Towards Adopting Inflation Targeting: The Credibility and Limitations of Monetary Policy Under The Fixed Exchange System: The Case of Jordan

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Abstract

In this paper the interest rate pass through is examined within its intermediate lag of action to shed light on the credibility of monetary policy in Jordan, where the reputation of low inflation is imported through a fixed exchange rate system to the U.S dollar. The Johansen approach is performed to estimate the long-run degree of pass-through along with the speed of adjustment to disequilibrium. The parsimonious conditional dynamic model of Hendry and Doornik (1994) is employed to connect the short-run and long-run effect, and to estimate the mean lag of adjustment under (a)symmetric market response. The results are compared to that of two inflation targeting countries at time proceeding building the credibility of price stability domestically: New Zealand and the UK. The empirical findings suggest that the interest rate pass-through in Jordan is weak and slow and the symmetric mean lags in the loan and deposit market are highly sticky. In addition, a deviation from symmetry is found in the loan market, where the mean lag is sticker to decreasing, which indicates the existence of non-competitive pricing behaviour in the market. Comparing the results to the two inflation targeters, the study suggests that Jordan needs to move to a more resilient exchange rate arrangement.

Key Words: Inflation Targeting, Jordan, Nonlinearities, Pass-through, Monetary Policy
JEL Classification: C32, E58, E42

1 Introduction

It was widely believed among the advocates of activist policies that monetary policy could keep productivity and unemployment close to their full-employment levels. The principle of policy activism was based on the tenet that the nexus between inflation and unemployment, known as the Philips curve, could be utilised to achieve a long-run low unemployment. However, the activist policies failed to deliver the promises of low unemployment and rather resulted in high inflation rates. The activism was challenged in different aspects; the most important one was the dynamics

of market agents' expectations about future policy outcomes. Both Friedman (1968) and Phelps (1968) state that the trade-off between inflation and unemployment is transitory, and in the long run, due to adjustments to market agents' wage settings, the only macroeconomic variable that can be controlled by the central bank is the inflation rate (Bernanke et al., 1999). Two decades later, namely in December 1989, New Zealand led the world to a new monetary framework called Inflation Targeting (IT), with one focused objective of monetary policy, that is, price stability. The need for a low-inflation framework which could suppress inflation and provide the leverage over the discretionary intentions of policy makers encouraged a number of middle and high income countries to follow IT. The movement to IT was supported by the failure of other monetary anchors such as monetary aggregates in the mid-1980s and the pegged exchange rate in the early 1990s.[1]

Indeed, IT has become a well-known framework for monetary policy. To date, over twenty countries have shifted their monetary regimes towards IT, and the world has been divided into inflation targeters and non-targeters. Many studies, e.g., Mishkin and Schmidt-Hebbel (2007), Hu (2003), Van der Merwe (2004), have been written to assess the benefits of adopting this framework in different developing and emerging economies. [2] Empirical evidence that focuses on whether IT strengthens the nominal anchor would be more telling about these gains.

In an early study by Bernanke and Mishkin (1997), after just seven years of the introduction of IT, the authors highlight that IT has a number of advantages related to enhancing monetary authorities transparency and accountability, and promoting the coherence of policymaking. Neumann and Von Hagen (2002) find that IT improves the credibility of central banks significantly. They further point out that this result supports the conclusion that IT is a useful regime to communicate with the public. Similarly, Mishkin and Schmidt-Hebbel (2007) examine the economic performance of IT in certain developing and developed economies that adopted IT explicitly. Their results show that the average inflation rates for all inflation targeters were reduced, and they were slightly lower than non-inflation targeters'. Recently, many studies indicate that inflation targeters have achieved lower inflation rates after IT, and their inflation rates have become even lower compared to non-inflation targeters. According to Batini et al. (2007), implementing IT controls inflation expectations and makes them consistent with the inflation target. A similar conclusion is reached by Capistrán and Ramos-Francia (2010), who argue that IT reduces the volatility of inflation expectations. Corbo et al. (2002), also state that inflation targeters have been successful at achieving their inflation targets, and they have consistently reduced inflation forecast errors.

In South Africa, for instance, Van der Merwe (2004) provides evidence that the introduction of IT has benefited the effectiveness of monetary policy. His evaluation shows that central bank transparency and accountability, which are essential to target inflation, help anchoring the market expectations of future inflation, the factors which affect the price and wage settings. Moreover, Mboweni (1999), the Governor of the central bank of South Africa, states that adopting IT, which is based on the

[1] A nominal anchor is a nominal variable that is the target of monetary policy, which restricts the price level to a certain value

[2] Such as: Indonesia, Romania, Turkey, Ghana, South Africa, Thailand, Poland, Philippines, Peru, Mexico, Hungary, Chile, and Brazil.

forward looking strategy, allows the monetary policy to reduce the changes in economic activities and output growth fluctuations.

Mishkin and Schmidt-Hebbel (2007) conclude that IT leads to a significant reduction in the volatility of output growth and output gap, namely in emerging market economies. This may happen because inflation expectations are supposed to be well-anchored under IT framework. However, Ball and Sheridan (2004) claim that their findings suggest no evidence that IT improves the economic performance of its followers, the result, which is based on a performance comparison between some industrialised inflation targeters and a control group of industrialised non-inflation targeters, contradicts the intuition that IT affects inflation, output and interest rates and ignores how IT helps economies with their disinflationary efforts. However, other studies show that IT plays an important role in enhancing the performance of economic variables. Hu (2003) assesses empirically the impact of IT on real economic variables for sixty-six countries: inflation targeters and non-targeters. He finds evidence that IT is effective in improving the performance of inflation and output, i.e., low inflation, low GDP growth volatility and high GDP growth, which is consistent with the view that the major motivation of this framework is to improve the overall economic performance. In addition, Walsh (2009) finds that inflation targeting has improved the macroeconomic performance in developing economies. The study's conclusion regarding the effectiveness of IT in emerging markets is consistent with Mishkin and Schmidt-Hebbel (2007)'s. Both reveal that emerging market economies have benefited more from IT, in terms of delivering both lower inflation and a more stable real economy, than advanced countries.

The benefits gained from this framework have encouraged more countries, namely emerging market economies and developing countries, to adopt it. Hence, several empirical studies have searched for the possibility and readiness to shift towards IT in different economies, and come up with different conclusions. In case of emerging markets, once preconditions of stable economy are met, IT can be used to shift the economy from high to low inflation equilibrium (Martínez, 2008).

Schaechter et al. (2000) illustrate that a successful IT is built upon: "central bank instrument independence, price stability as a leading objective, a well-developed financial market, well understood channels between policy instruments and inflation, and transparent policies to build accountability and credibility". Their conclusion comes from studying the mutual institutional and operational key aspects of developed and developing inflation targeters.[3] When the previously mentioned preconditions are met in an economy, it will be ready for adopting the full fledged IT. However, three main forms of IT have been identified. Full fledged IT, that is, when a country has only one final objective of maintaining low inflation, and enjoys a transparent and credible monetary policy along with a well-developed financial market and a flexible exchange rate (Mishkin and Schmidt-Hebbel, 2007). Eclectic IT when a country is able to achieve price stability as a result of its high monetary credibility, less monetary transparency, but at the same time it does not adhere to all IT's rules (Aliyu and Englama, 2009). The last form of IT is inflation targeting lite. This form is usually pursued by a country which is committed to other monetary objectives along the objective of price stability due to its vulnerability to

[3]Study conducted by the Monetary and Exchange Affairs for Emerging Market Department at the IMF.

external shocks and its weak financial market (Angeriz and Arestis, 2007).

