University of Wollongong
Economics Working Paper Series
2006

http://www.uow.edu.au/commerce/econ/wpapers.html

Unemployment Conundrum in Iran

Abbas Valadkhani

WP 06-15

June 2006

Unemployment Conundrum in Iran

Abbas Valadkhani

School of Economics and Information Systems, University of Wollongong, NSW 2522, Australia
Email: abbas@uow.edu.au

This paper examines the major causes of Iran's unemployment conundrum using a simultaneous-equation model and annual time series data from 1968 to 2000. It is found that the rate of unemployment responds positively to output gap and increasing economic uncertainty and negatively to the higher growth rates of real investment and inflation, supporting the view that there exists a degree of trade-off between inflation and unemployment. However, since persistent and soaring inflation rates eventually lead to the chronic depreciation of the domestic currency and rising economic instability, it will be irrational to exploit this trade-off to fight against unemployment, particularly in the post-1979 revolution. Iran possesses one of the youngest populations in the world with approximately 40 per cent of its population less than 15 years. It is thus argued that if major tax and constitutional reforms are not undertaken, unemployment will continue to rise, depicting a sombre future for the next working age generation.

1. Introduction

According to the Central Bank (2002), Iran's total population was 63.9 million in 2000. Unlike the previous two development plans conducted after the 1979 Islamic revolution, the most important concern of the recent Third Five-Year Development Plan (2000/01-2004/05) pertains to a growing rate of unemployment among youth. Political and religious leaders zealously supported a totally inappropriate policy of population growth after the 1979 revolution, particularly in the 1980s. This population policy was abandoned during the last decade but population continues to grow due to its momentum and dynamic nature. Population growth decelerated from 3.9 per cent in 1986 to 1.7 per cent in 2000.

The population pyramid in Iran is such that a large proportion of population will seek employment within the next five years or so because the economy has one of the youngest populations in the world with approximately 40 per cent under 15 years of age (Amuzegar, 2000). That is the reason why the population pyramid in Iran is literally referred to as a "time bomb". During the period 1996-2000 on average only 296,250 new jobs were created each year, whereas over the same period on average 692,750 new job seekers entered the labour market (Management and Planning Organisation, MPO, 2000, p.21). According to the Third Plan it is predicted that over the next five years on average every year between 750,000 to 800,000 people will be seeking employment. If the economy performs like it has been in the past five years, approximately half a million people will be added to the total mass of unemployed workers each year (Valadkhani, 2001).

The major objective of the Third Plan is to achieve a GDP growth of at least six per cent per annum in order to keep the rate of unemployment under control. Real GDP at factor price on average grew only 3.5 per cent per annum over the last five years (1996-2000) or even during the last decade (1991-2000) when Iran exported $US 150.5 billion worth of petrodollars (MPO, 2000). The Iranian government in the Third Plan wants to accomplish this policy target through heavy reliance on private sector investment. This paper examines the major determinants of unemployment conundrum, which is currently regarded as the most crucial issue in Iran.

The structure of the paper is as follows. In Section 2 a theoretical model is postulated which specifies a dynamic equation for unemployment within a simultaneous equations system. The empirical econometric results as well as policy implications of the study are presented in Section 3. Some concluding remarks will follow in Section 4.

2. Theoretical Model

To the best of the author's knowledge, with the exception of the Heiat (1986) model, the Valadkhani (1997) model, and a recent macroeconometric model developed in the Management and Planning Organisation (MPO, 2001), none of the previous studies has modelled employment or unemployment in Iran. Heiat (1986) simply specifies employment as a function of investment. Valadkhani (1997) formulates aggregate employment as a function of total labour force and GDP. His estimates indicate that, *ceteris paribus*, if total labour force increases by 1000 persons, aggregate employment will increase by only 770 persons. Put otherwise, 230 persons (23 per cent) who have just entered the labour market will be out of work. On the other hand, the MPO (2001) model estimates the demand for various categories of labour as well as several participation rates for male and female groups. Then they calculate the rate of unemployment from the "employment module" of the MPO macroeconometric model.

