Unemployment In Lebanon: Application Of Okun's Law

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ABSTRACT

The purpose of this paper is to apply Okun-type relationship to the Lebanese equation in order to estimate the Lebanese potential output. An empirical study covering 400 households is carried out to investigate the employment status using the BLS criterion in determining the most useful measures of the labor market.

INTRODUCTION

Okun's Law is one of the most enduring stylistic facts in macroeconomics. It is one of the basic rules of thumb of macroeconomics. As originally formulated for the US by Arthur Okun in 1962, it states "In post-war period, on the average, each extra percentage point in the unemployment rate above four percent has been associated with about a three percent decrement in real GNP¹." Since Okun's original publication, the existence of a trade-off between unemployment and output in mature market economies has been studied extensively and largely confirmed². Okun's law combines a host of variable and parameters into a bivariate model designed to estimate potential output.

The goal of this paper is to apply Okun-type relationship to the Lebanese equation, i.e, we will use Okun's model to measure the impact of unemployment on growth and to estimate the Lebanese potential output. For this purpose, an empirical study is carried out where the employment status is identified.

The paper consists of three sections. The first section describes the data and the research design, and presents empirical findings regarding employment status in Lebanon (unemployment rate, employment ratio, participation rate, etc). The second section is devoted to the presentation of the Okun's Law and its application to the Lebanese economy. The third section presents a summary and conclusions.

EMPIRICAL OUTPUT

Unemployment And Underemployment

To get a full understanding of the significance of the employment problem, we must take into account, in addition to the openly unemployed, the larger numbers of workers who may be visibly active but in an economic sense are grossly underutilized.

Edgar Edwards³ distinguishes among the following five forms of underutilization of labor:

¹ Okun, A.M. (1983). "Potential GNP: Its Measurement and significance." In Pechman, J.A., ed. *Selected Essays of Arthur M. Okun*. MIT Press, Cambridge, MA. p. 148.

² Gordan, R. J. (2003). *Macroeconomics*, 9th Edition, Reading, MA, Addison Wesley.

Mankiw, G (2000). *Macroeconomics*, 4th Edition, Worth, New York.

Lee J. (2000). "The Robustness of Okun's Law: Evidence from OECD Countries", *Journal of Macroeconomics* 22(2), 331-356

Moosa I. A. (1997). "A Cross-Country Comparison of Okun's Coefficient", *Journal of Comparative Economics* 24(3), 335-356.

³ Edwards, E. (1974), "Employment in Developing Countries", New York: Columbia University Press, p: 10-11.

As Edgar Edwards pointed out in his comprehensive survey of employment problems in developing countries:

In addition to the numbers of people unemployed, many of whom may receive minimal incomes through the extended family system, it is also necessary to consider the dimensions of

1. time (many of those employed would like to work more hours per day, per week or per year),

1. Open unemployment—both voluntary (on the part of people who exclude from consideration some jobs for which they could qualify, implying some means of support other than employment) and *involuntary*. Although voluntary unemployment (e.g., among the educated) was more prevalent in the growth decades of the 1960s and 1970s, in the slow-growth and demand-constrained 1980s and 1990s, most unemployment has been of the involuntary variety.
2. Underemployment—people working less (daily, weekly, or seasonally) than they would like to work. This, along with category 3, is the predominant form of contemporary labor underutilization⁴.
3. The visibly active but underutilized—people who would not normally be classified as either unemployed or underemployed by the definitions just given but who in fact have found alternative means of "marking time," including disguised underemployment⁵, hidden unemployment⁶, and premature retirement⁷.
4. The impaired—people who may work full time but whose intensity of effort is seriously impaired through malnutrition or lack of common preventive medicine.
5. The unproductive—people who can provide the human resources necessary for productive work but who struggle long hours with inadequate complementary resources to make their inputs yield even the essentials of life.

Data And Research Design

The purpose of this empirical study⁸ is to estimate the most useful measures of the labor market particularly, the unemployment rate, the participation rate, and the employment ratio. To this end, we followed the methodology used each month by the Bureau of Labor Statistics (BLS) in the United States.

The results of our empirical study are based on a survey⁹ covering 400 citizens distributed all over the Lebanese territory. The structure of the sample follows the distribution of the Lebanese population as published by the Central Statistics Administration in 2001.

Table 1: Sample's Distribution

Covered Area	Number of Questionnaires	%
Beirut and Mount Lebanon	190	48
North Lebanon	80	20
South Lebanon and Nabatiyeh	80	19
Bekaa Valley	50	13
Total (N)	400	100%

2. intensity of work (which brings in considerations of health and nutrition), and

3. productivity (lack of which can often be attributed to inadequate complementary resources with which to work).

