Preliminary, not to be quoted

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Is Cash Used Only in the Shadow Economy?

Abstract:

This paper analyzes the use of cash in the euro area. It tries to give at least a partial answer to the question of whether cash is predominately used in the shadow economy and whether consequently the development of cash balances is useful in monitoring the changes in the shadow economy. The paper shows that – opposite to often expressed assumptions – recent developments in cash demand (including changes in the denomination structure of cash) can be relative well be explained by some economic and institutional factors. Changes in cash demand do not seem to correspond to changes in existing measures of shadow economy, nor do cross-country measures correspond very well with each other.

Key words: shadow economy, cash demand, hoarding, interest rates

JEL-classification: O17, O5, D78, H2, H11, H26.

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1. Introduction

Recently, the demand of cash in the Euro area has increased substantially (Figure 1) and, at the first sight, it seems difficult to explain why this shift has occurred. Not surprising, the demand for cash is frequently associated with the shadow economy ("cash is nowadays used only the shadow economy") but it seems a bit difficult to reconcile the growth rate of cash with the existing estimates of the size of the shadow economy. These estimates do not show any marked upward trend which could explain the growth of cash demand (unless we interpret the growth of cash usage as direct evidence of change in the magnitude of the shadow economy). Moreover, the cross-country distribution of shadow economy estimates does not easily match with the cross-country differences in usage of cash.

In this paper we try see whether the growth of cash demand can be explained by some "natural" (not illegal) reasons. Very briefly the set of reasons consist of the following:

- The recent regime of very low interest rates has made cash an attractive instrument for saving (money hoarding). The relevant (after-tax) interest rate margin has become so small that is has no economic importance, at least among unsophisticated investors (households).
- The banking crisis has caused some unrest among the general public. It could be that bank accounts are no more considered more secure than money balances (madras money)
- All consumers do not have a free choice between money and cards. A considerable portion of households do not have any bank accounts at all an, similarly, all consumers do not have debit not credit cards (data here). In current bad times, more consumers may be forced to use cash as the only payment instruments.
- There are some signs of increased cross-border trade that is made by cash. The Euro has obviously made cross-border trade much easier (prices more transparent) and the Internet has facilitated trade that one could not imagine, say, ten or twenty years ago. Thus, second-cards and even houses are relatively frequently purchased with cash.
- Currency substitution has continued to increase the demand for Euros outside the Euro area. At the same time, the remains of dollarization (in some Southern European countries) have vanished.

In what follows, we try to document empirical evidence on these factors. We do also present some evidence on the relation between existing measures shadow economy and the usage of cash. These comparisons are presented in section 2 while evidence on the factors that may explain cash growth are reviewed in section 3. Finally, a short concluding section in presented in the end of the paper.

2. Cash and the shadow economy

We start by reviewing empirical evidence on the size of the shadow economy. That is rather demanding because there is not generally accepted/adopted methodology in measuring the shadow economy not to speak about the fact that the concept itself is somewhat ambiguous (see Schneider 2000 and Schneider (2005)) for more extensive review of these issues). Moreover, different studies represent different points of time and we do not really have systematic time series data of the size of the shadow economy. Not only are the samples different, often also the reference years are different. Thus, for instance, we use the so-called money demand method some assumptions are made on the base-year's situation (see e.g. Ahumada et al (2008)). In addition to the choice of the base year there are numerous other parameters which we have to be fixed in order to get the final estimates (like the velocity of money in the shadow economy vs. the velocity of money in the rest of the economy).

Thus, it comes as no surprise that the estimates in various studies vary a lot as one can see from the subsequent tables. From the point of view of this study all differences are not crucial. Thus, the "level" of the size of the shadow economy is not that important when we make comparisons with the growth rates of money balances, or the cross-country differences between money holdings unless the different country studies use completely different research methodology. From the point of view of these comparisons, the big problem arises because it is difficult to find such measures of shadow economy which would not use information on money demand in a way or another. Obviously, it is no point of comparing cash balances and shadow economy measures that are computed with the "currency demand method". Ideally, we should have genuine statistical data on the shadow economy but that is not possible. In the cross-country context, it is even difficult to know how, after all, the numbers have compiled.

Keeping these caveats in mind we move next to a partial survey of some representative estimates of the size of the shadow economy in developed economies. A summary of this evidence is presented in Tables 1 to 4.

