

## DEFLATION AS SEEN BY CONSUMERS

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### Abstract

*The Great Recession has re-established discussion on the causes and consequences of deflation. Especially central bankers across the European Union started to warn about the threat of a deflationary spiral. Deflation has a negative impact particularly on the public finance of heavily indebted European governments. In this contribution we have analysed consumers' expectations in a deflationary environment. The aim of this paper is to analyze consumers' expectations in a deflationary environment using data from Consumer Expectations Survey conducted by the Directorate General for Economic and Financial Affairs as well as data on rates of inflation published by the Organisation for Economic Co-operation and Development were used. We have found that European consumers consider consumer's prices as growing even during a deflation. Consumers are incompetent in predicting a future deflation. Current deflation does not help consumers to expect deflation in the following year. The severest deflation during the Great Recession was experienced in Ireland. However, there was a drawdown primarily in the Irish spending on durable-goods. The decrease of spending on non-durable goods was just modest, spending on services remained stable and spending on semi-durable goods actually grew. Based on the results of our analysis, we might conclude, that there is no evidence of a deflationary spiral.*

**Key words:** *consumer prices, deflationary spiral, expectations, inflation, Ireland.*

### 1. Introduction

The Great Recession of 2007 and following years has changed not only the fiscal policy of governments, but also the monetary policy. With interest rates being lowered to the technical zero, the European central banks have lost their main tool to cope the recession without endangering their economies by deflation (compare Svensson, 2003, and CNB, 2015). For the almost whole 20th century, the economic policy makers focused just on the threat of inflation, especially galloping inflation and hyperinflation. Deflation was considered as merely textbook episode from the 19th century, which was period of Gold standard and rapid growth of productivity. However, the Japanese lost decade associated with lengthy deflation and liquidity trap renewed the interest in the causes and consequences of deflation.

During 2015 several world leading economies fell into deflation. Harding and McGee (2015) alert, that Japan has fallen back into deflation in the second quarter of 2015 because of

the fall in headline prices and slumping global energy prices. According to CNB 2014 also the Czech inflation is reduced due to the fall in the prices of world energetic commodities. Recent studies of Berben and Stokman (2016) or Vithessonthi (2016) deal with the impact of deflation on the real private consumption and credit growth respectively.

As End et al. (2015) postulate, public finances are vulnerable to deflation on several accounts:

- Deflation diminishes the government revenues because of the loss of seigniorage.
- There is increase in the expenditure-to-GDP ratio as it is politically difficult to reduce government expenditures such as wages and social transfers even in the era of falling prices.
- Economy suffers from the mechanical rise of debt-to-GDP ratio, because during the deflation period government debt tends to increase and nominal Gross Domestic Product tend to decrease.

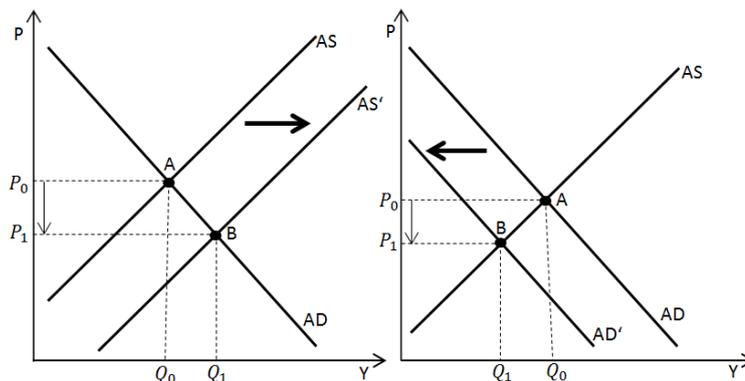
Adam and Zhu (2015) proved that unexpectedly low inflation rates recently experienced within the Euro Area shift wealth from borrower to lenders. If it is realized, that the largest lenders tend to be the European governments, it is clear that the threat of deflation is not a matter of the monetary policy, but it lies in the focus of the public finances.

Borio and Filardo (2004) distinguish three types of deflations:

- good deflation, which is result of positive supply shocks (movement in Aggregate Supply AS),
- bad deflation, which is result of recessions (for example the deflation in Japan during the 1990's),
- ugly deflation, which is result of deep decline in prices (such as during the Great Depression).

