.697	0.000**	0.000**	I(1)
LEMAN	Intercept	0.581	0.571	0.000**	0.000**	I(1)
	Intercept & trend	0.559	0.453	0.000**	0.000**	I(1)
LEMIN	Intercept	0.201	0.279	0.000**	0.000**	I(1)
	Intercept & trend	0.505	0.652	0.000**	0.000**	I(1)

Notes: (a) * means the rejection of the null hypothesis at the 5 percent level of significance

(b) ** means the rejection of the null hypothesis at the 1 percent level of significance

Source: Compiled by author using data from SARB

Table 4.1 displays the outcome of ADF and PP unit root tests for all variables. The results indicate that none of tested variables was stationary at level with or without trend. Since they were not stationary at the level, the second step was to differentiate them. All variables became stationary at first difference where the null hypothesis stipulating the existing of unit root within variables was rejected. This denoted that all variables with no exception were I (1) as represented in Table 4-1 and both approaches, ADF and PP reached the same conclusion.

Notwithstanding, when there is a lack of structural breaks within series, results from ADF and PP tests can lead to a biased conclusions where tests fail to reject the null hypothesis that deserves to be rejected. In addition, these tests mostly do not make an accurate difference between a higher and persistence process of stationary variables from those with unit root (McCarthy, 2015:5). Henceforth, the less power is accredited to these traditional tests of the

unit root tests and they are considered as deterministic approaches. Since results from these tests are doubtful, the KPSS test is used to redress effectively those weaknesses of traditional tests of unit root test.

The KPSS test plays a role of confirmatory and in macroeconomic and especially in econometrics, is considered to be more credible and more effective than ADF and PP unit root tests (Maddala & Kim, 1998). If results obtained from stationarity test (KPSS) differ from the previous two tests of unit root test, the graphical analysis shall be taken in consideration to determine whether there is no structural break into variables.

Table 4-2: Results of the KPSS stationarity test

Variable	Model specification	Levels	1 st difference	Order of integration
LCONS	Intercept	1.198	0.143*	I(1)
	Intercept and trend	0.119*	0.075*	I(0)
LGOVS	Intercept	1.167	0.367*	I(1)
	Intercept and trend	0.212**	0.233	I(0)
LINVES	Intercept	1.166	0.145*	I(1)
	Intercept and trend	0.117*	0.098*	I(0)
NEXP	Intercept	0.865	0.097I*	I(1)
	Intercept and trend	0.197**	0.090*	I(0)
LEBUS	Intercept	0.837	0.488**	I(1)
	Intercept and trend	0.272	0.133*	I(1)
LECONS	Intercept	0.727**	0.143*	I(0)
	Intercept and trend	0.159**	0.097*	I(0)
LEFIN	Intercept	1.041*	0.103*	I(1)
	Intercept and trend	0.179**	0.087*	I(0)
LEMAN	Intercept	0.987	0.078*	I(1)
	Intercept and trend	0.138*	0.052*	I(0)
LEMIN	Intercept	0.217	0.316*	I(1)
	Intercept and trend	0.220	0.178**	I(1)

Notes: (a) critical value 0.463 with intercept without trend. With intercept and trend 0.1460

(b) * rejection of null hypothesis at 5% level of significance

(c) ** rejection of null hypothesis at 1% level of significance

Source: Compiled by author using data from SARB

The outcome of KPSS stationarity test represented in Table 4-2 shows that some variables are stationary at level I(0), while others become stationary after the first difference I(1). In fact, using KPSS test with intercept and trend, all variables are stationary at level [I (0)] except LEBUS and LEMIN. Yet results obtained from ADF and PP tests as presented in Table 4-2, indicate that none of variables is I (0). All of them become stationary at first difference [I (1)]. In other words KPSS results did not confirm ADF and PP results. The next step is to perform

breakpoint unit root tests to detect the presence or absence of structural breaks into variables. Structural break analysis is very important in time series analysis because it allows the adjustment on the changes in variables due to change in time or economic cycles. If variables used contain a structural breaks and this breaks are not adjusted, the findings of the analysis are false and can lead to the use of wrong model, wrong conclusion and thereafter to the wrong forecasts and policies (Davis & Haltiwanger, 1992:223).

Using multiple breakpoints test, more than three breaks were found within variables and the common one was between the second quarter of 2002 and the fourth quarter of 2012. Therefore, it was worthy to employ dummy variables in the study. The value of 1 and 0 are used in dummy variable. Where 1 denotes the presence of shocks leading to the breakpoints and 0 represents the period without shocks (no breakpoints). As suggested by Lee and Strazicich (2003), the alternative hypotheses of unity root variables become trend stationary if series contain breakpoints. Consequently, the next section deals with breakpoint unit root test.

4.4 BREAKPOINT UNIT ROOTS TESTS ANALYSIS

Since variables under the study faced shocks overtime or rather structural breaks, the results found using the normal approach of unit root tests and stationarity test might not be accurate. The breakpoint unit root test was performed to confirm or reject the previous results of unit root tests. The outcome of breakpoint unit root displayed in Table 4-3, showed that variables were stationary at different levels of integration. Some of them were stationary at level I (0), while others become stationary after being differentiated I (1). This mixture of integration order from breakpoint unit root is similar to the results obtained from KPSS stationarity test (see table 4-2). These results confirm the reason why ARDL model was the right approach for this study.

Table 4-3: Breakpoint unit root test results

Variable	Model specification	Level		1st difference		Integration order
		T-value	P-value	T-value	P-value	
LCONS	Intercept	-4.443	0.697	-4.443	0.142	-
	Intercept & trend	-4.485	0.036**	-4.859	0.220	I(0)
LGOVS	Intercept	-4.443	0.981	-4.443	0.035**	I(1)
	Intercept & trend	-4.485	0.399	-4.859	0.114	I(0)
LINVES	Intercept	-4.443	0.517	-4.443	< 0.01*	I(1)
	Intercept & trend	-4.485	0.722	-4.859	< 0.01*	I(1)
NEXP	Intercept	-4.443	0.804	-4.443	< 0.01*	I(1)
	Intercept & trend	-4.485	0.919	-4.859	< 0.01*	I(1)
LEBUS	Intercept	-4.443	0.442	-4.443	< 0.01*	I(1)
	Intercept & trend	-4.485	0.980	-4.859	< 0.01*	I(1)
LECONS	Intercept	-4.443	0.239	-4.443	< 0.01*	I(1)
	Intercept & trend	-4.485	0.396	-4.859	< 0.01*	I(1)
LEFIN	Intercept	-4.443	0.01*	-4.443	< 0.01*	I(0)
	Intercept & trend	-4.485	0.01*	-4.859	< 0.01*	I(0)
LEMAN	Intercept	-4.443	0.867	-4.443	< 0.01*	I(1)
	Intercept & trend	-4.485	0.073	-4.859	< 0.01*	I(1)
LEMIN	Intercept	-4.443	0.855	-4.443	< 0.01*	I(1)
	Intercept & trend	-4.485	0.571	-4.859	< 0.01*	I(1)

Notes: (a) * rejection of the null hypothesis at 1 percent level of significance

(b) ** rejection of the null hypothesis at 5 percent level of significance

Source: Compiled by author using data from SARB

Since variables are now stationary and their order of co-integration is known, the next step is to conduct the analysis of relationship between aggregate spending and job creation in selected economic sectors. Each analysis starts with descriptive analysis (correlation among variables) followed by co-integration test, short run relationship, causality test and interpretation. The short conclusion for each analysis will be preceded by diagnostic tests.

4.5 THE EFFECT OF AGGREGATE EXPENDITURE ON JOB CREATION IN MANUFACTURING SECTOR

In this section the relationship between aggregate expenditure and job creation in manufacturing sector is analysed. The first step is to determine the correlation between dependent variable and the four component of independent variable (consumption, government spending, investment and net exports). The second step is to test the long and short run relationship between dependent and independent variables. Next steps are causality

test and diagnostic tests. The main aim of this section is to determine the component of aggregate expenditure that can create more jobs than others.

4.5.1 Descriptive and correlation analyses of manufacturing sector

Descriptive analysis was conducted in order to determine a quantitative state of relationship among variables subjected to the study and this was done using correlation analysis. The correlation coefficient value fluctuates between -1 and +1 (Ahlgren *et al.*, 2003). When the value is very close to 1, a strong positive linear relationship exists between two variables and both variables grow in the similar direction. In contrast, when the value of correlation coefficient is close to -1, a strong negative linear relationship exists between variables and variables increase in different directions, meaning that they are inversely related. Notwithstanding, if the value of correlation coefficient equals to zero, there is no any association between variables under the study. In other words variables with null correlation have no common econometric basis (Cohen & Cohen, 1983). The choice of descriptive analysis was based on the major role of correlation coefficients in providing a foundation for the next estimations, analysis and discussions. Table 4-4 represents correlation coefficients linking the four aggregate expenditure components and employment in manufacturing sector in South African economy.

Table 4-4: Results of correlation coefficients for manufacturing sector

	LEMAN	LCONS	LGOVS	LINVES	NEXP
LEMAN correlation	1	-0.842	-0.812	-0.787	0.518
t-Statistic	-----	-14.515	-12.919	-11.840	5.612
Probability	-----	0.000*	0.000*	0.000*	0.000*

Note: * significant at 1% level of significant

Source: Compiled by author using data from SARB

Table 4-4 exhibits the correlation coefficient between manufacturing employment and each of the dependent variables which are: households' consumption (C), government spending (G), investment or gross capital formation (I) and net exports (NX). All variables were statistically significant at 1 percent significance level. The result represented in Table 4-4 show that a strong negative association exists between job creation in manufacturing sector and three out of four aggregate expenditure components namely, households' consumption, government spending and investment spending. The correlation coefficient between EMAN

and CONS is -0.842 closer to -1 indicating a strong negative association between the two variables. Likewise, -0.812 and -0.787 were the correlation coefficients, respectively denoting a strong negative association between GOVS and INVES and job creation in manufacturing sector. These results violated the economic theory insinuating that growth in consumption; government spending and investment should positively affect economic growth resulting in job growth. This result suggests that households spend more on imported goods than domestic products. Likewise, government expenditure and investment spending focus on other sectors than manufacturing. Nonetheless, a positive association between net exports and employment in manufacturing sector was found as calculated correlation coefficient was 0.518.

4.5.2 Estimation of ARDL model for manufacturing sector

Prior to ARDL estimation and its results interpretation, the test of unit root was conducted in order to ensure that none of the used variable is integrated in the order two or I (2). The results from these tests are reported in Table 4.1, Table 4.-2, and in Table 4-3 in section one. The preliminary analysis such as the pairwise correlation was also conducted to ensure the basic association among variables, the results of correlation test are presented in Table 4-4. Moreover, to ensure the number of lag to be introduced into the model, the lag criteria was used and results are presented in Figure 4-13.

