Indexation, Inflation and Central Bank Independence

Lorenzo Pecchi, Banca di Roma, Italy
Gustavo Piga, Columbia University
September 1997

Discussion Paper Series No. 9697-28
INDEXATION, INFLATION AND CENTRAL BANK INDEPENDENCE

by Lorenzo Pecchi and Gustavo Piga

ABSTRACT

We provide a model which analyzes the effects on equilibrium inflation of different degrees of labor-market indexation. We show that time-inconsistency models cannot account fully for the stylized fact of policy-makers distaste for indexation clauses. In our model the Central Bank and the government interact, pressed by lobbying groups for redistribution through unexpected inflation. We find that inflation increases as indexation increases. The cornerstone of our model is that indexation changes the incentives of the various interest groups that press the government thereby changing the equilibrium inflation rate. A corollary of our model is that Central Bank independence is going to be successful only in societies with anti-inflationary preferences, reversing the traditional causality from independence to inflation.

JEL: E00, E50, J50.
1. Introduction

What relation exists between indexation and central bank independence? According to the main paradigm of inflation theory - based on the time-inconsistency approach pioneered by Kydland-Prescott (1977) and Barro-Gordon (1983) - both are institutional devices to avoid the inflationary bias in market economies. Central bank independence and indexation in these models are in fact substitutes to achieve the first-best outcome for society.

However, both instruments are not widely spread and do not seem to have undivided acceptance by policy-makers and market-makers.

Take indexation first. It is often argued that policy-makers dislike indexation clauses on the grounds that they stimulate inflation. Contracts are normally defined in nominal terms in most economies. Some very anti-inflationary countries, like Germany, actually explicitly forbid indexation clauses. In recent years, economists have tried to provide a rationale for the dislike toward indexation of policy-makers. Fischer and Summers (1989) present a model where indexation increases equilibrium inflation since it lowers its social costs. They use a Barro-Gordon time-inconsistency framework as a theory of inflation where an inflationary bias arises since the target output of policy-makers is higher than the natural rate of output, due to distortionary taxation. However, their model is inadequate since they do not fully consider the effect of the introduction of indexation on the parameter that measures the steepness of the Phillips curve, i.e. the lower advantage of unexpected inflation.² In their model, if wages were to be fully indexed there would not be any inflationary bias, unemployment would be at its natural level and welfare losses would be minimized. This argument extends to another source of the inflationary bias according to the dynamic inconsistency approach. A planner would be tempted to inflate away the stock of public debt outstanding when the latter is in nominal terms, leading to an increase in inflation and reduction in welfare. Such bias would be eliminated (Calvo-Guidotti (1990)) by using indexed bonds. This should not come as a surprise, since in general the time-inconsistency approach for monetary policy recommends the adoption of indexation clauses to eliminate the inflationary bias. For example, Waller and VanHoose (1992) - with a time-inconsistency set-up - find that the private sector provides too little indexation compared to the social optimum and suggest the possibility of government intervention to increase the degree of indexation in the

²To be sure, Fischer and Summers, in the conclusions of their paper recognize that many inflation-protection policies affect the steepness of the Phillips curve. However, the authors do not examine this aspect in their model.
Ball and Cecchetti (1991) have attempted to provide a more rigorous foundation for the Fischer and Summers argument within the standard time-inconsistency approach. They show that in a labor market with staggered wages, if indexed contracts adjust more frequently than non-indexed contracts, indexation reduces the costs of inflation by reducing relative wage variability. Furthermore, they take into account the effects of indexation in reducing the advantages of surprise inflation. They find that equilibrium inflation indeed rises with the increase of indexation but that welfare rises as well.

The time-inconsistency approach has therefore yet to provide a theory consistent with the fact that indexation decreases welfare so as to explain policy-makers aversion to indexation clauses and also capable of providing a general framework for understanding the effects of indexation on inflation regardless of the specific market considered. Indeed, it is well known that the policy-maker aversion for indexation extends to the government bonds market; for example, the U.S. Council of Economic Advisors in speaking about indexation in the bond market argued that:

"Widespread ownership of purchasing power bonds would add another group to those who think themselves sheltered from the effects of inflation, and would weaken public support for a stabilization program"\(^3\).

