V Financial Liberalization and Monetary Reforms

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Jordan’s financial system has expanded considerably over the last two decades, as evidenced by the increase in the ratio of money and quasi money to GDP from 60 percent in 1970 to over 100 percent in the late 1980s. Like the rest of the economy, the financial system in Jordan was adversely affected by the financial crisis of the late 1980s. Thereafter, it strengthened significantly as a result of the implementation of structural reforms, a general rebounding of economic activities after 1992, and the associated increased profitability of the commercial banks. Although the financial system is deeper than before, it is still dominated by a small number of domestic banks; the variety of financial instruments for users and providers of funds is rather limited; the capital market—with the exception of the stock market—is extremely thin. In general, like in many other developing countries, the financial system faces the challenge of funding the most efficient investments while managing risks and integrating with world financial markets.

Background and Developments

In 1970, the Jordanian banking system was underdeveloped and comprised eight commercial banks, of which four were branches of foreign banks. The largest domestic bank and the largest foreign bank accounted for half the total branches of domestic and foreign banks in Jordan, respectively. Twenty years later, the number of banks has increased threefold; the total number of branches has risen from 41 to more than 300 and are spread all over the country (Figure 5.1). The deepening of the financial system during these two decades encompassed many areas: banking intermediation has been enhanced, the payments system improved, and an active stock exchange established.

The banking system played an effective role in intermediating short-term savings and long-term financing requirements. Total outstanding credit facilities of commercial banks increased from 20 percent of GDP in 1970 to more than 60 percent of GDP in 1994, reflecting a deepening of private sector financing. Simultaneously, the role of the specialized credit institutions as major intermediating institutions expanded considerably. Their total loans and advances to the private and public sectors stood at 20 percent of GDP in 1993, compared with less than 7 percent of GDP in the early 1970s.

The payments system also improved considerably, with the commercial banks’ clearing operations reaching 7.2 million checks in 1993, compared with less than 500,000 in 1970. The shift from cash holdings toward time and savings deposits was reflected in an unprecedented growth of resident deposits in the banking system, which increased from 20 percent of GDP in 1970 to about 90 percent of GDP in 1993 (Chart 5.1). This rapid monetization of the economy resulted in a downward trend in the income velocity of money during the 1980s (Appendix I).

Performance of the financial system was further enhanced by the establishment in 1976 of the Amman Financial Market (AFM) for trading in securities. Since its creation, the AFM has expanded its operations rapidly, making it one of the most active emerging markets in the Middle East.

Operation of Monetary Policy, 1970-88

Monetary Developments

Jordan’s inflation during the 1970s and through the late 1980s was generally low, reflecting in part a

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1The banking system in Jordan consists of the Central Bank of Jordan, 6 foreign commercial banks, 16 domestic commercial banks (of which 1 operates on the basis of Islamic financial principles), 7 financial institutions, a number of financial institutions that do not accept deposits, including the Social Security Corporation, and 18 insurance companies.

2Traditionally, the financial depth of an economy is measured by the ratio of liquid liabilities to GDP, assuming that the size of the financial intermediary sector is positively correlated with the provision of financial services. Total liquid liabilities of the financial system may be proxied by the ratio of money and quasi money to GDP. In Jordan, this ratio has doubled since 1970, to reach 125 percent in 1993.
Figure 5.1. Banking System

National Banks

1964 Central Bank of Jordan 3

Commercial Banks

1930 Arab Bank PLC 29 40
1956 Jordan National Bank 34 4
1960 Bank of Jordan 37 24
1960 Cairo Amman Bank 20 13
1977 Jordan Kuwait Bank 17 7
1978 Jordan Gulf Bank 27 2
1989 Arab Banking Corporation (Jordan) 9 0
1991 Business Bank 9 0

Islamic Banks

1979 Jordan Islamic Bank for Finance and Investment 29 2

Investment Banks

1978 Arab Jordan Investment Bank 8 7
1989 Jordan Investment and Finance Bank 4 0
1980 Amman Bank for Investments 4 3
1991 Union Bank for Savings & Investment
1993 Philadelphia Investment Bank
1993 Middle East Investment Bank

Specialized Credit Institutions

Public Ownership

1959 Agricultural Credit Corporation 16 0
1965 Housing and Urban Development Corporation 1 0
1966 Cities and Villages Development Bank 2 0

Joint Ownership

1965 Industrial Development Bank 3 0
1968 Jordan Cooperative Organization 10 7
1974 Housing Bank 109 7

Other Financial Institutions

Money Changers

In Amman 44
Outside Amman 28

Contractual Credit & Saving Companies

1984 Beit Al-Mal Saving and Investment for Housing Company, Ltd. (Beitna) 6 0

Representative Offices 2

Note: Year of establishment is given.
1 Resulted from the merger of DARCO company and Jordan Finance House.
2 Previously known as REFCO.

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prudent stance of monetary policy. Money and quasi money expanded at an annual average rate of 18 percent during 1970–88, mainly as a result of the expansion in the net domestic assets of the banking system; these increased by 14 percent (as a percentage of the beginning period stock of broad money) on average during the period. By contrast, the rate of expansion in net foreign assets was limited to 4 percent on average during 1970–88. The bulk of the domestic liquidity expansion took the form of credit to the private sector, which rose by about 10 percent on average during the period. Borrowing by the Central Government and the public entities remained relatively small, rising on average by 6 percent a year during 1970–88. However, beginning in the early 1980s, a shift took place in the relative composition of the domestic credit expansion. The rapid expansion in claims on the private sector started to moderate in 1979, decelerating from about 25 percent (as a percentage of the beginning period stock of broad money) to 2.8 percent in 1987, whereas credit to the public sector started to rise at a double-digit rate.

