Central Bank Independence and Inflation Expectations: Evidence from British Index-Linked Gilts

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This paper conducts a case study of the impact of the May 6, 1997, announcement of enhanced independence of the Bank of England on estimates of expected future inflation and real interest rates. These are generated from observed yields on conventional and index-linked British gilts. For the longest-term bonds in the study, we find a 34 and 60 basis point decline in expected average future inflation over the life of the bond for one-day and two-week event windows, respectively. These results support the contention that institutional changes alone do affect agents' inflationary expectations.

"The ultimate judgement of the success of this measure will not come next week, or indeed in the next year, but in the long term."

Chancellor of the Exchequer Gordon Brown
May 6, 1997

With the above words, the Chancellor of the Exchequer of Great Britain, Gordon Brown, closed an announcement of a policy change which he described as "…the most radical internal reform to the Bank of England since it was established in 1694." The reform in question, which is reviewed in greater detail below, concerned granting the Bank of England control over its own interest rate policy, or "instrument independence" as it is known in the literature.

While most would agree with Chancellor Brown's contention that the ultimate impact of the institutional changes in the Bank of England will only be known over time, we can gauge the perceived impact at the time of the announcement by evaluating the market's response to the Chancellor's speech. This paper proceeds along this path. In particular, we examine the impact of the institutional change on inflationary expectations in the United Kingdom as reflected in British gilt price movements.

A large literature exists which predicts a negative relationship between central bank independence and inflation.[1] The most common motivation for such a relationship is that the general public desires monetary policies biased towards expansion, while a competent central banker in a Rogoff (1985) sense, who perceives that a long-run tradeoff between real activity and inflation is unattainable, will not pursue such biased policies if insulated from political pressure from the general public.[2]

A difficulty encountered by researchers in testing this hypothesis is that central bank independence is an elusive concept and one which defies measurement. Concerning what is meant by independence, Debelle and Fischer (1994)

1. For surveys, see Cukierman (1992), Eijffinger and de Haan (1996), and Walsh (1997a).

2. Eijffinger and de Haan (1996) also list government biases in favor of expansionary policies and the possibility that the central bank may be forced to finance government deficits ex-post as alternative arguments for a negative relationship between central bank independence and inflation.

highlight the distinction between instrument independence and policy independence. Central banks which have instrument independence enjoy the ability to set their policy instruments without interference from outside parties. In contrast, central banks which have policy independence can set their own policy goals, such as the determination of the appropriate long-run inflation target.

Most of the cross-sectional studies form indices of central bank independence based on a number of observable factors, such as legal differences (e.g., Cukierman 1992). However, as mentioned in Cukierman, there are also unobservable characteristics, such as informal arrangements with other branches of government, the quality of a central bank's research department, and individual personalities of key policymakers, which can heavily influence actual central bank independence. The omission of these other characteristics makes inferences from observed cross-sectional studies uncertain. Nevertheless, these indices of central bank independence all seem to be negatively correlated with inflation levels (e.g., Cukierman 1992, Cukierman, et al. 1992).

However, there is some question whether the observed negative correlation reflects a causal link between central bank independence and inflation performance. There are arguments in the literature that observed negative correlations between central bank independence and average inflation rates are spurious, primarily because nations which adopt independent central banking institutions are those which would exhibit lower inflation rates even in the absence of the adoption of such institutions. For example, Posen (1995) argues that opposition to inflation in financial markets is an important contributor to both institutionally independent central banks and the pursuit of low inflation policies.

In this paper, we conduct a case study of the impact of the announcement of the Bank of England's institutional change on expected future inflation and real interest rates. In particular, we use spreads between three maturities of conventional and index-linked British bonds to generate three time series of estimated expected future inflation and real interest rates. We then conduct a case study of the movements in these series over the date of the institutional change announcement. As we demonstrate below, we find a significant reduction in expected inflation both on the date of the institutional change and over two-day and two-week event windows. This change is noticeable for all three maturities in the study but appears to be largest for the longest maturity.

Our results complement the cross-sectional literature above. First, since we examine the impact of a single event which clearly enhances central bank independence, the problems encountered in cross-sectional studies with unobservable characteristics are circumvented here. Second, our study addresses the potential issue of spurious negative correlations observed between central bank independence and average rates of inflation. Since it is unlikely that other factors, such as financial market opposition to inflation, changed markedly over the event window, we can be pretty secure in attributing the changes observed here solely to the institutional changes associated with the May 6 announcement.

The remainder of the paper is organized into four sections. Section I describes the details of the policy announcement and assesses its predicted impact on inflation expectations. Section II describes the methodology used to estimate expected inflation from indexed and conventional bond spreads. Section III presents the details of our case study of the impact of the institutional change on May 6. Section IV concludes.

