The transition from national currencies to the Euro

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Abstract:
We initiated a survey to examine whether the transition from national currencies to the Euro involved significant increases in transaction times. Based on our sample of 42 observations, we found that the pure transaction time for making change did actually increase, while queuing time increased only in small shops. This increase in transaction time represented a more significant welfare loss than most estimated studies of shoe-leather cost have previously found.

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1. Introduction

The transition to the euro was, by all accounts, remarkably successful. There had been numerous worries; for example of logistical failures, counterfeiting, a smokescreen for price increases, etc. At the limit there were even a few fears of the public refusing to accept the new currency; in practice, apart perhaps from Italy, the public has appeared to do so enthusiastically. So far, at the time of writing, there have been few authoritative reports of the extent of any such problems, but anecdotes suggest that they have been minor; in some countries, for example Germany, the public has blamed the transition for instigating price increases, more so than official data suggest is applicable.

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The facet of the transition that we had, ex ante, expected to be most worrisome was that the problem of making change from national currencies into euro, (with an exchange rate of six significant figures), could so slow up transactions times at cash payment tills that large queues might build up at such tills, thereby causing a serious waste of time and frustration. There had been, for example, a widely reported simulation study of massive queues being likely to develop at the Amsterdam railway station[1]. A Dutch rail company estimated that the introduction of the Euro would double the time needed to buy a ticket during the changeover, when the two currencies would be in circulation, and that the queuing time would increase by the same proportion.

In the event such queues only occurred in a few isolated cases (a few cases of motorway toll queues were reported around Rome and outside Paris). But in advance it was not possible to predict how much transactions times would increase. We decided to try to run a controlled survey to examine this. Our sample survey exercise was neither as large, nor as well balanced and randomised, as we would have liked, owing to shortages of time and money. Nevertheless, and in the absence of any more authoritative data, notably from official sources, the results collected here may be of some interest.

2. The experiment

What we did was to collect a group of 42 students, mostly doing economics, from LSE and from Universitat Pompeu Fabra in Spain. The students were asked to visit the same shop, at the same time and buy the same product on three occasions; once before the introduction of the Euro, once on the first day that the shop would be open after the introduction of the Euro, and once as late as possible before returning to university in January. The selection of shops and products was, in

1 Wednesday 29 August 2001, Business and Finance, the News from Ireland:

the event, well diversified, (data are available on request). On all three occasions the students were asked to pay with the same note of national currency, and after January 1st to ask for change in Euro. Their task was to calculate:

(a) the time that it would take them from the moment they would reach the till to the moment they would be given back their change.

(b) The time they had to wait in the queue and the number of people in the queue.

They had also to report any changes in prices, or any other unusual occurrence after the introduction of the Euro.

However, many of these students did not manage to execute all the instructions correctly. 26 of them reported the pure transaction time. Meanwhile 31 reported queuing time, and amongst those 20 reported both the queuing time and the number of people in the queue. Given these results we have constructed three different measures for the time taken in the transaction process.

(a) The T-measure, which corresponds to pure transaction times. (26 observations)

(b) The Q-measure, which corresponds to queuing time (31 observations) and

(c) The QA-measure, which corresponds to the queuing time adjusted for the number of people in the queue (20 observations).

A shortcoming of our sample is that the subjects (except for 4 cases) were all students in economics. Another limitation, and for the same reason, was that the students who volunteered did not come from a geographically balanced sample. The bulk of them, [30 out of 42], came from Spain, though the remainder were widely spread over the Euro area. So the results are more descriptive of the Spanish experience rather than that of the euro-zone as a whole.

