

CHAPTER 4

General Information of Gold

Characteristic of gold

Gold is a chemical element with the symbol Au. It is a soft, yellow, metal with a beautiful lustrous sheen. It is the most malleable and ductile of all the elements and a single gram can be beaten into a sheet one square meter sheet of gold leaf. Gold is unaffected by air, water, alkalis and all acids except aqua regia (a mixture of hydrochloric acid and nitric acid) which can dissolve gold. Gold is widely used in jewelry and coinage. It is also used in dental work as crowns, as gold plating for decoration and as gold thread in embroidery work. The gold content in alloys is usually measured in carats (k), with pure gold defined as 24k. Many satellites carry gold-coated mylar sheets as a solar heat shield because gold is an excellent reflector of radiation and unreactive. Similarly astronaut's helmet visors are coated with a thin layer of gold to guard against dangerous effects of solar radiation. Gold is used widely in microelectronic circuits to ensure reliable, corrosion-resistant and static-free performance. (Source: <http://www.chemicool.com>)

Gold Weight Measurement

The Troy Ounces is a unit of weight for gold. It remains a traditional fixture of the gold trade.

A purity of gold 99.99%

1 kilogram = 32.1508 troy ounce

1 troy ounce = 31.1034807 grams

A purity of gold 96.50% (Standard for Thailand)

1 Baht (In form of gold bars) = 15.244 grams

1 Baht (In form of gold ornament) = 15.16 grams

Gold price in Thailand

Every shop in Thailand follows the gold price set by the Thai Gold Traders Association. The gold price of Thailand depends on

1. Gold spot price: price depends on gold with 99.99% purity (unit: USD)
2. Premium: cost for import or export of gold
3. Exchange Rate of THB per USD
4. Demand and supply of gold

The calculation will be made using the below formula:

$$Gold\ spot_{96.50\%, THB/Baht} = [Gold\ Spot_{99.99\%, USD/Onz} + premium] \times \left(\frac{15.244}{31.1035} \right) \times \left(\frac{0.9650}{0.9999} \right) \times \left(\frac{THB}{USD} \right)$$

where $Gold\ Spot_{99.99\%, USD/Onz}$ = the price of gold with 99.99% purity in the USD currency adjusted by weight of gold

Premium = cost for import or export of gold
(between 1 to 2 USD/Onz)

15.244 = 1 Baht gold (grams)

31.1035 = 1 troy ounce (grams)

0.9650 = the variable to adjust the unit weight of the gold to 96.50%

0.9999 = the variable to adjust the unit weight of the gold to 99.99%

THB/USD = Exchange rate (unit: Baht per USD)

Gold Weight Adjustment

In part of gold has the different of a purity but it has the same unit of weight. The calculation will be made using the below formula:

$$Gold_{purity1} = Gold_{purity2} \times \left(\frac{purity1}{purity2} \right)$$

In part of gold has a purity 99.99% (unit: USD/Onz) to a purity of gold 96.50% (unit: THB/Baht). The calculation will be made using the below formula:

$$Gold\ spot_{96.50\%, THB/Baht} = Gold\ Spot_{99.99\%, USD/Onz} \times \left(\frac{15.244}{31.1035} \right) \times \left(\frac{0.9650}{0.9999} \right) \times \left(\frac{THB}{USD} \right)$$

where $Gold\ Spot_{99.99\%, USD/Onz}$ = the price of gold with 99.99% purity in the USD currency adjusted by weight of gold

15.244 = 1 Baht gold (grams)

31.1035 = 1 troy ounce (grams)

0.9650 = the variable to adjust the unit weight of the gold to 96.50%

0.9999 = the variable to adjust the unit weight of the gold to 99.99%

THB/USD = Exchange rate (unit: Baht per USD)

Table 4.1: The Different between the gold price 96.50% and the gold price 99.99%

| | Purity | Liquidity | Quote price | Price volatility risk | Price spread |
|--------------------|---------------|--|-----------------------------|------------------------------|----------------------------------|
| Gold 96.50% | 96.50% | Trading in the gold shop: Standard in Thailand | Gold Trader Association | less volatility | more than 99.99% |
| Gold 99.99% | 99.99% | Trading in the global market: Standard from LBMA (London Bullion Market Association) | Live Gold Spot in real time | high risk & high return | less than 96.50%, more Liquidity |

Source: <http://www.ylgbullion.com>.