Given that rising unemployment is such an important issue in the Iranian economy, the objective of this paper is to specify an equation for the rate of unemployment as follows:

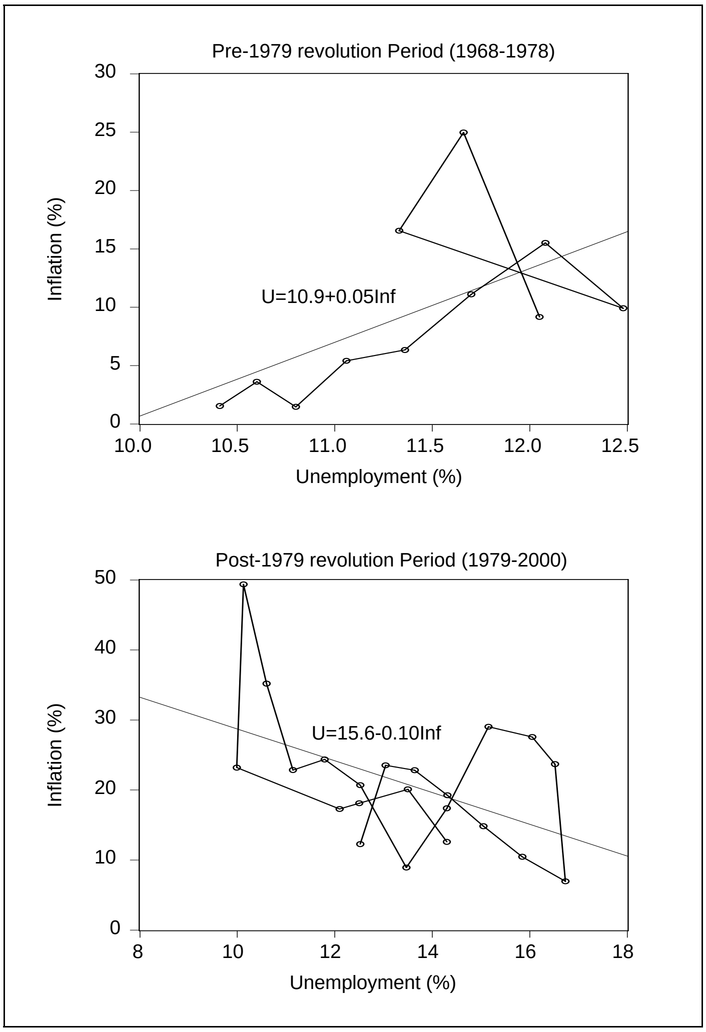
$$\ln(U_t) = \beta_{10} + \beta_{11}\Delta\ln(P_t) + \beta_{12}[\ln(Y_t) - \ln(Y_t^p)] + \beta_{13}\ln(B_t^P) + \beta_{14}\Delta\ln(I_t) + \beta_{15}\ln(U_{t-1}) + \beta_{16}D + \varepsilon_{1t} \qquad (1)$$

Where U is the annual rate of unemployment; P denotes the consumer price index (1982=1); G=$ln(Y)$-$ln(Y^p)$, is a measure of output gap; Y is actual real output (GDP at 1982 constant prices) and Y^p is a measure of potential output; B^P is the difference between the black market exchange rate (the price of $US in Iranian rial) and the official exchange rate or the black market premium as a proxy for economic uncertainty; I is total investment (at 1982 constant prices) and D is an intercept dummy variable taking the value of 1 for the Iraqi war (1980-1988) period, and zero otherwise. Theoretical justifications for the explanatory variables on the right hand side of equation (1) are presented below.

First, due to several factors such as the 1979 revolution, the US sanctions, and the eight years war with the belligerent Iraqi regime, it is plausible to argue that the Iranian economy has been performing below its full potential capacity, particularly since 1979. The rate of unemployment has not dropped below 10 per cent since 1968 and peaked at 16.7 per cent in 1985. According to an official estimate by the MPO (2001), the unemployment rate was more than 14 per cent in the year 2000. With such a high and persistent rate of unemployment one can argue that Iran suffers mainly from structural unemployment. One way of explaining unemployment is to use the Phillips curve. Figure 1 presents two Phillips curves (the first one representing the pre-1979 revolution period and the second curve representing the post-1979 revolution era) by plotting the unemployment rate versus the rate of inflation using annual time series data.

