

Szilárd Erhart and András Kollarik: The launch of HUFONIA and the related international experience of overnight indexed swap (OIS) markets*

In relation to the October 2010 launch of the **HUFONIA**¹ Swap Index, we discuss the most important characteristics of the **overnight indexed swap (OIS)** market, one of the fastest-growing segments of advanced money markets. OIS contracts allow for the **cost-effective management of short-term interest rate risks** while also **facilitating profitable investment strategies to foresee the central bank's interest rate decisions**, which, according to international experience, have greatly contributed to their popularity. A further benefit of OIS contracts is that partners' credit risk and counterparty limits only play a minor role in their pricing. Looking at the underlying motives of central banks in market development, empirical analyses show that OIS markets can provide **one of the most accurate indicators of short-term interest rate expectations**, and could furnish additional information in the preparation and evaluation of monetary policy decisions. In conjunction, the financial crisis brought attention to the significance of the so-called **LIBOR-OIS spread**, an indicator also suitable for assessing the solvency of the banking system. The essential conditions of market development, such as the availability of a reliable reference rate and the presence of foreign market makers, are ensured in Hungary. However, due to the limited market size the fixed costs of market development are somewhat higher than in major currency areas. Nearly half of market makers have prepared their trading and accounting systems for transactions until 2011 Q2. Market activity could be driven by strategies aimed at mitigating or converting banks' exposure to interest rate risks in the future.

WHAT IS THE USE OF OVERNIGHT INDEXED SWAPS?

Interest rate swaps are agreements used for exchanging floating and fixed interest rates, thereby facilitating the effective management of interest rate risks (hedging or speculation).

A special type of interest rate swap is the overnight indexed swap (OIS), the maturity of which is considerably shorter than other swaps. The typical OIS maturity is shorter than

three months, while standard interest rate swaps could be as long as 30 years. The floating leg of an OIS is tied to the reference rate of one day maturity (EONIA, Fed Funds Rate, POLONIA, etc.) and is therefore subject to daily change; whereas in the case of longer-term interest rate swaps reference rates are less frequently modified, quarterly adjustments being the most popular. The reference interest rate is usually an overnight rate (O/N, effective on the deal date), with the exception of Switzerland, where the tom/next rate is applied (T/N, effective on the next trading day after the deal date).

Chart 1

Advantages of OIS for money market participants and central banks

Market participants		Central banks
<ul style="list-style-type: none"> • hedging interest rate risk • partner limits are less affected (low credit risk) • speculation, undertaking interest rate position (~80 percent of deals in the eurozone) 	⇒	<ul style="list-style-type: none"> • smoothing risks, financial stability • solvency barometer of the banking system (LIBOR-OIS spread) • unbiased measure of interest rate expectations
	⇒	
	⇒	

* The views expressed in this article are those of the author(s) and do not necessarily reflect the official view of the Magyar Nemzeti Bank.

¹ HUFONIA: Hungarian Forint Overnight Index Average – the overnight reference interest rate published by the MNB. For details on its underlying calculation methodology and the publication procedure, please refer to page 27.

Chart 2

OIS settlement in practice: with cash flow reduced to a minimum, only the difference in interest payments is exchanged

Dates	Cash flows
T0 (deal date)	0
T1 (maturity date)	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 5px; text-align: center;"> Floating leg 1-day reference rate (eg. EONIA or HUFONIA) </div> <div style="font-size: 2em;">↔</div> <div style="border: 1px solid black; padding: 5px; text-align: center;"> Fixed leg Fixed rate at a maturity shorter than 1 year (eg. 3-month rate) </div> </div> $\left\{ \prod_{i=1}^n \left(1 + \frac{r_i^{o/n}}{360} \right) - 1 \right\} - \left(r^{fix} \times \frac{n}{360} \right) \times \textit{notional}$

A balance sheet and limit-friendly instrument

No cash is transferred at the conclusion of an OIS contract, and the parties only exchange the difference between fixed and floating interests upon maturity. This, as opposed to other instruments available for managing interest rate risks, greatly contributes to the popularity of overnight indexed swaps. Partners only need to take counterparty credit risk into account to a lesser degree (up to the net present value of future interest payments), which puts little burden on the banks' counterparty limits. Consequently, the popularity of OIS contracts is also due to the fact that they provide a flexible tool for taking a speculative position.