Table 4.1 shows the different between the gold price 96.50% and the gold price 99.99% follow as:

1. Gold price 99.99% is a purity of gold 99.99% and more flexibility of the metal than gold price 96.50%.
2. Gold price 99.99% has more liquidity trading in the global market than gold price 96.50%. Especially, the gold has recognized from LBMA (London Bullion Market Association).
3. Quote price of gold 99.99%, basically from Live Gold Spot in the real time. The price of gold 99.99% will be different because the premium at the each company's. The Quote price of gold 96.50% will be announced by the Gold Trader Association of Thailand which is used as the gold standard in Thailand.
4. Gold price 99.99% has higher risk and higher return than the gold price 96.50% since buyer can buy or sell in the real time. The gold price 96.50% will be less volatility because the price is determined by the Gold Trader Association.
5. Price spread of the gold price 99.99% is less than the price of gold 96.50% which indicates that the liquidity of the gold price 99.99% has more than the gold price 96.50%.

The factors that influence the gold price

They can be affected by principal factors follow as:

- Reserves in Central Banks which is the governments worldwide and their central banks turn to gold as a way of protecting their money against inflation. As a result, they invest in gold. When the economic is fluctuate, they automatically start in demand of gold and, therefore its price rises
- The Asian markets demand, especially the Indian and Chinese are greatly interested in gold jewelry. As this demand remains steady, the price of gold will go on experiencing an upward tendency and, on the other hand, if the demand drops, its price will go down too.
- Value of the US dollar is the most important and influential factor in the price of gold. When the US dollar is weak, investors all over the world turn their focus of attention to gold, so the price of gold will be increased. When the US dollar is a strong, the price of gold either drops.
- The gold production when producing gold gets more expensive due to strikes in gold mines or wars in gold producing countries, so this affects the price of gold will be increased.

Table 4.2: Gold demand (Value: Tonnes)

| | 2010 | 2011 | % change |
|---------------------------|-----------------|-----------------|-----------|
| Jewellery | 2,016.80 | 1,962.90 | -15 |
| Technology | 466.4 | 463.5 | -3 |
| Electronics | 326.8 | 330.4 | 0 |
| Other industrial | 90.9 | 89.3 | -9 |
| Dentistry | 48.7 | 43.8 | -10 |
| Investment | 1,567.50 | 1,640.70 | 19 |
| Total bar and coin demand | 1,199.80 | 1,486.70 | 1 |
| Physical bar demand | 898.9 | 1,159.10 | -1 |
| Official coin | 212.5 | 239.7 | 30 |
| Medals/imitation coin | 88.3 | 87.8 | -29 |
| ETFs and similar products | 367.7 | 154 | 290 |
| Gold demand | 4,050.70 | 4,067.10 | -2 |

Source: World Gold Council, <https://www.gold.org>.

Table 4.3: Gold demand (Value: US\$m)

| | 2010 | 2011 | % change |
|---------------------------|----------------|----------------|-----------------|
| Jewellery | 79,399 | 99,175 | 5 |
| Technology | 18,363 | 23,419 | 19 |
| Electronics | 12,867 | 16,696 | 23 |
| Other industrial | 3,579 | 4,513 | 12 |
| Dentistry | 1,916 | 2,211 | 11 |
| Investment | 61,710 | 82,897 | 46 |
| Total bar and coin demand | 47,234 | 75,114 | 24 |
| Physical bar demand | 35,390 | 58,567 | 22 |
| Official coin | 8,367 | 12,112 | 60 |
| Medals/imitation coin | 3,477 | 4,436 | -13 |
| ETFs and similar products | 14,476 | 7,783 | 382 |
| Gold demand | 159,472 | 205,491 | 21 |

Source: World Gold Council, <https://www.gold.org>.

Table 4.2 and table 4.3 show the gold demand. In 2011, the volume of global gold demand grew 0.4% to 4,067.1 tonnes which the value is US\$ 205,491mn in 2011 from US\$ 159,472mn in 2010. Global jewellery demand decreased amount 15% by year on year but investment demand increased 19% year on year that record in 2011 which is 1,640.70 tonnes.

