

## 52<sup>nd</sup> Konstanz Seminar on Monetary Theory and Monetary Policy

Sonja Dobkowitz\*, Matthias Gnewuch\*\* and Maximilian Weiß\*\*\*

Due to the pandemic, the 51<sup>st</sup> Konstanz seminar took place in 2020 only in a much shortened form and virtually. One year later, on September 9 and 10, 2021, around 30 participants were able to exchange ideas on site at the 52<sup>nd</sup> Konstanz seminar on monetary theory and policy; others were connected online. The annual symposium brings together experts from academia and central banks as well as young scientists for an intensive exchange. Founded in 1970 by Prof. Karl Brunner, the Konstanz seminar looks back on a unique tradition. The meeting traditionally takes place at the Strandhotel Löchnerhaus on the island of Reichenau on Lake Constance. This year's seminar was organized by Prof. Dr. Keith Küster with the help of other members of the sponsoring association. The papers for all presentations and the subsequent discussion are briefly presented below. All papers discussed here can be downloaded from <http://www.konstanzseminar.org/>.

This year's seminar began with a talk by *Maarten R. C. van Oordt* (Bank of Canada) on a practical topic that combines monetary theory and practice: the transition from cash to a digital currency (“Best Before? Expiring Central Bank Digital Currency and Loss Recovery”). An important property of cash is that no infrastructure is required at the time of payment. One disadvantage is that it can be lost. On the other hand, digital money stored online – apart from cases of fraud or software errors – cannot be lost. However, with digital money one gets exposed to the risk that payments are impossible in case of intermittent network or server failures. Van Oordt and his co-authors, Charles M. Kahn (University

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\* Sonja Dobkowitz, Bonn Graduate School of Economics, Universität Bonn, Institute for Macroeconomics and Econometrics, Kaiserplatz 7 – 9, 53113 Bonn, E-Mail: [sonja.dobkowitz@uni-bonn.de](mailto:sonja.dobkowitz@uni-bonn.de).

\*\* Matthias Gnewuch, Bonn Graduate School of Economics, Universität Bonn, Institute for Macroeconomics and Econometrics, Kaiserplatz 7 – 9, 53113 Bonn, E-Mail: [matthias.gnewuch@uni-bonn.de](mailto:matthias.gnewuch@uni-bonn.de).

\*\*\* Maximilian Weiß, Bonn Graduate School of Economics, Universität Bonn, Institute for Macroeconomics and Econometrics, Kaiserplatz 7 – 9, 53113 Bonn, E-Mail: [maximilian.weiss@uni-bonn.de](mailto:maximilian.weiss@uni-bonn.de).

of Illinois) and Yu Zhu (Bank of Canada), investigate a design of digital money that takes both into account.

Specifically, the authors have in mind that the economic agents can decide not to save part of their digital money holdings online, but rather offline on a device of their choice (e.g. a smartphone). This enables bilateral payments even if, temporarily, there is no network access. However, it does expose the owner to the risk of losing the device (and therefore their money). In the data, this risk is high. The authors therefore suggest that digital money stored offline has an expiration date. The advantage is that it can be reimbursed if it is lost and has not been used for payments. The expiry date means that it cannot be claimed by more than one person. The downside is that the buyers of the money (the sellers of the goods) must be able to go online to verify a payment before the expiration date to register their possessions. That puts them at risk. Using a quantitative model, the authors show that a well-chosen expiration date can have a significant positive impact on the demand for digital currencies. If in doubt, the study suggests, it is better to aim for an expiration date that is slightly too late than one that is too soon.

*Carl Andreas Claussen* (Sveriges Riksbank) confirmed the relevance of the paper in his discussion. He agreed that it was important that a digital currency also works offline. Claussen wondered whether the presented mechanism for storing digital offline currency would not also be suitable for physical cash. In addition, Carl Andreas Claussen discussed the technical feasibility of using digital offline currency in the event of power outages and avoiding multiple use (spending the money several times). Finally, he raised the question whether it was really the risk of loss that reduces the demand for offline currencies.

During the plenary discussion, historical events were highlighted that could be used to assess the importance of the risk of losing cash. Seminar participants also raised the question whether sellers of goods and services were able to price discriminate among buyers whose offline money holdings have different expiration dates.

The contribution by *Kei-Mu Yi* (University of Houston) investigates to what extent multinational companies accelerate structural change (“Multinationals and Structural Transformation”). In the early stages of the development of an economy, the share of employment in agriculture falls while employment in manufacturing rises. Later on, manufacturing employment is replaced by employment in the services sector. The paper, which is joint work with Vanessa Alvarez (UBC Sauder), Cheng Chen (Clemson University), Nitya Pandalai-Nayar (University of Texas), Liliana Varela (London School of Economics) and Hongyong Zhang (Research Institute of Economy, Trade and Industry), examines to what extent foreign direct investment by multinational companies contributes to this structural transformation.