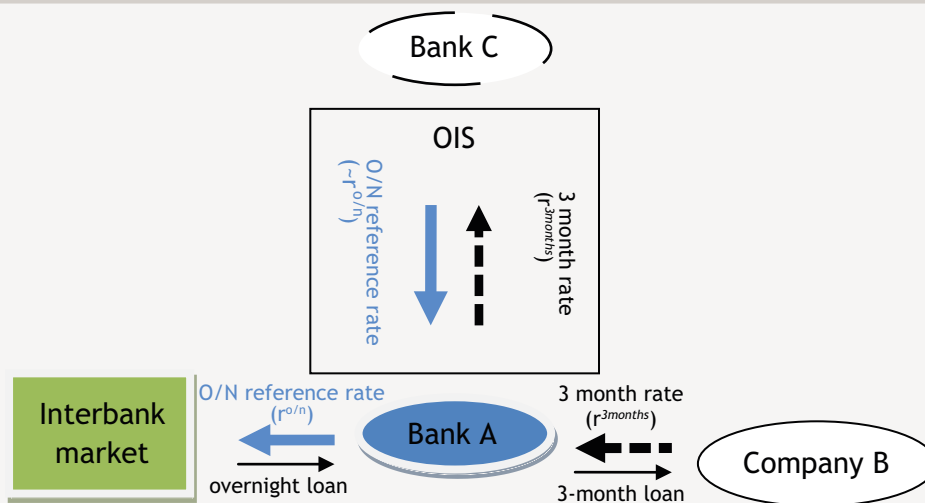
In addition to the low credit risk, overnight indexed swaps are also favourable with respect to liquidity management needs, as nominal values are not exchanged and netting occurs only upon settlement. Moreover, maturity of assets and liabilities can be matched with interest rate risk remaining unaffected (e.g. a bank may utilise its longer-term fixed-interest liabilities to finance variable-rate loans by engaging in an OIS contract, in which its liabilities are exchanged to those with a variable rate).

Hedging against interest rate risk

Being able to hedge against the interest rate risk resulting from the difference between the terms and repricing periods

Chart 3

An example of using 3-month interest rate swaps tied to the overnight reference rate (OIS) for the purpose of hedging



Source: Choy, Wai Kin (2003).

is considered an important requirement by banks and corporate treasuries. If, in the absence of other forms of funding, Bank A is only able to grant Company B a three-month loan of HUF 100 by borrowing from the overnight interbank market (Chart 3), it faces interest rate risk. Should the average overnight interbank rate exceed the pre-set interest rate during the loan's term, e.g. because of an unexpected rate hike by the central bank, this would result in an interest rate loss for Bank A. Overall, it is considerably less expensive and easier for Bank A to engage in a swap contract to hedge against interest rate risk than to adjust its balance sheet for hedging. Experiences of the recent credit crunch reveal that the increasing volume of short-term financing has made interest rate risk hedging even more relevant.

Gauging interest rate expectations

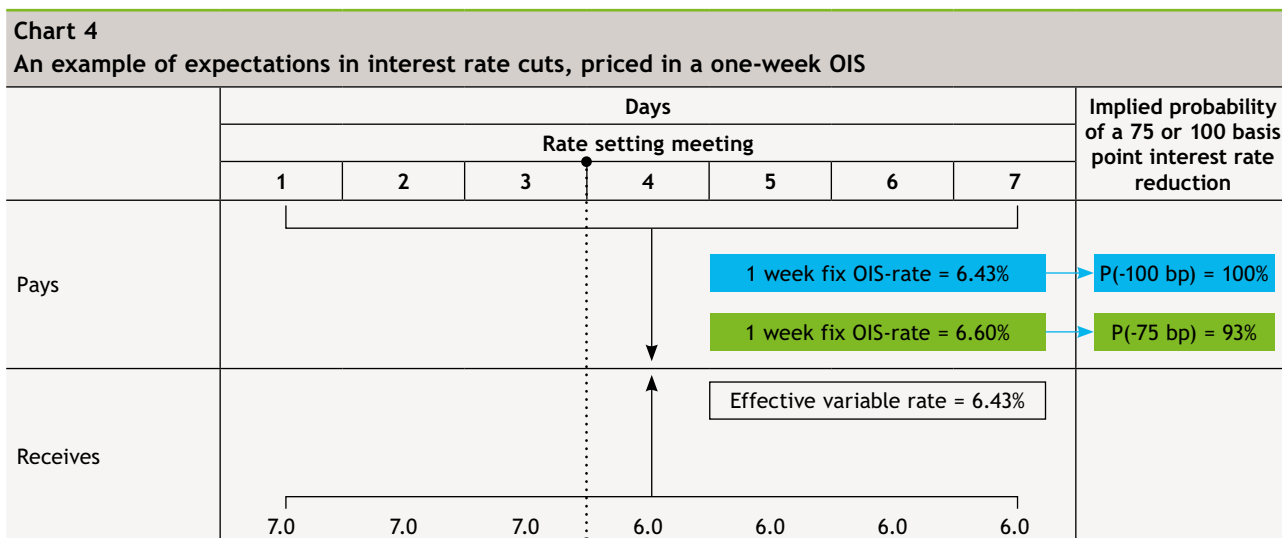
OIS contracts can provide central banks and key players of the economy with accurate information on developments in short-term interest rate expectations for the short run (maturities ranging from one week up to one year). As opposed to other reference rates (BUBOR, government bond yields, FRA²), the OIS rates allow for interest rate expectations up to 3 months to be measured at a considerably more accurate level. Overnight indexed swaps possess the lowest forecast error as regards sub-12 month terms on both Australian and Japanese money markets (Reserve Bank of Australia, 2002; Nagano and Baba, 2008). This is partly due to the fact that, in the absence of cash flow, OIS yields are less biased by credit

and liquidity risk premia. As of August 2008, the Bank of England has been using OIS yields to predict the expected trajectory of its reference rate and formulates the interest rate paths published in its inflation reports accordingly.