Credit Expansion Driven by the Public Sector

As a result of the expansionary fiscal policy stance from the mid-1980s, Jordan’s public finances deteriorated rapidly during 1987–88. As receipts of foreign grants declined steadily, recourse to domestic bank borrowing to finance the growing budget deficits increased sharply. Claims on the Government increased by 130 percent in 1987 and by 50 percent in 1988. This development together with a concomitant rapid increase in credit expansion to public sector enterprises resulted in a sharp expansion in the net domestic assets of the banking system. In the event, the annual rate of expansion of broad money (money and quasi money) averaged 13 percent during 1987–89, a period during which the real economy was stagnant or in recession. Thus, the economy was driven by government demand, which resulted in a large transfer of savings from the private to the public sector, crowding out private sector activities, and, ultimately, weakened the role of the banking system.

Use of Monetary Instruments Until the Late 1980s

From the early 1980s through 1988, money and credit policies were essentially geared toward stimulating domestic economic activity. Accordingly, commercial banks' reserve requirements, liquidity ratios, credit guidelines, and interest rate ceilings were adjusted frequently to support bank liquidity and encourage domestic lending. Some of the instruments used to this effect included lowering the ceilings on balances held abroad in relation to their current foreign commitments, extending credit against securities, lowering the maximum lending rate charged by the commercial banks and financial companies and the interest rate ceilings on time and savings deposits, and expanding and easing the use of the export credit facility. In 1987, the Central Bank introduced further measures to bolster bank liquidity and thereby facilitate domestic lending activity. These measures included lowering the amount that commercial banks were required to invest in stocks of public shareholding companies to 9 percent from 15 percent of their capital and reserves; reducing the amount of treasury bonds that the commercial banks

3The average rate of inflation was contained at about 6 percent during the decade through the late 1980s.
Monetary Policy Under Government Stabilization Programs, 1988—94

Use of Monetary Instruments

In late 1988, the authorities began to tighten monetary policy significantly in the wake of the emerging balance of payments crisis and intensified pressures on the exchange rate and domestic prices. To encourage domestic savings mobilization, banks removed ceilings on deposit rates, and banks and financial institutions increased their maximum base lending rate in September 1988 and February 1989. The commercial banks’ interest rate structure was completely freed in February 1990, following the removal of ceilings on the base lending rate, at which time the base lending rate (including commission) edged upward to about 12 percent in September 1990, and the effective lending rate increased to 12–13 percent.

The Central Bank also raised its rediscount rate and the rate on advances to commercial banks to 7 percent from 5.75 percent in September 1988, further increasing the rates to 8.5 percent by August 1989 and restoring positive real interest rates by 1991 (Chart 5.2). In line with the increase in the interest rate structure, in August 1989, the Central Bank also raised the rate of the export financing facility to 8 percent for exports to Arab countries that had trade agreements with Jordan and to 6 percent for exports to other countries. The rates on government securities were also raised during 1989–90. The rates on treasury bills were increased from 5 percent in 1988 to 6.25 percent in September 1990, and the interest rate on government bonds with a maturity of six years was increased to 9 percent.

In addition to raising the interest rate structure, the Central Bank began, in late 1988, to tighten domestic credit expansion. It raised the required reserve ratios on time and savings deposits in Jordan dinars to 9 percent from 6 percent—the same ratio that was applied to dinar demand deposits. The Central Bank further increased the required reserve ratio on dinar deposits to 11 percent effective October 1989. Moreover, commercial banks were required to place on deposit with the Central Bank 35 percent of their foreign currency deposits (of residents and nonresidents), including advance import deposits denominated in foreign currency by June 1989. To attract foreign currency deposits to the banking system, residents were allowed, as of July 1988, to deposit JD 50,000 with commercial banks and financial institutions, up from JD 30,000; this limit was raised to JD 150,000 in September 1990. In October 1990, a reserve ratio of 5 percent was imposed on investment banks, and the minimum ratio of capital and reserves that banks and finance companies were required to hold in public shareholding companies was raised to 20 percent from 15 percent. A measure to tighten credit entailed prohibiting commercial banks from extending credit against foreign currency deposits and restricting

4 An internationally competitive interest rate is payable on these foreign currency deposits and a penalty of 10 percent a year (payable in foreign currency) is required on the amount of the shortfall.

5 Jordanians working abroad are exempt from these limits.
their overdraft facilities to 20 percent of their credit facilities. Financial institutions were prohibited from extending credit in excess of JD 200,000 to any one client without prior approval from the Central Bank. Ceilings were also imposed on credit expansion to banks' board members and employees, as well as to limited private sharing companies.

Following a tightening from late 1988 through 1990, the credit policy stance remained broadly unchanged in 1991 in the aftermath of the regional crisis and was further tightened during 1992–94. Inflation (as measured by the consumer price index) decelerated sharply during 1989–94 and returned to its historic low levels, which were comparable with inflation performances in industrial countries and considerably lower than in many countries in the Middle East region. In view of the credit expansion to the private sector (by over 7 percent of the beginning period stock of broad money) in the first quarter of 1992 and persisting excess liquidity in the banking system, the Central Bank adopted a series of restrictive measures. It raised reserve requirements by 2 percentage points, to 13 percent on commercial banks and to 7 percent on investment banks in April 1992, and by an additional 2 percentage points in early 1993, with a view to siphoning off excess liquidity. Furthermore, the Central Bank used moral suasion with commercial banks to restrain lending.