I. The Bank of England's 1997 Regime Change

In this section, we examine the details of the actual regime change that took place on May 6, 1997. For the purposes of our event study, we first review the actual institutional changes delineated in the May 6th announcement under the widely held and accurate perception that all of the announced changes would be quickly undertaken by Parliament. Second, we assess the extent to which the event was a "surprise," in the sense that some positive probability of a move towards greater central bank independence in Britain was not already in place. Finally, we address the impact of the actual interest rate increase which took place simultaneously on the date of the announcement.

Details of the Policy Change

The policy change gave the Bank of England "instrument independence," in the sense that it was now free to pursue its policy goals without interference from outside political pressures. However, the Treasury still retained some input over the formation of policy, so the reforms did not give the Bank of England "goal independence." As Walsh (1997b) points out, the new arrangement was quite consistent with the proposed structure of the European Central Bank under the European Monetary Union (EMU).

In particular, the Chancellor proposed that monetary policy decisions be made by a nine-member Monetary Policy Committee, on the basis of a majority vote "…similar to arrangements in other countries including the USA and other G7 members." To ensure openness, minutes of proceedings and votes would be published.

Also consistent with the structure of the European Central Bank, but perhaps inconsistent with the pure notion of goal independence, the Chancellor made clear that there would be enhanced requirements for the Bank of England to report to the Treasury and the House of Commons on monetary policy. In addition the Court of the Bank of England, which would be reformed to represent "…the whole of the United Kingdom…," would review the performance of the Bank of England.

In his clarification of the policy change before the House of Commons on May 20, however, the Chancellor made it clear that the government would retain the right to override the operational independence of the Bank in "extreme circumstances." This clearly places some limits on the degree of central bank operational independence. While he stressed that he expects this right to be exercised rarely, the vague terminology surrounding the criteria for overrides leaves open the possibility of government intervention when it disagrees with central bank monetary policy. These are, of course, the episodes in which institutional guarantees of independence have the most impact.

The News Content of the Institutional Change Announcement

There are two primary reasons for not considering the policy announcement a complete surprise to bond markets. First, there was some belief that Britain would eventually join the EMU, particularly after the Labour Party, which was generally believed to be much more amenable to the concept of EMU than its Tory predecessor, took office. The Maastricht Treaty calls for a European Central Bank which holds price stability as its sole objective and enjoys complete instrument independence. It follows that if Great Britain joined the EMU, it would be required to grant much greater independence to its central bank, whether that bank remained the Bank of England or became the European Central Bank.

Second, there was an independent debate on enhancing central bank independence already taking place within England. This debate was stimulated by positive experiences other nations had recently had with central bank independence, such as New Zealand. Debelle and Fischer (1994) report a "lively discussion" concerning central bank independence in the United Kingdom three years prior to the 1997 announcement. A panel of experts known as the Roll panel (1993) urged the Bank of England to declare price stability as its ultimate objective and urged the government to grant the central bank instrument independence.

There was also some indication that the new Labour government would be amenable to reforming the Bank of England. In his May 6 policy announcement, Chancellor of the Exchequer Gordon Brown reminded his audience of Labour's election manifesto which said that if elected Labour would "…reform the Bank of England to ensure that decision-making is more effective, open, accountable and free from short-term political manipulation."

To some extent, then, it would be unfair to characterize the monetary policy announcement as a complete surprise to markets. This is an issue for the current study, because the observed price movement in bond markets would only reflect the innovation in information associated with the policy change announcement. If we find, for example, that the response in bond markets was surprisingly tepid, we must entertain the possibility that the market already believed with positive probability that the Bank of England would achieve greater independence.

Nevertheless, it seems likely that the May 6 announcement was to some degree a surprise, at least in its timing. For example, Walton (1997) in his March forecast of policy under a Labour government, reports that Gordon Brown has proposed the creation of a Monetary Policy Committee and predicts that "…once this body is in place and it has demonstrated a successful track record in its advice, a Labour government would consider granting it operational independence…. However, it will take several months before the MPC is up and running. In the meantime, Gordon Brown will have to operate within the existing framework."

Our case study below is therefore a test of the joint hypothesis that the announcement represented a surprise and that this surprise was priced in bond markets. Because it may not have been a total surprise, however, our estimates of the magnitude of the response to the announcement then represent lower bound estimates of the expected impact of the enhanced level of Bank of England independence on future expected inflation levels.

The Simultaneous Interest Rate Increase

In the same speech in which Gordon Brown announced the institutional changes in the Bank of England, he also announced a 25 basis point increase in the base (or repo) interest rate. This interest rate announcement could complicate our event study considerably if it, too, were a surprise. In that case, we would be in the undesirable position of having to apportion the estimated change in inflation expectations between the institutional surprise and the interest rate increase surprise.