Based on international experience (see the upcoming section), **the popularity and liquidity of interest rate swap markets are fuelled by the speculation activity to foresee and benefit from central bank interest rate decisions** (amounting to approximately 80% of euro-area transactions), whereas banks' motivations in risk management are of less importance. The most traded maturities quite often overlap with interest rate decisions made by the relevant central banks. In Japan, for instance, intermeeting trades amount to 79% of the total trading volume.

To illustrate the capability of overnight indexed swaps in gauging interest rate expectations, consider the following example. Let us assume that three days before the Monetary Council is to decide on the interest rate the current reference rate stands at 7% and the market is convinced about a 100 basis point cut. In this case, the expected (floating) interest rate of the one-week OIS will be 6.43% ($6.43\% = 3/7 \times 7\% + 4/7 \times 6\%$) provided that the overnight reference interest rate on each day throughout the term equals the key policy rate. Assuming that the term premium is non-negative, the OIS fixed rate cannot be lower than 6.43%.³

In reality, however, markets can never be fully certain about the future development of central banks' reference rates; only



² FRA: forward rate agreement.

³ According to the liquidity preference theory of the yield curve, longer-term interest rates are equal to expected short-term interest rate averages that also include a non-negative liquidity premium.

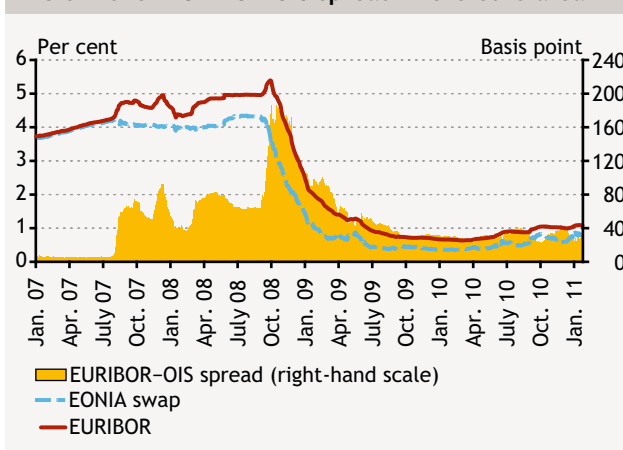
expectations are available, as reflected by OIS quotes as well. Using the above example as a starting point, if the OIS yield stands at 6.6%, it means that the market is only expecting, based on the OIS rate, a maximum overnight rate of 6.3% for the first four days following the Monetary Council's decision, instead of 6% ($6.6\% = 3/7 \times 7\% + 4/7 \times 6.3\%$). Naturally, swap quotations only convey information regarding the expected value of an upcoming interest rate decision and cannot be used to estimate the distribution – e.g. standard deviation – of such decisions. Given that interest rate decisions by the Monetary Council typically use multiples of 25 basis points, in the above example the implied probability of a 75 basis point cut is 93% ($0.7/0.75$).

LIBOR-OIS spread: the banking system's solvency barometer

The overnight indexed swaps have little influence on the balance sheet of banks (Chart 3) and therefore include very low credit risk premium, which clearly distinguishes them from other vehicles of short-term financing. For example, uncollateralized interbank loans burden banks' limits essentially by the transaction amount (Balogh and Gábel, 2003); therefore, the yields on interbank transactions (LIBOR, BUBOR, etc.) perfectly reflect the credit risk premium of banks taking out these loans.

As a result, OIS yields can be used to break down banks' cost of credit to its components – this is one of the reasons why OIS was brought into the spotlight following the banking crisis that erupted in the fall of 2008. In Alan Greenspan's words:

Chart 5
The 3-month EURIBOR-OIS spread in the euro area



*“LIBOR-OIS remains a barometer of fears of bank insolvency”.*⁴ From October 2008 onwards, as financial turbulences were escalating, the banking system's credit risk perceptions deteriorated and, parallel to the banking system's declining stability, credit risk premia and the LIBOR-OIS spread soared (Table 1, columns 2 and 3). The widening and increasing volatility of the spread also limited the applicability of OIS contracts for hedging purposes during the crisis.

