

The financial system of the future

Summary of the 44th OeNB Economics

Conference in Vienna on May 29 and 30, 2017

Christian Beer,
Ernest Gnan,
Manuel Mayer,
Martin Summer¹

Modern economies need a functioning financial system. In principle, the financial system has four main functions: providing a payment system, matching borrowers and lenders, enabling people to manage their personal finances across their lifetimes and between generations, and sharing and managing risk. Despite the implementation of a series of reforms in 2010, including enhanced capital requirements for banks, new banking resolution legislation and the centralization of derivatives markets, the question whether the current financial system is fit for the future remains unanswered. Critics claim that the financial system today is still very similar to what it was before the financial crisis started in 2007. So is the financial system fit for the future? Will its current structure allow it to fulfill its main functions? Do we need further structural changes? If so, what kind of changes? Are tighter banking regulation, an increasing role for shadow banking and the EU's project of establishing a capital markets union the way to go? What opportunities and potential risks do such changes involve? How will technological developments like FinTech and digital money shape the future financial system? To shed light on these issues, the Oesterreichische Nationalbank (OeNB) joined forces with SUERF – The European Money and Finance Forum to organize its 44th Annual Economics Conference in Vienna on May 29 and 30, 2017, on the topic The Financial System of the Future.

In his opening remarks, OeNB Governor *Ewald Nowotny* highlighted the OeNB's long-standing and excellent cooperation with SUERF and shared his appreciation of the collaboration on this year's Economics Conference in particular. He emphasized central banks' commitment to long-term economic stability. This is all the more important – and difficult – in times of fast change. Our ability to forecast future developments and crises has proven to be limited. In the same vein, we should be wary to draw deterministic conclusions on the implications of technological innovation for future developments. We can predict neither the future path of innovation nor the future sources of financial crises. Whatever impact digitization will have on the future shape of the financial sector, it seems reasonable to expect job losses in the banking sector. Both globally and in Austria, downsizing is already underway and is going to con-

tinue. Another significant change is the rise of market-based financing, also in countries like Austria which have traditionally been dominated by bank-based finance. The EU's capital markets union will foster the cross-border integration of financial markets and promote the development of new forms of finance. These trends will, however, be shaped less by technology than by deep macroeconomic parameters, such as growth, demographics, employment and social developments. Nonetheless, framing technological change in a way that best adapts to macroeconomic circumstances and contributes most to favorable economic development is important.

Thomas Drozda, Austrian Federal Minister for Arts and Culture, Constitution and Media, pointed out that financial systems might enhance growth and welfare if they served their original purpose of collecting savings to finance the creation of new productive

¹ Oesterreichische Nationalbank, Economic Analysis Division, christian.beer@oenb.at, ernest.gnan@oenb.at and Economic Studies Division, manuel.mayer@oenb.at, martin.summer@oenb.at. Opinions expressed by the authors of this report do not necessarily reflect the official viewpoint of the OeNB or of the Eurosystem.

capacity. However, if credit is used to buy existing real estate, no value added is created and the risk of house price bubbles arises. To prevent boom-bust cycles, regulators and supervisors need to have adequate macroprudential instruments at hand. Income and wealth inequality may also be a source of financial instability as it prompts the less wealthy to take out loans beyond their capacity to maintain their standard of living. The resulting financial fragility may deepen recessions. Thus, it is necessary to strengthen the middle class and to ensure the sustainability of the welfare state in order to foster crisis resilience. While in theory, integrated financial markets facilitate international risk-sharing and the allocation of capital from surplus economies with ageing societies to catching-up economies, in practice, this process does not run smoothly. Excessive fiscal restraint may lead to deteriorating domestic public infrastructure.

