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The Analysis of The Consumption Function of the Iraqi Economy

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Abstract

Consumption is of great importance due to its association with people. In addition, its study is a significant tool that helps the planner to predict the size of demand and to draw up the state's price and tax policies, especially with regard to wages, salaries, subsidies and dealing with inflation. It helps to redistribute income in order to achieve the principle of social justice. As consumption is subject to a set of economic and social variables, it affects and is affected by those variables, the most prominent of which are the income factor and its distribution, GDP, population number, investment, prices and other variables.

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Introduction

The research aims to identify the most important economic variables that affect consumption, which actually determine the volume of consumption and its patterns in the Iraqi economy and analyze these variables to find out the size of the impact.

The importance of the research lies in the study of consumption in the Iraqi economy, its patterns and trends thoroughly. It is also significance because it analyzes the determining factors during a period during which there are clear limits to changes in consumption patterns in the Iraqi economy.

Changes in the conditions of the overall Iraqi economy have shifted consumption patterns in the Iraqi economy.

Because of the changes in consumption patterns in the Iraqi economy, we aim to determine the consumption function of the Iraqi economy through the determining factors of consumption and the changes occurring in the ratios of their importance through the search period and the available statistical data.

The study has formulated the following two hypotheses:

- 1- Consumption as a macro variable in the economy is linked to a set of variables within a specific time frame. These factors could change according to certain circumstances. This change could possibly lead to changes in consumption patterns in the Iraqi economy.
 - 2- These changes in consumption patterns determine conditions for its analysis that enable us to define a set of standard models for the consumption function. These changes could help us to arrive at the determination of a consumption function that represents the general trend of this important economic variable.

Part I

A. The Economic Consumption Theory

First: the Concept of Consumption

Consumption has several concepts such as:

Consumption is defined as individuals' expenditure on essential and unnecessary goods, and on services (Savin, 2008). It can also be defined as the purchases of final goods and services (Taylor, 1998).

It is expenditure on goods and services by individuals on food, clothing, and for the purpose of entertainment (Gordon, 1978).

Furthermore, it is the advantage gained from income (Y) after saving (S). Therefore, consumption is the uses of the final goods and services to directly satisfy the needs of individuals. These needs represent the individual or personal consumption. It is similar to the state uses of consumer goods and services to carry out its activities, especially those that satisfy the general needs (that is, the needs of society) in general and for all individuals. It is called governmental or public consumption. Likewise, there are goods called intermediate goods, meaning their consumption is called intermediate consumption, whereby goods and services are used in the production of other goods and services and represent the requirements for the production process (Khalaf, 2009).

Second: - The Importance of Consumption

Consumer spending is of great importance in economic experiences, as it is considered the most dangerous function in economic activity. It is the central point or goal of economic activity, for the following reasons (Darwish, 2010):

- 1- The share of income consumption in total demand in the open economy is not less than (80%) in most developing countries.
- 2- It is possible for the individual to be non-productive, meaning that s/he does not practice any productive work. In return, those individuals cannot be non-consumer because when they stop consumption, they will be in a state of perdition.

Third: - Factors affecting consumption

Income plays an important role in the theories of consumer behavior. It is the main determinant of consumption, but there are many affecting factors. These factors lead to shifting the consumption function to the left, which leads to an increase in consumption (Al-Habib, 2000).

- 1- Sudden wealth: When a person suddenly possesses wealth (such as inheritance), for example, s/he initially tries to satisfy their desires largely by purchasing goods and services previously needed. This leads to an increase in the volume of consumption in the short term. However, after a certain period, s/he will have satisfied the desires that the person was deprived of, and savings begin to increase with the stability of the consumption pattern in the long term.
- 2- Price level: The real value of liquid assets is directly affected by changes in the general level of prices. This is called the Peugeot effect where the price decline leads to an increase in the real value of liquid assets. This means an increase in the purchasing power of wealth and in turn increases the percentage of income allocated for consumption. Thus the consumption function rises and vice versa (Dawood, 2010).
- 3- Interest rates (Al-Kadawi, 2009): Interest rates are evident through the assumption of traditional economists. Consumption is a function of the interest rate. The idea that increasing the interest rate encourages saving and impedes consumption was

common. It may help saving and impede consumption, but it may have the opposite effect. If the individuals save to obtain a steady income at retirement age, those individuals will find themselves at higher interest rates. They can save less than the current income and achieve the desired goal because under the higher interest rate, savings will earn a higher return and grow at a faster rate. Therefore, they can enjoy consuming a large part of their current income. If members of society as a whole aim to save, increase the interest rate results in a decrease in saving and an increase in consumption. This is the opposite to the traditional economists.