Decomposing the LIBOR-OIS spread

Quotations of interbank lending (LIBOR, BUBOR) basically comprise the future trajectory of overnight rates as set by the central bank's interest rate policy, as well as liquidity

Table 1
Pre- and post-crisis premia on key instruments of the international banking system

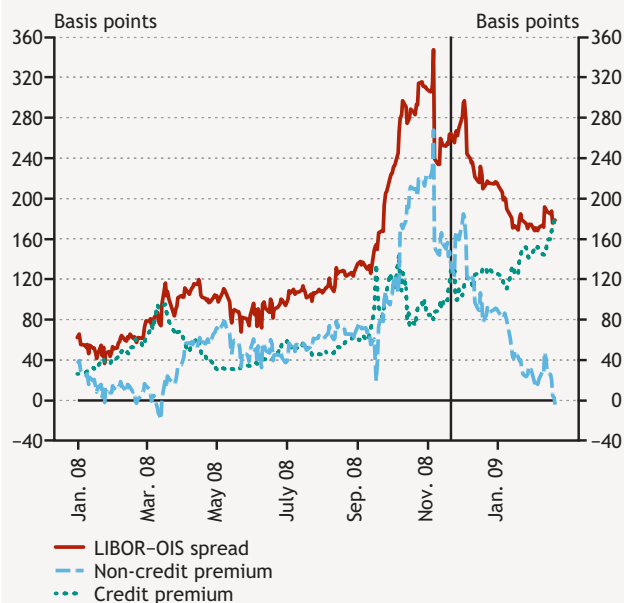
(in basis points)

	Pre-crisis period	Turbulence	Crisis	Consolidation	
	Jan. 2007 – Jul. 2007 average	Aug. 2007 – 14. Sept. 2008 average	15 Sept. 2008– Nov. 2008 average	Dec. 2008 – Aug. 2009 Average	Sept. 2009 average
LIBOR–OIS-SPREAD (3 MONTH)					
– USD	8	68	222	78	12
– GBP	10	70	195	111	27
– EUR	5	62	150	76	34
5-year CDS spreads of the banking sector					
– USA	18	158	209	211	115
– UK	7	97	140	167	137
– Eurosystem	9	79	146	197	114
– Average of the parent banks of the domestic banking sector	21	81	153	206	129

Source: MNB (2009).

⁴ Thorton (2009).

Chart 6
Decomposing the LIBOR-OIS spread



and credit risk premia. During the financial crisis, attempts at decomposing the two latter components of the LIBOR-OIS spread were made by several central banks (liquidity and credit risk premia). Considering the CDS premia of panel banks providing quotes for LIBOR and using assumptions on the compensation rate of depositors in the case of bankruptcy, the value of the LIBOR-OIS spread corresponding to the credit risk premium may be estimated. The residual of this estimate offers hints about the development of liquidity and other premia.

According to an analysis by the Bank of England (BoE), following a gradual rise in credit risk premia but prior to the outbreak of the crisis, a marked increase in liquidity premium could be observed on the UK money market. By early 2009, however, liquidity-providing operations by the BoE quickly reduced the liquidity premium. Government bond purchases of the BoE resulted in an immediate drop in gilt yields, thereby exerting a squeezing effect on the LIBOR-OIS spread as well. Meanwhile, banks were stimulated by the excess liquidity to restructure their portfolios, which further added to the decrease in yields and the narrowing of the spread.

Consolidation and the closing of the LIBOR-OIS spread

The interest rate cuts and liquidity-providing operations of the central banks later on helped in reducing the rates on interbank markets and caused the LIBOR-OIS spread to close. Over the past two years, international markets have

witnessed a declining stock of overnight central bank deposits while interbank activity gradually picked up, suggesting a reduction in counterparty risks and liquidity tensions. Surprisingly, despite the shrinking LIBOR-OIS spread, credit risk perception only showed limited improvement based on CDS premia (last column in Table 1), and the spread suggested that the aggregate amount of liquidity and other premia became negative. This contradiction was scrutinised in several quarterly BoE reports, and the experts offered the following possible causes:

- instead of actual transactions, the LIBOR is based upon quotes and, as such, it might underestimate the costs of interbank lending (the distortion could be moderated by the fact that the LIBOR is an offer rate);
- CDS markets are illiquid and could overestimate default risk;
- banks' needs for interbank financing may have been reduced due to the liquidity-providing operations of central banks, which could also have resulted in the narrowing of the liquidity premium;
- banks were more compelled by the cleaning up of their balance sheet to focus on longer-term capital market financing.

INTERNATIONAL TRENDS ON THE OIS MARKET

Reference yields similar to the EONIA have been available to money market participants since the late 1990s. As a general rule, reference yields are calculated from the weighted average yields of uncollateralized interbank loans, which are published either directly or indirectly by central banks. There are only a few exceptions: in Canada and New Zealand the OIS reference rate is, respectively, the O/N repo interest rate and the central bank's base rate.

Having studied various analyses discussing international practices, we were able to identify four conditions that could ensure the development of the OIS market (Table 2).

Reliable reference rate

Based on feedback from market participants, one of the factors behind the success of EONIA swaps is that the reference interest rate is calculated transparently and it reflects realistic market conditions. This condition is fulfilled in Hungary's case as well, since the HUFONIA meets all international standards regarding terms and conditions, underlying calculation methodology and regulation of publication alike.

