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# **AN OVERVIEW OF THE ECONOMIC STATUS OF THE SAFAVID ERA ON THE BASIS OF SILVER COINS, CASE STUDY: SHAH ABBAS II AND SULTAN HUSSEIN**

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## **ABSTRACT**

Safavid era is one of the important periods in the history of Iran at the Islamic period. In the Safavid period, trade and particularly foreign trade was highly developed due to the established security on the roads. Silk was one of the goods that received attention in foreign trade cycle. As a result, a great number of merchants traveled to Iran in this period, and this led to an economic boom in this period. In the Safavid era, gold, silver, and copper coins were minted, but silver coins were used in trade exchanges. In this study, the total of 13 silver coins belonging to the mid and late Safavid era (Shah Abbas II, Shah Sultan Hussein) was analyzed using PIXE method. This study is an attempt to figure out the economic situation of the Safavid period. The amount of silver used in the coins pertaining to Shah Abbas II represents a good grade of the coins belonging to the king. In the reign of Sultan Hussein, coins were of very high grade despite the undesired political and social conditions of the country.

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**KEYWORDS:** Safavid, coin, Shah Abbas II, Shah Sultan Hussein, PIXE

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## 1. INTRODUCTION

Utilizing PIXE technique to study ancient coins is one of the prevailing methods for finding the chemical composition of ancient metals (Smith, 2005, 258-264). Elemental analysis of coins provides valuable information on metallurgy of minting time, metal sources, changes in monetary system, political and economic conditions (Tripathy, 2010). Ancient coins are often struck with a well-controlled alloy by a known mint with a date of issue and for most of them references can be found in ancient documents dealing about their typology and metrology (Ben Abdelouahed, 2010). The Safavid was an Iranian and Shiite dynasty who dominated in the years 1501-1722. Shah Ismail I, crowned in 1501 in Tabriz, is the founder of the Safavid dynasty and the last Safavid king is Shah Sultan Hussein who was defeated by the Afghans in 1722 and, thereby, the Safavid dynasty was abolished in practice (Asef, 1978: 20; Savory, 1984: 32). Safavid period is one of the most important historical periods of Iran because an Iranian centered empire could rule the whole land of Iran at that time after the passage of nine hundred years from the destruction of the Sassanid empire. In the Safavid era, gold, silver, bronze, and copper coins were minted; however, silver and bronze coins were used in trade exchanges and gold coins were usually used in festivals and ceremonies (Tavernier, 1957: 806). The names and titles of kings and date and place of coinage were written on the Safavid coins and most titles were written in the form of Persian poetry from Shah Abbas II onwards. The heyday of economic boom of this dynasty pertained to Shah Abbas I when trade enormously flourished in this period. At the time of this king, silver money was plentifully found in Iran because Armenian merchants who took Iran's silk and other goods to Europe brought back some silver in addition to foreign goods. This amount of silver was consumed for minting. However, the Armenians took back gold coins from foreign countries into Iran and refused to sell them. Therefore, the amount of silver coins was reduced, as well (Falsafi, 1966: 260). At the beginning of the Safavid era, coins were not as diverse and valuable as those of the next times because of the economic and business conditions of that time. For example, half-Shahi, one-Shahi and two-Shahi coins were common at the time of Shah Ismail I and 20-Shahi coin also came into existence for the first time from the reign of Shah Tahmasb. At the time of Mohammad Khodabande, Mohammadi coins equivalent to two Shahis and three-shahi coin were minted. At the time of Shah Abbas I, gold and silver coins known as Abbasi and equivalent to four Shahis and 200 dinars, were minted for the first time. When it

comes to Shah Abbas II, a wider variety of coins were minted and 10-Shahi and 5-Abbasi coins were also minted. The weight of Abbasi coins was gradually reduced in later periods (Albuquerque, 1923: 106) and Abbasid gold coinage was stopped in the late Safavid era (Chardin, 1966: 383-384). There were several mints in the Safavid period and the Safavid kings embarked on minting coins in each city in order to stabilize their political and military power. It is possible to review the political situation of the periods by investigating the name of these mints.