Fortunately, there is reason to believe that the interest rate increase was *not* a surprise, but instead was relatively consistent with market expectations. For example, the April 1997 Goldman Sachs *U.K. Economics Analyst* reported, "We expect a base rate rise of at least 25 basis points at the

7 May monetary meeting, and an increase of 50 basis points is becoming increasingly likely" (p. 1). If we take this report as an indicator of the expectations of the market as a whole, the 25 basis point interest rate increase would not have been a surprise tightening. Indeed, if anything, the market appears to have expected an increase somewhere between 25 and 50 basis points, implying that the 25 basis point increase was surprisingly low. The Bank of England did raise rates another 25 basis points following its July 10 monetary policy meeting. It therefore appears that the May 6 increase of 25 basis points did not represent much of a surprise to investors, as the Bank of England may have been choosing to move in small increments, as central banks often do. Given this information, it seems appropriate to proceed by treating the "event" on May 6 as a purely institutional change.

II. Estimation of Expected Inflation Levels from Indexed and Nominal Bond Spreads

The Fisher Identity

Several studies in the literature (e.g., Arak and Kreicher 1985, Woodward 1988, 1990, and Deacon and Derry 1994) have used the "break-even" method to estimate expected inflation in the United Kingdom from indexed and conventional British gilts of comparable maturities. Typically, these studies specify an equation for the price of indexed gilts and an equation which incorporates the Fisher identity. Solving this system of two equations yields solutions for expected inflation and the underlying real rate of interest.[3]

We use bonds of comparable maturity rather than duration. As discussed by Woodward (1990), there are conceptual problems associated with matching indexed and non-indexed bonds by duration. The duration method was designed to account for differences in interest rate risk. However, the indexed and conventional bonds face different classes of interest rate risk. In particular, while the indexed bond faces real interest rate risk, the conventional bond faces nominal interest rate risk. As Bootle (1991) discussed, these forms of risk can differ widely depending on the relative fluctuations in real rates and inflation premia over the life of the two bonds. This invalidates the standard duration analysis.[4]

We begin with the Fisher identity: R represents the nominal interest rate yield, and r represents the real rate of interest over a six-month period. Coupon payments on British gilts are made semi-annually. Following Anderson, et al. (1996) we ignore liquidity risk premia and specify the Fisher identity as:

$$(1) \qquad \left(1 + \frac{R}{2}\right) = \left[(1+\pi^e)\,(1+\lambda)\right]^{\frac{1}{2}} \left(1 + \frac{r}{2}\right)$$

where π^e represents expected future inflation over the period, and λ may be positive due to an inflation risk premium.

In practice, changes in the inflation risk premia are hard to distinguish from changes in expected inflation empirically. As a result, most researchers proceed by assuming a zero inflation risk premium (Arak and Kreicher 1985, Woodward 1990, Barr and Campbell 1997).[5] We follow such an approach, which can be justified for two reasons. First, it has been estimated that inflation risk premia are in fact rather small (e.g., Cogley 1995). Second, methods used to disentangle inflation expectations for inflation risk premia are unlikely to be superior to ignoring the inflation risk premium altogether.

Finally, it is well known that there is a positive relationship between the level and the variability of inflation (e.g., Taylor 1981). This makes it likely (although by no means certain) that there also will be a positive relationship between inflation levels and inflation risk premia. If this latter relationship holds, then our test of the impact of the Bank of England announcement will be robust to positive inflation risk premia. If we find that the spread between nominal and index-linked gilts decreased after the announcement, for example, then that should indicate a decrease in both expected inflation and the inflation risk premium. While inflation risk premia may then hinder our estimate of the magnitude of the change in expected inflation, we should still be able to test for the sign of any change.

Valuation of Indexed Gilts

We next turn to the valuation of indexed gilts. We first address a number of issues which complicate the relationship between expected inflation and the price of indexed British

3. Using an alternative asset-pricing approach, Barr and Campbell (1997) also use conventional and index-linked bonds to estimate inflation expectations and expected future real interst rates. They find that inflation forecasts obtained from index-linked bonds forecast future inflation more accurately than nominal bond yields.

4. For an example of estimating inflation expectations using duration analysis on British gilts, see Deacon and Derry (1994).

5. An exception is Kandel, et al. (1996), which uses five bonds to measure a single real interest rate series for Israel. However, their method requires short-term indexed bonds with identical maturity dates which are not available for the U.K.

gilts. These include lags in indexing and the tax treatment of bonds.[6]

Tax Issues. Taxation issues used to be a primary concern in the literature in extracting British inflation expectations from comparisons of indexed and nominal gilts. Tax laws previously favored small coupon indexed bonds, because the scaling up of principal payments was treated as capital gains and exempt from tax purposes, while the scaling up of coupon payments was treated as ordinary income and subject to taxation (Woodward 1990).

There was also the issue of withholding tax, which reduces the after tax rate of return on bonds. In the U.K., 25 percent of coupon payments on British gilts was subject to withholding tax (Andersen, et al. 1996). These tax issues required adjustments when estimating expected inflation and real interest rate yields from conventional and index-linked gilt spreads, as in Shen (1995).

