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Prospects for a currency board in the Arab Republic of Egypt

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Abstract. The National Bank of Egypt (NBE) was introduced in 1898. It acted as both a central and commercial bank for Egypt, and for Sudan for some time. The burgeoning Egyptian economy was thought to eventually necessitate a central bank, so in 1961, some of the assets of the NBE were taken to form the Central Bank of Egypt (CBE). Ever since, the CBE has been Egypt's monetary authority. Its activity has come under scrutiny over the years due to its inability to cope with economic challenges, most notably inflation. This paper examines the prospects for introducing a currency board in Egypt. It compares this possibility to the existing monetary infrastructure in place and determines whether a currency board is a suitable path to take.
Keywords. National Bank of Egypt (NBE), Central Bank of Egypt (CBE), Inflation, Currency board.
JEL. E58, N15, O23.

1. Introduction

The central banking system in Egypt is old for an emerging market country, having existed for almost 120 years. Its long-term record raises the question of whether some other monetary arrangement may be more suitable for Egypt. This paper is split into several sections, primarily according to inflection points in the Egyptian economy. The first section begins in 1898, when the National Bank of Egypt (NBE) was introduced, and explores several important features of the period that lasted until 1960. The next section coversthe introduction of the Central Bank of Egypt (CBE) in 1961, and continues until the Arab Spring, which took place in Egypt in 2011. The third section explores the Egyptian economy since the Arab Spring. The final section discusses the concept of a currency board as an alternative to a central bank and the feasibility of introducing one in Egypt.

The table below offers a summary of key economic and political events that will be useful for readers to keep in mind.

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2. Chronology of key political and economic events in Egypt since 1898

1898: National Bank of Egypt founded

1914-18: World War I; Egypt suspends gold standard and remains tied to pound sterling; UK asserts a protectorate over Egypt to supplant Ottoman influence

1919: Revolution in protest of British suzerainty

1922: British protectorate ends but British influence remains strong

1939-45: World War II; Egypt invaded by Axis powers,but British and Egyptian forces repulse the attacks

1947: Egypt leaves the sterling area

1948-49: First Arab-Israeli War

1952: Coup ends Egypt's monarchy and begins rule by a series of dictators

1955: Sudan unilaterally declares independence from UK and Egypt

1956: Nationalization of Suez Canal; Suez War

1958-61:United Arab Republic, an abortive attempt at union with Syria

1960: Banks nationalized

1961:Central Bank of Egypt created

1962: First-ever devaluation of Egyptian pound relative to the pound sterling

1967:Six-Day War against Israel

1973:Yom Kippur War against Israel

1981:Substantial devaluation of Egyptian pound begins an era, continuing to the present, in which the pound always depreciates against major currencies over a long enough horizon

2011: Arab Spring protests lead to downfall of dictator Hosni Mubarak

2011-12: First democratic elections in Egyptian history bring Muslim Brotherhood to power

2013: Coup deposes Muslim Brotherhood

2016:IMF deal reached; Egyptian pound floated, depreciates substantially

2017: Second tranche of IMF loan worth $1 billion approved

3. The National Bank of Egypt as Central Bank, 1898–1961

The National Bank of Egypt (NBE) was established on June 25, 1898 by a Khedival decree. (The Khedive was a Turkish term meaning "viceroy." Before World War I, Egypt was nominally part of the Ottoman Empire and the Egyptian ruler was nominally subordinate to the Ottoman sultan. In practice Egypt was independent, though under considerable British influence.) The statutes of the bank provided it with some objectives,listed in Table 1.

Table 1. *Summary of several objectives of the National Bank of Egypt upon inception in 1898 (Statute of NBE, 1898: 3–10)*

Article Number	Objective
4	Issue advances to agricultural persons Issue of loans and advances to the government of Egypt and Sudan Receive deposits from the public
8	Perform all commercial and financial operations in Egypt and Sudan Publish, every month, its financial situation, in the Official Journal

The NBE had an interesting management structure due to the influence of foreign powers. It was initially set up and funded by three individuals: Sir Ernest Cassel (British, of German origin), Raphael Suares (an Egyptian Jew), and Constantine Salvago (Italian). Cassel bought 50 percent of the shares in the company, whileSuares and Salvago each purchased 25 percent. The NBE did not have an Egyptian chief executive until 1940, when Ali Chamsi Pasha took office (Raafat, 1998). Until then, a British subject ran the NBE. This exemplifies the level of control the British wanted to have over Egypt, which was strategically valuable given itsregional importance in the Middle East and its position as a chokepoint for transit to Britain's Indian Ocean colonies via the Suez Canal.

The Khedival decreespecifiedseveral aspects of how the bank was to be operated. For instance, Article 20 requiredan administrative council headed by a governor composed of at least 12 members and at most 28 members. Four members were part of a special committee in London. The rest of the members had seats in Cairo. In addition, Article 21 affirmedthat the governor and the sub-governors were responsible for their acts before the administrative council. Their nomination and appointment had to be ratified by the Egyptian government before they took office. The governor could be hold office for five years. Members other than the governors but including members in London were required to have had at least five years of residence in Egypt.

Imitating both the Bank of England and a number of other central banks at the time, the NBE was separated into an Issue Department and a Banking Department. The former department primarily issued notes and coins, whereas the latter conducted day-to-day banking activities.

A later statute, Section 2 of Law No. 163 of 1957, illustrates the relationship of the NationalBank of Egypt with the government. In addition to statingthat the NBE would not charge the government for any of its services, Article 14 affirmed that the "Bank shall act on behalf of the Government in administering, floating, serving, and amortizing debt." Article 15 specified the details of this relationship by asserting that the "Bank may advance loans to the Government to cover seasonal deficits in the State Budget within 10 percent of the average public revenue during the three preceding years" (Law No. 163, 1957). Moreover, the government was expected to settle these loans within 12 months of their issuance. It is also worthwhile to mention that operating banks at that time were required to

have at least 500,000 Egyptian pounds (EGP) in the form of shares owned by Egyptians (El-Din & Algarhi, 2005).

The NBE also had a reserve requirement for its note issue, as exemplified by Article 18 of Law No 163 of 1957,which stated:

> Banknotes in circulation shall always have an equivalent cover consisting of gold, foreign bonds, Egyptian Government Bonds and bills, Egyptian bonds guaranteed by the Egyptian Government and discountable commercial papers.

Khalid Ikram, a former longtime World Bank resident representative in Egypt, mentions that the National Bank of Egypt essentially functioned like a central bank, for it "had a monopoly of the note issue, it was the lender of last resort, and it had control of the bank rate" (Ikram, 2007, p.6).

Like most other central banks, the National Bank of Egypt was conceived only after the country already had a substantial commercial banking system. The first durable moderncommercial bank, the London-based Bank of Egypt, had been established in 1856. Prior to 1898, though, there was no local issue of currency notes. The public used domestic and foreign coins. Gold coins predominated in larger transactions, with the British sovereign having particularly wide acceptance (Rifaat 1935: 47ff). Although not immediately popular, notes soon gained traction, and their supply gradually increased over the years.

The issuance of notes was relatively slow immediately after the inception of the NBE in 1898. This was the case until 1914, the beginning of World War I, when the annual growth rate of notes issued hit 205 percent. Soon after WWI, noteissuance decreased, but circulationremained higherthan its prewar level. Theoutbreak of World War II in 1939 againboosted note issuance. These observations make intuitive sense, as Egypt fundedits wartimespendingpartly through the increased supply of notes. In addition to the aforementioned, Egypt, acting as a base for British military operations during both wars, received an inflow of funds from the United Kingdom to pay for local supplies that British military personnel used.

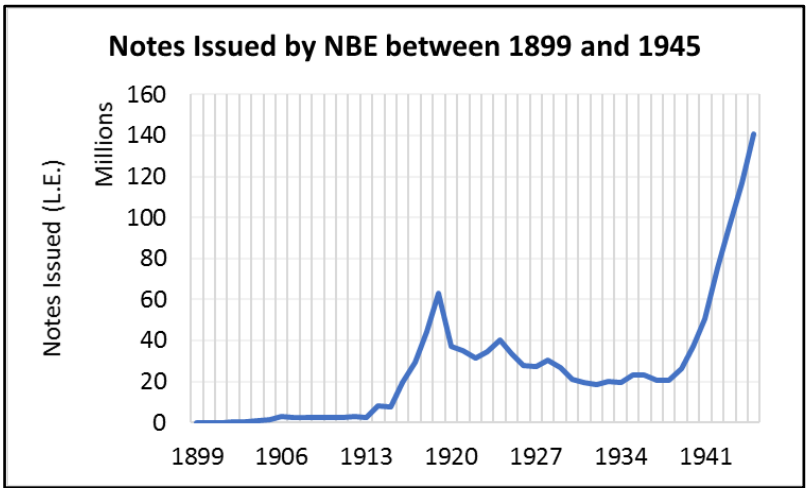

Figure 1. *Notes Issued by the National Bank of Egypt, 1899-1945*

A Khedival decree of November 14, 1885 had enacted a gold standard in Egypt, which set the Egyptian pound as equal to 7.4375 grams of gold. That made EGP 0.975 equal to £1 sterling. On August 2, 1914, just after World War I began, Egypt enacted a decree to suspend the gold standard. The exchange rate with sterling, which had also suspended the gold standard, remained unchanged. Egypt was henceforth effectively on a sterling exchange standard, and the exchange rate with sterling would remain unchanged until Egypt devalued the Egyptian pound in 1962. Egypt however left the "sterling area," the common set of exchange controls for most countries pegged to sterling, in 1947, and the U.S. dollar became increasingly important in Egypt's trade, finance, and monetary policyafter World War II. The Egyptian pound had exchange controls that, especially after Egypt left the sterling area, made it difficult to obtain foreign currency at the official exchange rate. A black-market parallel exchange rate existed where the Egyptian pound was weaker than the official rate. A parallel rate (not an informal market rate) was a persistent feature of Egyptian foreign exchange from 1914 until the pound was floated in 2016, although the gap between the official rate and the parallel rate varied widely over time.

Figure 2 shows the assets and the liabilities of the National Bank of Egypt during the period it had central banking responsibilities. Figures 3 and 4 show breakdowns of major assets and liabilities. The underlying data have been digitized for the first time in an accompanying Excel workbook. Figure 5 shows real GDP per person. The average growth of real GDP (total, not per person) from 1898 to 1945 was 2.66 percent, while the average growth of nominal GDP was 5.79 percent, implying a GDP deflator of 3.05 percent a year.

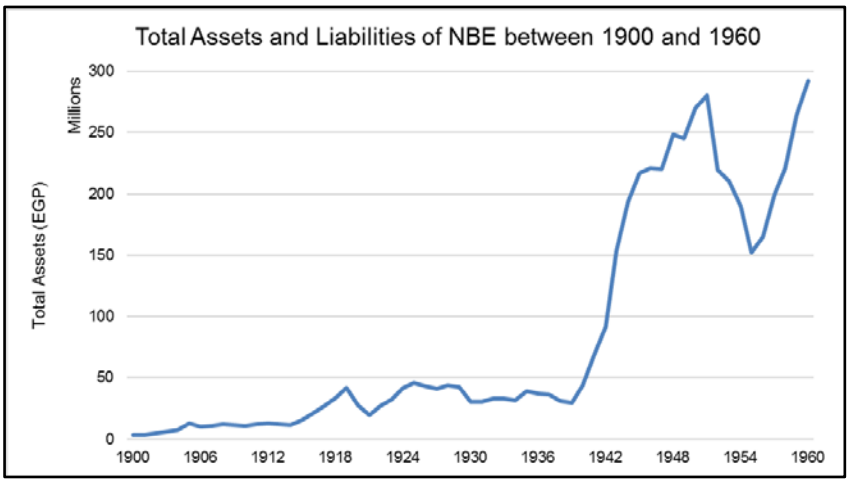

Figure 2. *Total assets and liabilities of the Central Bank of Egypt from 1902 to 1957 (National Bank of Egypt, 1902-1957). Note that assets equal the liabilities.*