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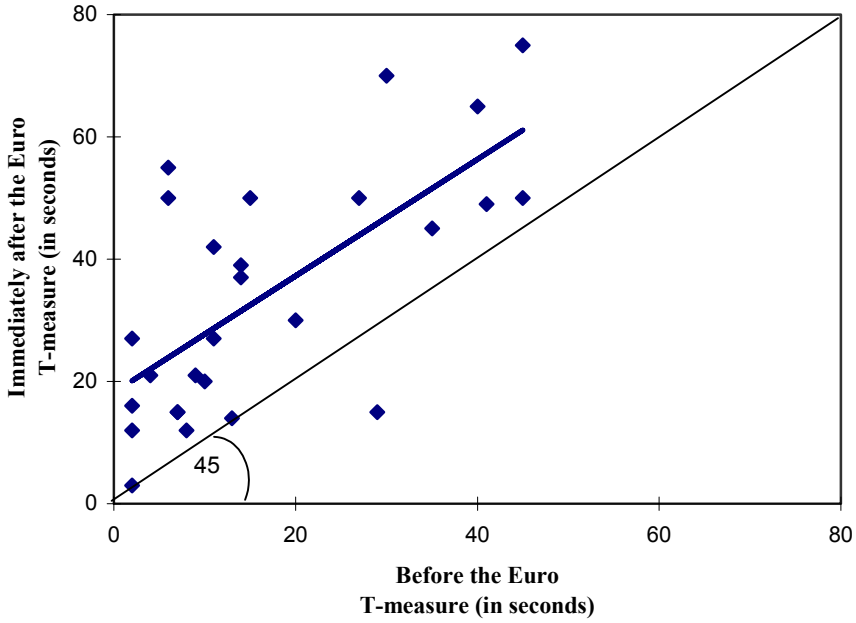
http://new.businessandfinance.ie/anchors/anchor82.htm

3. Results

3.1 The effect of the euro changeover

As was predicted, the introduction of the new currency did increase pure transaction time. In Figure 1 we present the line fit plot of regressing the pure transaction times before the introduction of the euro to transactions immediately after the introduction of the euro. The slope of the fit line is 0.95 (t = 4.65), while the intersection equals 18.2 seconds (t=4.67)[2]. The picture is similar when we regress transactions adjusted for queuing. The above results indicate that the transition to the new currency was relatively smooth. Pure transaction time increased by 18 seconds on average because of the euro changeover. The average pure transaction time before the introduction of the euro was 16.85 seconds, that is the pure transaction time more than doubled on the first day after the introduction of the euro.

Figure 1: Pure Transaction Time

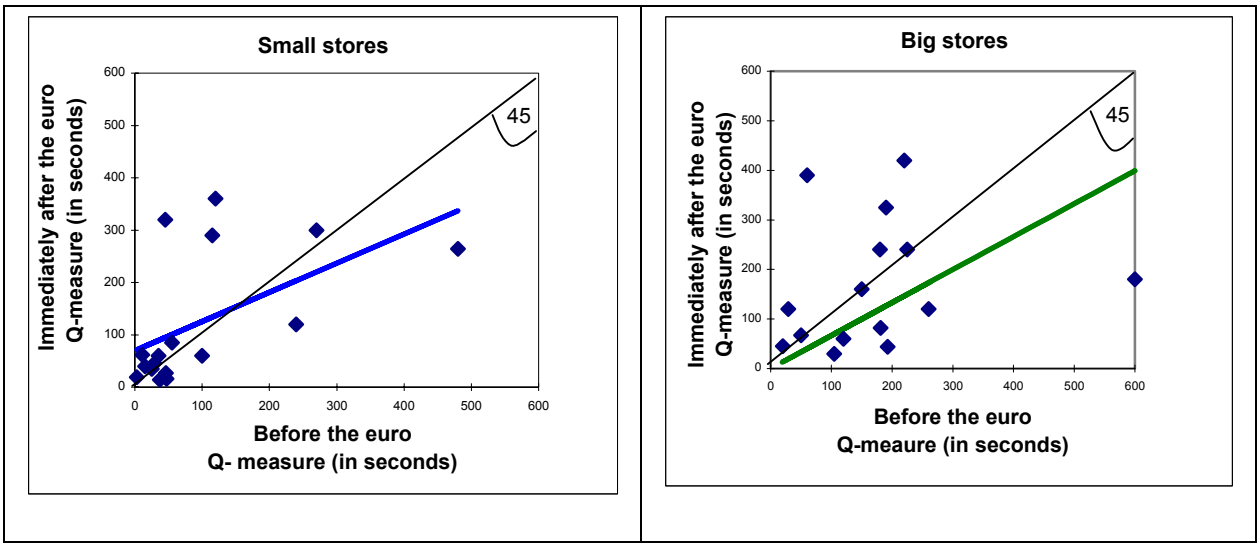


In contrast to the increase in the time taken to complete transactions, the queuing time remained almost unchanged. The results do not indicate any clear significant change in queuing time. The slope of the fit line is 0.74 with t=5.92. To assess whether the distributions of queuing time before and immediately after the introduction of the euro were different, we performed a K-S test on the cumulative distribution of the queuing times on the two visits. We could not reject the null hypothesis of identical distributions both at the 95% and 99% confidence intervals.

