Asymmetric price rigidity and the optimal interest rate defense of the exchange rate:
Some evidence for the US

V.V. Dobrynskaya *

International College of Economics and Finance, Department of Economics,
State University—Higher School of Economics, Russian Federation

Received 1 March 2007; received in revised form 1 November 2007; accepted 1 December 2007

Abstract

This paper analyses the optimal monetary policy under incomplete exchange rate pass-through and asymmetric price rigidity. In a general equilibrium sticky price model of an open economy we find that the optimal interest rate rule is to respond to all types of shocks in an economy: real exchange rate shocks, supply shocks and demand shocks. We concentrate our analysis on the interest rate defense of the currency. We claim that the extent of the optimal response of the interest rate to exchange rate shocks depends positively on the degree of pass-through and negatively on price rigidity. Therefore, in the presence of asymmetric price rigidity, the optimal monetary policy should be non-linear, and the interest rate should be adjusted more in case of depreciation of the domestic currency than in case of its appreciation by the same magnitude due to higher downward price rigidity and lower downward pass-through, which are observed empirically. We test this prediction for the US economy and find that the US monetary policy is asymmetric indeed with higher reaction of the interest rate to depreciations of US dollar than to appreciations of the same size.

© 2007 Society for Policy Modeling. Published by Elsevier Inc. All rights reserved.

JEL classification: E31; E52; E58; F41

Keywords: Monetary policy; Non-linear interest rate rule; Exchange rate pass-through effect; Asymmetric price rigidity

1. Introduction

The traditional New Keynesian literature on the optimal monetary policy does not assume any non-linearities or asymmetries in its three main building blocks: the IS curve, the Phillips
curve and the social loss function. Therefore, the derived optimal monetary policy rules appear to be linear, according to which positive and negative shocks should be accompanied by equal changes in the monetary policy instrument. But empirical evidence of the last decade speaks in favor of different kinds of asymmetries in the behavior of economic agents. First, the Phillips curve is empirically found to be convex (Alvares Lois, 2000; Latxoa, Rose, & Tambakis, 1999, for the USA; Dolado, Maria-Dolores, & Naveira, 2005, for several European countries) implying asymmetric price rigidity, which means that prices are more sticky downwards than upwards. This results in the Phillips curve being steeper for positive changes in inflation than for negative ones. Therefore, as documented by many authors for many countries (e.g. Cover, 1992), positive demand shocks give rise to inflation without affecting output significantly, while negative ones reduce output without affecting inflation.

There are many explanations for this phenomenon. The most traditional view is that the labour market is the primary source of the asymmetry. Many papers show that a wage cut is a much rare phenomenon than a wage increase (e.g. Altonji & Devereux, 1999; Holden & Wulfsberg, 2004; Holzer & Montgomery, 1993). But an asymmetry is also widely observed in the prices of final goods. For example, Peltzman (2000) studies over 240 markets for consumer as well as producer goods and finds that asymmetries are persuasive, substantial and durable, and exist in periods of low inflation as well as in periods of high inflation. These asymmetries also apply to price indices (Verbrugge, 1998). Among theoretical explanations for the asymmetric price rigidity are consumer search with learning from prices (Benabou & Getner, 1993), consumer search with reference prices (Lewis, 2003), tacit collusion among firms with the past price serving as a focal price (Borenstein, Cameron, & Gilbert, 1997), implicit coordination among firms in an industry to rise prices after a positive cost shock while not to reduce prices after a negative one (Bhaskar, 2002), a trend in the marginal costs or desired mark-ups (Dhyne et al., 2006), an overall positive trend inflation in an economy (Ball & Mankiw, 1994) and other.

Also the social loss function may be asymmetric when, for example, a positive inflation gap is weighted more than a negative one, while a positive output gap is weighted less than a negative one. Empirical evidence supporting such central bank preferences is found by Cucierman and Muscatelli (2002), Ruge-Murcia (2004), Dolado, Pedrero, and Ruge-Murcia (2004) and others.