These issues have been alleviated by recent changes in the tax treatment of British gilts (Bank of England 1997). Since the beginning of 1996, withholding taxes on dividend payments for wholesale investors holding their gilts in special accounts (known as "STAR accounts") in the Central Gilts Office have been abolished. These account for nearly 80 percent of gilt holdings by value.

Moreover, since April of 1996, most wholesale investors were taxed on a total return basis. Taxes are now based on both capital gains and losses and income payments. These policy changes remove many of the tax issues associated with estimation of expected inflation rates.

Indexation Lags. The problems associated with the lags in indexing are well-documented in the literature. Principal and coupon payments of indexed gilts are linked to the Retail Price Index (RPI). However, the base month for indexation is the month eight months prior to the date of issue.[7] The bond therefore carries inflation risk associated with the difference between the inflation rate eight months prior to issue and the rate during the last eight months of the bond. To see this, consider a bond which was issued in month $m = 0$ which has an annual real coupon rate of c and a final real principal payment of S, and which matures in month T. In any coupon month m, the nominal coupon payment on an index-linked bond, C_m, satisfies

$$C_m = \frac{c}{2} \cdot \frac{P_{m-8}}{P_{-8}},$$

where P_m represents the value of the RPI in month m.

Let M represent the final month of the bond. The nominal value of the principal payment in that month will also be indexed with an eight-month lag and satisfies

$$S \frac{P_{M-8}}{P_{-8}}.$$

Calculation of Present Value of Indexed Bonds. Our sample includes three index-linked bonds which were issued prior to the beginning of our event window. To calculate the present value of indexed bonds, it is useful to decompose the future payments into three components: the first coupon payment, the remaining coupon payments, and the final principal payment.

We begin with the first coupon payment. Consider a bond which at some date t is n half years (or $6n$ months) from its next coupon payment. For our purposes, we treat n as a daily value. Since the indexation lag exceeds a half-year, the nominal value of the first coupon payment is always known with certainty. For a bond on any date t, let Π_t^0 represent the inflation adjustment in the next coupon payment, which satisfies:

$$\Pi_t^0 = \frac{P_{m+6n-8}}{P_{-8}},$$

where P_{m+6n-8} refers to the RPI for *month* of the coupon date because RPI's are only calculated monthly. The value of Π_t^0 only changes semiannually on coupon dates. Since this nominal payment is known with certainty at date t, it obviously follows that it is invariant to the inflation which occurs between date t and the first coupon date.

Let C_0 represent the nominal value of the first coupon payment after date t. The expected present value of the first dividend payment at date t is therefore a function of expected inflation over that period and satisfies

$$E_t[PDV(C_0)] = \frac{c}{2}\,\Pi_t\,(1+\pi^e)^{-\frac{n}{2}}\,(1+\frac{r}{2})^{-n}.$$

We next turn to the remaining dividend payments. Suppose that there are T semiannual payments after the first payment. For example, consider the jth dividend after the first dividend payment. The expected nominal value of that payment is

$$E_t(C_j) = \frac{c}{2}\,\Pi_t^0\,(1+\pi^e)^{\frac{j}{2}}.$$

The expected present discounted value of that payment is then

$$E_t[PDV(C_j)] = \frac{c}{2}\,\Pi_t^0\,(1+\pi^e)^{-\frac{n}{2}}\,(1+\frac{r}{2})^{-(n+j)}.$$

6. Another potential issue would arise if the bonds used in the study were callable. We avoid bonds which possess these options, as pricing them would pose additional difficulties.

7. Deacon and Derry (1994) break down the eight-month lag in indexing as six months due to the method used to calculate interest on gilts, plus one month for the lag in RPI figures and one additional month because of differences in dates of coupon payments.

Except for the effects of the lag in first-payment indexing, then, the remaining payments are not exposed to inflation risk. The present discounted value of the sum of all dividend payments then satisfies

$$E_t\left[PDV\left(\sum_{j=0}^{T} C_j\right)\right] = C_0(1+\pi^e)^{-\frac{n}{2}} \sum_{j=0}^{T} \left(1+\frac{r}{2}\right)^{-(n+j)} .$$

Finally, we consider the terminal principal payment. Let S_T represent the actual nominal principal payment. This payment is expected to equal

$$E_t(S_T) = S\Pi_t^0 \,(1+\pi^e)^{\frac{T}{2}} .$$

The present discounted value of the expected future principal payment equals

$$E_t\left[PDV(S_T)\right] = S\Pi_t^0 \,(1+\pi^e)^{-\frac{n}{2}} \left(1+\frac{r}{2}\right)^{-(n+T)}.$$

Let V_t represent the present value of the indexed bond. Collecting terms, V_t satisfies[8]

$$(2) \qquad V_t = \Pi_t^0 \,(1+\pi^e)^{-\frac{n}{2}} \left[\frac{c}{2} \cdot \sum_{j=0}^{T} \left(1+\frac{r}{2}\right)^{-(n+j)}\right] .$$

Equation (2) demonstrates that due to the lag in indexing, the present discounted value of the indexed bond will be a decreasing function of the expected future inflation rate. Having set the risk premium equal to zero, equations (1) and (2) then give us two equations and two unknowns: the real interest rate, r, and the expected future inflation level, π^e.