Even these are only the most obvious dimensions of effective work, and factors such as motivation, attitudes, and cultural inhibitions (as against women, for example) must also be considered.

⁴ For example, while Peru reported an open unemployment rate of 15% in 1992, its underemployment rate was estimated at 70%.

Central Intelligence Agency, *The World Factbook*, 1994, Washington D.C.: U.S. Government Printing Office, 1994. p. 314.

⁵ Many people seem occupied on farms or employed in government on a full-time basis even though the services they render may actually require much less than full time. Social pressures on public and private industry may also result in substantial amounts of disguised underemployment. If available work is openly shared among the employed, the disguise disappears and underemployment becomes explicit.

⁶ Many people are engaged in second-choice non-employment activities, such as education or housekeeping, primarily because job opportunities are not available either at the levels of education already attained or, for women, due to social mores. Educational institutions and households become employers of last resort. Moreover, many people enrolled for further education may be among the less able as indicated by their inability to compete successfully for jobs before pursuing further education.

⁷ This phenomenon is especially evident, and apparently growing, in the civil service. In many countries, retirement ages are falling at the same time that longevity is increasing, primarily as a means of creating promotion opportunities for some of the large numbers pressing up from below.

⁸ We have developed a very detailed questionnaire (taking into consideration the specificities of unemployment definitions), and trained three of Notre Dame University MBA students in order to get an optimized performance regarding the accuracy of results. Even if our sample is not large enough, its structure respects the rule of diversification.

⁹ The targeted sample is constituted of females and males above sixteen (intercepted in public places).

Table 2: Size of Households

	N	Minimum	Maximum	Sum	Mean
Number of dependant children (under 16)	400	0	5	437	1.09
Number of working persons per household	400	0	5	736	1.84
Number of unemployed persons per household	400	0	5	333	0.83
Households' size	400	1	12	1921	4.8
Valid N	400				

Based on the above results, we postulated the following hypothesis:

1. The number of unemployed (looking for a job) in the respondents' households questionnaire (please refer to table 2) shows how many persons belong to the labor force and are in fact unemployed. Consequently, the 333 under the “sum” category represent the total number of unemployed people still searching for a job.
2. The 736 represent the total number of employed workers.
3. The total number of people in the labor force becomes: (1) + (2) = 333 + 736 = 1,069 persons; hence,
4. The estimated unemployment rate, (EUR), is represented by the total number of unemployed divided by the size of the labor force: $EUR = 333 / 1069 = 0.3115$ (or 31.15%)
5. Adult Size (Working-age population) = Total households' size (–) Dependent children (under 16) = 1,484 persons
6. Rate of adult people = adult size divided by total households' size = $1484 / 1921 = 0.7725$ or 72.25%
7. Size of people not included in the labor force¹⁰ = Adult size – (unemployed + employed people) = 415
8. Rate of "Out of labor force" = Size of "out of labor force" / Adult size = $415 / 1484 = 0.2756$ or 27.56%
9. Participation rate = Labor Force / Working-age population = 72.03
10. Employment ratio = Employed people / Working-age population = 49.59%

If compared with other local (Lebanese) studies carried out to measure the unemployment rate, we find that our result exceeds by at least 70% any other published¹¹ rate. Beyond the accuracy of this rate (which remains a mystery in Lebanon), this study constitutes a real "academic case" illustrating the methodology and the distinctiveness of estimating the unemployment rate and its consequences on growth.

¹⁰ If the person didn't work during the past week and didn't look for work during the past four weeks (examples are full-time students, homemakers, and retirees).

¹¹ For example, the average unemployment rate published by many official organizations or demographic researchers does not exceed the ceiling of 19%.

Empirical Results

The Lebanese labor market status is pointed up in the table below:

Table 3: Status¹² of the Labor Market According to (N)

Category	Share of Labor Force (%)	Share of Adult Population (%)
Employed workers	68.84	49.59 (Employment ratio)
Unemployed workers	31.15 (unemployment rate)	22.43
Voluntary unemployed	12.54	9.33
Non-voluntary unemployed	18.61	13.86
Males unemployed	23.39	17.4
Females unemployed	7.76	5.6
Labor force (Employed + unemployed workers)	100	72.03 (participation rate)
Not in the labor force		27.97
Adult population (or Working-age population) (labor force + not in the labor force)		100
Underemployment	41% of employed people	
Average unemployment spell duration ¹³	17 months	

Note: Figures may not add up because of rounding.