- 4- The pattern of income distribution in the community: The income distribution pattern in the society greatly affects the volume of consumption, as the poor classes in society consume the greater part of their income and save a little while it happens and vice versa. This means that the marginal tendency of consumption for the poor classes is high, while it is low for the rich classes.
- 5- The effect of simulation: The simulation factor is one of the important factors that affect the consumption pattern. People usually try to imitate their peers and neighbors and those around them in their consumption pattern even if this leads to spending all of their income on consumption in order to simulate the class in which they live.
- 6- Consumer tendencies and expectations: This factor is one of the most important factors that affect income, wealth and consumption rates. Those individuals who expect an increase in their income tend to increase consumption spending and reduce savings over individuals who expect their incomes to decrease. For this reason, it can be expected that the

consumption function will rise to the highest point when the state of recovery is common and individuals expect to increase income, and vice versa.

B. The Conceptual Framework of the Consumption Function The consumption function is the relationship between consumer spending and the determinants of that spending, especially disposable income after tax deduction. It is also known as the relationship between consumption and disposable income (Dornbusch, 2004).

In addition, it could as the dependence of total consumption expenditure in the baseline on automatic consumption (C0) and marginal propensity to consume (MPC) as well as its dependence on disposable income (Yd)(Delong & Olney, 2006).

Keynesian consumption function:

When emerged, the Keynesian theory gave a strong impetus to the theory of consumption, and the theory of consumer choice. However, this choice varies according to the individual because their proportions are consumed and others are invested according to the direction of demand towards present and future consumer goods. Keynes considered consumption as a function of disposable income, meaning that there is a positive relationship between consumption and disposable income. Keynes argued that consumption increases income, slightly, and this is known as the marginal propensity to consume (MPC)(Wallis, 1973).

Keynes also studied the factors that affect consumption as an economic phenomenon, and according to this perspective Keynes divided the factors affecting consumption into two parts, namely (Rahman & Erekat, 2004).

- I. Subjective factors: These factors represent a purely personal view of consumption that leads to the tendency of individuals to reduce spending from their income such as:
 - 1. Create a reserve against emergency and unforeseen events.
 - 2. Creating a better environment than the future, such as creating better conditions when a person grows old, or for the education of family members, or for marriage in the future etc.
 - 3. Enjoy greater real consumption in the future and the desire to live at a better level.
 - 4. Enjoying a feeling of independence and the ability to get to know even with no clear idea of what we will do in the future.
 - 5. Saving for the purposes of speculation and trading.
 - Creating wealth for those who succeed or who will succeed them later.
 - 7. Responding to mere emotion of parsimony, i.e. unhappy about all spending.
- II. Objective factors: The objective factors include a set of objective factors related to specific economic conditions, including (income, wealth, population, and interest rate).

The Keynesian function can be formulated as follows:

$$C = F(Y_d)$$

Mathematically, it can be expressed as:

$$C = \alpha +$$

The main theories of Keynesian function in terms of consumption

 The consumption function is stable and constant at least in the short run. Also, the changes in the consumption function are the result of a change in income in terms of moving from one point to another on the consumption curve or function. Furthermore, there is a clear and direct relationship between consumption and income.

- 2. The marginal propensity to consume is determined by a constraint <MPC <0, and it is constant along the consumption function because it is a linear function. However, Keynes also described it as nonlinear and in this case the marginal slope decreases with the increase in income.
- 3. The marginal propensity to consume is always less than the average propensity to consume APC> MPC.
- 4. The average propensity to consume decreases with the increase in income.