Table 1: Estimates of the shadow economy

OECD-Countries	Size of the Shadow Economy (in % of GDP) using the Currency Demand and DYMIMIC Method					
	Average 1989/90	Average 1994/95	Average 1997/98	Average 1999/2000	Average 2001/2002	Average 2002/2003[1)]
1. Australia	10.1	13.5	14.0	14.3	14.1	13.8
2. Belgium	19.3	21.5	22.5	22.2	22.0	21.5
3. Canada	12.8	14.8	16.2	16.0	15.8	15.4
4. Denmark	10.8	17.8	18.3	18.0	17.9	17.5
5. Germany	11.8	13.5	14.9	16.0	16.3	16.8
6. Finland	13.4	18.2	18.9	18.1	18.0	17.6
7. France	9.0	14.5	14.9	15.2	15.0	14.8
8. Greece	22.6	28.6	29.0	28.7	28.5	28.3
9. Great Britain	9.6	12.5	13.0	12.7	12.5	12.3
10. Ireland	11.0	15.4	16.2	15.9	15.7	15.5
11. Italy	22.8	26.0	27.3	27.1	27.0	26.2
12. Japan	8.8	10.6	11.1	11.2	11.1	11.0
13. Netherlands	11.9	13.7	13.5	13.1	13.0	12.8
14. New Zealand[2)]	9.2	11.3	11.9	12.8	12.6	12.4
15. Norweay	14.8	18.2	19.6	19.1	19.0	18.7
16. Austria	6.9	8.6	9.0	9.8	10.6	10.8
17. Portugal	15.9	22.1	23.1	22.7	22.5	22.3
18. Sweden	15.8	19.5	19.9	19.2	19.1	18.7
19. Switzerland	6.7	7.8	8.1	8.6	9.4	9.5
20. Spain [3)]	16.1	22.4	23.1	22.7	22.5	22.3
21. USA	6.7	8.8	8.9	8.7	8.7	8.6
Unweighted Average over 21 OECD countries	13.2	15.7	16.7	16.8	16.7	16.4

Source: Schneider (2005)

Table 2 estimates of the size of the shadow labour force several OECD countries

Country or Group	Year	Participants (thousands of people)[a]	Participants (% of labor force)[b]	Size of Shadow Economy (% of GDP)[c]
Austria	1990–91	300	9.6	5.47
	1997–98	500	16.0	8.93
Denmark	1980	—	8.3	8.6
	1986	—	13.0	—
	1991	—	14.3	11.2
	1994	—	15.4	17.6
France	1975–82	800–1,500	3.0–6.0	6.9
	1997–98	1,400–3,200	6.0–12.0	14.7
Germany	1974–82	2000–3000	8.0–12.0	10.6
	1997–98	5,000	22.0	14.7
Italy	1979	4,000–7,000	20.0–35.0	16.7
	1997	6,600–11,400	30.0–48.0	27.3
Spain	1979–80	1,250–3,500	9.6–26.5	19.0
	1997–98	1,500–4,200	11.5–32.3	23.1
Sweden	1978	750	13.0–14.0	13.0
	1997	1,150	19.8	19.8
European Union	1978	10,000	—	14.5
	1997–98	20,000		
OECD	1978	16,000	—	15.0
	1997–98	35,000		

Source: Schneider (2000)

Table 3

Estimated size of the shadow economy

Country	Estimated size, in % of GDP	Year
Austria	1.5 %	1995
Belgium	3 – 4 %	1995, confirmed in 97, 99
Cyprus	4.2 %	2003
Czech Republic	9 – 10 %	1998
Denmark	5.5 %	2001
Estonia	8 – 9 %	2001
Finland	4.2 %	1992
France	4 – 6.5 %	1998
Germany	6 %	2001
Greece	> 20 %	1998
Hungary	18 %	1998
Ireland	n.a.	
Italy	16 – 17 %	1998/2001
Latvia	18 %	2000
Lithuania	15 – 19 %	2003
Luxembourg	n.a.	
Malta	n.a.	

Country	Estimated size, in % of GDP	Year
The Netherlands	2 %	1995
Poland	14 %	2003
Portugal	5 %	1996
Slovakia	13 – 15 %	2000
Slovenia	17 %	2003
Spain	n.a.	
Sweden	3 %	1997
United Kingdom	2 %	2000

Source: RENOOY P, IVARSSON S, VAN DER WUSTEN-GRITSAI O & MEIJER R (2004) *Undeclared work in an enlarged Union. "An analysis of undeclared work: an in-depth study of specific items"*, Malmö/Amsterdam, INREGIA/Regioplan, pp 107 & 158.