Undoubtedly, adopting IT across developed countries has encouraged emerging market economies to move towards this framework. However, the experience of IT in developing countries reflects that a transition period was needed to adopt the highest form of IT, i.e., the full-fledged. Therefore, many scholars have studies the readiness of developing inflation targeters to move towards the full-fledged IT, while others have focused on assessing the ability of developing non-inflation targeters to follow IT framework.

Alamsyah et al. (2001) investigate whether Indonesia was able to follow the full-fledged IT after the introduction of the new central bank Act of May 1999.[4] The findings suggest that the existing preconditions cannot be satisfied and need to be improved. In Hungary, Siklos and Ábel (2002), find that the country is ready for full-fledged IT, although the relative responsibilities and expectations of the central bank and government need clarification and elaboration.

Jha (2008) assesses the readiness of India to adopt IT, by examining the existence of a stable and significant relationship between inflation rate and short-term interest rates. Using a VAR model, she concludes that the interest rate has no effect on inflation. Likewise, Aliyu and Englama (2009) evaluate the feasibility of IT in Nigeria by testing the relationship between inflation and monetary instruments, also through a VAR model, finding the existence of a weak relationship between the inflation rate and interest rate. Similarly, following the same methodology, Saleem et al. (2010) assesses the preconditions of IT in Pakistan, and reveals that Pakistan cannot adopt the full-fledged IT due to the undeveloped financial market and weak transparent monetary policies. However, the last two studies suggest that both Nigeria and Pakistan could adopt inflation targeting lite.

For Tunisia, Boughrara (2007) explores the ability of Tunisia to move to IT. A VAR methodology is used, and the results indicate that adopting IT strategy may lead to increase exchange rate volatility, which generates uncertainty about future inflation, the effect which weakens the controllability over inflation. In another study conducted by Boughrara et al. (2008), the authors simulate the effectiveness of IT under the current financial system in Tunisia, by testing the reaction of frozen loans to official interest rates, suggesting that Tunisia has to improve its financial market structure before adopting IT.

Both Youssef (2007) and Awad (2008) review the prerequisites for IT in Egypt. The former focuses on the financial sector, the central bank's transparency, credibility, technical capabilities and accountability. The latter tests the efficiency of the monetary aggregates strategy, adopted by the central bank of Egypt, and finds that the current monetary regime is not satisfactory and adopting IT is preferred once the institutional preconditions are reached.

Boughrara et al. (2008) examine the transmission mechanisms in Morocco, in an attempt to clarify the effectiveness of monetary policy under the current financial market, concluding that Morocco is not yet ready for adopting IT. Using the same approach, Neaime et al. (2008) aim to shed light on the monetary transmission

[4]Indonesia has been categorised as a fully fledged inflation targeter since 2005.

mechanism across the Middle East and North Africa region. Their results show that the exchange rate has a dominant impact on the transmission mechanism of monetary policy in Egypt, while in Jordan, Lebanon, Morocco and Tunisia, the interest rate plays a key role in monetary policy effectiveness. The same result for Jordan is found by Poddar et al. (2006).

The subsequent dollar depreciations in early 2002, and the 2008 financial crisis (Ghanem et al., 2010), as well as the difficult economic conditions of Jordan after the 2003 Iraq War and the Arab Spring raise skepticism on the stability and sustainability of the pegged exchange rate system. Many economists in Jordan, especially after the 2008 financial crisis, advised the CBJ to change its monetary anchor; however, the policy makers argued that the pegged exchange rate to the US dollar has played an important role in improving the credibility of the currency. They also pointed out that the level of foreign reserves has been increased unprecedentedly, as the current regime worked out to attract investment (the CBJ's 2010 annual report). Moreover, the CBJ's own view according to the IMF evaluation report (1989-2004) is that "there is no reason to fix a system that is not broken". Nonetheless, the IMF's executive directors suggest that Jordan should move towards a more flexible exchange rate regime and focus on maintaining the price stability as a leading objective. Furthermore, in 2010, the bank underwent a considerable reduction in its holding of international reserves coupled with enormous fiscal deficit, which present a direct threat to the pegged exchange rate system.

The successful implementations of IT across developed and emerging market countries have led monetary authorities and researchers to question adopting this strategy. However, one of the challenges that faces countries which seek to adopt IT is the level of development of monetary institutions and constitutions that may hamper building the credibility of low inflation domestically. Therefore, adopting IT or building the base to move towards a domestic reputation for the price stability goal, particularly in developing and emerging market economies, requires intensive considerations of the economic conditions to assess the level of monetary institutional development, or what kind of reforms should be implemented to successfully manage the transition to the low inflation framework. From the inflation targeters' experience, there are some key features associated with IT framework, agreed among economists to be preconditions for adopting the framework. These preconditions are: central bank independence, transparency, credibility, the existence of a well-developed financial market, and the presence of a stable and predictable relationship between inflation and monetary instruments.

The paper is organised as follows. Next section discusses some issues related to interest rate pass through. Section three explains the methodology applied to examine the interest rate pass-through and the asymmetries in the market. Section four and five4 present the data and results, respectively. The last section provides some conclusions and policy implications.

2 The Interest Rate Pass-Through

The credibility of achieving the announced quantitative target for price stability requires an effective and efficient monetary policy. This effectiveness is determined by the magnitude and speed at which monetary policy affects retail interest rates

to reach the final goals by influencing consumption and investment decisions. Although they are different channels for monetary policy and the importance of each channel varies across countries, economies and time (Amarasekara, 2005), the interest rate pass through channel is the most widely used channel through which the monetary objectives of maintaining price stability and/or inducing output growth can be achieved. In fact, this channel has gained much attention in recent literature and started cropping its popularity with the introduction of inflation targeting to be a vital and effective channel in achieving the goal of price stability (Gigineishvili, 2011).

If the transmission mechanism is incomplete and inefficient, the monetary authority will find it difficult to influence consumers' and businesses' behaviour, and, consequently, it will be impeded to achieve its intermediate and long-run goals. Hence, it is important to assess the effectiveness of monetary policy in achieving the key macroeconomic goals and the effectiveness in bringing price stability into economy. This assessment is crucially essential for designing policymaking rules.

The interest rate channel is designed to convey the policy message, that is, to influence domestic demand and output, through affecting retail interest rates. In other words, in case of expansionary monetary policy, lowering official interest rates should pass on to retail interest rates to encourage investment and consumption (Karagiannis et al., 2011).

Essentially, the monetary policy accounts for one side of the whole transmission process; the part of inducing the change. The other side of sending the change to the public is represented by the financial intermediaries, and their role is as essential as central bank's. Commercial banks play a major role, as dispatchers of monetary policy innovations, in correcting the economic path. For monetary policy to be effective and highly credible in the market, a change in official interest rates should be completely and quickly transmitted into changes in retail interest rates.

To understand to how extent monetary policy affects investment and consumption to meet the monetary policy goals, measuring the size and speed at which monetary impulses are transmitted could reflect the credibility of monetary policy. In this study, we focus on assessing the monetary policy transmission within its intermediate lag of an action for the case of Jordan. Practically, there are three time lags between taking an action to when the macro variables react to official changes. The first lag, or the central bank inside lag, lies between the time when an action is taken and when it is pragmatically implemented. The intermediate lag is the time lag from when an action is taken by commercial banks to when spending decisions are affected. The third lag, or outside lag, occurs in the last part of the chain, reflecting the time needed for macroeconomic variables to assimilate the changes transmitted through the monetary policy conveyers (Amarasekara, 2005).

Inflation targeting countries, either developed or developing, employ the interest rate channel to achieve the long run objective of price stability along the other intermediate targets. Our aim is to assess the effectiveness of the Interest Rate Pass-Through (IRPT), the main monetary policy transmission channel in Jordan, by examining whether the degree of pass-through is complete and quick and comparing the results to two inflation targeters models, New Zealand and the UK, at

time proceeding building the rules of monetary policy domestically. This comparison helps better understand the size of reforms needed for countries with monetary policy actions veiled behind a fixed exchange rate system, and allows understanding the difficulties facing a country while building the credibility of low inflation domestically.