Now take central bank independence. There is widespread theoretical and empirical agreement that it is negatively correlated with inflation. However, an argument put forward recently by Posen (1995) and McCallum (1996b) is that central banks do not operate in a vacuum but are sensitive to government and society's preferences. According to these theories, the above-mentioned correlation is a spurious one, since inflation and central bank independence are jointly determined by political pressures by constituencies. Whether a central bank turns out to be effective in its anti-inflationary stance depends on the strength of society's opponents to inflation, reversing the traditionally accepted causality that the establishment of an independent central bank results in lower inflation. The argument is backed by circumstantial evidence. Japan - a country with high central bank dependence and a zero-inflationary bias which in all regressions

has always been a puzzling outlier⁴ - has recently implemented a reform aiming at making the central bank more independent. However, it seems that reforms of such kind do not generate unequivocal praise:

"A new law governing the Bank of Japan (BoJ) has been proposed by the Financial System Research Council, an advisory body to the government. Although the new law, if adopted as proposed, is unlikely to have any significant effect on monetary policy, it will make the BoJ more independent and its operations more transparent. Nevertheless, the acid test of BoJ independence under the new law will come only when a policy conflict emerges."⁵

This statement seems in accordance with the view that central bank independence is neither a necessary nor a sufficient condition to eliminate an inflationary bias.

In this paper we try to provide an alternative approach to explain the inflationary process determinants and the role played by indexation and central bank independence in it.

In our model inflation is the result of a game played by the Central Bank and the Congress. While the Central Bank has the objective of price stabilization, the Congress is pressed by interest groups to use inflation as a redistributive tool. The cornerstone of our model is that indexation changes the incentives of the various interest groups that press the government thereby changing the equilibrium inflation rate. We show that under realistic circumstances greater indexation in labor markets induces higher inflation.

Our approach has two advantages compared to the Ball and Cecchetti model. First, it can be easily applied to all circumstances where indexation is relevant, like the bond-market, while Ball and Cecchetti rely on an explanation that is very specific to the labor market. Second, it can rationalize the views of Posen and McCallum cited above. We show that "legal" or formal central bank independence may be helpless to counter inflationary pressures in the absence of a widespread degree of de-indexation.

⁴See Walsh (1996)

⁵Salomon Brothers, Japanese Economic/Market Analysis, 2/10/1997, italics added.
2. A political model of inflation

2.1 The timing of the game

Where does the incentive for inflation surprises come from according to the Barro-Gordon set up? Should we infer that central banks are inherently interested in unemployment-reducing or redistributive policies? Several authors have pointed out that this bias derives from political pressures on Central Banks from governments (McCallum (1996a), Leijonhuvud and Heymann (1995) and Patinkin (1993)). If this is the case a model of inflation - like the time-inconsistency one - that does not include these two actors explicitly is bound to provide a misrepresentation of the workings of the world. In this section we will provide a model which expands on Hetzel (1990) and Ball and Cecchetti (1991) that is capable of accounting for why indexation is disliked by policy makers.

Our model has four players: Congress, the Central Bank, Trade-Unions and Net Borrowers (Lenders). Trade Unions and Borrowers have an interest in forecasting correctly inflation and are capable of organizing their members into lobbies. The temporal setting of our game is the following:

a) trade-unions and borrowers (lenders) fix inflation-expectation in their contract (be it a wage, debt or loan) not knowing the type of government that is going to prevail in the near future, but only the distribution of types of governments and not knowing the realization of the economy's demand and supply shocks. Governments differ in the way they respond to lobbying pressures to redistribute through inflation: some governments might be more prone than others to respond to these pressures;

b) once the government-type is revealed in its redistributive stance, agents engage in a costly lobbying of the government so as to achieve the optimal level of redistribution through inflation. The equilibrium level of lobbying is given by a Nash game between various lobbies;

c) the equilibrium intensity of lobbying and the government's willingness to respond to these pressures determine the government taste for redistribution through inflation. The government then engages in a game with the Central Bank that controls money supply. The game between the Central Bank and Congress takes place, given expectations formed in part a) and the intensity of lobbying formed in part b), without knowing the realization of the demand and supply shocks in the economy.
d) Shocks occur and firms choose the level of employment.

2.2 The players of the game
2.2.1 The labor market

We will start with the description of the labor market so as to provide a framework for the trade unions setting of expectations in stage a).