Bad and ugly deflation in this classification is result of negative demand shocks (movements in Aggregate Demand AD, see Figure 1). Although Borio and Filardo (2004) notice that deflation is often seen as a cause, not the symptom of economic conditions, it is not necessarily always negative phenomenon. As it is clear from the Figure 1 (on the left) it may be connected even to the economic growth. However, even the bad or ugly deflation might be just the accompanying effect of recession, not the deflation starter.

Figure 1: Two sources of deflation



Source: the authors.

Nevertheless, the current mainstream economy tends to consider deflation as only the negative phenomenon. For example Krugman (2010) describes deflationary trap, which is the situation “when economy may stay depressed because people expect deflation, and deflation may continue because the economy remains depressed”. Such a deflationary trap (or

deflationary spiral) is based on the assumption, that households expecting deflation defer their consumption just because of the prospect of lower future prices. Although this “deflationary-spiral argument” is very popular not just among the theoretical economists, but also among central bankers (compare with Holub and Král, 2015), there are several counterarguments:

- Some sectors (such as consumer electronics) have been deflationary for a long period, yet their volumes steadily grow as mentioned by Janáčková (2015).
- Postponing consumption because of the vision of even lower prices would mean, that consumers can predict when the deflation will end. They would have to be successful in finding the price bottoms. However, as it is clear from the investments records, consumers are very unsuccessful in speculations (compare with Barber and Odean, 2011).
- Consumers do not postpone their consumption because of vision of lower prices, but because of the growth of uncertainty. During the bad or ugly deflation they have fear of unemployment. On the other hand, during the good deflation the consumers would *ceteris paribus* consume more (and save more as well), because they would be relatively wealthier. The strong disagreement which exists between various economists on this issue (e.g. Holub and Král, 2015, versus Janáčková, 2015) stems from the misapprehension or possibly ignorance of good-bad-ugly deflation concept as presented by Borio and Filardo (2004).
- Consumers cannot postpone consumption of non-durable good (OECD 2012 defines non-durable good as a good, that can only be used once or that has a lifetime of considerably less than one year) but at most – and for just a certain time – the durable good (a good that can be used repeatedly or continuously over a period of considerably more than one year and has a substantially higher purchasers’ price than semi-durable goods and non-durable goods, see OECD 2012). Davis (2015) showed that during the Great Depression, deflation depressed prices merely of the durable goods however grocery store sales of non-durable good did not react to expected price changes at all.
- Household do not expect deflation in general. On the contrary, they mostly perceive their individual consumer basket getting more expensive in time.

This last point is of vital importance. If households even during the deflationary periods do not feel the consequences of deflation, nor they tend to expect future deflation, the deflationary-spiral argument is not valid. In that case we might suspect that the aim of inflationary monetary policy is not to avoid the deflationary trap, but to protect public finances from the rise of debt-to-GDP ratio and other adverse deflationary effects.

The aim of this paper is to analyze the consumers’ expectations in the deflationary environment. Firstly the dataset and method is described. Secondly we introduce our results. The relationship between actual deflation values and deflation perception is analyzed. Further we study how the deflation expectations influence rates of inflation. Finally we focus on the case study of Ireland, which was the only country within our dataset, which households actually experienced deflation.

## 2. Material and Methods

### 2.1 Dataset

According to the Organisation for Economic Co-operation and Development (OECD) dataset for 43 countries in 1927 – 2014 altogether 26 countries have experienced deflation at least once in this period<sup>1</sup>. In this research we focus merely on the members of European Union, specifically to those economies, for which we had even other necessary data. Table 1

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<sup>1</sup> Even though this dataset covers period from 1927, we have complete data for all the OECD countries just since 1998.

shows sample of 11 European countries (altogether 20 observations) from this original OECD dataset, which were included into our final dataset.

Table 1: Dataset's description

Country	Year of deflation			Code
Belgium	2009			BE
Estonia	2009	2014		EE
Germany	1986			DE
Greece	2013	2014		EL
Ireland	2009	2010		IE
Latvia	2010	2013		LV
Netherlands	1987			NL
Portugal	2009	2014		PT
Slovak Republic	2014			SK
Spain	2009	2014		ES
Sweden	1998	2009	2013 2014	SE

Source: the authors.

For each of this country we added data on its rate of inflation during the deflationary periods, as well as data on average inflation rate. Furthermore, data from Consumer Expectations Survey<sup>2</sup> conducted by Directorate General for Economic and Financial Affairs (DG ECFIN) were used. We focused on two questions from the Consumer's section of this survey:

Q1: How do you think that consumer prices have developed over the last 12 months?