We use these equations to solve for these variables for three pairs of bonds (see Table 1). While bonds with identical maturity dates are not available, it can be seen that maturity dates are close enough to treat them as comparable. The three pairs of gilts in our study mature in 2001, 2006, and 2016.[9]

Using these three pairs of gilts and the methodology above, we obtain estimates of average levels of inflation and real interest rates expected to prevail over the duration of the gilt pair. These are plotted for our sample in Figures 1 and 2 respectively, with the May 6 event date and the traditional two-week event window highlighted.

Figure 1 demonstrates that expected inflation decreased on the event date and, indeed, over the entire two-week event window. Moreover, these decreases were seen for all three maturities in the study. In contrast, Figure 2 shows that the response of real interest rate levels was less clear. While real interest rates increased on the announcement date (again, for all three maturity pairs in the study), the two-week window indicates a decline in real interest rates. The response in real interest rates appears to be more moderate, which we demonstrate more rigorously below. Both the inflation and real interest rate expectation series estimates are quite comparable to those produced by the Bank of England using a very different methodology.[10]

TABLE 1

INDEX-LINKED BONDS AND CONVENTIONAL BONDS USED IN STUDY

	2001	2006	2016
Index-Linked Maturity Date	Sept. 24	July 19	July 26
Index-Linked Par Coupon	2½%	2%	2½%
Conventional Bond Maturity Date	Nov. 6	Sept. 18	Dec. 7
Conventional Bond Par Coupon	7%	7¾%	8%

III. A CASE STUDY OF THE INSTITUTIONAL CHANGE ANNOUNCEMENT

To examine the impact of the announcement of institutional changes at the Bank of England on expectations of future inflation and real interest rates, we next conduct a standard case study. We compare movements in variables of interest during the event period to an earlier defined “estimation period.” See Figure 3, which depicts the identification of dates used in the case study for a two-week event window.

Given an event window, in our case one day, two days, or two weeks, we examine movements in the variables of interest over the 120-day period prior to our event. This “estimation period” allows us to examine the standard errors of changes in both expected inflation and real interest rates.

Since our event (the institutional change in the Bank of England) has only one observation, and since the set of pairs of conventional and index-linked gilts is rather small, we cannot conduct an event study in which we can exam-

8. Our specification also implicitly assumes no risk premium on indexed gilts, ignoring the inflation risk due to lagged indexation.

9. The 2001 maturity gilt included a coupon date over the period studied. For details of the estimation method used for this bond prior to the coupon date, see the Appendix.

10. The Bank of England series is generated by assuming an average rate of expected inflation over the duration of the gilt pair of 5 percent. This then yields real interest rate and inflation expectation estimates. The problem with this methodology is that the estimated expected inflation rate rarely conforms to the initial assumed 5 percent value.

FIGURE 1

EXPECTED INFLATION

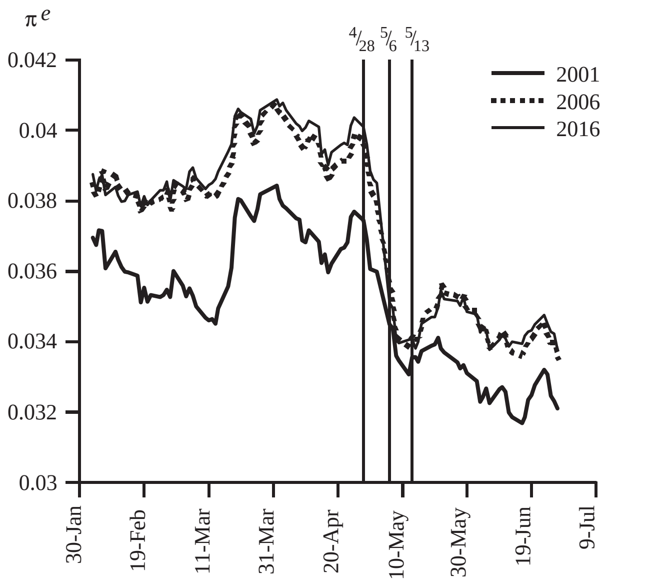
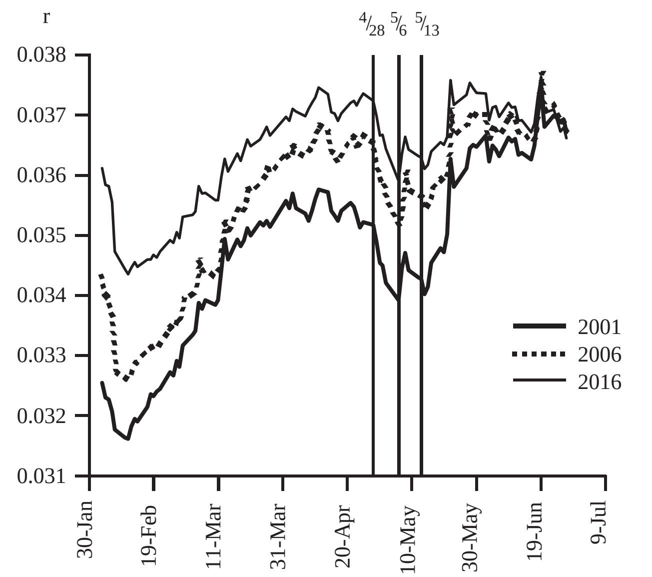


