

## Adult numeracy in the context of economic change: the conversion to the Euro in the Slovak Republic

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*This study investigates common issues faced by consumers in Slovakia after the currency change from the Slovak crown to the Euro. Thus our first research question is: How do Slovak citizens cope with the numerical demands of conversion? Which conversion method do they use and how do they develop their price intuition in the new currency? Our approach towards numerate thinking emphasises peoples' attitudes and emotions as part of the 'charge' of an activity (Evans, 2000). In this situation, national currencies have symbolic and emotional meaning and may influence people's attitudes towards the Euro. Thus, the second research question is: What are citizens' attitudes and emotions towards the Euro? The pilot study for this research (n=86) was carried out in April 2008, and a main study at the end of the dual circulation period in January 2009 (n=102). Data were collected in two regions, Trenčín and Bratislava, using face to face interviews. A sample was selected to reflect the characteristics of the Slovak population such as sex, age, education and income level. Results from the surveys related to the Research Questions are presented and discussed. One of the aims of this study was to bring together two previously disparate approaches<sup>1</sup> – namely, 'Adult Numeracy' and 'Numerical Cognition' (Gärting, T. & Thørgersen, 2007).*

### Introduction

Many financial decisions are based on our intuition, acquired and developed over a long period of time. However, when the currency changes and we can no longer rely on our price intuition, our ability to plan, negotiate and make decisions in daily financial transactions is affected. People have to re-learn the new value of the currency, acquire price intuition or price knowledge as well as methods of price estimation, and to properly understand evaluation of price differences.

On 1<sup>st</sup> January 2009, the Slovak Republic replaced the existing national currency (Slovak crown) with the Euro and became officially the 16<sup>th</sup> Eurozone country.

The government approved a single-step transition to the Euro, called the "Big Bang" scenario, where cash and non-cash transactions were introduced simultaneously. This approach was considered more acceptable, now that Euro bank notes and coins were already in circulation and Slovak citizens had previously had an opportunity to see or

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<sup>1</sup> This study is done under the aegis of a European network for research into Adult Numeracy and 'Numerical Cognition', organised under the leadership of Jeff Evans and including ALM members.

perhaps use the Euro in other Eurozone countries. With respect to educating the public however, this approach offers fewer learning opportunities for the public to adapt to the Euro.

From a historical point of view the Slovak crown was not in circulation for a long time. The short lived Slovak crown (SKK) was established in 1993; previously Slovakia had shared the same currency with Czechoslovakia (Czechoslovak crown CSK). When the CSK was replaced by the SKK, it was only the design that changed, not the nominal value, although the political and economic changes since 1989 (the end of communism) were followed by both economic and social crises. The currency had fallen in value due to inflation<sup>2</sup> followed by enormous price increases and a deep decrease in real wages. However, prior to the introduction of the Euro, the Slovak economy was the fastest-growing economy in the EU and the Slovak crown increased by as much as 14% against the Euro. The important dates of Slovak history are briefly summarised in the Appendix (see table A1).

The changeover had a great impact on the economy and the everyday life of citizens. Some of the main issues and problems citizens had to deal with were: (a) to adapt their intuitive value system (Hofmann et al., 2007) so that they can make decisions and judgements, for example, to check whether a product is expensive; (b) the influence of the nominal values on peoples' evaluation of prices, something called the 'Euro Illusion' (Ranyard et al. 2005, Gamble et al. 2002); and (c) attitudes towards the Euro and how citizens' attitudes are influenced by the symbolic meaning of their national currencies, European identity, their beliefs, concerns and expectations. These ideas are discussed in more detail below.

### **Conceptual Framework**

There are several approaches to study a problem like that of a conversion of prices into Euro, such as 'Numerical Cognition' (NC) and 'Adult Numeracy' (AN) as we call them. Our aim is to investigate the extent to which we can bring them together. The key differences in these two approaches are: 'NC' researchers tend to be psychologists using experiments and quasi-experiments to explain issues such as the development of price intuition in the new currency and the 'Euro Illusion'. Adult Numeracy researchers, including ALM members, are mainly educators using survey and qualitative methods focusing on peoples' ability to do useful calculations and make appropriate decisions. It seems appropriate in this context to say a little about the 'NC' approach with the 'AN' only briefly discussed.

