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Genesis of the 2008 global financial crisis and challenges to the neoclassical paradigm of finance

Abstract: The paper presents the genesis of 2008 global financial crisis, discusses systemic changes in the financial world, and rises the question about the need for the new paradigm of finance in the lieu of the witnessed turbulent processes. A hypothesis is formulated that the neoclassical theory of finance lost its credibility due to systemic changes that have happened within institutions, markets, and instruments over the last three decades. It is suggested that the theory should be modified in line with dynamically changing financial environment. Conclusion is reached that an interdisciplinary approach is needed in the search for an adequate theory of finance.

Keywords: paradigm of finance, transformation of financial markets, financial crisis.

JEL codes: G1, G2, F02.

Introduction

2008 abounded with financial markets events on the scale and scope often compared to the Great Depression that happened in the 1930s. Global problems of the financial sector, loss of liquidity by the recently still very credible institutions, drastic devaluation of assets and a significant growth in the volatility of the stock and commodity markets – all these factors give rise to the questions that are very often difficult to answer on the grounds of the neoclassical financial theory.

In the first step, this paper briefly discusses the macroeconomic background of the recent market turbulences. It also discusses market developments and specific financial instruments that greatly contributed to the scale of the crisis.

Further on, a wider approach is taken. We look at systemic changes that the global economy, and financial markets in particular, had undergone. We wonder if the these transformations and their effects so dramatically demonstrated in 2008, give grounds to modify a theoretical background of finance and to search

for a new paradigm that could better describe processes occurring in the global financial market.

1. Genesis of the 2008 crisis

The 2008 crisis can be associated with a number of macroeconomic issues and imbalances in the global economy, originating in the U.S. economy.

One of the material ways in which the U.S. economy influenced the world economy was through its high import demand which led to an increasingly unfavorable external trade imbalance. Such imbalance always appears when the consumption exceeds production in a country. Additionally, it was fostered by the long-term policy of China aimed at maintaining the undervalued exchange rate of the Chinese currency. The deepening trade deficit of the U.S., and the interventions in the foreign exchange market aimed at preventing the RMB appreciation, resulted in the fact that significant foreign exchange reserves were accumulated in China, denominated mainly in U.S. dollars. According to the data of the International Monetary Fund, since 2006 China has outrun Japan and has become the largest holder of foreign exchange reserves in the world. It is estimated that at the end of 2008 the value of those reserves amounted to over 1.9 billion USD. The other leading Asian economies (Japan, South Korea, India, Taiwan, Singapore and Hong Kong) gathered reserves of 2.1 billion USD. Hence, together at the end of 2008 Asia held approximately 60% of the entire world foreign exchange reserves, which were estimated to amount to the total of 6.7 billion USD. The IMF estimates that 64% of the world foreign exchange reserves are denominated in the US dollars [*Currency Composition...* 2009]. The data quoted above do not include the funds accumulated in sovereign wealth funds being the primary destination of the USD surplus from crude oil export.

Besides the increasing external account deficit, the U.S. economy was also threatened by a growing internal budget deficit. Although the US still recorded a budget surplus over 1% in 2000, after the first term of office of G. W. Bush the deficit already amounted to 4.3% GDP and indicated a further decline tendency. The growing budget deficit was caused by relatively lower revenues resulting from a temporary economic slowdown directly after the dotcom bubble burst and after the terrorist attacks of 9/11, but also by tax cuts introduced by G.W. Bush on two separate occasions. On the other hand, budget expenses were on a significant rise, due to, among others, financing the war in Iraq and the war on terror. Lewis (2004) and Chinn (2005) had warned against the impossibility of maintaining such a twin deficit long-term long before the crisis occurred.

Financing the American budget deficit required vast sales of treasury bills. Nevertheless, investors accepted low yields on American debt because of the cred-

ibility of the U.S. Treasury Department. This was mainly the case with the Asian investors who, as a result of the lessons learned from the Asian crisis of 1997, were eager to invest foreign exchange surpluses in U.S. treasury securities. Hence, it may generally be said that the capital that was flowing out of the United States to Asia as a result of the trade imbalance was coming back to the United States, financing its debt relatively cheaply. Warnock and Warnock (2005) estimated that the inflow of the official foreign capital to the United States affected the decrease in profitability of 10-year treasury bills by about 150 basis points.

The expansive fiscal policy of the U.S. government had for a long time been accompanied by the low interest rate Fed policy. The interest rates in the United States were significantly reduced after the dotcom bubble burst in 2000/2001. The reduction was to ensure the economy's soft landing after massive numbers of Americans lost their savings in the dotcom mania. The low interest rate policy was additionally reinforced by the 9/11 attacks on the World Trade Center. To avoid the negative economic consequences that could arise from the anxiety related to terrorist attacks, decisions were made to maintain cheap financing.