Either of the above types of asymmetries may give rationale for the optimal monetary policy rule to be non-linear. For example, Diana and Mémon (2005) analyze the optimal monetary policy under asymmetric wage indexation and propose that positive shocks should be absorbed more than negative ones. Dolado et al. (2005) study the implications of non-linear Phillips curve for the derivation of the optimal monetary policy rules and find that the policy-maker should “increase the interest rate by a larger amount when inflation or output are above the target than the amount it will reduce them when they are below the target”. Dolado et al. (2004) assume both asymmetric central bank’s preferences and non-linear Phillips curve to derive the optimal interest rate rule for a closed economy, and they come to a similar conclusion.

The theoretical prediction that monetary policy is non-linear is tested empirically, but the evidence is mixed. Some papers confirm that monetary policy is asymmetric indeed (Dolado et al., 2004, 2005; Olmedo, 2002; Taylor & Davradakis, 2006). Others do not find any signs of non-linearities in monetary policy rules (e.g. Bruinshoofd & Candelon, 2004).

The existing literature on the non-linear optimal monetary policy assumes closed economies in the theoretical models and does not take into account exchange rate shocks in the empirical tests. But in open economies where foreign shocks may be passed into the domestic economy through
the exchange rate adjustments the task of the monetary policy becomes even more complicated. In order to reduce exchange rate fluctuations, the monetary policy stops to be fully independent and should adjust to exchange rate shocks. Monetary intervention may take place directly in the foreign exchange market by buying or selling foreign currency reserves, or indirectly by adjusting the interest rate. Such policy of smoothing exchange rate fluctuations through an adjustment in the interest rate is called “interest rate defense of the currency” and is common in western economies (e.g. Parsly & Popper, 1998).

A number of theoretical papers propose that the optimal degree of such intervention depends on the exchange rate pass-through effect in an economy (e.g. Devereux & Engel, 2000). If pass-through is high, in the absence of intervention an exchange rate shock will be reflected in the domestic prices. Therefore, some degree of intervention is desirable in order to reduce the pass-through effect and the domestic price volatility.

This paper contributes to the existing literature by analyzing the non-linear optimal monetary policy in an open economy, which is characterized by asymmetric price rigidity.

First, we extend the notion of asymmetric price rigidity. While traditionally asymmetric price rigidity is captured by convex closed-economy Phillips curve, we allow for the asymmetric pass-through effect besides the asymmetric stickiness of the domestic goods’ prices. Asymmetric pass-through means that the domestic prices rise more as a result of the domestic currency depreciation, than they fall as a result of the domestic currency appreciation. Such asymmetry is observed empirically (e.g. Goldberg, 1995; Pollard & Coughlin, 2004, for the USA; Webber, 2000, for a set of Asian countries; Ohno, 1990, for Japan; Dobrynskaya & Levando, 2005, for Russia) and supported by some, although very limited, theoretical explanations (e.g. Floden & Wilander, 2006; Knetter, 1994; Mirzoev, 2004).

So, in this paper we propose a simple general equilibrium sticky price model of an open economy with a kinked Phillips curve and incomplete and asymmetric pass-through. By minimizing a symmetric social loss function, we obtain an optimal monetary policy rule, which states that the interest rate should be adjusted to supply shocks, demand shocks and exchange rate shocks, and the degree of the adjustment should be different depending on the sign of a shock. We claim that inflationary shocks should lead to more significant changes in the interest rate than deflationary ones of the same size. For instance, depreciation of the domestic currency should be accompanied by a more significant rise in the interest rate, than its appreciation of the same size, due to asymmetric price rigidity and asymmetric pass-through.

In the empirical part of the paper we test the predictions of our model for the US economy using VAR analysis. The existing empirical literature on the asymmetric price rigidity (Alvares Lois, 2000; Peltzman, 2000) and the asymmetric pass-through effect (Olivei, 2002; Pollard & Coughlin, 2004) in the USA allows us to study the US monetary policy directly without performing preliminary tests of the assumptions of our model.