Table 4.4: Consumer demand in selected countries (Unit: Tonnes)

| Countries | 12 months ended (2010) | | | 12 months ended (2011) | | | Year on Year % chg | | |
|---------------|------------------------|---------------------------|----------|------------------------|---------------------------|-------|--------------------|---------------------------|-------|
| | Jewellery | Total bar and coin invest | Total | Jewellery | Total bar and coin invest | Total | Jewellery | Total bar and coin invest | Total |
| India | 657.4 | 348.9 | 1,006.30 | 567.4 | 366 | 933.4 | -14 | 5 | -7 |
| Greater China | 480.1 | 186.7 | 666.8 | 545.2 | 266 | 811.2 | 14 | 43 | 22 |
| China | 451.8 | 187.4 | 639.2 | 510.9 | 258.9 | 769.8 | 13 | 38 | 20 |
| Hong Kong | 20.6 | 1.1 | 21.7 | 27.5 | 1.8 | 29.3 | 33 | 68 | 35 |
| Taiwan | 7.7 | -1.8 | 5.9 | 6.8 | 5.4 | 12.1 | -12 | - | 105 |
| Japan | 21.3 | -40.0 | -18.7 | 20.8 | -45.2 | -24.4 | -2 | - | - |
| Indonesia | 32.8 | 15.0 | 47.8 | 29.5 | 21.8 | 51.3 | -10 | 45 | 7 |
| South Korea | 15.9 | 0.6 | 16.5 | 13.7 | 3.1 | 16.7 | -14 | - | 2 |
| Thailand | 6.3 | 63.2 | 69.4 | 4.1 | 104.8 | 108.9 | -34 | 66 | 57 |
| Vietnam | 14.4 | 67.0 | 81.4 | 13.0 | 87.3 | 100.3 | -9 | 30 | 23 |

Source: Thai Customs Department, data calculation by the Gem and Jewelry Institute of Thailand (Public Organization)

Table 4.4 shows that the consumers demand in selected countries which Thailand is top ten for consume gold market that is jewellery, gold bar and coin invest. The jewellery demand of Thailand market declined -34% by year on year which the demand for gold market of Thai has been switching out of jewellery and towards investment products from 63.2 tonnes in 2010 to 104.8 tonnes in 2011.

Table 4.5: Thailand's Gem and Jewelry Export Value from January to December 2009-2010

| Categories | Value (Million US\$) | | Share (Percent) | | Change (Percent) |
|--|----------------------|------------|-----------------|------------|------------------|
| | Jan-Dec 09 | Jan-Dec 10 | Jan-Dec 09 | Jan-Dec 10 | |
| 1. Unwrought Gold or Semi-Manufactured Gold | 5,667.46 | 6,493.87 | 58.06 | 55.73 | 14.58 |
| 2. Jewelry | 2,492.06 | 3,122.27 | 25.53 | 26.8 | 25.29 |
| 2.1 Silver jewelry | 956.29 | 1,304.83 | 9.8 | 11.2 | 36.45 |
| 2.2 Gold jewelry | 1,388.69 | 1,620.24 | 14.23 | 13.91 | 16.67 |
| 2.3 Platinum jewelry | 26.02 | 41.97 | 0.27 | 0.36 | 61.31 |
| 2.4 Others | 121.06 | 155.24 | 1.24 | 1.33 | 28.23 |
| 3. Diamonds | 818.36 | 1,097.85 | 8.38 | 9.42 | 34.15 |
| 3.1 Rough | 112.09 | 189.57 | 1.15 | 1.63 | 69.12 |
| 3.2 Polished | 704.92 | 907.98 | 7.22 | 7.79 | 28.81 |
| 3.3 Others | 1.35 | 0.30 | 0.01 | 0.00 | -77.56 |
| 4. Colored Stones | 396.94 | 473.05 | 4.07 | 4.06 | 19.17 |
| 4.1 Rough | 16.44 | 19.98 | 0.17 | 0.17 | 21.5 |
| 4.2 Polished precious stones | 178.74 | 228.82 | 1.83 | 1.96 | 28.01 |
| 4.3 Polished semi-precious stones | 201.76 | 224.26 | 2.07 | 1.92 | 11.15 |
| 5. Imitation Jewelry | 213.02 | 288.27 | 2.18 | 2.47 | 35.32 |
| 6. Synthetic Stones | 59.96 | 82.21 | 0.61 | 0.71 | 37.12 |
| 7. Others | 113.6 | 94.59 | 1.17 | 0.81 | -16.74 |
| Total (1+2+3+4+5+6+7) | 9,761.40 | 11,652.11 | 100 | 100 | 19.37 |