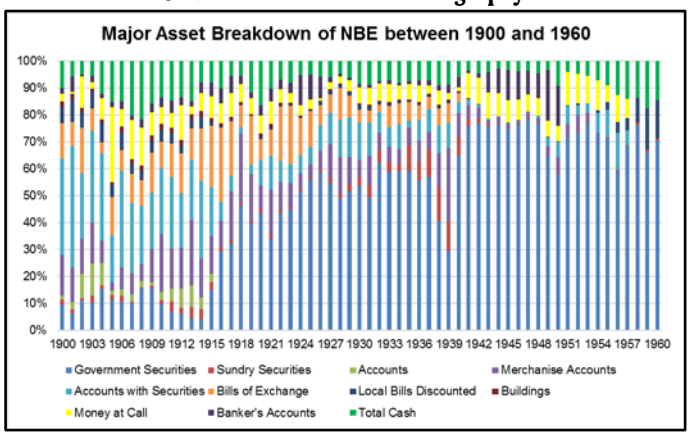

Figure 3. *Major components of the assets of the NBE over time expressed as a percentage of the total assets (National Bank of Egypt, 1900-1960).*

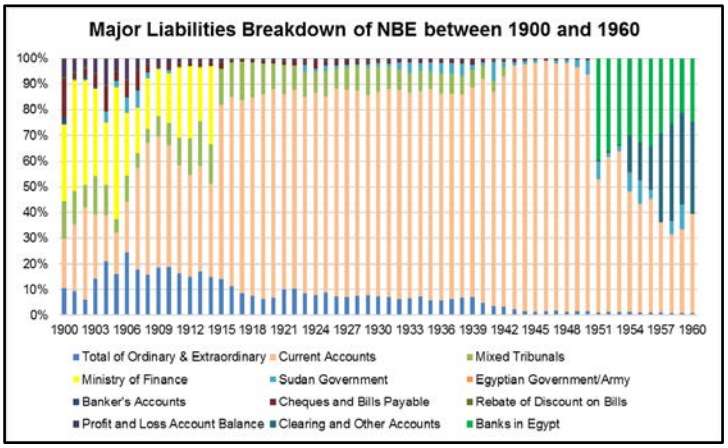

Figure 4. *Major components of the liabilities of the NBE over time expressed as a percentage of the total assets (National Bank of Egypt, 1902-1957).*

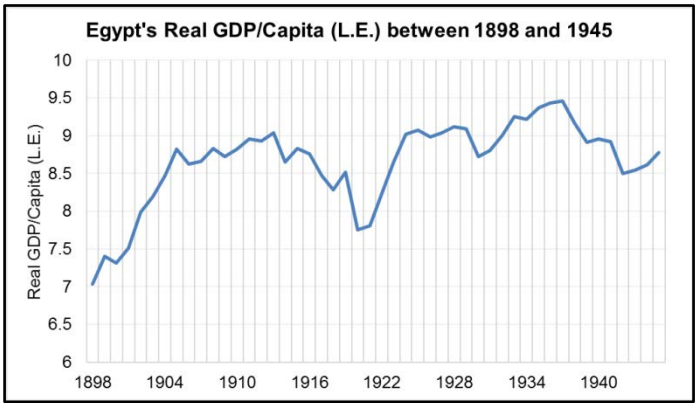

Figure 5. *Egypt's real GDP per capita spanning the 48 years between 1898 and 1945 (Yousef, 2002).*

The NBE asset breakdown shows the high degree of interaction between the NBE and the government. As Figure 3 illustrates, the proportion of assets the NBE held that were government securities burgeoned, reaching a peak of 75 percent in 1947. We will touch on the implications of this asset composition later with regard to the political independence of the bank. It

may be worthwhile to note that in its early years, the NBE was involved in Sudan, hence a small proportion of its assets are attributed to the government of Sudan.

4. The Central Bank of Egypt, 1961–2011

Soon after Gamal Abdel Nasser took office in 1956, a wave of nationalizations took place in Egypt. It seemed that these nationalizations were preliminaries to what was known as the *first five-year plan* – a plan intended to span 1960 to 1965, in which the public sector was to fill in deficiencies found in the private sector (Waterbury, 2014).

In mid-1960, the government nationalized the NBE and other domestic banks, which included BankMisr and BanqueBelge et Internationale. The government then separated some of the NBE's assets and liabilities with the objective of establishing the Central Bank of Egypt (CBE) (Economy of the United Arab Republic,n.d., p. 20). These assets and liabilities were taken from both the Note Issue Department and the Banking Department of the NBE, and included bankers' deposits, gold, and foreign reserves, among other categories (Sanchiz, 1965). Many felt that it was the righttime to introduce a "pure" central bank, which would not engage in retail deposit taking and lending, into the Egyptian economy.

Looking at the annual reports of the NBE at the time of the spinoff of part of the NBE into the CBE, there appears to be a huge spike in the total assets and liabilities of the CBE, from approximately EGP 76million at the beginning of 1961 to EGP 125 million by the end of the year (National Bank of Egypt, 1973). The exact direction of this causation, or whether it even exists, is difficult to pinpoint. In other words, did the spinoff of part of the NBE into the CBE result in this change, or did the increase in total assets and liabilities provoke the establishment of CBE? Interestingly, the primary liability that contributed to the rise was *deposits*, which almost doubled in 1961. On the assetside, *bills discounted* increased by a factor of ten.

To compare the CBE and NBE, let us analyze their respective statutes. Articles 38 and 39 in Presidential Decree No. 64 (establishing the CBE) state:

> *Article (38)* - The government may assign the Bank to act on its own behalf, in issuing government bonds and bills. The Bank shall extend consultation to the government in respect thereof. The Bank shall not incur any obligations nor gain any rights by virtue of this assignment.
> *Article (39)* - The Bank shall extend financing to the government, upon its request, to cover the seasonal deficit on the general budget. The Bank, in agreement with the Ministry of Finance, shall determine the conditions concerning this finance, according to the prevailing monetary and credit situations, provided that the amount of such finance shall not exceed 10 percent of the average revenues of the general budget in the three previous years. The term of the said finance shall be three months renewable for other similar periods. The finance shall be settled in full within twelve months at most from the date of its extension. (Emphasis added.)

Comparing these articles to those of the original statute of the National Bank of Egypt, one sees that they are almost identical. In other words, from this perspective, the objectives of the CBE as stated in 1961 are the same as the objectives of the NBE as stated in 1898. This corroborates the idea that the National Bank of Egypt had been acting as a central bank as well as a commercial bank.

Certain objectives of the CBE, however, differed from those of the NBE's 1898 charter. In addition to having the responsibility of issuing banknotes, the CBE was assigned with carrying out open-market operations. The rest of the CBE's objectives, less important for our analysis here, can be found in Article 6 of Presidential Decree No. 64.

In 1962, soon after the initiation of the CBE, Egypt devalued the pound from US$2.80 to $2.30. In 1973, it revalued the pound to $2.55555 when the dollar was devalued against gold. All during this time, Egypt had exchange controls, a multiple exchange rate system (see parallel exchange rate above), and a parallel market in foreign exchange. The pound was in reality far weaker than the official rate. In 1979, it was devalued to approximately $1.43 (EGP 0.70 = $1). From 1987 onward, the exchange rate was a managed float with the U.S. dollar.

A turning point in Egyptian economic policy occurred with the Economic Reform and Structural Adjustment Program (ERSAP) implemented in 1991. Prior to ERSAP, the CBE had undertaken monetary targeting for quite some time. This monetary targeting was performed with the aim of achieving price stability; however, according to Abu-Elayoun (2003), the strategy was limited in its success due to the weak relationship between broad money supply (M2) and the interest rate.

The ERSAP was an economic and structural agreement by the Egyptian governmentwith several other institutions, including the International Monetary Fund (IMF) and a division of the World Bank known as the International Bank for Reconstruction and Development (IBRD). AsEgypt wasexperiencing high inflation toward the end of the 1980s, the ERSAP programme was deemed necessaryto re-stabilize the economy, and ultimately reduce inflation. An analysis by the African Development Bank (AfDB) lists the following as the primary goals of the ERSAP (African Development Bank Group, 2000):

1. Economic stabilization and inflation reduction.
2. "Structural adjustment to stimulate medium and long-term growth."
3. Liberalization of interest rates.

Thethird point meant that the central bank was no longer able to target inflation via administrative controls of interest rates, as it had long done. Consequently, another method had to be chosen. Note that monetary policy canhave three different levels: the final target, the operational target controlled by the monetary authority, and the intermediate target linking them. According to some sources, the CBE after 1996 had a pair of contradictory goals in mind. It desired to achieve both price stability and exchange rate stability. This was problematic, since the maintenance of a

pegged exchange rate requiredmanipulation of the money supply, which in turn would affect the price level. In his historical summary of Egyptian monetary policy, Sherif Hassan (2016) writes:

> Third, authorities should refrain from targeting the level or path of any other nominal variable, such as wages or the nominal exchange rate. A country that chooses a fixed exchange rate system subordinates its monetary policy to the exchange rate objective and is not effectively able to target directly any other nominal variable, such as the rate of inflation.

From 1996 onwards, the CBE conducted monetary policy through monetary targeting. The operational target was the overnight interbank rate. The intermediate target was M2, chosen because it was believed to have the strongest relationship with inflation, the final target, though there was no explicit numerical target (M2) range. By adjusting the overnight rate, the CBE moved closer toward inflation targeting as practiced by other central banks. The broad money supply, M2, remained the intermediate target.

For inflation targeting to work efficiently, the central bank requires a certain level of autonomy. In other words, inflation targeting necessitates the independence of the central bank from the government. The central bank independence (CBI) index, shown below, was introduced by Jacome and Vazquez (Jacome & Vazquez, 2005). The index hypothesizes an inverse relationship between inflation and central bank independence. The first figure represents the weighting criteria used for each category. The second figure applies the criteria to the CBE from its inception in 1961 to 2004. We have extendedtheirframework to cover a fifth periodfrom 2005 to 2017.

The CBE always had a close relationship to the Egyptian government in terms of financing its budget deficit. Such a relationship, some argue, hindered the CBE's ability to handle global and local challenges. For instance, in 1999, the CBE experienced a significant drop in foreignreserves, which was detrimental to the economy as it meant that vital imports could no longer be obtained at the official exchange rate. During the recession of 2001, the CBE responded with an expansionary monetary policy, and inflation rose to a high of 9 percent in 2004 (Index Mundi, n.d.). Although not high by the standards of many emerging markets, in the Egyptian context it was substantial. Consequently, the CBE, as an institution that is supposed to control inflation and not create it, lost credibility amongst investors.

Table 2. *Jacome Index for Central Bank Independence: criteria and wieghts*

Value / Criteria (Weight)	1	0.5	0
1- Central bank objective (2)	Preserving price stability is the single objective. If more than one conflicting objective, price stability has priority.	Multiple conflicting objectives without establishing price stability have priority.	Multiple objectives including growth, an orderly development, or economic development, without priority.
2- Appointment and term of office of the members of the Central Bank Board(2)	Nominated (appointed) by government and appointed (confirmed) by Congress Term in office exceed or overlap government period.	Nominated and appointed in a two-step process for same term in office than government without overlap, or directly for longer term.	Appointed directly by the government for the same or shorter period than the government.
3- Structure of Central Bank Board (2)	No private sector and government representatives, except Min of Finance without vote.	Direct government representatives, including Minister of Finance with vote.	Direct government plus private sector representatives (bankers, entrepreneurs, etc).
4- Removal of Board members (2)	Two-step process, with qualified majority under strictly legal grounds, Final decision by Congress or Judicial Court.	Directly by the Executive branch under strictly legal grounds, or in two-step process under non-legal basis.	Removal by the Executive branch for subjective or political – not legal- grounds, or by the private sector.
5- Central Bank credit to government (3)	No direct credit, except in clearly regulated emergency situation Or through the secondary market, with Limitations.	Direct credit with limits, via secondary market without limits, through overdrafts, or indirectly via public banks.	Direct or indirect credit without limits.
6- Leader-of-last resort (2)	Emergency loans legally regulated, including limits to the amount to be granted.	Emergency loans legally regulated, without limits to the amount to be granted.	Discretionary policy for emergency loans and provisions for bank resolution.
7- Instruments independence in the conduct of monetary policy (3)	Total independence in the use of monetary instruments.	Government involvement in formulation of monetary and exchange rate policy.	Limitations on the use of monetary instruments (reserve requirements, interest rates) .
8- Financial independence (1)	Government assures central bank capital integrity. Central bank transfers profits to the government after proper provisioning.	Government not required to assure integrity of central bank capital, External approval of central bank budget.	Central bank conducts quasi-fiscal operation, no government capitalization required.
9-Accountability (1)	Central bank Governor appears before Congress and reports to government. Report disclosed on a timely basis.	Reports only to the government on a regular basis or when there are monetary disturbances plus a manual report.	Central bank only publishes an annual report.
10Transparency and disclosure of financial statement(1)	Publishes periodically financial statement certified by an external auditor.	Publishes financial statement with the approval of a public sector auditor	Inappropriate accounting procedures. Publishes financial statement with the seal of internal auditor.