Q2: By comparison with the past 12 months, how do you expect that consumer prices will develop in the next 12 months?

The respondents answered on the scale shown in Table 2.

Table 2: The answer scale.

Answer	Code
Risen a lot	++
Risen moderately	+
Risen slightly	=
Stayed about the same	-
Fallen	--
Don't know	

Source: DG ECFIN.

For each year in which the individual country fell into the deflation, we observed answers on both questions (Q1 and Q2). First question (Q1) encovers, if consumers actually experienced the existing deflation. Second question (Q2) allows us to detect:

- i. if the deflation was expected, and
- ii. if the deflation in year  $t$  makes people to expect deflation even in the following year  $t + 1$ .

Data on the structure of consumption are based on the OECD dataset Final consumption expenditures of households. This dataset classifies consumption into four groups: i. durable goods, ii. semi-durable goods, iii. non-durable goods, iv. services in the period 2008 – 2013.

<sup>2</sup> Available online at: [http://ec.europa.eu/economy\\_finance/db\\_indicators/surveys/metadata/index\\_en.htm](http://ec.europa.eu/economy_finance/db_indicators/surveys/metadata/index_en.htm).

## 2.2 Statistical Methods

Standard methods of descriptive statistics were used (see e.g. Budíková, 2010). Mean and median were used to measure the location. Association between two quantitative variables is measured by the Pearson's correlation coefficient. Strength of this dependency is evaluated according to Table 3.

Table 3: Pearson's correlation coefficient

Correlation coefficient	Strength of association
$\langle \pm 0.7; \pm 1 \rangle$	strong
$\langle \pm 0.3; \pm 0.69 \rangle$	medium
$\langle \pm 0.1; \pm 0.29 \rangle$	weak
$\langle 0.00; \pm 0.09 \rangle$	none

Source: based on Jackson (2008).

We estimated this model using standard OLS estimating method for estimating the parameters in a linear regression model. Statistical software STATISTICA 12 was used to perform standard methods of descriptive statistics, OLS regression models were estimated using *Gretl* software for econometrics analysis.

## 3. Results and Discussion

The average proportion of respondents who recognized deflation in deflationary year is about 10%. It is five times more than average proportion of respondents who felt deflation in the inflationary year (see Table 4).

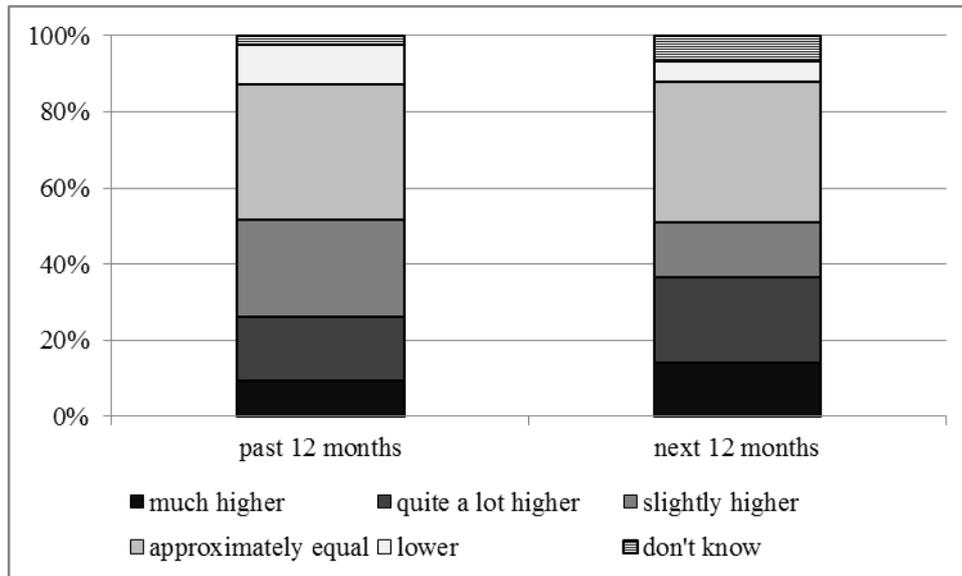
Table 4: Descriptive statistics of basic variables used.