FIGURE 2

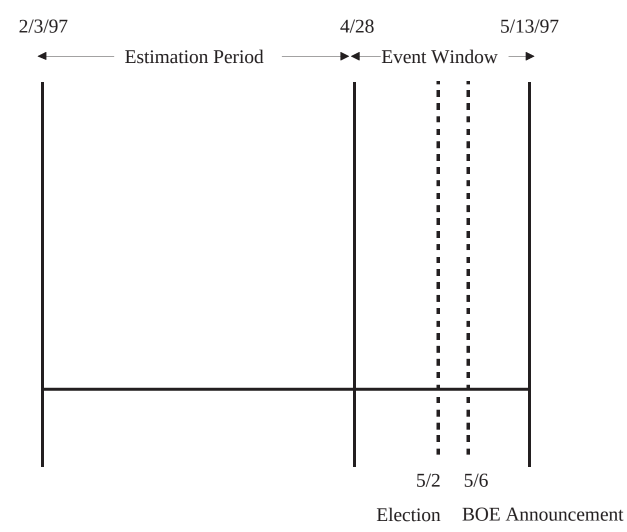
REAL INTEREST RATES



ine the implications of the event on a population of assets. Instead, our study is a case study, where we can simply report if the observed change over the event window was or was not more than a two standard deviations change in the variables of interest relative to comparable length windows observed over the estimation period.

FIGURE 3

CASE STUDY METHODOLOGY



One-Day and Two-Day Event Windows

Table 2 shows levels and changes in our estimates of expected inflation and real interest rates treating the event as a one-day or two-day window. One can see that the announcement date coincided with a decline in expected inflation. The result was strongest for the longest maturity bonds (2016), whose estimate of average inflation declined from 3.85 percent on May 2 to 3.51 and 3.50 percent on May 6 and 7 respectively, a 34 or 35 basis point decline.[11] Moreover, this movement is dramatic relative to those observed during the estimation period. One can see that the movement represented a 10 standard deviation movement relative to movements in expected inflation observed over the estimation period. While this is by no means a formal hypothesis test, it appears quite unlikely that the movement in this series was random noise.

11. The long gap between May 2 and May 6 reflects a long holiday weekend just prior to the announcement.

The movements in expected inflation for the shorter maturity bonds was more moderate. Expected inflation for the 2006 bonds declined from 3.80 percent on May 2 to 3.57 and 3.54 percent respectively on May 6 and 7, 24 and 26 basis point declines respectively. The shortest-term 2001 bonds exhibited declines in expected inflation from 3.60 percent on May 2 to 3.45 and 3.44 percent respectively on May 6 and 7, 15 and 16 basis point declines. Despite their relatively more moderate response, these movements were over two standard deviations away from the mean magnitudes of observed movements during the estimation period. It therefore appears quite unlikely that the estimated changes reflected random noise.

Our estimates of real interest rates exhibited much smaller effects of the central bank announcement, as would be expected. The greatest response occurred again at the longest maturities. However, the 2006 and 2016 bonds only exhibited a 5 basis point decline in the expected future real interest rate over the one-day window. While this change was more than 2 standard deviations relative to the estimation period, the effects completely disappear when we move to a two-day event window. Over a two-day window, we don't see movements greater than a single basis point for either of the longer maturities. The short-term bonds also exhibit very small changes over the one-day and two-day windows which are less than two standard errors relative to their movements over the estimation period.

Finally, note that the real interest rate movements do not strongly suggest that the simultaneous monetary policy announcement of a 25 basis point increase in interest rates represented a significant policy shock. As we indicated above, the markets had predicted either a 25 or 50 basis point increase, so the announcement of a 25 basis point increase could be interpreted as a smaller increase than that expected by the market. The fact that our real interest rate estimates exhibited small declines over one (but not two) day windows appears to support this contention. However, the declines in interest rates were smallest for the short-term bonds, which is the opposite of what we would have expected if these declines reflected responses to a short-term monetary policy shock.

