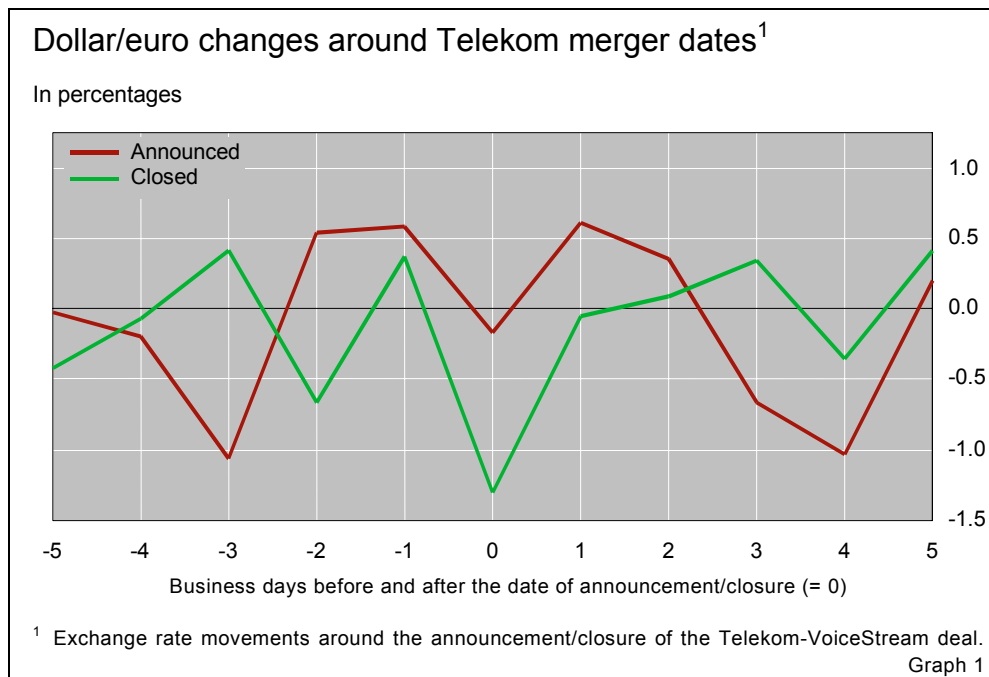


## The impact of transatlantic M&A activity on the dollar/euro exchange rate<sup>1</sup>

On 19 July 2000, following breaking news about an imminent \$53 billion cash-and-shares acquisition of US wireless operator VoiceStream by Germany's Deutsche Telekom, the euro depreciated against the dollar by 1.06% – a significant move for a single day. On the day of the official announcement, 24 July, the euro lost another 0.17%, and further depreciated by a total of 2.94% over the 10 trading days that followed. By the time the deal was finally closed, on 31 May 2001, the euro had lost some 1.30% of its value against the dollar (Graph 1).

High-profile transatlantic M&A deals

News about cross-border mergers and acquisitions (M&As) has figured quite prominently in the public debate. This is due partly to the huge size of a



<sup>1</sup> The authors would like to thank Angelika Donaubauer and Marian Micu for excellent research assistance. The views expressed in this special feature are those of the authors and not necessarily those of the BIS.

number of high-profile deals, like the aforementioned takeover of VoiceStream, but also to their possible impact on exchange rates.<sup>2</sup> In recent years, market commentary has pointed to the continuous stream of M&A-related capital flows from the euro zone towards the United States as a factor weighing on the euro. However, it is still not clear what impact these M&A deals actually had in practice, given that daily turnover in the FX markets is measured in trillions of dollars.<sup>3</sup> Moreover, quite a few takeovers are, at least partially, paid for with shares, not cash, and thus have no direct implications in terms of FX cash transactions.

FX effect can occur through three channels

This special feature explores the extent to which transatlantic M&A deals<sup>4</sup> are associated with movements in the dollar/euro exchange rate over the period 1 January 1999 to 30 September 2001. Three hypotheses are typically put forward to explain the potential impact of cross-border mergers on the exchange rate: the transactions effect, the portfolio effect and the announcement effect. In this paper, we test whether the last of these effects shows up in transatlantic M&A data and also provide some evidence on the first hypothesis.