We focus on the role of marginal pricing costs which reflects how official monetary policies are strong in affecting banks profitability, regulating banking system and thus achieving price stability. Therefore, we first test whether the degree of pass-through is complete and quick. An effective monetary policy means that a one percent change in official interest rates, which could initially be exerted to money market interest rates, leads promptly to a one percent change in retail interest rates. In fact, the degree of pass-through could reflect the market structure. In the presence of incomplete pass-through, the market reflects a high degree of imperfect competition (De Bondt, 2002), switching costs, information asymmetries (Sander and Kleimeier, 2004), banks fixed adjustment costs or reliance on long-term capital market funds (Bredin et al., 2002). The pass-through in such cases of sluggishness is described as sticky.

In addition, while symmetric behaviour of financial intermediaries to monetary shocks can be an indicator of market efficiency, in which retail interest rates respond indifferently to changes in official interest rates, the mismatching response in loan and deposit markets would occur due to market concentration or consumer sophistication (Karagiannis et al., 2011). There are two hypotheses which explain the deviation from symmetry in an industry. According to the structure performance hypothesis, the non-competitive pricing behaviour happens in concentrated markets where firms have the power to set the market prices. On contrary, an efficient structure of economy as implied by the efficient structure hypothesis allows firms to enjoy large scale of economies and thus to produce at a low cost which adds to the welfare of households and public. Hannan and Berger (1991) Berger and Hannan (1989) explain the two behaviours in the banking industry. Banks in concentrated markets, according to them, set low deposit interest rates compared to other banks operating in less concentrated markets. Hence, banks respond faster to decrease their interest rates on deposit, following an official change, when they are above long-run equilibrium. Therefore, we also examine the (a)symmetric behaviour of the financial market.

3 Methodology

Since many economic variables are found to be cointegrated of order one, studying the relationship between two economic variables in first difference will invalidate their long run nexus. In principle, a random linear combination of two series of the same order will also be cointegrated of that order, and the problem of spurious regression may arise (Harris, 1995). Nevertheless, if we have two cointegrated series of order one, the residuals of the regression will be stationary I(0), and inference by means of standard hypothesis testing would be valid.

The partial adjustment model, which identifies the relationship between retail interest rates and official interest rates, where the latter is assumed to be weakly

exogenous, can be represented as follows:

$$rr_t = \phi_0 + \phi_1 mm_t + u_t \tag{1}$$

rr is the price charged for given loans, or offered to depositors by commercial banks, ϕ_0 is constant markup or markdown on retail interest rate, mm is the official or money market interest rate set by central banks, and u_t is the error term. Money market interest rates could also be seen as banks marginal cost of funding, which reflects the marginal yield of free-risky assets (Weth, 2002). In a perfect competitive financial market, prices set by commercial banks should equal marginal costs, represented in our study by official or money market interest rates. Therefore, the derivative of retail interest rates with respect to money market interest rates should equal one (De Bondt, 2002). In most cases, ϕ_1 lies between zero and one. The value of one implies a complete pass-through, which means that retail interest rates are perfectly elastic to changes in money market interest rates. However, it is rare that ϕ_1 would equal one, owing to market power, information asymmetries, switching costs, adverse customer reaction, adjustment costs and the possibility to access different source of finance. In addition, because of information asymmetries, an overshooting in the pass-through, that is, $\phi_1 > 1$, might also occur in a situation where banks behave irrationally in compensating their default risk (De Bondt, 2002), by increasing their interest rates instead of decreasing the supply of loans (Aziakpono and Wilson, 2010).

Studying the stickiness in prices or retail interest rates has received heavy attention in the literature, which came initially from studying the pass-through of industrial organisation prices in concentrated markets (Hofmann and Mizen, 2004), using different error correction models. In this study, we use the Johansen approach (Johansen, 1991) to estimate the long run degree of pass-through along with the speed of adjustment to disequilibrium. The Johansen general equation of vector error correction form is as follows:

$$\Delta Z_t = \mu + \pi \Delta Z_{t-1} + \sum_{i=1}^{p-1} \tau Z_{t-i} + \epsilon_t \tag{2}$$

$$\pi = \alpha\beta \tag{3}$$

Where Z_t is a vector of jointly endogenous variables and π contains information about the long run relationships between the variables.[5] In accordance, the Johansen reduced rank regression of the long run relationship is identified in equation 3, as α represents the speed of adjustment to disequilibrium, whereas β is a matrix of long run coefficients. In this case, β reflects the magnitude of pass-through, while α shows the speed at which retail interest rates respond to changes in official interest rates.

According to equations 2 and 3, Johansen suggests that the reduced rank of π contains a number of cointegrating vectors exist in $\beta : r \leq n - 1$. To specify the number of r, Johansen puts forward to test two ratios of maximised likelihood functions, known as the maximal eigenvalue, or *lambda*-max statistic, and the trace test. In order to look for $[n - 1]$ cointegrating relationships, the non-stationarity should

[5]Note that, according to Johansen equation, no restriction is imposed. Nevertheless, in our analysis, money market interest rates are considered exogenously determined.

be ensured. Therefore, Augmented Dickey and Fuller (1979)(ADF) test is carried out to test whether the series is level or first difference stationary.

After obtaining the long run equilibrium, we examine the existence of asymmetries over an interest rate cycle. Hence, we employ the dynamic model, which connects both the short-run and the long-run effects using the error correction term. The following equation represents the full system of Hendry and Doornik (1994), which identifies the conditional dynamic model when the money market interest rate is weakly exogenous:

$$\Delta rr_t = \delta_0 + \delta_1 \Delta mm_t + \sum_{q=1}^{p} \delta_2 mm_{t-q} + \sum_{i=1}^{n} \gamma rr_{t-i} + \lambda ect_{t-1} + \varepsilon_t \tag{4}$$

Δ denotes the first difference of retail and money market interest rates. δ_1 and δ_2 represent the short run pass-through and the parameters of the lagged exogenous variable, respectively. γ is the coefficient of the lagged endogenous interest rates. λ refers to the speed of adjustment when retail interest rates adjust indifferently to money market rates changes. $ect_{t-1} = [rr_{t-1} - \alpha_0 - \alpha_1 mm_{t-1}\ ]$ is the residual of the long run relationship obtained from equation 1 by the Johansen approach at time (t-1). The sign of λ should be negative to ascertain stationary. q and i are the optimal lag length determined by the information criteria. ε_t is the white noise error term.

The simple model of equation 4 is:

$$rr_t = \alpha_0 + \alpha_1 mm_t + \lambda ect_{t-1} + \varepsilon_t \tag{5}$$

According to the equation above, the mean lag (Hendry and Doornik, 1994) is:[6]

$$ML = (\delta_1 - 1)/\lambda \tag{6}$$

The mean lag of equation 6 measures the degree of stickiness for symmetric error correction model, where high ML reflects a slow or sticky response to changes in money market interest rates. This in our analysis reflects the short run lag, i.e., months, needed for a full long run equilibrium adjustment.

In practice, banks would respond differently to official interest rates changes in an attempt to maximise their profit by widening the spread between interest rates on deposit and that on loans. However, this behaviour depends mainly on the level of market structure. In a weak competitive market, banks incline to respond to a decrease in official interest rates by lowering their interest rates on deposit quicker than on loans (Weth, 2002), whereas a high competitive market adds to the welfare of households and investors (van der Cruijsen, 2008).