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Table 4

Estimates of the shadow economy by sector in Finland

- Between 1995-2002 a private consultant specialised on studies concerning the amount and share of the undeclared economy in various industries has estimated the following:

- 1. In construction (1998) the share of the grey production is about 6-16 %, which accounts 0.5 – 1 billion euro.
- 2. In restaurants (1999) the amount of the undeclared wages is about 380-430 million euro with tax losses amounting over 100 million euro.
- 3. In transports (1995) the amount of undeclared activity accounts for 150 million euro.
- 4. In private services like barber shops undeclared income accounts for 50 million euro and in other business services over 80 million euro.
- 5. Drug traffic (2002) has been evaluated to amount approximately worth about 200-300 million euro.
- 6. Prostitution (legal and partly illegal, private entrepreneurship is legal, but procuration i.e. pimping is illegal, quite recently buying has been defined illegal) has been evaluated to account for 100-200 million euro in 2002.

- **In total therefore the amount of undeclared economy in these industries accounts for 1.7 – 2.2 billion euro. If these figures are compared to annual GDP, they account about 1.2 - 2.2 % of GDP.**

- ***References:*** *Pekka Lith, Various studies e.g. in Statistics Finland publications.*

The striking feature in the estimates of Schneider (2005) is the fact that GDP shares of the shadow economy are relatively high and the values have been more or less constant over time (especially after the mid 1990s, see Table 1). Not surprisingly, the values of employment shares are of the same magnitude (Table 2). The problem is of course, the fact that the various other estimates are so different. Typically, the "official" estimates are smaller; cf. e.g. Renooy (2007). Thus take for instance, Finland and the estimates of Lith (1997 & 2003) which are made in cooperation with Statistics Finland. They are only of the magnitude of 2 per cent of GDP (Table 4).

If the range of estimates is something like 2 – 20 %, one cannot really say much of changes in size of the shadow economy nor make any cross-country comparisons[1]. Clearly, the problem of the existing estimates is the fact that they do not seem to explain the observed growth of cash nor the cross-country differences in cash holdings which shows up Graph 1 and Table 5, for instance.

We have made some comparisons between measures of shadow economy and the development of cash holdings in Euro area (see figures 7 and 8). There are also some data on regional distribution of money holdings which may be used in comparing currency ratios with corresponding shadow economy measures.

All comparisons show that it is very difficult see any link between the cross-country differences in shadow economy and measures of cash holdings. So, it does not seem to be case that countries (regions) with large shadow economy would use disproportionally more cash or have increased their cash holdings more than the small shadow economy countries. Interestingly (Finnish) banks' cash officers do not see any major change in the shadow economy during the Euro period (see Figure 9 for details).

[1] Relationships with size estimates and some obvious background variables (like tax rates or corruption) obviously make the estimates more trustworthy in cross-country comparisons but they do not help so much in determining the right over level for the GDP shares. For more details, see e.g. Schneider and Klinglmair (2004) Buhen & Schneider (2009)

Table 5: Shares of the euro banknote denominations and annual growth rates

	€500	*€200*	*€100*	*€50*	*€20-€5*	*Total*
Share in value	34.7%	4.5%	18.1%	32.2%	10.5%	100.0%
Share in volume	4.0%	1.3%	10.5%	37.4%	46.8%	100.0%
Growth 2004	28.4%	5.7%	13.5%	12.4%	1.3%	14.9%
Growth 2005	20.9%	3.9%	10.8%	11.3%	3.7%	12.8%
Growth 2006	13.2%	2.7%	9.6%	12.5%	7.8%	11.2%
Growth 2007	7.9%	1.9%	8.3%	8.9%	5.0%	7.7%
Growth 2008	17.1%	9.3%	14.2%	10.6%	5.2%	12.7%

Source: ECB, Currency Information System. The value shares are for the end 2008

Table 6 Some estimates for the Euro area currency ratio (cr)

	coef	***t***	***coef***	***t***
constant	2.537	3.28	.171	2.40
inflation	-1.841	2.28	-.279	2.74
Dummy 1	.054	1.46	.024	2.65
Dummy 2	.311	6.02	.039	4.06
Lagged cr			.953	34.11
R2	0.577		0.983	
SEE	0.102		0.020	

Dummy 1 indicates the Finnish banking crisis in the early 1990 and Dummy2 the current financial crisis**.** t-ratios are Newey-West t-ratios. The sample period is 1980Q1-2000Q4 and 2003Q1-2009Q3.

3. Reasons for growth of cash demand

Before going into details, it could be useful to list some stylized facts of the recent developments of cash demand.