¹² The collected data was coded under the SPSS software package by Nassar Daher (an MBA student).

¹³ The length of time that an individual is continuously unemployed is called unemployment spell. The length of time that an unemployment spell lasts is called its duration. The duration of an unemployment spell determines in large part the degree of hardship suffered by an unemployed worker.

APPLICATION OF OKUN'S LAW

Theoretical Framework

"Okun's Law" describes an empirical regularity between unemployment and real output growth: "... each extra percentage point in the unemployment rate above four percent (i.e., full employment) has been associated with about a three percent decrement in real GNP." Okun's Law has proved to be one of the more durable relationships in modern macroeconomics, and is now often presented as an element of core beliefs, as in textbooks by Hall and Taylor¹⁴ and in policy discussions by Blinder¹⁵ (1997). Durability and simplicity being relatively scarce commodities in macroeconomics, Okun's Law is appealing as a shorthand guide to policy outcomes.

Whether Okun's Law travels well is another question. Cross-country comparisons of the relationship between unemployment and output have been estimated for other countries by Knoester¹⁶ (1986), Paldam¹⁷ (1987), and Moosa (1997), among others, but magnitudes vary depending on country and time period. Estimates¹⁸ of the increase in output growth associated with unemployment reduction of one percent range from a low of around two percent in the U.S. and Canada, to three to five percent in Europe, to more than 10 percent in Japan, with estimates for Europe tending to be higher for more recent time periods.

Empirical Problems

Because of the way that Okun's Law is framed, tests of its proposition involve two imposing empirical problems.

First, as usually stated, the Law refers to the relationship between departures of real GDP and unemployment from their long-run, or equilibrium trends, often referred to as "potential GDP" and the "natural rate of unemployment," respectively. These equilibrium trends must be estimated, either by time series methods as in Moosa (1997) or by construction using a modified production function approach in which potential output is estimated using fully employed inputs, as in Gordon¹⁹ (1984) or Adams and Coe²⁰ (1989). Either of these approaches invites considerable criticism of assumptions and methods; see, for example, the comments of Clark²¹ (1984) and of Baily²² (1984) on Gordon (1984).

Second, in formulating his law, Okun seems clearly not to be referring to a *ceteris paribus* relationship between changes in the unemployment rate and changes in real GDP. Writing later, Okun posited that other factors and inputs would be changing *pari passu* with employment: "The 3 percent result (from a reduction of one percent in the unemployment rate) implies that considerable output gains in a period of rising utilization rates stem from some or all of the following: induced increases in the size of the labor force; longer average weekly hours; and greater productivity" (Okun²³ [1970, p. 140]). Thus, a complete specification of the effect of changing unemployment rates on output would include factors such as capital inputs, labor hours and participation rates, all measured as deviations from long-run trends.

¹⁴ Hall, R. E., and J. B. Taylor (1993). *Macroeconomics, Fourth Edition*. New York, p. 77.

¹⁵ Blinder, A. S. (1997). "A Core of Macroeconomic Beliefs?" *Challenge*, 40(4), 1997, 36-44.

¹⁶ Knoester, A (1986). "Okun's Law Revisited." *Weltwirtschaftliches Archiv*, 122(4), 657-66.

¹⁷ Paldam, M. (1987). "How Much Does One Percent of Growth Change the Unemployment Rate?" *European Economic Review*, 31, 306-13.

¹⁸ Donald G Freeman (2001). "Panel tests of Okun's law for ten industrial countries", *Economic Inquiry Huntington Beach*, Vol. 39, Iss. 4, p. 511-523

Sheehan R. G., (1980). "The Variability of The Okun Coefficient", *Southern Economic Journal*, 47(2).

¹⁹ Gordon, R. J (1984). "Unemployment and Potential Output in the 1980's." *Brookings Papers on Economic Activity*, 2, p. 537-86.

²⁰ Adams, C., and D. T Coe (1989). "A Systems Approach to Estimating the Natural Rate of Unemployment and Potential Output for the United States." *IMF Working Paper 89/89*.

²¹ Clark, P. K. (1983). "Okun's Law and Potential GNP." *Working Paper, Board of Governors of the Federal Reserve System*.

²² Baily, M. (1984). "General Discussion on Robert J. Gordon." *Brookings Papers on Economic Activity* 2, p. 567-68.

²³ Okun, A. M (1970). *The Economics of Prosperity*. Washington, DC: Brookings Institution.