According to the findings of Berger and Hannan (1989) and Hannan and Berger (1991), banks in oligopolistic markets have major price rigidity, and thereby their deposit interest rates are stickier upward. Similar view of noncompetitive pricing behaviour is argued by Neumark and Sharpe (1992). Two hypotheses are put forward

[6] In a simple dynamic model, a mean lag measures the time needed for the regressand to converge to its long-run equilibrium level, and depends on the magnitude of $(\delta_1 - 1)$. For further details, see (Hendry, 1995).

to explain asymmetric reactions to monetary policy shocks: the bank concentration, or bank's collusive pricing hypothesis, and the consumer behaviour hypothesis (Scholnick, 1996). The latter hypothesis exhibits "the degree of consumer sophistication with respect to capital market" Karagiannis et al. (2011). In other words, this means that sophisticated consumers are able to hinder the market power and thereby, deposit markets respond slower following a decrease in money market rates but quicker following an increase. By contrast, the bank concentration pricing hypothesis suggests that banks can exercise their market power by adjusting their interest rates quicker downward on deposit and upward on loans.

Therefore, to see if retail interest rates are rigid upward or downward, we incorporate two dummy variables depending on whether retail interest rates are above or below their long-run equilibrium level. This approach is followed by Scholnick (1996) and Ozdemir (2009). However, we do not use their specification of the dynamic equation; we do not remove the lagged coefficients of retail and money market rates as in Scholnick (1996) nor we do omit the intercept from the main equation 4 as in Ozdemir (2009). We spilt the error correction term into two series:
$ect^+ =$ ect if $ect > \mu$
$ect^+ = 0$ if $ect < \mu$
$ect^- =$ ect if $ect < \mu$
$ect^- = 0$ if $ect > \mu$
Where μ is the mean of ect. After including the two dummy variables to equation 4, the new equation is presented as:

$$\Delta rr_t = \delta_0 + \delta_1 \Delta mm_t + \delta_2 \sum_{q=1}^{p} mm_{t-q} + \gamma \sum_{i=1}^{n} rr_{t-i} + \lambda_1 ect_{t-1}^{+} + \lambda_2 ect_{t-1}^{-} + \varepsilon_t \quad (7)$$

λ_1 acts as the speed of adjustment when retail interest rates are above their equilibrium level, and the opposite for λ_2.

Our methodology to examine the asymmetries in the financial market could also be seen as a threshold autoregressive error correction model followed by Enders and Siklos (2001) and Enders and Chumrusphonlert (2004). In both studies, two dummy variables are included to capture the changes, i.e., when the error term is above and below its long run equilibrium level; however, they set the threshold value, μ in our case, to zero.

Retail interest rates are said to be adjusted symmetrically if the coefficient of ect_{t-1}^{+} is not statistically different from the coefficient of ect_{t-1}^{-}. Hence, a Wald test is conducted to test the equality between the two coefficients: $\lambda_1 = \lambda_2 = 0$. The asymmetric hypothesis can be rejected if the P-value is less than the level of significance. As explained by the bank's collusion hypothesis, if $\lambda_1 > \lambda_2$, then the response in deposit market is quicker upward than downward, while if $\lambda_2 > \lambda_1$, the change in loan rate is faster upward than downward. It is assumed, according to equations 4 and 6, that retail interest rates behave indifferently with respect to decreases or increases in official interest rates. The following equations show the mean adjustment lag when retail interest rates respond asymmetrically to money market interest rates changes (Liu et al., 2008):

$$ML^+ = (\delta_1 - 1)/\lambda_1 \quad (8)$$

$$ML^- = (\delta_1 - 1)/\lambda_2 \quad (9)$$

3.1 Data Collection and Description

All data on Jordanian official, money market interest rates and retail interest rates are obtained from the CBJ's Statistical Database. For our comparison purpose, the series of New Zealand's deposit interest rate and British interest rates on lending and deposit are extracted from the International Monetary Fund/ International Financial Statistics, whereas, the remaining series: the RBNZ's bill rate-30 and 60 days, interest rate on housing loan and deposit and British certificates of deposit, are collected from the released Statistical Database of the their central banks.

All the series represent monthly data from January to December. However, we allow the time prior to IT for the two inflation targeters models to be compared to the recent period for Jordan. In accordance, as IT has been adopted in 1990 by the RBNZ and in 1992 by the BoE, we cover the span 1985-1990 and 1985-1992 for New Zealand and the UK, respectively. For Jordan, the years between 1995 and 2011 are covered; however, we cover the years from 1997 to 2007 for one money market interest rate, that is, the interest rate on three months certificates of deposit, as it was the CBJ's main operating instrument until the early 2008. Each country's official and retail interest rates utilised in the analysis are illustrated in Table 1 and Table2, respectively.

Table 1: Official Interest Rates

Country	Official Interest Rate
Jordan	CD: Interest rate on Certificate of Deposit
Jordan	Redis: Rediscount rate
Jordan	Repo: Interest rate on repurchase agreement
New Zealand	TB-30: Bank bill yield-30 days
New Zealand	TB-60: Bank bill yield-60 days
UK	CD: 3 months average of Sterling certificates of deposit interest rate

Table 2: Retail Interest Rates

Country	Retail Interest Rate
Jordan	Deposit: Weighted average interest rate on demand deposit
Jordan	Loan: Weighted average interest rate on loans and advances
New Zealand	Housing: Floating first mortgage new customer housing rate
New Zealand	Deposit: Six-month term deposit rate
UK	Lending: Lending interest rate
UK	Deposit: Interest rate on deposit

4 Results

We test for the order of integration of the variables by the mean of the well-known Dickey and Fuller (1979) test. The results, shown in Tables 3, 4 and 5 point out

the possibility for a long-run of order one relationship between each retail interest rate and money market rate. A constant is added to the test equation, and the lag length of the test is determined by the Schwartz information criterion.

Table 3: Unit Root Test-Jordan

Series	NO. Obs	Level	Prob.	First difference	Prob.
loan	204	-0.408	0.904	-17.648	0.000
Deposit	204	-0.713	0.839	-16.035	0.000
Redisc	204	-1.206	0.671	-7.399	0.000
Repo	204	-0.904	0.76	-11.726	0.000
CD	132	-1.796	0.38	-11.46	0.000
Loan	132	-0.619	0.861	-16.066	0.000
Deposit	132	-0.913	0.781	-14.086	0.000

Table 4: Unit Root Test-New Zealand

Series	NO. Obs	Level	Prob.	First difference	Prob.
TB-30	72	-1.953	0.306	-9.751	0.000
TB-60	72	-1.871	0.343	-3.277	0.000
Housing	72	-1.357	0.598	-3.277	0.019
Deposit	72	-1.158	0.687	-6.67	0.000

Table 5: Unit Root Test-UK

Series	NO. Obs	Level	Prob.	First difference	Prob.
CD	96	-1.245	0.651	-7.714	0.000
Lending	96	-1.258	0.646	-6.875	0.000
Deposit	96	-2.241	0.192	-11.503	0.000

In all cases, the series are found to be stationary on first difference, which comprises the first step to look for a cointegrating relationship. The optimal lag length is determined based on the Schwartz information criterion to ensure that the residuals are all Gaussian. Tables 6, 7 and 8, 2_{nd} column, show the optimal lag length of the relationship between each retail and money market interest rate. Using the Johansen approach, a cointegrating relationship is found between each official interest rate and retail interest rate, except between the British CD and deposit.[7] Both Johansen maximum likelihood tests confirm that we cannot reject the hypothesis of one cointegrating vector, as given in Tables 6, 7 and 8.

[7]Even in the short run, the relationship between the two interest rates is found to be weak with money market coefficient equals 0.40.