The 'Numerical Cognition' (Marques 1999) literature provides a conceptual framework to study and to understand how consumers learn the value of the Euro and how they develop the price intuition system. It is probably the most important aspect of the Euro changeover, because without understanding of the new currency the changeover process is not successfully completed. Previous findings show that the learning process is not straightforward and people do need to do conversion (Marques & Dehaene 2004; Lemaire 2007; Hofmann et al. 2007) to be able to understand the prices in the new currency. According to Marques (1999) the problems consumers

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<sup>2</sup> According to the Statistical office of the Slovak Republic the total inflation rate in the period 1990-1998 reached 226%; in housing services for the period 1991-1999 the inflation increased by 382%.

face are evaluating if something is cheap or expensive and comparing prices of different brands of the same product. These changes affect citizens' ability to manage their finances.

According to Hofmann et al. (2007) there are four strategies people use to learn the value of a currency so they are able to accomplish everyday tasks and financial transactions: (a) 'Conversion Strategy'; (b) 'Intuition Strategy'; (c) 'Anchor Strategy'; and (d) 'Marker Value Strategy' (see description for Austria's transition to the Euro in Table 1).

**Table 1 Strategies by Hofmann et al. (2007)**

Strategy	Description
Conversion Strategy	Converting all the Euro prices into the old currency. The calculation can be exact or rule of thumb. (See conversion strategies identified by Lemaire et al.(2001).
Intuition Strategy	No conversion or comparison of the Euro to the old currency. People rely on preliminary intuition and buy what they need.
Anchor Strategy	Anchor strategy involves learning prices of some regularly bought products for price evaluation. For other products the remembered prices are used as an anchor.
Marker Value Strategy	Specific values are learned for example how much 5€, 10€, 20€ is worth in Austrian Schillings.

Indicators of these strategies can be used to evaluate the learning process, since the 'Intuition Strategy', 'Anchor Strategy' and 'Marker Value Strategy' can positively contribute to the development of price intuition in Euro. The choice of a strategy is also related to the attitudes toward the Euro; therefore people with positive attitudes towards the Euro are more likely to use the 'Intuitive' or 'Anchor' strategies (Hofmann *et al.* 2007).

Previous research shows that people spend significant time converting (calculating) to work out how much things cost in the old currency (Marques & Dehane 2004). The Slovak conversion rate is €1=30.126, this will be most probably rounded to 30 and used for conversions. This conversion may look simple but previous research shows that at the beginning people use multiple conversion strategies and vulnerable populations such as older adults are prone to use idiosyncratic strategies which may be less efficient (Lemaire 2007). Another research study shows that in Italy people sometimes used the wrong conversion strategy (Strazzari et al. 2005). For example when converting from lira to Euro (1EUR= 1,936.27Lira), some people divided by 2000 and then subtracted a little instead of adding a little.

The transition to the Euro meant that the Slovak national currency was replaced by a currency where a single unit is worth more than the original unit i.e. 1€ is worth 30 times more than the SKK. Consumers could be subject to what economists call the 'Money Illusion' a tendency to think in 'nominal' rather than the 'real' value of money (Diamond & Tversky, 1997). For the purpose of this study we adopted the term 'Euro Illusion' coined by Gamble et al. (2002).

The “Euro Illusion” is caused by the difference between the nominal value of the two different currencies (for example the Euro and the Slovak crown), for any given price. For example a bill for 5€ may possibly appear lower than a bill for 150.60SKK although the ‘real value’ is the same. On the other hand a salary of 8,398€ will possibly appear much lower than a salary of 253,000 SKK.<sup>3</sup> Dealing with a currency which has a higher/lower value requires an understanding of the ‘nominal value’ of money.