Source: Jacome, (2001)

Table 3. *Application of Jacome Index for central bank independence to the National Bank of Egypt and the Central Bank of Egypt recently (after Kamaly & Farrag, 2007)*

Period / Variable	First Period 1961-1971			Second Period 1972-1982			Third Period 1983-1993			Fourth Period 1994-2004		
	Numerical Value	Weight	Weighted Value[29]	Numerical Value	Weight	Weighted Value	Numerical Value	Weight	Weighted Value	Numerical Value	Weight	Weighted Value
1- CB objective	0.5	2	1	0.5	2	1	0.5	2	1	1	2	2
2- Appointment and term of office of the members of the CB Board	0	2	0	0	2	0	0	2	0	0	2	0
3- Structure of Central Bank Board	0.5	2	1	0.5	2	1	0	2	0	0.5	2	1
4- Removal of Board members	0	2	0	1	2	2	1	2	2	0	2	0
5- CB credit to government	0.5	3	1.5	0.5	3	1.5	0.5	3	1.5	0.5	3	1.5
6- Leader-of-last-resort	0.5	2	1	0.5	2	1	0.5	2	1	0.5	2	1
7- Instruments independence	0	3	0	0.5	3	1.5	0.5	3	1.5	0.5	3	1.5
8- Financial independence	1	1	1	1	1	1	1	1	1	1	1	1
9- Accountability	0.5	1	0.5	1	1	1	1	1	1	1	1	1
10- Transparency and disclosure of financial statement	0.5	1	0.5	1	1	1	1	1	1	1	1	1
CBI (=∑ of the weighted values of the 10 criteria)	_	19	**6.5**	_	19	**11**	_	19	**10**	_	19	**10**

Table 4. *Our extension of the Jacome Index for central bank independence to the NBE from 1898 to 1961, and to the CBE from 2005 to 2017.*

	NBE 1898-1961			CBE Fifth Period 2005-2017		
Criteria	Value	Weight	Weight-ed Value	Val-ue	Weight	Weight-ed Value
1. Central Bank Objective	0	2	0	0.5	2	1
2. Appointment and terms of office of the members of CBE	0	2	0	0	2	0
3. Structure of central bank board	0	2	0	0.5	2	1
4. Removal of Board Members	0.5	2	1	0.5	2	1
5. CBE credit to government	0.5	3	1.5	0	3	0
6. Lender of last resort	0.5	2	1	0.5	2	1
7. Independence in monetary policy	0.5	3	1.5	0.5	3	1.5
8. Financial independence	1	1	1	1	1	1
9. Accountability	1	1	1	1	1	1
10. Transparency and disclosure of financial statement	1	1	1	1	1	1
(See appendix for explanation of values)		19	**NBE Σ = 7**		19	**CBE Σ = 8.5**

In response toinflation-related problems, an amendment was introduced to the CBE charter in 2003, stating that the main objective of the CBE was to perform inflation targeting (Youssef, 2007). One of the main potential inconsistenciesin the resultingpolicy mixwas that it is quite difficult to simultaneously maintain a fixed exchange rate and control inflation. In order to maintain the peg of the Egyptian pound with the U.S. dollar, the money supply would have to be altered accordingly. The change in money supply, however, would surely affect the price level. Consequently, the CBE announced at the end of 2003 that it would move to a floating exchange rate. This move resulted in a 50 percent depreciation of the Egyptian pound and a subsequent rise in prices. This situation, as will be shown later, wassimilar to what happened in November 2016. In mid-2014, however, the exchange rate was pegged once again to the U.S. dollar. At the end of June 2005, the official pegged rate was EGP 5.80 per dollar (Central Bank of Egypt, 2005, p.24).

To evaluate the performance of the CBE during this period, Figure 6 presents the trend of real GDP per person per capita. Figure 7 presents the total assets and liabilities of the CBE during its lifetime.

Figure 6 shows that real GDP per capita had an average annual growth rate of 2.60 percent from 1961 to 2016. Growth in nominal GDPaveraged 4.85 percent per annum. (See the next page.)

To delve deeper into the balance sheets of the NBE and CBE, Figures 8 and 9 show the major components of their assets and liabilities, expressed as a percentage of the total. (See two pages below.)

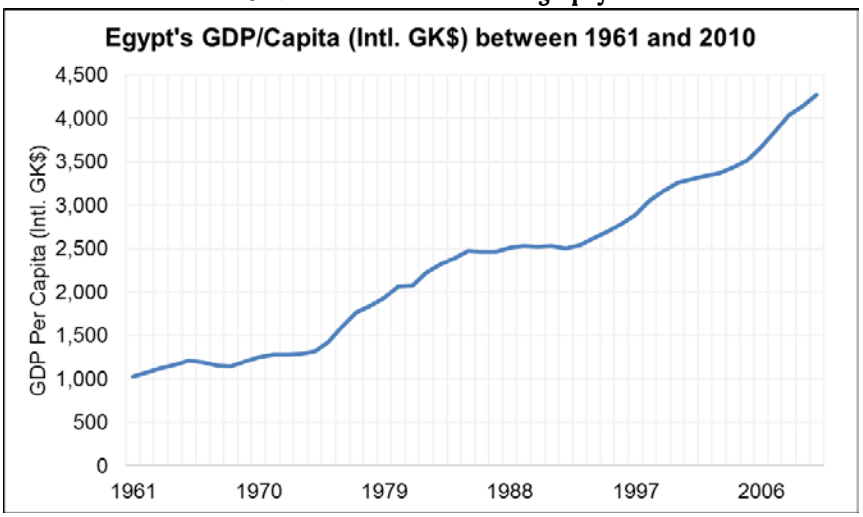

Figure 6. *Egypt's real GDP per capita from 1961-2010 (IMF International Financial Statistics, 2015)*

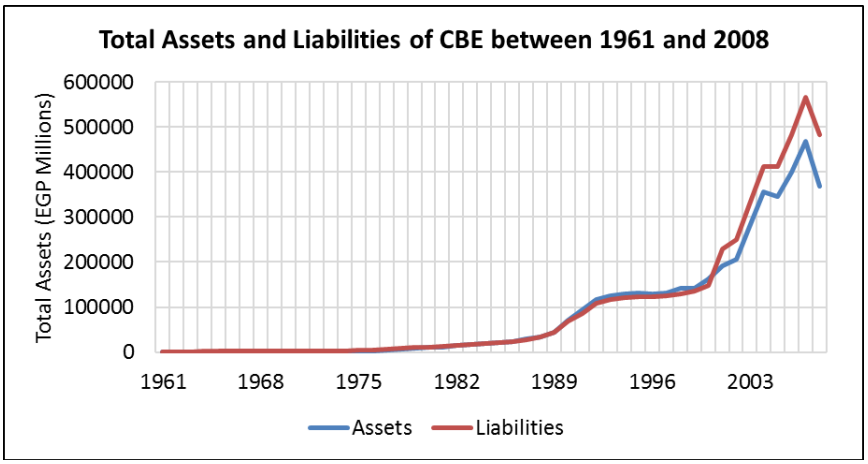

Figure 7. *Total assets and liabilities of the Central Bank of Egypt from 1961-2008 (IMF International Financial Statistics, 2015)*

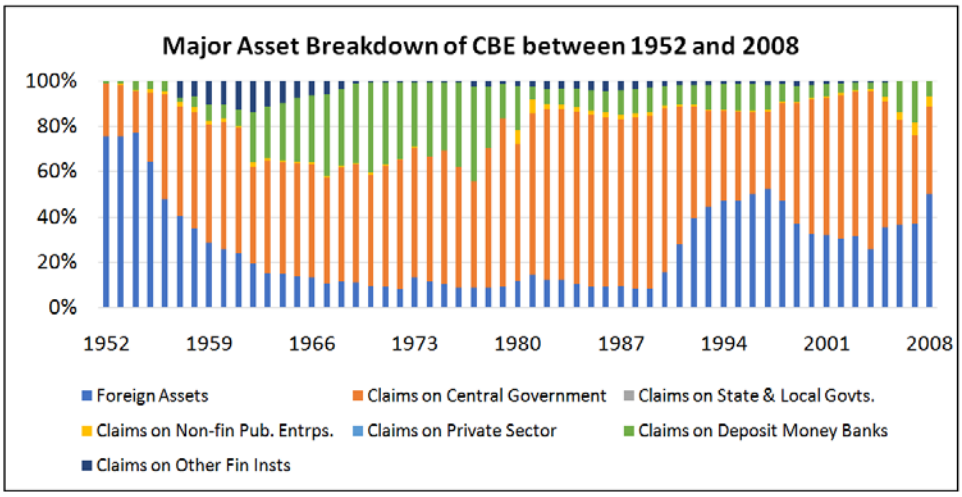

Figure 8. *Major components of assets of the NBE, and then CBE, as a percentage of total assets (International Monetary Fund, 2008). Data for 2009 onward are in Figure D3 in Appendix D.*

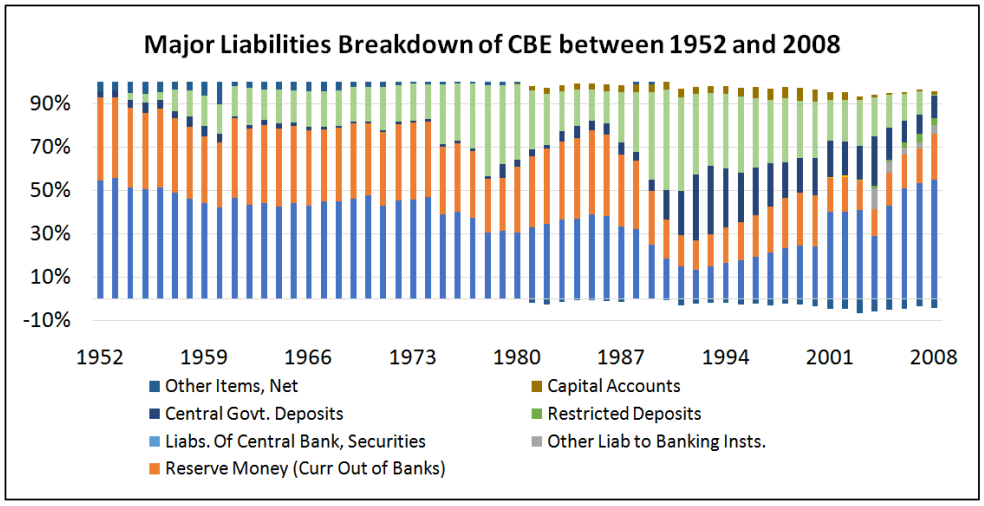

Figure 9. *Major components of liabilities of the NBE, and then CBE, as a percentage of total liabilities (International Monetary Fund, 2008). Data for 2009 onward are in Figure D3 in Appendix D.*

There are two particularly interesting features of Figure 8. The first involves the proportion of assets that are net foreign assets (the light blue bars at the base).This value dropped from a high of 78 percent in 1953 to a low of 8 percent in 1989. This finding is significant and will be relevant when discussing currency boards later in the paper, since orthodox currency boards usually have 100 percent of net foreign assets to total assets. A small ratio of foreign assets implies that it may be difficult for the CBE to transition to a currency board. The second interesting feature is the proportion of total assets comprising claims on the central government (the orange bars). Loans to central government institutions were as low as 17 percent of total central bank assets in 1954; however, they steadily increased and reached a high of 78 percent in 1989. That is a significant rise, which is consistent with the increase in government debt in that period (see Figure 12 a few pages below). Increased debt requires funding, and some of it came from the CBE. Whether or not the rapid growth in net claims to central government in the 1970s can be attributed to any one factor is beyond the scope of this paper. However, it is worth mentioning that Anwar Sadat took power in 1970, and the government began to advocate the concept of *infitah*(openness regarding private investment with Israel; more on this in section III). In more recent years, the net claims on the government and public economic authorities have continued to grow, rising by 30.2 percent in 2014 and 23.6 percent in 2015. By the end of June 2015, net credit to the government was 65.3 percent of total banking system credit (CBE Annual Report, 2015: 12).