Post to the 2003 Iraq War, Jordan's official interest rates increased rapidly until the 2008 financial crisis as can be seen from Figure 1. Apparently, the money market interest rates do not respond to changes in domestic inflation rates. The official interest rates reflect the changes in the Federal Fund Interest Rate (FFIR), depicted in Figure 2, given the commitment to the pegged exchange rate to the U.S. dollar system. In addition, in Figure 3, the mark-up of the interest rate on loans and the mark-down of interest rate on deposit increased markedly during the financial crisis onwards. This could be attributed to the cost-minimisation pursuit of the banking sector in Jordan.

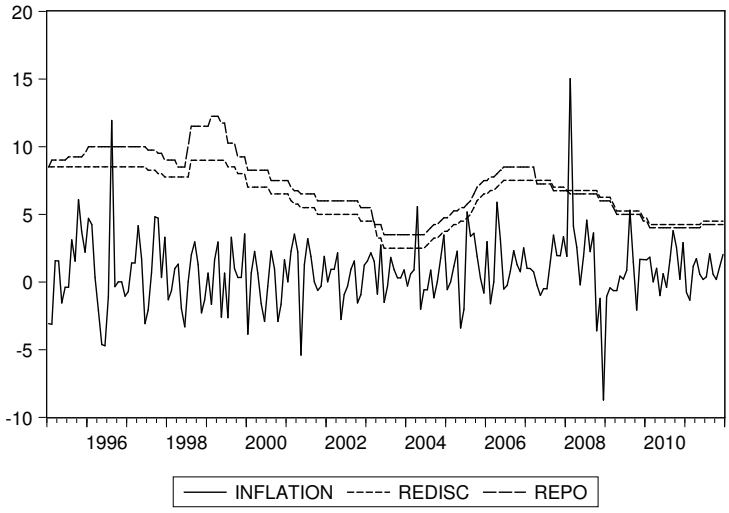

Figure 1: : Jordan- rediscount rate, repo rate and inflation

*Inflation rate is calculated based on the monthly consumer price index gathered from the CBJ's Statistical Database.

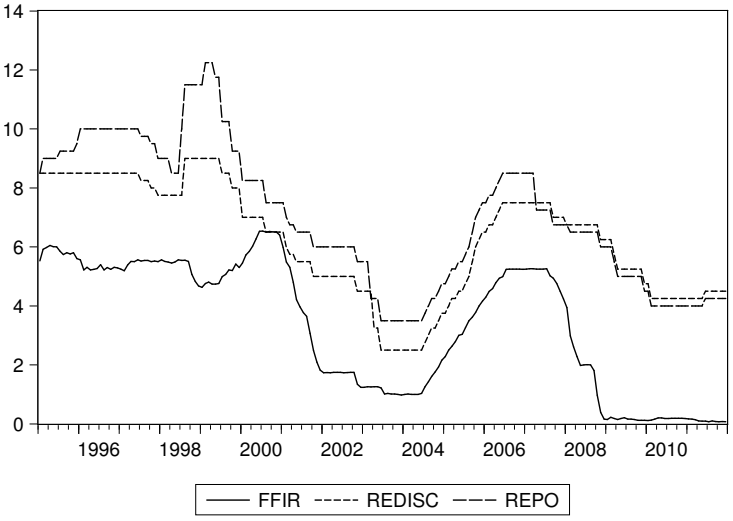

Figure 2: : Jordan- rediscount rate, repo rate and Federal Fund interest rate

*FFIR is obtained from the database of the Federal Reserve Bank of America .

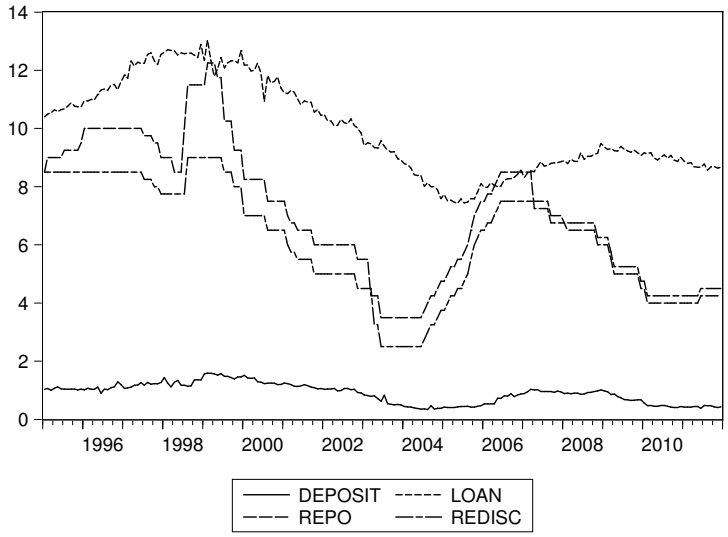

Figure 3: : Jordan- rediscount rate, repo rate, loan and deposit

Table 6: Trace and Max-Eigen Tests-Jordan

Series	lags	Trace statistic	critical value	Max-Eigen statistic	critical value
		$r \leq 1$	%5	$r \leq 1$	%5
Redisc/Deposit	2	28.592*	20.261	19.947*	15.892
Redisc/loan	1	32.401*	20.261	26.397*	15.892
Repo/ Deposit	3	30.484*	20.261	23.840*	15.892
Repo/loan	1	23.282*	20.261	20.945*	15.892
CD/Deposit	3	29.632*	20.261	24.793*	15.892
CD/loan	2	24.872**	15.494	21.633**	14.264

Note: *significant at 5% level according to Osterwald-Lenum (1992) critical values of model 2 (Constant in the cointegration space). **significant at 5% level according to Osterwald-Lenum (1992) critical values of model 3 (Constant in the cointegration space and linear trend in the data).

Table 7: Trace and Max-Eigen Tests-New Zealand

Series	lags	Trace statistic	critical value	Max-Eigen statistic	critical value
		$r \leq 1$	%5	$r \leq 1$	%5
Housing/TB-30	2	23.809*	20.261	20.206*	15.892
Deposit/TB-30	1	20.347**	15.494	17.535**	14.264
Housing/TB- 60	2	22.286*	20.261	19.163*	15.892
Deposit/TB-60	1	20.244**	15.494	17.614**	14.264

Note: *significant at 5% level according to Osterwald-Lenum (1992) critical values of model 2 (Constant in the cointegration space). **significant at 5% level according to Osterwald-Lenum (1992) critical values of model 3 (Constant in the cointegration space and linear trend in the data).

Table 8: Trace and Max-Eigen Tests-UK

Series	lags	Trace statistic	critical value	Max-Eigen statistic	critical value
		$r \leq 1$	%5	$r \leq 1$	%5
Lending/CD	1	45.276**	15.494	43.547**	14.264
Deposit/CD	...	No cointegration			

Note: *significant at 5% level according to Osterwald-Lenum (1992) critical values of model 2 (Constant in the cointegration space). **significant at 5% level according to Osterwald-Lenum (1992) critical values of model 3 (Constant in the cointegration space and linear trend in the data).

Intuitively, as official interest rates are supposed to affect retail interest rates and not vice versa, money market interest rates should be treated as weakly exogenous. This implies that the speed of adjustment or α for official interest rates in equation 3, should not be significantly different from zero. This is to ensure that the past disequilibria have no remaining effects on official interest rates. The results, shown in Table 6, Table 7 and Table 8, indicate that all α of official interest rates are weakly exogenous.[8]

Table 9: Cointegration Test-Jordan

Official/Retail	lags	β	α(retail)	α(official)
			normalised	
Rediscount/Deposit	2	0.204 (0.027)	-0.073*** (0.018)	-0.120 (0.064)
Rediscount/loan	1	1.088 (0.161)	-0.0415*** (0.007)	-0.010 (0.009)
Repurchase/Deposit	3	0.173 (0.017)	-0.102*** (0.020)	-0.077 (0.108)
Repurchase/loan	1	0.848 (0.129)	-0.043*** (0.009)	-0.005 (0.014)
CD/Deposit	6	0.233 (0.029)	-0.091*** (0.018)	0.132 (0.140)
CD/loan	2	1.276 (0.216)	-0.037*** (0.008)	0.021 (0.019)

Note: Standard errors are in parentheses.