## 2. POLITICAL AND ECONOMIC SITUATION IN THE ERA OF SAFAVID SHAH ABBAS II AND SHAH SULTAN HUSSEIN

Shah Abbas II was the seventh king of the Safavid dynasty in Iran. He reigned from 1642 to 1666. At his time, culture and economy were booming again. In this period, silk trade was still flourishing, some concessions were assigned to French merchants in this period, and their businesses were created in Isfahan and Bandar Abbas (Ravandi, 1985: 155-167). During this period, trade relations with Europe were largely peaceful. He paid nonstop attention to public affairs and severely acted against corruption and irregularities in political and bureaucratic organizations and generally reformed the political situation of the Safavid era (Roemer, 1974)

Shah Sultan Hussein was the last king of the Safavid dynasty who ruled from 1694 to 1722. End of his reign marked the collapse of the Safavid lasting dynasty. Corruption of the government agency, vigilantes' placement in governmental positions, marauding cities rulers, huge lavish spending by the king, back-breaking taxes, foreign trade collapse, the king's neglect of civil and military affairs, and the like were among the direct reasons for the collapse of the Safavid dynasty within the kingdom of Shah Sultan Hussein (Panahi Soleimani, 1995: 59).

## 3. MATERIAL AND METHODS

### 3.1 Preparation of samples

The silver coins in this research have been selected, which had been found in the archaeological excavations and kept in private collections. After choosing, they have been classified. The coins belonging to Safavi Kings Shah Abbas II and were minted in a Tabriz and Ardebil and Sultan Hussein were minted in a Nakhchivan, Tbilisi, Esfahan, Yerevan, Mashhad. the silver coins were submitted to the PIXE for spectroscopy to study elemental composition.

### 3.2 Experimental setup

A 2 MeV proton beam with a current of 2-3 nA from AEOL, Van de Graff accelerator was used to bombard the coins. A multipurpose scattering chamber with 12 in. the beam size at the target position was 0.5 in 0.5 mm in diameter. The beam direction and the characteristic X-rays emitted from the samples were detected by an ORTEC Si (Li) detector (FWHM 170 eV at 5.9 keV) at 45°. Each target was run for 2 mm approximately. The GUPIX software was employed to analyze the obtained spectra. The

vacuum obtained inside the experimental chamber was of the order of  $10^{-5}$ Torr. The detector signal was shaped and amplified and finally, through a pulse height analysis, the energy spectrum was store and displayed in a multichannel analyzer. Standard Merck Art 2700 were used for calibration (Masjedi *et al*, 2013). 13 coins belonging to Safavid Period (Shah Abbas II, Shah Sultan Hussein) were collected for our analysis (Fig 1). The results of this study are shown in Table 1.



Table 1: Percentage concentration of present elements in analyses coins

sample	Cl	Ca	Si	S	Fe	Cu	Ag	Au	Pb	King	Mint
1	0.63	0.62	1	0.28	0.05	0.48	96.73	0.11	0.34	Sultan Hussein I	Nakhchivan
2	83	0.37	0	-	-	1.94	86.76	0.12	0.57	Sultan Hussein I	Esfahan?
3	0.45	0.45	1	0.42	-	1.1	96.29	0.15	0.57	Sultan Hussein I	Tbilisi
4	0.48	0.47	1.3	-	0.12	8.32	88.45	0.52	0.36	Sultan Hussein I	Esfahan
5	0.66	1.38	3.4	0.44	7.65	1.50	85.12	0.40	0.20	Sultan Hussein I	Esfahan
6	0.69	1.32	3.8	0.46	7.58	1.57	83.66	0.11	0.33	Sultan Hussein I	Yerevan
7	0.44	0.92	1	-	0.11	0.56	96.96	0.44	0.92	Sultan Hussein I	Mashhad
8	0.53	0/8	2.6	-	0.28	1.41	93.78	0.12	0.43	Sultan Hussein I	Nakhchivan
9	0.55	0/6	2.2	-	0.27	1.40	94.2	0.10	0.37	Sultan Hussein I	Nakhchivan
10	0.53	0.76	0.4	-	0.04	0.66	97.2	0.25	0.19	Sultan Hussein I	Mashhad
11	1.34	0.83	-	-	-	15.63	80.56	0.81	0.83	Abbas II	Tabriz
12	1.73	1.16	5.1	0.54	1.44	3.73	81.38	0.83	1.32	Abbas II	Ardebil
13	2.54	0.72	-	-	-	11.61	83.24	0.83	1.06	Abbas II	Tabriz



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Fig 1: Both sides of silver coins used in the study.