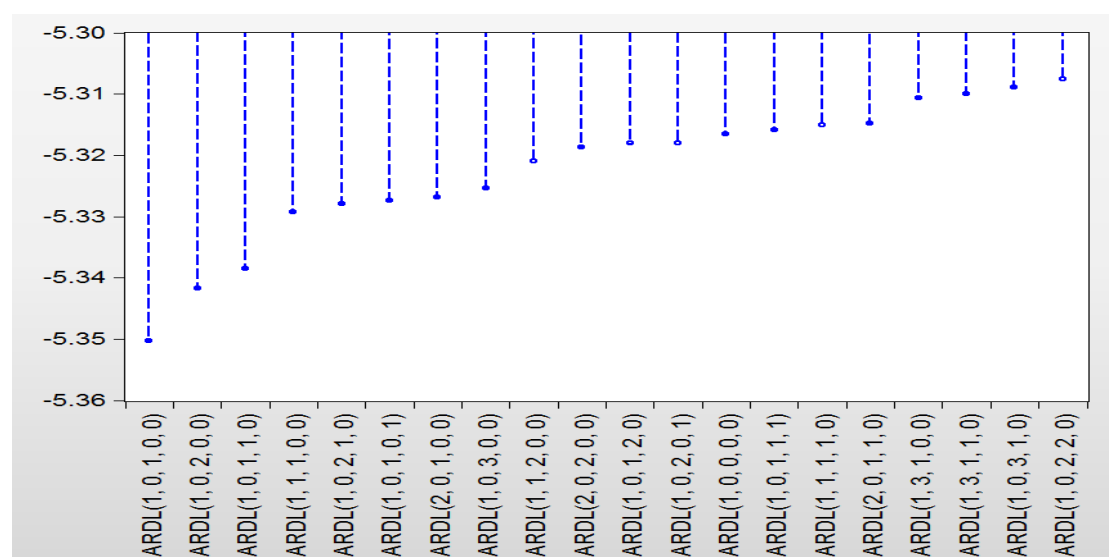


Figure 4-12: ARDL model summary selection for manufacturing sector

Source: Compiled by author using data from SARB

The automatic method suggested that a maximum number of lag that can be used between employment in manufacturing sector and the aggregate expenditure should be three. However the best model selected was ARDL 1, 0,1,0,0. In other words, the analysis considers one lag for job creation in manufacturing and government spending and for other variables namely consumption, investment spending and net exports no lag was selected. The Akaike Information Criteria (AIC) was used to select these lags.

4.5.3 Long-run analysis of job creation in the manufacturing sector

Since variables stability is tested and the best model is known, the next step is to determine whether variables under the study have a long-run relationship (co-integrate) or not. The bound test of co-integration was employed to achieve this objective. In order to compare F-statistics and the critical values, the following hypotheses were formulated:

H_0 : No co-integration (long-run relationship) among variables

H_1 : There is a co-integration (long-run relationship) among variables

According to Pesaran (2001:300), 5 Cases and 5 tables of critical values can be used to compare calculated F and W (Wald) statistics when testing co-integration among variables. The study, in this section, applied case and table number five with unrestricted intercept and unrestricted trend. If the calculated F-statistics was greater than the critical value, the null hypothesis implying the absence of long-run relationship is rejected. However, if the calculated F-value is below (smaller than) lower boundary, the null hypothesis is not rejected. Lastly, if F-statistics lies between the two boundaries, the results are inconclusive. The results of bound co-integration (in Table 4-5) indicates that at the 5 percent level of significance, the F-statistics of 4.222 falls between the lower and upper bound of 3.47 and 4.57 respectively. Neither null nor alternative hypothesis is rejected or accepted. This implies that without further information, the relationship between aggregate expenditure and job creation in manufacturing sector remains inconclusive at the 5 percent level of significance. Nonetheless, at the 10 percent level of significance, the F-statics of 4.22 is greater than upper bound critical value of 4.06, denoting the presence of long-run relationship among variables.

Table 4-5: Results of bounding co-integration test for manufacturing sector

Dependent variable LEMAN	Estimated F-Statistic 4.222	
Critical Values*	Lower Bound Critical Value	Upper Bound Critical Value
1%	4.4	5.72
2.5%	3.89	5.07
5%	3.47	4.57
10%	3.03	4.06

Note: * critical values from Pesaran *et al.* (2001) Table CI (V)

Source: Compiled by author using data from SARB

This co-integration or long-run relationship among variables implied that the overall of aggregate expenditure impacts on job creation in manufacturing sector. This study is not the only one to reach these finding. Other researcher such as Dinh *et al.* (2012); Gavin (2013); Makgetla (2014); Shi & Michelitsch (2013); Byiers *et al.* (2015) and Levinson (2015) reached the same conclusions that spending on manufacturing sector increased job creation in this sector.

The estimated long-run relationship among variables and its coefficients is presented as follows:

$$\text{LEMAN} = 16.230 - 1.606\text{LCONS} - 0.252\text{LGOVS} + 0.337 \text{ LINVES} + 0.000\text{NEXP} + 0.0108\text{D} + 0.0150\text{TREND} \quad (4.1)$$

Based on the results in the equation above, one percent increase in household's consumption and government spending would cause job creation in manufacturing sector to decline by 1.606 and 0.252 percent respectively. However, one percent increase in investment spending would lead to 0.337 percent increase in job created in manufacturing sector. During the economic shocks, employment in manufacturing sector increases by 0.010 compared to non-shock periods. This might result into positive trends found in series. Nonetheless, there is no effect of net exports on job creation in manufacturing sector. Besides that net exports was not statistically significant, its coefficient was also zero. The net exports do not affect employment because South Africa tends to be more importing than exporting country (Chapman, 2012). This might be due to the higher cost of production which makes South African manufacturing industries non-competitive. The pertinent example is that in 2010 South African exports to Sab-Saharan markets declined by 20 percent due to an increase in cheaper products from china's manufacturing industries in the same markets.

4.5.4 Short-run relationships between aggregate expenditure and job creation in the manufacturing sector

Since there was a presence of long run relationship, it was worthwhile to analyse the short-run relationship and estimate the unrestricted error correction model (UECM) to determine how long it take for the long-run to come back to the equilibrium if any shock affects the system. The analysis of short-run relationships was performed using Pesaran *et al.* (2001) Case V.

The results displayed in Tables 4-6 represent short-run relationship and error correction model (VECM). The error-correction term (ECT) coefficient was -0.223558 with a negative sign as expected, with probability of 0.0020 (significant at the 1percent level of significance). This suggested that the long-run equilibrium will regain it steady state if any disturbance affects the system. The values of error correction term being about 0.224 signify that 22 percent of any disturbances in the system (between aggregate expenditure and job creation in the manufacturing sector) is corrected each quarter. Furthermore, changes in aggregate expenditure take approximately 4.473 ($1/0.224$) quarter to affect job creation in the manufacturing sector.

With short-run coefficients, a strong relationship exists between household's consumption and job creation in manufacturing sector. So the null hypothesis of no relationship between the two variables is rejected at 1 percent level of significance. One percent increase in consumption can cause short-term jobs in manufacturing sector to increase by 0.359 percent. However, a weak negative relationship exists between short-run job created in manufacturing sector and investment and government spending as the null hypothesis is only rejected at the 10 percent level of significance. In other words, an increase in government and investment spending can cause short-term job loss in manufacturing sector. The net-export is not significant and its coefficient is zero; meaning that it has no effect on short-term jobs in manufacturing sector. These results are not new in South African particularity because some of other previous studies Langdon and Lehrman (2012); Shi and Michelitsch (2013);

Byiers *et al.* (2015) found the same results that manufacturing sector create short term jobs. These short-term jobs, in some cases may even cause short and long term jobs within other sectors.

Table 4-6: Short-run relationship and the error correction results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LCONS)	0.359148	0.104073	3.450913	0.0009*
D(LGOVS)	-0.4123	0.22372	-1.84291	0.0691**
D(LINVES)	-0.07551	0.042363	-1.78242	0.0786*
D(NEXP)	0.00000	0.000000	-0.22432	0.8231
D(DUMMY)	-0.00242	0.010317	-0.23441	0.8153
D(@TREND())	-0.00336	0.00092	-3.64553	0.0005*
CointEq(-1)	-0.22356	0.069856	-3.20027	0.002*

Note: *rejection of null hypothesis at 1% level of significance


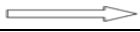
* **rejection of null hypothesis at 10% level of significance

Source: Compiled by author using data from SARB

4.5.5 Analysis of causal relationships between aggregate expenditure and job creation in the manufacturing sector

To determine the causal relationship within variables, Granger causality test was employed. The outcome of causal relationship among variable is presented in Table 4-7. The results from Granger causality test portray only one bi-directional (two ways relationships) and one unidirectional (one way) causality relationships within the analysed variables. In the short-run, consumption can cause job creation in manufacturing and in return these jobs can boost consumption. In addition, there is one way causal relationship between employment in manufacturing and investment spending. Job created in manufacturing sector can influence investment spending, while investment spending cannot cause jobs in manufacturing sector. Notwithstanding, there is no causality between government spending and job creation in manufacturing sector. Likewise, no causality found between net export and job creation in manufacturing.

Table 4-7: Pairwise Granger causality results

Null Hypothesis:	F-Statistic	Prob.	Causality	Direction of causality
LCONS does not Granger Cause LEMAN	4.188	0.018**	Yes at 5%	
LEMAN does not Granger Cause LCONS	3.412	0.037**	Yes at 5%	
LGOGS does not Granger Cause LEMAN	0.654	0.522	No	No causality
LEMAN does not Granger Cause LGOVS	0.809	0.448	No	
LINVES does not Granger Cause LEMAN	1.468	0.236	No	
LEMAN does not Granger Cause LINVES	2.487	0.089***	Yes at 10%	
NEXP does not Granger Cause LEMAN	0.352	0.703	No	No causality
LEMAN does not Granger Cause NEXP	1.165	0.316	No	

Note: *rejection of null hypothesis at 1% level of significance
 * *rejection of null hypothesis at 5% level of significance
 *** rejection of null hypothesis at 10% level of significance

Source: Compiled by author using data from SARB

4.5.6 Residual diagnostic tests for the manufacturing ARDL model

The study employed residuals tests to ensure that obtained results were accurate. The Lagrange Multiplier test was performed to detect the presence of auto-correlation among variables, while the White Heteroscedasticity was used to distinguish whether variables are homoscedastic or heteroscedastic. Finally the normality test was performed using Jarque-Bera test. Findings of abovementioned tests are illustrated in Table 4-8 and indicated that the model passed all tests. Residuals are homoscedastic, normally distributed and there is no autocorrelation among variables.

Table 4-8: Results of diagnostic tests

Test	H0	P-value	Decision	Conclusion
Jarque-Bera	Residuals are normally distributed	0.52251*	Fail to reject H0	Residuals are normally distributed.
L M Test	No Serial correlation	0.7437*	Fail to reject H0	No serial correlation in the model.
White (CT)	No Heteroscedasticity	0.5281*	Fail to reject H0	No Heteroscedasticity in the model.

Note: * failure to reject null hypothesis at the 5% level of significance.

Source: Compiled by author using data from SARB

Overall, findings revealed that total spending on manufacturing sector positively affects the number of jobs created in manufacturing sector. In short-run, a strong relationship exists

between job creation in manufacturing sector and consumption, while weak relationship exists between government spending, investment and manufacturing employment growth. The net-export has no effect on job creation in manufacturing sector in short- and long-run. Moreover, consumption dominated the causal relationship among variables. The findings indicated that the only component of aggregate expenditure that creates jobs in the manufacturing was investment spending.

4.6 THE EFFECT OF AGGREGATE EXPENDITURE ON JOB CREATION IN BUSINESS ENTERPRISES SECTOR

4.6.1 Descriptive and correlation analyses for Business Enterprises sector

The correlation coefficient test is one of measures that are used to determine the strength of a linear relationship between two variables. When the correlation coefficient is close to +1 a strong positive association exists between the two variables. In contrast, the closer is the correlation coefficient to -1; the stronger is the negative linear relationship between the variables (Ahlgren *et al.*, 2003:551). The Table 4-9 depicts the results of employment in business enterprises sector (LEBUS) and the components of aggregate expenditure (LCONS, LGOVS, LINVES, NEXP) in South Africa. Analysing the correlation between these variables, the result in table 4-9 shows that a strong negative correlation exist between employment in business sector and the three components of total spending namely consumption, investment and government spending. However, a weak and positive relationship is found between net-export and job creation in business sector. A strong and positive correlation exists between household's consumption, investment and government spending whilst a strong and negative relationship exists between net-exports and other three components of aggregate expenditure.