Table 10: Cointegration Test-New Zealand

Official/Retail	lags	β	α(retail)	α(official)
			normalised	
Housing/TB- 30	2	0.657 (0.086)	-0.082*** (0.027)	0.283 (0.164)
Deposit/TB-30	1	0.715 (0.125)	-0.157*** (0.038)	0.166 (0.135)
Housing/TB- 60	2	0.634 (0.082)	-0.097*** (0.030)	0.152 (0.159)
Deposit/TB-60	1	0.700 (0.118)	-0.173*** (0.041)	0.116 (0.113)

Note: Standard errors are in parentheses.

[8]For the case of Jordan, saving deposit interest rate was found to be first difference stationary; however, their market rates' α (money market; Redisc and Repo) are significantly different from zero. Therefore, we exclude this retail rate from our analysis although the Granger causality test indicates that the causality runs from the money market rates to saving interest rates.

Table 11: Cointegration Test-UK

Official/Retail	lags	β	α(retail)	α(official)
			normalised	
Lending/CD	1	1.012 (0.011)	-0.620*** (0.298)	0.237 (0.366)

Note: Standard errors are in parentheses.

The estimated β, which indicates the degree of pass-through, varies in Jordan from incomplete to overshooting. Although this might reflect the imperfect competition in the Jordanian banking sector, it is not possible, due to the lack of information released by the CBJ which explain the market structural behaviour, such as the commercial banks' market share of all mortgages issued, to infer whether or not market power exists. In general, for Jordan, the degree of pass-through indicates that the changes in money market interest rates are not fully absorbed by retail interest rates. Furthermore, the overshooting response of retail interest rates, with respect to changes in rediscount rate, indicates that banks in Jordan behave irrationally due to information asymmetries. Nevertheless, as it is clear from the results, the repo rate has the most significant impact on the loan interest rate; a unit change in repo rate is reflected after one lag by 0.85 changes in loan rate. However, the degree of pass-through from all money market interest rates to deposit interest rates is weak.

For New Zealand, the magnitude of pass-through points out that the bill interest rates changes are not completely reflected into changes in retail interest rates. However, these results might not be optimal owing to the fact that bank bill rate was not the RBNZ's main monetary instrument. The main monetary interest rate between 1985 and 1990 was the overnight interbank cash rate, which is found stationary at level.[9] Nevertheless, according to Liu et al. (2008), IRPTC in New Zealand is still, even after the introduction of the official cash rate in 1999, incomplete for all retail interest rates, but some: floating mortgage rate, the base lending rate, and the six-months deposit rate. This was attributed to low household savings and the reliance of the banking sector on international markets to finance their supply for mortgages. An immediate pass-through is only observed for the British case, where the magnitude of pass-through is close to one.

In fact, for Jordan, the results provide evidence that the money market instruments are not effective in inducing changes in retail interest rates. This might be due to the existence of market power, information asymmetries, switching costs, and the openness to the world financial markets. Besides, as shown in Figure 1, it is likely that the official interest rates in Jordan are not powerful at provoking changes in the domestic market, given the current monetary anchor.

Tables 12 to Table 20 provide the results of the dynamic model estimated for all cases.[10] The symmetric and asymmetric dynamic model of equations 4 and 7 are estimated, respectively, before and after dropping the insignificant lagged values of

[9]Bill rates are the only cointegrated of order one series found to match our targeted period (1985-1990). The cointegrating relationship between the interbank-overnight rate and deposit is found to be starting from the year 1994.

[10]Parameters constancy tests and CUSUM test for stability are provided in Appendix **??**.

exogenous and endogenous variables. The parsimonious results of both equations do not give any noteworthy difference compared to the general results. We conduct a Wald test to examine the asymmetries. For each case, we test the null hypothesis if λ_1 is not different from λ_2 and reject the null if the critical value of the F test's critical value is less than the calculated value. Generally, in most cases, we could not reject the equality between λ_1 and λ_2.

We find an asymmetric response in the Jordanian loan market, when the monetary instrument is the repo rate, at 10% level of significance. The asymmetric result shows that banks are more sluggish to decrease their interest rates on loan but they are quicker to increase them. This behaviour could be explained by the structure hypothesis or the bank concentration hypothesis, which indicates that the non-competitive pricing behaviour exists in Jordan. Moreover, even when we assume no asymmetries in the loan market, the symmetric mean lags of the loan rate with respect to changes in rediscount and repo rates are slow; in both cases the banks need more than twenty months to converge to the long run equilibrium, while the deposit market shows no deviation from symmetry, and rather a faster mean lag, i.e., 10-13 months. Generally, the results reveal that even if there are no asymmetries in the market, substantial lags are needed in the short run, reflecting a sluggish response to changes in the CBJ's interest rate instrument. In addition, it is clear that the changes in the retail market interest rates in Jordan are not mainly due to changes in the money market interest rates. Adjusted R^2 for the loan and deposit market are very low, i.e., 20%. This questions the efficiency of the monetary policy in Jordan in handling the changes in the domestic market. The results of the dynamic effects, in Table 12, Table 13, Table 14 and Table 15 indicate that monetary policy in Jordan is not only weak in the long-run but the impact of money market interest rates on retail interest rates is also neutral in the short-run as the magnitude of pass-through for most money market interest rates lags appears insignificant.

Interestingly, the asymmetric behaviour in deposit markets is not observed in Jordan but in New Zealand. The deposit interest rate in the latter is found to be sticky upward, which is compatible with the collusive hypothesis. The quickest response with no asymmetries among all cases is found in the UK; the lending rate was adjusted to a monetary shock within the same month, while the retail interest rates in New Zealand needed eight to nine months to converge to the long run equilibrium.

The IRPT results for Jordan clarify the limitations of monetary policy under the pegged exchange rate regime. With a low degree of pass-through, deviation from symmetry in the loan market and high mean lags, supporting with low R^2, the results indicate that the monetary policy in Jordan is ineffective. Therefore, the credibility of monetary policy in Jordan in affecting the domestic disturbances, other than providing the market with a price anchor, is obscure. Considering central bank independence as a prior condition, and by comparing the results to our two inflation targeters in their period prior to IT, we can conclude that the effectiveness of the IRPTC in Jordan needs to be thoroughly solidified to enable building the credibility of low inflation domestically.

Table 12: Jordan: Short-run Symmetric/Asymmetric Results

Official/Redisc	Retail/Deposit		GTA	GTA
	Symmetric	Asymmetric	Symmetric	Asymmetric
Constant	-0.061	-0.065	-0.059	-0.062
	(-0.015)	(0.22)	(0.014)	(0.022)
Δrediscount	-0.002	-0.002	dropped	dropped
	(-0.02)	(0.02)		
Δrediscount$_{t-1}$	-0.006	-0.007	dropped	dropped
	(-0.02)	(0.02)		
Δrediscount$_{t-2}$	0.073	0.072	0.072	0.072
	(-0.02)	(0.021)	(0.02)	(0.02)
Δdeposit$_{t-1}$	-0.284	-0.284	-0.286	-0.286
	(-0.065)	(0.065)	(0.064)	(0.064)
Δdeposit$_{t-2}$	-0.131	-1.32	-0.131	-0.131
	(-0.066)	(0.066)	(0.065)	(0.065)
Symmetric ect	-0.075		-0.072	
	-0.018		0.017	
Symmetric ML	13			
Above equilibrium		-0.081		-0.079
		0.04		0.039
Below equilibrium		0.077		-0.075
		0.024		0.023
ML^+		12		
ML^-		13		
R^2	0.232	0.232	0.231	0.231
AdjustedR^2	0.208	0.204	0.215	0.211
F-statistics	9.75	8.33	14.75	11.75
Wald test P(F* > Fc)*		0.853		0.856

Note: Official: Official interest rates; Retail: Retail interest rates; GTA: General-to-specific approach. ***, **, * denote significance at 1%, 5% and 10%, respectively. Standard Errors are between parenthesis. Wald test tests wether the deviation of the speed of adjustment to monetary shock is equal.