Consider an economy with a production function:

\[ y_t = \alpha_0 l_t + \varepsilon \]  

(1)

made by continuum of firms uniformly distributed over the interval \([0,1]\) whose total output, \(y\), depends on the total labor input, \(l\), and a supply shock \(\varepsilon\). Trade unions fix nominal wages based on optimal expected real wages and let firms make employment decisions based on profit maximization.\(^6\) Wage contracts allow for partial or complete adjustment for unexpected inflation. Let all variables be expressed in logs and let \(p^s_t = 0\), so that \(p^s_t\) can be interpreted as the inflation rate. The labor market is therefore described by the following equations:

\[
\begin{align*}
    l^d_i &= -\alpha_1 (w_i - p^s_t - \varepsilon), \quad \alpha_1 = \frac{1}{1 - \alpha_0} \\
    w - p^e &= w^* \\
    w_i &= w^* + p^e + I_i \cdot (p^s_t - p^e) \\
    y^*_i &= -\alpha_0 \alpha_1 w^* + \varepsilon(1 + \alpha_0 \alpha_1)
\end{align*}
\]  

(2)

From now on set \(\beta = \alpha_0 \alpha_1\). The first equation represents labor demand for firm i, the second represents the trade union desired real wage, \(w^*\), the third represents the contracted wage equation (where \(I_i\) is the degree of indexation of contracts in firm i) and the fourth the full-

\(^6\)Since all variables are expressed in logs, the elasticity of output with respect to labor is constant. This implies that the optimal real wage chosen by a monopoly union is invariant to supply shocks.
information level of output for firm i. When workers form their expectation $p^*$ they do not know either the realization of demand and supply stochastic shocks or the type of government that will prevail (see later), but only the distribution of the shocks and of the type of government. Aggregate supply in this economy is given by:

$$Y^s_t = -\beta w^* + \beta(1 - \ell) (p^s_t - p^e_t) + (1 + \beta) \varepsilon_t$$  \hspace{1cm} (3)$$

where $\ell$ is the aggregate degree of indexation in the labor market (when $\ell=0$ all contracts are nominal and when $\ell=1$ all contracts are fully indexed) and $(-\beta w^* + (1 + \beta) \varepsilon)$ is the full information output.

Aggregate demand is given by:

$$Y^d_t = m_t - p^s_t + \nu_t$$  \hspace{1cm} (4)$$

where $\nu$ is a velocity shock with zero mean and variance $\sigma^2\nu$ and $m$ is money supply.

It can be shown that the price level $p^*$ is equal to:

$$p^*_t = \beta w^* + m^e_t + \frac{1}{1 + \beta(1 - \ell)} (m_t - m^e_t + \nu_t - \varepsilon_t(1 + \beta))$$  \hspace{1cm} (5)$$

2.2.2 The government and the central bank

Money supply, set by the Central Bank, determines trend inflation $p^{\tau}$, i.e. the expected inflation before stochastic shocks $\nu_t$ and $\varepsilon_t$ occur. Note that $p^{\tau}_t$ is different from $p^*_t$ since the former is based on the knowledge of the type of government while the latter is not. Both expectations are formed without knowledge of the realization of supply and demand shocks. The money supply is the result of a game played by the Central Bank and the Congress. While the Central Bank dislikes inflation, the Congress is pressed by different interest groups to use inflation
(or deflation) as a redistributive tool. Both institutions suffer from a cost of disagreeing with one another.

We assume that the Congress minimizes the loss function $L^c$ by choosing the appropriate level of inflation to demand to the Central Bank, $p^D$:

$$\ln p^D L^c = E [k^c(p^c - p^D_t) + \delta(p^D_t - p^S_t)^2$$

where $E$ is an expectation operator conditional on the knowledge of the type of government, $p^D$ is the inflation demanded by the Congress to the central bank, $p^S$ is the inflation supplied by the Central Bank, $p^c$ is the expectation of inflation included in the contracts in stage a) and is therefore a given when the government minimizes (6), $k$ is an index of the strength of the inflationary constituency and $\delta$, which is strictly positive, is an index of Congress sensitivity to conflicts with the Central Bank. When $k$ is greater than zero the inflationary constituency is stronger than the deflationary one. In this case the Congress will recommend to the Central Bank an unanticipated inflation.⁷