In May 1992, the Central Bank implemented additional measures. First, it opened a new six-month deposit facility for commercial banks with an interest rate of 4 percent. Second, it introduced, for the first time, a capital adequacy ratio of 1 to 10 of capital (including reserves) relative to credit for all commercial banks. Third, it established a new maximum loan-to-deposit ratio of 90 percent. All commercial banks were required to observe both the capital adequacy ratio and the loan-to-deposit ratio. Commercial banks that were in violation of any of these ratios had to consult immediately with the Central Bank on a timetable to achieve compliance.

The credit rationing resulting from the use of direct instruments for credit control prevented the development of proper market instruments to allocate scarce financial resources efficiently. The money multiplier increased in the early 1980s, reflecting the fall in the public’s cash to deposit ratio, and it decreased during 1987–90, partly because of the regional financial and political turmoil (see Appendix II). The money multiplier had recovered to its pre-crisis level by 1991 and remained at about this level thereafter.

In 1994, monetary policy was geared toward maintaining the attractiveness of financial assets denominated in Jordan dinars, in support of the exchange rate policy, and building up gross official reserves to a more comfortable level. Consistent with this policy, interest differentials in favor of assets denominated in Jordan dinars were increased to 2.7–2.9 percentage points vis-à-vis assets of similar maturity denominated in U.S. dollars. The effect of this high interest rate policy was to limit broad money expansion to 8 percent, below the nominal GDP growth of 9.9 percent. The increase in the net domestic assets of the banking system was limited to 6.6 percent of the beginning period stock of broad money, partly because of the tight credit stance but more directly because of net repayments to the banking system by the Central Government and the contractionary effect of other items (net) associated with the accumulation of reserves and capital by commercial banks.

**Banking Supervision and Regulatory Measures**

Bank supervision was strengthened in 1989 in the wake of the financial problems facing two major domestic commercial banks (Petra Bank and the Jordan Gulf Bank). The insolvency of Petra Bank surfaced in August 1989, following the bank's inability to comply with the directive requiring all banks to place 35 percent of their foreign currency deposits with the Central Bank of Jordan. The authorities acted promptly to prevent a banking crisis by shoring up Petra Bank's reserves so that it could meet the run on its deposits and settle some of its foreign obligations. Financial support was provided through an overdraft facility with the Central Bank. Moreover, the Economic Security Council created a special committee to oversee the operations of the Petra Bank. Finally, the Central Bank issued a number of additional regulatory measures governing loan loss provisioning, capital adequacy requirements, and portfolio management of the commercial banks (see Box 5.1).

**Development of AFM**

Together with the Istanbul Stock Exchange, the AFM is one of the leading capital markets of the Middle East. It ranked fifth out of 45 emerging markets in terms of total return index in 1992. The ratio of Jordan's market capitalization to GDP, which

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1. Previous facilities were for a duration of up to three months, and carried interest rates of 1–2 percent. Reserves held at the Central Bank under the previous facilities amounted to about 6 percent of the money stock.

2. For more details, see Mohamad El-Erian, and Mannohan S. Kumar, "Emerging Equity Markets in Middle Eastern Countries," *Staff Papers*, International Monetary Fund, Vol. 42 (June 1995), pp. 313–43.
Box 5.1. Banking Crisis of 1989–90

The collapse of a major bank in August 1989, the third-largest banking institution in Jordan, together with the emergence of financial difficulties in six other financial institutions linked to it jeopardized the integrity of Jordan’s banking system. The banking crisis emerged for three main reasons: (1) inadequate banking regulations, (2) overexposure of the banking system to the real estate market, and (3) imprudent speculation on foreign exchange.

One of the main reasons for the emergence of a major banking crisis in the late 1980s was the lack of proper banking supervision and prudential regulation. The specialized financial institutions, which are oriented toward long-term sectoral projects and are thus likely to be exposed to risky intermediation, were not under the surveillance of the Central Bank but were supervised by their own sector ministries. The Central Bank was limited to ensuring that commercial banks complied with five critical operating ratios and to approving any credit in excess of JD 500,000 granted by a commercial bank. However, this prudent credit management seems to have discouraged the commercial banks from doing the proper risk credit analysis in their loan allocations. More important, Jordan’s accounting regulations for loan loss provisions were inefficient in identifying nonperforming assets early because decisions to build provisions were usually delayed until after the final court decision on the destitute asset was rendered. These weaknesses in the regulatory framework resulted in widespread fraudulent practices and mismanagement that the monetary authorities failed to detect.

Loans collateralized with real estate property became nonperforming during the real estate market slump of the late 1980s. In the aftermath of the second oil shock, Jordan registered large inflows of workers’ remittances, which reached an all-time high of $1.3 billion (about 25 percent of GDP) in receipts from abroad in 1984; this injection of demand led to a rapid expansion of private sector construction activities, and exposure of the banking system. As speculative real estate activities collapsed in the late 1980s, together with the collateralized values of real estate loans, several banks were highly exposed, with numerous nonperforming assets in their balance sheets.

Banks’ excessive exposure on their foreign exchange position also contributed to this crisis. Before 1987, the Jordan dinar was strictly pegged to the SDR in nominal terms. In 1987, with the weakening of Jordan’s balance of payments position, a parallel market for foreign exchange emerged, and financial institutions were overexposed, with high levels of foreign obligations. In several cases, speculative operations in the form of positions between the official and parallel exchange markets resulted in the loss of almost the entire foreign assets of the banks.

