REGULATING GOLD *MURABAHAH* IN ISLAMIC BANKING

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Gold *Murabahah* endorsed by DSN is a *Murabahah* contract which allows Islamic banks to finance gold trading with a deferred payment basis.

In fact, gold *Murabahah* is a new trend because of: (i) the world gold price hike, (ii) a liquid asset & tradable in the market and, (iii) protection wealth from inflation.

Nevertheless, it may face market risk, liquidity risk, credit risk, default risk and reputation risk due to market fluctuation and cause losses to investors. It then affects the performance of Islamic banks.

The paper attempts to analyze: (a) the behavior of gold prices as the most determinant factor for investors to purchase gold including gold *Murabahah* and the behavior of gold investors in purchasing or selling their gold *Murabahah*. At the end, it proposes some recommendations to regulate gold *Murabahah* contract in the Islamic banking industry.
• **Expected price of gold and probability of occurrence.** Investors want to know the future price of gold, probability of occurrence, the behavior of gold prices, and the time to purchase gold.

• The transactions of gold *Murabahah* involves on the spot price of purchasing gold and expected price of gold due to the volatility gold prices in the market.

\[
E(V_t) = r_{t+1}(V_t)
\]

*E*(V<tsub>_t</tsub>) = the expected price of gold in the certain period;
*r<sub>t+1</sub>* = the probability of occurrence of the gold price;
*V<sub>t</sub>* = the price of gold in the next period.

The probability of occurrence is determined by constructing intervals and locating prices in the intervals based on certain division.
• In an observed period, the highest price of gold is \( b \) and the lowest one is \( a \). Then, the difference between the highest and the lowest price of gold or \( (x) \) is divided into four intervals of gold prices.

\[
\begin{align*}
\text{Interval 1: } & y_1 \left( a + \frac{x}{4} \right) \\
\text{Interval 2: } & \left( a + \frac{x}{4} \right) y_2 \left( a + \frac{x}{2} \right) \\
\text{Interval 3: } & \left( a + \frac{x}{2} \right) y_3 \left( a + \frac{3x}{4} \right) \\
\text{Interval 4: } & y_4 \left( a + \frac{3x}{4} \right)
\end{align*}
\]

• the probability of occurrence of a gold price in certain interval is a basis to compute expected price of gold in a certain period. The formulas of the probability of occurrence per interval and expected price of gold are written as:
Probability of interval 1: \( r_1 = \frac{y_1}{\sum_{t=4}^{1} y_t} \)  

Expected price: \( E(V_1) = \left( \frac{y_1}{\sum_{t=4}^{1} y_t} \right) V_1 \)

Probability of interval 2: \( r_2 = \frac{y_2}{\sum_{t=4}^{1} y_t} \)  

Expected price: \( E(V_2) = \left( \frac{y_2}{\sum_{t=4}^{1} y_t} \right) V_2 \)

Probability of interval 3: \( r_3 = \frac{y_3}{\sum_{t=4}^{1} y_t} \)  

Expected price: \( E(V_3) = \left( \frac{y_3}{\sum_{t=4}^{1} y_t} \right) V_3 \)

Probability of interval 4: \( r_4 = \frac{y_4}{\sum_{t=4}^{1} y_t} \)  

Expected price: \( E(V_4) = \left( \frac{y_4}{\sum_{t=4}^{1} y_t} \right) V_4 \)

- the risk of gold price volatility is a variance between actual price of gold and expected price of gold multiplied by the probability of occurrence.

\[ (Var_t) = r_t [V_t - (EV_{t+1})] \]  

or \[ (Var_t) = \left[ \frac{y_t}{\sum_{t=4}^{1} y_t} \right] V_t - \left( \frac{y_1}{\sum_{t=4}^{1} y_t} \right) V \]
• the **early termination** risk is a risk happening prior to the maturity date of gold *Murabahah* contract.

