Inflation derivatives – history in the making

It has been a roller-coaster ride of a year for inflation-linked products – thanks to the global economic problems that everybody has been encountering, the collapse of Lehman Brothers and the use of quantitative easing by central banks – in their efforts to combat inflation and deflation. Sponsored by BGC Partners, a panel of inflation risk professionals convened in New York to explore a range of topics around inflation and inflation-linked products

Risk: The past few months have been very volatile since the collapse of Lehman Brothers. Could you each provide a brief summary of how that collapse has affected this market?

Jeremie Banet, BNP Paribas: I'd like to start with a statement. Despite the collapse of Lehman Brothers and despite the fact that last year for three months our market almost shut down – whether it was on the cash or on the derivatives side – a year down the road, we can be proud to say that the inflation market is healthy, strong, dynamic, and the volumes are bigger than they've ever been. D'Arcy, correct me if I'm wrong – but I think, on the derivatives side, the market has grown its share. Treasury Inflation-Protected Securities (Tips) are extremely liquid. Bid-offer on swaps – asset swaps – are much tighter than they were, even pre-crisis, I think. The market is more transparent and more efficient.

One of the results of the Lehman Brothers collapse was that the market created such a big arbitrage of opportunity that it started to attract a much wider array of investors. If I'd looked about a year ago, I would have said that the derivatives market was pretty much end-users, hedge funds and banks. Today, you've got bank asset and liability management (ALM), sovereign wealth funds and insurance companies trading asset swaps, so the public for these swaps is much wider than it used to be. Even on the zero-coupon types, we start to realise that, not just end-users, but different speculative accounts and funds, are getting involved. I would say that the consequence of Lehman Brothers is that inflation is even stronger than it was.

The Panel

Barclays Capital, Nikolay Stoyanov, Inflation Derivatives Trader
BNP Paribas, Jeremie Banet, Head of US inflation /CAD Rate Trading Director
Deutsche Bank, Allan Levin, Head of Inflation, North America
Goldman Sachs, Joshua Schiffrin, Head of US Inflation Products
Pimco, Mihir Worah, Managing Director, Head of Real Return Products

BGC Partners, D'Arcy Miell, Global Head of Inflation Products,

D'Arcy Miell, BGC Partners: We see a year-on-year growth across asset swaps and the zero coupons of about 20%–25% very evenly distributed between both products. I believe that asset swaps account for about 30%–35% of total business transacted through brokers. It important to note that the increased volumes seen in the last quarter of 2008 have been sustained throughout 2009, albeit more evenly spread out.

Mihir Worah, Pimco: I agree with what Jeremie and D'Arcy said. When Lehman collapsed, it wasn't just that the inflation market pretty much shut down. It wasn't just a fear factor and a flight to quality. Lehman was also a big provider of funding in this market, and the dysfunctional unwinding of their trades pushed valuations to such attractive levels that it really brought in a wider range of players, beyond the traditional asset managers and hedge funds, to more long-term hands. So, in hindsight, the market has developed nicely, especially on the derivatives side.

Risk: **From your perspective as an investor, what has been your involvement in the inflation derivatives market over the past few years, just to give a bit of context?**
Mihir Worah: We are obviously involved as traders and investors, taking long-term views and shorter-term positions. When we see balance-sheet pressures or one-way pressures, we provide liquidity to many of the banks. That is a shorter-term trade. We also take longer-term investment views in the inflation derivatives market to express views on rising or falling inflation. Finally, away from taking active views for our clients, we do have several clients who look for inflation exposure in an unfunded or overlay strategy. We invest on their behalf in the inflation derivatives or swap markets. We have been quite involved and quite interested in having this market develop in size and in liquidity.