We concentrate on the interest rate defense of the US dollar, performed by the Fed. We expect that the exchange rate should play a significant role in the US monetary policy because of its outsized current account deficit the adjustment of which is likely to have significant impact on global exchange rates and other economies, as noted by Rogoff (2006). We confirm this statement by performing a variance decomposition test. We also find some asymmetry in monetary policy reaction to positive and negative exchange rate shocks, which goes in line with the prescriptions of our theoretical model.

---

1 Actually the direction of the asymmetry may be reversed, but most empirical evidence supports this kind of asymmetry.
The rest of the paper is organized as follows. In Section 2 we lay out the theoretical model, derive and analyze the optimal interest rate rule. Section 3 is devoted to the empirical tests. In Section 4 we conclude and make policy recommendations.

2. The model of the optimal monetary policy

In this section we lay out a simple stochastic sticky price model for an open economy which is similar to the New Keynesian closed economy model popularized by Clarida, Gali, and Gertler (1999).

The demand side of the economy is represented by a forward-looking IS-type equation of the following form:

\[ y_t = a + E_t[y_{t+1}] - b(i_t - E_t[\pi_{t+1}]) + cE_t[\Delta q_{t+1}] + \varepsilon_t, \]  \hspace{1cm} (1)

where \( y_t \) is the output gap, \( i_t \) the nominal interest rate, \( \pi_t \) the rate of inflation, \( q_t \) the real exchange rate, an increase in which means real depreciation of the domestic currency, \( \varepsilon_t \) a demand shock (e.g. government expenditure shock), which is assumed to be normally distributed with the mean of zero, and \( a, b \) and \( c \) are positive coefficients.

Such New Keynesian IS curve is different from a traditional one since current output depends positively on expected future output due to consumption smoothing and negatively on real interest rate due to intertemporal substitution of consumption. Since net export is another component of aggregate demand in an open economy, output gap also depends on expected changes in the real exchange rate (see Gali & Monacelli, 2005, for a microfounded derivation).

The supply side of the economy is presented by a New Keynesian Phillips curve. In order to derive it, we distinguish between two types of firms in the economy.

Firms of the first type are importing firms and they set prices according to the Law of One Price:

\[ P_{it} = P_{it}^*S_t \]  \hspace{1cm} (2)

where \( P_{it} \) and \( P_{it}^* \) are domestic and foreign prices of the \( i \)-th import good, respectively and \( S_t \) is the nominal exchange rate. Aggregating (2) over all such firms and log-linearizing, we obtain the following relationship for the inflation in this “full pass-through” (FPT) sector of the economy:

\[ \pi_t^{\text{FPT}} = \pi_t^* + \Delta s_t \]  \hspace{1cm} (3)

Firms of the second type are either local firms or importing firms, which adopt a pricing-to-market strategy. This means that the pricing decisions of these firms are not affected by exchange rate considerations, implying zero pass-through, but are affected solely by local economic conditions. We assume that these firms set prices in a staggered fashion a Calvo (1983), when a fraction of firms re-sets prices every period. We assume that more firms adjust prices upwards than downwards, implying asymmetric price rigidity and a kink in the Phillips curve:

\[ \pi_t^{\text{PTM}} = E_t[\pi_{t+1}] + dy_t + \omega_t \]  \hspace{1cm} (4)

where

\[ d = \begin{cases} 
  d_1, & \pi_t > 0 \\
  d_2, & \pi_t < 0 \\
  d_1 > d_2, & 
\end{cases} \]

and \( \omega_t \) is a supply shock, which is assumed to be normally distributed with the mean of zero.
To derive a Phillips curve for our economy with two types of firms we assume that there is a share \( e \) of the firms of the first type and a share \((1 - e)\) of the firms of the second type. Then the overall inflation is

\[
\pi_t = e\pi^\text{FPT}_t + (1 - e)\pi^\text{PTM}_t
\]