On the basis of a combination of the above-mentioned relaxed fiscal policy and low interest rates, the United States created a boom in the economy, much higher than that of the majority of other developed countries. For example during the period 1991–2005, the U.S. economy was developing on average about three times faster per annum than the economies of the 15 states of the so-called old European Union. However, the boom was mainly based on consumer demand and on the expenditure on housing which had been particularly booming since 2006. The American society, with its traditionally low-saving tendencies, took advantage of the benefits of cheap money and continued to go deeper and deeper into debt. Life on credit became standard.

At the same time, the long-lasting foreign trade imbalance and the combination of the expansive fiscal policy and low interest rates led in the end to a material depreciation of the US dollar against other leading world currencies, in particular against the EUR. Asian and Arab countries became a sort of hostages of their own foreign exchange reserves denominated in US dollars. On the one hand, they suffered increasingly from the dropping dollar, and on the other hand even announcements of possible corrections in the foreign exchange reserve structures by increasing the share of other currencies were causing nervous reactions of the market and sharp depreciation of the dollar¹.

When the interest rates started growing again and reached their highest level in 2006, many households faced problems with debt servicing. At first, the problem

¹ For example, on November 7, 2007 the vice-director of the People's Bank of China suggested that at the time it was ineffective to base China's reserves on the USD and that it was worthwhile to consider a stronger currency. This suggestion of selling out the US currency by China immediately caused the dollar to drop against the leading world currencies.

affected Americans with the lowest creditworthiness, who had nevertheless been granted risky mortgages. Financial institutions were even willing to lend to people who could not demonstrate permanent employment, regular income, or any material assets. Such persons were referred to as NINJA (No Income No Job or Assets). This situation was based on securing the loans on properties the prices of which had continued to grow during the previous years.

However, in the end, the property values began to fall, which also meant that the value of securities accepted by banks upon granting the loans was also decreasing. In case of a borrower's insolvency, banks could not fully recover the extended loans and had to write off reserves for bad or uncollectible debt. To obtain the capital required to increase the lending, banks very often borrowed money from other institutions or issued special securities based on the portfolio of the previously extended mortgages. At that point, they too were in danger of insolvency because borrowers found it difficult to repay their current installments and interest. Banks suddenly had trouble with servicing their own indebtedness which, to a large extent, was to be synchronized with the payments received from customers.

This was the beginning of the mortgage market crisis, which gave rise to much turbulence in the financial markets. The direct source of the problem was the overheating of the property market boom, which in turn resulted, among others, from the excessive supply of cheap money in the economy. However, a massive accelerator to the crisis came from the derivatives market.

Two kinds of financial products are of particular interest in this case: collateralized debt obligations (CDOs) and the so-called credit risk swaps (CRS). Issuing CDOs helped credit institutions acquire new lending funds from the market on the basis of their previous lending portfolio. It was assumed that the funds to service CDOs, that is, to cover current coupon payments and to buy out the bonds in the future, would come from the cash flowing from the already acquired borrowers. The bonds based on diversified and collateralized mortgage portfolios were placed in the market as relatively safe instruments. They constituted a source of cheap capital for lenders and encouraged them to continue credit expansion.

Alternatively, CRS made it possible to transfer the risk of borrowers' insolvency within a given claim portfolio from a borrower onto another entity. The ease with which new lending funds could be obtained and the possibility of transferring the risk onto another entity prompted lending institutions to accept applications from clients with increasingly low credit scores. Lenders were interested in maximizing their credit sales, as they earned profits primarily on credit service commissions and on the differences between the credit cost and their own financing cost.

These two transaction types were among the factors contributing to the fact that mortgage-related risk became widespread throughout the entire financial sector, both in the United States and globally, even among financial institutions that did not have operations in the United States at all or which did not offer financing di-

rectly in the mortgage market. Mortgage-based derivatives became the main cause of the unbelievably strong domino effect that characterized this crisis.

The last component worth mentioning with regard to the genesis of the global crisis is the pricing of commodities, particularly crude oil prices. Since the beginning of 2002, there was a dynamic price growth in commodity markets which reached its peak in mid-2008. Initially, it seemed that the growth was justified in the context of an intensified demand for commodities from fast-developing economies. However, the growth dynamics of commodity prices was much higher than the accompanying increase in global demand. A significant portion of raw material appreciation was caused by investors' speculations. They started treating crude oil or copper, for example, as ordinary financial assets they could invest in with their surpluses of cheap money and the expected further growth in demand; hence, prices increased.