The authors first work out the mechanisms in a two-country model. Multinational companies tend to be big, and big firms tend to be big because they are productive. Restrictions to foreign direct investment in poorer economies prevent these more productive foreign firms from entering the market. The average producer is then smaller and less productive than abroad and pays lower wages. The removal of barriers to foreign direct investment induces multinational firms, based in more mature economies, to relocate. Therefore, employment in manufacturing rises at home, while it falls abroad. At the same time, employment in the services sector rises in the home country of the multinational companies.

The authors empirically validate the model's predictions using data from Japanese multinational companies and their subsidiaries in China. They consider the reduction of restrictions on foreign direct investment in certain manufacturing sectors, which China implemented in 2002. In industries in which Chinese restrictions were relaxed, Japanese subsidiaries in China grew faster after 2002 than in industries in which restrictions were reduced less or not at all. At the same time, the respective parent companies in Japan reduced the number of employees in manufacturing. In addition, the parent companies in Japan increased the number of employees in service and research jobs.

In her discussion, *Carolina Villegas-Sanchez* (ESADE Business School) noted that the empirical results may be due to reasons other than the relocation of production by some multinational companies. For example, it could be that the choice of industries in which Chinese restrictions were reduced was not random, but deliberate. Industries in which restrictions were reduced could have been industries with high growth potential, which could explain the empirical results on the Chinese side.

In the evening of the first conference day, Dr. *Rolf Strauch* (European Stability Mechanism) gave this year's speech on current monetary and economic policy issues. First, he summed up the first 21 years of the euro and emphasized that so far, the common currency has proven to be very resilient in face of a financial crisis, the euro crisis and the pandemic. Nevertheless, in his view there remains a need for reform in the European Economic and Monetary Union. His speech was followed by a lively discussion.

At the end of the first day, *Dirk Krueger* (University of Pennsylvania) presented a joint paper with Nicola Fuchs-Schündeln (Goethe University Frankfurt), Alexander Ludwig (Goethe University Frankfurt) and Irina Popova (Goethe University Frankfurt), "The Long-Term Distributional and Welfare Effects of Covid-19 School Closures". The authors are concerned with the question of what long-term effects the school closings during the Covid-19 pandemic will have on macroeconomic productivity and the income distribution. In the paper, the pandemic is understood as a temporary decline in public investment in chil-

dren's human capital formation. Using a model, the authors investigate how this decline will affect the incomes of later adults over the life cycle. The model incorporates both insights into how children of different ages learn and insights into how much parents can influence their children's human capital formation. The analysis is carried out for the United States of America, but also allows to draw conclusions for other countries.

The main results can be summarized as follows. First, the effects are big. Children who have been affected by school closings lose around 1 percent of their lifetime income. Still, the effects of school closings on average human capital are not as big as the decline in government investment suggests. The reason is that parents can mitigate the effects through private investment in the form of financial investment or time invested in children. Second, younger children are more affected than older children. This is due to the fact that older children can develop skills they have already acquired to a greater extent on their own. In addition, the loss of human capital increases through the further educational trajectory of the children. Thirdly, children of parents with a lower level of education and income are most severely affected by school closings, again because of less compensation, and the amplification of this effect over the course of the educational life. The structural model makes it possible to compare the effects of school closings with the negative effect on children's education solely due to the changes in parents' income during the recession. The latter plays a minor role in reducing the long-term prosperity of children.

*Rüdiger Bachmann* (University of Notre Dame) discussed the paper. He welcomed the approach of using a model to study the consequences of the pandemic. The paper complements the numerous experimental and microeconomic studies by allowing an analysis of the mechanisms by which the educational losses arise. Bachmann suggested that government aid programs which were carried out during the pandemic should be taken into account in the analysis. He noted that the model gave food for thought for further questions. In particular, as a result of the pandemic, children were unable to accumulate social capital and social skills. The effect of this on future earned income was an open question.

In the plenary discussion, it was pointed out that, contrary to the model assumptions, the effects of school education, that is, public investment in human capital, may not be linear. Since the model only takes two generations into account, the question of indirect effects on subsequent generations arose. Seminar participants also noted that when schools are closed, there was a higher risk that children will develop behavior that could negatively affect their willingness to learn in the long term.

At the beginning of the second day of the seminar, *Kurt Mitman* (Institute for International Economic Studies Stockholm) presented his paper "Why Does

Capital Flow from Equal to Unequal Countries?” It is joint work with Sergio de Ferra and Federica Romei (both University of Oxford). The authors first work out empirically that those industrialized countries in which incomes are more unevenly distributed tend to have lower current account surpluses or higher current account deficits. They observe that private saving is responsible for this empirical correlation: in countries with higher income inequality, private households save less than households in less unequal countries. Private savings can be invested abroad (to finance current account surpluses) or invested domestically. Keeping domestic investments constant, the empirical relationship mentioned at the beginning arises for purely arithmetical reasons.

