

Innovation in Finance

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Your Excellency, Deputy Prime Minister and Minister of Finance,
Distinguished Guests,
Sabah-al-khair and a very good morning.

As always, I am pleased to be here. Thank you Mr. Banks for your kind introduction and for inviting me to speak before this august gathering of professionals. I also commend you and your team on organizing this conference of great significance.

Today, I will be speaking about 'Innovation in Finance', or rather a few dimensions of it, to be more precise. It goes without saying that innovation has been one of the key drivers of growth, productivity and prosperity across countries and over time. The role of innovation is well recognized in economic literature; Joseph Schumpeter, an Austrian economist, has expounded how the innovative entry of entrepreneurs serves as a disruptive force. He argues that it is "not...competition which counts but the competition from the new commodity, the new technology, the new source of supply, the new type of organization..." To him, it is this process of '*creative destruction*' that helps lift growth and boost productivity.

In the field of finance, the role of innovation can be discussed from a variety of angles; after all, our modern world of finance is an innovation in itself, under a constant evolutionary cycle spanning over decades. Yet, given the broad nature of this topic, I would like to talk about innovations in finance from the standpoint of three key set of players; *central banks*, *financial institutions* and *technology firms*.

These players have introduced innovative *policies*, *products* and *systems* in the face of incessantly changing demands of their respective mandates. Against this backdrop, I would like to share a few examples of innovative developments, along with a brief assessment of their risks and rewards.

Central banks and innovative policies

Let me start with central banks. One relevant example of central banks' innovative approach towards policymaking has been the use of unconventional monetary policies (UMPs) in recent years.

You will recall that in the wake of global financial crisis, the central banks of major advanced economies provided substantial emergency liquidity support to their battered financial systems. Moreover, policy rates were swiftly slashed in successive intervals - for instance, the Federal Reserve cut interest rate from 5.25% in July 2007 to between 0.00% - 0.25% by January 2009. Likewise, the Bank of England lowered its policy rate from 5.75% in July 2007 to 0.5% by March 2009.

However, even as the policy rates hit the zero-lower bound through successive cuts, financial markets remained in turmoil, real output kept declining and threats of below-target inflation loomed large. As economic theory would tell us, central banks were confronted with a liquidity trap at the zero-lower bound. No longer being able to cut nominal rates any further, central banks in major advanced economies were compelled to adopt an innovative policy stance. So the central banks pursued UMP, and rounds of quantitative and credit easing were introduced.

It is true that the use of quantitative easing (QE) was not entirely a novel concept as the Bank of Japan had pursued the same since back in 2001. However, the scale, the length and the impact of QE and other innovative measures introduced since 2008 have been unprecedented. The Federal Reserve alone conducted three different rounds of QE programs, purchasing financial assets worth more than USD 3.5 trillion - an amount roughly equal to the size of Germany's economy.

On the positive side, these innovative policies have definitely helped in improving credit conditions, providing liquidity, bringing yields to historically low levels and lifting growth. Without such measures, we may have seen a repeat of conditions last observed during the Great Depression of 1930s. Though recovery is still somewhat fragile and uneven across the major advanced economies, the economic outlook has turned clearly positive in both the US and the UK.

Yet the pursuit of UMPs has also spawned debate about their unintended consequences, their diminishing efficacy and their serious implications for global financial stability.

I would like to highlight a few concerns in this regard.

First, the UMPs have helped pushed interest rates in many advanced countries to record low levels. In fact, rates in the Eurozone have turned negative - which effectively means depositors are being charged to make deposits. As the Bank for International Settlements has pointed out in its latest Annual Report, 'boundaries of the unthinkable in monetary policy are being tested in the Continental Europe'. With interest rates at record lows, risk taking has increased as investors continue to search for yield. Returns on risky and non-risky assets have sharply converged, evident from the extreme compression in sovereign credit spreads in the Eurozone. This has increased the danger of mispriced sovereign risks. Moreover, with short-term rates at zero lower bound, investors are investing in long-dated securities at very low yields, pushing even term premium into negative territory. These investors are likely to suffer significant losses when long-term yields ultimately normalize.

Second, with ultra-loose monetary policies, prices of financial assets have seen a rapid climb. This has increased the risk of a hard landing in the future particularly when the current level of liquidity is ultimately withdrawn.

Third, despite historically low interest rates, the impact on real economic activity has remained limited amid weak investments. As the International Monetary Fund once put it, 'there has been a lot of *financial risk taking* but little *economic risk taking*'. The transmission of an easy monetary policy into the real economy has been limited, particularly in countries where banks' balance sheets remain weak.

Fourth, UMPs have also caused significant portfolio rebalancing amid shifting capital flows. Between 2009 and 2012, emerging markets received about US\$ 4.5 trillion of gross capital flows, as investors rebalanced their portfolios away from US Treasuries in search of higher yields. We also witnessed the vulnerability of emerging markets in the summer of 2013 when the 'taper tantrum' led to a sharp reversal in capital flows. That experience also reminded us that UMPs have global implications, despite that the monetary policy mandates of the central banks are still domestic.

Fifth, despite enhanced communication of policy paths, the timing and pace of reversals in UMPs can rattle markets. In any case, orchestrating an orderly exit would not be easy. If central banks exit too early, they run the risk of choking off otherwise nascent growth in their respective economies. If they exit too late, excessive liquidity may cause asset price bubbles, making the financial sector more vulnerable in the future.