Researchers have adopted various techniques to study the ‘Euro Illusion’ such as interviews and experiments. Gamble et al. (2002) investigated the effect of the ‘Euro Illusion’ on salaries, some of the factors found to account for the extent of the ‘Euro Illusion’ experienced by subjects are: familiarity with the conversion technique, complexity of the conversion strategy and attitude towards the currency (Gamble, 2007).

Moreover, attitudes influence citizens’ economic behaviour. According to Meir-Pesti & Kirchler (2003) positive attitudes towards the currency can encourage savings and investments in home countries, while on the other hand negative attitudes decrease citizens’ trust in the economy and people start to invest abroad. Muller-Peters et al. (2001) found that people’s attitudes depend on whether citizens expect the introduction to have positive or negative consequences, either personally or for their country.

Some of the domains identified by Muller-Peters et al. (1998) to measure peoples’ attitudes towards the Euro changeover include:

- Involvement and knowledge concerning the Euro
- National identity, national pride and European identity
- Financial behaviour

The earlier experiences of transition from the national currencies to the Euro led citizens to believe that prices will increase in Slovak Republic. In order to try to meet citizen’s legitimate concerns in this respect, the Ministry of Economy agreed on regular price monitoring for two years and businesses were encouraged to sign up to a voluntary code of good practice ( a pledge not to increase prices and a part of the Euro changeover).

### **Research Questions**

This study investigates common issues consumers in Slovakia were facing after the currency change from the Slovak crown (SKK) to the Euro (EUR). The conversion process requires most consumers to do simple calculations, therefore our first research question is:

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<sup>3</sup> According to the Eurostat, the average gross annual earnings in the Slovak Republic for the year 2007 in industries and services.

**RQ1:** How are Slovak citizens<sup>4</sup> coping with the numerical demands of conversion? Which conversion method are they using and how do they develop their price intuition in the new currency?

Also we want to investigate ‘Euro Illusion’ aspect in relation to the introduction to the Euro therefore, the second research question is:

**RQ2:** To what extent are the Slovak citizens influenced by the nominal representation of prices rather than the ‘real’ value?

Our approach towards numerate thinking emphasises peoples’ attitudes and emotions (Evans, 2000). In this situation, national currencies have symbolic and emotional meanings and may influence people’s attitudes towards the Euro. Thus, the third research question is;

**RQ3:** What are citizens’ attitudes and emotions towards the Euro?

### **Need for this research**

There has been a fair amount of research undertaken in this area, although most of it appears to focus on the first wave of entrants to the Eurozone in 2002. Exceptions to this include the Eurobarometer surveys, conducted on a regular basis in each EU member state. Current literature about the transition to the Euro (Eurozone entries 2002) provides good source of relevant information for all the recent and potential entrants, but more research is needed in all Eurozone countries to better reflect the current situation and possibly identify new areas of study. One key difference between the earlier entrants and the new entrants is that now, Euro coins and notes are already in circulation in other countries. According to the Eurobarometer survey (2008) prior to the changeover 82% of Slovak respondents had seen Euro coins and notes and 50% had used Euro coins and notes, something the first Eurozone entrants could not do.

Prior to the Euro changeover the first-wave entries had much stronger and more stable economies in comparison to the Slovak Republic. The Slovak Republic still has a lot of economic ‘catching up’ to do in comparison to other EU countries, for example high unemployment and low wages are still a concern. The Slovak case is especially interesting because Slovakia is (a) the first Visegrad Four<sup>5</sup> country and (b) the second post-communist country after Slovenia (converted 2007) to adopt the Euro. Furthermore, Slovakia is the only country to join the Eurozone during the economic slowdown.

This study can provide good source of relevant information for the neighbouring countries, the Czech Republic, Hungary and Poland (the other Visegrad 4 countries). Visegrad aims to integrate Central Europe with the West (European Union).