To preserve the security of the entire banking system from the systemic risk of chain failures, the Central Bank had to inject $400–500 million (about 10 percent of GDP in 1989) into the banking system through its overdraft facility to meet the run on insolvent banks’ deposits and to settle some of their foreign obligations. This very large injection of liquidity was reflected in both the Central Bank’s balance sheet and the monetary survey through the growth of reserve money and money and quasi money aggregates. Both monetary aggregates increased by more than 13 percent in 1989 and contributed to fuel inflation, which peaked at 26 percent, at a time when real GDP was contracting by 13.5 percent. Since 1990, the Central Bank has gradually begun to recover a part of these unsecured assets; by mid-1994, it had recovered 20 percent of the total cost of the bailout operations.

In the wake of the banking crisis, the Central Bank issued a number of additional regulatory measures aimed at improving its surveillance over the banking system. Specific measures governing loan loss provisioning, capital adequacy requirements, and portfolio management of commercial banks were enacted. As regards provisioning for bad loans, the guideline issued in 1992 required provisioning of 50 percent for loans for which banks had not received any payments for more than 180 days but less than one year, and 100 percent of the loan amount for loans for which the banks had not received payments for more than one year or for which the banks had determined that no repayment would be expected. Regarding general provisioning for ordinary bank credit, 1–2 percent would be required for direct credit facilities and 0.25–0.50 percent for indirect credit facilities. The guideline also streamlined the procedure for notifying the Central Bank about loan losses. The regulations governing capital adequacy requirements of the commercial banks issued in 1992 essentially applied the Basle Convention regarding capital adequacy to Jordan’s banking system.

A subsequent effect of the banking crisis has been to shift the composition of the assets held by the private sector, in either cash or deposits, in favor of assets denominated in foreign exchange. In the event, the combination of low nominal interest rates, high anticipated inflation, and the perception that further depreciation of the Jordan dinar may follow contributed to a fall in the demand for holdings of Jordan dinars. Thus, by 1989, about 30 percent of the increase in broad money was in the form of an increase in residents’ foreign currency deposits, which in part reflected the valuation gains arising from the dinar’s depreciation.\(^1\)

\(^1\)The major bank accounted for more than 10 percent of the total assets of the banking system in 1989. Total bad assets were believed to represent up to 20–30 percent of the total assets of the banking system.
stood at about 74 percent in 1992, exceeds that of most emerging markets and is similar to that of industrial countries (Table 5.1). Instruments traded on the stock exchange include private corporate equities and bonds, Jordanian government bonds and treasury bills, and development bonds. The bull or bear markets of the 1980s were determined by developments in workers' remittances (which were themselves closely correlated with movements in international oil prices). The impressive performance of the AFM was also attributable to the fact that it did not have to compete in an environment of perverse yield curve, such as rates of return on fixed interest deposits well in excess of the rate of inflation, resulting from government intervention. Market capitalization stood at $4.7 billion as of the end of December 1994, and the number of shares traded in 1994 amounted to 134 million for a total value of $620 million.

Since 1990, the performance of the market has improved steadily, with the AFM index registering annual gains averaging 25 percent and the index of total returns improving markedly. However, during 1993–94, the AFM was somewhat less buoyant than in 1992 because of a tightening of credit since the second half of 1993; the number of trade shares declined by 30 percent, to JD 245 million in 1993 and to JD 134 million to 1994. Since 1990, the increase in the index has been broadly based, with the industrial sector registering the best performance, followed by insurance, banking, and other services. Unlike other emerging capital markets, the AFM is dominated by domestic commercial banks and is characterized by low foreign participation. Although the influence of foreign investors is increasing, most market participants are Jordanian (85 percent in 1992). Residents of some neighboring Arab countries also participate in the stock market. Although repatriation of investment income in any convertible currency out of Jordan by Arab and non-Arab investors is free of restriction, foreign participation by residents of non-Arab countries has so far been limited.

A range of economic and institutional circumstances have contributed to the successful development of the Jordanian equity market since 1990, considerably enhancing investors' confidence in Jordan's economic potential. These circumstances include Jordan's recent gains in macroeconomic stabilization, and the progress it has made in reducing the external debt and debt-service burden, normalizing payment relations with external creditors, and liber-
alizing the exchange system. As regards institutional factors, Jordan has embarked on comprehensive financial liberalization aimed at better mobilizing and allocating domestic and foreign resources. In particular, the Jordanian authorities decided to improve the trading, reporting, and accounting systems; strengthen legal procedures; and liberalize regulations governing foreign direct and portfolio investments, including ownership, market access, and repatriation of capital, dividends, and profits.

Ongoing and Prospective Financial Reforms

Although the Jordanian authorities have not issued a detailed blueprint for further financial reform, they have already either implemented some elements or referred to them in official pronouncements. The authorities' strategy, in general terms, entails (1) controlling monetary conditions using the new instruments of indirect monetary control (Appendix III); (2) maintaining all interest rates positive in real terms and achieving much more flexibility in interest rates than in the past, with a view to achieving efficient market-based mobilization and allocation of loanable funds; (3) using central bank CDs denominated in Jordan dinars in a manner that would enable the authorities to respond to shifts in the flow of foreign assets and movements in the exchange rate, and to maintain the liquidity of the banking system consistent with domestic price stability; (4) eliminating redundant monetary control instruments, particularly following the effective introduction of indirect monetary controls, and improving the efficiency of the remaining necessary monetary instruments; (5) removing impediments to the development of the interbank market; and (6) improving efficiency through enhanced competition among commercial banks and specialized credit institutions, such as the Housing Bank, the Industrial Development Bank, and the Agriculture Credit Corporation.