While there is consensus that financial system stability is key for economic prosperity, we may be trapped in a cycle of complacency as long as financial stability prevails – a situation which leads to crises, which in turn trigger better regulation, which then leads to financial stability, complacency, and so forth. To avoid this vicious cycle, those parts of the financial sector that serve a useful economic purpose should be saved in times of crisis, while the rest should be unwound. This requires a workable and credible resolution framework. The legally enacted EU bank resolution framework must now be put into practice. Recent global tendencies to roll back post-crisis regulatory reforms should be regarded critically. Policymakers in EU Member States are urged to stick to the rules they agreed upon at the EU level. Regarding future means of payment, Drozda, while expressing some appreciation for competing private

currencies, emphasized network externalities, which may work in favor of existing legal tender issued by central banks. He stated that various recent reports on the death of cash were greatly exaggerated, as the Austrian government had no intention to abolish cash. By way of conclusion, Drozda urged that we should avoid falling into the trap of “unknown knowns,” i.e. of neglecting insights gained in previous decades, as happened in the run-up to the crisis.

Session 1 was chaired by *Doris Ritzberger-Grünwald*, Director of the OeNB’s Economic Analysis and Research Department, and dealt with the topic of *Digital money and digital banking*.

Michael Kumhof, Senior Research Advisor, Bank of England, discussed *The macroeconomics of central bank-issued digital currencies*. In his view, the emergence of distributed ledger technology (DLT) and bitcoin was a watershed in the history of e-monies. For the first time in history, it may be technically feasible for central banks to offer universal access to central bank money. Kumhof suggests a scheme for central bank-issued digital currency (CBDC) in the form of a universally acceptable and interest-bearing central bank liability, issued against government debt and implemented through DLT, which would compete with bank deposits as medium of exchange. The central bank would grant universal, electronic, continuous national currency-denominated and interest-bearing access to central bank money. The majority of transaction balances would continue to be held as deposits with commercial banks. Credit would continue to be the purview of existing financial intermediaries. While the use of DLT is not strictly required for the operation of such a CBDC system, Kumhof argues that, in practice, DLT would be necessary to ensure system resilience.

Is such universal access economically desirable? Using a DSGE model calibrated to match the pre-crisis United States, Kumhof finds that a CBDC issuance of 30% of GDP (an amount calibrated to be similar in magnitude of the quantitative easing conducted by various central banks in response to the crisis) against government bonds could permanently raise GDP by as much as 3% due to the resulting reductions in real interest rates, distortionary taxes and monetary transaction costs. Countercyclical CBDC price or quantity rules, as a second monetary policy instrument, could improve the central bank's ability to stabilize the business cycle. At the same time, the speaker acknowledged that there remain concerns about managing risks that might arise in the transition to a different monetary and financial regime.

Thomas Puschmann, Head of the Swiss FinTech Innovation Lab at the University of Zurich, discussed *Banking without banks? How will technology transform financial intermediation?* He started out with predicting that in the future, we will transfer values among individuals and organizations directly without intermediaries. After the *internet of information* (1985–2000) and the *internet of services* (2000–2015), from now until 2030 the *internet of values* will be setting the tone. DLT puts an end to its users' dependency on time and location. It rests on decentral (rather than central) organization, transaction validation by consensus (rather than through an intermediary), a chronological (rather than relational) data structure, the impossibility of hidden data changes, and the anonymity (rather than transparency) of users. The blockchain enables new business models, which can be categorized by degree of complexity and coordination, and by degree of novelty. It forms the foundation of a global

peer-to-peer economy. Firms need to reposition themselves in the evolving new financial system. The development of standards and new services requires time and will not happen overnight. Nevertheless, as the first two phases of the internet have shown, early movers may benefit. Financial institutions need to act if they do not want to experience a fate similar to Kodak's or Olivetti's, firms which did not recognize the need to adjust to technological change on time.

In session 2, chaired by OeNB Vice Governor *Andreas Ittner*, *Sir Paul Tucker*, Chair of the Systemic Risk Council and Senior Fellow at the John F. Kennedy School of Government, gave a keynote speech on *The political economy of central banking in the digital age*. In his opinion, the financial crisis has not triggered a fundamental change away from the established fractional reserve banking system. However, it has, re-established the insight that financial system stability is integral to monetary stability because, simply speaking, money is only stable as long as banks are. Monetary stability comprises the stability of the purchasing power of central bank money and the stability of the money deposited in the private banking system in the sense that payment services are reliably performed by the system as a whole. Sir Tucker went on to argue that a "money credit constitution" needs to have five components: a target for inflation, a requirement for banks to hold reserves in relation to their risks, a liquidity reinsurance regime for illiquid but solvent banks, a resolution regime for insolvent banks and constraints on the central bank's balance sheet. Typically, central banks (with regulatory functions) manage both the state's consolidated balance sheet (by issuing money against public and/or private debt) and constrain the banking system's balance sheet with a view to safeguarding financial stability.