Table 13: Jordan: Short-run Symmetric/Asymmetric Results

Official/Redisc	Retail/loan		GTA	GTA
	Symmetric	Asymmetric	Symmetric	Asymmetric
Constant	0.242	0.137	0.237	0.135
	(0.051)	(0.067)	(0.049)	(0.067)
Δrediscount	0.01	0.016	dropped	dropped
	(0.06)	(0.06)		
Δrediscount$_{t-1}$	-0.033	-0.031	dropped	dropped
	(0.061)	(0.061)		
Δloan$_{t-1}$	-0.369	-0.368	-0.369	-0.368
	0.064	0.064	0.04	0.064
Symmetric ect	-0.041		-0.04	
	(0.008)		(0.007)	
Symmetric ML	24			
Above equilibrium		-0.027		-0.027
		(0.009)		(0.009)
Below equilibrium		-0.017		-0.017
		(0.014)		(0.014)
ML^+		36		
ML^-		58		
R2	0.208	0.203	0.207	0.202
Adjusted R^2	0.192	0.183	0.199	0.19
F-statistics	13	10.02	26.06	16.75
Wald test P(F*>Fc)*		0.131		0.137

Note: Official: Official interest rates; Retail: Retail interest rates; GTA: General-to-specific approach. ***, **, * denote significance at 1%, 5% and 10%, respectively. Standard Errors are between parenthesis. Wald test tests wether the deviation of the speed of adjustment to monetary shock is equal.

Table 14: Jordan: Short-run Symmetric/Asymmetric Results

Official/Repo	Retail/Deposit		GTA	GTA
	Symmetric	Asymmetric	Symmetric	Asymmetric
Constant	-0.073	-0.039	-0.077	-0.043
	0.015	0.012	0.014	0.011
Δrepo	0.007	0.011	dropped	dropped
	(0.013)	(0.014)		
Δrepo$t-1$	-0.041	-0.04	-0.04	-0.039
	(0.014)	(0.015)	(0.014)	(0.014)
Δrepo$_{t-2}$	0.035	0.036	0.038	0.039
	(0.014)	(0.015)	(0.015)	(0.015)
Δrepo$_{t-3}$	0.023	0.023	dropped	dropped
	(0.015)	(0.015)		
Δdeposit$_{t-1}$	-0.304	-0.314	-0.27	-0.282
	(0.067)	(0.068)	(0.064)	(0.065)
Δdeposit$_{t-2}$	-0.158	-0.152	-0.145	-0.141
	(0.066)	(0.068)	(0.064)	(0.065)
Δdeposit$_{t-3}$	-0.064	-0.061	dropped	dropped
	(0.655)	(0.067)		
Symmetric ect	-0.102		-0.108	
	(0.021)		(0.067)	
Symmetric ML	10			
Above equilibrium		-0.037		-0.041
		(0.018)		(0.018)
Below equilibrium		-0.058		-0.063
		(0.014)		(0.013)
ML^+		27		
ML^-		17		
R^2	0.277	0.253	0.267	0.242
Adjusted R^2	0.247	0.218	0.248	
F-statistics	9.173	7.187	14.24	10.36
Wald test P(F*>Fc)*		0.141		0.134

Note: Official: Official interest rates; Retail: Retail interest rates; GTA: General-to-specific approach. ***, **, * denote significance at 1%, 5% and 10%, respectively. Standard Errors are between parenthesis. Wald test tests wether the deviation of the speed of adjustment to monetary shock is equal.

Table 15: Jordan: Short-run Symmetric/Asymmetric Results

Official/Repo	Retail/Loan		GTA	GTA
	Symmetric	Asymmetric	Symmetric	Asymmetric
Constant	0.382	0.185	0.373	0.184
	(-0.081)	(0.074)	(0.08)	(0.074)
Δrepo	0.033	0.026	dropped	dropped
	(0.043)	(0.043)		
Δrepo_{t-1}	-0.049	-0.044	dropped	dropped
	(0.043)	(0.043)		
Δloan_{t-1}	-0.35	-0.347	-0.356	-0.352
	(0.064)	(0.064)	(0.01)	(0.064)
Symmetric ect	-0.046			
	(0.009)			
Symmetric ML	21			
Above equilibrium		-0.026		-0.025
		(0.008)		(0.007)
Below equilibrium		-0.018		-0.018
		(0.01)		(0.01)
ML^+		37		
ML^-		54		
R^2	0.202	0.202		0.197
Adjusted R^2	0.186	0.181		0.185
F-statistics	12.48	9.93	24.23	16.22
Wald test P(F*>Fc)*		0.087*	0.087*	0.094*

Note: Official: Official interest rates; Retail: Retail interest rates; GTA: General-to-specific approach. ***, **, * denote significance at 1%, 5% and 10%, respectively. Standard Errors are between parenthesis. Wald test tests wether the deviation of the speed of adjustment to monetary shock is equal.

Table 16: New Zealand: Short-run Symmetric/Asymmetric Results

Official/TB-30	Retail/Deposit		GTA	GTA
	Symmetric	Asymmetric	Symmetric	Asymmetric
Constant	0.209	0.441	-0.19	-0.043
	(0.105)	(0.151)	(0.099)	(0.141)
ΔTB-30	0.024	-0.008	dropped	dropped
	(0.035)	(0.038)		
ΔTB-30$_{t-1}$	-0.025	-0.011	dropped	dropped
	(0.039)	(0.039)		
Δdeposit$_{t-1}$	0.126	0.093	dropped	dropped
	(0.039)		(0.033)	
Symmetric ect	-0.161			
	(0.039)		(-0.149)	
Symmetric ML	7			0.033
Above equilibrium		-0.258		-0.263
		(0.068)		(0.053)
Below equilibrium		-0.044	-0.04	
		(0.068)	(0.053)	
ML$^+$		4		
ML$^-$		22		
R^2	0.259	0.306	0.229	0.295
Adjusted R^2	0.213	0.251	0.218	0.274
F-statistics	5.68	5.64	20.55	14.25
Wald test P(F*>Fc)*		.037**		.011**

Note: Official: Official interest rates; Retail: Retail interest rates; GTA: General-to-specific approach. ***, **, * denote significance at 1%, 5% and 10%, respectively. Standard Errors are between parenthesis. Wald test tests wether the deviation of the speed of adjustment to monetary shock is equal.