Due to substantial oil price rises and subsequent supply shocks worldwide in the 1968-1978 period, particularly in 1974, the Phillips curve in the upper part of Figure 1 shows an overall upward slope as if the curve has shifted to the right. However, the Phillips curve in the post-1979 period clearly exhibits a downward slope, supporting the view that, to some extent, there is a likelihood of trade-off between unemployment and inflation in this period. Given that there have been times when inflation and unemployment have moved in the same direction, the simplistic Phillips curve model is inadequate in explaining Iran's unemployment problem and One need to augment this model with a number of other relevant factors, which are discussed below.

Figure1. The Phillips curve before and after the 1979 Islamic Revolution



Source: Table 1.

These additional explanatory variables are incorporated into the unemployment equation to address the instability of the Phillips curve, a phenomenon, which is referred to as stagflation in the relevant literature. For a detailed discussion of the source of stagflation in Iran see Bahmani-Oskooee (1996). Therefore, it is hypothesised that there should be a reasonable trade-off between inflation and unemployment, particularly in the post-1979 revolution era. If the coefficient for β_{11} is significant and negative, one can contend that the Phillips curve hypothesis does apply in the context of Iran.

One may argue that under inflationary circumstances labour unions feel that real wages decrease, thus they demand higher nominal wages. The capitalists respond to this increase in nominal wages by raising prices. As a result of this ongoing procedure a wage-price spiral will persist. However, labour unions do not have a determining role in the Iranian economy and it appears that labour unrest was not the cause of inflation, but a response to it (Dadkhah 1988). The NAIRO (nonaccelerating inflation rate of unemployment) model is also highly unlikely to apply in the context of Iran because the unemployment rate has never dropped below 10 per cent since 1968. The natural rate of unemployment is usually defined around five per cent in most developed countries. This means that a five percent unemployment rate is tantamount to full employment, but in Iran the rate of unemployment never reached this level. According to the 1996 census more than 50 per cent of Iran's population were below 19 years of age, therefore given such a massive pool of growing labour force and unemployed population and other idle resources, a decline in unemployment should not give a rise to higher inflation. The degree of capital utilisation was about 40 per cent at the end of the 1980s (Amuzegar, 1992, p. 420).

Second, following Fahrer and Pease (1993) and Nguyen and Siriwardana (1988), a measure of output gap has also been included in the unemployment function. These two Australian studies have estimated forms of the Okun's law, where the rate of unemployment is specified, *inter alia*, as a function of the percentage gap between actual and potential output. One expects that if actual output becomes less than potential output, the rate of unemployment should increase, supporting the view that $\beta_{12}>0$. It should be noted that data on various aspects of labour markets in Iran are scarce and of poor quality. For example annual time series data on the number of hours worked are not available and as a result it is not possible to measure the impact of labour productivity changes on the unemployment rate.

The potential output is calculated by employing the Hodrick and Prescott (HP, 1997) filter that is widely used in the literature to decompose a time series into trend and cycle as well as the computation of potential output (Y^p). See for example de Brouwer (1998) and Haltmaier (2001). The two-sided linear HP method estimates the potential output (Y^P) from actual output Y by minimizing the variance of Y around Y^p. More specifically, the HP filter sets the potential component of output in order to minimise the following loss function:

$$L = \sum_{t=1}^{T}(Y_t - Y_t^p)^2 + \lambda\sum_{t=2}^{T-1}\left[(Y_{t+1}^p + Y_t^p) - (Y_t^p - Y_{t-1}^p)\right]^2 \qquad (2)$$

where λ is the smoothing weight on potential output growth and T is the sample size.

Because of the use of annual time series data in this paper, I have followed de Brouwer (1998) and assumed that λ=100. In an iterative process the HP filter sets the potential component of output or Y^p to minimise the loss function or L as shown in equation (2). It should be noted that as λ approaches zero, potential output would converge to actual output. Therefore a lower smoothing factor (λ) generates a 'smaller' estimate of the gap. One advantage of the HP filter is that it makes the output gap stationary using a wide range of smoothing values (Hodrick and Prescott 1997) and it also allows the trend to vary through time. However, Brouwer (1998, p.7) points out that the HP filter also has "the distinct disadvantage that the selection of the smoothing weight is arbitrary, and that this matters to the estimate."