(5)

Substituting (3) and (4) into (5) and using the following relationship for the real exchange rate:

\[
Q_t \equiv \frac{S_t\pi^*_t}{P_t} \quad \text{or} \quad \Delta q_t \equiv \Delta s_t + \pi^*_t - \pi_t
\]

we obtain the following version of a New Keynesian Phillips curve for the economy:

\[
\pi_t = \frac{e}{1 - e}\Delta q_t + E[\pi_{t+1}] + dy_t + \omega_t
\]

(6)

This Phillips curve shows explicitly the degree of pass-through of the real exchange rate onto consumer price inflation, measured by the coefficient \( e/(1 - e) \). The higher is the share of first-type firms \( e \), the higher is the pass-through effect in an economy. In order to allow for the asymmetric pass-through, we assume that parameter \( e \) depends on the sign of the exchange rate shock:

\[
e = \begin{cases} 
e_1, & \Delta q_t > 0 \\
e_2, & \Delta q_t < 0 \\
e_1 > e_2 & \end{cases}
\]

meaning that the pass-through effect may be lower in cases of appreciation of the domestic currency than in cases of its depreciation as more firms may adopt pricing-to-market strategy instead of reducing their prices.

So, the final expression for the Phillips curve under asymmetric price rigidity will be the following:

\[
\pi_t = \begin{cases} \frac{e_1}{1 - e_1}\Delta q_t + E[\pi_{t+1}] + dy_t + \omega_t, & \Delta q_t > 0 \\
\frac{e_2}{1 - e_2}\Delta q_t + E[\pi_{t+1}] + dy_t + \omega_t, & \Delta q_t < 0 \\
\end{cases}
\]

(7)

The equilibrium in the economy is described by the system of the IS and the Phillips curves holding simultaneously.

To complete the model, we assume that the real exchange rate follows non-stationary AR(1) process (a random walk):

\[
q_t = q_{t-1} + \eta_t
\]

(8)

where \( \eta_t \) is a normally distributed shock with the mean of zero. Such exchange rate behavior is often observed in economies with the flexible exchange rate regime.

As has become common in the literature on the optimal monetary policy, we assume that the monetary authority minimizes the following loss function:

\[
L_t = (\pi_t - \pi^T)^2 + \lambda y_t^2
\]

(9)
Minimizing the social loss function (9) subject to the Phillips curve (7) and using the IS curve (1) we obtain the following optimal interest rate rule\(^2\):

\[
\begin{align*}
  r_{opt}^t &= \begin{cases} 
  \frac{a}{b} + \frac{e_1 d_1}{b(1 - e_1)(d_1^2 + \lambda)} \eta_t & \text{if } \pi_t > 0 \\
  \frac{a}{b} + \frac{e_2 d_2}{b(1 - e_2)(d_2^2 + \lambda)} \eta_t & \text{if } \pi_t < 0
\end{cases}
\end{align*}
\]

(10)

It should be noted that positive shocks lead to a positive inflation while negative ones—to deflation, since in the absence of shocks the inflation equals to the target, which is zero in this case.

The rule (10) states that in order to minimize the social losses the real interest rate should respond to all types of shocks in the economy: real exchange rate shocks, supply shocks and demand shocks—with positive coefficients. This means, for example, that positive shocks, being inflationary, should be accompanied by a contractionary monetary policy, leading to negative output gap and lower equilibrium inflation, than what would be without intervention.

Moreover, the degree of the interest rate response should depend on the sign of a shock. Under some conditions, the optimal interest rate adjustment should be more significant in case of inflationary shocks than in case of deflationary ones due to higher downward price rigidity and lower downward pass-through. A similar conclusion was drawn in Diana and Méon (2005) and Dolado et al. (2005), but for a closed economy.