Risk: **I'd like to explore liquidity in the market and, in particular, zero-coupon inflation swaps. How do they work? How liquid are they? And how will liquidity change in this instrument over time?**
Joshua Schiffrin, Goldman Sachs: As the market has grown and we've seen more entrants into the market and greater trading volumes, we've seen a decline in the bid-offer in the inflation swap and asset swap markets. At the same time, we've seen a corresponding widening in bid-offer in Tips. I think that, as Tips became more volatile, bid-offer spreads widened. At the same time, as more players wanted the pure bet on inflation in off-balance-sheet form, and started becoming more conscious of how they were using their balance sheets, the greater volume in the derivatives pushed bid-offer in. That cycle became virtuous and, as the two have bid-offers more in line with one another, that has only served to increase the volume in the derivatives market over the last few years.

Nikolay Stoyanov, Barclays Capital: Zero-coupon swaps have always been one of the most liquid instruments because of the simple nature of the product. There is only one payment at maturity and zero-coupon swaps are model-independent. As Josh said, they have returned to normal liquidity. Surprisingly, it took so little time. I would still say that there is a little less risk tolerance overall, in terms of how much exposure dealers would want to have. In addition, to the extent that dealers or end-users are more cautious about how they use balance sheets, zero-coupon swaps are actually a very good alternative to Tips breakevens.

Allan Levin, Deutsche Bank: One of the features of our market is that zero-coupon inflation swaps are very simple instruments. I find the best way to explain it is via an example – if the market implied, let's say, a 2% inflation rate for the next five years, an investor can very easily take a view on this by just trading a five-year swap. For example, if they think inflation will exceed 2% on average, they can buy the inflation swap and, at the end of five years, they will receive the excess over 2% for the period. Similarly, if they think inflation is going to be less than 2%, they can go the other way, and then they will benefit from any underperformance below 2%, so that this makes for a very straightforward instrument. And, because it only has one payment to maturity, it is possible to construct any cash flow profile, by combining different swaps, making it very flexible and amenable for many different purposes.

I think the enhanced liquidity that we are experiencing bodes well for the future growth and robustness of the inflation derivatives market.

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Risk: **We mentioned earlier some of the dislocation that has occurred in the Tips market. I'd like to ask now about the cheapness of Tips relative to inflation swaps, and how investors can take advantage of this, and what trading strategies are popular.**
Jeremie Banet: This is my favourite subject, so I'll try not to be too long. It is key that the inflation derivatives market has actually two completely different complements: one, which is the inflation swap; and the flipside, which is the asset swaps. What's actually very interesting for us is that the asset swap could almost be an asset class on its own. We went to a wider array of investors and explained to them that buying cheap assets has nothing to do with inflation, and basically the idea is, after the Lehman crisis and at the end of the year, you could have different asset classes that were more or less backed by the government, from Federal Deposit Insurance Corporation-secured paper, agencies, obviously Tips, and simple Treasury notes. You could actually get rid of all inflation risk and buy Tips, and just put that in your array of investments and get a better pick-up. It has always been true, but it reached a point where it was actually extremely attractive.

Another of our favourite trades, and slightly on the side, is that Tips are collateral. Most of the derivatives trades generate collateral positions – traditionally, we would post cash as collateral. There was a big argument about – depending on what kind of collateral you post – how your firm discounts your derivative cash flows. That was at the heart of trading last year. Banks could argue back and forth about whether you should use the Libor curve, the overnight index swap curve, your funding curve and really the credit support annex was key. The fact that Tips are acceptable collateral basically means that you could buy Tips on asset swaps and use that as collateral management, and then basically improve your return massively. That's one of the trades that we have been pushing for this year.

We see a year-on-year growth across asset swaps and the zero coupons of about 20%–25% very evenly distributed
D'Arcy Miell, BGC Partners

Allan Levin: We have many investors who would traditionally invest in Treasury bonds and, just by pointing that out by buying Tips and swapping out the inflation, they can end up with a fixed rate that exceeds that of Treasuries, has made it a very obvious substitute, especially for investors who tend to hold these bonds for longer terms. The one key attraction is that the credit risk is comparable with that of Treasuries, if not identical.