This function is characterized by the fact that the average propensity to consume (APC) decreases with the increase in disposable income

$$EC = \frac{\frac{\Delta C}{\Delta Y}}{\frac{C}{Y}} = \frac{MPC}{APC}$$

$$E_{c,y} = MPC * \frac{\dot{c}}{\tilde{y}}$$

Third: the main concepts for the Keynesian function

Keynes arrived at through the study of consumer to four concepts, namely: (Al-Idrisi, 1986):

Marginal propensity to consume (MPC)

Average propensity to consume (APC)

Autonomous Consumption

Induced Consumption

1. Marginal propensity to consume (MPC)

It is a part of the new or added income that has been consumed (Faruqi & Jaber, 2009). MPC is measured as the change in consumption to the change in income, where (Connell & Brue, 2008)

$$MPC = \Delta C / \Delta Y \dots (3)$$

In equation (2), assuming that consumption has changed and that it has changed with an increase from position (C) to topic (), then the equation

$$\acute{C} = A + B \, \bar{Y}_d \, \dots \, (4)$$

Then we deduct equation (2) from equation (4):

$$\Delta C = \beta \bar{Y}_d$$
(5)

From equation (5), we obtain the marginal reference for consumption (β) :

It is worth noting that the MPC value from Keynes' point of view is greater than zero and less than the integer one, i.e:.

1
< MPC < 0.

2. The average propensity to consume (APC)(S.L.Brue(.

As for the second concept that Keynes reached through the study of consumer behavior, it is the average propensity to consume, which is measured by dividing consumption to income, as shown in equation (7).

$$APC = C / Y_d(7)$$

3. Autonomous Consumption

Autonomous Consumption indicates the value of consumption expenditure in the absence of income, and this is done through the use of previous savings or borrowing.

4. Induced Consumption

It is the product of the marginal propensity to consume by the total national income (i.e. β Yd/)

MPC is the economic basis for the idea of multiplier, whose mathematical formulation is as follows(Agarwal, 2009):

$$K = \frac{1}{MPS}$$
(8)

$$MPS = 1 - MPC(9)$$

Thus, the marginal propensity to consume is high if the value of the marginal propensity to save is low and vice versa.

Part II

First/theories

First: The Relative Income Hypothesis

Economist James Dowsenberry stated that people's consumer behavior depends on the behavior of others around them- relatives, neighbors and friends at work. The principle of simulation is when a person tries to imitate others in their method of consumption and simulate them in this pattern of consumption even if the income is less than their average income the principle of simulation (Al-Habib, 2000).

In this hypothesis, consumption is a function of current income in relation to the higher level of previous income, as there are strong tendencies among individuals to emulate their neighbors and strive to raise the standard of life. If we assume that the income of individuals

has increased so that the distribution of income remains the same, then consumption increases as a percentage of the increase in income. Therefore, within the framework of the relative income assumption, the basic function of consumption is the long-term function (Abidjman, 1999).

Second: Brown's hypothesis(Estimating the consumption function in Iraq, 1990)

Brown pointed out that consumption in the previous period is the best indicator to embody the principle of temporal correlation of consumption. Therefore, he suggested that the present consumption of the individual is determined by the consumption level in the past period and the current income level.

That is, that the total current consumption (C_t) depends on the total income (Y_t) and on the consumption in the past period or year $(C_t -1)$. This theory can be formulated with the following statistical relationship:

$$C_t = \alpha_0 + \alpha_1 Y_t + \alpha_2 C_{t-1} + e_t$$
....(10)
 $C_t = \alpha_2 + Ct_{-1} = \alpha_0 + \alpha_1 Y_t + e_t$(11)

In the long run, it can be equivalent to \boldsymbol{C}_t -1 with \boldsymbol{C}_t

$$C_t$$
 (1- α_2) = α_0 - α_1 Yt +e_t(12)
(1- α_2) C_t = α_1 Y_t

Thus, the marginal propensity to consume is as follows:

The previous consumption function is subject to Keynes's assumptions:

$$\alpha 1 < \frac{\alpha 1}{1-\alpha 2}$$

The previous assumption depends on the fact that the standard of living of the individual is inflexible in the short term in relation to actual income and ordinary consumption. It requires a long time in order to change the pattern and size of the relationship of the consumption and income.

