

# News filtering, financial instability and the euro

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## 1. Introduction

Policymakers have always been concerned with financial stability issues, as financial crises are very costly events, particularly in terms of macroeconomic performance. The financial crises of 1997/98 brought about a fresh wave of attention to predicting, avoiding and managing episodes of financial distress. Following these crises, many attempts are made to detect and assess potential financial vulnerabilities in the international financial system. In this context, the present paper studies whether filtering of information in currency markets (eg ignoring some news releases or overreacting to others) may contribute to explaining the build-up of mechanisms underlying financial instability.

The first part of this paper describes several phenomena in asset markets that may be labelled, from the viewpoint of efficient markets, irregularities. These phenomena create imbalances and could be a source of instability that policymakers should be careful to detect, as conventional policy reactions may not be sufficient or adequate. Understanding the mechanism underlying irregularities is a first step towards formulating policy recipes to prevent or mitigate them. In this paper, contributions in the field of cognitive psychology are invoked to explain irregular patterns in financial markets. Special attention is paid to the theory of *cognitive dissonance*, which states that individuals filter publicly available information to make it correspond to their so-called framework of reference.

The second part of the paper is empirical, and investigates whether information filtering may have influenced the exchange rate of the euro vis-à-vis the US dollar. The empirical analysis provides some indications that, at least on days of large exchange rate movements, investors reacted differently to news about the euro area than to US news. However, based on our data set and results, it cannot be concluded that the fall in the euro can be attributed (partly) to news filtering. Further research using daily data should shed more light on this issue.

## 2. Several irregularities

Economic theory generally assumes that agents gather, process and interpret information in a rational way. This assumption is indeed useful for building models of market behaviour, but - as North (1990) pointed out - economists can enhance their understanding of many phenomena by allowing for other behavioural aspects in their models. In particular, it may be useful to take into account the contributions by cognitive psychologists on the processing of information by individuals. Both theoretical research and empirical evidence have shown that individuals may exhibit biases in processing information, and it is reasonable to assume that economic agents are no exception. In fact, several phenomena observed in asset markets in the Netherlands, the euro area and Asia suggest that investors show biased reactions to news as well as herd behaviour, with destabilisation as an observed or potential result.

A *first* example is the housing market in the Netherlands. House prices have doubled over the past five years. Many homeowners have used this increase in their wealth to take out additional mortgage loans to help finance consumption. Over the past years, the Netherlands Bank has repeatedly warned homeowners not to be over-optimistic. A recent poll by the Netherlands Bank shows that homeowners expect an increase in interest rates in the near future, believe that house prices are too high, and foresee that within 10 years the tax deduction of mortgage interest payments will be limited.

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Nonetheless, homeowners expect house prices to rise further and plan to take out additional mortgage loans in the near future (Netherlands Bank (2000)). A similar, though less pronounced pattern is observed in the New York housing market.

A *second* example is the development of prices in technology stocks. Keijer (2000) shows that the hype in technology shares on the Amsterdam Stock Exchange (AEX), which ended in March 2000 shortly after the scandalous introduction of World Online, was at least partly due to a biased reaction by investors to news about the IT sector. Keijer's empirical analysis focuses on explaining the difference between changes in IT shares and the AEX general stock market index. He concludes that the increase in IT prices following good news about this sector is significantly larger than the decrease in the case of unfavourable news.

A *third* example is, again, found in the Amsterdam stock market. Research for the period 1983-99 indicates that from the third year after their initial public offering, the performance of newcomers on the AEX, measured in terms of their share prices, trails behind that of established firms, and that in the fifth year the difference amounts to 30%. Further analysis shows that from the first year after their introduction, growth figures and profits of newcomers fall. This is not reflected in the stock prices, however, until the third year. Hence investors show a long lag in their reaction to bad news about the newcomers, something the researchers are unable to explain (Bosveld and Venneman (2000)).