Risk: **Talking more broadly about inflation curve dynamics, are there different factors that affect different parts of the curve, and what are they for each part of the curve: the front end, zero to two years; the middle, five to 10 years; and the long end, 20–30 years?**
Allan Levin: We do see slightly different dynamics in each part of the curve. The front-end, zero to two years, is much more affected by near-term technicals. It is sensitive to changes in equity and oil prices and intraday will move, to some extent, in line with them. Whereas, if we go to the five- to-10-year sector, these effects are less obvious. The five- to 10-year period is probably the most liquid part of the inflation curve not only because it is less sensitive to short-term technicals but also because many players in the market have a limited time horizon and don't tend to trade beyond 10 years. Many of the speculators in the market who take shorter-term views tend to trade in this part of the curve, which creates a very liquid market with very tight bid-offer spreads.

As we go out longer, let's say 20 to 30 years, we find that the numbers of players involved does reduce somewhat. But we still see some very large players. It's a much more flow-dependent part of the curve, where we perhaps see fewer trades, but chunkier in size.

Joshua Schiffrin: The only thing I would add is that the different dynamics across the curve create a little bit of excitement – they are each moving based on different dynamics, different flows and different investor bases. We see trading not only in the spot maturities, but also in different forward combinations; the five-year five-year forward; the 10-year 10-year forward. The Federal Reserve has indicated to the market that it pays very close attention to these forward measures of inflation, and consequently we see investors both monitoring and trading these forward measures actively as well.

Jeremie Banet: That is very interesting because the US curve is actually slightly different from the European curves. One of the consequences of the fact that the Fed has always put the focus on the five-year five-year is that the US curve is the only curve where the premium is in the 10-year rather than in the longer-term. So if you look at the forward curve, and especially this year, when there is an emphasis on the risk that the Fed might actually lose control of inflation for the next cycle, the five-year five-year is now much higher than the very long-end forwards. That is specific to the US and that is one of the consequences of the Fed always emphasising the five-year five-year, and investors also focusing more on the five-year five-year than more longer-term bets, whereas, in Europe, most of the interest was on 20-year to 30-year. It might change, and you've been one of the advertisers of bad news. If we get to 30-year Tips, the dynamic could start to change because, eventually, investors will shift further up the curve and might attract new interest.

Joshua Schiffrin: One point to conclude with here that is specific to the inflation derivatives market, which is a primary focus, is that these forward trades become easier to implement in the derivative market. You can simply write a contract on a five-year five-year forward inflation, you can do a 10-year 10-year forward trade, less a five-year five-year forward trade. To do a similar trade in the Tips market would require tremendous usage of balance sheet, multiple combinations of bonds, and the derivatives market presents a clean and simple way of executing these transactions.

Nikolay Stoyanov: I'd like to add something else. There are different dynamics that affect the very short end, the middle part of the curve and the long end. The one big unknown that I'm sure everybody considers in their risk – but is very hard to hedge out – is seasonality. In terms of basis points, seasonality has a higher impact on the very short end. Zero-coupon swaps, as great as they are, have one problem. They have a single payment at maturity, and that exposes whoever has the position to that single one or two Consumer Price Index (CPI) prints that determine the final interpolated CPI number. To that extent, because there is a bigger impact in terms of basis points on the front end, and uncertainty about seasonality and the associated difficulty to hedge that out, it probably contributes to the wider bid-offer. The five- to 10-year sector that we've discussed already is probably the most liquid and narrowest in terms of bid-offer. The longer end, 20- to 30-year, has another issue. The longest inflation-linked US treasury security as of now matures in April 2032, and that is just a little beyond the 20-year mark. So there is a whole – almost 10 years portion of the curve – which, in the derivatives, market has no benchmark in the Tips market. Anybody that would have to take a 30-year position in zero-coupon inflation would probably demand a little bit more risk premium, because there is no corresponding benchmark in the Tips market and, to this day, the Tips market is still more liquid than the derivatives market.

Risk: **Would anyone like to comment on that?**
Joshua Schiffrin: I'd just address the first point that Nikolay mentioned, which is the fixing risk associated with the final payment in a CPI swap, which introduces risk to a single CPI setting, and I'd

like to note that the market has again risen to the challenge. As more market participants have these risks, we've seen an over-the-counter market develop, trading on the actual CPI prints. So, if one person has setting risk to the number where they'd like the number to be higher than the market forecast or their forecast, and someone else has a risk that the number might come in lower, you see transactions in the market that allow market participants to lay off that risk with one another. We've seen several sizeable transactions going through the market this year allowing participants to lay off that risk. So, as more market participants have these trades, they have risen to the challenge, and we've seen the ability to lay off that risk.