Table 4-9: Correlation coefficient results

	LEBUS	LCONS	LGOVS	LINVES	NEXP
LEBUS correlation	1	-0.781	-0.727	-0.762	0.437
t-Statistic	-----	-11.630	-9.826	-10.939	4.511
Probability	-----	0.000	0.000	0.000	0.000

Note: * rejection of null hypothesis at 1% level of significance.

Source: Compiled by author using data from SARB

4.6.2 Lags and model selection for Business Enterprises sector

Using automatic strategy to determine the number of lags to be used in this section, the optimum number of lags was 3 as it is depicted in Figure 4-10. This graph summarised the process followed to determine the best model. Under Akaike Information Criteria (AIC), the best model selected was: ARDL (3, 1, 0, 0, 2).

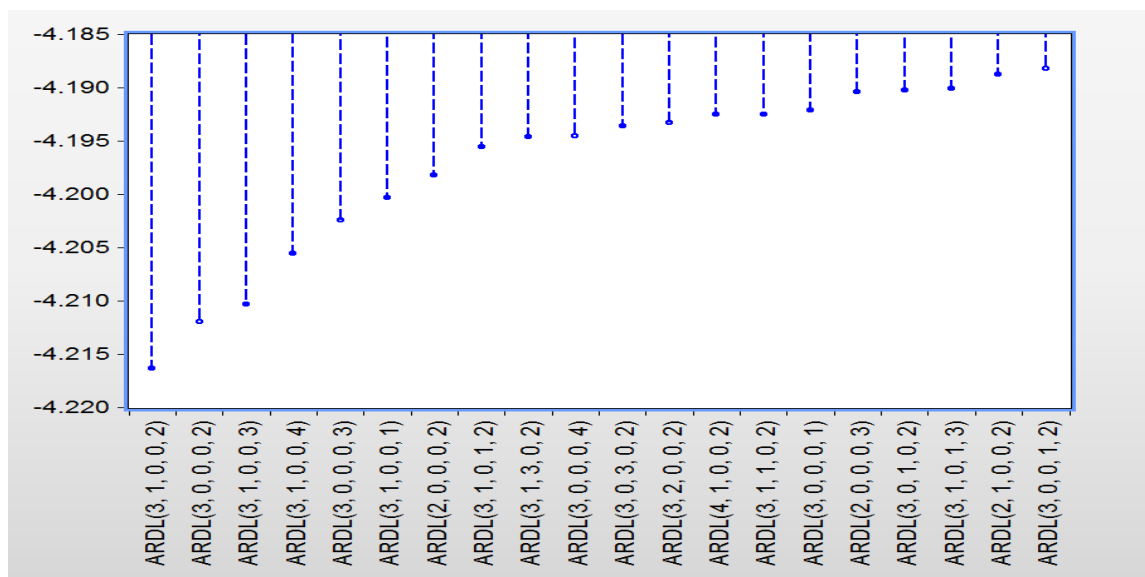


Figure 4-10: ARDL model summary selection for business enterprises sector

Source: Compiled by author using data from SARB

4.6.3 Analysis of the long-run relationship for Business Enterprises sector

The long-run relationship among variables was tested using the bound test of co-integration and the method used to formulate hypotheses and to compare the estimated F-value to critical values was explained in section one. The summary of obtained results is displayed on Table 4-11. The estimated F-value of 5.96 (see Table 4-11) is greater than the upper bound critical value, at all levels of significance(10%, 5%, and 1%), implying that the null hypothesis of no long-run relationship (no co-integration) must be rejected in favour of the alternative hypothesis. These results suggest that there is a long-run relationship between aggregate expenditure components and job creation in business enterprises sector. This relationship can be explained by the fact that business sector accommodate people with different skills; high as well as lower skilled people can be employed in business enterprises sector depending on the type of business or firm in which those skills are needed. Moreover, business enterprises are the niche of self-employment especially in rural areas. Therefore, this can explain why

higher level of spending in this sector can positively affect job creation. Numerous studies from different researchers such Birch (1979); Neumark *et al.* (2008); Freund (2011); Criscuolo *et al.* (2014) and Kerr *et al.* (2014:2) found that increasing spending in business enterprises sector could be one of remedies to the issue of unemployment.

Table 4-11: Bounding co-integration test for Business sector

Dependent variable LEBUS	Estimated F-Statistic 5.96	
Critical Values*	Lower Bound Critical Value	Upper Bound Critical Value
1%	4.4	5.72
2.5%	3.89	5.07
5%	3.47	4.57
10%	3.03	4.06

Note: * critical values from Pesaran *et al.* (2001) Table CI (V)

Source: Compiled by author using data from SARB

The estimated F-value of 5.96 (see Table 4-11) is greater than the upper bound critical value, at all levels of significance, implying that the null hypothesis of no long-run relationship (co-integration) must be rejected in favour of the alternative hypothesis.

These results suggest that there is a long-run relationship between aggregate expenditure components and job creation in business enterprises sector. This relationship can be explained by the fact that business sector accommodate people with different skills. Higher as well as lower skilled people can be employed in business enterprises sector depending on the type of business or firms in which those skills are needed. Moreover, business enterprises are the niche of self-employment especially in rural areas. Therefore this can explain why higher level of spending in this sector can positively affect job creation. Numerous studies from different researchers such as Birch (1979); Neumark *et al.* (2008); Freund (2011); Criscuolo *et al.* (2014) and Kerr *et al.* (2014:2) found that increasing spending in business enterprises sector could be one of remedies to the issue of unemployment. The long-run equation was contracted as follow:

$$\text{LEBUS} = 50.5925 + 6.8422\text{LCONS} + 0.7085\text{LGOVS} + 2.1509\text{LINVES} + 0.0000\text{NEXP} - 0.6648\text{DUMMY} \quad (4.2)$$

Equation 2 indicates that all dependent variables have a positive relationship on independent variable. One million increase in consumption and one million increases in spending on

government spending lead to 6.84 percent and 0.71 percent increase in job creation in business enterprises respectively. Likewise, one unit increase in investment spending results in 2.51% increase in in job creation, whilst the effect of net export is nil. Consumption and investment spending have a higher effect on job creation in business enterprises sector. The results are supported by Keynesian model, explained in literature review, suggesting that demand increase creates employment.

4.6.4 Short-run relationships and error correction model in business sector

Since the results from bound co-integration test revealed the presence of long-run relationship, it was necessary to analyse the short-run relationship among variables and perform the error correction model (ECM) in order to determine the times it takes changes in the system to come back to the equilibrium. The short-run relationship result would determine whether spending in business sector can create short-term employment or not. In addition, it would indicate which component of aggregate expenditure favours short-term jobs in business sector.

Table 4-12: Short-run relationship and error-correction results in business sector

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LEBUS(-1))	-0.412243	0.114213	-3.609417	0.0006*
D(LEBUS(-2))	-0.200889	0.115416	-1.740565	0.086**
D(LCONS)	0.205266	0.204717	1.002682	0.3193
D(LGOVS)	-0.021255	0.202028	-0.105208	0.9165
D(LINVES)	-0.064527	0.07842	-0.82284	0.4133
D(NEXP)	0.000000	0.00000	-1.292077	0.2004
D(NEXP(-1))	0.000000	0.00000	1.666856	0.0998***
D(DUMMY)	0.019944	0.02113	0.943866	0.3484
D(@TREND())	-0.002197	0.002013	-1.091179	0.2788
CointEq(-1)	-0.038758	0.032503	-0.922997	0.02875**

Note: *rejection of null hypothesis at 1% level of significance
 * *rejection of null hypothesis at 5% level of significance
 ** rejection of null hypothesis at 10% level of significance

Source: Compiled by author using data from SARB





The results of short-run relationship between aggregate expenditure and job creation in business enterprises are depicted in Table 4-12. As it can be seen from the table, none of independent variable is statistically significant at 5 percent level of significance. Yet, the net exports are statistically significant at 10 percent level of significance. Hence there is no

short-run relationship between dependent and independent variables except with net-exports. This suggests that, it takes time for new business enterprises or firms to start hiring new workers and no short-cut for job creation. The idea is that new employees are hired in business sector only if those businesses are making profits and growing. These results are supported by findings of Haltiwanger *et al.* (2010) and Freund (2011). Their studies reached the conclusion that the size of firm affects its level of employment and in many cases starting businesses may destroy more job than the ones they create.

Additionally, the model presents a statistically significant error correction term (ECT) of 0.038758 with the negative sign as expected. This means that approximately 4% of shocks in the system will be fixed each quarter. In other words, it will take around 26.32 (1/0.038758) quarters for the changes in aggregate expenditure to affect job creation in business enterprises sector. It takes around six years for a new business to be stable and creates more jobs. In meantime, unfitted no competitive firms die away, thus no short-run job created in this sector.

Based on the aforementioned results, it was better to analyse the causality among variables. The Granger causality test was used to determine the short-run causal relationship. The outcome of the test is shown in Table 4-13.

Table 4-13 Pairwise Granger causality tests for business sector

Null Hypothesis:	F-Statistic	Probability	Causality	Direction of causality
LCONS does not Granger Cause LEBUS	4.15706	0.0191**	Yes at 5%	
LEBUS does not Granger Cause LCONS	3.81027	0.0262**	Yes at 5%	
LGOVS does not Granger Cause LEBUS	2.99559	0.0556***	Yes at 10%	
LEBUS does not Granger Cause LGOVS	4.54083	0.0135**	Yes at 5%	
LINVES does not Granger Cause LEBUS	4.67571	0.012*	Yes at 5%	
LEBUS does not Granger Cause LINVES	2.99403	0.0557***	Yes at 10%	
NEXP does not Granger Cause LEBUS	10.64	8.00E-05	Yes at 1%	
LEBUS does not Granger Cause NEXP	3.79193	0.0267*	Yes at 5%	

Note: *rejection of null hypothesis at 1% level of significance
 * *rejection of null hypothesis at 5% level of significance
 ** rejection of null hypothesis at 10% level of significance

Source: Compiled by author using data from SARB

4.6.5 Analysis of causal relationships between aggregate expenditure and job creation in the business enterprises sector

The Table 4-13 represents the results of granger causality test. All variables have bi-directional causal relationship. Consumption, government spending, investment and net exports do cause job creation in business enterprises and, in return, job created in this sector cause an increase in the aggregate expenditure's components. This means that by increasing aggregate expenditure in business sector, job creation is granted in business sector *ceteris Paribas*.

4.6.6 Residual diagnostic tests for the business enterprises ARDL model

In this section the study used residuals tests to determine the correctness of the obtained results. The Lagrange Multiplier test was performed to detect the presence of auto-correlation among variables, while the White Heteroscedasticity was used to distinguish whether variables are homoscedastic or heteroscedastic. Finally, the normality test was performed using Jacque-Bera test. Findings revealed that the used series was homoscedastic and normally distributed. Moreover, residuals are not auto-correlated. This implies that the reached findings are trustworthy.

Table 4-14: Results of diagnostic tests for business sector

Test	H0	P-value	Decision	Conclusion
Jarque-Bera	Residuals are normally distributed	0.734137*	reject H0	Residuals are not normally distributed.
L M Test	No Serial correlation	0.4627*	Fail to reject H0	No serial correlation in the model.
White (CT)	No Heteroscedasticity	0.7508*	Fail to reject H0	No Heteroscedasticity in the model.