A *fourth* example dates back to the Asian crisis. Kaminsky and Schmukler (1999) try to explain the 20 largest one-day swings in stock prices in nine Asian countries during 1997 and 1998. They find that some of these swings cannot be explained by economic or political news only. Kaminsky and Schmukler conclude that, in the period surrounding the Asian crisis, investors exhibited herd behaviour. Their evidence indicates that stock prices overreact with the deepening of the crisis, and investors react more strongly to bad news than to good news. They suggest that bad news in crisis episodes may increase uncertainty and accentuate herd behaviour, but do not explain what kind of mechanism would be at work here. The theory of cognitive dissonance outlined in the next section provides some insights in this respect (Prast (2001)).

### 3. Cognitive psychology and financial markets

Rational models of economic behaviour, including those that try to explain herding by investors, have in common that they focus on the *availability* of information, not on how individuals *gather, process and interpret* information. In fact, no attention at all is paid to the possibility that individuals may deal with information in a biased way. That makes these theories inappropriate to explain the type of behaviour by market participants described in the examples of Section 2.<sup>3</sup> Other disciplines - notably cognitive psychology - have intensively studied this subject, and have developed views on information seeking and processing that can be applied in economic and finance theory. Some of these have already been used to explain financial market behaviour. Daniel et al (1998) use the psychological concepts of overconfidence and biased self-attribution to explain sequential herding and under- and overreactions by securities markets.<sup>4</sup> The concepts of overconfidence and biased self-attribution could provide an additional explanation for biased responses to news. Barberis et al (1998) use a concept introduced by cognitive psychologists Tversky and Kahnemann, the "representativeness heuristic", to

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<sup>3</sup> For an overview of rational herding models, see Devenow and Welch (1996). Most relevant for financial market fragility is the so-called informational cascade model of herding (Banerjee (1992)). This assumes that agents have limited private information and that publicly visible actions by others act as an additional source of information. This may lead to a situation in which the individual's private information is rationally overruled. As a result, extensive herding may occur. This type of model may explain the emergence of financial market fragility, as it shows that small changes in publicly available information can reverse the direction in which the crowd is moving (Bikchandani et al (1992)). Therefore, it can contribute to offering a rational explanation of financial fragility and sudden panics and flights to safety. A qualification is, however, that the participants act in an exogenously imposed ordering: they cannot postpone their actions. Moreover, efforts to gather information are not modelled. And, perhaps most importantly, it is assumed that prices do not move with demand.

<sup>4</sup> Overconfidence among investors would imply that they overestimate their ability to value securities. Biased self-attribution relates to the dynamics of self-confidence: confidence is assumed to grow when public information confirms private information, but does not decline in case of a contradiction between the two. An interesting implication is that if, as some psychological evidence indicates, experts are more overconfident than inexperienced individuals, aggressive expert trading will intimidate other traders and lead to higher returns. See Daniel et al (1998).

analyse investor behaviour. This concept implies that people have a tendency to see patterns in random events, which may lead to overreaction in the sense that people draw far-reaching conclusions on the basis of only little evidence. The implication for investor behaviour may therefore be an overreaction of stock prices to news. Barberis et al admit that, although their model results confirm some (but not all) of the empirical evidence, it is not clear why certain types of news are relevant in the eyes of the investor and others are not. They conclude therefore that “to push this research further, it is important to develop an a priori way of classifying events by their strength and weight” (Barberis et al (1998), p 333).

The theory of cognitive dissonance - developed almost half a century ago by Festinger - may prove to be useful in this context. Festinger (1957) defines cognitive dissonance as a situation where the individual is faced with two contradictory cognitive elements. Cognitive elements may include opinions, information and beliefs. According to Festinger, cognitive dissonance is unpleasant and individuals have the subconscious psychological mechanism to diminish the dissonance they perceive:

“The presence of dissonance leads to seeking new information which will provide cognition consonant with existing cognitive elements and to avoiding those sources of new information which would be likely to increase the existing dissonance” (Festinger (1957), p 264).