D'Arcy Miell: Further to what Josh said, in the broker market there is certainly liquidity in the fixing contracts as they're known. Bid offer spreads are very tight and, over the last six months, much larger transactions have taken place than in previous years. Originally they were quoted by a few participants in the market, and only traded intermittently. Now there's a lot of price discovery, and the trades are substantially larger.

Risk: **Let's talk about how volatile inflation has been over the past 12–24 months, and explore how long this volatility will last. What are the broader implications of this for inflation derivatives going forward?**

Jeremie Banet: First, when we talk about volatility, we have to be extremely careful about what we're talking about. There are three kinds of volatility. There is the actual delivered volatility by CPI, which has been extremely high for the past one and a half years, and was mostly driven by the volatility in commodities. If you look at core CPI, actually, I'm not going to say it's boring, but almost. We went from a high 2% to something that is around 1.25%. Each component of the CPI had some volatility. Tobacco was the big surprise this year. If you look at the aggregate number, it's usually pretty stable. On the flipside, commodities were extremely volatile last year. It's been less volatile for the past two months but we can expect that this volatility will remain. We'll still get some delivered volatility in the CPI index.

The second part of the volatility is the actual volatility of the inflation market. It's a lot more stable now. Last year obviously was at some points dramatic, especially because some of the options strategies that the dealers carried forced volatility to increase. I think that volatility will not resume and that, now, people are much more confident about what to expect. Even if oil goes back to $150, I don't think we'll get inflation overshooting oil. I expect it will be more stable.

The last part is that the volatility is the actual price for volatility. I would love to say that it's a great market, and it works well, but it's still shut down. It's probably the part that really disappeared after the Lehman collapse. The structured business has disappeared and there is actually no way to outsource it. You cannot get a hedge fund to take the other side of that trade. One of the reasons is that the control over the underlying is really difficult, I hope it will resume.

Mihir Worah: Inflation in 2007 was close to +5%; coming into 2008 and 2009, -2%, most of the swing due to oil prices and commodity prices. I don't think we'll see that kind of extreme volatility in inflation going forward, but definitely inflation, along with all the other economic variables, is going to be more volatile going forward than it has been. Commodity prices will stay volatile. They may not see the swings of $150 through $30 dollars of oil in six months' time, but they will continue to be volatile. And I think that, in core inflation, underlying inflation, also the volatility will increase. We've gone down from 2.5% to 1.5%. What increases the risk of volatility in underlying inflation is the chance that the Fed might lose control, or might tighten too, so all economic variables become more volatile. There is also a chance of more administered prices in the US, like in Europe, where inflation is hard to model because of administered prices. Politicians may decide that prices are going to be cheaper to help somebody out or prices for certain goods are going to be more expensive to impose a tax on consumers and help budget deficits, so I think the US is going to see more government-mandated pricing, which is going to make inflation hard to predict, so volatility should go up.

As a result of that, we are seeing investors starting to hedge their inflation exposure, because, if volatility is higher, they aren't sure of the outcomes and they need to be hedged. So, in this respect, I think the Tips market and the inflation derivatives market are likely to grow in importance, and that's part of the reason it has been growing in 2009 compared to the recent past.

The inflation market is healthy, strong, dynamic and the volumes are bigger than they've ever been
Jeremie Banet, BNP Paribas

Risk: **Given the state of inflation and the inflation markets at present, I'd like to ask the panel what improvements they'd like to see, starting with the investor perspective.**

Mihir Worah: It's quite simple: liquidity is improving in the inflation derivatives market. However, although volumes are clearly higher in the inflation swap/Tips asset swap market, it still somewhat tends to be a by-appointment market. From our side, to help our investors and our investment positions, we'd love to see a more liquid two-way market in inflation derivatives and, to help our investors out, we'd love to see a two-way and more transparent fixing market for shorter-term inflation risk too. These are the two things that we would look for, for the inflation providers on the other side of the fence, sitting over here, to help out our investors.