Note: * failure to reject null hypothesis at 5% level of significance.

Source: Compiled by author using data from SARB

This section dealt with interaction between aggregate expenditure and job creation in business enterprises sector. The analysis revealed that durable jobs can be created in this sector using consumption, government and investment spending. Spending on export has a zero effect on job creation in this sector. The analysis of short-run relationship between job creation and employment in business sector proved that there is no such thing as a quick job creation. In other words, short-term spending cannot create jobs in business sector.

Analysing the causal relationship among variables, the outcome was that consumption and government spending cause job creation, and influence spending from investment and net-export.

4.7 THE EFFECT OF AGGREGATE EXPENDITURE ON JOB CREATION IN CONSTRUCTION SECTOR

4.7.1 Descriptive and correlation analyses for construction sector

Table 4-15 portrays the correlation between dependent variable (employment in construction sectors and independent variables (consumption (LCONS), government spending (LGOVS), investment (LINVES) and net-exports (NEXP). There is a strong positive relationship between job creations in construction sector and all independent variables except net exports. The correlation coefficients of independent variables towards dependent variable are: 0.73, 0.79, 0.78, for LCONS, LGOVS and LINVES respectively. This suggests that increasing spending in the three component of aggregate expenditure will lead to job creation in construction sector. However, a strong negative correlation exists between net export and job creation in construction sector.

Table 4-15: Correlation coefficient results

	LECONS	LCONS	LGOVS	LINVES	NEXP
LECONS : correlation	1	0.729	0.786	0.778	-0.825
t-Statistic	-----	9.905	11.807	11.492	-13.576
Probability	-----	0.000	0.000	0.000	0.000

Note: * significant at 5% level of significance

Source: Compiled by author using data from SARB

4.7.2 Lag selection and model specification

Lag selection is the first important step to perform when analysing time series. The results on Figure 4-14 suggest 4 as maximum number of lags. However, the best model selected used 3 lags as optimum number of lag, the value of AIC test is smaller. Henceforth, the best model selected was :(ARDL 3,3,0,0, 0.).

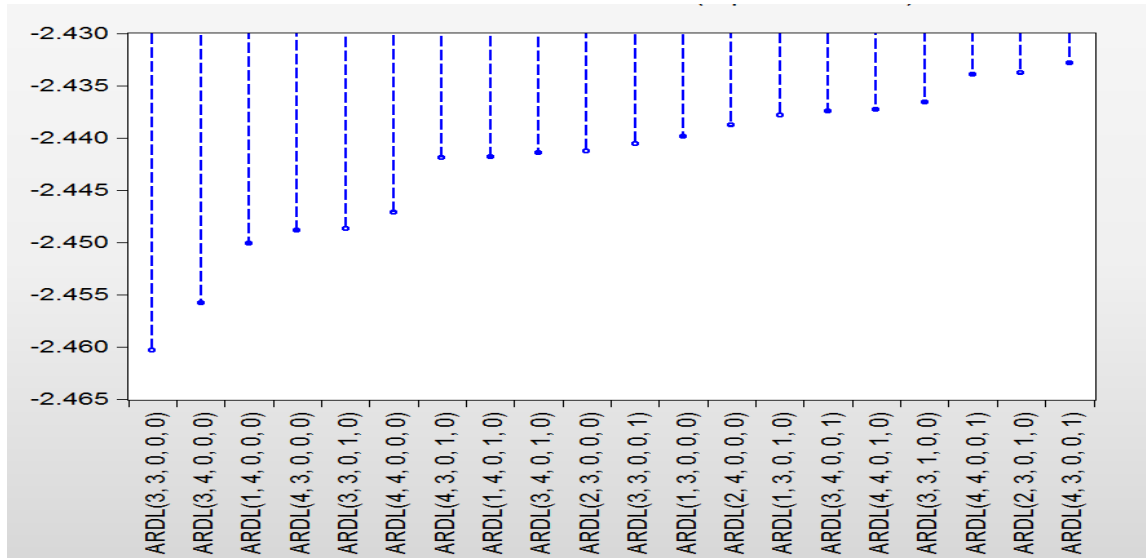


Figure 4-13: ARDL model summary selection for the construction sector

Source: Compiled by author using data from SARB

4.7.3 Co-integration results interpretation in construction sector

The Pesaran *et al.* (2001) critical values Table CI case (V) was employed to determine the co-integration between dependent and independent variables and the attained results are displayed in Table 4.2. The calculated (estimated) F-value was greater than all up bounds, even at 1percent level of significance, 5.72 (up bound) is lower than 6.41(estimated F-statistics). Therefore, the null hypothesis suggesting that there is no co-integration among variables is rejected in favour of alternative indicating that a strong long-run relationship exists between job creation in construction sector and aggregate expenditure. Excluding the contribution of net-exports in this sector, the co-integration results confirm the correlation coefficient results. Employment growth in construction sector resulting on more spending, suggests that jobs are created during the construction of buildings and continue for the maintenance of the same buildings. The long-run equation is as the following:

$$\text{LECONS} = 14.3108 + 0.1681\text{LCONS} + 0.0384\text{LGOVS} + 0.0666\text{LINVES} + 0.0000\text{NEXP} - 0.0492\text{DUMMY} - 0.0086\text{@TREND} \quad (4.3)$$

The equation 4.3 infers that if one percent increases in households' consumption, job created in construction sector would increase by 0.17 percent; and one percent increase in government spending would cause contraction jobs to increase by 0.038 percent. Likewise, one percent increase in investment spending would lead to 0.067 increases in construction job creation. The effect of net-exports on construction employment is nil.

Different studies conducted in different countries, reached the same conclusion of long-run relationship between employment growth in construction sector and different factors of total spending. Among those researchers who confirmed the co-integration between total spending and job creation in construction sector are: (Birch, 1979; Neumark, Wall and Zhang, 2008; Saks, 2008; Freund, 2011; the World Bank, 2011; Dlamini, 2012; Kerr *et al.*, 2014; OECD, 2015). The result of these studies showed that the best way to increase jobs in construction sector is to increase the level of spending on this sector.

Table 4-16: Bounding co-integration test in construction sector

Dependent variable LECONS	Estimated F-Statistic 6.41	
Critical Values*	Lower Bound Critical Value	Upper Bound Critical Value
1%	4.4	5.72
2.5%	3.89	5.07
5%	3.47	4.57
10%	3.03	4.06

Note: * critical values from Pesaran *et al.* (2001) Table CI (V)

Source: Compiled by author using data from SARB

4.7.4 Short-run relationships between aggregate expenditure and job creation in the construction sector

The presence of long-run relationship provided by bound test of integration suggested the error correction model (ECM). However, this step was preceded by the short-run relationship analysis in order to determine the effect of aggregate expenditure on job creation in construction sector is short-term. The results presented in Table 4-17 indicate that only consumption was significant at 5 percent level of significance. In other words, consumption spending is the only component of total spending that can be employed to boost jobs in construction sector in short-run. The role of error correction model was to determine how long it takes for the change in total spending to affect job creation in construction sector. As it was expected, the error correction term (ECT) was negative and significant at 1 percent level of significant. Its value was 0.300458 whilst its probability was 0.0005. This means that around 30% of changes in the model (system) will be adjusted each quarter. It will also take approximately 3 ($1/0.300458$) quarters, for change in aggregate expenditure to affect job created in construction sector.

Table 4-17: Short run relationship and the error-correction results for construction sector

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LECONS(-1))	0.171692	0.110166	1.558486	0.1235
D(LECONS(-2))	0.199747	0.116633	1.712609	0.0911***
D(LCONS)	0.698311	1.78903	0.39033	0.6974
D(LCONS(-1))	-7.001179	3.055631	-2.291238	0.0249**
D(LCONS(-2))	4.585309	1.792278	2.558369	0.0126**
D(LGOVS)	0.637253	0.44101	1.444983	0.1528
D(LINVES)	0.261625	0.281109	0.930687	0.3551
D(NEXP)	0.000000	0.000000	0.605095	0.547
D(DUMMY)	-0.044552	0.048125	-0.925761	0.3577
D(@TREND())	-0.003928	0.004736	-0.829371	0.4096
Coint Eq(-1)	-0.300458	0.081829	-3.671793	0.0005*

Note: *rejection of null hypothesis at 1% level of significance
 * *rejection of null hypothesis at 5% level of significance
 ***rejection of null hypothesis at 10% level of significance

Source: Compiled by author using data from SARB

4.7.5 Analysis of causal relationships between aggregate expenditure and job creation in the construction sector

In this section, previous tests focused on how spending in each component of aggregate expenditure can affect job creation in construction sector. However, it important to analyse the causality among variables, to determine if the jobs created in construction sector can influence spending and if spending in one factor of total spending may have any impact on spending on other factors. This analysis was done using Granger causality test and the results are presented in Table 4-18. As it can be seen in this table, most of variables have a unidirectional relationship. There were only two bidirectional causality, one between government spending and households' consumption, and the other one between investment spending and government spending. The causal relationships between government spending and households' consumption indicate that a share on the amount of money spent by government increases the level of consumption. In return, from the money spend on household's consumption, there is a portion paid to government in the form of tax (VAT), and since this tax increases government revenue, it positively affects the future government spending. There was no causal relationship between investment spending and net-exports and this explains why net export does not create jobs in construction sector.

If investment spending was generating products for exportation, more building would be needed for production and for stocking, and this could lead to labour hiring. However, the

absence of causality between investment spending and net export results in lower employing capacity in construction sector.

Table 4-18: Granger causality results for construction sector

Null Hypothesis:	F-Statistic	Probability	Causality	Direction of causality
LCONS does not Granger Cause LECONS	3.1823	0.0467**	Yes at 5%	→
LECONS does not Granger Cause LCONS	0.1979	0.8208	No	
LGOVS does not Granger Cause LECONS	2.9634	0.0556***	Yes at 10%	→
LECONS does not Granger Cause LGOVS	0.229	0.7958	No	
LINVES does not Granger Cause LECONS	3.9061	0.0240**	Yes at 10%	→
LECONS does not Granger Cause LINVES	0.8627	0.4259	No	
NEXP does not Granger Cause LECONS	1.7009	0.189	No	
LECONS does not Granger Cause NEXP	2.6155	0.0793***	Yes at 10%	→

Note: *rejection of null hypothesis at 1% level of significance
 * *rejection of null hypothesis at 5% level of significance
 ***rejection of null hypothesis at 10% level of significance
 Source: Compiled by author using data from SARB

4.7.6 Residual diagnostic tests for the construction ARDL model

The accuracy or validity of time series results are mostly justified by the diagnostic tests outcome. If the model failed to pass the diagnostic tests, its results are hardly to be considered genuine. In this section the study tested the Heteroscedasticity, auto-correlation and normality of variables. The results displayed in Table 4-19, showed that variables are homoscedastic and there is no auto-correlation among the variables.

Table 4-19: Results of diagnostic tests for construction sector

Test	H0	P-value	Decision	Conclusion
Jarque-Bera	Residuals are normally distributed	0.000131*	reject H0	Residuals are not normally distributed.
L M Test	No Serial correlation	0.4158	Fail to reject H0	No serial correlation in the model.
White (CT)	No Heteroscedasticity	0.2446	Fail to reject H0	No Heteroscedasticity in the model.