Source: Thai Customs Department, data calculation by the Gem and Jewelry Institute of Thailand (Public Organization)

Export Performance

Table 4.5 shows Thailand's gem and jewelry export value from January to December 2009-2010. Product with the highest export value in 2010 was unwrought or semi-manufactured gold, of which the export value increased by 14.58 percent and the export value increased from 5,667.46 million US\$ in 2009 to 6,493.87 million US\$ in 2010. Thailand's overall gold export value in 2010 moved in the positive territory while performance of other main products including jewelry, diamonds, colored stones, imitation jewelry and synthetic stones will be explained. Gold jewelry grew 16.67 percent from the previous year.

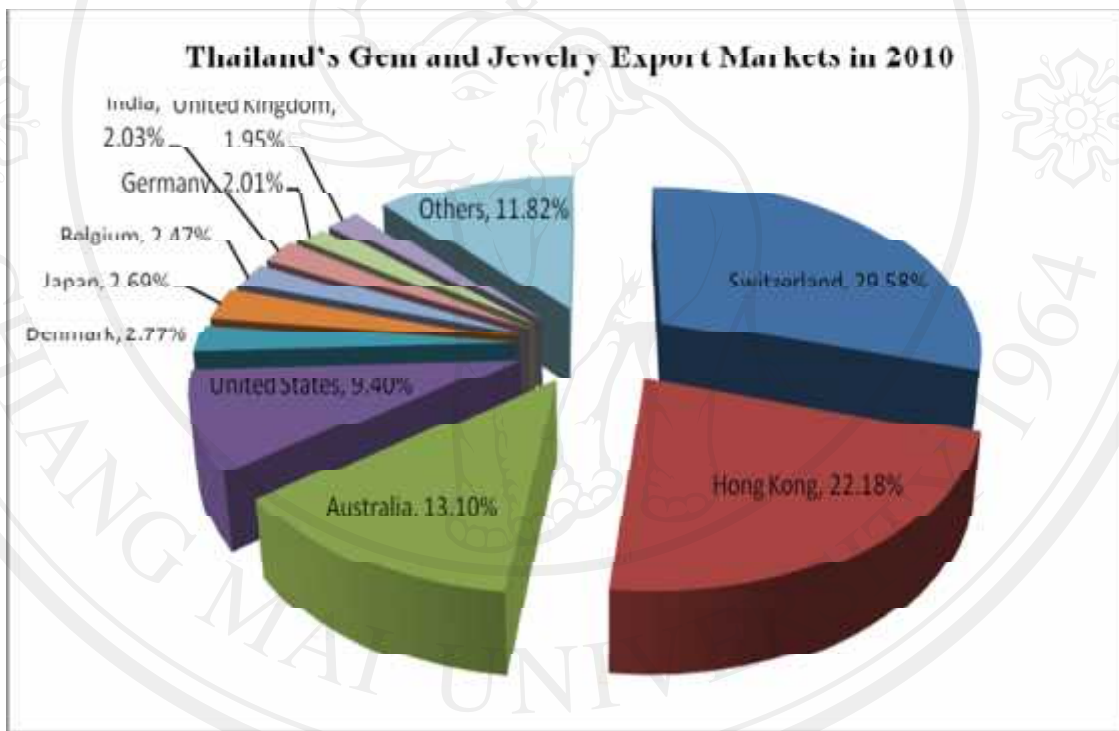


Figure 4.1: Thailand's Gem and Jewelry Export Markets in 2010

Source: Thai Customs Department, data calculation by the Gem and Jewelry Institute of Thailand (Public Organization)

Figure 4.1 shows Thailand's Gem and Jewelry Export Markets in 2010 which the top three gems and jewelry export markets of Thailand in terms of value in 2010 were Switzerland accounted for 29.58 percent and the export value increased by 30.75 percent, Hong Kong accounted 22.18 percent and the export value increased by 30.75 percent and Australia accounted 13.10 percent and the export value 35.14 percent. The main export product to Switzerland, Hong Kong and Australia was unwrought or

semi-manufactured gold. The United States accounted for 9.40 percent of the total value and the main export products were silver jewelry and gold jewelry, which grew 32.31 percent and 41.28 percent respectively. The main export products to Japan were gold jewelry and platinum jewelry, as well as unwrought or semi-manufactured gold. As for the Indian market, the main export product was gold jewelry.