Risk: **Do you think you can help them out?**

Allan Levin: I think we can. I think what we are seeing, both in terms of derivatives and in terms of near-term fixing risk, is greater liquidity. D'Arcy can confirm that – we are certainly seeing liquidity improving due to not only an increase in the number of players involved but also incumbents becoming more comfortable with taking on risk again. There is no doubt that investors will have an easier and easier time as we go forward.

D'Arcy Miell: I am seeing far more willingness to provide liquidity in the interbank market on a day-to-day basis. While I appreciate it isn't a flow market, from a broker's point of view, it's a polar opposite to what it was two to three years ago, when there were very few liquidity providers. Today a lot more people are participating in the market and we see genuine interest from other banks that are currently not active in the market but are looking to enter into it.

The inflation market is an extremely exciting place to be and, as economic indicators have become more volatile, we've seen more participants enter the market
Joshua Schiffrin, Goldman Sachs

Risk: **Are there other improvements you would like to see in the market or steps towards changes being made, going forward?**
Joshua Schiffrin: The growth rate of the product has been substantial over the past few years and I think we will continue to evolve. If the US Treasury Department increases the supply of Tips, I think that will be something that brings more focus to inflation markets in general and derivatives as well. I cannot foresee the derivative market in the US looking like it does in Europe, but that's not to say that the market can't develop quite a bit further and continue to grow at the pace it has over the past few years.

Risk: **How have the events of the past 18 months shaped the way your firms are risk-managing inflation derivatives? Have firms changed the way they risk manage these products?**
Nikolay Stoyanov: Basically, the events of last year led to very violent moves that few people had expected. That means that a lot of risks that were considered small led to much more significant profit-and-loss swings. A lot of risks that were not believed to be there all of a sudden appeared, because correlations broke down. There is a lot more fine-tuning when looking at risk now, and a lot more facets are evaluated. When you're talking about our market, you have: pure inflation risk; you have the basis risk (Tips breakevens versus inflation swaps); and you have CPI fixing risks. The latter is a relatively newer issue because, when the derivatives markets started developing in 2003, a lot of the derivatives, zero-coupon swaps in particular, that were done were relatively longer term, because they were supported by the corporate-linked issues at the time and so maturing in several years from then. Of course those several years have now passed and now a lot of those CPI fixings, which determine the zero-coupon swap payments, are only a couple of months away or have passed over the past couple of years. So you have that fixing risk, you have the seasonality risk, which is also a component of that fixing risk. Then you have the risks of deflation – a lot of the outstanding options are, effectively, deflation floors. Some of them are in the money because CPI started to fall after July last year. You also have breakevens and inflation swaps that went through much narrower levels than ever before and the bonds with the higher base CPI all of sudden had embedded deflation floors with non-trivial values, which also show up in the corresponding asset swap.

Mihir Worah: So are these showing up on the trading desk or your bank's risk management radar too?

Nikolay Stoyanov: They are showing up on the risk management radar as well. But, at the end of the day, I'm very concerned about knowing those first, because – as we found out last year – whatever risks one has, as small as one thinks they may be, can significantly affect the portfolio one way or another.

Allan Levin: I would say that due to the extreme volatility that we experienced, last year, any small residual risks in our books became blatantly obvious, and there's no doubt that all of us increased our focus on risk management to a large degree and have become much more careful in managing even the smaller risks in our books. It's not that we are unwilling to take risks. We will take risks that we believe to be appropriate and sensible, not the ones we're concerned about.