In Festinger’s view, individuals may diminish dissonance in a number of ways.<sup>5</sup> The most important is the filtering of information. Thus, when faced with dissonance, individuals engage in actively seeking out information that confirms their belief and the choices they have made. Also, they tend to avoid information that would suggest they have made the wrong choice. Finally, they may try to find support and comfort in the fact that other people have made identical decisions. When the dissonance in relation to the existing framework of reference becomes so large that it is impossible to reduce it by selective gathering and interpretation of information and by finding social support, the individual switches to the opposite method of dissonance reduction. Instead of trying to find evidence that his opinion is correct, he will now, faced with too much unfavourable information, make an effort to change his belief or opinion.<sup>6</sup> He does so by actively seeking out *dissonance-increasing* information. The dissonance then disappears because the large amount of dissonance between the individual’s opinion and the information received enables him to change his existing belief. The reversal in the biased information-seeking behaviour occurs when the dissonance perceived by the individual equals the resistance to changing his framework of reference. Festinger pays special attention to what he calls mass phenomena. If many people, for one reason or another, suffer from the same cognitive dissonance, it is particularly easy to find support in the pursuit of dissonance reduction. In particular, he analyses the role of rumours, especially in situations in which fear is widespread, but evidence justifying fear is not available.

The theory of cognitive dissonance, when applied to financial markets, would explain so-called “sequential herding”: the phenomenon that investors, analysts and fund managers “herd” on previous behaviour. Furthermore, the theory predicts that investors, when faced with dissonance, find comfort in the fact that they are part of a group. This may explain crowd behaviour and reinforces the bias in information gathering in situations where many investors have previously made similar decisions. As time goes by, unfavourable information (bad fundamentals, increased probability of default) may grow in intensity and frequency. At a certain point this cannot be disregarded anymore, not even by an individual who is part of a crowd. Investors start paying attention to it, first gradually, but when the cognitive dissonance between the new (unfavourable) information and the existing (optimistic) mood becomes too large, they start actively seeking information that increases dissonance, enabling them to change their framework of reference (optimistic mood) about the investments made. Obviously, the dissonance is reinforced when the group starts falling apart. This happens as soon as the dissonance

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<sup>5</sup> In his own words, “by changing one or more of the (cognitive) elements involved in the dissonant relation, by adding new cognitive elements that are consonant with already existing cognition and, finally, by decreasing the importance of elements of the dissonant relation itself”. From these three “strategies”, the second and third are the most important for the purpose of this paper, as they both have to do with information gathering and interpretation on an individual basis and with finding social support for the decision that has been taken.

<sup>6</sup> Examples abound both in the realm of mass psychology and in daily life. Religious fanatics try to reduce the cognitive dissonance between their belief and real-world evidence by attracting new souls to their group. “Shooting the messenger” is a well known stereotype reaction, especially at a group level.

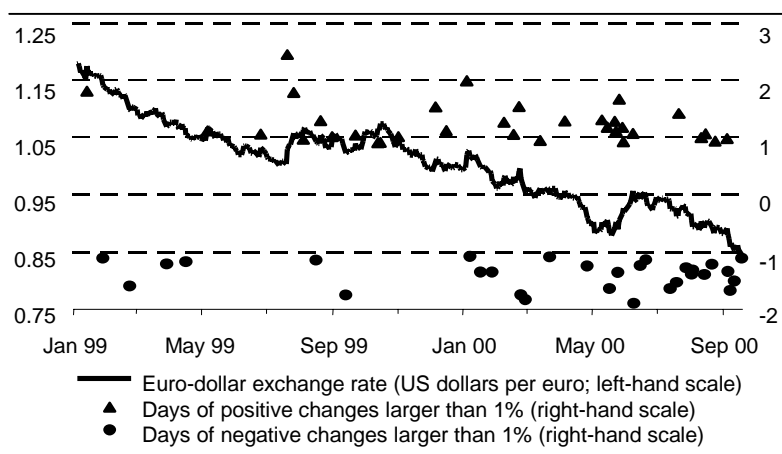
has become too large for one or more investors, but the mere fact of their departure from the crowd increases the dissonance of the remaining investors, who in their turn will start seeking out dissonance-increasing information. The theory, therefore, would predict a sudden reversal of the crowd, which once it has started will proceed at a high speed. The timing of the reversal is unpredictable because, although the reversal ultimately depends on the fundamentals, it depends on the (subjectively perceived) dissonance and resistance to change of some investors. Nonetheless, one may try to influence this turning point by careful timing of a policy measure or announcement. Kindleberger (1996) argues that cognitive dissonance has been a recurrent source of herding and of inertia in decision-making. Cailloux (2000), finally, develops a theoretical model of investor behaviour, taking the possibility of cognitive dissonance reduction into account by assuming that investors seek and process information to make it correspond to their strongly held internalised beliefs. All in all, it seems clear that the concept of cognitive dissonance provides a framework in which biased reactions to news can be explained.