• If \( P_t = \) payment price of gold Murabahah, \( P_0 = \) initial price of gold, \( r = \) Murabahah margin, \( I_t = \) installment of gold Murabahah, \( D = \) down payment, \( t = \) tenor of Murabahah, then

\[
P_t = r P_0 \quad I_t = \sum_{t=1}^{T} \frac{(P_t - D)}{t}
\]

• Early termination occurs if \((P_{t+1}) > (P_t)\).

• Simulation of the maximum limit of gold *Murabahah* contract: maximum gold *Murabahah* financing of Rp250 million and Rp150 million per debtor.

\[
\text{Max} \quad N = \frac{M_0}{\sum_{n=1}^{N} p_n} \quad \text{or} \quad N \sum_{n=1}^{N} p_n = M_0
\]

Max early termination

\[
M_t = (p_1 n_1) + (p_2 n_2) + (p_3 n_3) + ... + (p_{t+n} n_{t+n})
\]
ANALYSIS OF HISTORICAL GOLD PRICES

- A **stable** period of gold prices (January 1999 – September 2004);
- A **increasing** period of gold prices (September 2004 – May 2011);
- A **volatile** period of gold prices (May 2011 – February 2012).

The first period is notified by the average prices of gold below USD400/ounce and, low volatility in the last 6 years.

The second period occurs when the prices of gold moved up from the lowest price of USD402/ounce (10 September 2004) to USD1563/ounce (29 April 2011), and

the last period is noted when the prices of gold keeps rising up to USD1900/ounce followed by a very high volatility.
• in the **stable** period, the highest probability of occurrence (53%) was in the prices were **below USD296/ounce**.

• in the **increasing** period, (i) when the prices were **less than USD693/ounce** (44%), and (ii) if the prices were **USD693/ounce – USD983/ounce** (30%).

• in the **volatile** period, when the prices of gold were between (i) **USD1591/ounce – USD1694/ounce** (34%); (ii) **USD1694/ounce – USD1797/ounce** (32%) and, (iii) less than **USD1591/ounce** (25%).

<table>
<thead>
<tr>
<th>Price Interval Harga and Probability per Period</th>
<th>Stable</th>
<th>Prob of Occurrence</th>
<th>Increasing</th>
<th>Prob of Occurrence</th>
<th>Volatile</th>
<th>Prob of Occurrence</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 296</td>
<td>0.53</td>
<td>&lt; 693</td>
<td>0.44</td>
<td>&lt; 1591</td>
<td>0.25</td>
<td></td>
</tr>
<tr>
<td>296 - 339</td>
<td>0.19</td>
<td>693 - 983</td>
<td>0.30</td>
<td>1591 - 1694</td>
<td>0.34</td>
<td></td>
</tr>
<tr>
<td>339 - 383</td>
<td>0.13</td>
<td>983 - 1273</td>
<td>0.16</td>
<td>1694 - 1797</td>
<td>0.32</td>
<td></td>
</tr>
<tr>
<td>&gt; 383</td>
<td>0.15</td>
<td>&gt; 1273</td>
<td>0.10</td>
<td>&gt; 1797</td>
<td>0.09</td>
<td></td>
</tr>
</tbody>
</table>
FINDINGS

• When the prices of gold are **stable**, the next prices tend to decrease or stand in the **lower** position than the existing one.

• Hence, from the **investors** (gold *Murabahah* investors) point of view, investing funds in gold, when the price is stable, will **not** be really **profitable**.

• When the prices of gold are **increasing**, the next prices will go up (maximally 10.78%) or will moderately go down.

• Lastly, when the **prices** of gold are **volatile** in the high position, the next prices will **inflate modestly** with the maximum inflation of 3.35%.
ANALYSIS OF THE EXPECTED PRICE OF GOLD

Actual price (kiri)
Expected price (kanan)

STABLE PERIOD
INCREASING PERIOD
VOLATILE PERIOD
FINDINGS

• When the prices of gold are stable and suddenly go up unexpectedly (not persistently), the expected price of gold is low. It is because the investors are not sure if the next prices will increase or decrease as it happens unintentionally.