Third, a volatile and uncertain economic environment adversely affects unemployment. A large number of seemingly employed people in Iran's large cities engaged in "unproductive" activities in various service sectors. This portion of the labour force is largely involved in small retail and itinerant petty trade, which is termed "rent-seeking" by Karshenas and Pesaran (1995) and Farzin (1995). In order to capture economic uncertainty and the adverse impact of these unproductive activities on the "official" and recorded unemployment figures, the black market premium has been used as a proxy in the unemployment function with an expected positive coefficient. The black market premium defined as the difference between the black market exchange rate and the official exchange rate. Not only does this measure reflect the over-valuation of the national currency, it also captures economic instability. In other words, it is assumed that the impact of economic uncertainty on unemployment can be captured by an unstable and constantly depreciating domestic currency. The black market premium has been included in the unemployment equation with an expected positive coefficient. It is important to note that according to Bahmani-Oskooee (1996, p.609) "massive depreciation of the Iranian rial is one of the sources of Iran's current stagflation".

The fourth determinant of the rate of unemployment is the real growth of total investment. Given that unemployment in Iran is structural, it is expected that a rise in the real growth of investment can lead to a fall in the unemployment rate. As mentioned earlier according to the Iran's Third Plan, investment should grow more than 8.5 per cent per annum in order to stabilise the rate of unemployment. It is thus expected that a positive growth in real investment can assuage unemployment or $\beta_{14}<0$. Fifth, an adaptive expectation mechanism has also been incorporated by including $ln(U_{t-1})$ in equation (1). Finally, an intercept war dummy variable is also included in equation (1) to capture the adverse effect of the eight years war with Iraq on unemployment.

Due to the simultaneity problem between U and the explanatory variables (inflation, economic growth, and investment growth) on the right hand side of equation (1), the unemployment equation is estimated by both OLS and 2SLS (two stage least square) within the following simultaneous equations system:

$$\begin{cases} \ln(U_t) = \beta_{10} + \beta_{11}\Delta\ln(P_t) + \beta_{12}[\ln(Y_t) - \ln(Y_t^p)] + \beta_{13}\ln(BP_t) + \beta_{14}\Delta\ln(I_t) + \beta_{15}\ln(U_{t-1}) + \beta_{16}D + \varepsilon_{1t} \\ \Delta\ln(P_t) = \beta_{20} + \beta_{21}\Delta\ln(M2_t) + \beta_{22}\Delta\ln(Y_t - OV_t) + \beta_{23}T_t + \varepsilon_{2t} \\ \Delta\ln(Y_t) = \beta_{30} + \beta_{31}\Delta\ln(OV_t) + \beta_{32}\Delta\ln(I_t) + \beta_{33}\Delta\ln(M2_t / P_t) + \beta_{34}\Delta\ln(P_{t-1}) + \varepsilon_{3t} \\ \Delta\ln(I_t) = \beta_{40} + \beta_{4i}\sum_{i=0}^{1}\Delta\ln(Y_{t-i}) + \varepsilon_{4t} \end{cases}$$

where M2 is the broadest measure of liquidity in Iran, O^V denotes the value added (at 1982 constant prices) in the oil sector, T is a trend variable and ε_{ij} are stochastic residuals.

It should be noted that the specification of this system has been finalised after an iterative transition between the alternative theoretical justifications and the empirical results. For example given the lack of the data on interest rate in Iran, the total investment function (the fourth equation above) innitially included the inflation rate as a proxy for the nominal rate of interest but this variable was not statistically significant and consequently it was excluded from the investment equation. Also the exclusion of the oil sector value added from GDP in the inflation equation is supported by the work undertaken by Aghvli and Sassanpour (1982) for the Iranian economy. Using a small multi-equation econometric model, emphasising the relationship between inflation and the oil sector, they conclude that a booming oil sector can induce inflationary pressures in other sectors of the economy. Given that the expected sign on the non-oil GDP is negative (e.g. β_{22}), GDP including of the oil sector, is an inappropriate explanatory variable in this context. The appropriate measure is GDP exclusive of the oil sector. See Valadkhani (1997) for a detailed theoretical specification of the similar equations embedded in an Iranian macroeconometric model.