This implies many tasks, a need for explanation and justification, and power for central banks, which in turn raises issues regarding the separation of fiscal and monetary policies, and questions about who is to set the rules of the game for the financial system.

Will new technology challenge or even undermine the broad conception of current central banking? Tucker argued that it will not, unless central banks move into providing banking services for everyone, which would make them rather resemble a latent state credit bank. An important qualification for “things to stay the same” is that central banks will need to re-engage with the integrity of the structure and design of the financial system. However, they must be vigilant in not taking on roles that give them excessive power or which do not fit their core purpose of maintaining monetary system stability.

Session 3, chaired by *Martin Summer*, Head of the OeNB’s Economic Studies Division, dealt with *Technological change and the future of financial intermediation*. *Patricia Jackson*, Chair of Risk Committee at the digital challenger bank Atom and member of the EY Global Regulatory Network, opened the session with her presentation on *The future – banks or platforms*. She argued that the recent technological progress, in particular digitization, will lead to fundamental changes with long-term implications for the value chain in banking in the near future. Jackson pointed out that while the entry of new, specialized players will represent a threat particularly to existing retail and SME banks, the possibility of increasing efficiency and decreasing costs entails opportunities as well. The latter is particularly relevant as many banks are facing pressure from high cost-income ratios and increasing regulatory costs. Moreover, Jackson ex-

plained that technologically, the financial services industry is lagging behind other industries, e.g. airlines. Comparing the U.S.A. and Europe, she highlighted that unlike in the U.S.A., regulators in Europe are leading the way in terms of open banking.

An important regulatory development that will change the banking industry in the EU is the revised Payment Services Directive (PSD2), which is scheduled for implementation in 2018 and 2019. PSD2 intends to improve the level of customer protection and to increase competition in the EU payments market by creating a level playing field for all payment service providers, including new players. It enforces the unbundling of banking services, i.e. services typically offered in a package will be split up and offered by different service providers. This might severely affect the entire value chain of credit cards. Another effect of PSD2 is better access to information on payment behavior, specifically via the aggregation of data from banks and savings institutions individuals or companies hold accounts with. Jackson also addressed the challenges PSD2 entails, highlighting in particular that there is still regulatory uncertainty associated with this directive, especially in the areas of customer authentication and secure communication. The enhanced data that have been made available through the digital revolution and relevant regulatory changes have the potential to fundamentally change the banking industry.

Do we have too much intermediation? was the title of the presentation by *John Kay*, economist, writer and Fellow of St. John’s College, Oxford. Kay started with the notion that the current financial system is too complex and needs to be simplified and reduced to its fundamental functions. To a large extent, trading activity in financial markets

results in a zero-sum game with limited value added. Global trade in foreign exchange is about a hundred times the volume of underlying trade in goods and services, and the volume of outstanding exposures under derivative contracts far exceeds the value of global assets. The financial sector has lost sight of its four core purposes as defined above. Over the last 50 years, there has been more and more activity in secondary financial markets trading rather than in primary market operations intended to raise fresh capital. The insurance market shifted from a market of sharing and mutualizing risks to a market for trading risks. The latter concentrated on the transfer of risks from people with information advantages to people with little knowledge of the traded risks. The transfer of risks to less informed market participants played a crucial part in the latest financial crisis, where loans were securitized, split into tranches, repackaged and eventually sold to people who did not understand the underlying risks.

Addressing recent developments in Europe, Kay expressed doubts about the aspiration of creating simple, transparent and standardized securitization of financial assets in Europe, arguing that from his perspective, capital allocation and risk transfer are activities that are by their nature difficult to standardize. Furthermore, he disagreed with the frequent argument – as brought forward e.g. in the debate on European capital markets union – that continental Europe should follow the “Anglo-American model” of financial markets. Kay concluded that we need less intermediation in financial markets than we have today. However, despite the technological developments that we have seen in the last decades, there still is, and will be, a need for financial intermediation. Lending and equity financing of new businesses requires experience,

judgment and skepticism, and these are characteristics for which it is very hard to find technological replacements.