The average annual growth rate of cash demand has exceeded 10 per cent for the whole period of Euro. Growth for small denominations (5 to 20 Euros) has been of the magnitude of 5 per cent while the demand for 500 Euro notes has increased at the rate of 20 per cent. Thus the values share of 500 Euro notes is now more one third of cash and the combined value share of 100, 200 and 500 Euro notes is close to 60 per cent of all bank notes in circulation. The demand has increased very rapidly during the recent financial crisis period but there seems no clear sign of the end of the growth even though

the very financial crisis seems to be over. No doubt, this is puzzling. When looking for an answer, the following explanations come to our mind:

1) Low interest rates have made cash an attractive (saving) asset

The idea that cash is used an saving instrument is generally overlooked The main reason is probably the zero rate of return but other reasons do surely exist: cash has to be physically transferred and stored, it is difficult to use it as a collateral, and there is some risk of damage due to fire, robbers and so on. The advantage is, of course, anonymity which seems to be very important for some people who do not completely trust on authorities (and other people). In recent times, the idea of using cash as store of value is not so absurd it used to be under the circumstances of high inflation and nominal returns of other financial assets (see the interest rate graphs). The fact that cash is indeed used in this role may become obvious when scrutinizing the demand for cash by denominations. the fact the roles of 500 Euro note is no 35 per cent of the total outstanding value of currency is hardly consistent with the idea that cash is primarily used in the shadow economy – who would there be a motive of storing the value in the shadow economy? Rather, one might expect that the velocity of money (and thus the need for transactions) is quite similar to the rest of the economy.

There is lot of evidence that "old people" use cash in a disproportional manner. There are certainly many reasons for that including habits and customs. One reason which is often encountered is the above mentioned fear of authorities. Social security systems often operate in a means-tested way and old people (sometimes correctly) fear that their assets will confiscated to cover old-age nursing and health expenditures. That easily creates a flight to more secure asset, which is in most cases cash. One might consider that a feature of the shadow economy but, probably, the phenomenon reflects more unclear rules and weak credibility of authorities' promises on provision of welfare services. In a sense, it reflects some sort of a Peso problem.

Anyway, along with ageing, these kinds of motives become more important.

2) Financial crisis has made cash a safe a asset

Banking crises always lead some flight to (safe) cash. This seems obvious when scrutinizing the graphs for recent developments of cash demand within the Europe is (see Figures 1 and 2). Also the Finnish banking crisis in the early 1990s seems to show up as peak in currency demand (see Figures 1 and 4, as well as estimation results in Table 6).

3) All households do not have access to other means of payment

Usually, we assume that households can freely choose between different payment media. In practice, this may not be true. Take for instance, the United States. It is estimated that roughly 9 million U.S. households have no checking or savings accounts while an additional 21 million households have checking accounts but use problematic alternative services such as payday loans or overdraft programs that provide quick cash but carry high fees or triple-digit interest rates (source FDIC). Similarly, one forth of households does not have a credit card. Economic depression may well affect the choice of payment media: unemployed persons do not get a credit card and cash-in-advance payments become more popular in small-scale business[2].

4) Cross-border trade has increased

There is some evidence that Euro has facilitated new form of trade of services, durables and houses over national borders within the Euro area. Thus, for instance, in Finland the trade of used cars (bought from Germany, in particular) has almost exploded. To some extent this also applies to apartments and some health related services. To large extent these are dome by cash (see Figure 5 for partial evidence). One has to keep in mind that not only households but also firms still use still relatively large amounts of cash (cf. Viren (1996) and Figure 6).

5) Currency substitution has affected Euro, in particular

Currently, it is estimates that something like 20-25 per cent of Euro currency is used outside the Euro area. The share has been steadily increasing since 2002 at the rate 1-2 percentage points. In the US, estimates are larger even exceeding 50 per cent. Under such circumstances it very difficult to use the currency ratios in individual countries as indicators for the shadow economy. The problem is particularly serious in terms of individual country estimates (within the Euro area). Currency migration makes the data for some countries like Belgium and Luxembourg practically useless for this kind of purposes.[3]

[2] Recent Boston Fed study (see Foster et al (2010)) indicated that about 80 per cent of consumers have a debit card. While practically 100 per cent of consumers had used cash in 2008 "only" 80 per cent had used debit and similarly 80 per cent had used credit card.

[3] See Viren (1990) and (1992) for attempts to take financial innovations and currency substitution into account in modelling cash demand.