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<sup>4</sup> In the discussion of this paper at the ALM-16 conference, a participant asked why we use the word ‘citizen’ rather than ‘consumer’. We wish by this to indicate our interest in the whole range of demands made on adults by the Euro changeover process, as well as the challenges to the country’s political and economic system.

<sup>5</sup> Visegrád Four or V4, is an alliance of four Central European states – the Czech Republic, Hungary, Poland and Slovakia – the purposes of co-operation are to obtain easier access to other European markets and to further European integration.

Historically, they have had similar political regimes and now cooperate closely to rebuild their economies.

## **Methodology**

This paper reports on a pilot study carried out just before Euro changeover in April 2008 (n= 86) and my phase 1 study conducted at the end of the dual circulation period in January 2009 (n=102). Data were collected in two regions, Trenčín and Bratislava, using face-to-face street interviews which lasted on average 20 minutes. During the selection process the aim was to select a sample that reflects the characteristics of the Slovak population such as sex, age, education and income level. Using this information allowed us to analyse the cross-sectional distribution of different demographic characteristics. First we identified the categories such as age and gender and the proportions to which they are represented in the population, as this allowed us to collect the required number of responses for each group, using a 'quota sample'.

Through examination of existing literature such as the Eurobarometer survey and studies by Ranyard (2007), Muller-Peters et al. (1998) and Hofmann et al. (2007), we identified concepts to measure peoples' attitudes towards the transition such as National identity, European identity, expectations, concerns, benefits and fears concerning the changeover. The questionnaire was designed in English and translated to Slovak. Prior to data collection it was pre-tested in the Slovak Republic.

## **Results January 2009**

**RQ1:** How are Slovak citizens coping with the numerical demands of conversion? Which conversion method are they using and how do they develop their price intuition in the new currency?

In January 2009 for the 'Euro to Slovak crown' conversion, we asked respondents whether they knew the approximate value of 5EUR in Slovak crowns and 75% answered 150SKK, 4% answered 151SKK and one respondent was able to give us the exact value 150.63SKK. 18% of respondents did not answer the question which could be due to various factors: either they did not know, could not at that moment recall the answer or perhaps were afraid of giving the wrong answer (see table 2).

To replicate Lemaire's (2007) study of 'strategies' (what we call 'tactics') we observed that people mostly multiplied by 30 and some respondents multiplied by 30 and added a little bit to be more precise. As Lemaire (2007) pointed out people use various conversion techniques. Furthermore we observed that some citizens recalled the value from memory. This could be the indication of the 'Marker Value strategy' as identified by Hofmann et al. (2007).

**Table 2 How much is 5 Euro in Slovak crowns?**

		Number of Respondents	Percentage of Respondents
Valid	150.00	76	74.5
	150.63	1	1.0
	151.00	4	3.9
	153.00	1	1.0
	155.00	1	1.0
	160.00	1	1.0
	Total valid	84	82.4
Missing		18	17.6
Total		102	100.0

For the ‘Slovak crown to Euro’ conversion, we asked respondents whether they knew the approximate value of 100SKK in Euros and over half answered 3EUR or 3.30EUR and 11% of respondents gave us the exact value 3.32EUR which perhaps suggest the presence of the ‘Marker Value strategy’. Respondents’ answers varied between 3EUR to 33EUR with significantly more inaccurate answers than for the ‘Euro to Slovak crown’ conversion (see table 3).

**Table 3 How much is 100Skk in Euro?**

		Number of Respondents	Percentage of Respondents
Valid	3.00	16	15.7
	3.10	2	2.0
	3.12	1	1.0
	3.20	1	1.0
	3.29	1	1.0
	3.30	41	40.2
	3.31	1	1.0
	3.32	11	10.8
	3.33	6	5.9
	3.40	1	1.0
	3.50- 4.20	6	6.0
	9.00-33.00	5	5.0
	Total valid	92	90.2
Missing		10	9.8
Total		102	100.0

In general, respondents found the ‘Slovak crown to Euro’ conversion slightly more difficult as they had to (a) divide by 30 and (b) larger numbers were involved (100/30 in comparison to  $5 \times 30$ ). Mental arithmetic is generally considered more difficult with larger numbers (e.g. Lemaire et al., 2001).