Two-Week Event Window

We next turn to a two-week event window which examines movements from April 28 through May 13, one week before and after the May 6 announcement. In general, two-week windows are commonly used in event studies because the exact timing of the event in question is uncertain. For example, if the market partially anticipated the announce-

TABLE 2

Levels and Changes in Inflation Expectations and Real Interest Rates (One-Day and Two-Day Windows, %)

		May 2	May 6	ΔMay 2–6	May 7	ΔMay 2–7
Sept. 24, 2001						
	Expected Inflation	3.599	3.450	–0.149 (0.0425)	3.438	–0.162 (0.0425)
	Interest Rate	3.421	3.393	–0.028 (0.0211)	3.445	0.025 (0.0211)
July 19, 2006						
	Expected Inflation	3.804	3.567	–0.237 (0.0380)	3.540	–0.264 (0.0380)
	Interest Rate	3.566	3.517	–0.048 (0.0232)	3.568	0.000 (0.0232)
July 26, 2016						
	Expected Inflation	3.851	3.512	–0.339 (0.0334)	3.495	–0.355 (0.0334)
	Interest Rate	3.644	3.591	–0.053 (0.0204)	3.635	–0.010 (0.0204)

*Standard errors are in parentheses

ment prior to the actual date in which it took place, bond prices would have moved earlier and the impact of the announcement would already have been reflected in the spreads between conventional and index-linked gilts.

In our case, the motivation for a two-week window is very concrete. As we indicated above, the Labour Party had mentioned in its platform that enhanced independence of the Bank of England was one of its policy goals. Since the election in which the Labour Party won so dramatically was within a week of the announcement date, our two-week window also will capture the effects of the election on bondholder's expectations of future inflation.

Our results for the two-week event window are shown in Table 3. Over the two-week window the movements in expected inflation levels are even larger than those observed for one-day and two-day windows. As in the one-day and two-day event windows, the largest movements are observed for the longer-term bond pairs. Expected inflation exhibits a 60 basis point decline for the 2016 bond pair and a 55 basis point decline for the 2006 bond pair. These movements are greater than five standard errors for two-week window movements over the estimation period, again indicating that the movements are too large to attribute to random noise. While the 2001 bond pair again exhibits a more moderate response, we also see significant movement in this maturity pair, which exhibits a 39 basis point decrease.

The two-week event window also indicates some movement in expected future real interest rates, although the movement in real interest rates is again much more moderate than that in expected inflation. All three bond pairs exhibit approximately a 9 basis point decline in real interest rates over the two-week event window. However, for all maturities these movements are too small to reject the notion that they are driven by random noise.

The Election Date as an Event

Because of the stronger response we observed in the two-week window which included the election, one might wonder whether the election of the Labour Party, rather than the institutional change at the Bank of England, is the source of the movements in estimated inflation expectations and real interest rates. To investigate this possibility, we examine one-day and two-day event windows around the election date.

Our one-day study goes from the close the day before the election, May 1, to the close on election day, at which point in time it was quite clear that Labour would enjoy a large victory. Our results are shown in Table 4. We only see a 1

TABLE 3

LEVELS AND CHANGES IN INFLATION EXPECTATIONS
(TWO-WEEK EVENT WINDOW, %)

		April 28	May 6	ΔApril 28–May 6	May 13	ΔApril 28–May 13
Sept. 24, 2001						
	Expected Inflation	3.746	3.450	–0.295 (0.0419)	3.357	–0.388 (0.0419)
	Interest Rate	3.517	3.393	–0.125 (0.0208)	3.428	–0.089 (0.0208)
July 19, 2006						
	Expected Inflation	3.973	3.567	–0.406 (0.0367)	3.424	–0.549 (0.0367)
	Interest Rate	3.657	3.517	–0.140 (0.0230)	3.567	–0.090 (0.0230)
July 26, 2016						
	Expected Inflation	4.011	3.512	–0.499 (0.0319)	3.408	–0.603 (0.0319)
	Interest Rate	3.724	3.591	–0.133 (0.0202)	3.630	–0.094 (0.0202)

*Standard errors are in parentheses

TABLE 4

Levels and Changes in Inflation Expectations on Election Date
(One-Day and Two-Day Event Windows, %)

		May 1	May 2	ΔMay 1–2	May 6	ΔMay 1–6
Sept. 24, 2001						
	Expected Inflation	3.604	3.599	–0.004	3.450	–0.153
				(0.0429)		(0.0429)
	Interest Rate	3.450	3.421	–0.029	3.393	–0.057
				(0.0213)		(0.0213)
July 19, 2006						
	Expected Inflation	3.818	3.804	–0.014	3.567	–0.251
				(0.0383)		(0.0383)
	Interest Rate	3.593	3.566	–0.027	3.517	–0.076
				(0.0234)		(0.0234)
July 26, 2016						
	Expected Inflation	3.860	3.851	–0.009	3.512	–0.348
				(0.0335)		(0.0335)
	Interest Rate	3.668	3.644	–0.023	3.591	–0.077
				(0.0206)		(0.0206)

*Standard errors are in parentheses

basis point movement in expected inflation levels for the longer term issues and less than 1 basis point move for the 2001 bond pair. These movements are well within the standard errors we obtain over the estimation period. Consequently, we cannot dismiss the possibility that these small movements merely represent random noise.