Table 17: New Zealand: Short-run Symmetric/Asymmetric Results

Official/TB-30	Retail/Housing		GTA	GTA
	Symmetric	Asymmetric	Symmetric	Asymmetric
Constant	1.202	1.027	1.136	0.855
	(0.287)	(0.391)	(0.196)	(0.284)
ΔTB-30	0.079	0.074	0.054	0.072
	(0.018)	(0.02)	(0.014)	(0.019)
ΔTB-30$_{t-1}$	-0.005	-0.001	dropped	dropped
	(0.018)	(0.019)		
ΔTB-30$_{t-2}$	-0.008	-0.008	dropped	dropped
	(0.015)	(0.015)		
Δhousing$_{t-1}$	-0.125	-1.22	dropped	dropped
	(0.104)	(0.104)		
Δhousing$_{t-2}$	0.308	0.297	dropped	0.298
	(0.104)	(0.106)		(0.101)
Symmetric ect	-0.107		-1.02	
	(0.025)		(0.017)	
Symmetric ML	9			
Above equilibrium		-0.093		-0.077
		(0.032)		(0.231)
Below equilibrium		-0.083		-0.068
		(0.043)		(0.033)
ML$^+$		10		
ML$^-$		11		
R^2	0.491	0.495	0.375	0.482
Adjusted R^2	0.442	0.437	0.357	0.449
F-statistics	10	8.55	20.45	14.9
Wald test P(F*>Fc)*		0.508		0.47

Note: Official: Official interest rates; Retail: Retail interest rates; GTA: General-to-specific approach. ***, **, * denote significance at 1%, 5% and 10%, respectively. Standard Errors are between parenthesis. Wald test tests wether the deviation of the speed of adjustment to monetary shock is equal.

Table 18: New Zealand: Short-run Symmetric/Asymmetric Results

Official/TB-30	Retail/Deposit		GTA	GTA
	Symmetric	Asymmetric	Symmetric	Asymmetric
Constant	0.275	0.449	0.271	0.448
	(0.112)	(0.136)	(0.104)	(0.136)
ΔTB-60	0.009	-0.015	dropped	dropped
	(0.045)	(0.045)		
ΔTB-60$_{t-1}$	-0.017	-0.017	dropped	dropped
	(0.05)	(0.049)		
Δdeposit$_{t-1}$	0.012	0.106	dropped	dropped
	(0.107)	(0.105)		
Symmetric ect	-0.174		-0.173	
	(0.041)		(0.034)	
Symmetric ML	6			
Above equilibrium		-0.251		-0.25
		(0.054)		(0.048)
Below equilibrium		-0.063		-0.064
		(0.066)		(0.059)
ML$^+$		4		
ML$^-$		16		
R^2	0.28	0.327	0.262	0.313
Adjusted R^2	0.236	0.275	0.251	0.292
F-statistics	6.33	6.24	24.53	15.49
Wald test P(F*>Fc)*		0.033**		0.024**

Note: Official: Official interest rates; Retail: Retail interest rates; GTA: General-to-specific approach. ***, **, * denote significance at 1%, 5% and 10%, respectively. Standard Errors are between parenthesis. Wald test tests wether the deviation of the speed of adjustment to monetary shock is equal.

Table 19: New Zealand: Short-run Symmetric/Asymmetric Results

Official/TB-60	Retail/Housing		GTA	GTA
	Symmetric	Asymmetric	Symmetric	Asymmetric
Constant	1.369	1.452	1.062	1.155
	(0.316)	(0.373)	(0.224)	(0.296)
ΔTB-60	0.099	0.101	0.099	0.101
	(0.02)	(0.021)	(0.026)	(0.02)
ΔTB-60$_{t-1}$	-0.014	-0.016	dropped	dropped
	(0.02)	(0.02)		
ΔTB-60$_{t-2}$	-0.014	-0.013	dropped	dropped
	(0.019)	(0.019)		
Δhousing$_{t-1}$	-0.111	-0.106	dropped	dropped
	(0.101)	(0.103)		
Δhousing$_{t-2}$	0.327	0.333	0.35	0.359
	(0.102)	(0.104)	(0.095)	(0.098)
Symmetric ect	-0.113		-0.088	
	(0.026)		(0.018)	
Symmetric ML	8			
Above equilibrium		-0.119		-0.094
		(0.029)		(0.022)
Below equilibrium		-0.123		-0.099
		(0.035)		(0.029)
ML$^+$		8		
ML$^-$		7		
R^2	0.536	0.538	0.521	0.523
Adjusted R^2	0.491	0.485	0.499	0.493
F-statistics	11.97	10.15	23.62	17.56
Wald test P(F*>Fc)*		0.671		0.628

Note: Official: Official interest rates; Retail: Retail interest rates; GTA: General-to-specific approach. ***, **, * denote significance at 1%, 5% and 10%, respectively. Standard Errors are between parenthesis. Wald test tests wether the deviation of the speed of adjustment to monetary shock is equal.

Table 20: UK: Short-run Symmetric/Asymemtric Results

Official/CD	Retail/Lending		GTA	GTA
	Symmetric	Asymmetric	Symmetric	Asymmetric
Constant	-0.089	-0.072 -0.085	-0.07	
	(0.021)	(0.029)	(0.019)	(0.027)
Δcd	0.755	0.756	0.752	0.753
	(0.031)	(0.032)	(0.03)	(0.03)
Δcd_{t-1}	0.002	0.001	dropped	dropped
	(0.083)	(0.083)		
$\Delta lending_{t-1}$	-0.028	-0.029	dropped	dropped
	(0.078)	(0.078)		
Symmetric ect	-0.801		-0.776	
	(0.111)		(0.074)	
Symmetric ML	0.31			
above equilibrium		-0.951		-0.889
		(0.201)		(0.17)
Below equilibrium		-0.732		-0.716
		(0.136)		(0.11)
ML^+		0.26		
ML^-		0.33		
R^2	0.89	0.891	0.89	0.89
Adjusted R^2	0.885	0.885	0.887	0.887
F-statistics	181.48	145	372.67	247.4
Wald test P(F*>Fc)*		0.376		0.461

Note: Official: Official interest rates; Retail: Retail interest rates; GTA: General-to-specific approach. ***, **, * denote significance at 1%, 5% and 10%, respectively. Standard Errors are between parenthesis. Wald test tests whether the deviation of the speed of adjustment to monetary shock is equal.

5 Conclusions and Policy Implications

In this paper we shed light on the credibility of monetary policy under the fixed exchange rate regime for the case of Jordan. Our aim is to show to how extent a country with a peg is able to move towards building the credibility of low inflation domestically instead of importing prices from abroad. Hence, we assess the magnitude and speed of interest rate pass-through channel and the behaviour of the financial market to monetary policy shocks and compare the results to two inflation targeters, New Zealand and the UK, prior to official announcement of inflation targeting. The country-specific comparison allows understanding whether the move to achieve price stability domestically under the current financial and monetary system is possible and the reform needed to move towards building independent domestic monetary policies.

We apply the Johansen approach to examine the degree and speed of adjustment to disequilibrium in the long run, then we obtain a univariate error correction parsimounous model of Hendry and Doornik (1994) that connects the short-run and

long-run effects. We also test whether asymmetries occur in the deposit and loan markets by incorporating two dummy variables in the conditional dynamic model to act when retail interest rates are above or below their long-run equilibrium level. The years from 1995 to 2011 are taken into consideration to assess the current economic situation for Jordan, while we allow the period prior to IT for our model cases.

Initially, we notice that official interest rates follow changes in the American Federal reserve rate, given the imported credibility for the goal of price stability. The findings show that the interest rate pass-through in Jordan is weak and sticky and substantial lags are needed for a full equilibrium adjustment. Furthermore, banks non-competitive pricing behaviour is observed in the loan market, where a significant deviation from symmetry in the speed of adjustment is found sticker to decreasing. Interestingly, an asymmetric behaviour to monetary shocks in the deposit market is found for the case of New Zealand.

Our findings indicate, and in comparison with inflation targeters, that with weak and slow interest rate pass-through, as well as an asymmetric reaction in the loan market, moving towards achieving price stability by adopting any form of inflation targeting in Jordan will not give its desirable outcomes. Although the possibility for the lite form of inflation targeting could be claimed, any commitment to an inflation target, while preserving the goal of exchange rate stabilisation, will put the central bank at the risk of losing its credibility, and increase the likelihood to renege on inflation targeting framework. This suggests that Jordan has to move to a more resilient exchange rate arrangement to build in the goal of price stability domestically, given the importance to have an independent central bank.

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