In 2006, oil exporting countries became the biggest source of capital in the world. An inflow of petrodollars resulted both from a rapid increase in oil prices and from the rising volumes of oil export. Contrary to classic foreign exchange reserves of central banks, which are usually conservatively invested in safe governmental debt securities, petrodollars also funded higher-risk investment in various segments of the capital market. A significant portion of that capital found its way to the world markets through independent investment funds, governmental agencies, state-controlled investment companies, and individual wealthy investors. The McKinsey Global Institute (2008) estimated that in 2006 only, 200 billion petrodollars went towards global stock markets, 100 billion USD were invested in debt securities, and about 40 billion USD were fed into private equity funds. The capital was mostly allocated in the United States and Europe, which contributed not only to the drop in profitability of debt securities, but also to the reduced cost of equity and to maintaining favorable trading on stock exchanges and in the commercial properties market.

2. Systemic changes in the financial world

Over the last two decades we have witnessed processes of economic globalization, increasing international and inter-industrial ties, growing global macroeconomic imbalances, and strengthening competition both on local and global markets. The financial sector has been a subject of particularly significant changes. Transformation, or rather revolution as one should say, took place in three main areas: within financial institutions, in the way of organization and functioning of financial markets, and among financial instruments.

During the last 20 years investment banks have greatly gained in importance. Holding capital amounts in many cases greater than state budgets of many countries,

investment banks became global players with a wider and wider profile of activities, beyond traditional understanding of investment banking (greater spectrum of investing on own books, including pure speculation, tendency to engage in areas reserved previously for insurance companies, growing connection to retail banking and consumer finance). The segment of investment funds has changed, too. Speculative funds and hedge funds have been developing dynamically and gained a vast share in the asset management market. A completely new category of institutions – sovereign wealth funds – has also emerged. They supply lots of capital and often provide liquidity when it is needed, but on the other hand their appearance has raised a question about geopolitical and strategic criteria in asset allocation. These state controlled investors may have other than purely financial criteria of investment. Finally, not without an impact on the institutional sphere was the liberalization of the US law. The Depository Institutions Deregulatory and Monetary Control Act of 1980, among others, gave birth to development of non-banking financial organizations targeted at high risk lending, including mortgages offered to people with low creditworthiness (so called NINJA).

Financial market trading platforms have also been subject of vital transformation. We have witnessed a process of consolidation of exchanges and a tendency to cross-list the same financial instruments on different markets over the globe. Development of telecommunication means, and the Internet in particular, made dealing with financial instruments really global and active practically 24 hours a day. Exchanges started to implement electronic trading systems, gradually diminishing the role of the traditional human factor (market makers). Automatic order systems have gained in importance, particularly among big institutional players. Volatility has greatly increased in almost all categories of assets. Volume and value of transactions have significantly grown in all markets, but predominantly in commodities and derivatives. These two markets have been subject to most significant changes of systemic character.

Commodities became commonly treated as any other financial assets, and traded to a great extent for speculative purposes. Since the beginning of 2002 we have witnessed a dynamic price growth in commodity markets, which continued and reached its peak only in mid-2008. Initially it could seem that the boom was justified in the context of an intensified demand for raw materials coming from fast-developing economies. However, the growth dynamics of commodity prices was much higher than the accompanying increase in global demand. Investors started treating e.g. crude oil or copper as ordinary financial assets in which they could invest the surplus of cheap money, hoping for further growth in demand and hence – also growth in prices.

Even greater and more dynamic changes happened in markets for derivatives. Over two recent decades derivatives have been more and more frequently used for speculative purposes rather than risk hedging, which was their primary purpose.

According to the data of the Futures Industry Association (FIA), in 2007 the total trade volume of derivatives in 54 stock exchanges worldwide amounted to 15.2 billion pieces (of futures contracts and options), whereas in 1999 that volume only amounted to 2.4 billion pieces. The Bank for International Settlement (BIS) estimated that in 2007 the value of the stock exchange trading of derivatives amounted to almost 2.3 trillion US dollars, and at the end of the year the take up value on exchange derivatives amounted to over 28 billion USD. This value should also be increased by the value of derivatives transactions entered into on the OTC market. Statistics concerning the total volume of transactions in the global OTC market are not available but its size is reflected by the actual value of outstanding contracts which the data of BIS valued at 595.3 billion USD at the end of 2007. A vast majority of derivatives transactions concerned financial underlying assets. The share of derivatives transactions associated with non-financial assets (e.g. agricultural produce, energy, precious metals, raw materials) did not exceed 10% [FIA 2009].