4. Concluding remarks

Surprisingly often, it is argued that cash is nowadays used "only" in the shadow economy and, therefore, we should speed up the process of replacing cash with cards (or other electronic payment media). Moreover, it is argued that cash very inefficient – or in other words expensive means of payment (the cost of cash being as high as three per cent of GDP). The shadow economy argument is discussed to some extent in this paper but we want to point out that the argument on costs is not necessarily warranted either (see Takala and Viren (2009)). To some extent, at least, the argument is based on data from the most inefficient distribution systems and relatively backward technologies.
One has also to keep in mind that the existence of cash can be motivated with at least two additional arguments. First, it provides an alternative to credit and debit cards – and thus prevents the banking industry from using the monopoly power in pricing the use of cards. The second argument is related to security. Cash has turned out to striking secure in the payment industry and consequently there have been no large-scale payment failures due to misuse or forgery of cash. With other payment media such large-scale system risk could come out e.g. in the form identity thefts. Partly because of that, it would also be useful to have some back-up system which works also in system failure situations.

The functioning of the shadow economy is certainly related to payment media. The relationship is, however, more sophisticated than the saying "cash is only used in the shadow economy" would suggest. Take for instance the seigniorage. Seigniorage means a tax on cash usage and to the extent cash is used in the shadow economy it is the only tax which is "directly" levied on the shadow economy. If cash usage is eliminated also that tax revenue is eliminated.

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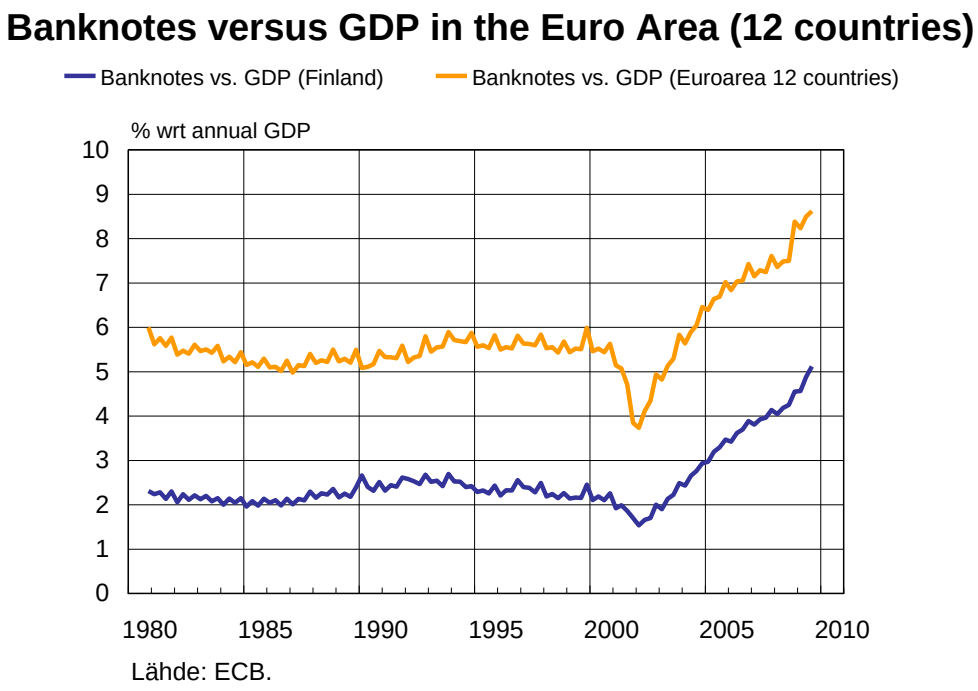
Figure 1



Lähde: ECB.