What determines the parameter "$k$" in equation (6) that stands for the taste for redistribution through inflation of the government? We will assume that it depends on pressures from lobbying groups, namely creditors or debtors and trade-unions, which the government internalizes so as to satisfy those interests groups. However, each government differs as to the degree to which it decides to bend to those pressures. Let therefore $k$ be an index of the net strength of the inflationary constituency given the sensitivity of the government to inflationary pressures:

$$k = a + l^{tot}$$

$$l^{tot} = l^{TU} + l^{OL}$$

⁷Unexpected inflation or deflation is a powerful tool for governments to redistribute wealth across citizens or groups. Beetsma (1996) shows the effects in the Calvo (1988) set-up of such a redistributive tax in the presence of individuals with different nominal debt-holdings. That this constituency pressure on Governments will end-up affecting the central Bank's behavior is noted by McCallum (1996b), p.10, when he argues that "... I would expect that the relative importance given to inflation and unemployment avoidance will be approximately the same by a Central Bank and the society of which it is a part."
where $I^{TOT}$ is the net inflationary pressure on the government from lobbies (if $I^{TOT}$ is negative the pressure is deflationary) and $\alpha$ is the degree of response of the governments to lobbying pressures, representing the government's type. When contracts are signed in the economy, at stage a), agents only know the distribution of this variable and we assume $E(\alpha) = 0$.

The Central Bank in turn minimizes instead the following loss function by choosing the appropriate level of money supply:

$$\min_{m_t} \quad L^b = E[\gamma (p^S_t - p^D_t)^2 + b (p^S_t)^2]$$

subject to equation (5). $\gamma$ is a positive number representing the degree of "legal" dependence of the Central Bank on Congress\(^8\), while $b$ is strictly positive and has the same interpretation as in the standard time-inconsistency approach.

These objective functions present the realistic feature mentioned above that the Central Bank does not care about unexpected policies "per se", but through the cost of disagreeing with Congress. The latter is subject to pressure from constituencies which we will show to be at the root of the inflationary process. Congress itself cares only indirectly about inflation, through the cost of disagreeing with the Central Bank. This is consistent with the institutional framework of industrialized countries where central banks have generally the primary mandate to preserve the value of money.

2.2.3 The lobbies

The total lobbying pressure in this model is simplified to be the result of competing pressures from two classes of agents: from trade unions ($I^{TU}$) and from other lobbies ($I^{OC}$), representing either lenders or borrowers. The trade unions, as we will see, will lobby to have no redistribution through inflation so as to ensure the optimal real wage $w^*$ for the workers; the other lobby will press for either greater or lower inflation than expected depending if it is a net

---

\(^8\)As it will become clearer later on, $\gamma$ is an indicator of formal or legal independence: effective independence will be given by $k \gamma$. The parameter $\gamma$ could in principle be affected by the dominant constituency in society, i.e. by $k$. For example, one might expect higher independence of the Central Bank there where anti-inflationary constituencies are stronger.
debtor or a net creditor.

Once expectations have been included in all relevant contracts in the economy and the government type \( a \) has been revealed, lobbies have an incentive to pressure the government which, in turn, will pressure the Central Bank as to the inflation level. Trade Unions, as depicted in our model, will lobby to preserve the purchasing power \( w^* \) of their members, derived in a previous maximization. Lobbying however is costly. The workers objective function can be formulated as follows:

\[
\min_{Lw} \ E \ Lw = \ E \ [(1 - f) (p^s - p^e)^2 + \frac{c}{2} (l^{TU})^2] \quad (9)
\]

where the expectation term is due not to the government type (which is known at this stage of the game when groups lobby) but to the randomness of supply and demand shocks of the economy. Notice that the cost of inflation departing from expected inflation is increasing in the degree of real flexibility of the contracts. If contracts are fully indexed, mistakes in forecasting inflation are irrelevant. \( c^{wu} \) represents the marginal cost of lobbying.

Facing the trade-unions is a group of other lobbies, synthesized by the following objective function:

\[
\min_{Lol} \ E \ Lol = \ E \ [\Omega (p^e - p^s) + \frac{d}{2} (l^{OL})^2] \quad (10)
\]

where \( \Omega \) is greater than 0 when debtors are dominant and \( \Omega \) is less than 0 when creditors are dominant. \( d^{OL} \) is the marginal cost of lobbying for this group. Note that debtors (creditors) do not ask to preserve the real terms of their contract - as trade-unions do - but try to wipe out (increase) the real value of their liabilities (assets). The gains from lobbying will have to be equated at the margin with the costs of this activity.

2.3 Solving the game

We will look for a sub-game perfect equilibrium by solving the whole game backwards.
We will therefore first examine the sub-game between Congress and Central Bank given inflationary expectations $p'_t$ of wage-setters and borrowers and lenders and the equilibrium level of lobbying, but not knowing the supply and demand shocks that will affect the economy.