The authorities have made considerable progress recently in a number of areas of structural reform.

First, the Central Bank has held weekly auctions of CDs since September 1, 1993 and, since then, has increasingly used this indirect instrument to exercise control over reserve money. For the indirect system of control to have its desired impact, the Central Bank must maintain reserves close to their required minimum level at all times by developing proper monetary programming techniques, including testing, and by improving reserve forecasting. The auctions of CDs are being coordinated with the auctions of treasury bills in terms of timing and settlement, eligible holders and bidders, and the range of maturities offered.

Second, in line with the steady implementation of indirect monetary control operations, the Central Bank streamlined certain facilities and is improving existing facilities by (1) replacing the deposit facilities by CDs as the term deposits mature; (2) eliminating the credit-to-deposit ratio once the indirect monetary control program becomes effective—on prudential grounds, the authorities have already adopted the Basle standards regarding the risk-based capital-to-assets ratio; and (3) viewing the liquidity ratios as having a useful prudential function but not as monetary instruments. The Central Bank is also (1) gradually reducing reliance on obligatory reserve requirements as a monetary policy instrument; (2) improving the operations of reserve requirements by gradually unifying and reducing the reserve requirements for all banks; and (3) eliminating or reducing preferential credit facilities and providing subsidies explicitly through the budget.

Third, the authorities are planning to remove the current impediments to the development of the interbank market. To this end, they eliminated the practice of double reserve requirements on interbank deposits in 1994.

Appendix I: Money Demand Function

Broad money demand (money and quasi money) is usually analyzed using the income elasticity of money demand or, more directly, the income velocity of money.

The transactions demand, the precautionary demand, and the speculative demand for money are usually proxied in the money demand function with key macroeconomic variables, in particular, real GDP, consumer prices, and other variables such as interest rates or real wealth. The estimation of the money demand function in Jordan is complicated by a number of economic factors (such as the policy of direct monetary control, the recent switch toward indirect control, erratic inflows of labor remittances, and transfers of workers' savings) or political factors (such as the August 1990 regional crisis, and recent developments and prospects in the West Bank and Gaza Strip). However, a rough estimated relationship for 1980–93 suggests a long-term income elasticity close to unity and that real demand for money increases with inflationary trends and thus is sensitive to money illusion (Chart A1).

Income money velocity, defined as the ratio of nominal GDP at market prices to outstanding money and quasi money at the end of the period, decreased steadily during most of the 1980s, from 1.2 in 1981 to 0.8 in 1989 (Chart A2). This downward trend reflected essentially the monetization of the economy.
during the 1970s and 1980s. Since 1989, the ratio has fluctuated within a narrow range and has been relatively stable.

In the absence of quarterly national accounts, the quarterly path for money demand can be captured with the seasonal information content in available historical data. Chart A3 presents the quarterly demand for money as a percentage of the annual change in money demand. It appears that the largest expansion in money demand generally occurs during the first two quarters of the year, in line with the seasonal pattern for credit and investment. On average, 75 percent of the year’s money demand is reached by midyear, and the last two quarters account for only 25 percent.\(^8\) Except during 1988–92, when special factors affected the financial system, this seasonal pattern appears rather robust.

\(^8\)On average, the annual distribution for money demand is 30 percent for the first quarter, and 45 percent, 15 percent, and 10 percent, respectively, for each subsequent quarter.

Appendix II: Money Multiplier and Reserve Money, 1980–94

Ex post, the money multiplier \((k)\) is simply the ratio of the stock of money and quasi money \((MQM)\) to reserve money \((RM)\): \(k = MQM/RM\). Ex ante, the money multiplier is derived consistent with the cash-to-deposit ratio \((C/D)\), the ratio of banks' cash in vaults to deposits \((VC/D)\), the ratio of required reserves to deposits \((RR/D)\), and the ratio of excess reserves (excluding cash in vaults) to deposits \((ER/D)\): 

\[
k = (C/D + 1)(C/D + VC/D + RR/D + ER/D)
\]

This expression is derived from the following three identities:

1. \(MQM = C + D\)
2. \(RM = C + VC + RR + ER\), and
3. \(MQM = k \times RM\).

Identity (1) means that the money supply equals the sum of cash outside banks \((C)\) and deposits of the public in the banking system \((D)\). Identity (2) means that reserve money equals the sum of cash holdings outside of the banking system and total bank reserves (including banks' cash in vaults). A simple manipulation substituting (1) and (2) into (3) yields the ex ante definition of the money multiplier.

The money multiplier, that is, the relationship between reserve money and broad money, was affected by four factors during 1980–94: the public’s cash holding over time, the licensed banks’ cash in vaults,
the legal rate for reserve requirements (which is the weighted average of legal rates applicable to licensed banks on various deposits), and the licensed banks’ behavior toward constituting excess reserve (excluding cash in vaults). Accordingly, the following key constituents are analyzed for 1980–94.