## 4. The impact of news on the euro-dollar exchange rate

### 4.1. Empirical analysis: method and data

Since its introduction on 1 January 1999, the euro has steadily declined with respect to the US dollar (see Figure 1). Both the reasons behind this development and its implications for economic stability are currently among the most frequently discussed issues among academics and policymakers. Several comments have suggested that investors in currency markets show a biased reaction to news. Wellink (2000), for example, has suggested that investors react in an asymmetric manner to news about the euro area and the United States respectively. De Grauwe (2000) has expressed similar views. Moreover, these asymmetric reaction patterns may not be harmless. This is obvious from the theory discussed in the first part of this paper, but also from comments by international institutions. The IMF (2000) has, for instance, suggested that a further weakening of the euro might have serious adverse implications for economic stability worldwide. According to the Fund, a prolonged weakness of the euro would hamper adjustment of the existing current account imbalances across the major currency blocks, which could increase the prospects of a disorderly adjustment in exchange rates and give rise to protectionist pressures. Furthermore, a sustained period of misalignment would lead to a shift towards now more profitable traded goods sectors in the euro area and away from such sectors elsewhere. If a rapid appreciation of the value of the euro were to take place, a corresponding and probably costly reallocation of resources would follow.

Figure 1  
Euro-dollar exchange rate



In general, the impact of news on exchange rates has been the subject of extensive research, although much of the work has concentrated on announcements of US macroeconomic data (Edison (1996)). More recently, studies have been undertaken to analyse the effects of economic news released in other countries such as the United Kingdom, Germany and Australia (Clare and Courtenay (2000)). One of the differences between these studies and the approach used in this paper is that, in addition to economic news variables, we consider statements by central bankers and politicians (eg on the strength of the currency or the economy) to be possible determinants of exchange rate changes, and therefore take them into account. Our analysis is in this sense similar to the aforementioned analysis by Kaminsky and Schmukler (1999), although their focus is not on asymmetries in reactions to news coming from different countries, but rather on asymmetric responses to good and bad news during crisis periods.

In order to test the hypothesis of biased responses to news, we have studied the reaction of the euro-dollar exchange rate to news from 1 January 1999 until the first coordinated intervention to support the euro by the world's main central banks on 22 September 2000. The study focuses on the largest exchange rate movements, namely those exceeding  $\pm 1\%$ . This choice is based on practical considerations, and the analysis is to be seen as a first step towards assessing the role of information filtering in influencing the exchange rate. During this period, there were 63 days on which the change in the euro-dollar exchange rate exceeded this threshold. We analyse the effects of relevant economic and non-economic news regarding the euro area and the United States on the exchange rate on these 63 days. The main focus is *not* to explain these movements per se, but rather to verify whether different reaction patterns exist related to news about the euro area and the United States. The Dutch financial newspaper *Het Financieele Dagblad* is used as the source of information. It has been verified that this journal contains information consistent with alternative news sources such as Bloomberg.