Session 4, on The capital markets of the future was chaired by Ernest Gnan, Secretary General, SUERF, Counsel to the Board and Head of the OeNB’s Economic Analysis Division. The session was opened by Nikolaus Hautsch, Professor at the University of Vienna, who elaborated on *High-frequency trading: costs and benefits*. Hautsch aimed to clarify the different points of view put forward in the very controversial discussion about the costs and benefits of high-frequency trading. While there is no unique definition of high-frequency trading, there are certainly some clear characteristics. In particular, high-frequency trading employs algorithms for order execution and routing, low-latency technology and co-location services and yields high message rates. Mostly, high-frequency trading is carried out by proprietary firms, broker-dealer proprietary desks and hedge funds. Its central characteristics are very short holding periods, no significant overnight positions, very low margins per trade as well as a focus on highly liquid instruments. In particular, high-frequency trading typically avoids taking high risks, i.e. highly leveraged positions.

Hautsch went on to discuss typical high-frequency trading strategies, e.g. high-frequency market-making, where high-frequency traders offer the best ask and bid rates and earn the bid-ask spread. Other strategies are order detection strategies, where traders use small test orders (“pinging”) to detect and exploit hidden liquidity. Further frequently employed strategies include statistical arbitrage, where traders try to exploit inconsistencies in prices between different products or markets that typically occur in very short time periods only, or latency arbitrage, which is based

on receiving market information milliseconds before other market participants. Finally, “quote stuffing” is an illegal high-frequency trading strategy. It involves quickly placing and cancelling bids and offers in the market to slow down market access for other market participants and for the matching engine of the respective exchange.

Hautsch highlighted that high-frequency trading is a natural step in market evolution and the consequence of both technological and regulatory changes, which started with the change from classical floor trading to electronic trading and the introduction of so-called electronic communication networks in the 1990s. Most research papers find that high-frequency trading improves liquidity, reduces transaction costs and improves the informativeness of quotes. However, high-frequency trading also has the potential, especially in turbulent and crisis periods, to have a destabilizing effect, driving up market volatility and increasing the risk of tail events. He concluded that the question whether, overall, high-frequency trading provides social benefits is still undecided and requires further research. The future of high-frequency trading is crucially dependent on regulatory developments. Recent regulatory initiatives in the U.S.A. and Europe have caused significant regulatory uncertainty regarding high-frequency trading. Hautsch warned of insufficient regulation on the one hand and too rigid regulation on the other.

David Yermack, Professor at NYU Stern School of Business, gave the second presentation of this session on *Smart contracts and corporate governance*. The idea behind smart contracts is to embed different contractual clauses (e.g. concerning collateral, bonding, the delineation of property rights, etc.) in the hardware and software that is being used in such a way as to make a breach

of contract expensive. This provides security superior to traditional contract law and reduces transaction costs. Smart contracts economize on contracting and enforcement costs and deter strategic behavior. Prominent examples of smart contracts include vending machines and recurring payments. Pointing to possible applications in corporate finance, Yermack explained the use of smart contracts in secured corporate debt. For example, he outlined the idea of automatically conveying collateral upon default, which reduces enforcement and contracting costs as well as moral hazard problems and thus the cost of debt. Further possible applications of smart contracts in corporate governance involve selfexercising executive stock options or automatically converting debt instruments. However, smart contracts also pose risks, in particular, the excessive use of automated decision-making in business operations. Without doubt, businesses need to fully understand smart contracts and their underlying technologies before such contracts are introduced.

The first conference day ended with the traditional *Kamingespräch*, a dialog between Austrian Federal Minister of Finance *Hans Jörg Schelling* and OeNB Governor *Ewald Nowotny*, who opened their talk by stressing the importance of interlinkages between monetary and fiscal policy measures. Nowotny then addressed the successful resolution of the Hypo Alpe Adria crisis, highlighting the efficient crisis management. Turning to the current economic situation in Austria, Nowotny pronounced both Austria’s economy and banking sector to be in good shape, despite today’s turbulent environment, pointing to the clear improvements that were made over the last year.