So, although the pure transaction time did increase with the introduction of the new bank notes and coinage, the time spent queuing at the tills did not seem to have increased significantly. This is probably due to the fact that shop-owners had been prepared to welcome the arrival of the new currency. Many of the subjects reported an increase in the number of tills open on the first day after the introduction of the euro, while others reported the presence of separate lines, one for euros and one for national coinage. In Spain, before the introduction of the euro, supermarkets' employees were trained to handle the double circulation of coinage after the 1st of January. Since the subjects reported the type of store which they visited to undertake the transaction, we can condition on the kind of the shop visited and check whether the queuing time was different between small (corner) shops and big supermarkets. Our finding is that queuing time did actually increase in small shops, while in big supermarkets there was no significant change in the queuing time. In Figure 2 we plot the queuing time before and after the introduction of the euro for small stores and supermarkets. For the fitted line in the left-hand graph both the constant and the slope are significant, while for the fitted line in the right-hand graph the intercept is not significantly different than zero while the slope is 0.67 (t=3.7).

2 We could not reject the hypothesis of unitary slope (t=5.33).

Figure 2:Time in the queue big versus small stores



In both cases there is an outlier. If this is excluded, the results indicate that in both cases there has been no significant change in the slope of the fitted line.

3.2 Learning to use the euro

The objective of the last part of our experiment was to investigate whether the costs of the introduction of the euro were persistent. The students were asked to pay always in national currency and to ask for their change in euro. Some of the subjects had some difficulty in carrying out their task without complaints from the cashiers. Besides complaints, learning about using the new currency seems to have occurred.

The students provided us with information both about the transaction time of the last purchase and the date that this transaction was undertaken. Luckily for us, the last dates of transactions were quite widely dispersed and this allowed us to run a regression of the form[3]:

$$LT_t = \delta_0 + \delta_1 t + u_t$$

3 We have also regressed LT on a time trend and its square to check for convexity in learning, however, the coefficient on t^2 was insignificant.

where LT_t is the ratio between the last transaction and the transaction immediately after the introduction of the euro and t is the days elapsed between these two transactions. The estimation of the above regression is:

$$LT_t = \underset{(5.99)}{1.33} - \underset{(-2.05)}{0.05}\, t$$

where the terms in the parenthesis denote t statistics. According to the above estimates, the difference between the time taken for the first transaction after the introduction of the euro and the last transaction of the experiment decreased as additional days passed. In other words, users have learned to handle the new currency over time[4].

3.4 The welfare costs of the euro changeover

The above analysis indicates that the transition to the euro was not entirely costless for European consumers. Transactions times actually increased immediately after the introduction of the euro, but slowly decreased thereafter. One interesting question to study then is what were the welfare costs of the introduction of the euro in terms of time losses.

We can assess the welfare costs of the euro changeover using the results of the above regression and the information available about the average time of transactions before and after the introduction of the euro. The estimation of the above regression shows the learning rate of the subjects from the first date of the introduction of the euro until the date of their last transaction. However, for assessing the welfare costs of the introduction of the new currency, we have to calculate the days it took the subjects to return to their regular transactions' time, before the introduction of the new currency. Thus, we substitute LT_t in the above regression with the

4 As was noted for the difference between the two first observations, the difference in the queuing time between the two last transactions was insignificant.

average ratio between transactions' times after and before the introduction of the euro. This number was equal to 0.60.

The time lapse for the ratio of the transactions after the introduction of the euro to be equal to the ratio of transactions beforehand was 15 days approximately, while the average time losses per transaction during the transition were approximately 2.6 minutes. If a consumer conducts *n* transaction per day on average, the above number suggests that the consumer has lost *n*2.6* minutes per day on average during the transition. To get a sense of the magnitude of this number, we compare it with the estimated time needed per quarter for an agent to reorganize his flow of funds by going to the bank in Christiano and Eichenbaum (1992). The latter authors have estimated that the average time loss per quarter for going to the bank is 3 minutes. Here, we find that the average loss per day during the two weeks of the introduction of the new currency was 2.6 minutes per transaction. According to the information provided by the POPAI Europe Consumer Buying Habits Study, for average weekly visits to grocery stores, the consistent European average is for one major shopping trip per week with two to three other visits for top up shopping, which corresponds to 3 to 4 transactions per week. This implies that the average time loss for visiting the grocery store in the first quarter of 2002 amount to 15.6 to 20.8 minutes. Therefore, welfare time losses due to the introduction of the euro appear to have been significant, but acceptable in view of the importance of the regime change.

References

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