The greater the proportion of CBE credit to the government, the less market oriented the Egyptian economy probably becomes because the less likely it is that that government is paying a market rate of interest on its debt. Continuous credit given by the CBE to the government makes it difficult for the latter to ascertain the true status of the market.

5. The Arab Spring and after, 2011-present

The so-called Arab Spring began in Tunisia in December 2010 as a protest against the corruption and cronyism that were prevalent during the long rule of dictator Zine El Abadine Ben Ali. The protestors found that they had widespread support and they were successful in forcing Ben Ali to flee the country, ending his rule. The Tunisian revolution inspired similar events in many other Arab dictatorships. In Egypt, mass protests erupted on January 25, 2011 and on February 11 the vice president announced that President Hosni Mubarak had resigned. Egypt held its first truly democratic parliamentary electionsfrom November 2011 to January 2012 and its first truly democraticpresidential electionin May and June 2012. The Muslim Brotherhood, the most well organized political group, dominated the parliamentary elections, and wonthe presidency. However, President Mohamed Morsi and the parliament undertook measures that created distrust among many Egyptians, in particularthe hasty drafting of a new constitution, whose approval by referendum did not allay the concerns of large and influential groups within Egyptian society. On June 30, 2013, protests against Morsi erupted. On July 3, a military coup ousted him. The Egyptian military issued a decree in November 2013 that in effect granted itself unlimited powers. Egypt has since remained under military rule. The current president, Abdel Fattah el-Sisi, who assumed office in 2014, was the minister of defense and commander-in-chief of the armed forces under Morsi.

Upon election, Sisi faced the same problems as his predecessors: economic growth lagging well behind the leading emerging markets; large government budget deficits, financed in part by central bank credit and leading to persistent inflation; insufficient creation of jobs in the formal sector to absorb large numbers of young job-seekers; inefficient yet politically popular subsidies draining government resources; large, unproductive state enterprises; and pervasive corruption. The latest of many economic reform programs is attempting to tackle some of these issues. It is described in more detail below. First, let us take stock of key economic and financial indicators over the whole period since 1898, to the extent that data are available.

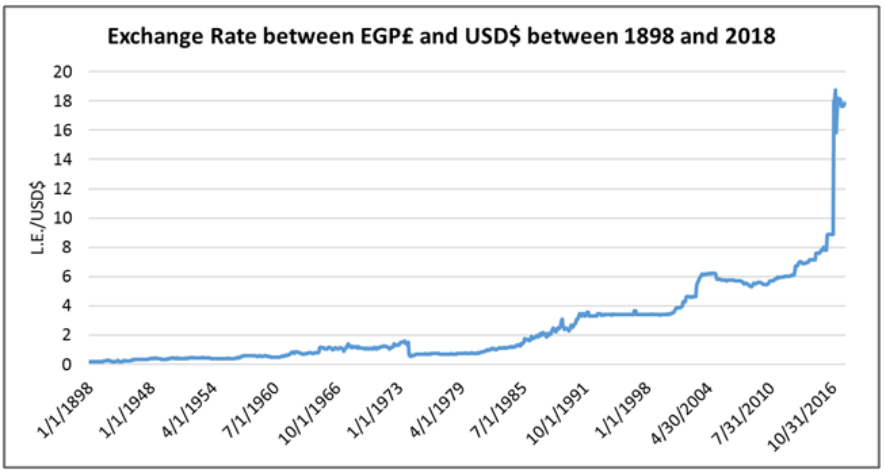

Figure 10. *Egyptian pounds per US dollar, 1898-2018 (Measuring Worth, 2018; scale on horizontal axis varies).*

Figure 10 illustrates the trajectory of the exchange rate between the Egyptian pound and the US dollar since 1898, the same year the NBE was initiated. As the reader can see, there have been frequent depreciations of the Egyptian pound since then, with a sharp appreciation in the first quarter of 1974. This could be attributed primarily to the *infitah* that Egyptian economic policy was promoting at the time. The government was encouraging foreign and Arab investment in the economy, and such activities increased demand for the Egyptian pound. The relative stability of the Egyptian pound at the end of the 20th century is due to the managed float that the CBE introduced. Subsequent sections discuss the next period in Egypt's financial history.

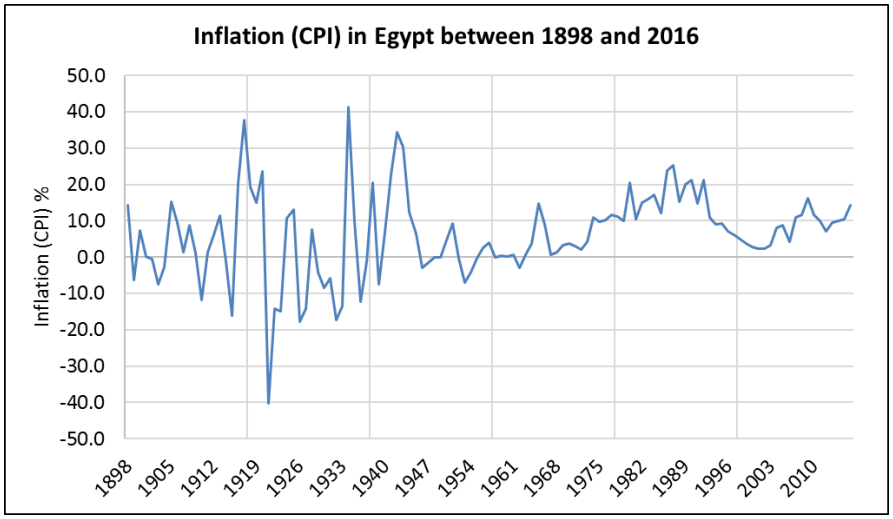

Figure 11. *Inflation in Egypt as expressed by the Consumer Price Index (CPI), starting in 1898 (Reinhart and Rogoff, 2010; Central Bank of Egypt, 2017).*

Figure 11 shows that inflation in Egypt has followed the same trend as many other economies: inflationhas become more stable over time. In the early 20th century, inflation jumped sporadically from large positive values to large negative values within relatively short periods. For instance, 1918

saw an annual inflation rate of approximately 38 percent, whereas in 1920 the economy experienced 40 percent deflation. Such large swings and deflations are rarely seen nowadays, due to interventions by central banks that aim to stabilize inflation.

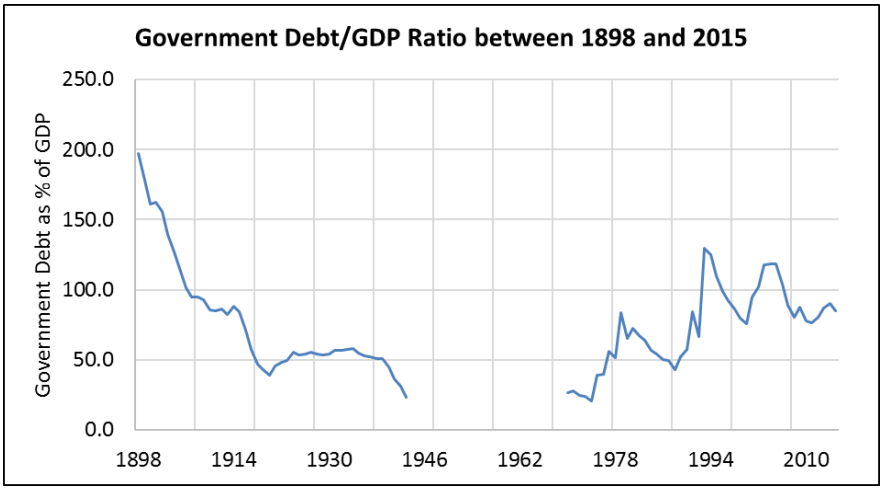

Figure 12. *Government debt as a percentage of GDP from 1898to 2008. Note that data are missing for the years 1944 to 1969 (Reinhart &Rogoff, 2010).*

Government debt is whenthe sum of government surpluses and deficits over time, plus interest, is negative. There is an observable decrease in government debt as a percentage of GDP from 1898 to 1943, when a data gap begins. This decrease could have several possible explanations. It could be that the government was generating surpluses in that period. Another possibility is that the economy was experiencing a deficit, but GDP was growing faster than government debt. These different explanations have implications in terms of whether the NBE and later the CBE stepped in to fund the deficit and acted differently than a purely profit-oriented commercial bank would have. Although it is not apparent in Figure 12, there has been an uptick in the government debt to GDP ratio in the past few years. Fakhry El-Fiky, a professor of economics at Cairo University,has implicitly confirmed the lack of independence of financial institutions in Egypt, stating "the government only takes loans from banks to make up for the budget deficit" (Shuwekhi, 2015). Observers believe that since the banks give out loans to the government, there exists a lack of loans to the private sector, which potentially contributes to economic sluggishness in Egypt.

5.1. Total unemployment

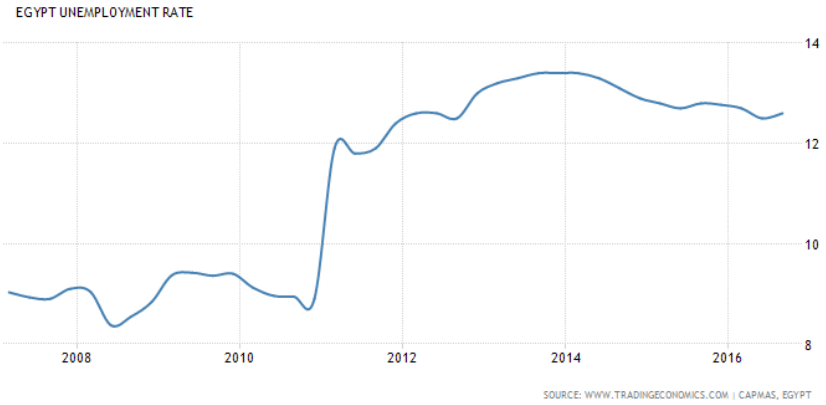

Figure 13. *Total unemployment rate in Egypt since 2008 (Egypt Unemployment Rate, 2017)*

Figure 13 clearly shows the immediate detrimental impact of the Arab Spring uprisings on Egypt's economic situation. The uprisingsresulted in a spike of the total unemployment rate from around 9 percent to 12 percent within the first year, 2011. The rate reached a high of 13.4 percent, and currently rests at 11.3 percent. On a more positive note, however, anIMF report released in October 2016 forecasts total unemployment to fall to 8.4 percent by the end of 2020. Whether these estimates took into consideration the $12 billion IMF loan issued in November 2016 is uncertain. That factor may provide the economy with a greater push.

Even though total unemployment has been worrisome, a more alarming indicator has been youth unemployment. In 2013, it reached a high of 13.6 percent, whereas estimates of the 2017 value are at 12.1%, with a projected decrease in subsequent years (International Labor Organization, 2018).

5.2. Recent developments: 2016-2018

In November 2016, the IMF and the Egyptian government reached agreement on an IMF loan worth $12 billion that would span three years. The details of the loan can be found on the IMF website. Some of the key points ofthe agreement are summarized below (IMF, 2017).

1. Real GDP growth is forecasted to increase to 6 percent in the medium term.
2. Foreign reserves are expected to reach $33 billion by the end of the 2018/2019 fiscal year.
3. The Central Bank of Egypt will be involved in "money targeting."
4. The CBE will "maintain short-term interest rates at levels that ensure tight liquidity conditions."
5. The wage bill will be increased, though at below the rate of inflation.

Throughout its history, Egypt has switched betweenseveral exchange rate regimes. The two most common ones have been*managed floats* and *pegging to the U.S. dollar*. For instance, between August 1, 1981, and August 14, 1989, the Egyptian pound was pegged at EGP 0.70 = US$1. This was the

official rate, even though most transactions occurred at a slightly different level due to the introduction of premiums by Egyptian commercial banks.

On November 3, 2016, the CBE decided to float the Egyptian pound, resulting in its immediate depreciation (by 57.8 percent) from a pegged value of 8.8 EGP/US$ (with the pegged value only recently set in March of the same year). Devaluation was a prerequisite for the IMF loan, and it was believed that it would eventually boost Egypt's external standing. Egypt's exports and tourism industry should be observing a healthy comeback if the devaluation works—a much-needed change for tourism, which has experienced a steady decline since the uprisings of 2011. An extensive study of the Egyptian pound devaluation by PricewaterhouseCoopers (2017) offers some hope on that score.