Third: The Life Cycle Hypothesis-:

Three economists came up with this theory: Modigliani, Brumberg and Ando. Therefore, they called the hypothesis "MBA" after the first letter of each name (Eida, 2013):

In this hypothesis, the consumer must obtain stable consumption, not only for a specific period of time, but rather over the span of life, and this hypothesis can be represented by graph No. (4). For example, we measure income and consumption on the vertical axis and the age of the person on the horizontal axis. In this example, we assume that the income that the individual gains during the period of scientific life since the beginning of work until the retirement age is (y0) at (y), meaning that the income is represented by the area (y0) \bar{y} where (r) is the retirement age.

The individual does not finish consumption by reaching retirement age, but rather continues until death. Say, this consumption is at (C0), meaning that consumption will be represented by area (Occl) where (I) represents the end of the individual's life.

According to this theory, a person saves more in youth than in any other period. Hee, saving is represented in the canopy area (y `sc 0 y 0), and the income here is greater than consumption, but after that the

individual has no source to finance his consumption except through withdrawal Of savings.

So according to the life cycle hypothesis:

This the equation is

This means consumption is equal to the ratio of working life to the chronological age of the individual multiplied by income. These economists have practically tested the hypothesis and have confirmed the validity of their theory and according to their hypothesis they say:

$$C_{t} = K (P.W)$$

Therefore, consumption depends on the current value of a person's wealth or assets. According to this theory, wealth is divided into:

Current income from sources other than ownership (Yt).

Expected annual income from sources other than ownership (Yet.(

Net worth at the end of the period (t-1) A.

Based on that, the consumption function can be formulated as follows:

$$C_t = b_0 Y_t + b_1 Y_{et} + b_2 A_{t-1} \dots (17)$$

So consumption, according to this theory, depends on current income, expected annual income from sources other than property, and the net worth of man.

Fourth: The Permanent Income Hypothesis-:

Milton Friedman's hypothesis on permanent income solves the problem of proportionality between consumption and disposable income. This is through the hypothesis that consumption does not depend on the level of current disposable income. According to Friedman, current disposable income (i.e. measured Ym) consists of permanent income (Yp) and income transient (Yt). The former is the income that families expect to obtain over a large number of years, while transitory income consists of any unexpected addition or decrease in permanent income and then (Delong & Olney, 2006):

$$Ym = Yp + Yt$$

Also, the volume of permanent consumption, according to this assumption, represents a fixed percentage of the stable income, i.e (Hat ϵ C^p = KY^p......(19)

We conclude from the foregoing that permanent consumption depends only on permanent income and that consumption in its permanent and emergency parts is not affected at all by a sudden increase or unintended decrease in income. In addition, the transfer of the positive value of emergency income to a savings fund is used to fund any deficit that may arise between permanent income and actual income (i.e. negative value of emergency income). The saving fund is used to absorb any increase in the actual consumption and to cover the deficit when actual consumption exceeds permanent consumption. Upon moving to the practical level, we find that Friedman has used expected income to be synonymous with the concept of permanent income. Thus Friedman used the hypothesis (conditioned expectations) in the study of expectations that adapt to a certain percentage of the

previous error and that adapting that error takes a long time (Hatem, 1983).

Part II

Analysis of the Most Important Economic Variables Affecting Consumer Spending During the Period (2004-2017)

In order to stand on the path of the consumption function in the Iraqi economy, we must shed light on the most important economic variables. These variables have an impact on the general consumption of the country and analyze them in detail, depending on the data and during the research period.

The data indicate that consumer spending in Iraq reached (14683390.3) million Iraqi dinars during the year 2005, up from 2004 with a growth rate of (7.90%). The data continued to increase during 2006 and 2007 with growth rates of (2.05%) and (39.29%). Consecutively, at a time that witnessed a clear growth of the variables of the Iraqi economy during these years, the values were the growth rate (16.60%), the gross domestic product (3.03%), the population (182.54%), while the rate of investment growth was (17.17%). Here, the growth in these variables increase in consumer spending in the country reaching (20871484) million dinars compared to previous years. This increase in spending continued until it reached (27517759.7) million dinars in 2009 with a growth rate of (5.27%), achieving a decrease in the growth rate from previous years. As a result, the growth of economic variables declines during this year. However, it rose again during the period (2010-2013), which led to an increase in the growth rate of the consumer agreement about (20.95%) in 2013, with the exception of the investment variable, which decreased, achieving a negative growth of (42.28%) in this year.