Included in the data set are economic news releases, statements by central bankers and politicians, and political events that can be thought of as relevant for investors in the foreign exchange rate market. The economic news variables are divided into three categories: real economic variables (economic growth, industrial production, (un)employment rates, confidence indicators, trade deficits, budget deficits and changes in taxation and social security); inflation (forecasts); and changes in the official interest rates. The non-economic news items include: statements of central bankers in the euro area and the United States, reflecting the importance of ECB- and Fed-watching; statements of politicians, reflecting the fact that political risk is one of the important factors for investors in currency markets; and major national and international political events (such as the Kosovo crisis). As far as news about the euro area is concerned, only the news items referring to the largest countries - Germany, France and Italy - and to the euro area as a whole have been taken into account. This choice is made because a development in the smaller countries is unlikely to have a major effect on investor behaviour. Moreover, including these items would create an asymmetry with the US news, as economic and political developments in individual US states have *not* been included in the data set. When interpreting the results, it should be kept in mind that the 63 days on which the change in the euro-dollar exchange rate exceeded  $\pm 1\%$  do *not* reflect the steady decline of the value of the euro since its birth on 1 January 1999; 33 observations of the sample of 63 relate to a *rise* in the value of the euro.

Where possible, the announcements of news figures are compared with expectations of market participants and included only if there is a difference between the two. An unexpected increase in real economic activity is assumed to lead to an appreciation of the currency. Furthermore, if announced inflation is higher than expected, we assume that the currency will depreciate. An actual increase (decrease) of the official interest rate is expected to have an upward (downward) effect on the exchange rate. Also, it is assumed that statements by central bankers hinting at future interest rate increases (decreases) have an upward (downward) effect on the exchange rate.<sup>7</sup> By including changes in the official interest rate as a separate dummy variable, it is possible to assess whether or not market participants expect these changes, and thus incorporate them in the exchange rate. Statements by politicians interfering with monetary policy are categorised as unfavourable, because it is generally assumed that independent central banks have more credibility in safeguarding the internal value of their currency. This applies especially to the euro area, where the Eurosystem decides on monetary policy for an area covering 11 different countries, all with their own governments.

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<sup>7</sup> One could argue that any statement by a central banker should be interpreted as a hint at future interest rate policy. However, this may not be the case, because central bankers also give peptalks and warnings.

Table 1  
**News releases on the euro area and the United States  
relevant for the euro-dollar exchange rate, by category<sup>1</sup>**

Type of news	n	Favourable €	Unfavourable €
<b>Euro area</b>	<b>148</b>	<b>89</b>	<b>59</b>
Real economy	85	60	25
Inflation	17	6	11
Official interest changes	1	1	0
Statements and political events	45	22	23
	<b>n</b>	<b>Favourable \$</b>	<b>Unfavourable \$</b>
<b>United States</b>	<b>56</b>	<b>33</b>	<b>23</b>
Real economy	37	21	16
Inflation	8	5	3
Official interest changes	2	2	0
Statements and political events	9	5	4
<b>Total</b>	<b>204</b>	<b>122</b>	<b>82</b>

<sup>1</sup> News releases during the 24 hours preceding the official release of the euro-dollar exchange rate by the ECB at 2.15 pm.

In all, there were 204 relevant news items on the 63 days of large exchange rate changes. Of these, 103 were about the economy in the euro area, of which 67 were favourable and 36 unfavourable. There were 47 items about the US economy, of which 28 were favourable and 19 unfavourable. Finally, 45 news items referred to statements by central bankers or politicians, or to political events in the euro area (about half were favourable for the euro), and nine news items in this category referred to the United States (about half were favourable for the dollar). There was only one day of large exchange rate movements without any relevant news releases (see Table 1). A full list of the news items, including their classification, can be obtained from the authors upon request.