5.3. Exchange rateand inflation rate

The Troubled Currencies Project, directedby Professor Steve Hanke at the Cato Institute, records black market exchange rates of many currencies. As of November 2, 2017, the black-market exchange rate was EGP 17.75per U.S. dollar. Thiswas quiteclose to the official rate of 17.70, partly due to the recent devaluation of the pound, which was, as mentioned above, a prerequisite for the IMF loan.

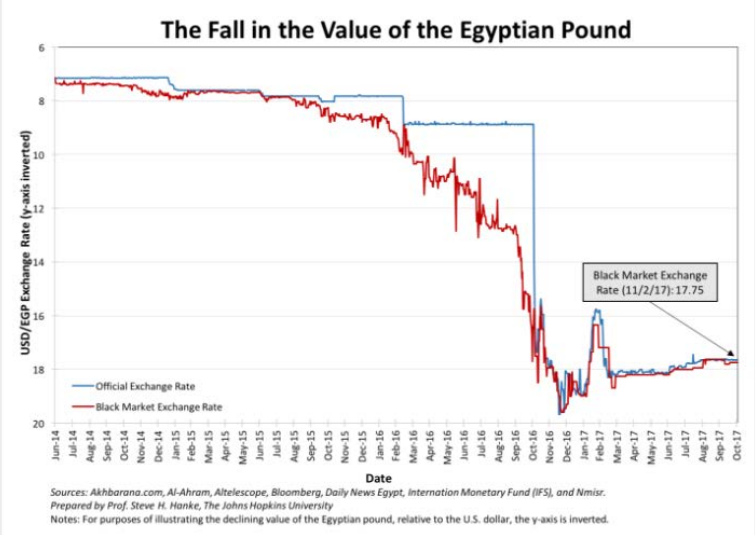

Figure 14. *Devaluation of the Egyptian pound in the last three years. The red line is the official exchange rate, while the blue line is the black-market rate (Hanke, 2017a).*

The black-market rate can be used to calculate an alternative, implied inflation rate, as follows:

$$(1 + annual\ inflation\ rate\ in\ Egypt) = \frac{(1 + annual\ inflation\ rate\ in\ US)}{(1 + annual\ \ percent\ change\ in\ exchange\ rate)}$$

$$Black\ Market\ Exchange\ Rate = \frac{EGP.}{US\$}$$

The implied inflation rate as of May 3, 2017 was 105.1 percent, where as the official inflation rate on the same date was 30.9 percent. The difference is attributable to a number of factors. One is that the consumer price index basket includes goods whose prices are fixed by the government and hence do not vary according to the exchange rate. Another is that the exchange rate pass-through is often less than 1 when prices of foreign goods rise. In addition, consumers can often substitute foreign goods with cheaper domestic goods when the exchange rate depreciates substantially. Despite all those considerations, though, the enormous difference between the official and implied inflation rates suggests that the official rate is missing something important about what is happening to the economy. As of February 2018, the official inflation rate has fallen to 14.4% from its highest value of 35.3% in July of 2017.

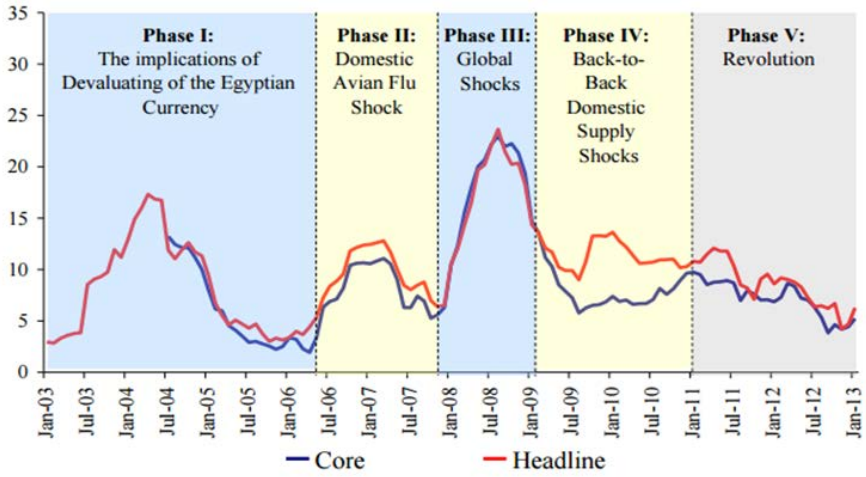

Figure 15. *Cycles of inflation (year on year growth, in percent) in Egypt from January 2003 to January 2013 (Central Bank of Egypt, 2016).*

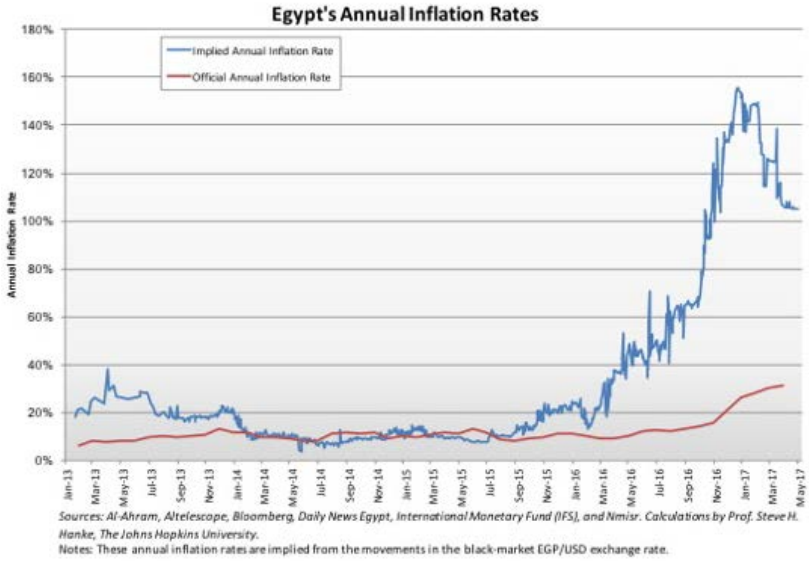

Figure 16. *Annual inflation rate in Egypt over the past four years. The red line represents the official year-over-yearinflation rate, whereas the blue line is the implied annual inflation rate. The latter's derivation is shown above (Hanke, 2017b).*

5.4. Interest rates – Lending and deposit

As of March 27, 2017, the commercial bank deposit rate in Egypt was 14.75 percent, whereas the lending rate was 15.75 percent. These rates had risen to these values following the IMF deal reached with the Egyptian government in mid-November 2017. Overall, the direction of this trend is consistent with the current policy the central bank is undertaking, which is one of increased interest rates. The justification for this is to curbexpectedincreases in prices (inflation) as a result of the depreciation of the Egyptian pound. Currently, as of March 24, 2018, the commercial bank deposit rate in Egypt is 7.25 percent, whereas the lending rate is 11.10 percent.

6. The concept of currency boards

The foregoing analysis of Egypt's experience of inflation, exchange controls, and currency depreciation under central banking, especially under the CBE, raises the question of whether some other monetary arrangement might be more suitable for Egypt. One potential alternative arrangement would be a currency board. Currency boardswere first established in the 19th century and in the early 20th century they existed in dozens of countries, especially in the British Empire. An orthodox currency board hasa number of characteristics (Hanke & Schuler 2015: 3). The key ones are:

1. A fixed nominal exchange rate with an anchor currency. The anchor currency is usually one that is relatively stable and has high credibility
2. Unrestricted convertibility between the domestic currency and the anchor currency.
3. All note and coin issues and other monetary liabilities of the currency board, if any, must be backed 100 percent by foreign reserves.
4. Depending on its structure, the boardcan be established as having a monopoly of note issue, or in parallel to the existing central bank of the economy.

A case study of a currency board success in Bulgaria can be found in Appendix C.

7. Establishing a currency board

In the 1990s, currency boards enjoyed a revival after a generation of neglect. Several emerging market countries established currency board-inspired systems, ranging from fairly close to orthodox currency boards to more like typical central banks but with additional constraints on their behavior. Currency boards received consideration across emerging markets because of the demonstrably poor long-run performance of many emerging market central banks in curbing inflation and providing convertible currencies. That is the context in which we consider the possibility and mechanics of establishing a currency board in Egypt.

The table below shows the Jacome and Vazquez central bank independence (CBI) index, discussed earlier, applied here theoretically to an orthodox currency board. An orthodox currency board would be more independent than the NBE was or than the CBE has been. To repeat, economic literature hypothesizes an inverse relationship between central bank independence and inflation. A currency board would accordingly be conducive to low inflation.

Table 6. *Extended Jacome CBI index applied to an orthodox currency board*

	Currency Board		
Criteria	Value	Weight	Weighted Value
1. Central Bank Objective	0	2	0
2. Appointment and terms of office of the members of CBE	0.5	2	1
3. Structure of central bank board	0.5	2	1
4. Removal of Board Members	0.5	2	1
5. CBE credit to government	1	3	3
6. Lender of last resort	1	2	2
7. Independence in monetary policy	1	3	3
8. Financial independence	0.5	1	0.5
9. Accountability	0	1	0
10. Transparency and disclosure of financial statement	1	1	1
(See appendix for explanation of values)			**CB Σ = 12.5**

The establishment of a currency board in Egyptcould arise in one of two ways. The first would beto replacethe central bank with a currency board. The second would be to introduce the currency board as an institution that issues a currency parallel to the one issued by the Central Bank of Egypt. Both of these scenarios will be evaluated in the following section.

7.1. Scenario A –Replacing the Central Bank of Egypt with a currency board

To ensure the proper and efficient establishment of a currency board, certain steps must be taken, as Hanke & Schuler (2015: 46-50) have described. The requirements are listed below.

1. *Delegate certain activities performed by CBE.*

The finance ministry could take over the task of advising the government on monetary affairs.Commercial banks could take over the tasks of clearing checks and providing deposit insurance protection through a cooperative arrangement.

2. *Prevent the CBE from increasing the money supply to fund budget deficits.*

Governments that are tightly connected to their central banks often have the central banks increase the money supply to fund budget deficits. This cannot be the case with a currency board. The Egyptian government would have to manage fiscal policy to fund such deficits by market means. In other words, they would be required toincrease taxation levels, borrow from the public, and/or decrease their expenditure.

3. *Obtain sufficient reserves.*

Currency boards are required to have 100 percentor slightly greater foreign reserve backing for their monetary liabilities. These reserves can include, but are not limited to, assets denominated in the anchor currency. In this manner, seigniorage develops a greater role in the economy. It ultimately comes down to the difference between the interest earned on the bonds held by the currency board, and the expenses of handling and maintaining the issued notes, coins, and deposits.

4. *Fix the Egyptian pound to an anchor currency.*

The Egyptian pound would need to be fixed to a stable anchor currency, one that the public has confidence in. The choice of such an anchor currency is an important one and is evaluated below. A fixed exchange rate creates a predictable environment, one that divests it of speculation, injects the economy with confidence, and attractsforeign investment.

5. *Transfer the assets and liabilities of the CBE to the currency board.*

As this point, the CBE would cease to exist, and the currency board would enter the economy as a functional institution.

Since point 3 above calls for sufficient reserves, the CBE's current foreign reserves would have to be analyzed. The deal Egypt reached with the IMF bolstered Egypt's weak foreign reserve position. As of January 31, 2018, the CBE said that its foreign reserves stood at approximately $37.020billion (Ahram Online, 2017). At the exchange rate of about 17.7 EGP per dollar on that date, foreign reserves totaled 655 billion EGP. As of October 2017, the latest date currently shown in the CBE's *Monthly Statistical Bulletin,* the monetary base was 675 billion EGP—not far above reserves, if the monetary base has not grown substantially since October. To achieve 100 percent reserve backing, the earnings of the successor currency board could be retained until foreign assets equal the monetary base. Even though the sale of domestic assets inherited from the CBE is also a possibility, assuming they are liquid, the currency board may be better off holding on to them in the meantime.