As seen, there are only four endogenous variables and nine predetermined variables in the system. According to the rank and order conditions (not reported here but available from the autor upon request) all the four equations specified within the system are overidetified and thus one can estimate these equations by 2SLS to obtain consistent estimators.

3. Empirical Results and Policy Implications

Table 1 presents sources and descriptions of the data employed as well as the computed summary statistics using annual time series data from 1968 to 2000. An important step before estimating equation (1) is to determine the time series properties of the data. This is an important issue since the use of non-stationary data can result in spurious regression results. To this end, the ADF test has been adopted to examine the stationarity, or otherwise, of the time series data.

The empirical results of the Augmented Dickey-Fuller (ADF, 1979, 1981) test have not been reported here but are available from the author upon request. According to the ADF test results, all the variables employed in equation (1), *i.e.* $ln(U)$, $\Delta ln(P)$, $ln(BP)$, $\Delta ln(I)$ and G, are

I(0). Since only 33 annual observations are used in the estimation process (1968-200), the unit root test results should be taken with a pinch of salt, as all these tests are appropriate for large samples.

Table 1. Summary statistics and description of the data employed, 1968-2000

Variable	Description	Mean	Maximum	Minimum	Standard Deviation
U	Unemployment rate (%)	12.7	16.7	10.0	1.9
Δln(P)	Inflation rate (fraction)	0.155	0.401	0.015	0.084
Y	Actual real GDP (1982 billion rials)	11813	18701	5104	3382
Δln(Y)	Real GDP growth (fraction)	0.041	0.160	-0.161	0.077
Y^p	Potential GDP (1982 billion rials)	11803	18472	5807	3134
G	Output gap (1982 billion rials)	9	2498	-1842	920
B^P	the black market premium (rial per $US)	1097	6908	6	1771
Δln(I)	Real investment growth (fraction)	0.043	0.406	-0.368	0.172
$\Delta ln(O^V)$	Growth of real value added in the oil sector	0.007	0.792	-1.074	0.267
Δln(M2)	Nominal growth of M2	0.226	0.451	0.058	0.079
Δln(M2/P)	Real growth of M2	0.071	0.307	-0.082	0.102

Sources: Management and Planning Organisation (2000); Central Bank (2002); and Tabibian, et al. (2000).

Starting with these I(0) variables, the general-to-specific methodology is now used to omit the insignificant variables (if any) in equation (1) on the basis of a battery of maximum likelihood tests. As mentioned earlier, due to the simultaneity problem between U and the four explanatory variables on the right hand side of the unemployment function (*i.e.* inflation, economic growth, and investment growth) this equation has been estimated by 2SLS (two stage least square) within the following simultaneous equations system:

$$\begin{cases} \ln(\hat{U}_t) = 1.12 - 0.394\Delta\ln(\hat{P}_t) + 0.324[\ln(\hat{Y}_t) - \ln(Y_t^p)] + 0.074\ln(\hat{B}_t^P) - 0.102\Delta\ln(\hat{I}_t) + 0.550\ln(U_{t-1}) + 0.075D \\ \quad (5.0) \quad (-2.2) \quad (2.7) \quad (2.6) \quad (-2.8) \quad (6.0) \quad (3.7) \\ \bar{R}^2 = 0.924 \quad h = -0.44 \quad DW = 2.13 \end{cases}$$

$$\begin{cases} \Delta\ln(\hat{P}_t) = -0.03 + 0.689\Delta\ln(M2_t) - 1.088\Delta\ln(\hat{Y}_t - O_t^V) + 0.003T_t \\ \quad (-0.6) \quad (4.0) \quad (-3.9) \quad (2.7) \\ \bar{R}^2 = 0.448 \quad DW = 1.60 \end{cases}$$

$$\begin{cases} \Delta\ln(\hat{Y}_t) = 0.041 + 0.181\Delta\ln(O_t^V) + 0.230\Delta\ln(\hat{I}_t) + 0.096\Delta\ln(M2_t / P_t) - 0.115\Delta\ln(P_{t-1}) \\ \quad (3.4) \quad (9.9) \quad (5.0) \quad (1.7) \quad (-1.9) \\ \bar{R}^2 = 0.887 \quad DW = 2.12 \end{cases}$$

$$\begin{cases} \Delta\ln(\hat{I}_t) = -0.026 + 0.632\Delta\ln(\hat{Y}_t) + 1.029\Delta\ln(Y_{t-1}) \\ \quad (-1.1) \quad (1.7) \quad (3.1) \\ \bar{R}^2 = 0.516 \quad DW = 1.60 \end{cases}$$