#### 4. RESULTS AND DISCUSSION

In this study, 13 silver coins belonging to the Safavid kings was studied using PIXE method. In these coins, the elements Ag, Pb, Au, Cu, Fe, S, Si, Ca, and Cl were identified. Among the total number of the coins, the number of 3 coins belonged to Shah Abbas II that has been minted in Tabriz and Ardebil from 1647 to 1649; and 10 coins also belonged to the Safavid Shah Sultan Hussein that have been minted in Nakhchivan, Yerevan, Tbilisi, Mashhad, and Isfahan's mints from 1717 to 1718. It is noteworthy that the silver concentration in coins pertaining to Shah Abbas II is between 80.56 and 83.24 percent (Figure 1). This shows the presence of a good grade and reflects the economic boom in this period. In these coins, there is a copper concentration of 3.73 to 15.63 percent, which is a high amount and has been added intentionally to the coins according to economic requirements (Tripathy, 2010). In addition, the existence of lead in the coins numbered 12 and 13 shows that lead and zinc ores have been used in making these coins (Uzonyi, 2000). Given that gold concentration can be a sign that silver ore has been used (Meyers, 1975), the percentage of gold in the coins belonging to Shah Abbas II shows that an ore has been used in making these coins (Figure 3). In the coins belonging to Sultan Hussein's period, there was a silver concentration of 93.78 to 97.2 percent in Nakhchivan, Tbilisi, Mashhad's mints (Figure 2), which represents the very high grade of these coins. In addition, there was a silver concentration of 83.66 to 88.45 percent (Figure 2) in Isfahan and Yerevan's mints. According to the written sources of the Safavid period, social unrests and civil strife, significant decline in foreign trade, corruption have dominated the society during the kingdom of Shah Sultan Hussein and the country has not been placed in a desired situation. However, the results of analysis on the coins minted in the last years of his kingdom represent the desired grade of the coins. Since the cities where the coins were minted were important and key cities, this can be the sign of Shah Sultan Hussein's attempt towards the improvement of trade

and economic situation. On the other hand, the high grade of these coins can indicate the rich silver resources in this period. Low levels of lead in the coins of Shah Sultan Hussein Safavid represent the good refining process of silver (Tripathy, 2010). The figure of gold percentage shows that the ore used in the coins numbered 4, 5, and 7 is different from that of the other coins (Fig. 4).

#### 5. CONCLUSION

These coins had been minted in the mints active in Safavid period. According to the written sources within the kingdom of Shah Abbas II, the country has still enjoyed an acceptable socio-political situation and trade has been booming. However, in the era of Sultan Hussein, the country has been involved in social and political turmoil and it eventually fell apart by Afghans' invasion.

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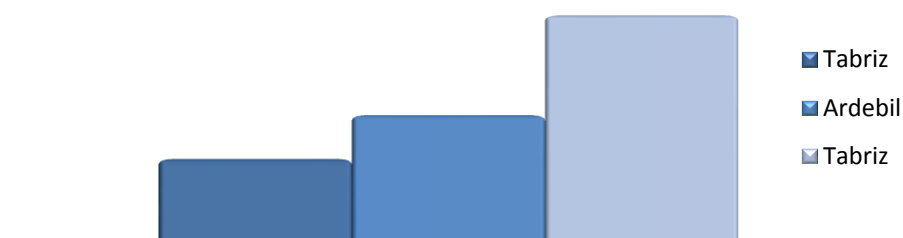


Chart 1: The percentage of Ag in the the coins of Shah Abbas II.