One might risk a conclusion that the dynamic development of the derivatives markets led to abandoning the typical function of money in economy, i.e. its traditional currency function. In the beginning, money followed merchandise. When specific goods were purchased, money was used to pay for them. Now, money and goods circulations became largely separated. Money and monetary products became merchandise themselves, with an increasing number of derivative transactions based on them. The volume of trade in the derivatives markets became even 10 times higher than the volume in the markets of their underlying assets. There were two primary reasons for this effect. First, the development of the derivatives market was driven by greed and a chase after profits accompanied by a simultaneous growing tolerance for risk. Various derivatives with built-in leverage mechanism were needed, which, though highly risky, were able to deliver high returns. Second, a high supply of cheap money in the economy facilitated asset monetization, and new derivative products made it possible to trade new asset categories in the financial markets. The most spectacular and, as it later turned out, the most fateful type of asset monetization was the creation of derivatives the value of which was associated with a mortgage portfolio.

3. In the search for the new paradigm of finance

Consequences of the above mentioned changes in financial institutions, markets, and instruments demonstrated themselves particularly in the time of the global financial crisis in 2008. In lieu of those turbulences of extraordinary scale, dynamics, and range, a question has been asked if the traditional paradigm of economics – and within it, the neoclassical theory of finance – adequately describe the economic re-

ality and events occurring in the financial world. Any theory is only as good as its ability to explain or predict the processes actually taking place.

Although questions of this kind have become frequent due to the global crisis, they are not new. In the finance literature of the last two or even three decades, there are many empirical findings which are at odds with the traditional perception of the capital market. In response to a growing number of market anomalies, behavioral finance emerged. This relatively new vein of finance delivers highly intuitive and convincing explanations referring to irrational behavior and psychological biases. In the context of recent market turbulences this it has particularly gained in popularity (Szyszka, 2010). However, there are also doubts if behavioral finance, at least at the current stage of development, may fully replace the neoclassical theory and be claimed as a new theory of capital markets.

Behavioral finance is affected by an ailment typical of relatively young and scarcely penetrated areas of knowledge. That is, a plethora of research carried out in an uncoordinated manner produced fragmentary outcomes that are difficult to cohere into a comprehensive theory. Issues related to investors' behavior and the way it affects valuation of assets are complex. Thus, researchers face much difficulty in specifying all the factors and relationships that describe the phenomena taking place in the capital market. However, limiting attention to selected aspects of the market leads to behavioral models that appear fragmentary and designed only to fit selected peculiarities.

Unlike behavioral finance, the complex and coherent neoclassical theory is replete with mathematical functions and equations that offer predictions of a normative character. This is the main advantage and beauty of well established and neatly designed area of knowledge. The major disadvantage comes from many strong assumptions and simplifications that lay at its foundations. Full rationality of all investors and no impact of psychological biases on asset prices are among those.

Unrealistic assumptions and simplifications are often an unavoidable compromise on the way to build a formal theoretical model. They do not depreciate the theory, as long as the theory generally describes the reality correctly and it is not empirically overthrown. And, this is where the actual problem of the neoclassical paradigm of finance is. Empirical studies conducted on market data for the period when the keystone elements of the neoclassical theory were designed, that is from the end of the 1930s till the end of 1970s, generally did not reveal contradictive observations. Models seemed to be quite nicely fitted to the empirical data from that period. Empirical findings at odds with the neoclassical theory started popping up in the literature in 1980s, and intensified later over the last two decades. In terms of timing, studies on anomalies cover more or less the same period as the systemic changes discussed in the previous section of this paper.

Therefore, a hypothesis may be formulated that the neoclassical theory of finance lost its credibility (understood as an ability to describe the capital markets reality)

due to systemic changes that happened within institutions, markets, and instruments over the last three decades. The theory should be modified in line with dynamically changing financial environment. Among the key elements that should be considered are globalization of financial markets, greater significance of institutional investors, including appearance of the new category of state controlled investors, higher cross-correlation between various categories of assets, monetization of new classes of assets, and increased volatility of almost all economic factors. In other words, the new modified theory of financial markets should take into account that we live in a relatively smaller world (global village), but the world which at the same time is far more complex and dynamic.

In contemporary circumstances an interdisciplinary approach is needed in the search for an adequate theory. The neoclassical paradigm might be seen as an idealized normative benchmark. On the other hand, behavioral finance help explain deviations from this benchmark, showing how psychological biases may cause irrational behavior of investors. Behavioral approach is a valuable supplement when trying to understand financial markets. However, it would be of greater usefulness if it allowed not only to explain events *ex post*, but also if it delivered some normative tools for modeling the market and predicting behavior of investors *ex ante*. Perhaps the theory of finance should also be enriched by other disciplines of science than only psychology, for example neuropsychology, sociology, economic cybernetics, geopolitics. There is a lot to be done. Thanks to interdisciplinary cooperation of scientists we shall learn more about processes taking place in global financial markets, and hopefully we shall be able to built a new coherent theory of finance, reflecting the complexity of contemporary state of affairs.

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