**Cash-to-Deposit Ratio**

The pattern of cash holdings is reflected in the change in the ratio of currency outside banks to total deposits in the banking system. This ratio has steadily decreased since 1980, except during 1988–90 when unusual events (including the collapse of Petra Bank, the bankruptcy of several financial institutions, and the August 1990 regional crisis) temporarily undermined confidence in the banking system. This downward trend is the result of various institutional and financial innovations, including in particular the proliferation of means of payments other than cash (such as credit cards or banking transfers); and increasing confidence in the banking system. The cash-to-deposit ratio, which exceeded 55 percent in 1980, declined to less than 30 percent in the early 1990s. The estimated equation indicates that the cash-to-deposit ratio declined at an annual average rate of 1.7 percent during the 1980s and was sensitive to developments in inflation (Chart A4).\(^\text{10}\)

Furthermore, the analysis of the quarterly cash-to-deposit ratio reveals a strong seasonal pattern associated with the seasonal consumption, or demand, of the private sector. On average, the ratio declines during the first quarter, rebounds during the second and third quarters, and decreases sharply in the fourth quarter. However, the stability of this seasonality was disrupted in the late 1980s and in 1990 as a re-

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\(^9\)Twenty-two licensed banks (including the Housing Bank) have liabilities in the form of sight and time deposits payable on demand, transferable by check, or otherwise usable for making payments.

\(^{10}\)This is apparent from the following regression for the cash-to-deposit ratio during 1980–93: \(C/D = -0.017\,\text{Time} + 0.05\,\text{Inflation} + \text{Dummies} 1988-90 + 34.6 (-17.8) (5.1) \text{SER} = 1.3\%; R^2 = 0.98.\)
FINANCIAL LIBERALIZATION AND MONETARY REFORMS

result of the unusual events mentioned. Since 1991, however, this seasonal pattern appears to be holding, although it is less pronounced.

**Ratio of Cash in Vaults to Deposits**

Because of improvements in banking management and a deepening of the financial system, the ratio of cash in vaults of licensed banks to deposits decreased during the 1980s, from 1.3 percent in 1980 to 0.8-0.9 percent of deposits in the early 1990s (Chart A5). Although banks' cash in vaults, like other deposits at the Central Bank of Jordan, represents immediate and final payment, it (i.e., banks' cash in vaults) cannot currently count toward satisfying the reserve requirements. Until the treatment of cash holdings is changed so that they count as reserve assets, cash in vaults is independent of other reserve assets in Jordan's monetary program.

**Legal and Excess Reserves Ratios**

The money multiplier is highly sensitive to the ratio of banks' required and excess reserves at the Central Bank to deposits. Although legal reserves are supposed to be easily predictable because they are known institutional instruments, the existence of different reserve requirements complicates the predictability of this component. Legal reserve requirements are currently higher for commercial banks (14 percent) than for investment banks (9 percent) because of the authorities' belief that investment banks are better able to forecast their liquidity needs. In addition, with a legal reserve requirement of 5 percent, the Housing Bank was granted an exemption because of its involvement in long-term financing. As a result, the ratio of effective reserves to deposits is a weighted average of the legal rates for commercial and investment banks, and the fluctuations within the range reflect substitutions in the public deposit behavior between these banks (Chart A5). In addition, projecting the actual rate for the legal reserve requirement is complicated by the requirement that reserves be held against interbank deposits, and by the exemption of advances for export promotion toward reserve requirements.

Banks' excess reserves at the Central Bank of Jordan (excluding remunerated deposits at the Central Bank) are less predictable than legal reserves because they are related to (1) the microeconomic situation of each individual bank, (2) the interest rate and credit control (credit ceiling) policies, and (3) individual constraints on commercial banks' balance sheets. Three different phases can be identified in the evolution of the ratio of licensed banks' excess reserves to deposits during the 1980s (Chart A6). From 1980 to 1987, the ratio declined to 1 percent.

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11 Until 1988, legal reserve requirements for Jordan dinars differed according to the nature and maturity of deposits (demand, time, or savings deposits).

12 Since 1994, the Housing Bank is subject to a 15 percent legal reserve requirement on its commercial activities (which represent less than 1 percent of its total activities); and a 5 percent legal reserve requirement (which gradually increased to 9 percent in 1994) on its traditional activities.

13 In 1993, deposits in commercial banks (excluding those of the Housing Bank) represented 71.4 percent of total deposits in the banking system. The total deposits of the Housing Bank and other investment banks represented 18.3 and 10.3 percent, respectively, of total deposits in the banking system.

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from 5 percent, notwithstanding sharp fluctuations around this trend. In 1988, the ratio collapsed and turned negative, reflecting the emergence of the banking system crisis. By the early 1990s, the ratio had recovered to its pre-crisis level, and in the aftermath of the August 1990 regional crisis, the excess reserves accounted for 2.5 percent of total deposits. This latter level seemed to have been the historical average level targeted by the licensed banks to preserve themselves against an unexpected shortfall in liquidity. However, it should be noted that the effective level of excess liquidity should also include the banks’ remunerated deposits at the Central Bank, which represented half the total banks’ deposits at the Central Bank in 1992. In 1993, this component of excess liquidity appears to have been largely absorbed, mainly through the newly introduced CDs denominated in Jordan dinars. It disappeared completely in 1994 as the remunerated deposits of three and six months matured.

**Money Multiplier**

The money multiplier is defined as the ratio of money and quasi money (M2 in the case of Jordan) to the narrow concept of reserve money. Consistent with the trends in the above constituents, the money multiplier increased in the early 1980s, up to 3 by 1987 (echoing the fall in the cash-to-deposit ratio), and decreased thereafter to 2.6 by 1990, partly in response to the regional financial and political turmoil. The money multiplier recovered to its pre-crisis level by 1991 and remained at about this level thereafter, reflecting declines in both the cash-to-deposit ratio and the licensed banks’ excess reserves.