Table 2
Factors facilitating development of the OIS market – international experiences and opportunities in Hungary

Factors facilitating development of the OIS market	Reliable reference rate	Interest rate risk – central bank’s interest rate policy	Size of the currency area	Financial literacy, foreign primary dealers
International examples	EONIA, CZEONIA, POLONIA	Japan (2006) – following the abandonment of the zero-interest rate policy and quantitative easing, USA (2006), Eurosystem (2006), Hungary (2011?)	Eurosystem, USA, Japan, Poland	Eurosystem, USA, Japan, Australia, New Zealand
Hungarian practice	☑	☑	☒	☑ ☒

Interest rate risk – central bank interest rate policy

In several countries the expansion of markets could be observed when, following the mid-2000s, central banks started to raise their respective base rates and thus short-term interest rate risk increased. Japanese markets began to grow dynamically in 2006, after the abandonment of the zero-interest rate policy and quantitative easing; meanwhile the start of the cycle of interest rate hikes considerably boosted market activity both in the euro area and in the US.

In a number of countries OIS turnover is most likely to grow as the date of interest rate decisions approaches. In a few countries (UK, Japan), inter-meeting OIS contracts, whose starting and ending data fits to the calendar of decision-making bodies of monetary policy, are especially popular. In this regard, banks’ quotation activity could indeed have been motivated by the interest policy environment in Hungary, after the HUFONIA indexed swap quotes were introduced in 2010.

Size of the currency area – financial literacy

As in the case of other markets, development of the OIS market could also be bolstered by economies of scale given the volume of the currency area. Of smaller markets, only Australia and New Zealand saw a relatively early emergence of OIS markets, which could be related to a more advanced system of financial institutions and a higher level of financial literacy that are characteristic of Anglo-Saxon countries.

Activity on OIS markets is often fuelled by large foreign market makers, which, according to central banking experiences in New Zealand and Japan, has considerably facilitated market creation.

Markets are typically highly concentrated, with 80-90% of all turnover on even the largest OIS markets being dominated by the five largest players.

In the region of Central and Eastern Europe, Poland is the only one to stand out with an active OIS market. This could be attributed to the country’s relatively large size in the region, as well as to its higher interest rate risk and the participation of foreign banks.

Euro Area – the EONIA success story

Over the past few years, the European Central Bank’s (ECB) reference rate nicknamed EONIA (euro overnight index average) has become the reference yield for a number of derivative instruments (mainly interest rate swaps).⁵ It was the overwhelming portfolio volume that was generated after euro area members converted their debt securities to euros which first propelled interest rate swaps featuring longer-term yields to the foreground. Gradually, however, the bulk of the trade involving euro-denominated interest rate swaps concentrated at the short end of the yield curve; by 2001 the maturity of more than 60% of all contracts were under-24 month. Before the crisis of 2008, the market for EONIA-based interest rate swaps boasted particularly dynamic growth figures of 40 to 50 per cent per year, resulting in an average annual growth rate of 6% in the period between 2000 and 2010. After the crisis, this market experienced a tumble similar to that of the unsecured interbank market, with the ECB’s liquidity-providing operations, the diminishing rate of interbank exposures and interest rate risks, as well as the dissipation of opportunities for speculation all being possible culprits.

The market’s liquidity indicators also underscore the popularity of EONIA swap markets. Bid-ask spreads are generally narrow at a meagre 1 to 2 basis points. According to a survey by the ECB, market players only saw a temporary

⁵ Sources of information: money market reports by the ECB (2001–2010).

Table 3
A comparison of OIS markets worldwide*

	Australia	Eurosystem	USA	Japan	Poland	Czech Republic
Currency	AUD (billion)	Index (2002 = 100)	USD (billion)	YEN (trillion)	USD (billion)	CZK
Reference rate	Cash Rate	EONIA	Fed Funds Rate	BOJ – weighted O/N rate	POLONIA	CZEONIA
2000	508	54	5,705			NA (according to the information of the Czech National Bank there is no significant market activity)
2001	1,159	87	18,605			
2002	2,829	100	27,118			
2003	931	221	35,961			
2004	926	151	52,170		0.3	
2005	851	162	48,306			
2006	2,660	247	74,880	390		
2007	1,846	201	70,617	1,940	164	
2008	1,031	141	86,072			
2009	3,000	119	46,622			
2010		96	55,151		65	
Average annual growth rate (according to the first and last observation)	22%	6%	25%	123%	141%	
OIS share in the total IRS turnover	no data	-50%	no data	no data	-50%	
Share of the 1 month maturity in the total OIS turnover	25%	39%	27%	no data	no data	
Market concentration (5 largest dealer)	93%	43%	no data	82%	no data	
Launch of the market	1999	1999	no data	1997	2004	2001

* US figures featured in the table pertain to the Fed Funds Future market.