Note: * rejection of null hypothesis at the 5% level of significance
 Source: Compiled by author using data from SARB

The overall findings in this section of analysis revealed that the total spending can create jobs in construction sector and these jobs are durable. This is because jobs created during the construction of buildings are continued when those building are being maintained. However,

it seemed difficult to create short-term employment using spending. Only consumption spending can be used to create short-term job in construction sector. The causal relationship showed that most of variables have a one way causal relationship. There was no causality between investment spending and net export. Besides causal relationship of net-exports, this component of aggregate expenditure (net exports) was found to have no effect on jobs creation in construction sector.

4.8 THE EFFECT OF AGGREGATE EXPENDITURE ON JOB CREATION IN FINANCIAL SECTOR

4.8.1 Descriptive and correlation analyses for financial sector

The Pearson correlation coefficient which lies between two values: +1 and -1 is used to determine the magnitude of two variables relationship. A higher absolute value of the value of the correlation coefficient indicates a strong relationship between variables. Correlations coefficient of all analysed variables is statistically significance at 5% level of significance. There is a positive strong relationship between job creation in financial sector and the three components of aggregate spending namely household consumption (LCONS), government spending (LGOVS) and investment spending (LINVES). Nonetheless, there is strong and negative relationship between job creation in financial sector and net-exports. Table 4-20 depicts the results of correlation test.

Table 4-20: Pairwise correlation coefficients for financial sector

	LEFIN	LCONS	LGOVS	LINVES	NEXP
LEFIN correlation	1	0.713	0.676	0.719	-0.634
t-Statistic	-----	14.784	9.873	10.675	-7.029
Probability	-----	0.000*	0.000*	0.000*	0.000*

Note: * significant at 1% level of significant

Source: Compiled by author using data from SARB

4.8.2 Lags and model selection for the financial sector

Lags selection being important in time series analysis, the study in this section, employed automatic lag selection and the maximum number of lags suggested by the system was 3 while the minimum was 0. However, the bested model selected used one lag as optimum lag for dependent variable: ARDL (1, 0, 0, 1, 0)

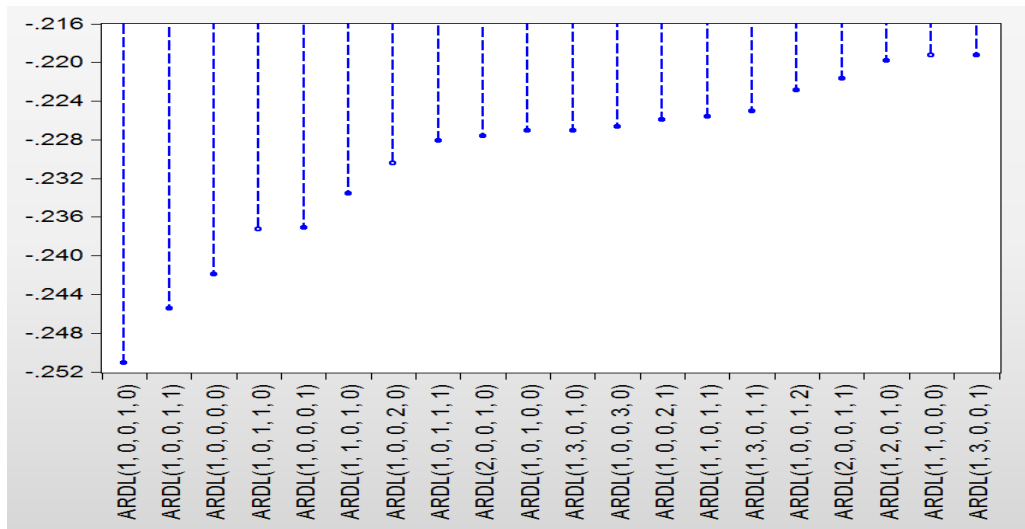


Table 4-21: ARDL model summary selection a for the financial sector

Source: Compiled by author using data from SARB

4.8.3 Co-integration test and results interpretation

Using bound test of co-integration, the results displayed in Table 4-22 showed that the calculated F-statistics with the value of 1.51 was lower than lower bound critical values of 2.45 at 10% level of significant. Henceforth, the null hypothesis suggesting the absence of long-run relationship among variables was not rejected. In other words, variables were not co-integrating. The total spending cannot create long-term jobs in financial sector. This might be due to the fact that from time to time there is technological improvement and when new machineries are introduce in financial sector, instead of creating employment, some workers lost their jobs. In financial sector, the advanced technology is more effective and efficiency than labour intensive. Human services are only needed to use those machineries, to helps customers to perform self-services, and to control the system. Moreover, financial sector is one those sectors that are mostly affected by global economics crises, meaning that if economy is facing its downfall , some of workers are hit by retrenchment. The results of co-integration test are presented in Table 4-22.

Table 4-22: Bounding co-integration test for financial sector

Dependent variable LEFIN	Estimated F-Statistic 1.51					
Critical Values*	Lower Value	Bound	Critical	Upper Value	Bound	Critical
1%	3.74			5.06		
2.5%	3.25			4.49		
5%	2.86			4.01		
10%	2.45			3.52		

Note: * critical values from Pesaran *et al.* (2001) Table CI (V)

Source: Compiled by author using data from SARB

4.8.4 Short run relationship between aggregate expenditure and job creation in financial sector

Since there is no long-run relationship among variables, the error correction model became unnecessary. However, it was important to test if at least there is a short-run relationship among variables. In other words, to ensure the aggregate spending can create short-term jobs in financial sector the model was used. The short-run relationship results are exhibited in Table 4-23. As it can be seen in table, none of aggregate expenditure components is statistically significant even at 10% percent level of significance. The results suggested increase in spending had no effect on job creation in financial sector.

Table 4-23: Short run relationship results for financial sector

Variable	Coefficient	Std. Error	t-Statistic	Probability
D(LCONS)	0.632556	1.369953	0.46174	0.6456
D(LGOVS)	0.860151	1.006007	0.85502	0.3952
D(LINVES)	1.505356	1.385297	1.08667	0.2805
D(NEXP)	0.000001	0.000001	0.98094	0.3297
D(DUMMY)	0.059237	0.122739	0.48263	0.6307
D(@TREND())	-0.004873	0.010889	-0.4475	0.6557
CointEq(-1)	-0.125141	0.063478	-1.9714	0.0522



Source: Compiled by author using data from SARB

4.8.5 Analysis of causal relationships between aggregate expenditure and job creation in the financial sector

Although job creation in financial spending might not result from direct spending within this sector, there is a possibility that jobs in this sector might be as the result of individual spending in each factor of aggregate expenditure.

Therefore using Granger causality test can help to predict how raising spending in any factor of total spending will affect jobs in financial sector and forecasting how job created in financial sector will affect spending in any of those components of aggregate expenditure. Results depicted in table 4-24 show that, a bidirectional causal relationship existed between government spending and households consumption, between investment spending and government spending. This suggested that government spending dominates the total spending. Apart from that mutual causality between government spending and the two mentioned components of total spending, it also causes the spending on net exports. Notwithstanding, there is no Granger causal between consumption and employment in financial sector, between government spending and employment in financial sector, between net-export and investment spending. The single effect of job created in financial sector is to cause a growth in net-exports.

Table 4-24: Granger Causality results for financial sector

Null Hypothesis:	F-Statistic	Prob.	Causality	Direction of causality
LCONS does not Granger Cause LEFIN	0.91730	0.4037	No	No causality
LEFIN does not Granger Cause LCONS	2.25706	0.1112	No	
LGOVS does not Granger Cause LEFIN	1.49619	0.2301	No	No causality
LEFIN does not Granger Cause LGOVS	2.25226	0.1117	No	
LINVES does not Granger Cause LEFIN	0.39980	0.6718	No	
LEFIN does not Granger Cause LINVES	5.05468	0.0085*	Yes at 1%	
NEXP does not Granger Cause LEFIN	0.30133	0.7407	No	
LEFIN does not Granger Cause NEXP	4.56356	0.0132	Yes at 5%	

Note: *rejection of null hypothesis at 1% level of significance

* *rejection of null hypothesis at 5% level of significance

***rejection of null hypothesis at 10% level of significance

Source: Compiled by author using data from SARB

4.8.6 Residual diagnostic tests for the financial ARDL model

To ensure the exactness of the obtained results in this section, three tests namely normality test, LM test for autocorrelation and heteroscedasticity test were conducted. Results of these tests are displayed in Table 4-25. The null hypothesis suggesting presence of serial correlation and heteroscedasticity in residuals was rejected at 5% level of significance for the probabilities of these two tests are 0.8721 and 0.3332 respectively. Inversely, the probability

of normality test was 0.000 signifying the absence of evidences to reject the null hypothesis. Consequently, variable used were not normal distributed.

Table 4-25: Results of diagnostic tests

Test	H0	P-value	Decision	Conclusion
Jarque-Bera	Residuals are normally distributed	0.000*	reject H0	Residuals are not normally distributed.
L M Test	No Serial correlation	0.8721	Fail to reject H0	No serial correlation in the model.
White (CT)	No Heteroscedasticity	0.3332	Fail to reject H0	No Heteroscedasticity in the model.

Note: * rejection of null hypothesis at the 5% level of significance

Source: Compiled by author using data from SARB

In this section, the relationship between job creation in financial sector and aggregate spending, the results from correlation test were different from co-integration test and short run relationship. Although correlation coefficients showed that a strong and positive relationship was between job creation and employment in financial sector, co-integration test revealed that there were no long-run relationship between aggregate expenditure and job creation in financial sector. The same results were found when testing short run relationships among variables. The granger causality test indicated that the government spending had a power to cause spending in other components of total spending.

4.9 THE EFFECT OF AGGREGATE EXPENDITURE ON JOB CREATION IN MINING SECTOR

4.9.1 Descriptive and correlation analyses for mining sector

In order to analyse employment growth in mining sector, all variables were transformed into natural logarithm with the exception of net exports since it contains some negative numbers which cannot be transformed into logs. The use of logarithm facilitates the analysis of growth (elasticity) among variables. Table 4-26 exhibits the correlation coefficient among variables selected for this section which are: Households' consumption (C), government spending (G), investment or capital formation (I) and net exports (NX). Based on the theory of correlation coefficient, the result represented by the table 4-26 shows a negative linear relationship between employment in mining sector and total spending on consumption and net exports.

Nevertheless, a strong and positive correlation exists between Government spending (LGOVS) and investment spending (LINVES), meaning that increase in spending on these two components of aggregate expenditure may lead to job creation in financial sector.

Table 4-26: Pairwise correlation coefficients for mining sector

	LEMIN	LCONS	LGOVS	LINVES	NEXP
LEFIN correlation	1	-0.764	0.673	0.7167	-0.5539
t-Statistic	-----	-5.196	8.681	6.155	-4.725
Probability	-----	0.000	0.000	0.000	0.000

Source: Compiled by author using data from SARB

4.9.2 Lag and model selection

In this section, like previous sections, the study employed the automatic lag selection and the maximum number of lags suggest by the system were four lags. However, in model selection, the best model suggested the use of three lags as maximum, because it has the lower AIC value and it passes diagnostic tests. The optimum number of lags for each variables reported in Figure 4-15 shows that two lags were used for the dependent variable (LEMIN) and no lags were chosen for independent variables except for net-exports (NEXP) for which 3 lags were suggested and used (in the best model).