Schelling pointed out that current uncertainties are largely driven by political

risks, referring to the U.S.A., the U.K., Turkey and Russia in particular. Looking at the European banking sector, Schelling noted that declining revenues, insufficient cost reduction and low interest margins drove net income down by almost half in recent years. The gap between European banks and their U.S. peers is currently widening as U.S. banks continue to grow relative to their European counterparts. In particular, Schelling noted that European banks are running into a profitability crisis, and with the most important challenges being a high number of banking outlets, the emergence of new specialized financial services providers that pick only the most profitable banking services (“category killers”) and new technologies that have been developed in connection with digitization.

Digitization is already changing the economy. It is crucial to adapt regulation accordingly. An example of the challenges associated with digitization is taxation of internet businesses. Discussing the situation of Austrian banks, Schelling noted that even though the capitalization of the Austrian banking sector has improved significantly since the onset of the financial crisis, capital ratios are still below the European average and further regulatory challenges may lay ahead, e.g. prompted by Basel IV. Banks need to adapt to today’s changing regulatory, technological and economic environment, which involves questioning their business models and making necessary adjustments.

OeNB Executive Director Kurt Pribil opened the second conference day with a session on *Technological change and the future of cash*. As the first speaker in this session, François Velde, Senior Economist and Research Advisor at the Federal Reserve Bank of Chicago, discussed *Money and payments in the digital age: innovations and challenges*.

With bitcoin and DLT, it is possible to solve the problem of how to issue and manage online tokens without a central authority. Bitcoin is unique in monetary history because it has no intrinsic value, it is dematerialized (i.e. no physical tokens exist) and neither inside nor outside money. Velde pointed out that the lack of information and enforcement and the need for trust are recurring themes in monetary history. However, a distributed ledger does not eliminate the need for trust but shifts it. Instead of having to trust a counterparty, users have to trust the protocol. When transferring DLT to applications outside the monetary and payment context, the key question should be whether decentralization and lack of trust are the key features of the problem at hand. If not, applying DLT might not make sense. If DLT does come into broad use, central banks will become involved i.a. to set standards and ensure safety or by using the new possibility to pay (negative) interest rates on digital money.

In the same session, Helmut Stix, Senior Expert at the OeNB, spoke about *The surprising resilience of cash*. Using data reaching back to the 19th century, he demonstrated that – notwithstanding a downward trend because of financial innovations – currency in circulation in relation to nominal GDP has proven rather resilient. Recently, demand for currency even increased in many economies including the euro area and the U.S.A. Cash allows for expenditure control and for economizing on fees. To some extent, the recent increase in cash demand is attributable to the currently low interest rates. This effect becomes smaller as interest rates approach zero, while the size of the shadow economy has no effect on cash demand. In higher-GDP economies, the evolution of cash demand cannot be fully explained by GDP and the interest

rate. Apparently, there was a shift in cash demand in economies after they experienced a financial crisis, while this was not the case in economies that did not experience a financial crisis.

OeNB Executive Director *Peter Mooslechner* chaired a panel discussion on *FinTech: opportunities and challenges for banks and regulators*. The main questions here were whether FinTechs will show in productivity statistics and whether technological progress will be evolutionary or revolutionary.

Reinhold Bierbaumer, managing partner of MEP Mobile Equity Partners, identified key opportunities for FinTechs in business-to-business platforms. According to Bierbaumer, the reason why there are less interesting start-ups in Vienna than e.g. in Berlin or London lies, inter alia, in a lack of cooperative attitude. *Klaus Kumpfmüller*, Executive Director of the Austrian Financial Market Authority (FMA), stated that regulators support innovations as long as they comply with the law and that in doing so, they apply both technological neutrality and neutrality between newcomers and incumbents. Kumpfmüller highlighted that the FMA has established a *FinTech Contact Point* and invited market participants to make regulators aware of whether legislation hinders innovation. *Marc Niederkorn*, Senior Partner at McKinsey & Company, confirmed that enormous investment in FinTechs has taken place. The larger part of these investments focuses on retail banking, especially on payment systems. FinTech companies and banks are increasingly moving toward working together. However, the increasing importance of FinTech companies might negatively affect banks' origination and sales business, which is currently the most profitable activity in banking. Furthermore, fee-based businesses are likely to experience the largest margin reduction. *Thomas Schaufler*, Member of the Management