Source: Australian Financial Market Association; European Central Bank: Money Market Report (2010); Bloomberg; Bank of Japan: Survey on Yen – OIS Market in May 2007; National Bank of Poland: Turnover in the Polish Foreign Exchange and OTC Derivatives Markets in April 2010.

decline in market efficiency during 2008 and 2009. Some more significant participants are permanently engaged in quotations and stand by even in the case of transactions with an exceptional volume (contract amounts up to EUR 10 billion have already been recorded), which greatly contributes to the liquidity of the market. According to the ECB survey, a considerable part of the liquidity of the EONIA swap market is furnished by speculators, whose market share may reach as much as 80%. A predominant share of the turnover (approximately 50%) is represented by voice-broker contracts made over the counter, but the stock exchange also proves to be a busy platform.

Poland – the regional centre of the OIS market

The only active OIS market in the CEE region is to be found in Poland, where a market size larger than anyone else's in the region and the activity of foreign institutions have both helped to promote market creation. Since it was launched in 2004, the annual turnover of the Polish market rose from USD 330 million to 64.8 billion in 2010, according to central bank surveys. It

must be noted, however, that a pre-crisis survey estimated the 2007 figure at USD 163 billion. Interbank transactions represent the bulk of the traffic and, based on feedback from market players, are used for hedging against the interest rate risks of interbank borrowing and for interest rate speculation.

The central bank's analysis concludes that, prior to the launch of POLONIA, the main obstacle to market creation had been the absence of a reliable reference interest rate.

Australia and New Zealand – overlapping swap markets

Of the two countries, it was Australia that first began trading with OIS contracts in October 1999. The activity of market participants has displayed dynamic growth ever since, with the average daily turnover rising by 22% between 2001 and 2010, according to a report by the Australian Money Market Association. Based on its findings, the OIS market was one of the fastest-growing segments of the Australian money market.

In New Zealand, trading at the initiative of Australian investment banks was launched in February 2002. At the end of 2003 the market showed little development and, with no formal quotations in place, domestic and foreign partners were typically engaged in bilateral trading. Market liquidity has been provided by Australian players since trading commenced. According to the experiences of the Reserve Bank of New Zealand, trading volume escalates primarily whenever expectations regarding the reference rate are about to change, with 60% of all contracts involving maturities of three months or less.

The Czech Republic – observations on the launch of the CZEONIA

Although the central bank's key policy instrument operates with a relatively long term – two weeks, as in Hungary's case – the Czech National Bank (CNB) has in recent years allocated significant resources to influence yields on contracts shorter than two weeks. With the announcement of the overnight reference interest rate (CZEONIA), the CNB's goal – similarly to other central banks – was to develop its overnight swap market. Regardless of this, ever since CZEONIA's January 2002 launch, the Czech OIS market has failed to exhibit the kind of dynamic growth that could be witnessed in other countries. Even though electronic news agencies do feature indexed swap quotations for CZEONIA, no actual trading is being transacted. According to information received from Czech experts, one can only guess what the underlying cause might be. The slow pace of development could be related to the fact that forward rate agreements (FRA), the function of which is similar to that of OIS contracts, had been ubiquitous in the Czech money market before CZEONIA was introduced. That said, the mere announcement of a reference yield might not necessarily be sufficient for derivative markets to start rolling, especially in the absence of an institutional framework and participants undertaking quotations. The country's stable interest rate environment and the development level of its financial markets could also have prevented CZEONIA swaps from experiencing a dynamic growth similar to what is seen in international markets.

LAUNCHING THE HUFONIA AND ESTABLISHING THE OIS MARKET IN HUNGARY

Setting the rules

Since the early 2000s, money market experts of the MNB – together with the Hungarian Forex Association representing

market participants – have made several attempts at market creation. After numerous presentations held on OIS market standards and benefits, the necessary consensus for the announcement of the HUFONIA reference rate and the launch of HUFONIA swap quotations was reached in September 2010.

Introduction of the HUFONIA: 1 September 2010

- **METHODOLOGY:** drawing on international practice (EONIA, POLONIA) – average interest rate on overnight unsecured interbank lending, weighted by turnover, derived from credit institutions' daily reports to the MNB
- **PUBLICATION:** at 11.00 am daily on the Reuters HTBL screen page and the MNB's website

Introduction of the HUFONIA Swap Index: 18 October 2010

- **CODE OF CONDUCT:** the Forex Association has finalised the HUFONIA Swap Index Code of Conduct; bid-ask quotes for eight maturities from 1 week to 12 months
- **PUBLICATION:** at 11.30 am on Reuters, BBG (HUFONIAINDEX) and the MNB's website
- **QUOTATION:** quotation system has been built up; 12 banks provide quotes daily
- **TECHNICAL INFRASTRUCTURE:** nearly half of market-making banks have already made arrangements for deals, while the rest are preparing their systems for dealing.

The first quotes

Since quotations started, only a limited-size database has been available. The little amount of data it contains could, however, be used to formulate some hypotheses, the validity of which could be tested as further data become available.