It is easy from (5), (6) and (7) to determine the Congress and the Central Bank reaction functions:

$$p^D_t (p^{Se}_t) = p^{Se}_t + \frac{k}{2\delta} \quad (11)$$

$$p^{Se}_t (p^D_t) = \frac{\gamma p^D_t}{(\gamma + b)} \quad (12)$$

This latter reaction function of the Central Bank can also be expressed in terms of money supply:

$$m_t (p^D_t) = \frac{\gamma p^D_t}{(\gamma + b)} \quad (13)$$

Notice that the higher the level of inflation demanded by the Congress, the higher the money supplied by the Central Bank. In the Nash equilibrium we have that:

$$p^D_t = \frac{k(\gamma + b)}{2\delta b} \quad (14)$$

This implies that the equilibrium trend inflation and equilibrium inflation are given by:

$$p^{Se*}_t = \frac{k \gamma}{2\delta b} + \beta w^* \quad (15)$$
We turn now to determining the equilibrium level of lobbying given inflationary expectations $p^*$ embedded in wage and debt contracts and the type of government $a$. Both groups determine their optimal level of lobbying taking as given the level of lobbying of the other group and the fact that inflation conditional on the type of government but not on the type of supply and demand shocks will be given by equations (7) and (15), to be inserted in (9) and (10). The two reaction functions will therefore be given by the solution to the following minimizations:

$$
\min_{\tau_U} (1 - I)(\frac{\gamma (a + l^{TU} + l^{OL})}{2\delta b} + \beta w^* - p^*)^2 + \frac{c}{2} (l^{TU})^2
$$

$$
\min_{\sigma} \Omega (p^* - \beta w^* - \frac{\gamma(a + l^{TU} + l^{OL})}{2\delta b}) + \frac{d}{2} (l^{OL})^2
$$

From (17) we obtain the following:

$$
\tau_U(l^{OL}) = \frac{2\delta b(1 - I)\gamma (p^* - \beta w^*) - (l^{OL} + a) \gamma^2(1 - I)}{2c\delta^2 b^2 + \gamma^2(1 - I)}
$$

$$
l^{OL}(l^{TU}) = \frac{\Omega \gamma}{2\delta b d}
$$

Notice that the level of lobbying from other lobbies is independent of the level of lobbying of the trade unions. Inserting (18) in (16) we have the expression for the inflation level:
This the price level given the knowledge of $a$, the Congress reaction to lobbying pressures, and the realization of the shocks. When forming expectations on inflation ($p^e$) however, agents do only know the expected value of $a$, $E(a) = 0$. We are now at the first stage of our game, when contracts in the labor and financial markets are signed. This implies that, by taking expectation of (19) conditional on being at the first stage of the game, inflation is expected to be equal to:

$$p^e \equiv \frac{\gamma^2 \Omega}{4 \delta^2 b^2 d} + \beta w^*$$  \hspace{1cm} (20)

Notice that inflation is expected to be higher the higher is the "legal" dependence of the Central Bank and the stronger the inflationary stance of the net debtor constituency. The inflation expectation is independent of the degree of indexation in the labor market. In our model indexation affects inflation through the level of lobbying that it stimulates. *Ex ante* trade unions expect on average not to need to lobby to protect the purchasing power of the contracted nominal wage. Therefore expected inflation does not depend on indexation.

Inserting (20) in the first equation of (18) we obtain the equilibrium level of lobbying activity by the trade unions, keeping in mind that the type $a$ of government is then known to the lobbies:

$$I^* = \frac{-a (1 - I) \gamma^2}{2c \delta^2 b^2 + \gamma^2 (1 - I)}$$  \hspace{1cm} (21)

Notice from (21) that trade-unions will not lobby if the government turns out to be as
expected ($a=0$) in its receptivity of lobbying pressures. Note also that if lobbying is costless ($c=0$)
trade-unions would exactly compensate for the surprise in the government's type preserving their
desired real wage-employment combination. Departures from this extreme case will make trade-
unions miss their first best even though lobbying allows for partial compensation. Also, the
lobbying activity is increasing in the degree of dependence of the Central Bank and is opposite to
the government stance: with a government more prone than expected to accept inflationary
pressures ($a>0$), trade-unions are threatened in the real value of the nominal wage and therefore
undertake a deflationary lobbying activity; with a government less prone than expected to accept
inflationary pressures ($a<0$) trade-unions are threatened in their desired level of employment and
therefore engage in an inflationary lobbying activity. Importantly, notice that the higher the degree
of indexation the lower is the level of lobbying activity given the type of government. In this
model, indexation for trade-unions is a costless substitute for lobbying.\footnote{In a world where inflation is costly also for workers this result needs to be qualified by trading-off the lower costs of lobbying with the higher costs of inflation that indexation brings about.}