The remainder of this special feature is organised as follows. The first section provides some background on transatlantic M&A activity and the development of the dollar/euro exchange rate over the period 1999–2001, while the second section describes the basic mechanics of cross-border M&A deals. The third section implements the empirical methodology and produces evidence in favour of a statistically significant impact of M&A announcements on the dollar/euro exchange rate. It is also shown that the size of a deal's impact is independent of its financing, a finding that is inconsistent with the transactions effect.

Overall, it is concluded that the direction and magnitude of transatlantic M&A activity are consistent with the strengthening of the dollar between 1999 and 2000. However, with average monthly volumes of newly announced cross-border M&A transactions down considerably from last year's record levels, it seems that the recent slowdown in M&A activity could be associated with a weakening of the dollar.

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<sup>2</sup> Large M&A deals, like the Telekom-VoiceStream transaction, can matter a lot in terms of current account financing. In its financial accounts for May 2001, the ECB registered relatively large net outflows of direct investment, valued at €40.4 billion. Final execution of the Telekom-VoiceStream deal, valued at \$27.1 billion (€31.9 billion), thus amounted to about 78% of net outflows in May 2001. See ECB (2001).

<sup>3</sup> The latest triennial central bank survey puts average daily turnover in traditional foreign exchange markets at an estimated \$1.21 trillion in April 2001. See BIS (2001b).

<sup>4</sup> We define transatlantic M&A deals to include cross-border M&A activity involving companies domiciled in the euro area and the United States.

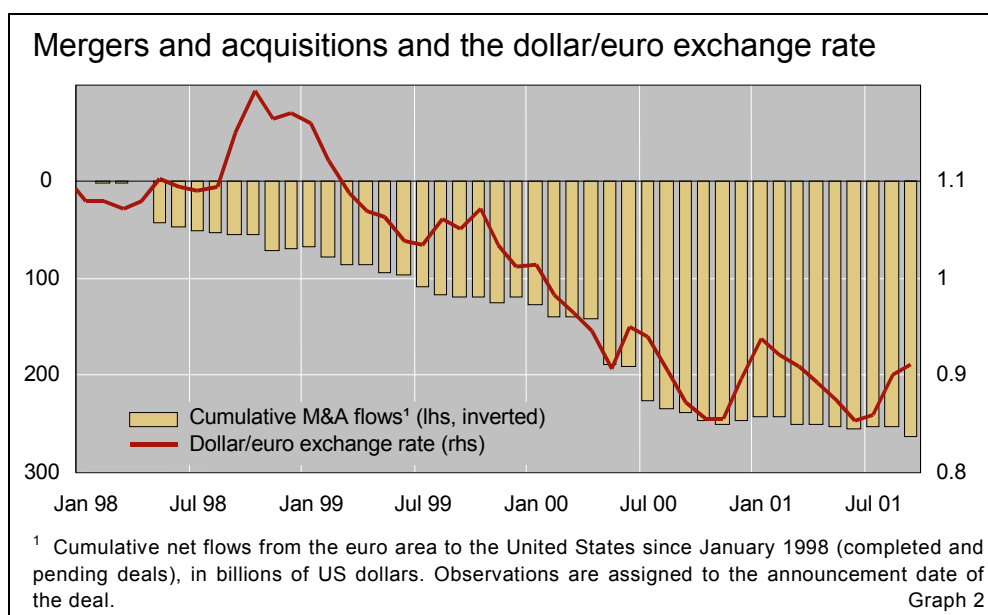
## Some background on M&A activity and the dollar/euro rate

The strength of the dollar between the mid-1990s and mid-2001 has usually been attributed to the perception of superior relative growth prospects of the United States vis-à-vis other economies over the medium term. In line with this view, revisions in expectations of growth differentials across the three main currency areas one to two years ahead seem to be broadly consistent with movements in exchange rates.<sup>5</sup> In 1999, and even more so in 2000, these expectations seem to have underpinned sustained portfolio inflows to the United States, which supported the dollar.