Risk: **From your side of the fence, what opportunities are developing in the inflation market and, in particular, how is the option market developing? Also, are constant maturity swap (CMS) caps a legitimate way to hedge inflation?**
Jeremie Banet: It has been an extremely large challenge for us. Most of the banks reclassified their risk last year, and the inflation volatility is now classed as exotic and illiquid. Marking-to-market the risk, and especially deep out-of-the-money floor, has been challenging. We know that that is the kind of risk that, if you take it on, you can't mark-to-market seriously. The only way to deal with it is on a dynamic hedging perspective, which means that, if we are again in a distressed situation, we won't be able to get out of that risk. As a result, that creates a premium on the product, and it has been difficult to answer the demand from customers for those products. Pretty much everybody perceived the fact that the outlook for inflation can either be deflation or hyperinflation and pretty much everything you want in between. At some point in 2008 a lot of the demand was in high strike caps. Through all the deflation threat we had last year, those caps did not come down. You could not mark them down, so you would have inflation at -2% and still, if you were trying to get an offer for those products, the offer would be exactly at the same level. That is one issue.

As the question points out, probably the best way to hedge against inflation right now is through nominals. Nominals have real inflation components, and probably buying swaps and payouts is the best way to protect yourself against that part, even though it is actually pretty expensive.

Joshua Schiffrin: Finally, on these points, while right now the inflation volatility market is largely one-sided, I think ultimately it will be up to the market price to adjust to find where the other side of the trade is. Similar to the way asset swap spreads blew out because the balance sheet was very precious, the market had to find a level where those with balance sheets would provide it. Ultimately, the same thing will happen to the inflation volatility market. Eventually, the clearing price will be found, and those who view the implied volatility levels as extremely high will choose to hedge the risks inherent in their portfolio. While right now that market remains quiet, I think, if clearing price is found, then the market will adjust and you will see volumes in that market eventually.

With respect to the CMS caps, under certain scenarios they provide a replicative strategy to protect against inflation, but I also think it's instructive to look at the period from 2004 through mid-2008, where you had a little bit of an inflation creep where inflation was consistently a little above the Fed's target, but the nominal bond market was more focused on a potential declining growth, and never actually re-priced the securities to price in any longer-term inflation risk. In that scenario, where you have a consistent stream of 3%–3.5% inflation that the market views as temporary, the CMS caps were not proved to be something that pays off in scenarios of higher inflation.

Allan Levin: We are starting to see liquidity in some options, albeit just in one or two. The one example is five-year zero-coupon floors, i.e. when issuing a zero coupon inflation swap, we guarantee that inflation over the five years won't be less than zero. We have started to see a two-way market develop in this particular option. The reason is that it's easier to hedge as it reflects the redemption floor in five-year on-the-run Tips. Seeing this market develop is a good sign for the future of the volatility market. We are likely to see participants take relative value views between this type of option and, say, year-on-year options. My colleagues in Europe who trade options in euro and sterling inflation markets have seen a dramatic increase in volumes being transacted. My own feeling is that the activity will migrate to the US. It will take a little bit of time – it may be this year or maybe next year – but undoubtedly the liquidity is improving and we will find that, at some point in time, an explosion of activity may lead to a much more liquid and easily tradable option market.

Joshua Schiffrin: It is important to highlight that the option Allan mentioned is really only in existence because it's the exact option that is embedded in the Tips structure. While I'd like to say that I believe it will float through into a structure that will enable the accounts who are currently looking at the CMS cap as a mechanism to hedge inflation risk, I don't think that you can really translate that one-look Tip-like structure into something that will make the inflation volatility market more liquid. I take the view that that is more of an isolated case and that, until you see a real other side of the trade in the exact structure for which the demand is met, the inflation volatility market for that type of structure will remain largely shut. I'd love to hear other people's views on this.

Jeremie Banet: Last year a couple of shops that were leaders in the inflation market would not even price the floor of the Tips. I think it's going to take a lot of time before we really develop that market, just because even now there is some disagreement around the more tradable part of the inflation volatility market. There is now probably consensus on how to price those asset swaps, even though some at some point of the curve did trade at a bizarre level, but now consensus is pretty much done. How can we really imagine that we're going to start to have a real smile, and a real volatility market? It's a very complicated product, and I don't think we're there yet.