Inserting (21) in (19) we can solve for the equilibrium level of inflation:

$$p^*_{s,t} = \frac{\gamma}{2\delta b}[a + \frac{\gamma \Omega}{2\delta bd} - \frac{a (1 - I) \gamma^2}{2c \delta^2 b^2 + \gamma^2 (1 - I)}] + \frac{\nu_t - \epsilon_t (1 + \beta)}{1 + \beta (1 - I)} + \beta w^*$$ (22)
less indexed are their contracts. On the other hand, when a "deflationary" government prevails, trade-unions lobby to protect employment of their members asking for inflation, the more so the less indexed are their contracts. Notice that this effort may not be entirely successful since lobbying is costly and trade unions will weigh the benefits of lobbying with its costs. In fact output in equilibrium will be given by:

$$Y^s = -\beta w^* + \frac{\beta(1 - I)y\delta bca}{2c\delta^2 b^2 + \gamma^2(1 - I)} + \frac{\beta(1-I)v + \epsilon(1+\beta)}{1+\beta(1-I)}$$  \hspace{1cm} (23)$$

To evaluate the structure of our model consider graph 1 (in the graphs that follow we assume no realized demand ($v$) nor supply-shocks ($e$)). The intersection of (AD0, AS0) is equilibrium in a model where there is no uncertainty on the government's type, no lobbying possibilities and a competitive labor market. When we introduce the presence of trade-unions, aggregate supply shifts from AS0 to AS1 and equilibrium unemployment rate and inflation are higher. If we then add the possibility of lobbying this creates an inflationary bias due to the receptivity of the government to those pressures: aggregate demand shifts to AD2 since the central bank has to accommodate partly these pressures, however there are no effects on equilibrium output since trade-unions are not surprised and adjust their nominal wage requests, shifting aggregate supply to AS2. This inflationary-bias is therefore independent from the indexation parameter.

In graph 2 we actually see from the equilibrium AD2-AS2 how indexation affects the economy in the presence of uncertainty on the government's type. Assume that $\alpha>0$, i.e. the presence of a government more prone to listen to the debtors requests than expected. Equilibrium output under full indexation is described by AD3-AS3: trade-unions do not lobby and the inflationary government stance will not be countered, letting inflation rise to its highest potential. Full indexation - in the absence of traditional supply shocks - however ensures output stability around its natural rate. Now let the economy be fully de-indexed ($I=0$). In this case equilibrium is at AD4-AS4: the inflationary stance of the government is countered by trade-unions and aggregate demand rises less than under full indexation. The lack of indexation however exposes workers to output fluctuations. These results are obviously very different from the time-inconsistency approach, where indexation removes the incentives to do expansive monetary
policies. Inflation is here higher when indexation is higher. The introduction of a political source of uncertainty therefore induces higher variability in output and in prices. This additional variability in output is increased but variability in prices is decreased with de-indexation.
3. Conclusions

We have shown that indexation increases inflation, a worry mentioned by all parties sincerely averse to inflation. Some models of time-inconsistency - like Ball and Cecchetti's - still find that inflation and indexation are positively correlated. Since we agree with the authors conclusions (but not their premises) it is legitimate to ask if the argument presented in the paper has any relevance for policy implications. We believe it does.

Persson, Persson and Svensson (1996) in a recent paper show that Sweden's budget is strongly exposed to inflation through its various nominal clauses. They argue that such an exposure increases the temptation to use the inflation tax and therefore that Central Bank independence should be strongly supported. On the basis of their data, we argue instead that such a nominal exposure is beneficial to oppose inflationary pressures since it gives rise to anti-inflationary lobbies, and that if Central Bank independence must be advocated, this should be done on other grounds. In another paper Svensson (1994) argues that Sweden should "...in order to reduce the incentive to inflate ... stop the partial deindexing of expenditures and taxes in recent consolidation proposals, and reduce the proportion of net public debt that is denominated in kronor by issuing indexed and foreign currency debt."10 Our view is opposite to this one. In fact, countries involved in fighting inflationary pressures often recur to de-indexing before (see for example the Italian experience in the 1990's).