[*] The numbers in parentheses below the estimated coefficients are the t-ratios.

Table 2. Empirical results for the unemployment equation, *$ln(U_t)$-1968-2000*

Variable	Estimated short-run elasticities	*t*-statistics*	Prob.	Expected signs	Estimated long-run elasticities
Constant					
OLS	1.068	5.3	[0.00]	+	2.50
2SlS	1.121	5.0	[0.00]		2.49
$\Delta ln(P)$					
OLS	-0.384	-4.7	[0.00]	-	-0.91
2SLS	-0.399	-2.2	[0.04]		-0.90
G					
OLS	0.245	3.0	[0.01]	+	0.57
2SLS	0.324	2.7	[0.01]		0.72
$ln(B^P)$					
OLS	0.074	2.8	[0.01]	+	0.17
2SLS	0.081	2.6	[0.02]		0.18
$\Delta ln(I)$					
OLS	-0.092	-3.0	[0.01]	-	-0.22
2SLS	-0.102	-2.8	[0.01]		-0.23
D					
OLS	0.070	3.7	[0.00]	+	0.16
2SLS	0.075	3.7	[0.00]		0.17
$ln(U_{t-1})$					
OLS	0.573	6.8	[0.00]	β_{15}<+1	
2SLS	0.550	6.0	[0.00]		
Order of integration of stochastic residuals: I(0)					
Adjusted R^2=0.925 OLS	Adjusted R^2=0.924 2SLS			Overall $F(6, 26)$ =67	[0.00]
Diagnostic tests:					
DW		2.13			
Durbin *h* statistic		-0.44			
AR 1-2:		$F(2,24)$=0.51	[0.60]		
ARCH 1-1		$F(1,24)$=3.3	[0.08]		
Normality		$\chi^2(2)$=2.1	[0.35]		
White		$F(11,14)$=2.9	[0.04] *		
RESET		$F(1,25)$=0.59	[0.45]		

* indicates that the standard errors of coefficients have been corrected by the Newey-West Heteroskedasticity-Consistent Standard Errors & Covariance before calculating *t*-ratios. The diagnostic tests are based on the OLS estimators.

All the estimated coefficients presented above (β_{ij}) have the expected theoretical signs. Since the objective of this study is to examine the causes of Iran's unemployment problem, the attention is now directed to the interpretation of the estimated unemployment equation. Table 2 shows the detailed econometric results of the unemployment equation. As it can be seen, the resulting residual term from the parsimonious dynamic unemployment equation is stationary, all the estimated coefficients are statistically significant at least at the 5 per cent level and have the expected theoretical signs. With an adjusted R^2 of 0.923, the estimated unemployment function also performs extremely well in terms of goodness-of-fit statistics and it passes each and every diagnostic test with the only exception being the White heteroskedasticity test. In order to address this problem, the standard errors of coefficients have been corrected by the Newey-West heteroskedasticity-consistent standard errors and covariance before calculating *t*-ratios. The estimated coefficients reported in the second column of Table 2 represent the short-run elasticities. One can divide them by one minus the lagged dependent variable coefficient to obtain the long-run elasticities. These long-run elasticities have been reported in the last column of Table 2.

As seem from Table 2, both the inflation rate and the real growth rate of investment have negative short-run elasticities of –0.39 and –0.10, respectively. Note also that the coefficient of the lagged dependent variable is well below unity (0.55). The long-run elasticity for inflation is -0.90, implying that, *ceteris paribus*, a hypothetical increase of x per cent in inflation can reduce unemployment by almost the same magnitude. On the other hand, a 10 per cent increase in the growth of aggregate real investment is capable of bringing down the unemployment rate by 2.3 per cent in the long run. Furthermore, if the gap between actual and potential output widens by say 10 per, the rate of unemployment will increase by 3.2 per cent and 7.2 per cent in the short- and long-run, respectively.