- **Expectations for rate hikes:** As in the case of other instruments, OIS quotes have since the fall of 2010 prognosticated gradual increases in the key interest rate. Over a 12-month horizon – similarly to various interbank money market and interest rate swap quotes (BUBOR, FRA, IRS⁶) – OIS contracts effected between October 2010 and February 2011 reflected that, according to expectations, an increase of approximately 60 basis points was in the making. According to the grapevine, some market makers continue to rely on FRA market information also when engaging in OIS quotes, for lack of substantive market activity.

⁶ IRS: interest rate swap. This refers to single-currency interest rate swaps other than the OIS, tied to a reference rate with a maturity exceeding one day (essentially the BUBOR).

Chart 7a
Yield curves for the HUFONIA swap (bid-ask average) and the BUBOR
(as of 2 March 2011)

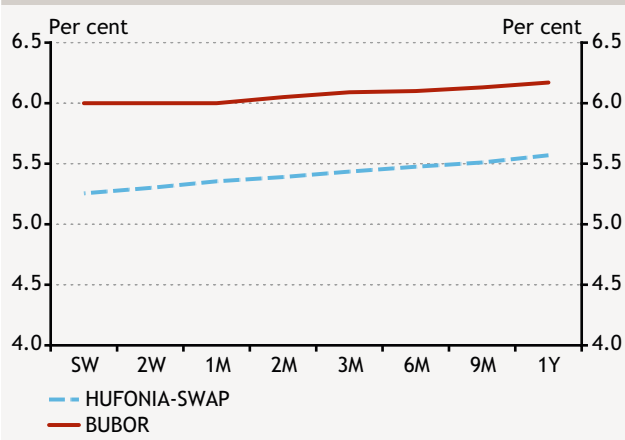
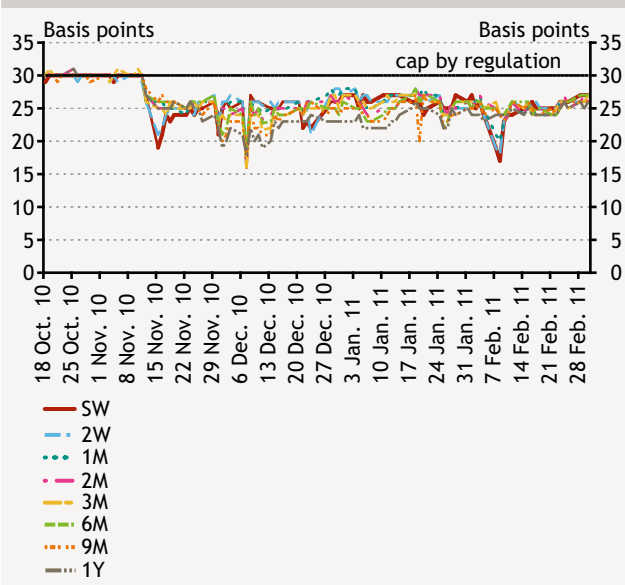
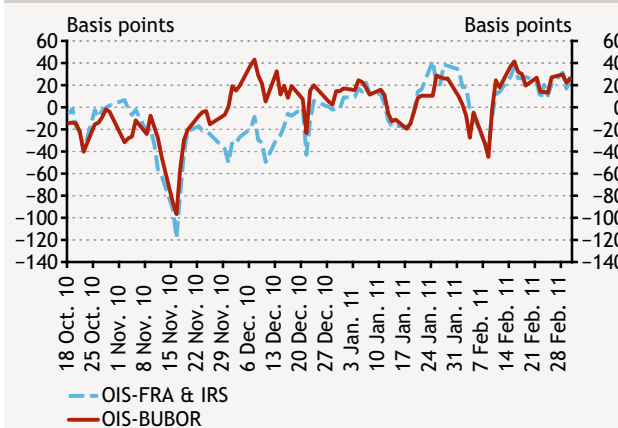


Chart 7b
HUFONIA swap bid-ask spreads over various maturities



- **Quotation falling behind but perhaps approaching the expected reference interest rate:** Forward rates derived from both shorter and longer-term OIS quotes are below those implied by quotes for BUBOR, FRA and IRS of the same maturity. This might suggest that panel banks continue to anticipate that the effective overnight money market rate could fall short of the interest rate on the two-week MNB bond. By this rationale, we can assume that banks continue to expect significant amounts of overnight deposits being held at the central bank and a moderate increase in interbank market

Chart 7c
Expected increases in yield over a 12-month horizon, as gauged from OIS quotations versus that estimated from quotes for FRA IRS and BUBOR



Methodology: As for OIS, the expected increase in yield was estimated by having the HUFONIA subtracted from the 9x12 implied forward (3-month forward starting in 9 months).⁷ In the case of FRA and IRS quotes, the current base rate was subtracted from the two-week forward becoming effective in a year from now, where the forward yield curve is calculated using spline method. Finally, the 1-month BUBOR was subtracted from the 11x12 implied BUBOR forward.