Variable	Explanation	Mean	Median	Min	Max
$\pi_{LOW}$	Number of respondents, who answered that consumer prices were lower during the past 12 months [%].	2.45	1.96	0.79	4.69
$\pi_{LOW}^{\delta}$	Number of respondents, who in the year of deflation answered that consumer prices were lower during the past 12 months [%].	10.23	5.41	0.20	55.20
$\pi_{\delta}$	Inflation rate [%].	-0.63	-0.30	-4.50	0.00
$E\pi_{t+1}$	Number of respondents, who expect lower consumer prices during the next 12 months in comparison to past 12 months [%].	2.46	2.40	0.87	4.56
$E\pi_{t+1}^{\delta}$	Number of respondents, who in the year of deflation expect lower consumer prices during the next 12 months in comparison to past 12 months [%].	5.37	3.63	1.30	24.75
$\pi_{t+1}$	Actual inflation in the year following the year of deflation [%].	1.16	0.95	-1.30	4.40

Source: the authors.

As Figure 2 clearly depicts, in general half of the customers in deflationary year tend to feel that prices grew in past 12 months and their also expect them growing in next 12 months. Above one third of customers tend to feel (and expect) stable prices and just 12% of customers feel/expect falling prices or they cannot answer these questions.

Figure 2: Backward perception of inflation in past 12 months and expectation of inflation in next 12 months. Average for deflationary years.



Source: the authors.

### 3.1 Backward Perception of Deflation

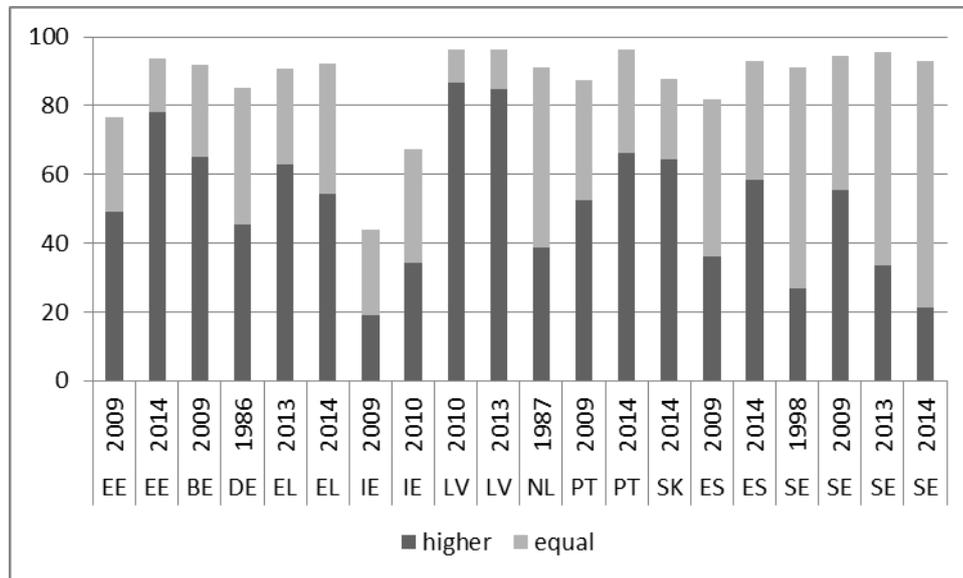
Even in the deflationary years, customers tend to consider prices always growing or at least remaining stable (see Figure 3). The only exception is Ireland during the economic crisis 2009 – 2010. At the end of 2009 even up to 55% of Irish respondents correctly answered that the consumer prices were falling during the past 12 months, while the deflation was about – 4.5%.

As the regression model

$$\pi_{LOW}^{\delta} = 3.9 - 10.2\pi_{LOW}, \quad R^2 = 0.61 \quad (1)$$

shows, the deeper the deflation was, the more respondents really experienced it. With each percentage point of deflation another 10% of respondents recognize it.

Figure 3: Perception of customer prices in the past 12 months (which were months of the deflation) among 11 European countries.



Source: the authors.

### 3.2 Expectations of deflation

How successful are consumers in expecting deflation in future year  $t$  if asked in (mostly inflationary<sup>3</sup>) year  $t - 1$ ? With exception of Ireland, consumers did not tend to predict deflation for deflationary year. As Figure 4 shows, most of the consumers do not expect deflation. They at most expect consumer prices remaining same (for example Sweden or Netherland). For about 80% of consumers from Baltic countries, that were severely hit with the Great Recession and subsequent strict economic policy of their governments, had expected inflation.