Now one may ask how can we narrow output gap? It should be noted that there is a non-quantifiable obstacle facing the Iranian government in relation to private investment: an antiquated and inflexible constitution. The output gap in Iran will continue to widen if private investment does not accelerate. In fact, the Third Plan expects the private investment to grow at 8.5 per cent but one should recognise that the private sector in Iran's constitution has been treated as "residuals" (Valadkhani, 2001). The Iranian constitution fails to appreciate the importance of the private sector in the economy, and this is in stark contrast with the high expectation of the Third Plan from the private sector.

President Khatami is unlikely to succeed in the Plan within the boundaries of the present constitution without overhauling labour law and introducing a comprehensive tax reform that does not discriminate between rent-seeking *bonyads* (revolutionary foundations supported by the government and the leader) and *non-bonyad* economic activities. Iran has been classified among the countries with the lowest tax-GDP ratio. It is argued that "only 50 per cent of the country's tax potential is actually collected" (Ghasimi, 1992, p.605). Unfortunately whenever there has been an oil boom in the economy, the issue of reform of the taxation system fades to insignificance. It appears that the oil industry has induced a "cargo cult" mentality among Iranian policy makers.

Since the 1979 Islamic revolution these foundations and a large number of financially haemorrhaging state-owned enterprises have been exempt and/or have benefited from various types of government subsidies. As a result, an enormous pressure has been placed on the government budget. Given that the major source of financing government budget deficit in Iran is through borrowing from the Central Bank, the monetary base and liquidity has increased substantially and as a result the Iranian rial became a declining currency. It is interesting to recognise that liquidity (defined as M2) increased prodigiously from 54 billion rials in 1960 to 249111 billion rials in 2000 (a 4622 fold increase!), whereas real GDP recorded only a 7.4 fold increase during the same period. As a result the black market rate depreciated from 90 rials (per US dollar) in 1960 to 8188 rials in 2000.

Table 2 also indicates that the black market premium, as a proxy for rising economic uncertainty and mushrooming rent-seeking activities, has the positive short- and long-run estimated elasticities of +0.08 and +0.18, respectively. Therefore, as expected, the existence of rampant rent-seeking activities (such as unofficial buying/selling foreign currencies, gold coins, cars, money laundering) results in higher "official" unemployment rates. In other words, a volatile and constantly depreciating currency can dishearten employers to create and/or maintain new jobs in the economy. Finally, the estimated positive and highly significant coefficient on the war dummy variable clearly supports the view that this calamitous war was responsible for a substantial number of job losses during the 1980-1988 period.

4. Conclusion

This paper examines the major determinants of the growing unemployment rate in Iran using annual time series data from 1968 to 2000. The general-to-specific econometric technique and a simultaneous equation system have been used to estimate a dynamic unrestricted equation for unemployment. The theoretical model postulated in the paper explains the underlying causes of unemployment using stationary time series data. Empirical results clearly indicate that the following five factors determine the significant variations in the unemployment rate: inflation, output gap, economic uncertainty associated with an unstable currency, the real growth of investment, and a dummy variable capturing the devastating impact of Iraqi war.

It is also argued that creating 750,000 to 800,000 jobs per annum during the next five years is an enormous task, which cannot be fulfilled without amending the present constitution and stimulating private investment. It is found that there exists a trade-off between inflation and unemployment for the post-1979 era. However, it should be borne in mind that persistent and soaring inflation can easily lead to the depreciation of the domestic currency, which in turn exacerbates unemployment. Therefore, if major tax and constitutional reforms are not undertaken in the near future, the goal of narrowing output gap and reaching higher rates of GDP and investment growth will not eventuate and hence the rate of unemployment will continue to rise in the years to come. The Iranian government should stimulate private investment and kick-start the lethargic economy before it becomes too late.

References

Aghevli, B.B. and Sassanpour, C. (1982), "Prices, Output and the Trade Balance in Iran", *World Development*, 10, No.9, pp. 791-800.