Figure 2 Growth of cash holdings in the Euro area

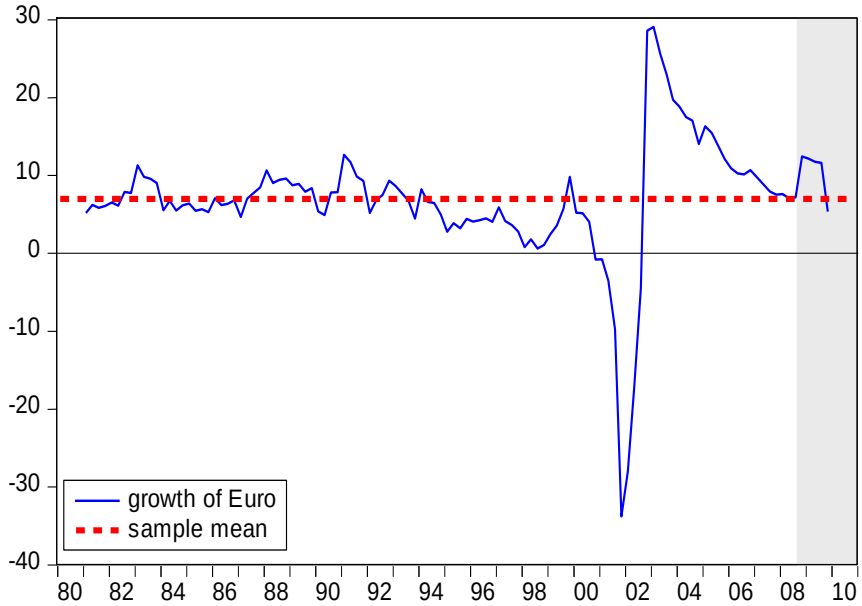


Figure 3

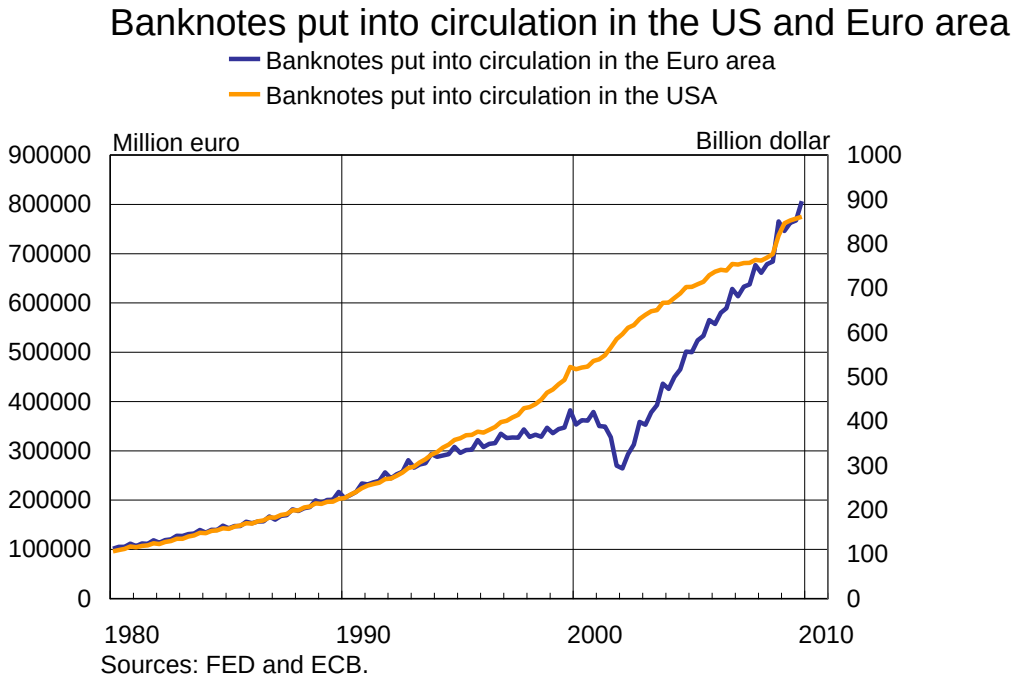


