An Econometric Model for Inflation and Unemployment Rate - Cases in Viet Nam and Myanmar

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Abstract—After the global economic crisis 2007-2011, Viet Nam and Myanmar economies experienced indirect and direct impacts on their economic, finance and banking system, and especially on unemployment rate. Although some economists have done researches on the relationship among macro economic factors such as: consumer price index (CPI), inflation, GDP...., this paper aims to consider the interaction between macro economic factors such as Viet Nam inflation, US inflation and Viet Nam and Myanmar unemployment rates in the context Viet Nam and Myanmar economics receive impacts from global economic crisis. This is one main objective of this research paper. And the below chart shows us the fluctuation of Viet nam unemployment rate comparing to fluctuations of inflation in the US and in Viet Nam.

Keywords—Inflation, Unemployment Rate, Viet Nam, Myanmar.

I. INTRODUCTION

Viet Nam and Myanmar economy have become active and growing recently and they are affected by both internal and external factors such as global economic crisis. Hence, the US economy has certain impacts on both economies. Therefore, unemployment rate in Viet Nam and Myanmar are also affected by external factors such as the recession from US economy, or the USA inflation.

In this research, we will consider unemployment rate in Viet Nam and Myanmar, are affected by two variables (inflation in Myanmar or Viet Nam, and inflation in the USA):

\[
Y (\text{unemployment rate in Viet Nam or Myanmar}) = f (x_1, x_2) = ax_1 + bx_2 + k
\]

Note: \(x_1\): inflation in Viet Nam or Myanmar, \(x_2\): inflation in the USA

In following sections, this paper will present research issues, research methods, research results, discussion and policy suggestion.
II. RESEARCH ISSUES

Because US economy has impacts on Viet Nam and Myanmar economy, especially during the global economic crisis 2007-2011, this paper will find out:

Research issue 1: estimate the relationship between unemployment rate in Viet Nam and inflation in Viet Nam and in USA.

Research issue 2: estimate the relationship between unemployment rate in Myanmar and inflation in Myanmar and in USA.

III. RESEARCH ON VIETNAM AND MYANMAR UNEMPLOYMENT RATES AND GDP PER CAPITA

The population in Myanmar is 53.3 million people in 2013:

Chart 1 – Population in Myanmar

While the population in Viet Nam is 89.7 million people in 2013:

Chart 2 – Population in Viet Nam
GDP per capita in Myanmar until 2011 is 824.19 USD:
Chart 3 – GDP per capita in Myanmar

GDP per capita in Viet Nam in 2011 is 946.8 USD:
Chart 4 – GDP per capita in Viet Nam

Comparing to GDP per capita in Singapore is 36102 USD in 2011:
Chart 5 – GDP per capita in Singapore
Comparing to GDP per capita in Malaysia is 6531 USD in 2011:

We see that both Viet Nam and Myanmar GDP per capita are much lower than GDP per capita in Singapore and Malaysia. In 2013, unemployment rate increases slightly compared to the rate in 2012 (1.9% compared to 1.81%) but Viet Nam is still among the countries with the lowest unemployment rates across the globe.

In Myanmar, unemployment rate in 2013 is 4.02%, increasing slightly from 4% in 2012. (see more in the below chart 9).

IV. CONCEPTUAL THEORIES

The Philips curve shows us the relationship between inflation and unemployment rate. When unemployment is high, wages increase slowly and inflation decreases. When unemployment is low, wages rose rapidly and inflation increases. The curve states that inflation and unemployment have a stable and inverse relationship. If economy is growing, inflation increases and more jobs (or less unemployment) are created.

The below chart shows us the Phillips curve during 1961-1969 (source: www.econlib.org)

In 1968, Milton Friedman stated that the Phillips curve will be applicable in short run and that in the long run, inflationary policies will not decrease unemployment.
V. RESEARCH METHOD

In this research, analytical method is used with data from the economy such as inflation and unemployment rate. Beside, econometric method is used with the software Eview. It will give us results to suggest policies for businesses and authorities.

Econometric model is established as in the introduction part. Unemployment rate in Viet Nam or Myanmar is a function with 2 variables:

\[ Y (\text{unemployment rate in Viet Nam or Myanmar}) = f(x_1, x_2) = ax_1 + bx_2 + k \]

Note: \(x_1\): inflation in Viet Nam or Myanmar, \(x_2\): inflation in the USA

VI. PHÂN TÍCH DỮ LIỆU TỔNG QUÁT

The below chart 8 shows us that inflation in VN has a positive correlation with inflation in the US:

Chart 8 – Inflation in Viet Nam and in the US (nguồn: Vneconomy, tradingeconomic)

The below chart 9 shows us that unemployment rate in Myanmar is higher than that in Viet Nam during the period 2003-2013.