In addition, expectations of superior medium-term performance also tended to show up in the large FDI inflows experienced by the United States, which reflected strong cross-border M&A activity. Indeed, over the last few years, M&A-related activities have become an important source of international financial flows. In 2000, total cross-border M&A activity rose to \$1.1 trillion, nearly 50% higher than in 1999. Net announced M&A inflows to the United States totalled \$217 billion, equivalent to 2.3% of US GDP. Over the same period, the euro area experienced net outflows from announced M&A deals worth \$278 billion, with gross outflows at \$395 billion.<sup>6</sup> The protracted weakness of the euro vis-à-vis the dollar in 1999 and 2000 is thus consistent with the continuous stream of M&A-related capital flows from the euro zone towards the United States (Graph 2).<sup>7</sup>

Relative growth prospects underpin net portfolio flows ...

... and net M&A flows into the United States



<sup>5</sup> See BIS (2001a).

<sup>6</sup> See Montgomery et al (2001).

<sup>7</sup> See BIS (2001a) and *Economist* (2000).

## The mechanics of cross-border M&A activity

Three hypotheses are typically put forward to explain the potential effect of cross-border mergers on exchange rates: the transactions effect, the portfolio effect and the announcement effect. In what follows, we will test whether the third hypothesis, the existence of an M&A announcement effect, is supported by the data.

Transactions  
effect ...

The first hypothesis relates to the transactions effect of M&A deals and states that only actual foreign exchange market flows should matter in terms of exchange rate movements. Due to this flow effect, the acquisition of a US corporate by a European firm will increase the demand for dollars relative to euros and, hence, affect the exchange rate.

For the transactions hypothesis to hold M&A-related payments have to be exchanged in cash and channelled through (spot) foreign exchange markets. Thus, any effect of a given M&A deal on the exchange rate will crucially depend on the financing of the deal, which can be arranged from available cash, by issuing debt instruments or obtaining bank loans and by issuing and/or transferring shares as well as combinations thereof.<sup>8</sup> And while all but the last of the above sources of financing entail cash payments, use of any of these sources will not necessarily imply foreign exchange transactions if firms finance their M&As in the target company's currency.<sup>9</sup>

... portfolio balance  
effect ...

The second hypothesis, which works in parallel to the influence of cash flows, invokes a portfolio balance (or stock) effect, claiming that transatlantic M&As generate an increase in the net desired stock of dollar exposure relative to euros. If dollar- and euro-denominated assets are imperfect substitutes, investors must be compensated with a higher expected return. This, in turn, will require the exchange rate to adjust in order to bring expected returns in line with the new portfolio composition. The effect of M&A flows on exchange rates through this channel depends crucially on the extent to which the foreign currency positions are hedged. However, since there is little information available on hedging, it is very difficult to test this hypothesis empirically.

... and  
announcement  
effect

The third hypothesis of how cross-border M&As might affect exchange rates centres around the idea that the mere announcement of the deal, rather than its finalisation and settlement, will influence exchange rates. This channel could work in two ways. First, the exchange rate might react to an announcement as currency dealers scramble to take positions in anticipation of future upward pressure on the currency (expectations effect). In addition, M&A announcements might be seen to convey signals as to the expectations of businesses about future growth prospects in the currency areas involved