As Figure 5 depicts, consumers utterly do not have deflationary expectations even when asked in the deflationary year. Only 5% of consumers expect in the deflationary year  $t$  deflation for the following year  $t + 1$ . Also in deflationary more sensible Ireland the deflationary expectations about following year did not exceed 25%. According to the results of linear regression, the actual rate of inflation in the year  $t + 1$  did not depend on the deflationary expectations among these 11 countries.

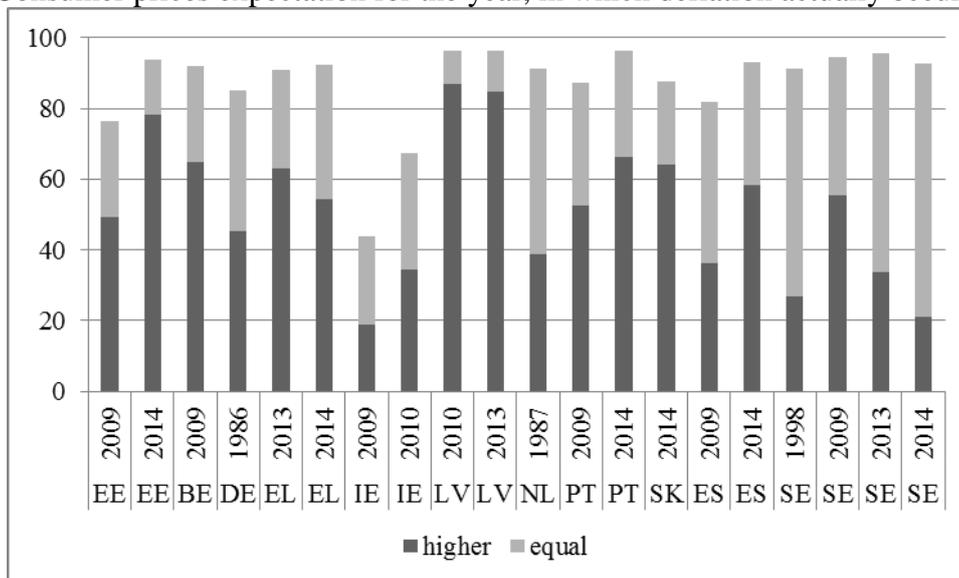
As the estimated linear regression model

$$E\pi_{t+1}^{\delta} = 1.4 - 1.3\pi_{\delta}^t + 0.3\pi_{\delta}^t, \quad R^2 = 0.83 \quad (2)$$

shows, the deeper the deflation in past year was, the more consumers expected deflation even for the next 12 months. Similarly, the proportion of consumers expecting deflation grew with the proportion of consumers, who actually recognized the inflation in past year.

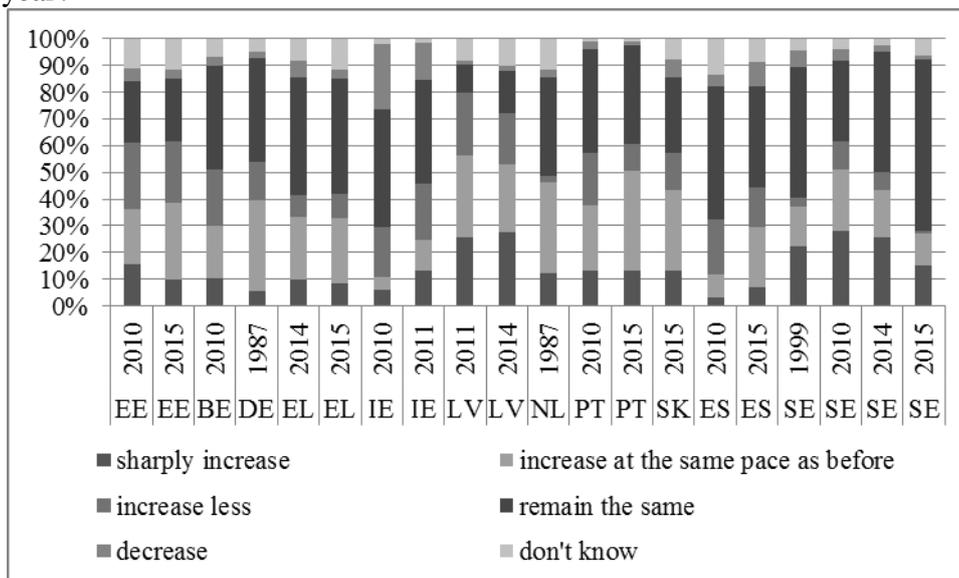
<sup>3</sup> Year  $t-1$  was not inflationary just for Greece and Swedish expectations regarding year 2014 and Irish expectations regarding 2010.