Because of the long holiday weekend, we cannot move to a two-day window without encountering the Bank of England's institutional change. Consequently, our two-day window includes the large movements in expected inflation reported above. These results are also reported in Table 4 for completeness.

Our ability to dismiss the election as the source of the movement in expected inflation encountered above therefore depends on whether one believes that the implications of the election were reflected in the May 2 figure or whether the market movements on May 6 reflected residual fallout from the election rather than from the central bank's institutional change.

While it is impossible to dismiss the latter possibility completely, one can take solace in the relative magnitude of movements we observe in expected inflation and real interest rates. The pattern of a large movement in expected inflation accompanied by almost no change in real interest rates appears to fit much more closely with the event of an institutional change which is likely to bring about less inflationary monetary policy for the foreseeable future than any other implication of the Labour victory. In other words, we would argue that if there is some movement of the market in response to the Labour victory, it is likely to reflect primarily the change in market expectations towards future central bank policies due to Labour's promise to enhance the Bank of England's independence.

IV. Conclusion

In this paper, we use information from conventional and index-linked British gilts to derive estimates of expected future inflation and real rates of interest. These estimates are then used to conduct a case study of the response of these variables to the May 6, 1997, announcement of enhanced independence of the Bank of England. Our results indicate that the market perceived that enhanced central bank independence would lead to lower average rates of future inflation. For the longest-maturity 2016 bond pair, we find that average future expected inflation rates decreased by 34 basis points on the day of the announcement, and by 60 basis points over the longer two-week event window.

These results do not suffer from the criticisms that have been made in the literature towards the earlier cross-sectional studies, namely, that a spurious negative relationship has been observed between central bank independence and inflation because countries which desire lower inflation rates are also likely to adopt more independent central bank regimes. In our case, it is unlikely that the attitude of the British public towards inflation changed markedly on May 6. The announcement therefore qualifies as a "natural experiment" of an institutional change in central bank regimes. Our results therefore provide evidence that announcements of institutional changes alone do matter, in the sense that the market priced this institutional change as having a significant impact on future expected inflation rates.

APPENDIX

Valuation of Inflation-Indexed Bonds within Two Months of Coupon Date

Within two months of the following coupon date, the market knows the nominal inflation adjustment on the next two coupon dates, rather than simply the next adjustment as we derived in the text above.[12] This appendix describes adjustments of our estimates of the present value of index-linked gilts to accommodate this complication which arises for the 2001 bond for the first month of its estimation period.

The calculation of the expected first coupon payment is exactly the same as above. For a bond which at some date t is n half years from its next coupon payment, Π_t^0, the inflation adjustment in the next coupon payment, satisfies:

$$\Pi_t^0 = \frac{P_{m+6n-8}}{P_{-8}},$$

where P_{m+6n-8} again refers to the RPI for the *month* of the coupon date because RPI's are only calculated monthly.

The nominal value of the first coupon payment after date t satisfies

$$E_t[PDV(C_0)] = \frac{c}{2}\,\Pi_t^0\,(1+\pi^e)^{-\frac{n}{2}}\,(1+\frac{r}{2})^{-n}\,.$$

Similarly, let Π_t^1 represent the second coupon payment. It will satisfy

$$\Pi_t^1 = \frac{P_{m+6n-2}}{P_{-8}},$$

and will have present discounted value equal to

$$E_t[PDV(C_1)] = \frac{c}{2}\,\Pi_t^1\,(1+\pi^e)^{-\frac{(1+n)}{2}}(1+\frac{r}{2})^{-(1+n)}\,.$$

Let V_t represent the present value of the indexed bond. V_t satisfies:

$$V_t = \frac{c}{2}\,\Pi_t^0\,(1+\pi^e)^{-\frac{n}{2}}\,(1+\frac{r}{2})^{-n} + \Pi_t^1(1+\pi^e)^{-\frac{(1+n)}{2}}\left[\frac{c}{2}\cdot\sum_{j=1}^{T}(1+\frac{r}{2})^{-(1+n+j)} + S(1+\frac{r}{2})^{(1+n+T)}\right].$$

12. The market does not know exactly what the second payment will be until the RPI is announced. However, our results indicate that treating the market as having an unbiased estimate of the future announced RPI within two months of the coupon date is far more accurate than treating it as having no information about the value of the second payment. Consequently, we pursue this strategy.

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