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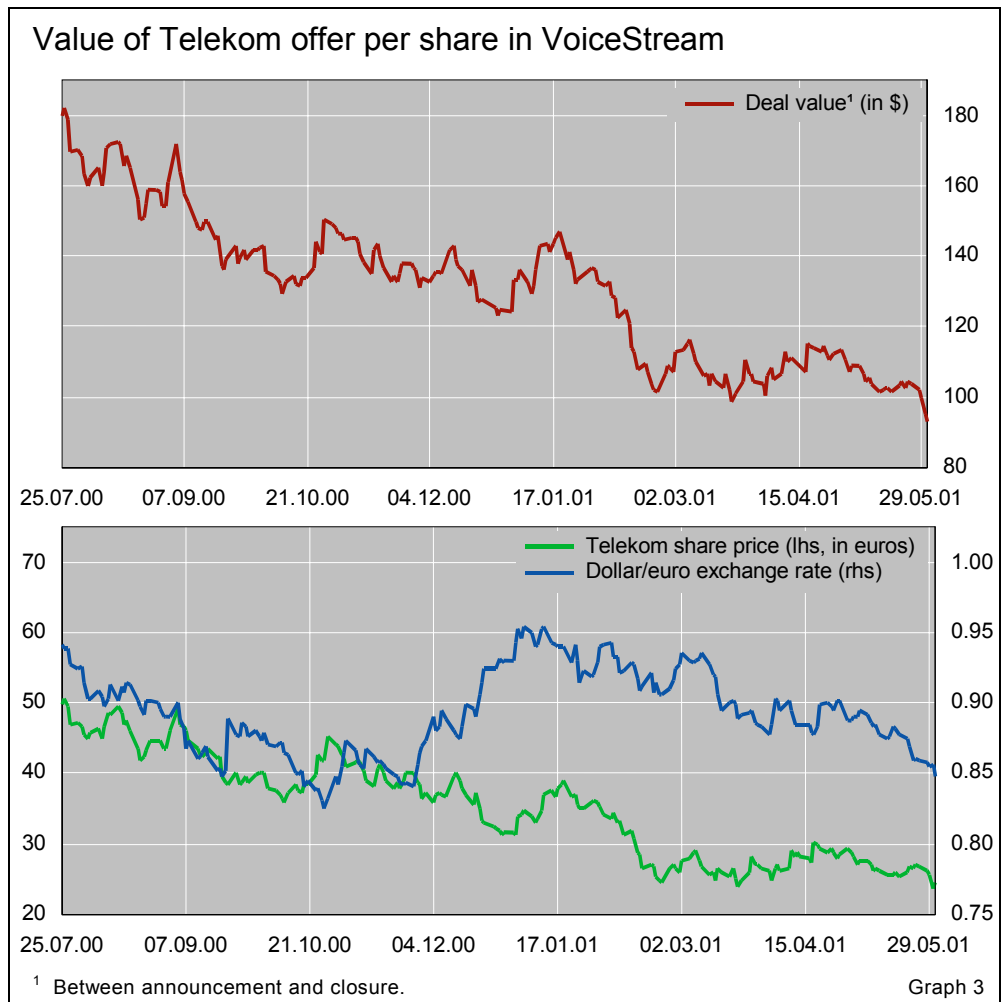
<sup>8</sup> Equity swap components of M&A deals may have indirect effects through this channel. While not involving an immediate cash payment, they are bound to potentially have exchange rate effects, if only indirectly via the so-called flowback of shares. The flowback will, in turn, depend on investors' portfolio adjustments and on whether and to what degree the proceeds from sold equity holdings are repatriated.

<sup>9</sup> This is particularly important for the United States and the euro area, due to their liquid corporate debt markets.

(signalling effect), that is, as a symptom of the strength of one economy versus the other – particularly if the stream of new deals consistently moves in the same direction (Graph 2). Due to these two elements of the announcement effect, exchange rates might move even when a newly announced deal does not involve immediate FX transactions and regardless of the precise financing strategies.

As far as the expectations effect is concerned, attempts to anticipate future FX transactions are complicated by considerable uncertainty, as the headline figures at the time of deal announcement might deviate substantially from actual deal size. The takeover of US wireless operator VoiceStream by Deutsche Telekom is, again, a case in point. When the terms of the planned deal first emerged, the offer valued the US company at about \$53 billion (€57.6 billion), of which \$7.8 billion was offered in cash. When the deal was finally closed, it was valued at \$27.1 billion (€31.9 billion), some 49% below the original headline figure, of which an amount of \$4.6 billion was settled in

Deal size and financing may change over time



cash (Graph 3).<sup>10</sup> Even so, while at the time of settlement the actual deal size and cash component of the deal were down substantially from the original figures, the deal still mattered a lot in terms of current account financing.<sup>11</sup> The Telekom example thus highlights the scope for significant effects of large M&A transactions, as huge acquisitions tend to generate flows that might influence the exchange rate. However, it also suggests that information about total deal size and the cash component of a given transaction can vary significantly over time. This will affect traders' ability to correctly anticipate the volume of M&A-related capital flows and may influence the announcement effects generated by M&A deals.