To prove our proposition we differentiate the coefficients in front of the exchange rate and supply shocks in (10) with respect to parameters \(e\) and \(d\). We will concentrate our analysis on the exchange rate shock. The derivative in front of the exchange rate with respect to parameter \(e\) is positive, meaning that the higher is the pass-through effect, the more should be the adjustment in the interest rate in response to an exchange rate shock. This finding goes in line with Devereux and Engel (2000). Since the pass-through effect is observed to be higher after the domestic currency depreciations, the optimal monetary policy should be asymmetric reacting to depreciations more severely than to appreciations of the same size.

The derivative of the same coefficient with respect to parameter \(d\) is also positive provided that \(d < \sqrt{\lambda}\). Since the domestic currency depreciation leads to inflation with higher price flexibility, while its appreciation, ceteris paribus, should lead to deflation with lower price flexibility, depreciations again should be contracted more severely.

Fig. 1 analyses the optimal monetary policy in cases of a positive and a negative exchange rate shocks of the same size assuming asymmetric price rigidity.

The kinked Phillips curve shifts further as a result of a positive exchange rate shock than a negative one due to asymmetric pass-through effect. In case of a positive shock the loss minimizing point is point C, which corresponds to an increased interest rate to \(r_u\). In case of a negative shock the optimal point is point D. To reach this point the interest rate should be reduced, but the magnitude of the change should be much less. The same conclusion will be true for a positive target inflation, although the difference in the required interest rate changes will be less significant.

\(^2\) We assume the zero target inflation here in order to see the implications of the asymmetric price rigidity in the national goods' prices, which arises around the zero inflation in our model.
This result is new to the Keynesian literature and has interesting practical implications for the conduct of monetary policy. It predicts that in order to minimize the social losses, the monetary authority should determine not only the direction of the required policy instrument change, but also its magnitude depending on the sign of a shock. If the monetary policy rule is specified so that it does not take into account such asymmetries, then following this rule may result in the equilibrium inflation and output gap, which are far from optimal. For example, if there is high upward pass-through but zero downward pass-through in an economy, while it may be optimal to increase the interest rate significantly as a result of a sharp depreciation of the domestic currency, it may also be optimal not to respond to the domestic currency appreciation at all. Then following the rule of a significant change in the interest rate due to an exchange rate shock will lead to higher social losses in case of an appreciation of the domestic currency than would be without monetary policy reaction.

3. The empirical test

Our proposition is especially relevant for the US economy in light if their present problems with the current account and inevitably depreciating US dollar, as claimed by Mussa (2007). In order to minimize the inflationary consequences of the depreciation the Fed should pay more attention to the exchange rate depreciation than appreciation. Hence, we analyze the US monetary policy empirically during the period from 1990 to 2006.

We use the following quarterly time series provided by IMFs International Financial Statistics: annualized federal funds rate ($r$) as the monetary policy instrument; logarithm of the real effective

![Diagram](image-url)
exchange rate (reer), an increase in which means real appreciation of the US dollar; consumer price inflation ($\pi$), calculated as the first difference of logarithm of CPI; logarithm of GDP volume ($y$, 2000 = 100) as a proxy for real income.3

In order to take into account the endogenous nature of the above variables, we estimate the following VAR model:

$$X_t = A_0 X_{t-1} + A_1 D_{t-1} \text{reer}_{t-1} + A_2 t + A_3 + \Psi_t$$

where $X_t$ is a vector of the endogenous variables ($r_t$, reer$_t$, $\pi_t$, $y_t$), $D_t$ a dummy variable which equals 1 if reer goes up and 0 otherwise, $t$ the time trend, $A_0$ a coefficient matrix, $A_1$, $A_2$ and $A_3$ the coefficient vectors, and $\Psi_t$ is the vector of residuals.

In order to determine whether the US monetary policy reacts to exchange rate shocks at all we perform variance decomposition test. Fig. A.1 in Appendix A shows the percentage of the interest rate variance that can be explained by fluctuations in the exchange rate, inflation and output over a 2-year horizon. We see that the exchange rate has very high explanatory power for the US monetary policy, since it explains 62.28% of the interest rate variance with the $t$-statistics of 5.91.