Table 4.6: Export products of Thailand in 2011 (Unit: Million Baht)

| No. | Items | Value |
|-----|---|------------|
| 1 | Computers and parts | 513,709.40 |
| 2 | Motor cars, motor vehicles, parts and accessories | 511,483.70 |
| 3 | Rubber | 397,079.80 |
| 4 | Gems and jewelry | 371,239.30 |
| 5 | Petrochemicals | 279,413.90 |

Source: <http://www2.ops3.moc.go.th>.

Table 4.6 shows that the top five export products of Thailand in 2011. The export value of gems and jewelry is 371,239.30 million Baht. The export market of Thailand has exported unwrought gold to Switzerland market is 112,452.38 million Baht in 2011 which the value has increased from 103,796.88 million Baht in 2010. The market value of United Kingdom was increased by 1,756.56 million Baht in 2011 from 1,083.17 million Baht in 2010. There was decline in some markets in 2011 such as Hong Kong and Australia which the export value decreased from 50,248.08 million Baht to 35,078.22 million Baht in 2011 and 42,323.34 million Baht to 16,945.44 million Baht in 2011 respectively which can be shows in table 4.7.

Table 4.7: Export market of Thailand (Unwrought Gold) (Unit: Million Baht)

| No. | Country | Value: Million Baht | | | |
|-----|------------------|---------------------|-----------|------------|------------|
| | | 2008 | 2009 | 2010 | 2011 |
| 1 | Switzerland | 33,756.77 | 85,186.25 | 103,796.88 | 112,452.38 |
| 2 | Hong Kong | 27,635.29 | 40,604.88 | 50,248.08 | 35,078.22 |
| 3 | Australia | 42,892.62 | 64,844.79 | 42,323.34 | 16,945.44 |
| 4 | Japan | 1,336.47 | 1,520.69 | 2,632.15 | 2,876.02 |
| 5 | Singapore | 4,882.32 | 647.38 | 23.87 | 2,419.71 |
| 6 | South Africa | 0.00 | 0.00 | 470.95 | 2,207.73 |
| 7 | United Kingdom | 601.40 | 150.75 | 1,083.17 | 1,756.56 |
| 8 | India | 258.98 | 5.01 | 238.80 | 921.83 |
| 9 | Indonesia | 0.00 | 1.25 | 360.44 | 915.42 |
| 10 | U. Arab Emirates | 0.00 | 113.97 | 0.00 | 610.12 |

Source: Information and Communication Technology Center with Cooperation of the Customs Department.

Import Performance

Gem and jewelry import value in 2010 increased by 74.01 percent. Unwrought or semi-manufactured gold was the top import product in terms of import value with the growth rate of 1.07 times due to increasing import during the gold price decline to make profits when the price went up.

Table 4.8: Thailand's Gem and Jewelry Import Value from January to December 2009 – 2010

| Categories | Value (Million US\$) | | Share (Percent) | | Change (Percent) |
|--|----------------------|------------|-----------------|------------|------------------|
| | Jan-Dec 09 | Jan-Dec 10 | Jan-Dec 09 | Jan-Dec 10 | |
| 1. Unwrought Gold or Semi-Manufactured Gold | 3,785.32 | 7,848.61 | 63.1 | 75.19 | 107.34 |
| 2. Diamonds | 774.16 | 773.42 | 12.91 | 7.41 | -0.1 |
| 2.1 Rough | 175.28 | 170.42 | 2.92 | 1.63 | -2.77 |
| 2.2 Polished | 590.22 | 596.05 | 9.84 | 5.71 | 0.99 |
| 2.3 Others | 8.66 | 6.95 | 0.14 | 0.07 | -19.72 |
| 3. Silver | 520.66 | 758.23 | 8.68 | 7.26 | 45.63 |
| 4. Jewelry | 507.02 | 547.57 | 8.45 | 5.25 | 8.00 |
| 4.1 Silver jewelry | 46.65 | 60.92 | 0.78 | 0.58 | 30.59 |
| 4.2 Gold jewelry | 427.34 | 457.16 | 7.12 | 4.38 | 6.98 |
| 4.3 Platinum jewelry | 8.33 | 5.43 | 0.14 | 0.05 | -34.84 |
| 4.4 Others | 24.69 | 24.06 | 0.41 | 0.23 | -2.55 |
| 5. Colored Stones | 233.56 | 273.16 | 3.89 | 2.62 | 16.95 |
| 5.1 Rough | 18.11 | 9.9 | 0.3 | 0.09 | -45.33 |
| 5.2 Polished precious stones | 101.76 | 127.09 | 1.7 | 1.22 | 24.88 |
| 5.3 Polished semi-precious stones | 113.68 | 136.17 | 1.9 | 1.3 | 19.78 |
| 6. Synthetic Stones | 51.17 | 70.18 | 0.85 | 0.67 | 37.16 |
| 7. Others | 126.62 | 166.64 | 2.12 | 1.6 | 31.6 |
| Total (1+2+3+4+5+6+7) | 5,998.49 | 10,437.81 | 100 | 100 | 74.01 |