Amuzegar, J. (1992), "The Iranian Economy Before and After the Revolution", *Middle East Journal*, 46, No.3, pp. 413-25.

Amuzegar, J. (2000), "A Perspective on Iran's Post-Revolution Political Economy", A lecture delivered at the Foundation for Iranian Studies, March 24, Bethesda (http://www.fis-iran.org/amuzegar.htm).

Bahmani-Oskooee, M. (1996), "Source of Stagflation in an Oil-Producing Country: Evidence from Iran, *Journal of Post Keynesian Economics*, 18, No. 4, pp. 609-20.

Central Bank (2002), *Nemagarhayeh Eghtesadi* (Economic Indicators), Department of Economic Accounts, Central Bank, Tehran.

Dadkhah, K.M. (1988), "The oil nationalisation movement, the British boycott and the Iranian economy:1951-1953", in *Essays on the Economic History of the Middle East*, Kedourie, F. and Haim, S.G. (eds.), Frank Cass, London, pp. 104-131.

de Brouwer, G. (1998), "Estimating Output Gaps", *Reserve Bank of Australia Research Discussion Paper 9809*, Reserve Bank of Australia, Sydney.

Dickey, D.A. and Fuller, W.A. (1979), "Distributions of the Estimators for Autoregressive Time Series with a Unit Toot", *Journal of the American Statistical Association*, 74, No. 366, pp. 427-31.

Dickey, D.A. and Fuller, W.A. (1981), "Likelihood Ratio Statistics for Autoregressive Time Series with a Unit Root", *Econometrica*, 49, No.4, pp. 1057-72.

Fahrer, J. and A. Pease (1993), "The Unemployment-Vacancy Relationship in Australia", *Australian Economic Review*, 28, pp. 43-57.

Farzin, Y.H. (1995), "Foreign Exchange Reform in Iran: Badly Designed, Badly Managed", *World Development*, 23, No.6, pp. 987-1001.

Ghasimi, M.R. (1992), "The Iranian Economy After the Revolution: an Economic Appraisal of the Five-Year Plan", *International Journal of Middle East Studies*, 24, pp.599-614.

Haltmaier, J. (2001), "The Use of Cyclical Indicators in Estimating the Output Gap in Japan", *International Finance Discussion Paper 701,* Board of Governors of the Federal Reserve System.

Heiat, A. (1986), *An Econometric Study of an Oil-Exporting Country: The Case of Iran*, an unpublished Ph.D thesis submitted to the Portland State University, Portland, Oregon.

Hodrick, R.J. and E.C. Prescott (1997) "Postwar U.S. Business Cycles: An Empirical Investigation", *Journal of Money, Credit, and Banking*, 29, pp. 1–16.

Karshenas, M. and Pesaran, H. (1995), "Economic Reform and the Reconstruction of the Iranian Economy", *Middle East Journal*, 49, No.1, pp. 89-111.

Management and Planning Organization (2000), *Majmooeh Amari* (Statistical Database), Macroeconomic Bureau, Tehran.

Management and Planning Organisation (2001), *A Macroeconometric Model of the Iranian Economy*, Macroeconomic Bureau, Management and Planning Organisation, Tehran.

Nguyen, D. and A. Siriwardana (1988), 'The Relationship Between Output Growth and Unemployment: A Re-examination of Okun's Law in Australia", *Australian Economic Review*, 21, pp.16-27.

Pesaran, M.H. (1995), "Planning and Macroeconomic Stabilisation in Iran", *DAE Working Papers Amalgamated Series No. 9508*, Department of Applied Economics, Cambridge University, Cambridge.

Tabibian, M. Rashidi M, and Sadighi, K (2000), *Pre-Data Process System (PDS)*, A database software package, Institute for Research and Economic Development, Tehran.

Valadkhani, A. (1997), *A Macroeconometric Model for the Iranian Economy*, An unpublished Ph.D. thesis submitted to The University of Queensland, Brisbane.

Valadkhani, A. (2001), "An Analysis of Iran's Third Five-Year Development Plan in the Post-Revolution Era (2000-2005)", *Journal of Iranian Research and Analysis*, 17, No. 2, pp. 1-21.