Figure 4

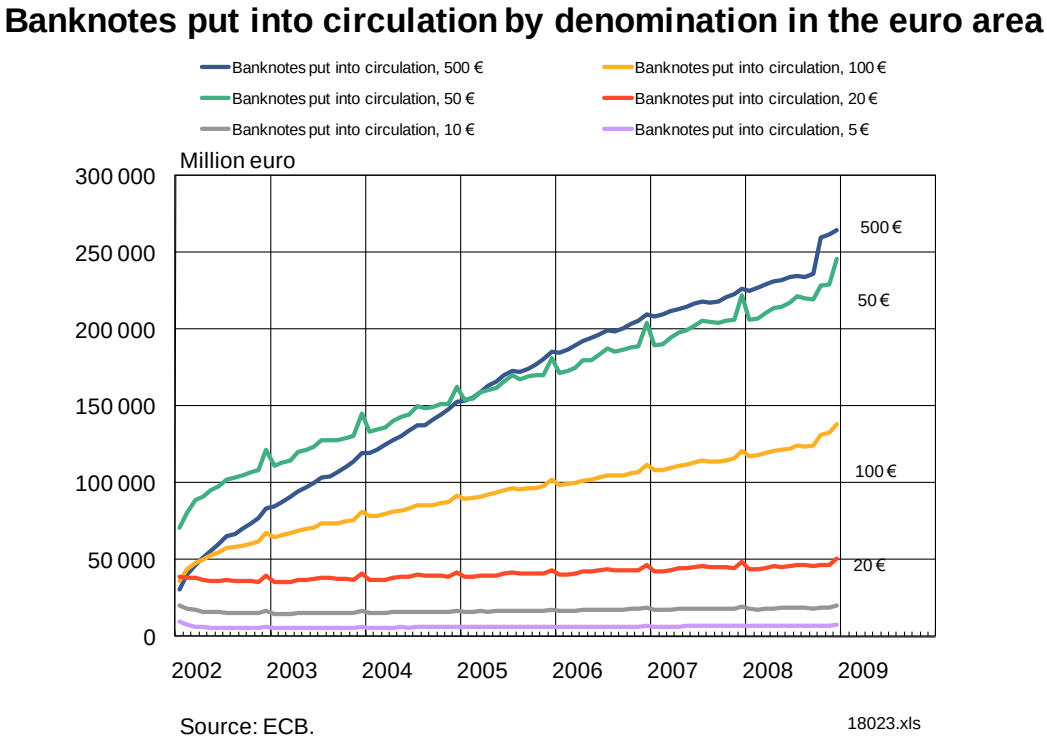
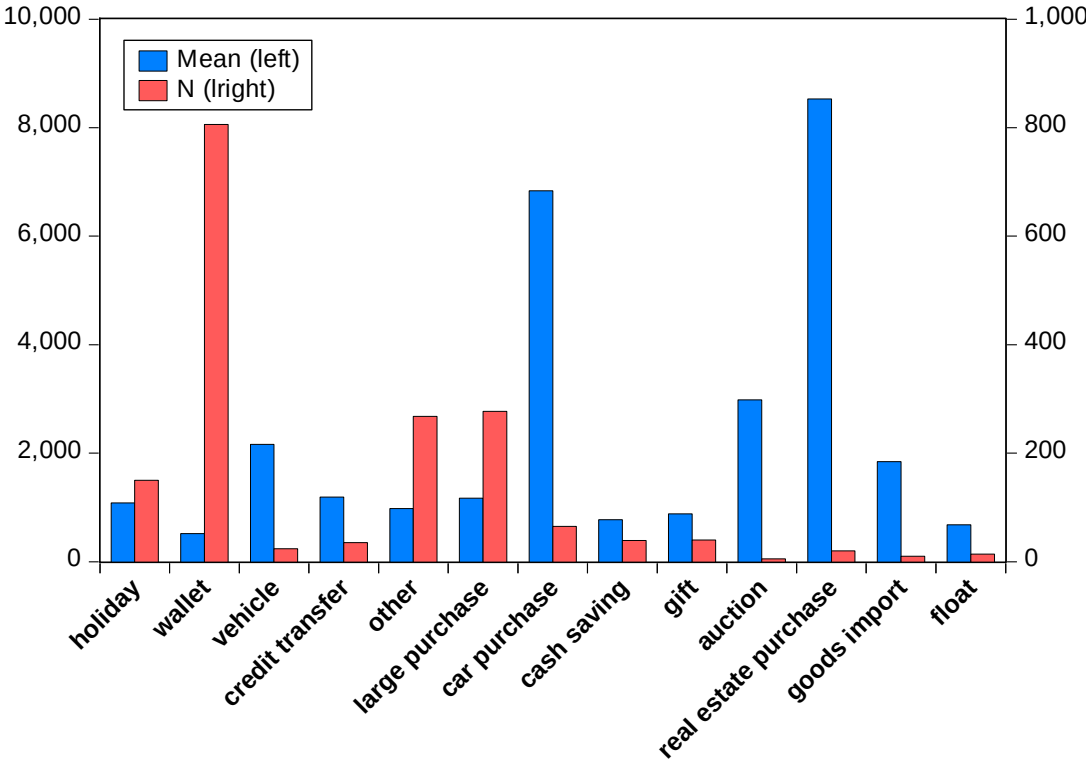
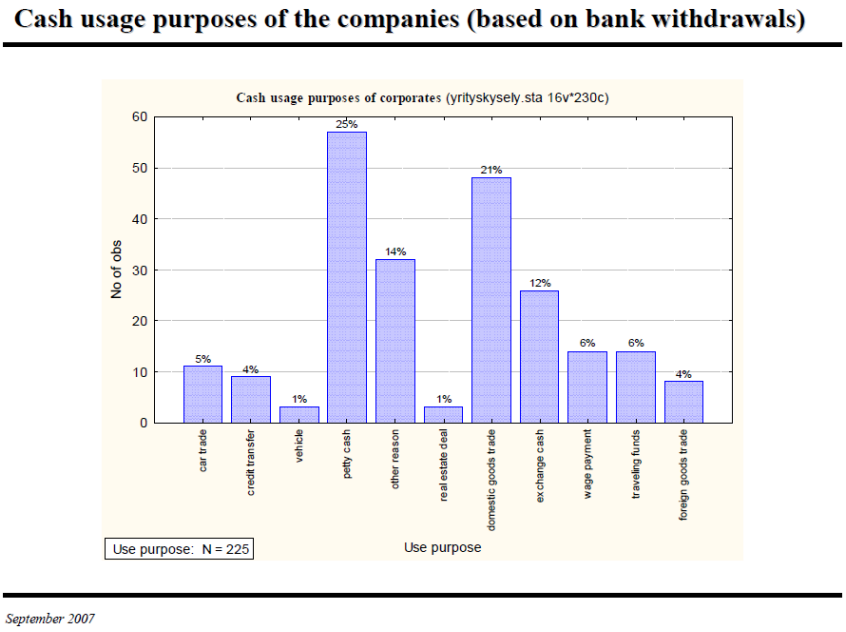