Application Of Okun's Law To The Lebanese Equation

Despite the presence of the above-mentioned empirical problems, we will consider in this research the Okun's equation as it is conceived and we will use the coefficient of 2.5²⁴ without introducing any adjustment. We also assume that the natural rate of unemployment is constant. The application of Okun's law suffers from many shortcomings, however, our goal is mainly to estimate the potential output that this country may reach using Okun's equation.

Accordingly, the gap between an economy's full-employment output and its actual level of output increases by 2.5 percentage points for each percentage point the unemployment rate increases, (i.e., the percentage gap between potential and actual output equals 2.5 times cyclical unemployment rate). Okun's Law is expressed algebraically as:

$$\Delta Y/Y = \Delta \bar{Y}/\bar{Y} = -2.5 \Delta U, \text{ hence}$$

$$(\bar{Y} - Y) / \bar{Y} = 2.5 (U - \bar{U})$$

Where:

- $\bar{U}$ is the natural unemployment rate; this rate is estimated by the Association of Banks in Lebanon to be close to 7%.
- U is the actual unemployment rate. According to our study, $U = 31.15\%$.
- $\bar{Y}$ is the full-employment output or the potential output.
- Y is the actual level of output; it is estimated to be approximately equal to \$21 billions in 2004.

With respect to the above equation, the gap between potential GDP and actual GDP is $2.5 (31.15 - 7) = 60.37\%$.

Therefore, $(\bar{Y} - Y) / \bar{Y} = 0.6045$ and the potential output equals:

$$(\bar{Y} - 21.00) / \bar{Y} = 0.6045 \iff \bar{Y} = 53.00 \text{ billion USD}$$

According to the above results, we can notice that the actual output is \$32.00 billion below the full-employment level.

Simulation of Results According To Other Published Unemployment Rates

If $U = 20\%$

$$(\bar{Y} - 21.00) / \bar{Y} = 0.325 \quad \bar{Y} = 31.11 \text{ billion USD}$$

If $U = 15\%$

$$(\bar{Y} - 21.00) / \bar{Y} = 0.2 \quad \bar{Y} = 26.25 \text{ billion USD}$$

In our simulation we did not adjust the coefficient, otherwise, we would have obtained approximately a $\bar{Y}$ very close to 53 billion USD in both cases.

Based on the above results, it would be important to illustrate how labor input is related to output:

²⁴ It's worth mentioning that Okun's law coefficient was 3.0 rather 2.5, so each percentage point of cyclical unemployment was associated with a difference between actual output and full-employment output of 3 percentage points. Current estimates put the Okun's law coefficient closer to 2.5.

$$Y = AF(K,N)^{25}$$

where

$$Y^{26} = Ak^n N^{1-n}.$$

Since it is quite impossible in Lebanon to observe the actual shares of income received by capital and labor, estimating the parameter n becomes unattainable for the Lebanese production function. Therefore, and based only on the shape of the Cobb-Douglas production function, we will try to identify the gap between the potential output (according to Okun's equation) and its present level.

When cyclical unemployment increases, other factors that determine output such as the number of people in the labor force, the number of hours each worker works, and the average productivity of labor, also fall, which magnifies the effect of the increase in unemployment.

CONCLUSION

This paper sought to measure the unemployment rate in Lebanon and its effect on the economic potential growth using Okun's Law. The impact of unemployment in Lebanon seems to be extremely harmful: the economy is

²⁵ Where Y = real output produced in a given period, A = a number measuring overall productivity, K = the capital stock, N = the number of workers employed in the period, and F = a function relating output to capital and labor.

Andrew A. B, Bernanke B. S., (1995). *Macroeconomics*, Second edition, Addison-Wesley Publishing Company, Inc.

²⁶ This type of production function is called a Cobb-Douglas production function where $0 < n < 1$. Under certain conditions, the parameter n corresponds to the share of income received by owners of capital, whereas labor receives a share of income equal to $1-n$.

at \$32 billion below its potential output. Unemployment in Lebanon is continuously growing as a result of the present financial and economic²⁷ “deadlock” situation. It is the human resources of a nation, not its physical capital or its natural resources, that ultimately determine the character and pace of its economic growth and social development. Capital and natural resources are passive²⁸ factors of production; human beings are the active agents who accumulate capital, exploit natural resources, build social, economic and political organizations, and carry forward national development. Clearly, a country which is unable to develop the skills and knowledge of its people and to utilize them effectively in the national economy, will be unable to develop anything else.

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