#### 4.2 Effect of economic news and statements/political events

To examine the impact of economic news and statements/political events on the euro-dollar exchange rate, a regression is run of the changes in the euro-dollar exchange rate on the news variables mentioned above. For this purpose, the news items are transformed into dummy variables representing each of the news categories. The first regression equation is:

$$(1) E_t = \alpha + \beta_i D_i + \varepsilon,$$

$$(i = 1, 2 \dots 8)$$

where  $E_t$  is the percentage change in the euro-dollar exchange rate from  $t-1$  (2.15 pm) to  $t$  (2.15 pm).  $D_i$  ( $i = 1 \dots 8$ ) represent dummy variables reflecting news about, respectively, the euro area real economy, euro area inflation, ECB official interest rate changes, central bank or political statements and political events concerning the euro area, the US real economy, US inflation, Fed official interest rate changes, central bank or political statements, and political events concerning the United States in the same period. The dummy variables may take a value of +1 or -1 when relevant news for the euro-dollar exchange rate has been released, and 0 if on a specific day no relevant news releases took place. To be more precise, the "real economy" variable takes the value +1 (-1) when the release suggests a better (worse) outlook for the real economy, and 0 otherwise. The inflation dummy is equal to +1 (-1) when the item suggests a better (worse) inflationary outlook, and 0 otherwise. The interest rate dummy takes on a value of +1 (-1) in the case of official interest rate increases (decreases), and 0 if official rates remain unchanged. Finally, the variable "statements and political events" is equal to +1 whenever there is news in this field that can be expected to support the currency, -1 in opposite cases, and 0 otherwise. The approach implies that all news items are considered to be equally important. This method is appropriate because the focus is not so much on the elasticity of the exchange rate to,

say, a change in the trade balance, but rather on the question of whether the reaction pattern of investors, as indicated by the change in the relative price of the two currencies, differs depending on whether there is news about the euro area and the US economy respectively. Table 2 gives the results.

Table 2  
Regression results equation (1)

Explanatory variables		Dependent variable Percentage change in euro-dollar exchange rate <sup>1</sup>	
Constant		-0.08 (-0.47)	
Real economy, euro area		0.40 (1.86)	
Inflation, euro area		-0.62* (-2.06)	
Change in official interest rate, ECB		0.23 (0.18)	
Statements/political events, euro area		0.56** (2.61)	
Real economy, United States		-0.65** (-2.64)	
Inflation, United States		0.10 (0.21)	
Change in official interest rate, Fed		-0.81 (-0.82)	
Statements/political events United States		-1.21** (-2.61)	
Number of observations	63	D-W statistic	1.69
Method	OLS	F-statistic	4.2
R <sup>2</sup>	0.38	Jarque Bera test	0.58 <sup>2</sup>
Adjusted R <sup>2</sup>	0.29		

Note: \* indicates statistical significance at a 95% confidence level; \*\* indicates significance at a 99% confidence level (t-statistics in parentheses).

<sup>1</sup> Dollars per euro. <sup>2</sup> Normality of errors cannot be rejected on the basis of this test.

Keeping in mind that the results provided by this event study should be interpreted with caution, a number of interesting conclusions emerge from Table 2. *First*, all coefficients except those of the inflation dummies have signs in accordance with intuition. Thus, good news about the real economy in the euro area, ECB official interest rate increases and favourable statements/political events has a positive effect on the euro-dollar exchange rate, whereas the coefficients of US news dummies in these different categories have a minus sign. *Second*, the effect of euro area real economic news is *not* significant at the conventional minimum confidence level of 95%, whereas the dummy of real economic US news releases is significant at the 99% confidence level. This suggests that investors react more strongly to US economic news and may imply that in periods with favourable economic news in both areas, there is a tendency for the US dollar to rise. *Third*, the impact of official changes in the interest rates in both the euro area and the United States is not significant; apparently these changes have largely been priced in by the markets. *Fourth*, statements and political events have a significant effect at a 99% confidence level for both the euro area and the United States, confirming both the importance of Fed- and ECB-watching and the role played by politics in influencing the taste of investors for a currency. *Last but not least*, good news about inflation in the euro area depresses the value of the euro vis-à-vis the dollar. This effect is significant at the 95% confidence level. For the United States the data do not show a significant effect of inflation figures and forecasts. The adverse effect of price stability in the euro area on the euro suggests that investors interpret lower than

expected inflation news as an indication that monetary policy will not become restrictive. In other words, it leads investors to believe that interest rate increases are not likely in the near future, and they react by turning their back on the euro. In a way, one might conclude that, at least in the short run, the ECB is judged not so much on its ability to keep prices stable, but rather on its plans for interest rate policy. Obviously, this makes life somewhat difficult for the ECB.