7.2. Scenario B -Introducinga Currency Board in Parallel to the Central Bank of Egypt

The second way in which the currency board could be introduced is in parallel to the CBE. This process might prove to be easier than outright replacement due to the fewer steps required and the potentially lower political resistance that it may face. Overhauling an important institution such as the CBE, which has existed since 1961, may prove difficult. Consequently, this idea is proposed as an alternative. In addition to the integral components of a currency board, such as the maintenance of at least 100 percentforeign reserves and the fixing of the issued currency to an anchor currency, the following steps are also required.

1. *Announce the anchor currency and fixed exchange rate.*

As in the replacement scenario, an anchor currency must be chosen appropriately, and the exchange rate at which it will be exchanged should

be accurately identified. A high exchange rate would decrease Egypt's foreign competitiveness, as their exports would appear expensive to foreigners. Conversely, an exchange rate thatis too low would makeforeign goods relativelyexpensive, and Egypt may experience "imported inflation." One way to address the issue would simply be to have the new currency equal to the anchor currency. Thus, the "Egyptian dollar" might be equal to the U.S. dollar and fluctuate against the Egyptian pound.

2. *Motivate the public with a small premium.*

Once the currency board currency is introduced, what will motivate the Egyptian public to use it? A premiumcould be offered for a limited time when a member of the public exchanges the anchor currency for the currency board's issued currency. The board's interest earnings would enable it to recoup the cost of the premium. The premium would only be available on conditions that would inhibit attempts to create opportunities for unlimited arbitrage.

3. *End the premium.*

The premium offering must eventually cease. Thereafter, the currency board and the public are free to engage in any transactions between the two currencies of interest.

7.3. Potential disadvantages of a currency board

There are some potential disadvantages associated with a poorly executed currency board. Let us consider the most prominent issues with respect to three potential anchor currencies: the U.S. dollar, the euro, and the British pound.

High dependence on the anchor currency. Fixing the Egyptian pound to ananchor currency means Egypt's economy will be heavily tied to the state of the economy of the anchor currency. Since economies do not mimic each other perfectly in other aspects such as unemployment, inflation, etc., a change in interest rates in the anchor country may have detrimental impacts on the Egyptian economy. For instance, if the U.S. dollar is once again the anchor, and interest rates in the U.S. begin to rise steadily, then the effects will percolate into the Egyptian economy. A country that is attempting to accelerate the rate of economic growth would not want to experience a rise in interest rates. Moreover, stability is almost always a desired characteristic in economic policy. Therefore, relatively steady interest rates in the reserve country areimportant.

Figure 17 indicates that prior to the Great Recession of 2008-09, the United Kingdom had the highest average nominal interest rate of the three potential anchor currencies. Once the Great Recession hit, one can observe the rapid drop in interest rates as central banks attempted to cushion the shocks. Note the historically low interest rates in the past half-decade or so. Only recently have they begun to rise, with the Federal Reserve taking the lead.

In the past decade or so, the United States, euro area, and United Kingdom have experienced reduced inflation volatility compared to the

mid-to-late 20th century. Inflation stability is definitely an advantageous characteristic for an economy to have as it allows for predictability, and it is the latter that, amongst other things, entices foreign investors. It is also interesting to note that inflation rates in these economies mimic each other in terms of their trends. This makes sense in the current highly interdependent world. From the perspective of *inflation stability*, all of the above currencies are suitable for use in a currency board as anchor currencies.

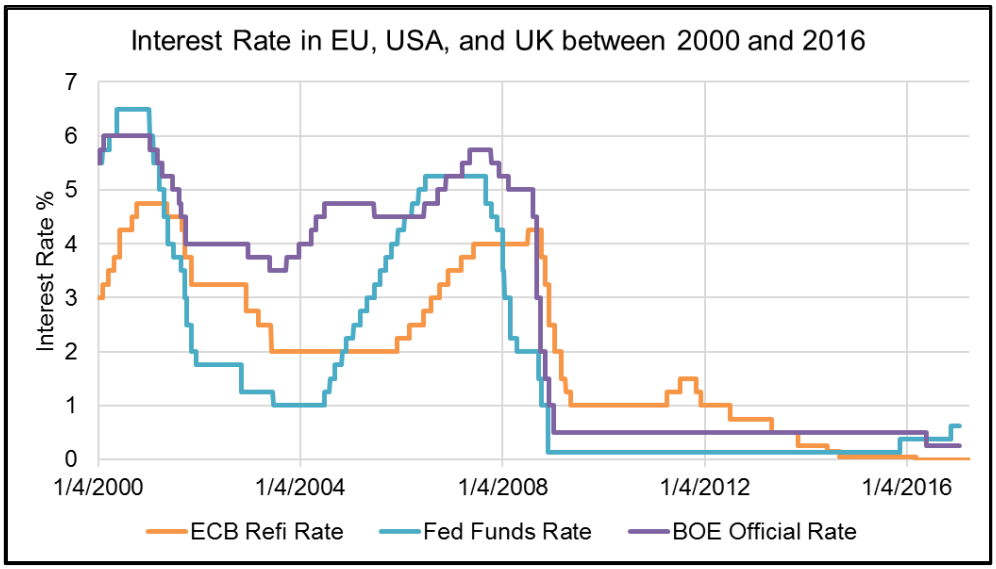

Figure 17. *Interest rates in the euro area, USA, and UK. The UK rate is the Bank of England Official Rate, the US rate represents the Federal Funds Rate (mid index), and the euro area rate is the ECB refinancing rate (Bloomberg, 2017a).*

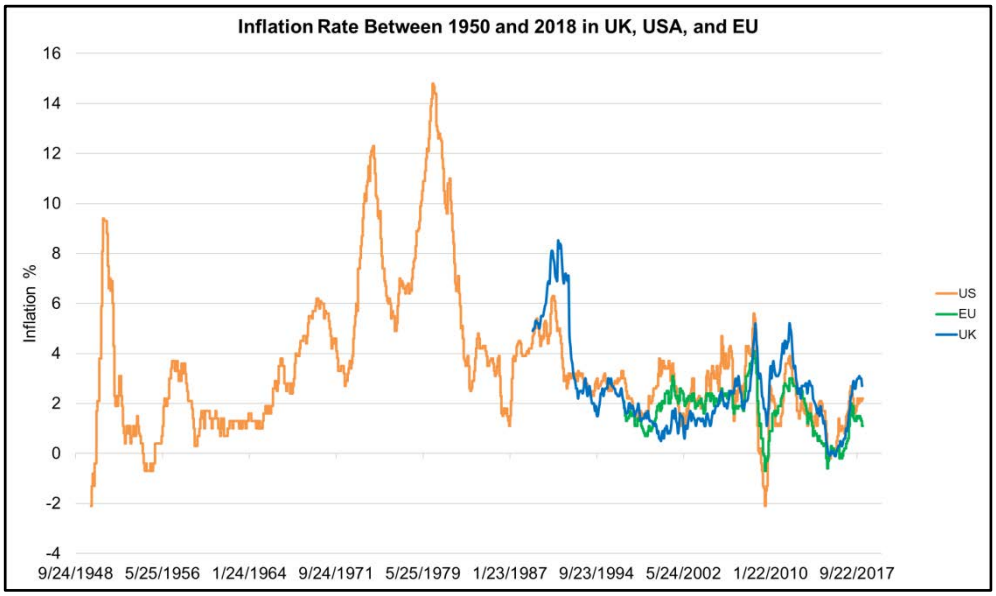

Figure 18. *Inflation rates in the past half-century in the USA, euro area, UK. Inflation for the EU28 is shown from 1998 onwards*

Poor choice of fixed exchange rate. As mentioned previously, deciding on the exchange rate between the Egyptian pound and the anchor currency is vital, since its implications can be significant. In order to decide on the most appropriate exchange rate, it seems most logical to observe the exchange rate under freely floating conditions. This would be the ideal exchange rate to choose, one thatis determined by the demand and supply forces of the market. In the case of Egypt, after the pound had experienced an extended period pegged to the US dollar, it was floated in November 2016. This resulted in its immediate depreciation against foreign currencies. To some extent, there is less work to do now, since it is possible to observe the trend of this floating rate, and thus determine an appropriate fixed rate. We suggest that a 120-day average of the floating exchange rate would be an appropriate basis for computing the value for fixing the Egyptian pound to an anchor currency.

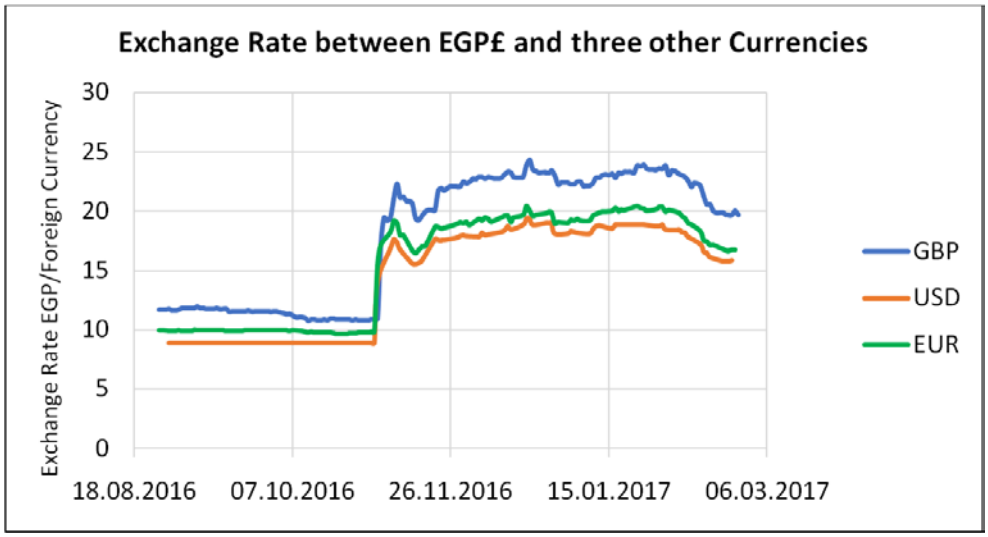

Figure 19. *The value of the Egyptian pound relative to the British pound (blue), the US dollar (orange), and the euro (green), during the phase of the IMF loan. The 120-day average of the exchange rates are 18.01 EGP/GBP, 14.37 EGP/USD, and 15.50 EGP/EUR (Bloomberg, 2017b).*

Figure 19 shows the exchange rate of the Egyptian pound relative to the three currencies around the time of the IMF loan. The average values of the exchange rates are mentioned above as being 18.01 EGP/GBP, 14.37 EGP/USD, and 15.50 EGP/EUR. Once one of these currencies is chosen as the anchor currency, the respective exchange rates is recommended to be used. Figure 20 below illustrates the most recent 120-day average of the floating exchange rates. If a currency board were to be initiated tomorrow, the following 120-day average exchange rate would need to be used.

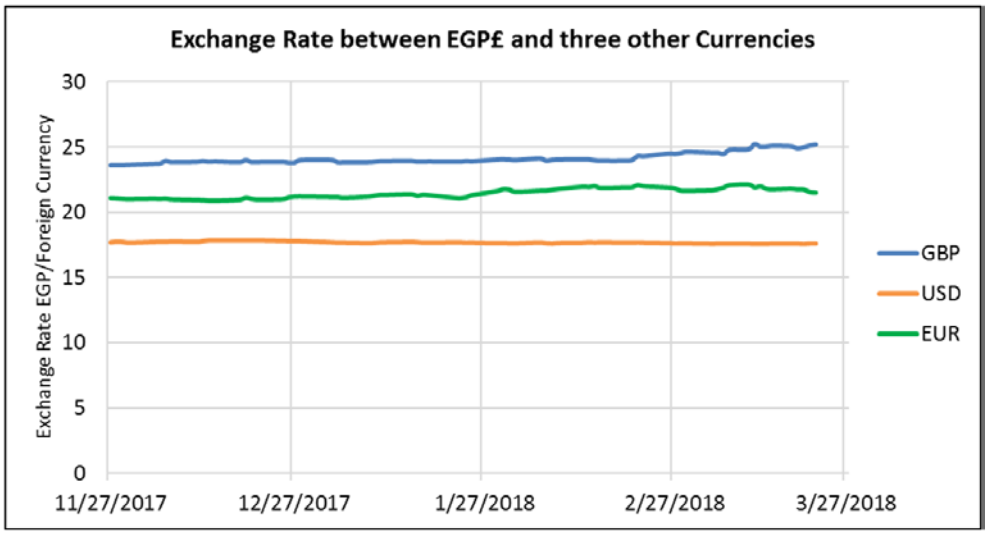

Figure 20. *The value of the Egyptian pound against the British pound (blue), the US dollar (orange), and the euro (green). The 120-day average of the exchange rates are 24.3 EGP/GBP, 17.7 EGP/USD,and 21.50 EGP/EUR (Bloomberg, 2017b).*

8. Conclusion

Soon after its initiation in 1898, the National Bank of Egypt was heavily involved in financing the Egyptian government. This is exemplified by the large proportion of its assets allocated to government securities, which reached a maximum of 75 percent in 1947. A lack of independence of the NBE is evidenced in the Jacome Central Bank Independence (CBI) Index which resulted in a value of 7 on a scale of 0 (not independent) to 19 (highly independent). The first half of the twentieth century coincided with an average yearly growth rate of real GDPof 2.6 percent. We were unable to find data for real GDP per person. In the same period, inflation sometimes fluctuateddrastically, partly because the NBE was targeting the exchange rate and not inflation. The average annual increase in the consumer price index between 1898 and 1961 was 3.1 percent.