.In 2015, we noticed an increase in consumer spending again, achieving the highest growth rate during the research period. It was (100%) compared to the previous year, and this increase is due to the growth achieved by the national income during this year about (40%). This led to a clear increase in spending consumer in the country. This increase continued during the years 2016 and 2017 with low growth rates (4.43%) and (6.96%) for consumer spending. This coincides with the increase in the economic variables under consideration that achieved varying growth rates, reaching (62.89%) for GDP and (2.82%) for the population. It increased (9.12%) for the variable investment (3.95%) for the national income, and all this escalated growth of consumer spending during this period.

We conclude from the previous analysis that the growth of consumer spending in Iraq was clearly linked to the growth rates achieved with the economic variables under investigation. They greatly affected spending, and this is what the growth rates of these variables explained during the research period.

Part VI

Measuring the effect of economic variables on public consumption in Iraq for the period (2004-2017)

This topic includes a statement of the impact of some economic variables on the course of consumer spending on the Iraqi economy during the research period. The econometrics was used to demonstrate this effect, through the use of linear regression in estimating the equation of consumption spending and by relying on statistical and standard indicators. This helps to reach the best standard models and analyzed, thus achieving the best results

First: Building the Standard Model

The aim of building the standard model is to demonstrate the effect of some macroeconomic variables on consumer spending and to ensure that this model is consistent with economic assumptions and theories. The construction of the standard model requires starting with the mathematical formula, which takes the following form:

Here, ui is the random variables that were not included in the model.

Results of statistical and standard tests of the impact of economic variables on consumer spending

Table (2)

D.W	R^2	Tabular F	Calculated F	Tabular T	Calculated T	Sample
					0.128	
					1.43	CS=-9.252- 0.076 GDP
١,٤	٠,٩٦	१,१२	٦٠,٧٣٠	١,١٤	0.073	+ 207.31 N + 0.101 I +
					1.195	0.280 NI
					3	

Source: Prepared by the researcher according to the results of the statistical program (SPSS).

After estimating and testing the effect of the independent variables on the dependent variable (consumption expenditure), it has become evident that these variables have an impact on consumption spending based on the following statistical and standard criteria:

1. Standard Analysis

The results indicate that the value of the (D.W) statistic calculated for this model falls in the non-judgmental region after it reached (1.4). Thus, it was accepted by the researcher.

2. Economic criterion

It appears through the estimated model there is a direct relationship between the variable of national income and the variable of consumption expenditure. Thus, with the increase of the national income by one unit, consumption will increase by (0.280) units. This indicates that the flexibility of consumption spending to the changes that occur in the national income. This is consistent with the logic of economic theory. The estimated model also shows that there is a direct relationship between the population growth variable and consumption, as the rise in the population by one unit will lead to an increase in consumption by (207.31) units and this indicates the flexibility of consumption for the changes that occur in the population confirming the economic theory. In terms of the investment variable, the results reveal that there is a direct relationship between it and consumer spending. With an increase in investment by one unit, consumption by (0.101) units increases. This indicates that consumption is affected by the changes in investment, but this contradicts the logic of the economic theory that indicates that the relationship between them is an inverse relationship. The results also show that there is an existence of an inverse relationship between GDP and consumption, whereby whenever the GDP increases by one unit, consumption increases by (0.076) units. This is contrary to the logic of economic theory. Besides, the equation explains that the fixed limit has reached (-9.252). This means that the general consumption in Iraq is (9.252) units when the independent economic variables in the national income, investment,

gross domestic product, and population are equal to zero, that is, it has no effect on consumption.

We conclude from the previous analysis that the most variable affecting consumption in the Iraqi economy is the population, followed by the national income variable.

Table (3)