• When the prices of gold go up persistently, the expected price of gold also raises because the investors have been assured and have adjusted their (short term) price expectation from the low level into the higher one.

• However, in a certain level when the prices of gold (are believed) have reached their highest level, such a high expectation of gold prices will then rebound. It is because the investors believe that the increasing trend of gold price will not always increase persistently in a very long time.

• Finally, when the prices of gold are volatile in their high level, the expected price of gold tends to be stable (moderately). It is because investors wait and see the next pattern of the gold prices.
ANALYSIS OF RISK OF PRICE FLUCTUATION

STABLE PERIOD

INCREASING PERIOD

VOLATILE PERIOD

Variance (kiri)
Actual price (kanan)
Poly. (Variance (kiri))
• When the prices of gold are stable, the risk of price fluctuation remains very low. Even, the increasing of the gold prices in the modest magnitude will not automatically increase the risk of price fluctuation.

• However, when the prices of gold inflate persistently, the risk of price fluctuation goes along such inflation.

• Nevertheless, the risk of price fluctuation will then go down when such a persistent increase of gold prices has been maximum (top of the threshold)

• The same as finding in the increasing trend of gold prices, when the prices are volatile in the high level, the risk of price fluctuation tend to be stable moderately.
• **Down payment** determines the share of investors’ funds to be invested in gold *Murabahah*. If the gold *Murabahah* transactions need to be restricted, down payment should be raised and *vice versa*.
• The **high *Murabahah* margin** could lower the probability of the investors to terminate their gold *Murabahah* contract prior to its maturity date.
• The possibility to have a higher gold price than the current price is higher in the **increasing period of gold prices** as indicated previously and in this gold *Murabahah* termination assessment.
ANALYSIS OF EARLY TERMINATION

• The **longer the tenor** of gold *Murabahah* contract, the **higher** the possibility for gold *Murabahah* investors to unilaterally end the contract especially when the price of gold is in the increasing trend.

• When the **price** of gold tends to **go up**, the banking regulator can raise the **margin** of gold *Murabahah* or at least set it in an appropriate level followed by **shortening** the tenor of gold *Murabahah* contract.

• Such strategy may mitigate the frequency of gold *Murabahah* termination because the possibility of the new gold price to exceed its initial price is controlled by *Murabahah* margin.

• In addition, the advantage of doing termination is minimized by the **short term tenor** of gold *Murabahah*
• The assessment informs that the lesser the maximum amount of gold Murabahah transaction per investor, the lesser the frequency of gold Murabahah termination prior to its maturity date.
• Further, the combination of minimizing the limit of the maximum amount of gold Murabahah per investor and the short tenor of gold Murabahah contract may limit the frequency of early termination compared to a higher limit of maximum amount of gold Murabahah with a long tenor.
RECOMMENDATIONS

• The regulation for gold Murabahah transaction should not be fixed (permanent) but it needs to be reviewed regularly based on the trend (pattern) of the gold prices.
• The regulation for gold Murabahah contract might be different in the cases of stable, increasing and volatile periods of gold prices.
• The key variables to manage gold Murabahah transactions and mitigate risk of early termination are:
  • **margin** of gold Murabahah contract as it determines the possibility and frequency of terminating gold Murabahah contract prior to its maturity date,
  • **tenor** of gold Murabahah contract as it controls the intention of investors to shortly end the gold
  • **down payment** as it can manage the amount of gold Murabahah, frequency of transactions and, unilateral termination of gold Murabahah contract
Associate Prof. Dr. Rifki Ismal is both a central banker and lecturer. He earned bachelor degree in economics from University of Indonesia, master in economics from University of Michigan, Ann Arbor (USA) and PhD in Islamic economics and Finance from Durham University (England). An Associate Professor in Islamic Banking and Finance is from the Australian Government (Australian Center for Islamic Financial Studies).