Table 3  
Regression results equation (2)

Explanatory variables	Dependent variable Percentage change in euro-dollar exchange rate <sup>1</sup>
Constant	-0.56 (-1.22)
Good economic news, euro area	0.69 (1.66)
Bad economic news, euro area	0.57 (1.20)
Good economic news, United States	-0.41 (-1.07)
Bad economic news, United States	0.58 (1.36)
Good statements/political events, euro area	0.77* (2.07)
Bad statements/political events, euro area	-0.46 (-1.04)
Good statements/political events, United States	-1.30* (-2.09)
Bad statements/political events, United States	1.46* (2.13)
Number of observations	63
Method	OLS
R <sup>2</sup>	0.32
Adjusted R <sup>2</sup>	0.22
	D-W statistic
	1.73
	F-statistic
	3.16
	Jarque Bera test
	1.36 <sup>2</sup>

Note: \* indicates statistical significance at a 95% confidence level (t-statistics in parentheses).

<sup>1</sup> Dollars per euro. <sup>2</sup> Normality of errors cannot be rejected on the basis of this test.

### 4.3 Cognitive dissonance?

Our finding that the euro reacts more strongly to US real economic news than to that about the euro area does not in itself imply that investors react more strongly to “good” US news compared to “bad” US news; in fact, the results merely indicate that the response of investors to both good and bad US news is more pronounced than to euro area news. In order to see whether investors have reacted differently to good and bad news we have run a second regression splitting up the news into good and bad news categories. Thus, we have created new dummies for good (bad) news in the various categories, which take on a value of 1 if there is a good (bad) news release and a value of 0 if there is no good (bad) news in that specific category. In doing so, we follow the approach taken by Kaminsky and Schmukler (1999). The second equation is:

$$(2) \quad E_t = \alpha + \beta_1 \text{DEG}^{\text{euro}}_t + \beta_2 \text{DEB}^{\text{euro}}_t + \beta_3 \text{DEG}^{\text{US}}_t + \beta_4 \text{DEB}^{\text{US}}_t + \beta_5 \text{DPG}^{\text{euro}}_t + \beta_6 \text{DPB}^{\text{euro}}_t + \beta_7 \text{DPG}^{\text{US}}_t + \beta_8 \text{DPB}^{\text{US}}_t + \varepsilon_t$$

where DEG (DPG) is a dummy for good economic (political, ie statements and political events) news, which has a value of 1 if there has been a good news release and a value of 0 otherwise, DEB (DPB) is a dummy for bad economic (political) news, which takes on a value of 1 if there has been a bad



news release and a value of 0 otherwise. In order to limit the number of dummies, official interest rate changes are included in the economic news variables. Table 3 shows the results of this regression. Three dummies for statements and political events are significant at the 95% confidence level. Economic news, be it good or bad, for the euro area and the United States, does not have a significant effect (which can perhaps be attributed to the reaction of investors to inflation news, as illustrated in the regression results of equation 1 above). Therefore, our conclusion is that on the basis of the data used in this paper, cognitive dissonance in the sense of a systematically different reaction to good and bad news does not seem to be an important phenomenon in explaining the largest exchange rate changes in the euro-dollar exchange rate. It should be kept in mind that these large changes are an increase as often as a decrease, and thus do not reflect the steady fall of the euro since 1 January 1999.