activity. Meanwhile, it can be observed that, according to expectations, the spread between the 1-month BUBOR (or the key interest rate) and HUFONIA will shrink: in early March 2011, OIS contracts showed an expected increase in yield of approximately 50 basis points over a 12-month horizon, as opposed to the 25-30 basis point increase suggested by other instruments. The closing of the BUBOR-HUFONIA gap might represent that credit and liquidity risk premia that are priced in the BUBOR are expected to fall, but could also mean that OIS panel banks expect the HUFONIA to climb gradually within the interest rate corridor, thereby indicating that the turnover rate of the overnight interbank market might improve over time.

- **A wide bid-ask spread:** At this young age of the market, the spread between bid and ask quotes is still rather wide and very nearly matches the 30 basis point maximum prescribed for market makers, which indicates a shortage of liquidity. Once actual trading starts to take place, it could help to reduce the spread.

Anticipated trends and suggestions for development

According to available information, the first months went without actual transactions taking place; however, based on

⁷ T1xT2 forward: The interest rate on a forward rate agreement taking effect in T1 months and expiring in T2 months.

international experience, the market can be expected to take off in view of various considerations. To begin with, the calculation and publication of the reference rate are in line with foreign standards, thus ensuring transparency both as a money market gauge and a settlement base. Moreover, given that Hungary's sovereign risk premium is rather volatile, there is also a significant interest rate risk, and banks' willingness to enter the market may have been boosted particularly by the MNB's November 2010 decision to start raising the interest rate. Finally, there are various financial service providers on the Hungarian market that are prominent on money markets across continental Europe and in London as well. Based on experiences from Japan, New Zealand and Poland, these institutions could assist in market creation and facilitate the commencement of trading.

In the short term, the size of Hungary's financial market is a strength that cannot be leveraged; therefore, **the central bank could do the most to ensure the future development of markets by improving the popularity of the OIS market, presenting the already existing quotation system and communicating the benefits of the HUFONIA swap instrument.** Although a euro-dominated OIS market could be established automatically once the country has joined the euro area, this event is likely to take place so far ahead in the future that it is not worth waiting for. That is to say, a quicker establishment of the market could have a favourable influence on the way banks and corporations manage interest rate risk, thereby lowering the chances for financial stability risks to arise. Moreover, it could also provide a rather useful indicator for the central bank's decision-making process, improving the efficiency of monitoring interest rate expectations and financial stability alike.

REFERENCES

BALOGH, CSABA AND GÁBRIEL, PÉTER (2003): 'The Interbank Money Market Past and Future Trends', *MNB Occasional Papers*, 28.

BANK OF ENGLAND (2009–2010): *Quarterly Bulletin*, BoE, London, 2009 Q1–2010 Q2.

BANK OF JAPAN (2007): 'Survey on Yen OIS Market in May 2007', *Reports & Research Papers*, (July).

BODOR JÓZSEF, SZÜCS GÁBOR AND VERES ISTVÁN ATTILA (2001): 'A Magyar Forex Társaság Szakmai Bizottsága ajánlása az Overnight Index (Interest Rate) Swap üzletek kötésére vonatkozóan', [Recommendation by the Special Committee of the Hungarian Forex Association regarding the conclusion of Overnight Index (Interest Rate) Swap contracts], manuscript.

CHOY, WAI KIN (2003): 'Introducing overnight indexed swaps', *Reserve Bank of New Zealand Bulletin*, Vol. 66. No. 1.

CREDIT SUISSE FIRST BOSTON (2001): *Overnight Indexed Swaps*.

EUROPEAN CENTRAL BANK (2001–2010): *Euro Money Market Survey*, Frankfurt am Main, ECB.

MAGYAR NEMZETI BANK (2009): *Report on Financial Stability*, Budapest, MNB, (November).

NAGANO, T. AND N. BABA (2008): 'Extracting Market Expectations from Yield Curves Augmented by Money Market Interest Rates. The Case of Japan', *ECB Working Paper Series*, No. 980.

NATIONAL BANK OF POLAND (2010): *Turnover in the Polish Foreign Exchange and OTC Derivatives Markets in April 2010. Summary of the Results*.

OOKA, E., T. NAGANO AND N. BABA (2006): 'Recent Development of the OIS (Overnight Index Swap) Market in Japan', *Bank of Japan Review*, 2006-E-4.

PINTÉR, KLÁRA AND PULAI GYÖRGY (2009): 'Measuring interest rate expectations from market yields: topical issues', *MNB Bulletin* (July), pp. 34–42.

RESERVE BANK OF AUSTRALIA (2002): 'Overnight Indexed Swap Rates', *Bulletin* (June).

THORTON, D. (2009): 'What the Libor-OIS Spread Says'. *Economic Synopses*, Federal Reserve Bank of St. Louis, No. 24.