### Empirical methodology and estimation

Data availability complicates the empirical investigation of the three M&A-related FX effects mentioned above, particularly as accurate information on the actual financing of a given M&A deal and on related hedging operations is not necessarily obtainable. Lack of detailed portfolio data, therefore, precludes any attempt to thoroughly test the relevance of separate stock and flow effects. By contrast, data on the announcement of transatlantic M&A deals can be drawn upon to test the third hypothesis, ie to establish the existence of an announcement effect. In addition, a degree of indirect evidence on the role of the transactions hypothesis can be provided by investigating whether announcement effects vary depending on the way the deals are financed, ie whether a given deal includes a cash component.

M&A flows between the United States and the euro area <sup>1</sup>								
	Capital flows into the United States				Capital flows into the euro area			
	Number of deals		Deal size		Number of deals		Deal size	
	Total	Of which: with cash payment (%)	Average (\$ m)	Total (\$ bn)	Total	Of which: with cash payment (%)	Average (\$ m)	Total (\$ bn)
1999	154	51.3	715	89.2	147	42.9	240	40.0
2000	234	44.0	778	176.4	133	31.6	330	50.1
2001	111	49.5	360	35.2	92	50.0	195	18.9

<sup>1</sup> All deals completed and pending. For 2001, January to end-September.

Source: Bloomberg. Table 1

<sup>10</sup> On 20 July 2000, when the terms of the planned deal emerged, the takeover offer of 3.2 Telekom shares and \$30 in cash for each share in VoiceStream valued the US company at about \$53 billion. By 24 July, the day of the official announcement, total deal size was down to \$46.5 billion as Telekom shares had fallen by some 15% from their close at €60.4 on 19 July. Shortly before the deal was completed, the offer was changed to around 3.7 Telekom shares plus \$15.90 per share in VoiceStream, which put total deal size at \$27.1 billion on 31 May 2001. See *Financial Times* (2000, 2001).

<sup>11</sup> See above and ECB (2001).

The empirical investigation of the relationship between the dollar/euro rate and the announcement of transatlantic M&As is based on a data set with daily observations on M&A transactions data between the United States and the euro area. The data, which are taken from Bloomberg, cover announced cross-border M&A deals from January 1999 to end-September 2001. M&A volumes are measured in US dollars and the data set includes volumes and financing information for all transactions greater than \$100 million. Table 1 provides some background information about the deals included in our data set. Between January 1999 and end-September 2001, 499 deals involved US companies as targets and euro area companies as acquirers, compared to 372 deals in which euro area companies were targeted. In addition, the table presents some summary statistics on the size of transatlantic M&A deals.

M&A data from January 1999 to end-September 2001 are investigated

The empirical methodology involves regressing log differences of the dollar/euro rate ( $XR$ ) on its past changes, the logarithm of current and lagged M&A deal volumes ( $M$ ) and a set of other explanatory variables ( $X$ ).<sup>12</sup> The applied specification differentiates M&A flows according to their direction. To distinguish the effect of the announcement of M&A deals from the effect of news about relevant macroeconomic variables that may arrive on the same day, an additional variable was included for each of the two economic areas to capture news about macroeconomic data releases. The chosen variable was the unanticipated component of announcements of the NAPM and Ifo indices, which are closely watched by forex market traders.<sup>13</sup> Finally, to control for day-of-the-week effects, dummies for each weekday were included among the explanatory variables.