To see what is the instant interest rate reaction to exchange rate shocks we test the sign and significance of the exchange-rate coefficient in the interest-rate equation in model (11) (see Table B.1 in Appendix B). As our theoretical model predicts, the coefficient is significantly negative. This means that the appreciation of the US dollar is accompanied by a cut in the interest rate while its depreciation, on the contrary, leads to monetary contraction. Such policy of the interest rate defense of the exchange rate smooths exchange rate volatility and, therefore, inflation volatility, which arises due to the pass-through effect.

Since the exchange rate shocks may affect the economy with some lags, e.g. because of the delayed pass-through effect, the interest rate may also adjust to such shock gradually. Indeed, as claimed by Woodford (1999), gradual adjustment of the interest rate in response to changes in the economic conditions, which is observed in western economies, is optimal, since small put persistent changes in the short-term interest rate have larger impact on the long-term interest rate and, therefore, on the economy. In order to test how the US interest rate adjusts to exchange rate shocks over time, we build impulse-response function assuming the following Cholesky ordering:

$$\text{reer} \rightarrow r \rightarrow \pi \rightarrow y$$

Fig. A.2 in Appendix A shows the estimated interest rate response to positive exchange rate impulse, normalized to one standard deviation, together with the confidence interval. As expected, we observe the gradual statistically significant adjustment of the federal funds rate to real exchange rate shocks, and the direction of the adjustment is again in line with our theoretical model.

Finally, we test the asymmetry in the interest rate reaction to positive and negative exchange rate shocks. According to our theoretical model, the domestic currency depreciation (a fall in reer) should be accompanied by a larger by the absolute value change in the interest rate than its appreciation of the same size. Therefore, the coefficient in front of the dummy variable in

---

3 We use real GDP instead of GDP gap in order to avoid ad hoc de-trending procedure, but we include the trend variable into our regressions.
the interest-rate equation is expected to be positive, but smaller by the absolute value than the corresponding coefficient in front of $rer$.

We find that the coefficient in front of the dummy variable in the interest-rate equation is indeed positive and significant at 10% significance level, although very small (see Appendix B). Our estimates mean that, ceteris paribus, the federal funds rate rises by 4.35 percentage points in response to the domestic currency depreciation by 1%, while it falls by 4.31 percentage points in response to an equal appreciation of the US dollar. According to our model, such asymmetry in the monetary policy reaction to exchange rate shocks is optimal in the presence of asymmetric price rigidity.

So, we find some evidence in favor of the asymmetric interest rate defense of the exchange rate, performed by the Fed, although the asymmetry is rather weak. We see two reasons for this. First, such weak asymmetry or even no asymmetry may be optimal according to our model if pass-through effect is very small and almost symmetric. Under sufficiently small pass-through and positive inflation target unexpected appreciation of the domestic currency would not lead to deflation and hence the asymmetric price rigidity would not play a role. But since we do observe some asymmetry, there should be a reason for this.

Secondly, while asymmetric monetary policy may be optimal, the monetary authority may not behave like this just because such literature is very new, it has evolved not more than a decade ago, and the monetary authority may not have managed to incorporate the theoretical prescriptions into the monetary policy practice yet. And the prediction that the interest rate defense of the currency should also be asymmetric is, to our knowledge, new and this is the contribution of the paper to the existing literature.

4. Conclusion

In this paper we analyze the optimal monetary policy in an open economy, which is characterized by asymmetric rigidity of the domestic goods’ prices and asymmetric exchange rate pass-through effect. We build a simple general equilibrium sticky price model where real exchange rate behaves like a random walk. Using quadratic loss function as an approximation of the social utility losses, we find that the optimal monetary policy rule is to adjust the interest rate in response to exogenous exchange rate, supply and demand shocks. We claim that the optimal degree of such adjustment depends positively on pass-through effect and negatively on price stickiness in an economy. Therefore, the optimal monetary policy should be different in cases of positive and negative shocks. We claim that deflationary shocks such as the domestic currency appreciation should be accompanied by a smaller adjustment in the interest rate than inflationary ones of the same size since prices are stickier downwards.