**Appendix III: Monetary Program Under Indirect Monetary Control**

As part of their medium-term structural reform program, the authorities moved from a system of direct credit controls to more market-based and indirect instruments of monetary control.

In this new monetary environment, the program aims at forecasting the Central Bank’s balance sheet in two stages. The first stage consists in ascertaining reserve money, consistent with the estimated money demand resulting from the overall macroeconomic baseline scenario (targeted growth, inflation, fiscal and external adjustments). The second stage essen-

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14 In 1991, the Central Bank promoted its three- and six-month remunerated accounts to sterilize the large inflows of foreign assets generated by labor remittances and the transfer to Jordan of workers’ or returnees’ lifetime savings from neighboring countries. These deposits accumulated to more than JD 350 million out of total deposits of JD 700 million at the Central Bank in 1992.

15 Money and quasi money includes currency in circulation and demand, saving, and time deposits of residents, denominated in Jordan dinars and foreign currencies, with both the Central Bank and the licensed banks (including the Housing Bank). Reserve money is defined as the sum of currency in circulation (currency outside banks and banks’ cash in vaults) and demand deposits of licensed banks at the Central Bank (excluding remunerated deposits and CDs denominated in Jordan dinars). In line with the recommendations of the IMF Statistics Department, a broader concept of reserve money would include all demand deposits at the Central Bank, particularly those of the financial institutions, public nonfinancial institutions, and the private sector.

16 The system of direct monetary controls consisted of a maximum loan-to-deposit ratio of 90 percent and the 10 to 1 ratio of credit to capital. These ratios were reinforced by limits on the expansion of individual bank credit introduced in late July 1993.
V  FINANCIAL LIBERALIZATION AND MONETARY REFORMS

tially forecasts the rest of the Central Bank’s balance sheet, in order to project the volume of CDs denominated in Jordan dinars that the Central Bank should auction to manage total liquidity in the banking system. The sequence in which the program is worked out is illustrated by the following relationships:

\[
\begin{align*}
(1) & \quad RM = MQM (targeted) + m (projected), \\
(2) & \quad NDA = RM - NIR (targeted), \quad \text{and} \\
(3) & \quad CDs = CREDg (targeted) + CREDbs (projected) + OIN (net) (projected) - NDA.
\end{align*}
\]

The first equation indicates the level of RM consistent with the projected money multiplier (m) and desired broad money supply MQM. The second identity gives the level of the Central Bank’s net domestic assets (NDA) consistent with the projected reserve money and targeted (or desired) level of net international reserves (NIR). The third identity indicates central bank intervention in the CD market through its sales and purchases consistent with (1) the Central Bank’s projected NDA; (2) the targeted government borrowing at the Central Bank (CREDg); (3) the estimated amounts of rediscount at the Central Bank’s credit facility windows (CREDbs); and (4) the projected changes in other items (net) (OIN). With respect to the conduct of monetary policy, the sequence is reversed: through its intervention in the CD market and its control over government borrowing and the rediscount credit facilities, the Central Bank tries to manage its net domestic assets consistent with the targeted floor of net international reserves, so as to keep reserve money at levels conducive to the country’s desired money supply.

Reserve Money and Money Multiplier

The money multiplier is estimated in line with the projections for public cash holdings, currency outside banks, banks’ cash in vaults, and legal and excess reserve requirements. The quarterly pattern should reflect the projected seasonal pattern of cash to deposits, all changes in the legal rates of reserve requirements, and the expected changes in commercial banks’ excess reserves at the Central Bank. Consistent with the adjustment program in terms of growth, inflation, and fiscal and external adjustments, the projected reserve money remains highly dependent on the quarterly demand for broad money. The money demand function may be temporarily disrupted by the financial liberalization as well as by recent developments and prospects in the West Bank and Gaza Strip.

Other Balance Sheet Items of the Central Bank

For the indirect system of control to have its desired impact, the monetary authorities must monitor the Central Bank’s NDA closely, in particular, government borrowing from the Central Bank and its rediscount credit facilities, consistent with the targeted or desired level for net international reserves. On this basis, the Central Bank would control the liquidity of the banking system by auctioning dinar-denominated CDs and by intervening in the secondary market.

Of the constituents of the Central Bank’s net domestic assets, net claims on the Central Government (CREDg) are projected in line with the contemplated fiscal adjustment and required central bank financing, and the seasonal pattern, which has been associated with government borrowing and deposits at the bank in the past.

Consistent with the program objective of building up official foreign exchange reserves, the Central

\footnote{\textsuperscript{17}Net claims on government, claims on licensed banks, and CDs denominated in Jordan dinars are the largest components of the Central Bank. Other components are either known with certainty (for example, capital accounts) or easily predictable (remunerated deposits, other items (net), and net claims on nonbanks).}

\footnote{\textsuperscript{18}The Central Bank’s net domestic assets are defined as the difference between the sum of (1) claims on the Central Government (general and own budgets), (2) claims on the Social Security Corporation, (3) claims on municipalities and local government, (4) claims on public nonfinancial institutions, (5) claims on the private sector, (6) claims on licensed banks, (7) claims on other financial institutions, and (8) unclassified assets; and the sum of (1) dinar-denominated CDs, (2) licensed banks’ remunerated deposits with the Central Bank, (3) deposits of the Central Government (general and own budgets), (4) other public sector deposits, (5) deposits of financial institutions, (6) deposits of the private sector, (7) unclassified liabilities, and (8) capital accounts. Alternatively, the net domestic assets of the Central Bank are defined as the difference between reserve money and the Central Bank’s net international reserves.