A related complication is the divergence in monetary policies across advanced countries; while the US and UK are preparing for their first lift-off in over eight years, the ECB and BOJ are continuing with their ultra-loose policies. So even if entry into this innovative and unconventional territory of monetary policy has been well coordinated, divergence in policy paths would make an orderly exit more challenging, not only for the countries concerned but for the global economy as well.

At this stage, let me highlight another equally important innovation in policymaking - the use of macroprudential tools.

As we have learned from the recent global financial crisis, ensuring stability of individual banks through a microprudential approach fails to preserve the stability of the system as a whole. With this realization, regulators are supplementing their existing microprudential toolkits with macroprudential measures - aimed at addressing systemic vulnerabilities across institutions and over time. Though the concept is not entirely new, macroprudential policy is increasingly being recognized as a valuable tool to address specific financial stability issues where the use of monetary policy on its own appears too blunt a tool to be entirely effective. However, challenges have also emerged about the appropriate calibration of macroprudential tools, effective coordination among various regulators and even the potential implications for central banks' independence.

Since I have discussed these issues in detail in my speech at this forum last September, I would prefer to move on to the next part of my discussion.

Financial institutions and innovative products

This brings us to the second set of players I mentioned at the beginning - financial institutions and their innovative products.

The pace of innovation in financial products and instruments has been particularly staggering in the run up to the global financial crisis. For instance, within 10 years leading up to 2007, the total outstanding value of interest rate swaps and other derivatives surged from \$75 trillion to \$600 trillion, almost eleven times the value of global GDP. During 2007 alone, the global derivatives market grew by almost 50%.

On the positive side, the development of innovative financial instruments has empowered institutions to accomplish their financial requirements and effectively hedge their risks. Individuals are also better able to smooth out their consumption over time. Likewise, the availability of catastrophe bonds and weather derivatives have helped countries insure against risks from natural disasters and adverse weather events.

But the growing complexity of financial instruments (e.g: CDO-squared) has also generated debate whether financial innovations have gone too far. Warren Buffet once argued that complex financial instruments with opaque structures were 'financial weapons of mass destruction'.

In general, the pooling and dicing of risks has enabled investors to take risks that specifically suit their risk appetites. It has also resulted in cleaner pricing of various dimensions of risk. Yet the pooling of risks is also likely to reduce the screening of risk *ex ante* and monitoring of risk *ex post*, a problem that was quite evident in the case of subprime mortgages in the US. As we witnessed, end-investors had little incentive to monitor the performance of loan originators, assuming originators had enough stakes in the securitization process. However, loan originators preferred to chase volume, thus seriously compromising on their lending standards.

As this example highlights, the very strength of innovative products, which at first enabled us to pool and transfer risk, had in the end disastrous consequences amid misaligned incentives and poor regulatory oversight.

Given such experiences, we need to strike a balance by providing a conducive environment for innovation but at the same time ensuring that innovations serve a meaningful purpose and do not become an end in their own right.

Technology firms and innovative systems & processes

Let me now turn to the third and final point of my speech; the tech firms' innovative solutions. Instead of discussing the role of tech firms in finance per se, I would like to share a few examples of technology driven innovations and their effect on financial systems and processes.

Indeed, technology has virtually transformed everything in finance, from our trading platforms to payment networks. Consider stock exchanges where computer technology has revolutionized the trading of stocks in recent decades, making it faster and more efficient. Now, with electronic trading platforms, millions of transactions are daily conducted over computer screens with buyers and sellers spread across the globe.

Likewise, technology is helping the developing countries achieve financial inclusion at a scale that was unthinkable before. The ubiquitous presence of mobile phones in countries with limited banking outreach has helped provide a variety of financial products and services to otherwise unbanked or under-banked poor people.

While the transformative impact of modern payment and clearing systems is beyond argument, we also face the daunting task of keeping our systems safe, stable and, above all, up and running. You may recall that on July 8th this year, computer systems at the NYSE went down for nearly four hours in the middle of the day, bringing to a halt the epicenter of America's financial markets. And this was not the first event where technical glitches put the markets out of operation. In April last year, trading was halted briefly on Chicago Mercantile Exchange, the world's biggest future market. Likewise, NASDAQ went down in 2013 for three hours due to a software bug. While these episodes are still rare, the impact is massive, thanks to the substantial interconnectivity of our systems and markets.

Moreover, with the growing footprint of modern technologies, the nature of risks has also evolved significantly. As various hacking episodes illustrate, now fraud can be perpetrated swiftly, remotely and on a massive scale. While the chances of frauds like tampering with cheques, as shown in Spielberg's *'Catch Me If You Can'* are getting remote, the risk of cyber-attacks is on rise. In 2013, hackers stole the personal financial data of 70 million customers at 'Target', a major discount retailer in the US. The breach cost Target more than \$150 million and the CEO his job.

Conclusion

To conclude, every innovative policy, product or a system brings its own unique costs and benefits. It needs to be ensured that benefits of any such innovation must outweigh its costs, at least in the long run, if not immediately.

Admittedly, it is difficult to reliably predict the negative outcomes of an innovation. A key challenge is that our earlier experiences are a poor guide when it comes to determining the outcome or impact of innovations. Innovations are by their very nature a departure from the past. And ironically, the more radical that innovations are, the less useful our past experiences become.

Still, societies need to encourage innovation as maintaining the status quo is not a solution. After all, standing still would mean falling behind, particularly in a world that is pacing forward.

Thank you for your attention.