$$\Delta \log XR_t = \alpha_0 + \sum_{i=1}^5 \alpha_{1,i} \Delta \log XR_{t-i} + \sum_{i=0}^5 (\beta_{EUR,i} \log M_{t-i} + \beta_{US,i} \log M_{t-i}) + \sum_{i=0}^5 \gamma_i X_i + \varepsilon_t$$

The equation was estimated with data on daily spot exchange rates in New York at noon local time. Table 2 reports the main results. The coefficients of M&A flows into and out of the United States were found to have the correct signs. Thus, the announcement of a takeover of a US corporate by a European acquirer lifted the dollar vis-à-vis the euro, while the acquisition of a European target tended, on average, to support the euro. However, while the contemporaneous impact on the dollar/euro exchange rate of transatlantic M&A deals with a US target was found to be statistically significant at the 6% level, M&A flows into the euro area were not found to have any statistically significant exchange rate effects. In addition, the cumulative coefficients for the current

Statistical significance of announcement effects

<sup>12</sup> Throughout the special feature, the dollar/euro exchange rate is defined in terms of dollars per euro.

<sup>13</sup> The number of macro variables was limited in order to avoid problems of near-collinearity that arise because of the large number of explanatory variables. Specifications with other variables did not change the main findings. For an analysis of the role of news about macroeconomic developments on the euro/dollar rate, see Galati and Ho (2001).

## Estimates of the effect of M&A flows on the dollar/euro exchange rate

January 1999–September 2001

	Lag	Coefficient	t-stat	Sig level	Lag	Coefficient	t-stat	Sig level
M&A flows into euro area	0	0.118	1.23	0.22	0 to 5	0.346	1.55	0.12
M&A flows into United States	0	-0.157	-1.89	0.06	0 to 5	-0.481	-2.52	0.01
NAPM manufacturing	0	-0.972	-1.36	0.17	0 to 5	0.377	0.22	0.82
German lfo	0	4.551	5.04	0.00	0 to 5	7.857	3.28	0.00

The dependent variable enters the regression equation in log difference form, M&A values enter in log levels, and news variables enter in their original form  $X_k$ . Coefficient =  $\beta \cdot 10^3$ . Adjusted  $R^2 = 0.09$ . Table 2

M&A volumes and five lags were highly statistically significant for M&A flows into the United States. The comparable effect of acquisitions of euro area targets by US companies, while having the correct sign, was again not statistically significant. The regression results suggest that the economic significance of the impact of M&A announcements is small on average. However, the estimated effect of very large deals on the euro/dollar rate can be sizeable.<sup>14</sup>

Seen together, these results suggest a degree of asymmetry in how announced M&A deals affected the dollar/euro market, and point to a degree of persistence of the effect of announcements of M&A deals with US target companies on the exchange rate.

Deal financing does not seem to matter ...

As a next step, the content of M&A announcements was investigated in more detail. M&A mechanics, as indicated above, suggest that the size of any announcement effect should depend on the deal's specifics, including deal size and financing. Using information on the cash/shares component of each deal in our data set, it was first tested whether the reaction of the exchange rate to M&A announcements depended on the type of payment, ie whether or not cash transfers were involved. To do this, the regression equation was augmented with two dummy variables (one for each direction of M&A flows) that took the value of one whenever a deal involved the exchange of cash and zero otherwise. As an alternative, a second specification included interaction variables that took values equal to the amount of the deal whenever there was a transfer of cash and zero otherwise. Empirical results for both specifications suggest that the choice of the means of payment on average did not affect the impact of M&As on the dollar/euro rate in a statistically significant way.<sup>15</sup>

<sup>14</sup> Table 2 suggests that \$1 billion worth of transatlantic M&A deals involving US targets imply a 0.11% appreciation of the dollar vis-à-vis the euro. Deutsche Telekom's offer for VoiceStream, worth \$46.5 billion on the day of announcement, thus implies a dollar appreciation of 0.169% – corresponding to the 0.17% change in the dollar/euro rate observed on 24 July 2000.

<sup>15</sup> The results are not reported here for reasons of space, but are consistent with those in Breedon and Fornasari (2000), who find non-cash deals to affect the exchange rate, although their effect is not statistically significant.