While our model does not have straight-forward welfare implications, it does suggest ways to "live without inflation". In our model, inflation decreases with increases in legal Central Bank independence and with central banker's conservativeness while it increases with the strength of the inflationary constituency. It may therefore seem that, as the dynamic inconsistency approach suggests, measures that increase the legal independence of Central Banks are welcomed even in our set up. Yet, in our model the government rather than the Central Bank plays the discretionary policy. This implies, as pointed out by McCallum (1996b) that Walsh-contracts11 that encourage Central Bankers to implement the optimal policy, while useful, do not necessarily provide a solution for the time inconsistency situation. In fact, the contract is granted by the same

institution, i.e. the government, that has an incentive to behave discretionally. On the other hand, the appointment of a conservative Central Banker with preferences different from society as suggested by Rogoff (1985) might not represent a practical solution to eliminate the inflationary bias. In our model the central banker incorporates society's taste for inflation through Congress' pressure and it is therefore hard to see why such a central banker would remain in place.\(^\text{12}\) In fact, we have assumed that the parameter \(\gamma\), which represents central bank legal dependence, is a constant. However, we could have easily modeled \(\gamma\) as a quadratic function of "\(k\)", the inflationary pressures in society. In this case, more deflationary or inflationary societies would impose a legal framework of dependence on the Central Bank, thereby making legal independence a less powerful tool for the defense of nominal values.

Posen (1995) argues that the negative correlation between central bank independence and inflation indicated in several studies\(^\text{13}\) is a spurious one. According to him, it is opposition in financial circles to inflation that explains this negative correlation. We offer a theoretical model that expands on Posen's intuition. However, our model shows that it is erroneous to concentrate exclusively on the opposition of financial circles, and that it would be worthwhile analyzing the stance of workers, bond-holders and tax-payers against inflation, especially when the representatives of these groups have an easy access to policy-makers through lobbying. For example, Pecchi and Piga show that the absence of index-linked bonds in the world can be explained by the opposition to it by the anti-inflationary interest groups.\(^\text{14}\)

The model presented in this paper shows that Central Bankers with a strong anti-inflationary stance (high \(b\)) and formally independent (low \(\gamma\)) are bound to be inherently more successful in those societies that present strong anti-inflationary constituencies (low \(k\)), while they may fail in their objective in societies dominated by inflationary interest groups. The question therefore remains as to how countries perceived as inflationary can achieve price-stability. In this paper we provide some suggestions. First of all countries where indexation devices are present have a harder time, ceteris paribus, to fight inflation. Second, the model might provide a rationale of why countries involved in anti-inflationary policies - like Israel - adopt de-indexation policies.

---

\(^{12}\)See McCallum, (1996b), and Hetzel (1990), p. 102.

\(^{13}\)See for example, Grilli, Masciandaro and Tabellini (1991).

As stated by Patinkin (1993) the success of the 1985 Israeli stabilization was due to the "cohesiveness" of Israeli society. De-indexation policies appear to be strategic devices to strike a political agreement among opposing interest groups thereby making society aware of the costs of unanticipated inflation and strengthening the anti-inflationary stance of workers, bond-holders or of tax-payers.

De-indexation and central bank independence are not substitute institutional devices to fight inflation. Two are the main differences. First, while central bank independence may be helpless against strong inflationary constituencies, de-indexation creates endogenously barriers against such inflationary pressures. Second, while central bank independence raises serious issues of accountability in modern democracies, de-indexation works through a democratic process of representation to preserve the stability of nominal values.

---

References


The following papers are published in the 1996-97 Columbia University Discussion Paper series which runs from early November to October 31 of the following year (Academic Year).


You may download any papers found on this site.

For Ordering Hardcopies:

Domestic orders for discussion papers are available for purchase at the cost of $8.00 (U.S.) Per paper and $140.00 (US) for the series.

Foreign orders cost $10.00 (US) per paper and $185.00 for the series.