Board at Erste Bank, described how Erste Bank established a FinTech application within the bank and invited clients to participate in FinTech development. As clients will continue to seek professional advice in their banking activities, he concluded that bank branches will not disappear. *Valentin Stalf*, founder and CEO of N26 Bank, expects a massive shift in user behavior and sees the bank of the future on the mobile phone. For banks to be successful, customer relationship, technology and design are important. He claimed that successful start-ups need a conducive ecosystem. Such an ecosystem exists in Berlin or London, but it is not as well developed in Vienna. According to the panelists, technological developments will have an impact on employment in the banking sector, entailing not only a change in the number of employees but also in their required qualifications.

In the final session, chaired by *Urs Birchler*, President of SUERF, *Erkki Liikanen*, Governor of Suomen Pankki – Finland's Bank, delivered the SUERF annual lecture entitled *Is the post-crisis financial system more resilient? What remains to be done?* According to Liikanen, the financial crisis was caused i.a. by underlying macroeconomic factors (e.g. current account imbalances between the U.S.A. and China, a false sense of security as a result of the great moderation), deficient monetary and macroprudential policies and imbalances in financial market developments (e.g. the liberalization of global financial markets and deregulation, "too-big-to-fail" financial institutions). In response to the crisis, banks strengthened their loss absorption capacity and their ability to withstand a liquidity crisis. Furthermore, there are no more banks that can be regarded as "too-big-to-fail", since authorities have been granted new powers to resolve banks efficiently. Supervisors now hold a stronger mandate to ensure the stability

of the financial system as a whole. It is essential that banks' profitability be no longer based on their funding being supported by public safety nets. The new rules regarding bank recovery and resolution allow for a genuine transfer of risks to bank owners and investors. A key remaining task for Europe is finalizing the banking union, i.e. establishing single deposit protection. Furthermore, the banking union should be complemented by the capital markets union. The links between banks and the shadow banking sector are now regulated more effectively, which helps transform shadow banking into resilient market-based finance that will not transmit excessive risks to the banking sector. Liikanen concluded by warning that regulatory fatigue should not bring financial regulation and market infrastructure reform to a premature end.

As part of the Economics Conference, OeNB President *Raidl* and OeNB Governor *Nowotny* awarded the Klaus Liebscher Award, which was established on the occasion of the 65th birthday of former OeNB Governor Klaus Liebscher in recognition of his commitment to Austria's participation in Economic and Monetary Union and to European integration in general. The two prize-winning papers in 2017 were *Regulatory Integration of International Capital Markets* by *Jean-Marie A. Meier*, London Business School and *Bank Lending and the European Sovereign Debt Crisis* by *Filippo De Marco*, Bocconi University.

In his empirical paper *Regulatory Integration of International Capital Markets*, *Jean-Marie A. Meier* analyzes the effects of an integrated regulatory framework for European financial markets on the financial system and the real economy. Using data from the EU's various regulatory steps toward establishing a single European capital market and a European market for financial services, he specifically examines the impact of this regulatory policy on the access of listed companies to external financing as well as on investment and employment. He finds quantitatively significant effects: In addition to a doubling of external financing through Europe-wide regulation, there is also a significant increase in investment and employment.

In his paper *Bank Lending and the European Sovereign Debt Crisis*, *Filippo De Marco* examines the impact of the interdependence between sovereign debt and the banking system on the real economy. Using data from the European sovereign debt crisis of 2010 to 2012, he analyzes the effects this interdependence has on the financing of companies' loans. He finds that the main mechanism that restricts bank lending to firms in a sovereign debt crisis is not the valuation loss of government bonds, but the elimination of short-term refinancing opportunities through unsecured, short-term liabilities at U.S.-based money market funds. These funding stops force banks to either reduce equity or limit credit supply.