In time, Egyptian policymakers considered the creation of a modern central bank to be necessary. Thus, the Central Bank of Egypt was formed in 1960 and, among many other things, took over the Issue Department of the NBE. Unlike the NBE, the CBE does not engage in retail deposit taking and lending. In terms of the relationship of the central bank with the government, the switch from the NBE to the CBE changed the situation little. Though net claims on the government initially shrank after the formation of the CBE, they began to burgeon, attaining a peak value of 78 percent in 1989. Although the central bank independence index of this period was fairly high at 10, the sub-components tell a different story. The way that members of the governing board were appointedremained structured in such a way as to hamper independence, and there existed a lack of discipline with regard to credit to the government. Recall further that in the latter half of the twentieth century,the CBE's net foreign assets decreased from a peak of 78 percent of total assets in 1953 to a low of 8

percent in 1989. During the same period, the average yearly growth of real GDP per capita was around 2.6 percent. Even though inflation has been somewhat less volatile under the CBE than under the NBE, it hasaveraged 9.7 percent a year, a significant increase from what was experienced under the NBE (3.1 percent).

As of the latest figures at this writing, the net credit of the CBE to the government lies at 65.3 percent of its total credit. High net credit to the government is a recurring theme in the history of the NBE and CBE. It has been facilitated in recent years by a reduction in the central bank independence score as compared to the previous period, down to a value of 8.5, the lowest score since the late 1960s. While the Arab Spring of 2011 is partly to blame for the economic challenges Egypt is currently facing, there are deeper issues within the economy that could be contributing to growth that is lower than Egypt's potential. This realization resulted in the Egyptian government undertaking an IMF program starting in late 2016. In an attempt to both incentivize foreign investorsand increase Egypt's foreign reserves, the Egyptian pound was allowed to float freely, resulting in its immediate devaluation by around 58 percent. The devaluation led to a subsequent increase in inflation, which rose above 30 percent in mid-2017 but as of February 2018 had fallen to a still concerning rate of 14.4 percent.

Given the historical difficulties of maintaining political independence for monetary policy in Egypt, we have proposed an alternative or perhaps a parallel solution to the existing economic situation. A currency board, characterized by minimal government intervention and high independence, seems to be a reasonable idea for Egypt. When evaluating a traditional currency board with the CBI, it resulted in an independence score of 12.5, higher than any attained during the history of the NBE and CBE. Its primary feature of high independence will ensure that net claims on central government will observe a decline, thus reducing the government's dependence on the CBE as a lender of last resort. Furthermore, the implementation of currency boards in the past, in various nations, has yielded significant benefits in terms of lowering inflation, and boosting economic growth in the long run. The CBE is aiming to increase its foreign reserves to $33 billion by the end of the financial year 2018/2019, which ends on June 30th, 2019.This growth would increase the viability of introducing a currency board.

We presented two scenarios for introducing a currency board: converting the CBE, or the possibly easier route of introducing a currency board in parallel to the central bank. We presented an example of the necessary measures that would be necessary to establish a currency board, but if the Egyptians were to actually implement a currency board, it would be desirable to revisit some of the pointsdiscussed to make sure that they still apply.

Appendices

Appendix A. *Nominal and Real GDP in Egypt (1886 – 1945)*

NOMINAL AND REAL GDP ESTIMATES FOR EGYPT, 1886–1945

	New Estimates				Previous Studies
	Nom. GDP (millions L.E.)	Real GDP (millions L.E.)	Nom. GDP per capita (L.E.)	Real GDP per capita (L.E.)	Real GDP per capita (L.E.)
1886	27.05	35.79	3.62	4.78	
1887	31.08	39.93	4.06	5.21	
1888	31.34	38.92	4.00	4.96	
1889	32.38	38.91	4.03	4.84	
1890	34.33	42.40	4.17	5.16	
1891	35.81	47.54	4.25	5.65	
1892	36.58	54.31	4.24	6.30	
1893	37.14	53.23	4.21	6.03	
1894	34.51	58.17	3.82	6.43	
1895	38.09	62.69	4.11	6.77	
1896	43.49	64.44	4.59	6.80	8.71
1897	41.27	70.36	4.25	7.25	
1898	46.47	69.25	4.71	7.03	
1899	50.74	74.02	5.07	7.40	
1900	58.19	74.26	5.73	7.31	
1901	58.98	77.40	5.72	7.51	8.63
1902	62.69	83.60	5.99	7.99	
1903	69.90	86.99	6.58	8.19	
1904	76.50	91.39	7.09	8.47	
1905	81.74	96.54	7.47	8.82	
1906	91.48	95.81	8.23	8.62	8.47
1907	97.85	97.65	8.67	8.66	
1908	97.59	100.78	8.55	8.83	
1909	99.03	100.78	8.57	8.72	
1910	107.09	103.22	9.15	8.82	
1911	107.09	106.16	9.04	8.96	8.19
1912	105.49	107.10	8.80	8.93	
1913	109.77	109.77	9.04	9.04	9.89
1914	106.33	106.33	8.65	8.65	
1915	112.01	109.82	9.01	8.83	
1916	133.38	110.23	10.59	8.76	
1917	166.28	107.98	13.05	8.47	
1918	201.71	106.72	15.66	8.28	
1919	224.19	110.98	17.21	8.52	
1920	241.70	101.98	18.36	7.75	
1921	203.74	103.95	15.31	7.81	
1922	194.77	110.67	14.47	8.22	12.71
1923	190.68	117.70	14.02	8.65	
1924	199.81	124.11	14.53	9.02	
1925	208.17	126.16	14.97	9.07	
1926	201.96	126.22	14.37	8.98	
1927	196.64	128.52	13.84	9.04	
1928	199.31	131.13	13.87	9.12	
1929	199.58	132.18	13.73	9.09	
1930	189.85	128.28	12.91	8.72	
1931	180.57	130.85	12.14	8.80	
1932	178.77	135.43	11.88	9.00	
1933	175.95	140.76	11.56	9.25	
1934	180.11	141.82	11.70	9.22	
1935	189.64	145.88	12.18	9.37	
1936	193.04	148.50	12.26	9.43	
1937	194.38	150.68	12.21	9.46	8.13
1938	194.42	148.41	11.99	9.16	7.96
1939	192.59	147.01	11.67	8.91	7.87
1940	213.71	150.50	12.73	8.96	8.18
1941	268.23	152.40	15.69	8.92	7.94
1942	347.16	147.94	19.95	8.50	8.30
1943	466.76	151.23	26.35	8.54	7.26
1944	552.21	155.19	30.63	8.61	7.40
1945	602.23	161.16	32.82	8.78	7.54

Notes: The real GDP series is given in 1913 prices. L.E. is the Egyptian pound, roughly equivalent to the U.K. pound.

Source: The estimates of this paper are calculated using the cointegration vector in column 2 of Table 4, deflated when relevant by population and consumer prices. Previous estimates have been deflated by the same population and price indices and come from the following sources: Hansen (1974) for 1896–1911, Issawi (1961) for 1913, Levi (1922) for 1922 and Anis (1950) for 1937–1945.

Appendix B. *Jacome Central Bank Independence Index – Scoring Justification*

Criteria and reasoning behind the scoring of the NBE, 1898-1961:

1. *Central Bank Objective ~ 0*
    a. The NBE was not given official central bank powers until the mid to late 1950's. Before then, it had acted as a commercial bank, therefore price stability was not its sole objective, if an objective at all.
2. *Appointment and Terms of Office of the Members of NBE ~ 0*
    a. As mentioned in section I of the paper, there were foreign nationals on the board of the NBE who were not elected. Even though appointments had to be ratified by the government, there was no 2-step vetting process that occurred.
3. *Structure of Central Bank Board ~ 0*
    a. The NBE had consisted of a wide array of people from different backgrounds, including entrepreneurs, and government officials from both Egypt and the UK. The high involvement of private and public sector officials justifies a score of 0.
4. *Removal of Board Members ~ 0.5*
    a. Article 21 in the statue of the NBE states that the governor can be nominated for 5 years. This can be categorized as 'legal grounds' as mentioned in the criteria for the score of 0.5. Judicial courts were not involved in this decision-making process.
5. *NBE credit to government ~ 0.5*
    a. Article 15 of Law No. 163 exemplifies the limit the bank had in issuing loans to the government to cover seasonal debt. The fact that there was a limit, officially, implies a score of 0.5.
6. *Lender of Last Resort ~ 0.5*
    a. Emergency loans were legally regulated and had a capital limit. This was seen to be the case as shown in point 5 above.
7. *Independence in monetary policy ~ 0.5*
8. *Financial Independence ~ 1*
    a. The government was highly involved in ensuring NBE integrity.
9. *Accountability ~ 1*
    a. The governor of the NBE had to report to the government in a timely basis.
10. *Transparency and disclosure of financial statement ~ 1*
    a. Publishes financial statements periodically and has them certified by external auditor. Their more recent annual reports can now be accessed online, whereas the older versions can be found in print, with some being digitized while working on this paper.

Criteria and reasoning behind the scoring of the CBE FifthPeriod, 2005-2017

11. *Central Bank Objective ~ 0.5*
    a. The CBE has had conflicting objectives in the past two decades. Many have shown, as explained in this report, that both maintaining a fixed exchange rate and controlling price levels is bound to be problematic. Ever since the IMF loan agreement in November 2016, the CBE has now oriented itself to targeting one goal: price stability. Given the recent introduction of a single objective, the score given seems satisfactory. If this remains consistent for the years to come, then the weighting is bound to increase.
12. *Appointment and Terms of Office of the Members of CBE ~ 0*
    a. The CBE governor was recently directly appointed by the president of Egypt, Abdel Fatah El Sisi. Since this was a direct appointment that did not have any other processes, the value remains at 0.
13. *Structure of Central Bank Board ~ 0.5*
    a. Although the minister of finance himself is not on the board of the CBE, there are some members from the private industry.
14. *Removal of Board Members ~ 0.5*
    a. The presidential decree No.428/2015 allowed for reshuffling of the board because of its upcoming expiration (Mounir, 2015). This is deemed legal, allowing for a score of 0.5 according to the criteria.
15. *CBE credit to government ~ 0*
    a. The CBE, over the years, especially both during the great recession and soon after the 2011 revolution, expanded its credit to the government.
16. *Lender of Last Resort ~ 0.5*
    a. Are emergency loans legally regulated and have a capital limit. This was seen to be the case as shown in point 5 above.
17. *Independence in monetary policy ~ 0.5*

18. *Financial Independence ~ 1*
    a. The government is highly involved in ensuring CBE integrity.
19. *Accountability ~ 1*
    a. The governor of the CBE has been reporting to the government in a timely basis. This has also been the case with the recently appointed CBE governor, Tarek Amer.
20. *Transparency and disclosure of financial statement ~ 1*
    a. Publishes financial statements periodically and has them certified by external auditor. Their annual reports can now be accessed online, further adding to their transparency.