Chart 9 – Unemployment rates in Viet Nam and in Myanmar (nguồn: Vneconomy, tradingeconomic)
And the chart 10 below shows us that unemployment rate in Viet Nam has a positive correlation with inflation in Viet Nam and in the US. From 2003 to 2008, unemployment rate in Viet Nam is lower than inflation in the US. From 2009 to 2010, unemployment rate in Viet Nam is higher than inflation in the US.

Chart 10 – Unemployment rate in Viet Nam, inflation in VN and in the US

This research sample uses data (unemployment, inflation) during 11 years from 2003 to 2013. The global crisis starting from 2007 has impacts on Viet Nam and Myanmar economy. Therefore, we could assume unemployment rate in Viet Nam or Myanmar as a function depending on inflation in the US.

Now, we see in the below chart 11, inflation in Myanmar has a positive correlation with inflation in the US. From 2005 to 2009, inflation in Myanmar is higher than (or equal to) that in Viet Nam. But from 2010 to 2013, inflation in Myanmar is lower than that in Viet Nam. Both inflation in Myanmar and in Viet Nam is higher than that in the US.

Chart 11 – Inflation in Myanmar, inflation in VN and in the US

Next we see unemployment rate in Myanmar in the below chart 12. It shows us that, different from Viet Nam, from 2003 to 2013, unemployment rate in Myanmar is higher than inflation in USA.
On the other hand, we could see statistical results with Eview in the below table with 3 variables:

Table 1 – Statistical results for SER03 (inflation in Myanmar), SER02 (inflation in the US) and SER01 (unemployment rate in Myanmar)

<table>
<thead>
<tr>
<th></th>
<th>SER03</th>
<th>SER02</th>
<th>SER01</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>13.5601</td>
<td>2.3811</td>
<td>4.0118</td>
</tr>
<tr>
<td>Median</td>
<td>7.8700</td>
<td>2.7000</td>
<td>4.0100</td>
</tr>
<tr>
<td>Maximum</td>
<td>32.9000</td>
<td>3.8000</td>
<td>4.0200</td>
</tr>
<tr>
<td>Minimum</td>
<td>3.8000</td>
<td>-0.4000</td>
<td>4.0000</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>10.8183</td>
<td>1.1779</td>
<td>0.0075</td>
</tr>
<tr>
<td>Skewness</td>
<td>0.6518</td>
<td>-1.1295</td>
<td>-0.2827</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>1.7692</td>
<td>3.8232</td>
<td>1.9735</td>
</tr>
<tr>
<td>Jarque-Bera</td>
<td>1.4731</td>
<td>2.6499</td>
<td>0.6294</td>
</tr>
<tr>
<td>Probability</td>
<td>0.4787</td>
<td>0.2658</td>
<td>0.7299</td>
</tr>
<tr>
<td>Sum</td>
<td>149.1700</td>
<td>26.2000</td>
<td>44.1300</td>
</tr>
<tr>
<td>Sum Sq. Dev.</td>
<td>1170.356</td>
<td>13.8763</td>
<td>0.0005</td>
</tr>
<tr>
<td>Observations</td>
<td>11</td>
<td>11</td>
<td>11</td>
</tr>
</tbody>
</table>

The above table shows us standard deviation of SER03 (inflation in Myanmar) is the highest (10.8), standard deviation of SER02 (inflation in the US) is the second highest (1.18) and standard deviation of unemployment rate in Myanmar is the lowest (0.007).

If we want to see correlation matrix of three (3) above variables, Eview generate the below result in table 2:
Table 2 – Correlation matrix for SER03 (inflation in Myanmar), SER02 (inflation in the US) and SER01 (unemployment rate in Myanmar)

<table>
<thead>
<tr>
<th></th>
<th>SER03</th>
<th>SER02</th>
<th>SER01</th>
</tr>
</thead>
<tbody>
<tr>
<td>SER03</td>
<td>1.000000</td>
<td>0.389730</td>
<td>0.140954</td>
</tr>
<tr>
<td>SER02</td>
<td>0.389730</td>
<td>1.000000</td>
<td>-0.131577</td>
</tr>
<tr>
<td>SER01</td>
<td>0.140954</td>
<td>-0.131577</td>
<td>1.000000</td>
</tr>
</tbody>
</table>

The above table 2 shows us that correlation between unemployment rate in Myanmar and inflation in Myanmar (0.14) is higher than that between unemployment rate in Myanmar and inflation in the US (-0.13). Unemployment rate in Myanmar has a negative correlation with inflation in the US and it has a positive correlation with inflation in Myanmar.