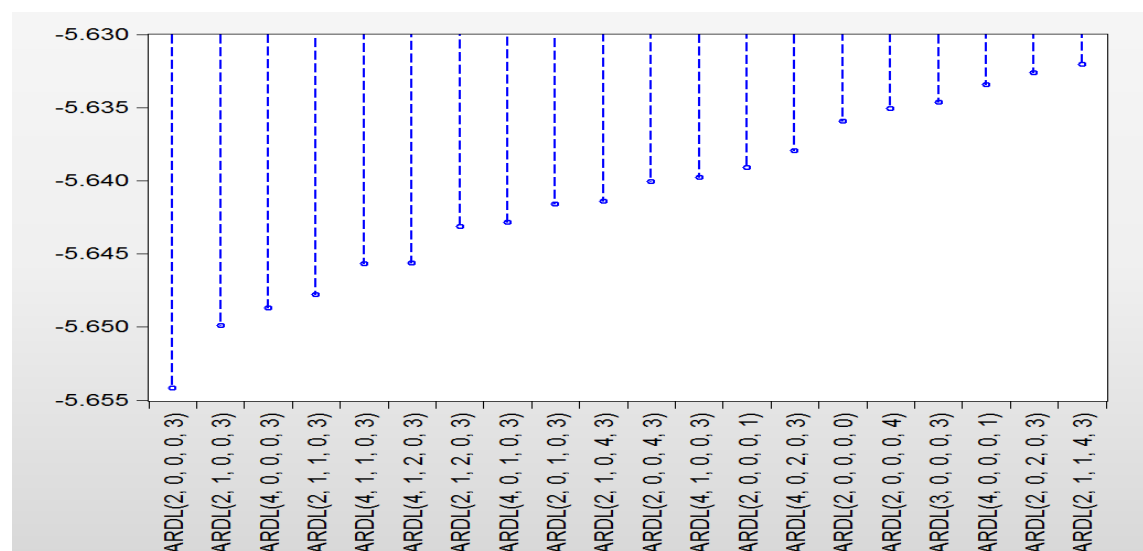


Figure 4-14: ARDL model summary selection for mining sector

Source: Compiled by author using data from SARB

4.9.3 Co-integration analysis and results discussion

The bound test of co-integration was used to determine the long-run relationship among variables. Fundamentally, the analysis of this test was performed under the following hypotheses:

H0: no long-run relationship among variables

H1: there is a long-run relationship among variables

The conclusion about the obtained results is made by making a comparison between F-statistics and critical values. If the estimated F-value is greater than the upper bound, the null hypothesis is rejected in favour of the alternative. If this estimated F-value is less than the lower critical value, null hypothesis is not rejected and the conclusion will be that variables are not co-integrated. However, if the estimated F-value falls between the two boundaries (lower and upper) neither the null hypothesis nor the alternative is accepted or rejected. Consequently, the results become inconclusive. As it was mentioned in previous sections, the used critical values are from Pesaran (2001:300). The results of bound test of co-integration for this section are depicted in Table 4-16. The estimated F-value of 6.82 is greater than value of upper bound of 5.72 at 1percent level of significance. Henceforth, variables are jointly co-integrated. In other words, there is a long-run relationship among dependent and independent variables.

Figure 4-15: Bounding co-integration test for mining sector

Dependent variable LEMIN	Estimated F-Statistic 6.82		
Critical Values*	Lower Bound Value	Critical Value	Upper Bound Critical Value
1%	4.4		5.72
2.5%	3.89		5.07
5%	3.47		4.57
10%	3.03		4.06

Note: * critical values from Pesaran *et al.* (2001) Table CI (V)

Source: Compiled by author using data from SARB

This co-integration among variables implies that by increasing aggregate expenditure, more jobs can be created in mining sector. These results show that the aggregate expenditure components jointly can create job in mining sector. However, as it one of the study's objectives, it is important to differentiate those components of aggregate expenditure that create jobs in this sector from those one that have no effect no job creation in mining sector.

To achieve this objective the study analysed the long-run coefficients or the co-integration equation. The following is the co-integration equation:

$$\text{LEMIN} = -10.6229 - 0.3432\text{LCONS} - 0.8834\text{LGOVS} + 0.0377\text{LINVES} + 0.00001\text{NEXP} + 0.1498\text{DUMMY} + 0.0106\text{ @TREND} \quad (4.5)$$

Equation 4.5 above shows that 1% increase in spending on consumption and government expenditure cause job creation in mining sector to decline by 0.34 percent and 0.88percent respectively. Studies of Kerr *et al.* (2014) and (OECD, 2015) reached the same conclusion that consumption and government spending may destroy jobs in mining sector. Yet these results contradict findings of Saks (2008) and StatsSA (2016) whose conclusion support the theory suggesting that consumption and government spending create jobs in manufacturing sector. Nevertheless, 1 percent increase in investment spending, job creation in mining sector increases by 0.03 percent. This positive relationship between investment spending and job creation in mining sector was also reached in the study of Psaltopoulos *et al.* (2011:55). Lastly, one million increases in spending on net-export has a minor positive effect on job creation in mining sector.

4.9.4 Short-run relationships between aggregate expenditure and job creation in the mining sector

The short-run analysis, determine the effects of the independent variables on dependent variable in short-run. The presence of co-integrating among variables is a step that leads to the error correction model (ECM) to analyse the time it takes the dependent variable to be affected by changes in independent variables. In other words, how long it takes the system to regain the equilibrium after disturbances in the system. The study used the results presented in Table 4-27 to analyse short-run and error correction model. As it can be seen from the results presented in Table 4-27, the three out of four components of aggregate expenditure, namely government spending, investment spending and net-exports can create jobs in mining sector. These variables are statistically significant at 5% level of significance. However, it takes some time for net-exports to create short-term jobs for spending on net-exports affects jobs after the second quarter. In addition, the previous employment in mining sector stimulates and affects positively new jobs in this sector. Notwithstanding, households' consumption is not significant, meaning that it does not affect short-term job creation in

mining sector. The dummy variable is also significant implying that breaks or economic shocks affect job creation in mining sector.

In terms of error correction model, the error term of 0.27459 was significant at 1 percent level of significant and it had the expected negative sign. Each quarter around 27% of changes in the system are corrected. It will take 3.7 (1/0.27459) quarters (almost a year) for shocks in aggregate expenditure to affect job creation in mining sector. Since the short-run results proved the effects on aggregate expenditure on mining employment, it was worthwhile to analyse the causality among variables.

Table 4-27: Short run relationship and the error-correction results for mining sector

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LEMIN(-1))	0.338382	0.093277	3.627695	0.0005*
D(LCONS)	0.094241	0.100992	0.933157	0.3538
D(LGOVS)	0.24258	0.086927	2.790605	0.0067**
D(LINVES)	-0.01036	0.041886	-0.24739	0.8053
D(NEXP)	0.00000	0.000000	-2.38934	0.0195**
D(NEXP(-1))	0.00000	0.000000	0.764879	0.4468
D(NEXP(-2))	0.00000	0.000000	-2.21118	0.0302**
D(DUMMY)	-0.04112	0.012513	-3.28642	0.0016**
D(@TREND)	-0.00292	0.000848	-3.44459	0.0010**
CointEq(-1)	-0.27459	0.059232	-4.63591	0.0000*

Note: *rejection of null hypothesis at 1% level of significance

* *rejection of null hypothesis at 5% level of significance

Source: Compiled by author using data from SARB


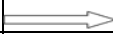
4.9.5 Analysis of causal relationships between aggregate expenditure and job creation in the mining sector

The granger causality test is a tool used to predict the future behaviour of one variable (x) based on the current state of the other (y) and vice versa (Granger, 1996:430). This test was used to determine, on one side, how each component of aggregates expenditure can be used to make a prediction about job creation in mining sector and to predict, on the other hand, how those jobs created can cause a movement towards aggregate expenditure's components. Moreover, the same test allowed determining a mutual causal relationship among four components of aggregate expenditure themselves. The results of the test are depicted in Table 4-28. The result shows that there is only one bidirectional relationship between job creation in mining sector and households' consumption. No any other component of aggregate expenditure can cause employment in mining sector. The government spending is the most

influential component of aggregate expenditure; it can cause spending in other factors of aggregate expenditure, while net exports remain insignificant towards other variables.

There is no causality between investment spending and consumption. The reason should be that investment spending aims to increase future production not direct consumption. Government spending and households' consumption are the only components of aggregate expenditure that cause increase in net-exports. The logic behind this is that consumption growth, as stipulated in Keynesian model, leads to high demand which requires production increase and higher labour demand, *ceteris paribus*. Furthermore, if domestic firms are supported and subsidised by government they become more productive and more competitive, since the support received lowers the cost of production. Table 4-28 below exhibits the results of granger causality test.

Table 4-28: Granger causality results for mining sector's employment

Null Hypothesis	F-Statistic	Prob.	Causality	Direction of causality
LCONS does not Granger Cause LEMIN LEMIN does not Granger Cause LCONS	2.90596 3.684	0.0604*** 0.0294**	Yes at 10% Yes at 5%	
LGOVS does not Granger Cause LEMIN LEMIN does not Granger Cause LGOVS	1.17097 1.9475	0.3153 0.1493	No No	No causality
LINVES does not Granger Cause LEMIN LEMIN does not Granger Cause LINVES	1.5697 4.3837	0.2144 0.0156**	No Yes at 5%	
NEXP does not Granger Cause LEMIN LEMIN does not Granger Cause NEXP	1.13962 0.33684	0.325 0.715	No No	No causality

Note: *rejection of null hypothesis at 1% level of significance
 * *rejection of null hypothesis at 5% level of significance
 ***rejection of null hypothesis at 10% level of significance

Source: Compiled by author using data from SARB

4.9.6 Residual diagnostic tests for the mining ARDL model

If the model employed to perform regression and analysis of series was inadequate, the conclusion reached would also be spurious. Henceforth, it was vital to apply the necessary model diagnostics. The most crucial residual test is serial correlation and heteroscedasticity tests. This study performed these two tests and included normality test. The results displayed in Table 4-29 indicates that the model employed in the study was adequate and appropriate

for all the test were passed at 5 percent level of significance. The null hypothesis suggesting the absence of serial correlation, homoscedasticity and the presence of normal distribution among variables was not rejected.

Table 4-29: Results of diagnostic tests for mining sector

Test	Ho	P-value	Decision
Jarque-Bera	Residuals are normally distributed	0.140*	Since P-value is greater than 5%, we fail to reject H0. Henceforth, residuals are normally distributed.
L M Test	No Serial correlation	0.1734*	Since P-value is greater than 5%, we fail to reject H0. Henceforth, there is no serial correlation in the model.
White (CT)	No Heteroscedasticity	0.2464*	Since P-value is greater than 5%, we fail to reject H0. Henceforth, there is no heteroscedasticity in the model.

Note * Failure to rejection of null hypothesis at 5% level of significance

Source: Compiled by author using data from SARB

Analysing the effects on aggregate expenditure on job creation in manufacturing sector, the correlation coefficients revealed a weak relationship between aggregate spending components, namely consumption, government spending and investment spending and job created in mining sector. Contrary to the literature, the correlation coefficient between investment spending and job creation in mining sector is not significant, meaning that investment spending has no effect on employment in mining sector. Notwithstanding, with the results from correlation analysis, the co-integration test indicated that aggregate expenditure has a major influence on job created in mining sector. The causality test showed that government spending can be used to predict the future of other component of aggregate expenditure while net exports has no causal relationship with employment in mining sector.

4.10 COMPARISON AMONG THE AGGREGATE EXPENDITURE COMPONENTS AND THEIR CONTRIBUTION TO SECTORIAL EMPLOYMENT

The Table 4-30 compares the aggregate expenditure components and their contribution towards job creation in the five selected economic sectors. Consumption and investment spending create more jobs in business enterprise sector than in other sectors. However, instead of job creation, consumption spending destroys jobs in manufacturing and in mining sectors. The government spending contributes more in business and mining sectors compare to the other sectors. The net export is the only component which has zero effect on job creation in all five sectors. While, overall, investment spending appear to be dominant in

creating jobs in four sectors namely business enterprises, construction, manufacturing and mining; all components of the aggregate expenditure have an effect on job creation in financial sector.