Source: Thai Customs Department, data calculation by the Gem and Jewelry Institute of Thailand (Public Organization)

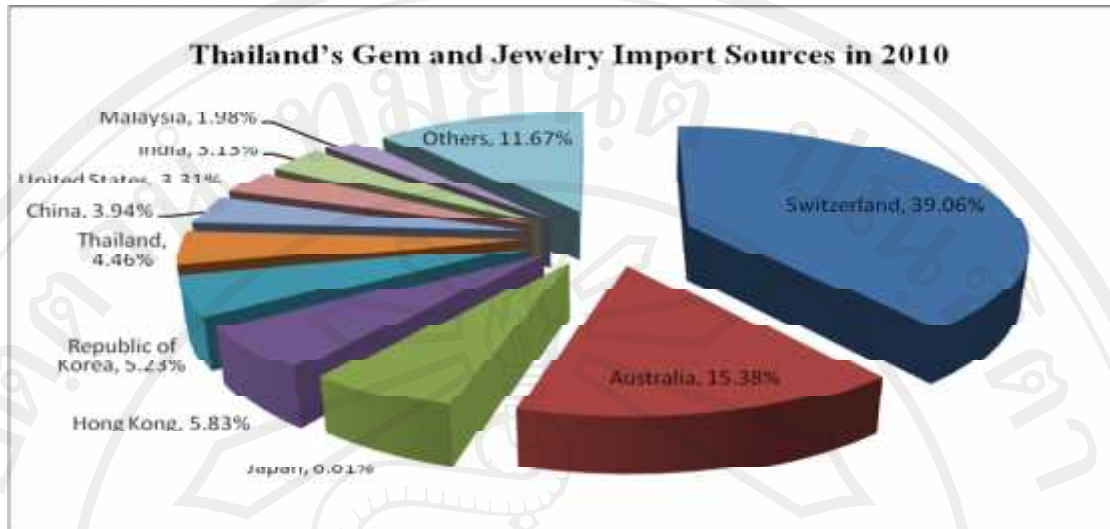


Figure 4.2: Thailand's Gem and Jewelry Import Sources in 2010

Source: Thai Customs Department, data calculation by the Gem and Jewelry Institute of Thailand (Public Organization)

Figure 4.2 shows the most important source for gem and jewelry import in 2010 was Switzerland with the share of 39.06 percent. Other countries with high import value include Australia, Japan, Hong Kong and South Korea, accounting for 15.38 percent, 6.01 percent, 5.83 percent and 5.23 percent respectively. Products from these top five import sources were mostly unwrought or semi-manufactured gold.

Table 4.9: Import products of Thailand in 2011

(Unit: Million Baht)

| No. | Items | Value |
|-----|---|--------------|
| 1 | Crude oil | 1,007,365.20 |
| 2 | Machinery and parts. | 608,912.30 |
| 3 | Jewelry, precious stones, gold and silver bars. | 607,509.10 |
| 4 | Chemical | 455,349.90 |
| 5 | Iron and steel products. | 424,271.00 |

Source: <http://www2.ops3.moc.go.th>.

Table 4.9 shows that the gold and silver bar is top five for import products of Thailand which the value is 607,509.10 million Baht in 2011.