The below table 3 shows us that correlation between unemployment rate in Vietnam and inflation in Vietnam (0.28) is higher than that between unemployment rate in Vietnam and inflation in the US (-0.07). Unemployment rate in Vietnam has a negative correlation with inflation in the US and it has a positive correlation with inflation in Vietnam.

Table 3 – Correlation matrix for SER04 (inflation in Vietnam), SER02 (inflation in the US) and SER05 (unemployment rate in Vietnam)

<table>
<thead>
<tr>
<th></th>
<th>SER04</th>
<th>SER02</th>
<th>SER05</th>
</tr>
</thead>
<tbody>
<tr>
<td>SER04</td>
<td>1.000000</td>
<td>0.488188</td>
<td>0.285421</td>
</tr>
<tr>
<td>SER02</td>
<td>0.488188</td>
<td>1.000000</td>
<td>-0.071628</td>
</tr>
<tr>
<td>SER05</td>
<td>0.285421</td>
<td>-0.071628</td>
<td>1.000000</td>
</tr>
</tbody>
</table>

VII. REGRESSION ANALYSIS

In this section, we will find out the relationship between macroeconomic factors such as inflation in Vietnam or Myanmar, inflation in the US and unemployment rates in Vietnam or Myanmar.


Note: unemployment rate in Vietnam (SER05), inflation in Vietnam (SER04), inflation in the US (SER02), inflation in Myanmar (SER03), unemployment rate in Myanmar (SER01)

Using Eview, give us the below results:

Dependent Variable: SER05
Method: Least Squares
Date: 08/09/14 Time: 11:53
Sample: 2003 2013
Included observations: 11

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SER04</td>
<td>0.017356</td>
<td>0.019986</td>
<td>0.893428</td>
<td>0.3949</td>
</tr>
<tr>
<td>C</td>
<td>2.128371</td>
<td>0.229341</td>
<td>9.262562</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

R-squared: 0.081465
Adjusted R-squared: -0.020594
S.E. of regression: 0.355800
Sum squared resid: 1.138065
Log likelihood: -3.131210
Durbin-Watson stat: 1.346473

Therefore, Unemployment_VN = 0.02 * Inflation_VN + 2.13 (7.1), R^2 = 0.08, SER = 0.4
(0.02) (0.23)

www.ijels.com
7.2 Scenario 2: regression model with 3 variables: unemployment rate in Viet Nam, inflation in Viet Nam and inflation in the US.

Using Eview give us the result:

\[
\text{Unemploy}_\text{VN} = 0.03 \times \text{Inflation}_\text{VN} - 0.08 \times \text{Inflation}_\text{USA} + 2.24
\]

\[R^2 = 0.14, \text{ SER} = 0.36\]  

Hence, unemployment rate in Viet Nam has a negative correlation with inflation in the US, but has a positive correlation with inflation in Viet Nam.

7.3. Scenario 3: regression model with 3 variables: unemployment rate in Myanmar, inflation in Myanmar and inflation in the US:

Using Eview gives us the result:

\[
\text{Unemployment rate}_\text{Myanmar} = -0.001 \times \text{Inflation}_\text{USA} + 0.0002 \times \text{Inflation}_\text{Myanmar} + 4.01
\]

\[R^2 = 0.06, \text{ SER} = 0.008\]  

Hence, unemployment rate in Myanmar has a negative correlation with inflation in the US and a positive correlation with inflation in Myanmar.
We find out unemployment rate in Myanmar has a negative correlation with inflation in USA, but has a positive correlation with inflation in Myanmar (similar to employment rate in Viet Nam in scenario 2).

VIII. LIMITATION OF THE MODEL
Eview has advantages such as: analyzing data quickly, and good for econometric and statistics. On the other hand, Eview can not give the absolutely correct correlation between variables in the model. Therefore, in this model, Eview can only provide us with results for reference.

IX. DISCUSSION FOR FURTHER RESEARCH
We can add one more factor into our regression model, for example, inflation in the UK. The reason is that both the US and UK economies create the global economic crisis with impacts on worldwide economies including Viet Nam and Myanmar.

X. CONCLUSION AND POLICY SUGGESTION
Because inflation in Viet Nam (or Myanmar) has a positive correlation with unemployment rates in Viet Nam (or Myanmar), the government and authorities of these countries might consider controlling inflation in order to reduce unemployment rates. Macro economic policies need to consider impacts of macro factors such as inflation in their countries and outside factors such as inflation in the US.
Because inflation in the US has a negative correlation with unemployment rates in Viet Nam (or Myanmar), the government of Viet Nam and Myanmar need to implement macro policies if inflation in the US decreases (and therefore, unemployment will increase in Viet Nam or Myanmar).
The government and authorities in Viet Nam and Myanmar can issue policies which can protect their market economy and reduce negative impacts from the global recession.

REFERENCES
Website