Years	General Consumption Expenditure	Total Local Production	Population	Investment	National Income
2004	177.1957,7	53235358.7	77179	15758326.00	£7977710,V
2005	157789.,8 73533598.6		77977	14319460.00	70797017,7
2006	1	95587954.8	7 1 1 1 1	17648394.00	10571071,1
2007	7.141515	111455813.4	7777	49864646.00	11/17,7
2008	77179177	157026061.6	71190	36547069.00	157751705
2009	7,00777077	131275592.6	٣١٦٦٤	33240939.00	17.279777,7
2010	۳٠٦٦٠٧٤٣,٧	162064565.5	٣٢٤٩٠	100007482.00	1 27 20 7 2 7 1 ,0
2011	77999077,9	217327107.4	٣٣٣٣٨	62501288.00	197777.7.,7
2012	27101772,7	254225490.7	٣٤٢٠٨	55076229.00	770.27111,7
2013	0.919212,5	273587529.2	٣٥،٩٦	31791296.00	7
2014	٤١١٧٦٠٠٠	266420384.5	770	49175932.00	77.71,1
2015	۸۲۳۵۲۰۰۰ 209491917.8		٣٧٠٢٣	115319265.00	TTYETE,1
2016	85999563 217527207.4		39022	119410375.00	٣ ٢٨١٠٠٨١٧,٦
2017	91984454	354325690.7	40123	130302589.00	TE1.EV171,T

All variables are in million dinars

Conclusions:

The study has come up with the following conclusions:

- 1. There is a direct relationship between the income variable and the consumption expenditure variable, when the national income increases by one unit. Thus, consumption increases by (0.280) units, which indicates the its flexibility spending that occurs with income and this is consistent with the logic of economic theory.
- 2. There is a direct relationship between the variable of population growth and consumption, as the increase in the population by one unit will lead to an increase in consumption by (207.31) units. This indicates flexibility of consumption for the changes that occur in the population and this is consistent with the logic of the theory.
- 3. There is a direct relationship between investment and consumer spending. Thus, that investment increases by one unit, as it will lead to an increase in consumption by (0.101) units. This entails that consumption is affected by the changes in consumption.

Recommendations:

Based on the results of the study, the followings are recommended:

- Working to increase the total supply, activate the agricultural sector and support the imports that meet the increasing effective aggregate demand.
- 2. Reducing consumer spending and moving towards investment spending.

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Abidjman, M. (1999). Macroeconomics Theoretical and Politics (M. I. Mansur, Trans.). Riyadh: Mars Publishing House.

Agarwal, H. S. (2009). Economic Analysis Jaina Offset.

Al-Habib, F. I. (2000). Principles of Macroeconomics (4 ed.(.

Al-Idrisi, A. S. (198 .(\(^\text{Macroeconomics}\): Basra University.

Al-Kadawi, T. M. (2009). The Impact of Indirect Interest Rate on the Impact on Future Consumption. University of Mosul.

Connell, C. R. M., & Brue, S. L. (2008). Microeconomics (17 Ed.): Mc Graw- Hill . Irwin.

Darwish 4H. D. (2010). Lectures in Macroeconomics, given to undergraduate students. College of Administration and Economics: Department of Financial and Monetary Management, University of Babylon.

Dawood, H. A. (2010). Principles of Macroeconomics (1 ed.). Maisarah House for Distribution, Publishing and Printing.

Delong, J. B., & Olney, M. L. (2006). Macroeconomics (2 Ed.): McGraw-Hill-Irwin.

Dornbusch, R. (2004). Macroeconomics (9 ed.): McGraw-Hill-Irwin.

Eida, O. M. A. (2013). Analysis of the Factors Affecting the Consumer Expenditure of the Palestinian Family Sector According to Modern Consumption Theories: A Field Study. The Jordanian Journal of Applied Sciences, 15(1.)

Estimating the consumption function in Iraq. (1990). Ministry of Planning Faruqi, T. A & ..Jaber, T. A. (2009). Dictionary of Modern economics (1 ed.). libanon.

Gordon, R. J. (1978). Microeconomic (4 ed.). America

Hatem, H. G. (1983). Economic Planning Commission,. Ministry of Planning

Khalaf, F. H. (2009). Socialist capitalist economic systems, the world of modern books for publishing and distribution (1 ed.(.

٠.

Rahman, I. A., & Erekat, H. (2004). Economic Concepts and Systems (Macro and Microeconomic Analysis) (1 ed.). Amman: Wael Publishing and Distribution House.

S.L.Brue, C. R. M. C. a .op . cit

Savin, L. (2008). Macroeconomics (8 ed.). mc Grow – Hill Irwin Taylor, J. B. (1998). Economics (Vol. 31): University of Chicago Press. Wallis, K. F. (1973). Topicsn in Applied Econometrics (1 ed.). Haver-Hill, Suffolk

Lowe and Brydone.