Translating from Lemaire’s (2007) study undertaken in France we observed that people mostly used two tactics for the conversion: (a) dividing by 30 and (b) calculating how many times 30 goes into 100. On the other hand, we observed that some people recalled the value from memory suggesting the use of the ‘Marker Value strategy’.

We asked respondents how often they convert the ‘Slovak crown to Euro’ and the ‘Euro to Slovak crown’ when undertaking regular shopping (products which they buy frequently: bread, milk, tissues and so on). The results showed that 51% of respondents answered ‘always’ and 25% ‘often’ (n=102). However 4% of respondents claimed that they do not convert at all. This could indicate the presence of the ‘Intuition strategy’, no comparison made between the new and old currency.

We also asked respondents how often they convert the ‘Slovak crown to Euro’ and the ‘Euro to Slovak crown’ when making a special purchase (products which they do not buy regularly, for example a TV, a DVD, a car or a house). The results showed that 81% of respondents who made such purchases (n=82) answered ‘always’ and 10% ‘often’. However 3% of respondents claimed that they do not convert at all, perhaps indicating the presence of the ‘Intuition strategy’.

The reason we distinguished between regular purchases and special purchases is that we assume that with regular purchases people will slowly learn and remember the prices of regularly bought products. They will, maybe, start to use the ‘Anchor strategy’. In other words, use the remembered prices for price comparison to other similar products. We can already see the difference; people making regular purchases tend to compare the new currency to the old, and vice versa, less often.

**RQ2** is: To what extent are Slovak citizens influenced by the nominal representation of prices rather than the ‘real’ value?

To examine what evidence exists of the ‘Euro Illusion’ we asked people whether they spend less or more in Euros than they would have if they had been using the Slovak crown. 10% of citizens believe they spend less, 72% the same, and 18% believe they spend most often/always more than they would have if they had been using the Slovak crown (see table 4).



**Table 4 Spend less/more Euro money then you would have if you had been using Slovak crown?**

	Number of respondents	Valid Percent
Valid		
Most often less	10	10.1
The same	71	71.7
Most often more	16	16.2
Always more	2	2.0
Total valid	99	100.0
Missing	3	
Total	102	

To examine what evidence exists of the ‘Euro Illusion’ we asked people whether they withdraw less or more money out of the bank in Euros than they would have if they had been using Slovak crowns. 17% of citizens believe they withdraw less money and 19% believe they withdraw more money than they would have if they had been using Slovak crowns. A large number of people 32% had not withdrawn Euro at the time (January 2009, two weeks after the changeover).

In both cases the results about the existence of the ‘Euro Illusion’ are inconclusive; the data were collected in the early days of the switchover, therefore citizens did not have enough time to grasp the consequences of the currency change. We observed that when people actually had to use the new currency, they were very conscious of how much money they had, how much they were spending, and whether they would overspend or whether they might be cheated.

### **RQ3:** What are citizens’ attitudes and emotions towards the Euro?

Examining citizen’s attitudes during the transition to the Euro, the January 2009 result shows that 25% of citizens agree that by adopting the Euro, the Slovak Republic will lose a great deal of its identity, slightly more than the number of people who agreed with this statement in the April 2008 pilot (21%). The data were collected during the very short dual circulation and citizens were spending the remaining Slovak crowns and perhaps feeling nostalgic seeing the crown to come to an end.

This apparently low percentage can be explained by the short lifespan of the Slovak crown, Slovak citizens were not emotionally attached. These results are very different to what we would expect here in the UK, where the pound is a symbol of national identity. Here the currency reflects national pride and is seen as a strong and stable currency.