We test this proposition for the US economy and find some evidence in favor of the non-linear monetary policy of the Fed which is in line with our theoretical model.

Our findings show that in order to conduct the monetary policy optimally it is insufficient to automatically adjust the monetary policy instrument according to some linear rule, but it is required to determine the magnitude of the adjustment in the monetary policy instrument depending on the sign of a shock. In order to design the optimal monetary policy it is important to know the parameters of the economy, such as upward and downward price stickiness, upward and downward pass-through, the relative weights of the inflation and the output gap in the social loss function and others.
Acknowledgments

I am grateful to all participants of the CAS Workshop at State University—Higher School of Economics and a research seminar at the Central Bank of Russia for their valuable comments and suggestions. Also many thanks to my supervisor Prof. C.G. de Vries at Tinbergen Institute of Erasmus University. This research was supported by an individual research grant of State University—Higher School of Economics #05-01-0008.

Appendix A

See Figs. A.1 and A.2.

Fig. A.1. Variance decomposition of the interest rate.

Fig. A.2. Accumulated response of the interest rate to Cholesky 1 standard deviation reer innovation and the corresponding confidence interval.

Please cite this article in press as: Dobrynskaya, V. V., Asymmetric price rigidity and the optimal interest rate defense of the exchange rate: Some evidence for the US, J Policy Model (2008), doi:10.1016/j.jpolmod.2007.12.003
Appendix B

See Table B.1.

Table B.1
Estimates of VAR model (11)

<table>
<thead>
<tr>
<th></th>
<th>(r_t)</th>
<th>(\text{reer}_t)</th>
<th>(\pi_t)</th>
<th>(y_t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(r_{t-1})</td>
<td>0.83** (17.13)</td>
<td>-0.00 (-0.42)</td>
<td>-0.00* (-1.65)</td>
<td></td>
</tr>
<tr>
<td>(\text{reer}_{t-1})</td>
<td>-4.35** (-5.38)</td>
<td>0.84** (14.38)</td>
<td>-0.02 (-1.02)</td>
<td>-0.04** (-3.84)</td>
</tr>
<tr>
<td>(\pi_{t-1})</td>
<td>0.37 (0.07)</td>
<td>-0.87** (-2.27)</td>
<td>0.13 (0.95)</td>
<td>-0.12* (-1.95)</td>
</tr>
<tr>
<td>(y_{t-1})</td>
<td>15.46** (2.98)</td>
<td>0.71* (1.88)</td>
<td>0.16 (1.18)</td>
<td>1.03** (16.65)</td>
</tr>
<tr>
<td>Const</td>
<td>-45.62** (-2.26)</td>
<td>-2.29 (-1.56)</td>
<td>-0.56 (-1.09)</td>
<td>0.06 (0.23)</td>
</tr>
<tr>
<td>Trend</td>
<td>-0.12** (-2.73)</td>
<td>0.01* (-1.70)</td>
<td>-0.00 (-1.04)</td>
<td>-0.00 (-0.28)</td>
</tr>
<tr>
<td>(D_{t-1}\text{reer}_{t-1})</td>
<td>*<em>0.04</em> (1.74)</td>
<td>0.00 (0.29)</td>
<td>0.00 (0.03)</td>
<td>0.00 (1.61)</td>
</tr>
</tbody>
</table>

*Statistics are in parentheses. The coefficients of our primary interest are marked in bold. *Significance at 10%; **significance at 5%.

References


Mirzoev, T. (2004). A dynamic model of endogenous exchange rate pass-through. The Ohio State University, Department of Economics.


Please cite this article in press as: Dobrynskaya, V. V., Asymmetric price rigidity and the optimal interest rate defense of the exchange rate: Some evidence for the US, J Policy Model (2008), doi:10.1016/j.jpolmod.2007.12.003