Criteria and the reasoning behind the scoring of an orthodox Currency Board (CB):

1. *Central Bank Objective ~ 0*
    a. A CB does not have price stability as its objective for it cannot create or mitigate inflation.
2. *Appointment and Terms of Office of the Members of NBE ~ 0.5*
    a. According to the currency board constitution, "The first two directors appointed by the government of Country X shall serve terms of one and four years. The first three directors appointed by the International Monetary Fund shall serve terms of two, three, and five years. Subsequent directors shall serve terms of five years. Directors may be reappointed once. Should a director resign or die, the appropriate organization as specified in paragraph 3(a) shall choose a successor to complete the remainder of the term" (Hanke& Schuler, 2015).
3. *Structure of Central Bank Board ~ 0.5*
    a. Two of the initial directors of the CB are appointed by the government. Whether these are government officials or not depends on the decision made. The assumption made is that they are government officials, thus generating a score of 0.5.
4. *Removal of Board Members ~ 0.5*
    a. Paragraph 4 of the CB constitution states that the board of directors have the right to hire and *fire* the CB staff. There is definitely no 2-step process involved here, and once again whether this done is done under legal grounds or not would affect the scoring. It is assumed that the removal is done under legal pretexts.
5. *NBE credit to government ~ 1*
    a. CB cannot finance the domestic government if it begins to face economic debt. It is prohibited from doing so.
6. *Lender of Last Resort ~ 1*
    a. A CB is not a lender of last resort. Financial institutions within the economy facing bankruptcy will have to look for alternative measures.
7. *Independence in monetary policy ~ 1*
    a. A CB has a constitution thatclearly states its objectives and thus allows for transparency. Moreover, it is "protected from political pressure" or at least it is supposed to be.
8. *Financial Independence ~ 0.5*
    a. The government is minimally involved with the CB and thus is not responsible for ensuring its integrity.
9. *Accountability ~ 0*
    a. Since the CB is not directly involved with the government, the directors do not necessarily meet with the government in a periodic manner.
10. *Transparency and disclosure of financial statement ~ 1*
    a. Due to the simplicity of the activities occurring within a CB, opaque activity is quite rare to find. It is also meant to publish financial statements at a minimum of a quarterly rate.

Appendix C. *Case Study of Currency Board Success: Bulgaria*

The potentially galvanizing effect of a currency board on an economy is exemplified by Bulgaria, whose currency boardstabilized prices and boosted productivity. The conditions the currency board system faced were far more challenging than those presently existing in Egypt.

Until 1997 the Bulgarian National Bank (BNB) operated as Bulgaria's central bank, issuing the Bulgarian lev. The Bulgarian financial system experienced structural issues in 1996, causing closure of nearly one-third of the banks. Inflation skyrocketed to 2040.4 percent by the first quarter of 1997 due to poor domestic confidence in the lev and a surplus of loans to banks nearing bankruptcy.

To combat hyperinflation, Bulgaria began implementation of a currency board in May 1997, setting the exchange rate at 1000 Bulgarian leva per German mark. To establish a currency board system, Bulgarian law was altered to both allow the International Monetary Fund to assist in the economy's stabilization and create a fiscal reserve account that ensures Bulgaria's government has the reserves to adhere to any budgetary issues. The Bulgarian National Bank continued in existence, but under different guiding rules.

Table C1 shows key economic factors, such as percent change in real GDP and inflation rate, before and after the implementation of the currency board. During the first quarter of 1996, real GDP dropped by 10.9 percent and inflation hit 310.8 percent. At its worst, Bulgaria's inflation hit over 2000 percent, and real GDP growth hit negative 69 percent.

Table C1. *Macroeconomic indicators before and after Bulgaria's adoption of a currency board (percent); first quarter (Gulde, 1999).*

Macroeconomic indicators before and after Bulgaria's adoption of a currency board
(percent)

			First quarter		
	1995	1996	1997	1997	1998
Real GDP growth	2.1	—10.9	...	—69	3.5
Inflation[1]	32.9	310.8	2,040.4	578.5	1.0
Fiscal balance (percent of GDP)	—6.4	—13.4	—62.1	—2.1	1.3
Bank financing of fiscal balance	4.9	14.5	40.7	—3.2	—0.3
Growth in reserve money	50.5	92.4	780.0	780.0	9.8 [1]
Growth in real broad money	5.1	—45.4	—75.3	—32.3	2.8
BNB credit to banks (percent change in monetary liabilities)	—7.8	122.4	67.5	4.5	—36.6
Foreign reserves including gold (million dollars)	1,546.0	781.0	826.0	2,474.0	3,056.0
In months of imports	2.9	1.6	1.7	5.1	6.1
Nominal interest rate differential[2]	19.4	116.6	128.6	0.03	0.38
Exchange rate (lev/U.S. dollar)	70.7	487.4	1,021.9	1,776.5	1,675.1
Exchange rate (lev/deutsche mark)	49.3	313.4	946.9	1,000.0	1,000.0

Source: IMF.
[1] Twelve-month change, end of period.
[2] End-of-year differential between three-month deposit rates in Bulgaria and Germany.
... Indicates data not available.

After the currency board took effect, inflation dropped to 1 percent by the beginning of 1998, and GDP growth returned to a healthy 3.5 percent. Today the currency board remains, pegging the lev to the Euro - no longer the mark - "[tying] the level of levs in circulation to the level of foreign exchange reserves" (Novinite Insider, 2015).

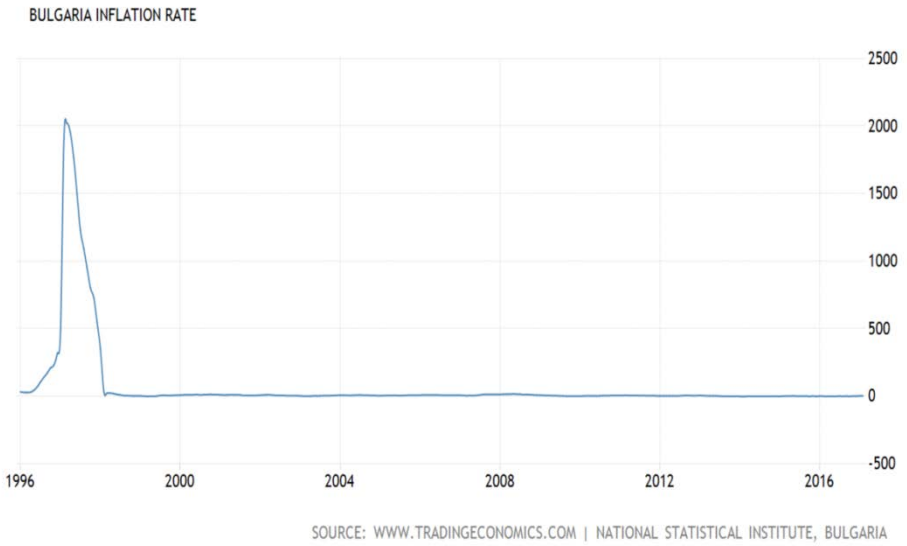

Figure C1. *Bulgaria's annual inflation rate, 1996-2017*

Figure C2. *Bulgaria's annual real GDP growth rate, 1996-2017*

Appendix D. *Balance Sheets*

This appendix includes samples of balance sheets of the Central Bank of Egypt and the aggregate of all commercial banks in Egypt. Digitized balance sheets of the NBE and CBE covering the years 1900 to 2016 can be found in the associated Excel file.

End of December	1990	1991	1992	1993
First: Notes Issued and Cover	13,456	14,731	16,751	19,085
Gold	1,281	2,179	2,046	2,198
Government Securities	12,175	12,552	14,705	16,887
Second :Banking Operations				
A- Assets				
Gold and SDRs	3	9	196	241
Balances with banks and correspondents abroad	9,314	21,212	38,698	51,494
Earmarked balances	266	756	735	810
Foreign securities	424	2,513	6,330	6,436
Payment agreements	1,078	1,287	1,280	1,274
Cash in vaults and banks	221	419	336	338
Government securities of which :	18,085	20,105	17,940	14,243
Treasury bills	---	---	---	6
Loans and other debit balances	24,652	28,757	30,269	27,643
Debit balances and fixed assets	1,205	3,214	3,057	2,445
Assets = Liabilities	**55,248**	**78,272**	**98,841**	**104,924**
B- Liabilities				
Deposits and other accounts	48,095	63,958	82,771	86,483
Payment agreements	53	36	48	41
Capital	100	100	100	100
Reserves	1,035	1,588	2,017	2,169
Provisions	117	118	204	245
Other Balances	5,848	12,472	13,701	15,886

Source: Economic Review, Central Bank of Egypt, Vol. XXXIV No.2 1993/94.

Figure D1. *Financial Position of the Central Bank of Egypt*

End of	1990 Dec.	1991 Dec.	1992 Dec.	1993 Dec.	1994 June
Assets					
Cash	1,018	1,162	1,416	1,775	2,285
Securities & investments of which:	8,267	19,573	41,613	41,991	45,969
Treasury bills	---	6,229	19,102	22,101	26,085
Government securities excluding bills	6,190	11,073	19,482	16,005	15,752
Balances with banks in Egypt	20,106	23,837	23,075	28,579	27,942
Balances with banks abroad	19,832	30,983	25,966	24,415	26,191
Loans & discount balances	39,461	45,133	46,031	55,531	59,674
Other assets	12,848	10,256	14,899	13,983	8,904
Assets = Liabilities	**101,532**	**130,944**	**153,000**	**166,274**	**170,965**
Liabilities					
Capital	1,108	4,174	4,207	4,600	5,057
Reserves	1,336	1,475	1,744	2,044	2,220
Provisions	4,587	6,064	8,544	9,866	10,168
Bonds & long term loans	184	290	292	302	454
Obligations to banks in Egypt	5,893	7,238	6,598	10,106	12,004
Obligations to banks abroad	6,439	7,659	3,355	1,971	1,701
Total deposits	70,483	89,559	110,999	120,411	125,655
Other liabilities	11,502	14,485	17,261	16,974	13,706

Figure D2. *Aggregate balance sheet of commercial banks in Egypt*

National Bank of Egypt

L.E. (millions) Year	2008	2009	2010	2011	2012	2013	2014	2015
ASSETS								
Cash	10,261	11,128	12,448	14,830	14,534	29,227	27,276	27,381
Securities & Investments in TB's, of which:	201,858	332,597	405,895	474,176	555,326	653,889	825,524	1,016,025
Balances with banks in Egypt; of which:	278,185	173,482	200,719	117,010	104,269	131,326	174,786	240,336
Lending and discount balances	1,307	775	729	885	978	953	363	1,500
Balances with banks abroad; of which:	122,792	77,120	57,371	96,080	75,905	77,012	78,742	54,834
Lending anmd discounting balances	2,448	1,869	2,004	1,398	2,714	1,800	2,284	1,520
Clinets' Loan and discount balances	401,425	429,957	465,990	474,139	506,736	549,120	587,852	717,999
Other assets	68,790	67,709	78,232	93,455	109,390	123,275	122,693	142,404
Total Assets	1,087,066	1,094,637	1,223,388	1,271,973	1,369,852	1,566,602	1,819,520	2,201,999
Assets = Liabilities Reported	1,083,311	1,091,993	1,220,655	1,269,690	1,366,160	1,563,849	1,816,873	2,198,979
LIABILITIES								
Capital	37,576	41,550	46,598	59,049	67,345	72,061	77,555	92,550
Reserves	19,763	21,371	28,486	22,056	25,539	35,838	47,022	50,080
Provisions	62,314	69,748	70,418	55,105	54,127	61,264	62,777	66,049
Bonds & long-term loans	22,285	22,045	21,697	26,180	27,840	30,312	30,168	38,453
Obligations to banks in Egypt	98,699	31,004	53,881	28,171	19,009	25,608	17,858	20,763
Obligations to banks abroad	13,327	18,195	20,305	15,168	14,792	15,222	14,699	30,147
Total deposits	747,199	809,694	892,492	957,037	1,023,517	1,186,985	1,429,432	1,734,178
Other liabilities; of which:	82,148	78,386	86,778	106,924	133,991	136,559	137,362	166,759
Payable cheques	4,450	3,576	4,764	5,143	4,848	4,850	6,880	8,175
Total Liabilities	1,087,761	1,095,569	1,225,419	1,274,833	1,371,008	1,568,699	1,823,753	2,207,154

Figure D3. *CBE Balance sheet assets and liabilities for the years 2008 to 2015 (Central Bank of Egypt, 2015). In the report, the total value of assets does not equal that of liabilities. The reasons for the differences are not made apparent in the CBE's annual reports. The reported figure of assets and liabilities for each year is shown by the line "Assets = Liabilities Reported."*

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