Estimates of the effect of M&A flows on the dollar/euro exchange rate								
September 2000–September 2001								
	Lag	Coefficient	t-stat	Sig level	Lag	Coefficient	t-stat	Sig level
M&A flows into euro area	0	0.494	2.85	0.00	0 to 5	1.089	2.63	0.01
M&A flows into United States	0	− 0.483	− 3.23	0.00	0 to 5	− 0.616	− 1.45	0.15
NAPM manufacturing	0	− 2.159	− 1.94	0.05	0 to 5	3.699	1.08	0.28
German Ifo	0	1.595	0.93	0.35	0 to 5	9.007	2.25	0.02

The dependent variable enters the regression equation in log difference form, M&A values enter in log levels, and news variables enter in their original form  $X_k$ . Coefficient =  $\beta \cdot 10^3$ . Adjusted  $R^2 = 0.18$ . Table 3

In addition, it was tested whether the impact of transatlantic M&A deals varied according to the size of the transaction, that is, whether so-called megadeals generated any additional effect. To this end, another augmented regression was estimated, with dummy variables for each direction of M&A flows that took values equal to one whenever the amount of the deal exceeded \$1 billion and zero otherwise.<sup>16</sup> In an alternative setup, interaction variables were used. Here too, neither specification produced evidence in favour of statistically significant size effects.

... nor do megadeals have any additional impact

Finally, it was investigated whether the impact of news on M&A flows changed at the end of 2000, when net cross-border flows into the United States declined markedly.<sup>17</sup> As Chow tests pointed to the existence of a structural break at end-August 2000, the main regression equations were re-estimated for the period from September 2000 to end-September 2001. The results, presented in Table 3, suggest that, in contrast to the whole period January 1999–September 2001, news about acquisitions of euro area companies by US firms on average had a positive, statistically significant impact on the euro vis-à-vis the dollar over that sub-period.

## Conclusion

This special feature investigated the extent to which announcements of transatlantic M&A deals are associated with movements in the dollar/euro spot exchange rate over the period January 1999–September 2001. It was found that announcements of M&A deals that involved the acquisition of a US target by a euro area company did indeed have a statistically significant impact on exchange rates and that the size of this impact was independent of the financing of the deal. Deals involving euro area targets, however, were not found to have a statistically significant impact on the exchange rate. In addition, there were no indications of added effects for so-called megadeals.

<sup>16</sup> The findings are robust to thresholds of \$2 or 5 billion. The results are not reported here for reasons of space but are available upon request from the authors.

<sup>17</sup> See *Economist* (2001).

The strong net M&A inflows from the euro area to the United States are therefore consistent with the downward trend of the euro vis-à-vis the dollar.

These results are taken to imply that announcement effects do not seem to fully reflect the specifics, ie financing, of any given individual deal. That is, announcement effects do not necessarily reflect traders' reaction to the anticipated FX flows generated by individual deals. The absence of statistically significant size and financing effects rather seems to suggest that the exchange rate reaction to an M&A announcement might be driven by the level of cumulative net flows, ie market perception as to the general trend of M&A flows. This might be taken as evidence for the existence of signalling effects, where the announcement of an M&A deal is seen as an indicator of the relative strength of growth prospects in the two economies involved in the deal and, thus, future M&A activity. This interpretation of the announcement effect is also supported by the finding that news about acquisitions of euro area companies by US acquirers started to support the euro towards the end of 2000, effectively putting an end to the previous asymmetry in the reaction of the exchange rate to announced deals with European as opposed to US targets.

Overall, it is concluded that cross-border M&A activity supported the strengthening of the dollar between 1999 and 2000. However, it is also noted that the pace of M&A activity has slowed markedly, beginning in the fourth quarter of 2000. Average monthly net volumes of newly announced transatlantic M&A transactions slumped, according to the data set used, to \$1.8 billion over the first three quarters of 2001, down from about \$10.5 billion per month in 2000. This is taken as indicative of a change in the relative strength of growth prospects in the two economies involved, which might, in turn, have weighed negatively on the dollar.

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