\textsuperscript{19}Jordan’s net international reserves consist of (1) gold, (2) its IMF reserve position, (3) purchases from the IMF, (4) SDRs, (5) treasury bills and securities in foreign currencies, (6) balances and deposits in foreign currencies, (7) bilateral accounts (net), and (8) other deposits in foreign currencies less deposits of international institutions. Net international reserves are equivalent to the Central Bank’s net foreign assets, adjusted for purchases and repurchases from the IMF.

\textsuperscript{20}These consist mainly of advances to the Government, development bonds, and treasury bills.

\textsuperscript{21}By law, the Central Bank may grant an interest-free ordinary advance to the Government of up to 20 percent of domestic revenues as estimated in the general budget law. It may also extend a profit advance to the Government from its share of net profits. As regards issuance of government bonds and treasury bills, the Central Bank is not committed by law to buy any amount of the public debt issues. (The nominal value of bonds issued by the Government cannot exceed 20 percent of the actual capital expenditures of the previous year; that of treasury bills issued cannot exceed 25 percent of the average domestic revenues collected in the past three fiscal years, or of total currency in circulation, whichever is larger.)}
Bank should gradually increase the stock of gross foreign exchange reserves.22

Claims on the banking system (CREDbs) consist of the credit facilities at the Central Bank’s rediscount windows and the unsecured advances attached to the bailout of bankrupt financial institutions during the 1980s. First, concerning the rediscount facilities, the Central Bank operates a standard rediscount facility at an interest rate of 8.5 percent; because of the commercial banks’ excess liquidity, they have not drawn on this facility since 1989. However, the shift toward market-based instruments for monetary control will probably make this facility more attractive to the banks when the excess liquidity is absorbed. The Central Bank also operates two preferential credit facilities. Although they are of limited quantitative significance at present,23 the Central Bank must exercise strict quantitative control over access to its refinancing and rediscount facilities, both on standard and preferential credit facilities, and rationalize the interest rates on these facilities. Second, with respect to the unsecured advances to those banks that experienced serious difficulties during the 1980s,24 the Central Bank may expect to gradually recover part of these unsecured assets.

The amount of dinar-denominated CDs to auction is residually determined so as to balance the balance sheet of the Central Bank.

Table A1. Sensitivity of the Monetary Program to Selected Parameters

<table>
<thead>
<tr>
<th>Element</th>
<th>Money Multiplier</th>
<th>Change in Reserve Money</th>
<th>Change in Money Demand</th>
<th>Sales of CDs (net)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline scenario</td>
<td>3.02</td>
<td>5.70</td>
<td>12.3</td>
<td>84</td>
</tr>
<tr>
<td>Elementary simulation</td>
<td>2.00</td>
<td>4.70</td>
<td>5.30</td>
<td>40</td>
</tr>
<tr>
<td>Income elasticity of money demand2</td>
<td>-</td>
<td>0.04</td>
<td>0.09</td>
<td>-12</td>
</tr>
<tr>
<td>Cash-to-deposit ratio3</td>
<td>-</td>
<td>0.08</td>
<td>-0.04</td>
<td>40</td>
</tr>
<tr>
<td>Reserve requirement4</td>
<td>-</td>
<td>-12</td>
<td>-8.04</td>
<td>-27</td>
</tr>
</tbody>
</table>

Source: IMF staff estimates.

21Different from baseline scenario.
22Income elasticity of money demand 0.1 point higher.
23Cash-to-deposit ratio 0.1 point higher.
24Reserve requirement (legal or excess) 0.1 point lower.

Sensitivity of the Monetary Program to Selected Parameters

Under indirect instruments of monetary control, the monetary program is likely to be highly sensitive to its achievements in terms of growth, inflation, and fiscal and external adjustments; financial liberalization and financial innovations; and monetary and banking developments and prospects in the West Bank and Gaza Strip. In particular, the money multiplier (and thus the broad money supply) may become unstable because of public behavior with respect to holding cash25 or the banks’ behavior with respect to building excess reserves. In addition, as experienced by countries that have recently switched to more market-based instruments of monetary control,26 the demand-for-money function may not remain stable, at least during the transition period. The use of the Jordan dinar as legal tender in the West Bank and Gaza Strip and the opening of banks dealing in Jordan dinars may contribute to this instability of the demand for money. In this regard, some fluctuations in the money multiplier and in reserve money may result from variations in three selected variables: the income money velocity, the ratio of cash to deposits, and the ratio of reserve requirements to deposits (Table A1).

A money demand income elasticity that is 0.1 point higher than the baseline scenario would require an additional increase in money supply of

25The currency-to-deposit ratio is likely to vary for economic reasons, including, in particular, the opportunity cost of holding cash, but also for political reasons, especially confidence in the peace process and the development of a sound banking system in the West Bank and Gaza Strip.


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about 1.1 percentage points, a supplementary increase of reserve money of about 1 percentage point, and, consistent with the underlying level of net international reserves, the repurchase of some JD 22 million in CDs from the baseline scenario. Similarly, a ratio of cash to deposits that is 1 percentage point higher by the end of the year would allow for an additional increase in reserve money of about 1.7 percentage points and would require the purchase of JD 27 million in CDs compared with the baseline scenario. More important, a decrease in the ratio of reserves to deposits (in either legal or excess reserves) would imply lower reserve money growth of about 2.5 percentage points (compared with the baseline) and the auction of an additional JD 40 million in CDs.