Figure 5 Motivation for cash holding for households



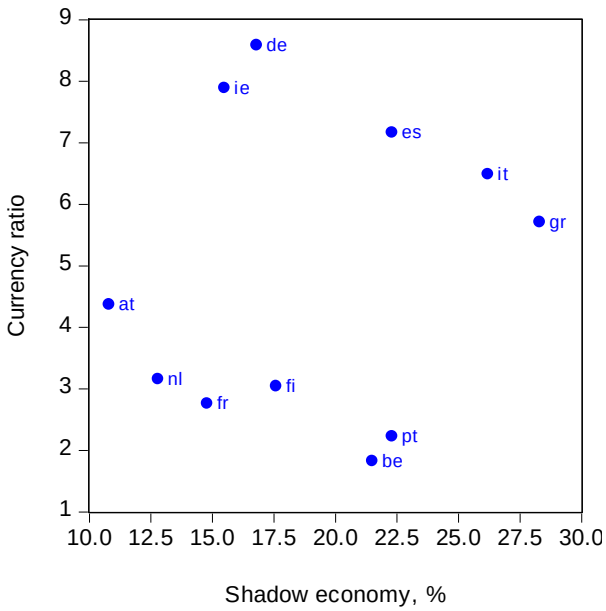
The data is based on a Bank of Finland questionnaire to Finnish households

Figure 6 Use of cash by firms



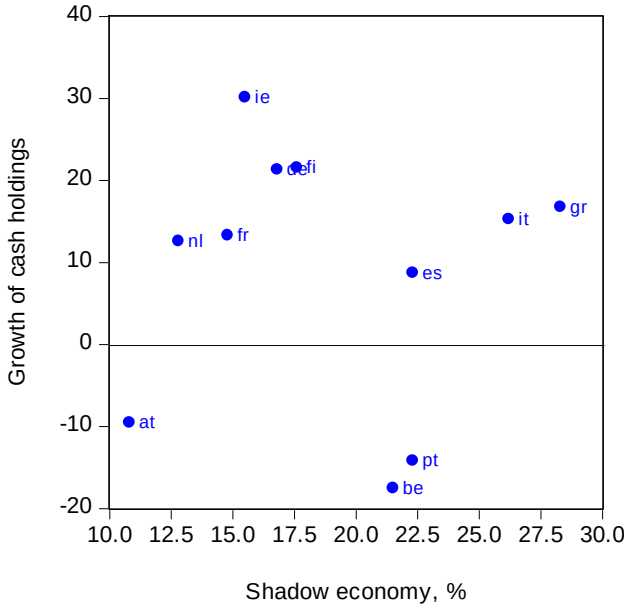
Source: Bank of Finland Questionnaire to Finnish firms

Figure 7 Shadow economy and the currency ratio 2002-2008



Measures of shadow economy come from Table 1 (for 2002/2003)

Figure 8 **Shadow economy and the growth rate of cash usage**



Measures of shadow economy come from Table 1 (for years 2002/2003)

Figure 9

Banks head cashiers evaluation about the grey economy during euro cash regime? (sample of 53 bank's head cashiers in April 2006, Finland)

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