As more and more people gain an awareness of their underexposure to protection against inflation risk, this market can only grow and develop

Mihir Worah, Pimco

Risk: Moving on to a slightly longer-term perspective, let's talk about building up the market for inflation products in general, first from the buy-side. How is Pimco involved in developing this market further in the long term?

Mihir Worah: There are several ways in which we are involved in this market, most of which are hopefully further developing the market. The first one is, just as large active participants in the market expressing views in the inflation market that may be market consensus, may be against market consensus. To the extent that we can help develop a two-way market in inflation derivatives, that certainly helps others. Another way is obviously – and I don't want to make this a marketing thing – because of our stability and long-standing presence in many markets. Just our involvement in the inflation derivatives market gives comfort to many other investors, who would not otherwise be investing in the market. The third way is, with the stable and long-term balance sheet, our investment horizons are sometimes a little bit longer than many of the people in the market. When there are liquidity pressures in the market and valuations get extreme on a short-term basis, we will step in and provide liquidity to the market and hope to earn some of that liquidity premium for our clients.

In other aspects, many of our clients are interested in overlay strategies – in inflation in a non-funded form – so, this has to occur in the derivatives market. We have products based on interest from clients that are upcoming in the future, that involve essentially are entirely based in the inflation derivatives market, and have no exposure to the cash Tips market at all. A final one is what we touched upon earlier, which is to try to bring issuers of payers of inflation into the market – issuers who are natural payers of inflation, who don't want to lay this off via an inflation swap – and so provide another source of liquidity into the inflation derivatives market. We are in active conversation with issuers. To the extent that we can agree on pricing, and we think that pricing is useful to our clients; we are encouraging corporations and municipal districts to issue directly into the inflation market. Hopefully all of these will, in the long term, help to grow the market.

After a couple of cycles like this one, people will basically be more aware of what the opportunities are, and that should create a bit more stability in the flows and moves in that market

Nikolay Stoyanov, Barclays Capital

Risk: **How do you see the market for inflation products developing over the 12–18 month window or even longer term?**
Joshua Schiffrin: The outlook for actual future inflation is highly uncertain. The inflation arena will be one to which more and more people look to lay off risks to both rising and falling prices. As such, the inflation market is an extremely exciting place to be and, as economic indicators have become more volatile, we've seen more participants enter the market. We've seen a greater sophistication and greater breadth in accounts transacting in the market, and I think we'll continue to see development and growth in the derivatives market over time, as we've seen. When I look at the landscape of interest rate products as a whole, I'd be surprised if everyone around this table didn't agree that inflation is probably one of the biggest growth areas at their respective firms.

Allan Levin: There are some very clear trends. One of them is that many of our clients who never used to hedge inflation historically are going through stages in their approach to inflation. First of all, they're hedging any explicit inflation exposures that they have. Secondly, they are looking to hedge implicit exposure where their exposure is not quite consumer price inflation but very similar. The third stage, which we are starting to see happen as well, is that for many of our clients – in the same way that they are very concerned about inflation – their own clients are concerned about inflation and they're developing products themselves that will provide inflation protection to an even broader market. I think all of these are adding much more liquidity to the market, many more participants, many more types of trades. I believe this is a market that is going to grow and mature very nicely over the next two years.

Nikolay Stoyanov: What I've started to see – and I'd like to see more of it – is basically greater awareness and sophistication among investors about the inflation market; whether it is Tips or derivatives. If you look back a few years, you could notice that, when inflation was running high and there were inflation fears about the future, that's when the most active buying of inflation happened, but that's also when the priced inflation was at its highest. Somehow, when inflation fears are subdued at points in time and lower future inflation is priced into the market, all of a sudden people lose interest, but logically that should have been the better time to hedge those risks, because then it was cheaper to do so. After a couple of cycles like this, I believe that people will basically be more aware of what the opportunities are, and that should create a bit more stability in the flows and moves in that market.

The events of last year, as already mentioned, underlined the importance of balance-sheet and funding considerations and, to that extent, I'm sure in the eyes of many, zero-coupon inflation swaps – although as an absolute number looks higher than the corresponding Tips' breakeven inflation level – now represent a good alternative. It is not that they are a more expensive alternative per se, they are at a higher level because they price in the value of the balance sheet. Correspondingly, today's more acute awareness of balance-sheet usage should, in its own right, provide a more stable demand for zero-coupon swaps as a valuable alternative to breakevens.