## 5. Conclusion

In this paper we studied the reaction of investors in foreign exchange markets to new information about the euro area and the United States on days of large changes in the euro-dollar exchange rate. Our aim was quite modest. Rather than fully explaining the exchange rate movements - which would require the use of a complete model - the purpose was to verify whether on these days investors reacted differently to news about the euro area and the United States. Given the nature of the data set, the results should be interpreted with caution. Nonetheless, it appears that the impact of news about the US real economy on the euro is significant, whereas the impact of news about the real economy of the euro area is not. Moreover, investors seem to punish the ECB for keeping prices stable: they react to good inflation news in the euro area by turning away from the euro. A similar pattern is not found for reactions to inflation news in the United States. Importantly, no indications were found for cognitive dissonance on the part of investors.

It should also be kept in mind that the exchange rate changes analysed in this paper do not reflect the steady fall of the euro in the past two years. Further research should clarify whether the patterns found in the paper for the largest exchange rate swings are confirmed in an analysis of daily exchange rate changes, and to what extent the downward trend in the euro can be attributed to news filtering.

## References

- Banerjee, A V (1992): "A Simple Model of Herd Behavior", *Quarterly Journal of Economics* 93(3), pp 797-817.
- Barberis, N, A Shleifer and R Vishny (1998): "A Model of Investor Sentiment", *Journal of Financial Economics* 49, pp 307-343.
- Bikchandani, S, D Hirshleifer and I Welch (1992): "A Theory of Fads, Fashion, Custom and Cultural Change as Informational Cascades", *Journal of Political Economy* 100, pp 92-1026.
- Bosveld, R and M A Venneman (2000): "Initial Public Offerings on the Amsterdam Stock Exchange: An Analysis of Short-run and Long-run Performance", unpublished paper, NUON nv/Boston Consulting Group.
- Cailloux, J (2000): "Explaining the Excess Volatility of Capital Flows to Emerging Economies", unpublished paper, Deutsche Bank Global Market Research, January 2000.
- Clare, A and R Courtenay (2000): "Financial Market Reactions to Interest Rate Announcements and Macroeconomic Data Releases", *Bank of England Quarterly Review*, 40(3), pp 266-273.
- Daniel, K, D Hirshleifer and A Subrahmanyam (1998): "Investor Psychology and Security Market Under- and Overreactions", *Journal of Finance*, LIII(6), pp 1839-1885.
- De Grauwe, P (2000): *Het Financieele Dagblad*, 16-9-2000.
- Netherlands Bank (2000): "Survey Among Dutch Mortgage-Holders on the Use of Mortgage Credit", *Quarterly Bulletin* June 2000, pp 32-43.
- Devenow, A and I Welch (1996): "Rational Herding in Financial Markets", *European Economic Review* 40, pp 603-616.
- Edison, H J (1996): "The Reaction of Exchange Rates to News Releases", *International Finance Discussion Paper*, Board of Governors of the Federal Reserve System, no 570.
- Festinger, L (1957): "A Theory of Cognitive Dissonance", Stanford University Press.
- Het Financieele Dagblad*, various issues, 1 January 1999 - 19 August 2000.
- IMF, *World Economic Outlook*, September 2000.
- Kaminsky, Graciela and Sergio L Schmukler (1999): "What Triggers Market Jitters? A Chronicle of the Asian Crisis", *Journal of International Money and Finance*, June 1999.
- Keijer, M (2000): "Cognitieve Dissonantie op Financiële Markten" (Cognitive Dissonance in Financial Markets), Master's thesis (unpublished), Faculty of Economics and Econometrics, Department of Economics, University of Amsterdam.
- Kindleberger, C (1996): "Manias, Panics and Crashes: A History of Financial Crises", Macmillan, Third Edition.
- North, D C (1990): "Institutions, Institutional Change and Economic Performance", Cambridge University Press, Cambridge.
- Prast, Henriëtte M (2001): "Herding in Financial Markets: A Role for Psychology in Explaining Investor Behaviour?", in Paul Wilmott and Henrik Rasmussen (eds), *New Directions in Mathematical Finance*, John Wiley, (forthcoming).
- Wellink, A H E M, (2000): *Het Financieele Dagblad*, 25 May 2000.