Table 4-30: Aggregate expenditure components and their contribution towards job creation

Sector	Aggregate expenditure components and their contribution sectorial employment			
	Consumption	Government spending	Investment	Net export
Business	6.842	0.708	2.150	0.0000
Construction	0.168	0.0384	0.066	0.0000
Financial	Not significant	Not significant	Not significant	Not significant
Manufacturing	- 1.606	0.252	0.337	0.000
Mining	- 0.343	0.883	0.037	0.000

Source: Compiled by author using data from SARB

4.11 CAUSAL RELATIONS ACROSS-SECTORAL EMPLOYMENT

Table 4-30 depicts the causal relationship among five economic sectors' employment. As it was reviewed in literature, employment in some sectors may stimulate and cause employment in other sectors. Employment in construction sector according to Granger causality analysis causes the employment in business sector and vice versa. New businesses require new buildings which lead to the hiring of new employees. In return, if there is new and affordable building, the cost of new venture should be lower, and many people should try to start small business, thus job creation. Business sector causes also employment in financial sector and in return financial sector causes job creation in business sector in easing access to funds.

There is bidirectional causality between manufacturing sector and business sector. The manufactured product are sold in business sector, therefore the more businesses demand from manufacturing sector the higher is the supply from manufacturing and more new jobs are created in manufacturing sector. Looking at the result presented in Table 4-30, business sector is the dominant sector to spread jobs in other sectors, while manufacturing employment affects few sector with regard to job creation.

Table 4-31: Causal relationship among sectors' employment

Null Hypothesis	F-Statistic	Probability	causality
LECONS does not Granger Cause LEBUS LEBUS does not Granger Cause LECONS	8.18835 2.85381	0.0006* 0.0634***	2 ways
LEFIN does not Granger Cause LEBUS LEBUS does not Granger Cause LEFIN	5.34921 3.67162	0.0066** 0.0298**	2ways
LEMAN does not Granger Cause LEBUS LEBUS does not Granger Cause LEMAN	0.07716 0.16123	0.9258 0.8514	No causality
LEMEN does not Granger Cause LEBUS LEBUS does not Granger Cause LEMEN	9.39745 2.45781	0.0002* 0.092***	2 ways
LEFIN does not Granger Cause LECONS LECONS does not Granger Cause LEFIN	2.75726 1.49342	0.0694*** 0.2307	One way
LEMAN does not Granger Cause LECONS LECONS does not Granger Cause LEMAN	2.3537 0.25467	0.1015 0.7758	No causality
LEMEN does not Granger Cause LECONS LECONS does not Granger Cause LEMEN	1.96896 1.75538	0.1462 0.1794	No causality
LEMAN does not Granger Cause LEFIN LEFIN does not Granger Cause LEMAN	1.74157 0.15283	0.1817 0.8585	No causality
LEMEN does not Granger Cause LEFIN LEFIN does not Granger Cause LEMEN	2.81092 1.78853	0.066*** 0.1737	One way
LEMEN does not Granger Cause LEMAN LEMAN does not Granger Cause LEMEN	1.0166 0.59843	0.3664 0.5521	No causality

Note: *rejection of null hypothesis at 1% level of significance

* *rejection of null hypothesis at 5% level of significance

***rejection of null hypothesis at 10% level of significance

Source: Compiled by author using data from SARB

4.12 CHAPTER'S SUMMARY AND CONCLUDING REMARKS

This chapter focussed on data analysis and results discussion. In this regard, the autoregressive distributed lag (ARDL) model was employed to estimate the co-integration between dependent and independent variables. Moreover, other econometric techniques such as error correction model (ECM), Granger causality test (GC) and diagnostic tests were employed in the study. The obtained results from the aforementioned test allowed the researcher to make a logical conclusion and implications. Furthermore, findings from the analysis in chapter enabled the study to provide the effective answers to questions raised in chapter one of this study.

The key findings of this chapter were that aggregate expenditure creates long run jobs in manufacturing, business enterprises, construction and mining sector. However, findings also revealed that spending on financial sector does not create long run jobs in financial sector. Investment spending, government spending and the household consumption were found to be the most influential aggregate expenditure component that creates jobs in these sectors. The net export was found to have no effect on job creation. Under the aggregate expenditure power, the business enterprises sector was found to be a dominant sector in job creation. The next chapter, provides a concise summary of the whole study, offers the conclusion and recommendations to South African macroeconomic authorities and policymakers on how job creation can be improved in different economic sectors. Lastly, it presents the limitations of the study and suggestion for further studies.

CHAPTER 5: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

A higher rate of unemployment generates multivariate problems and job creation remains the backbone of countries' development and the well-being of the citizens. South Africa being one of those countries with a high rate of unemployment, considers job creation as one of the urgent goals to be achieved in order to improve the South African economy and the welfare of its people. This objective can only be achieved if adequate methods and effective sectors, in which job creation is feasible, are selected by economic authorities and policymakers.

The contribution of the aggregate expenditure on job creation in five of South African major economic sectors was the primary objective of this study. This main objective was in line with other empirical objectives of determining the effects of each component of aggregate expenditure on job creation in each of the selected five sectors. These empirical objectives formed the basic pillars on which the conclusion was drawn, whether the aggregate expenditure in general, and of each component of aggregate expenditure (household consumption, government spending, investment and net exports) in particular, can stimulate and create jobs in business enterprises, construction, financial, manufacturing, and mining sectors. Different econometric approaches and models were used in this study to achieve those objectives. The main finding in this study was that the aggregate expenditure creates long-term jobs in four sectors, namely in business, construction, manufacturing and mining sectors. No long-run relationship was found between aggregate expenditure and job creation in financial sector. This was against the expectation that aggregate expenditure creates jobs in all five sectors as stated in other empirical studies.

This closing chapter consists of the summary of findings and the conclusion of the study. It provides the summarized review of literature and empirical studies and their outcome. Additionally, it concludes the study and provides the essential recommendations. Lastly, it outlines the limitations of the study and proposes some focus areas for the future studies.

5.2 SUMMARY OF THE STUDY

Since this study consisted of different sections. The summary reflects the manner in which the entire study was outlined. In other words, the study summary commences with the background of the study followed by the summary of literature and empirical review as

presented in the second chapter. Chapter 3 also provided a summary methodology used and empirical findings of the nexus between aggregate expenditure and jobs creation in five of the major economic sector in South Africa.

5.2.1 Summary of background and theoretical review

The theoretical review of the study was divided into two sections. The first section consisted of a review of Keynesian model of employment, its strength, weaknesses and criticism compare to the classical model. This discussion was preceded by the conceptual definitions. The second section focused on the review of empirical studies that analysed the relationship between aggregate expenditure and job creation in different economic sectors.

By definition, a job refers to a set of tasks to be performed by a person for his or her employer or for oneself in exchange of remuneration or profit. From this definition of the job, job creation becomes the provision of employment to a jobless person that generates wage/salary or starting of any activity that can generates profits to oneself. In this regards, a job and employment have similar meaning. However, employment mostly refers to those people having jobs in labour force compared to the unemployed ones. Employment can be formal or informal but both generate income. The difference between the two types of employment is that formal employment appears to be more secured and more beneficial than informal employment. Although it is difficult to determine the exact number of employed and unemployed people, the simple way to establish the level of unemployment and employment is by counting the number of people who are employed and unemployed from the total labour force.

In economy, there are multivariate strategies that can be used to create jobs and one of them is to increase the level of total spending. Aggregates expenditure consists of consumption, government spending, investment and net exports and it was seen by Keynes as an indispensable tool to boost employment. The Keynesian theory of employment suggests that demand creates its own supply. Therefore, the higher quantity demanded is, the more is quantity supplied to reach economic equilibrium. If more quantity has to be supplied, the level of production must shift upwards, meaning that more labour is needed, *ceteris paribus*. The force of the Keynesian theory is grounded on the fact that the components of aggregate expenditure remain the same factors of economic growth (GDP), and GDP being the engine of job creation in any economy.

The Keynesian theory differs from the classical theory in the sense that the latter argued that supply (production) creates its own demand. The classical theory states that economy operates always at full-capacity and hence any activity included into economy will not add any value but replace or substitutes the existing activity. In the classical theory, the economy is dominated by self-interest seeking and self-markets; henceforth, there is no need for government intervention. If economy is shaken by any disturbance, it must be left alone for it will come to the equilibrium by itself (*laissez-faire*). This is one of the theories that differ from Keynesian theory from Classical theories.

The mainstream of Keynesian theory was primarily to develop a theory that would explain factors of production, consumption, saving and investment. In his view, leaving an economy on its own was an unwise decision for as he said “in long-run we are all dead”. The problem of unemployment, he suggested, can be overcome if the level of domestic production is increased and this seems impossible if the level of demand is constant. In other words, growth in domestic demand stimulates production while production depends on the labour capacity *ceteris paribus*. Keynes argued that not only the lack or lower demand harms the economy, it also creates the involuntary unemployment. The solution to the lower demand and higher unemployment rate should be through government intervention with expansionary policy in the economy, rather than increase of money supply. Increase of money is not enough for private sector to increase their spending. The Keynesian theory argues that unemployment occurs when an economy is not operating under full-capacity or if an error was made in sales expectations.

The role of government will be to stimulate demand and economic growth by encouraging investment spending, reducing interest rates, cutting taxes and subsidising domestic producers. These strategies will allow household's income to rise leading to higher demand and supply. Consequently, more labour will be needed in order to increase production and satisfy the level of demand. Nonetheless, the Keynesian theory was not well understood by many economists of his time and who proceeded thereafter, hence it attracted support as well as criticisms.

Keynes argued that in order to boost the level of employment, the wage rate should be reduced to accommodate many employees. This idea was seen as impractical because a positive relationship exists between wages and employment. In this regard, Keynes was

criticised for creating confusion between the theory of money, wages and employment. The theory against the Keynesian model asserted that full employment does not depend on the quantity of money supplied rather on the level of interest rate and prices. Moreover, the role of government support in the economy was seen as self-defeating strategies. The money injected by government in the economy may cause a reduction in government bonds, price, higher wages and lower business profitability; consequently reducing employment capacity. Moreover, government has no resources without individuals and private sectors.

In support of Keynesian theory, the Keynesians argued that government intervention does not destroy private businesses but they work in complementarity. The government provision of infrastructures, government grants and subsidies, facilitate and stimulates business productivity and boost investment spending and as result more labour is employed. Government with its “invisible hand” can regulate the economy and improve economic growth leading to economic stability. Changing aggregate demand and output level is the only way to stabilise prices. For instance, the application of Keynesian theory on USA and Nepal economies resulted in improvement of economic growth and job creation. Furthermore, using aggregate expenditure appeared to be a better strategy to create jobs within various economic sectors.

5.2.2 Review of empirical studies on aggregate expenditure and job creation

Different studies in different countries tested the Keynesian theory of employment and they reached on different findings and conclusions. Firstly, analysing the impact of household consumption spending on job creation, some researchers found that the elasticity of household’s demand determines the level of industries’ production and their capacity of hiring new employees. However, other studies proved that higher level of demand might destroy domestic jobs if household’s consumption is mostly based on imported goods and services; or else, household’s consumption increases as result of higher rate of population growth and this is the case in most of the developing countries. Moreover, if the products consumed by the households are produced using machineries, increase in consumption spending has no effect on employment.