Jeremie Banet: I think the growth is actually going to come from home, and that European and Asian accounts have led the way in terms of sophistication and entering derivatives. But my hopes are that, within the last six months, domestic accounts – bank ALM, insurance, real money accounts and, hopefully one day, pensions – really developed their infrastructure to be able to trade inflation and you can really see that there is a much bigger domestic concern for that market, and a much wider interest in that market. I think that's where most of the growth will come from, because six months ago 80% of those people couldn't trade, and I think, in a year's time, most of those accounts will be set up and will provide a lot of liquidity. I think the future of our market is going to be liquid; it's going to be very flow- and linear-driven, active and, hopefully, tomorrow's swap trader.

Mihir Worah: I'd like to add to that, as far as looking forward, one should combine the two markets the inflation derivatives market, and the flipside of that, the cash or Tips market. We all know that the US Treasury has made a commitment that they will not only be behind the Tips programme, but the Tips programme is not going away and is likely to increase in size. I believe that this increase in size is going to be met with increased demand, to the extent that the commitment of the US Treasury to the Tips market starts bringing in more participants like domestic funds. Many of the larger pension funds have been worried about the commitment to the Tips programme. In fact, that commitment wasn't very clear during the last administration. With this new administration, it's very clear that the Treasury is committed to the Tips programme. It's trying everything it can to improve liquidity in that market. It's going to increase the size of that market and this flows through into the derivatives market and brings more participants. All in all, as more and more people gain an awareness of their underexposure protection against inflation risk, I think this market can only grow and develop.

Allan Levin: I see some specifics that may be worth mentioning. I agree that we will see growth from the local players in the US dollar market, especially the pension funds getting more involved. The fact that the foreign investors have come into the US – they are not going to go away – they're going to remain involved, and I think we will see more products developed specifically for them. I expect to see more relative-value-type views taken by clients, where they are taking views on, say, European inflation versus US inflation. I expect to see more products where we will introduce fixed foreign exchange rates into the contracts, where a foreign investor can invest in the US market but in a way that they are not exposed to the exchange rate risk and can thus take a view based on inflation itself. So I expect there will be some new developments around making products more amenable to overseas players.

There are a number of other trends that I see happening. One is the potential 30-year Tips issuance next year. As a result, we are likely to see much more liquidity at the long end of the US inflation curve, and many more 30-year, or perhaps even longer inflation swaps trading in the US market.

Furthermore, as much as it's been difficult to trade in inflation floors or caps, given the experience of the past year, I'm still optimistic that the option market will develop. The fact that it has developed in Europe gives us every reason to believe that it's very likely that it will do so in the US sooner or later. There is a lot of potential growth in products with embedded inflation optionality. One last trend I would like to mention is that we are seeing interest in hybrid products, products that combine inflation plus other asset classes. We have investors that typically invest in, say, equities and want to protect themselves against inflation at the same time. Accordingly, we will see products that combine different asset classes, whether its inflation and commodities, foreign exchange or equities.

Joshua Schiffrin: The bottom line for me is that today's Tips and inflation derivatives market looks completely different – almost completely unrecognisably so – from when I was first involved in this product in 2003. I think, if we are sitting around the same table in six or seven years from now, it will look completely different than it does now. I think it will be bigger and there will be more clients involved; and I think the growth rate among banks and end-users will have shown to be tremendous, as it has been over the past six years.

Risk: **D'Arcy, as a broker, this must sound very exciting.**
D'Arcy Miell: Let's be honest, it certainly is exciting. One thing I'll say, from my perspective: this year we've seen much more liquidity in the long end of the curve, such as 20-year asset swaps and 20-year zero coupons. I think this is a good indication of the expansion of interest from banks.

BGC wishes to thank all participants for their valuable contributions to this roundtable discussion and we invite any feedback and anyone interested to discuss these issues now and in the future.

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