We asked respondents: how happy or unhappy are they, personally, that the Euro had become their currency? 45% of citizens answered in January 2009 that they were ‘happy’ that the Euro had become their currency. The Eurobarometer survey September (2008) shows that in Slovakia (prior to the changeover) 57% of citizens were happy that the Euro would replace the national currency, as compared with 72% in Slovenia, 57% in Malta and 43% in Cyprus (prior to their changeover). Thus, the

results show that in comparison with the 4 most recent countries to adopt the Euro currency Slovak citizens were less optimistic than citizens in Slovenia and in Malta but more optimistic than citizens in Cyprus. This of course assumes that our sample was reasonably representative, which we tried to assure by the sample design discussed above.

### **Discussion and conclusion**

When a country changes its national currency to a new currency, citizens experience a temporary loss of price intuition. From previous research we know, that in the beginning citizens convert (calculate) to judge the price of a product in the new currency, or just to make a simple financial decision.

It is essential for the successful transition to fully understand the Euro currency and to support people to restore their temporarily lost price intuition. Probably the most reliable indicator of the adaptation process is the use of strategies when evaluating prices. Our results show that Slovak citizens routinely use the 'Conversion strategy' to make sense of the new currency, as has been found in previous research (Ranyard 2007, Hofmann et.al. 2007, Marques & Dehane 2004). Using mental calculation to compare prices is time consuming, liable to lead to mistakes and does not lead to learning. It is important that people start to use strategies which lead to learning such as the 'Anchor strategy', which requires using the remembered Euro prices of regularly bought products when making decisions, or the 'Intuition Strategy', meaning they do not compare the old and new currency. So far our results show that only a very small percentage of people (4%) claimed that they do not convert when doing regular shopping and just 3% when making special purchases. We expect this percentage to increase over time as people become more familiar with the new currency.

As the results of previous research show we can expect some degree of 'Euro Illusion' in the Slovak Republic. Although at this stage of the research our results were not conclusive, the next stage of data collection should allow us to provide more conclusive data. Things have settled now and the excitement about the new currency is not as strong as in January. The Euro is a reality now and people have to use it in everyday life and make important decisions.

It seems that people's attitudes before and shortly after the changeover are very positive although the changeover process is far from complete. This study will continue to monitor people's attitudes as they change. The focus of people's attitudes after the changeover is more on the economic and practical aspects rather than the symbolic meanings of the currency (Ranyard et al.2005) and people are expecting the Euro to result in economic growth and higher standard of living as in Ireland. Until now Slovakia enjoyed a rapid growth and had the fastest growing economy in the EU, but the growth has slowed down due to the low global demand that is affecting the whole of Europe. The Slovak economy relies too much on European export and due to the economic crisis the car manufacturers have to cut down on production and other businesses had to limit their activities, the housing market is at a standstill and the unemployment level is increasing fast from 9.7% in January 2009 to 11.1% in May 2009 (Eurostat 2009).

We hope that this study provides an interesting case study in the demands made on adults' numeracy during the process of currency conversion. We also hope that it will provide opportunities for collaborating in future research focused on the conversion to the Euro in a number of European countries. If you are interested in more information on this, please contact either of us.

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## Appendix

**Table A1 Important dates for the Slovak Republic and for the research fieldwork**

Year	Slovak History	Fieldwork
November 1989	Velvet Revolution in Czechoslovakia (fall of communist regime)	
January 1993	Slovakia became an independent state	
February 1993	Establishment of Slovak crown	
May 2004	Slovakia became a member of the European Union	
November 2005	Slovak crown included in the Exchange Rate Mechanism II (ERM II)	
April 2008		Pilot Study Data collection
August 2008	Start of 'Dual Pricing Display'	
January 2009	Slovakia adopted the single European currency Euro. Start of 'Dual Circulation'	1 <sup>st</sup> Phase Data Collection
January 16 <sup>th</sup> 2009	End of 'Dual Circulation'	
August 2009		2 <sup>nd</sup> Phase Data Collection
December 2009	End of compulsory 'Dual Pricing Display'	