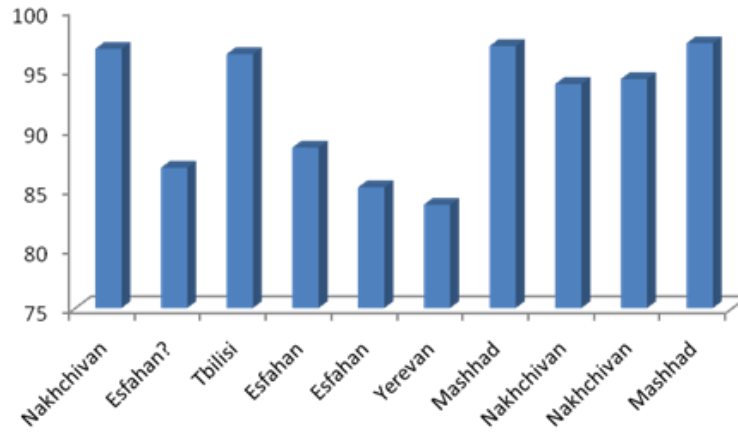


Figure 2: Mints location w.r.t. silver percentage in the coins of Sultan Hussein.

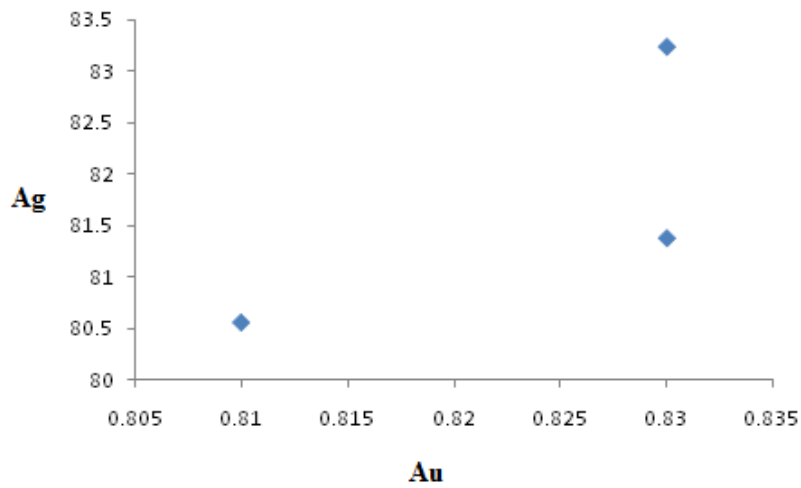


Figure 3: The percentage of Au/Ag in the Coins of Shah Abbas II

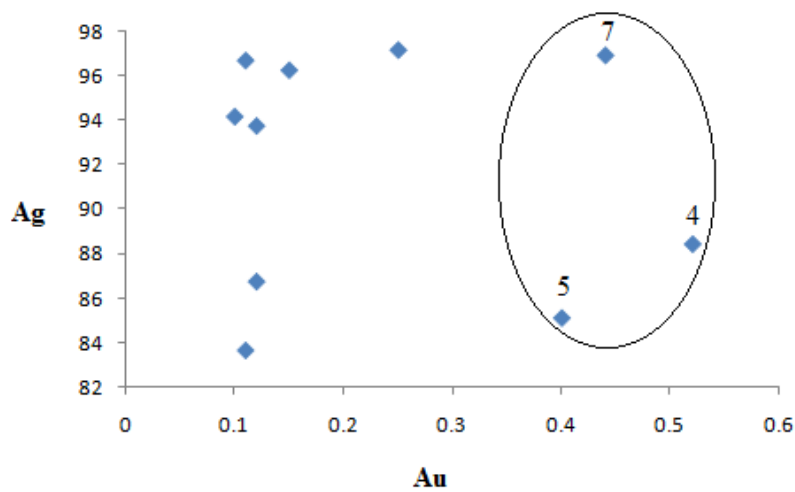


Figure 4: The percentage of Au/Ag in the Coins of Shah Sultan Hussein.

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