To order discussion papers, please write to the Discussion Paper Coordinator at the above address along with a check for the appropriate amount, made payable to Department of Economics, Columbia University. Please be sure to include the series number of the requested paper when you place an order.
<table>
<thead>
<tr>
<th>Series no.</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>9697-01</td>
<td>Fertility Behavior Under Income Uncertainty</td>
<td>Ranjan, P.</td>
</tr>
<tr>
<td>9697-02</td>
<td>Trade Restrictions, imperfect Competition and National Welfare with Foreign Capital Inflows</td>
<td>Ranjan, P.</td>
</tr>
<tr>
<td>9697-03</td>
<td>Restructuring an Industry during Transition: a Two-Priced Model</td>
<td>Ericson, R.</td>
</tr>
<tr>
<td>9697-04</td>
<td>A Conformity Test for Cointegration</td>
<td>Dhrymes, P.</td>
</tr>
<tr>
<td>9697-05</td>
<td>Low-Wage Employment Subsidies in a Labor-Turnover Model of the 'Natural Rate' (November 1996)</td>
<td>Hoon, H.T. Phelps, E.</td>
</tr>
<tr>
<td>9697-06</td>
<td>The Knowledge Revolution</td>
<td>Chichilnisky, G.</td>
</tr>
<tr>
<td>9697-07</td>
<td>The Role of Absolute Continuity in &quot;Merging Opinions&quot; and &quot;Rational Learning&quot;</td>
<td>Miller, R. Sanchirico, C.W.</td>
</tr>
<tr>
<td>9697-08</td>
<td>The Soviet Bloc and the Soviet Union: Why did they fall apart?</td>
<td>Desai, P.</td>
</tr>
<tr>
<td>9697-09</td>
<td>Regionalism and Multilateral Tariff Cooperation</td>
<td>Bagwell, K. Staiger, R.</td>
</tr>
<tr>
<td>9697-10</td>
<td>Supplier Relations and the Market Context: A theory of handshakes</td>
<td>McLaren, J.</td>
</tr>
<tr>
<td>9697-11</td>
<td>Vertical Foreclosure with the Choice of Input Specifications</td>
<td>Choi, J.P. Yi, S.</td>
</tr>
<tr>
<td>9697-12</td>
<td>Equilibrium Vertical Foreclosure with Investment</td>
<td>Choi, J.P. Yi, S.</td>
</tr>
<tr>
<td>9697-13</td>
<td>Going Global: Transition from Plan to Market in the World Economy</td>
<td>Desai, P.</td>
</tr>
<tr>
<td>9697-14</td>
<td>Reciprocity, Non-discrimination and Preferential Agreements in the Multilateral Trading System</td>
<td>Bagwell, K. Staiger, R.</td>
</tr>
<tr>
<td>9697-16</td>
<td>A Dynamic Analysis of Licensing: The &quot;Boomerang&quot; Effect and Grant-Back Clauses</td>
<td>Choi, J.P.</td>
</tr>
<tr>
<td>Series No.</td>
<td>Title</td>
<td>Authors</td>
</tr>
<tr>
<td>-----------</td>
<td>--------------------------------------------------------------</td>
<td>------------------------------</td>
</tr>
<tr>
<td>9697-17</td>
<td>An Economic Theory of GATT</td>
<td>Bagwell, K.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Staiger R.W.</td>
</tr>
<tr>
<td>9697-18</td>
<td>Climate Consumption and Climate Pricing from 1940 to 1990</td>
<td>Cragg, M.I.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kahn, M.E.</td>
</tr>
<tr>
<td>9697-19</td>
<td>Coddling Fatalistic Criminals: A Dynamic Stochastic Analysis of Criminal Decision-Making</td>
<td>O'Flaherty, B.</td>
</tr>
<tr>
<td>9697-20</td>
<td>Identification and Estimation of Structural VAR and MARMA Models</td>
<td>Dhrymes, P.</td>
</tr>
<tr>
<td>9697-21</td>
<td>Information, the Dual Economy, and Development</td>
<td>Banarjee, A.V.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Newman, A.F.</td>
</tr>
<tr>
<td>9697-22</td>
<td>Matching in Perfect and Imperfect Worlds</td>
<td>Legros, P.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Newman, A.F.</td>
</tr>
<tr>
<td>9697-23</td>
<td>The Labor Market and Corporate Structure</td>
<td>Newman, A.F.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Acemoglu, D.</td>
</tr>
<tr>
<td>9697-24</td>
<td>National Herding and the Spatial Clustering of Bank Branches: An Empirical Analysis</td>
<td>Chang, A.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chaudhuri, S.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Jayaratne, J.</td>
</tr>
<tr>
<td>9697-25</td>
<td>Almost Everybody Disagrees Almost All the Time: The Genericity of Weakly-Merging Nowhere</td>
<td>Miller, R.I.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sanchirico, C.W.</td>
</tr>
<tr>
<td>9697-26</td>
<td>Brand Extension as Informational Leverage</td>
<td>Choi, J., P.</td>
</tr>
<tr>
<td>9697-27</td>
<td>Speculatively Constrained Optimal Commodity Policies</td>
<td>McLaren, J.</td>
</tr>
<tr>
<td>9697-28</td>
<td>Indexation, Inflation and Central Bank Independence</td>
<td>Pecchi, L.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Piga, G.</td>
</tr>
</tbody>
</table>