Secondly, government spending positively affects job creation, in the sense that the social grants provided by government increases demand of households for goods and services. In addition, if domestic firms and private companies are supported by government in terms of

subsidies, tax cut and provision of necessary infrastructures, the cost of production is lower and these companies are able to increase the number of employees, *ceteris paribus*. Government also plays an indispensable role in resource allocation. Besides those indirect jobs that can be created through government supports, government has the power of creating direct jobs through hiring in public sector. Nevertheless, the government spending can also destroy jobs if the money spent by government does not play any role to economic growth. For example, if government is spending more on the military, jobs will be destroyed instead of being created.

Thirdly, fluctuations in the economy depend on the level of investment spending and so does employment growth. There is a positive relationship between investment spending and job creation. Investment spending is employed to create new jobs, and the salaries obtained from these jobs can be used to create new investment spending. Not only does investment spending create jobs, it also sustains existing employment. The change in investment spending affects directly the level of employment. However, the weak side of investment spending is that it creates jobs in one sector at the expenses of jobs in other sectors. If a significant share of investment spending is allocated to technology improvement, jobs will be destroyed as production shifts from labour intensive to capital intensive.

Finally, the more domestic firms' exports, the higher the quantity produced and as a result the more the labour is employed, *ceteris paribus*. Different studies conducted to determine the link between net export and job creation, proved that higher levels of net exports indicate the higher and better level of employment. Most countries with higher rate of unemployment are net importers, they import more than they export. A country is net exporter when its domestic firms are more competitive regarding international markets; hence the country's rising GDP. Nonetheless, the higher rate of exports may depend on the use of advanced technology and in this case, net export is insignificant towards job creation. Moreover, if the increase in exports causes an increase in working-hours for existing employees, the quantity increased in exports has no effect on job creation.

5.2.3 Summary of the methodology and findings

In this study, secondary data was used for the empirical analysis. The study used quarterly data acquired from South African Reserve Bank (SARB). The time frame was between 1994 and 2015 which makes the number of observation to be 84. However, before any attempt to

the data analysis, variables subjected to the study were described and the different statistical techniques and model were discussed in chapter three. The analysis consisted on the effect of aggregate expenditure (consumption, government spending, investment, investment and net exports spending) on job creation in five selected economic sectors (business enterprises, construction, financial, manufacturing and mining sector). To determine the elasticity of employment, the data was firstly transformed into logarithm form. However, since the net exports contains negative values and there is no logarithm for negative number, the net exports values were used in their natural forms. The analysis of data was conducted in accordance to the empirical objectives set in chapter one and the findings were presented hereafter.

To assess the relationship between the aggregate expenditure and job creation in five of major economic sectors (business enterprises, construction, financial, manufacturing and mining) in South Africa, some econometric approaches such as bound test of co-integration, Error Correction Model (ECM) and Granger causality tests were employed in the study. The analysis included the components of aggregate expenditure namely consumption, government spending, investment and net exports.

5.2.3.1 Summary of Findings of the study

Analysing the link between aggregate expenditure and job creation in manufacturing sector, the study found that the aggregate expenditure's component jointly create jobs in manufacturing sector. However, individually, consumption and government spending can cause short-term jobs, though they have a long-term negative impact on job creation in the South African manufacturing sector. The only way to increase job creation in the manufacturing sector is to boost investment spending. The study revealed that there is no relationship between job creation in manufacturing sector and net export. This conclusion is supported by the theory suggestion that if a country is net importer, its net export remains insignificant towards employment and job creation.

In addition, the analysis revealed a presence of a strong long-run between aggregate expenditure and job creation in business enterprises sector. The higher aggregate expenditure, the higher the number of new job created into the South African economy. Besides, the net-exports which have a zero effect on job creation in business sector, other three component of aggregate expenditure (consumption, government spending and investment) create jobs in

this sector. However, these jobs will take time to be created for there is no relationship between total spending and short-run job creation in business enterprises sector. The Granger causality test confirmed the results from co-integration test that net exports was the only component of aggregate expenditure that does not cause job creation in business sector, yet the business sector can cause the increase in net exports. Due to the use of advanced technology which may offset or reduce labour demand, the link between aggregate spending and job creation in financial sector was negative. It seems that this sector favored capital intensive over labour intensive. The aggregate expenditure creates long-term jobs in construction and mining sectors. However, short-term jobs in the construction sector can be created only through increase in consumption spending, while in long term jobs can be created in mining sector through investment spending and short-term jobs through all the aggregate expenditure's components. Apart from creating jobs in mining sector, the effect of spending on mining employment takes short time to create jobs compared to other sectors. Using causality test, the result was that only consumption can cause employment in mining sector, while government spending can influence spending of other component of aggregate expenditure.

5.3 ACHIEVEMENT OF THE STUDY OBJECTIVES

All the study's objectives set in Chapter one - being primary, theoretical and empirical - have been achieved. Summary of the study indicates how the primary objective has been achieved and the two paragraphs highlight the achievement of theoretical and empirical objectives.

- **Theoretical objectives:** The four theoretical objectives set in Chapter 1 were achieved in Chapter 2 of the study. This chapter discussed the key terms that are related to job creation and the components of aggregate expenditure. Comparisons between classical and Keynesian theory of employment were also discussed in Chapter 2. Moreover, in Chapter 2, the review of empirical studies on job creation through aggregate expenditure was provided.
- **Empirical objectives:** in Chapter 1 three empirical objectives were set. All of these empirical objectives were achieved through the econometric model that was built in Chapter 3 of the study and subsequently estimated analysed and discussed in Chapter 4 in this study. The results of the analysis indicated that, through aggregate expenditure, more jobs can be created in business sector followed by mining,

construction and manufacturing respectively. Although the graphical analysis revealed a higher growth of employment in financial sector between 1994 and 2015, the result from ARDL analysis indicated that aggregate expenditure did not create jobs in financial sector during the same period of time. In addition, investment spending was found to be a key factor of job creation in these four sectors namely business enterprises, construction and mining and manufacturing. Net export was found to have no impact on job creation in sectors under consideration.

5.4 CONCLUSIONS

Joblessness in South Africa seems to be one of the major sources of high crime rate, social instability and family problems among other social ills. As specified in the review of literature, job creation is the backbone of economic growth and the source of country's well-being. However, the high rate of unemployment in South African economy is a major concern of macroeconomic authorities and the policymakers. Different strategies were applied, yet the issue of joblessness remains unshakable. Thus new and fruitful strategies have to be established to overcome unemployment issues and solve the challenges it generates.

The main objective of this study was to analyse the interaction between aggregate expenditure and job creation in different sectors of the South African economy. The study found that aggregate expenditure can be used to create jobs in four sectors out of five analysed. The study also found that jobs created in one sector can stimulate and influence new jobs in other sectors.

Findings revealed that the aggregate expenditure, in South African economy, creates more jobs in business enterprises and mining sectors compared to the other sectors subjected to the study.

With the intension of meeting other empirical objectives, ARDL, ECM and Granger causality model were used. The results showed that, as suggested by the literature review, consumption, government spending and investment spending are the key factors of job creation in different sectors in South Africa. The role of net exports towards employment growth in South African context is less significant. The accuracy of findings was confirmed by diagnostic tests where the residuals were homoscedastic and no serial correlation was

found among variables. It can therefore be concluded that aggregate expenditure create jobs in business, construction, manufacturing and mining sector in South Africa; and that the jobs created in this sectors stimulate future spending. Thus there is a cause-effect relationship between aggregate expenditure and job creation.

5.5 POLICY RECOMMENDATIONS

The issue of joblessness can, in some instances, result from the non-favorable conditions of economic growth, the use of unfitted strategies to solve unemployment challenge and the lack of knowledge about sectors that favor job creation. In line with the findings of this study, some useful recommendations to create more and sustainable jobs in South African economy are suggested:

5.5.1 Empowering manufacturing sector and consumption of domestic products

Consumption in mining sector appeared to be the most dominant component of aggregate expenditure that stimulates jobs. However, more jobs should be created if the link between manufacturing and mining sectors is established. Most of South African minerals are exported to the world market as raw materials and come back in South Africa as the final products at higher price. Improving manufacturing capacity to transform these raw materials from mining sector will allow a lower cost of consumption of mining products. In addition, a better way to create more jobs in South African economy would be to reduce the quantity of goods imported from abroad so as to increase the demand and growth in local production. This can be achieved only if manufacturing sector is empowered.

Empowering manufacturing sector will enable job creation in manufacturing itself and in business sector, because the products transformed by manufacturing sector will be sold through business enterprises sector.

5.5.2 Create enabling and sustainable environment for small and medium businesses

Small and medium businesses are positively correlated to job creation in South Africa. However, this type of business is more volatile in the way they are supported because they can create or destroy jobs at the same time. Growing local businesses, small and medium business should be a strategy to create more jobs for people with lower skills lower academic qualifications. More effort and focus should be given to the business enterprises sector for it facilitates employment growth by allowing those people who cannot be employed into the

formal sector to get jobs in informal sectors or to become their own employers. Government and policymakers should create enabling environment that can facilitate the growth in these businesses. This should be done through the provision of different types of support such as financial supports, training sessions, mentorships and establishment of policies in support of youth entrepreneurial commitment and business educational.

5.5.3 Provide equal support for young/small and mature/large business.

Small and young businesses create fast and many jobs. However, as the time goes on they face the challenge of deficiency and the funds constraints which make them less competitive and as consequence more job are lost in this sector. However, jobs created by mature/large firms are durable and sustainable. The public and private sectors should collaborate to empower young and growing business (including young entrepreneurs) enabling them to create more and sustainable long term jobs through start-up businesses. They should also support mature/large firms for they play an important role in boosting economic growth which is key for job creation. Besides, the financial supports from different agencies, the new ventures need the moral supports, mentorships and training.

5.5.4 Empowering construction sector

Since construction sector creates short and long-run jobs in South African economy, this sector deserves a special attention when South African public and private sectors are allocating resources.

More jobs can be created in this sector during the construction of new buildings and extend them for maintenance. The state should increase its spending on construction sector and private sector should increase their investment spending in this sector because, as part of infrastructure, the growth in construction sector not only create jobs in this sector it stimulate job creation in other sector such business and mining sectors.

5.5.5 Establish the link among economic sectors

Since the results obtained in this study confirmed the finding of other studies that jobs created in one sector impact employment in other sectors, it would be a good strategy to create channel that links economic sectors. In regard to mining sector, it should mostly focus on the products needed by manufacturing. On the other hand manufacturing sector should focus on the needs of domestic households which can be sold through business enterprises, and

financial institutions would support and assist in well-functioning of other sectors. This network would not only enhance economic growth but also the job creation and social welfare.

5.6 LIMITATION AND SUGGESTIONS FOR FURTHER RESEARCH

In conducting this study, the main challenge faced was the time constraint which led to the selection of five of the major economic sectors in South Africa instead of analysing more sectors. Each economic sector plays its own role in economic growth generally and job creation particularly. Choosing some sectors at the expenses of others might have given different results. Secondly, the data employed by the study represents official and non-agriculture employment yet unofficial jobs also affect the country's economy. Moreover, agricultural sector plays an indispensable role in hiring of the low skilled and unskilled people. Henceforth, considering only the non-agriculture employment may not give a complete outlook of the total employment. In addressing these limitations future studies should take the following into account:

- Include those sectors ignored by this study and compare official and non-official employment to determine the true source of job creation in South Africa.
- Include wages and labour productivity to determine if these two factors do not contribute to the South African current high rate of unemployment.
- Comparing non-agriculture employment to agriculture employment to provide the complete outlook of the total employment.

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