Figure 4: Consumer prices expectation for the year, in which deflation actually occurred.



Source: the authors.

Figure 5: What are the consumer's deflationary expectations in the year of deflation for the following year?



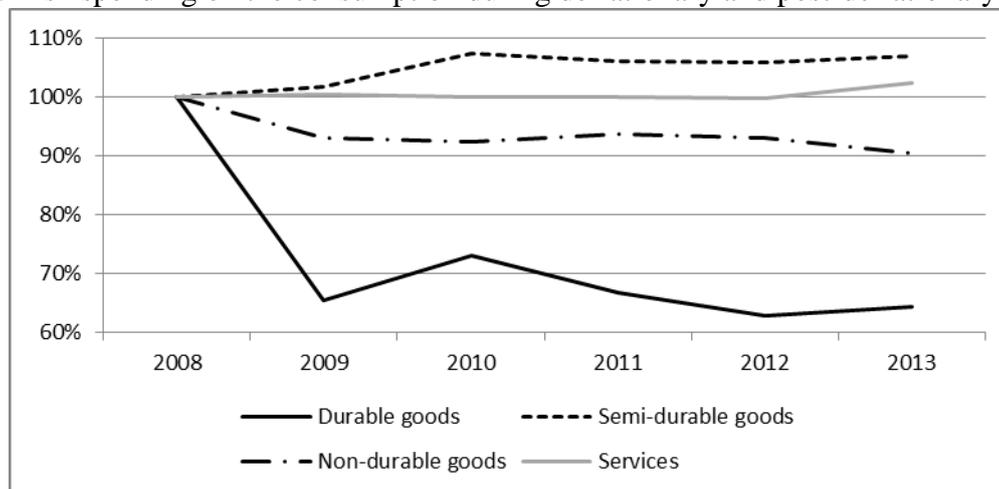
Source: the authors.

### 3.3 Case of Ireland

Deflation expectations in Ireland are considerably specific. In 2009 one quarter of Irish consumers expected deflation in 2010. In 2010 expected the 2011 deflation 14% of Irish consumers. However, in 2011 the Irish consumers spent on the households' consumption least from the period 2009 – 2013. If we take the year 2008 as basic year (spending in 2008 = 100%), the Irish spending on the durable goods during the crisis fell sharply to 65% in 2009. Similarly there was modest decrease in non-durable goods consumption. However, durables (similarly as semi-durables) stayed for only 6 – 8% of total household's consumption. On the other hand, the consumption of services (which stays for about 50% of household's

consumption) remain stable and consumption of semi-durable goods even increased (see Figure 6).

Figure 6: Irish spending on the consumption during deflationary and post-deflationary years.



Source: the authors.

#### 4. Conclusion

Due to the Great Recession the European economists stay before the long-forgotten problem of deflation. Deflationary pressures are very annoying especially for the public finances of heavily indebted European economies. It is therefore legitimate to ask, if the counter-deflationary monetary policy of European central banks really tries to fight the deflationary spiral, or if it just seeks to unburden the public finances of national governments.

In this contribution the consumer's perception of deflation in 11 European countries was analyzed. We have found that except for Ireland, the European consumers tend to consider the consumer's price as growing even during the deflation. Consumers are also extraordinary incompetent in predicting future deflation. Moreover, the mild deflation does not made the consumers expecting deflation in the following year. The severest deflation during Great Recession experienced Ireland, which was also deeply hit with the economic crisis. However, in line with our expectation, there was drawdown primarily in the spending on durable-goods. Decrease in the non-durable goods was just modest, spending on services remained stable and spending on semi-durable goods actually grew.

To conclude, no evidence of (even latent) deflationary spiral was founded. It seems that the bad and ugly deflation (as the accompanying phenomenon, not the cause of the crisis) worries more the politicians than the consumers. Inflation is without any doubt always and everywhere a monetary phenomenon. Nevertheless, the recent monetary fight with deflation is rather the consequence of unhealthy public finances.

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