The question is how to explain this phenomenon. To this end, the authors associate income inequality with a higher income risk that households cannot cover (incomplete financial markets). In many modelling frameworks (Bewley-Hugget-Aiyagari-İmrohoroğlu), such a higher income risk would lead to households wanting to save more, not less, which would be inconsistent with the empirical findings. Kurt Mitman and his co-authors show, however, that the model prediction is different when the borrowing constraint of households is determined endogenously. In a country with high income inequality, the high earners also have an interest in reducing their consumption risk. Therefore, they finance higher indebtedness for low-income households. Income risk also means that households do not want to lose access to future credit. In other words, the borrowing constraint shifts in equilibrium. Countries with more unequal incomes then have a financial market that, in autarky, provides more insurance at a higher level of interest rates.

The authors show that international capital market integration then leads to capital flowing from countries with less to countries with more income inequality: the high-income households from the country with lower income inequality finance, since they are themselves exposed to a lower consumption risk, the debt of low-income households from the more unequal country.

*Edouard Challe* (European University Institute Florence) discussed the paper. He first highlighted the central mechanism in a simplified model: high earners in the country with less income inequality insure households in the more unequal country, as they are paid a transfer via the higher interest income, which in turn increases the consumption risk in their country. He countered the implication of the model that the consumption risk is converging internationally with the observation that countries in the European Union with higher income inequality also have higher consumption inequality. He also asked whether income inequality could be equated with income risk. Another seminar participant noted that inequality in disposable income was influenced by the politics of the country and that therefore the causality could also run in the opposite direction, namely from more capital imports to higher income inequality.

Then, *Axelle Ferriere* (Paris School of Economics) presented a joint work with Philipp Grübener (European University Institute Florence), Gaston Navarro (Federal Reserve Board) and Oliko Vardishvili (Yale University), “Larger transfers financed with more progressive taxes? On the optimal design of taxes and transfers.” Against the background of the pandemic, the question of the optimal tax and transfer system appears more urgent than ever. The paper makes its case on the basis of a model framework in which there is income risk that households cannot fully protect themselves against. This forms the rationale for governmental redistribution.

As its main contribution, the paper works out the extent to which redistribution should be achieved through progressive income taxation or through lump-sum transfers that all households receive equally. The exciting result of the work is that, in this given model framework, the welfare-optimal tax and transfer system resembles a universal basic income with linear income taxation.

First, the authors use an analytical model to show that the optimal relationship between the progressivity of the tax system and the generosity of transfers is negative. That is, the more generous the transfers, the less progressive the tax system should be. The reason is that with increasing transfers in the model, the willingness of households to work decreases. A lower progressivity has the opposite effect. In the next step, the authors analyze a richer, quantitative model. The optimal tax and transfer plan is characterized by high transfer payments that abate slowly as income rises.

*Isaac Baley* (Universitat Pompeu Fabra) discussed the paper. Baley, first, worked out the effective channels. He asked if the policy advice was overcome if the complexities of the public sector, such as the provision and use of public goods, were given more consideration. Second, Baley raised the question of how great the efficiency costs of taxing labor income were in reality.

In the plenary discussion, the question arose whether the model could be understood as an argument for a universal basic income. The discussion pointed to the lack of human capital accumulation in the model, which is an argument against a basic income. Furthermore, possible implications of the model for the labor market and transitions to the optimal tax and transfer system were addressed.

Next, *Rubén Domínguez-Díaz* (PhD student at the University of Bonn) presented his paper “Precautionary Savings and Financial Frictions.” His work starts with the observation that households typically hold some of their savings in liquid assets, such as bank deposits, which can be accessed quickly in the event of a sudden loss of income. When income risk increases, households increase their precautionary liquid savings. Because these resources are not available to businesses as productive capital, heightened household income risk can

trigger a recession. This work examines the role of the banking system in this context.

The basic idea is that the banking system conducts liquidity transformation. It grants loans to companies and at the same time creates liquid deposits available to households. A well-functioning banking system allows households to accumulate liquid savings and at the same time grants loans to companies, such that a higher liquidity preference of households does not necessarily lead to a lower amount of productive capital in the economy. However, this changes as soon as the banking sector is constrained in its lending, for example due to capital requirements. In this case, the banking sector can only accept a limited amount of liquid deposits from households and transfer these funds to companies.

The author examines the empirical relevance of this mechanism using observable fluctuations in household income risk over time. The households' demand for liquid savings should increase with income risk. In line with the theory, the author finds that higher income risk triggers only a mild recession if financing conditions of the financial sector are above average. However, if financing conditions of the financial sector are below average, higher income risk triggers a deeper recession. The author shows that a model framework with equity-constrained banks and heterogeneous households that hold liquid and illiquid savings and are exposed to income risk fluctuations delivers results which are consistent with the empirical evidence.

In his discussion, *Anton Braun* (Federal Reserve Bank of Atlanta) underlined that the macroeconomic transmission of fluctuations in income risk via the banking system depended on the effect on banks' profit margins. In this regard, there was no conclusive empirical evidence. He also emphasized that fluctuations in income risk could affect not only labor income, but also capital income. In the ensuing discussion, fiscal policy measures to accommodate fluctuations in households' demand for liquid assets were debated.

The conference ended with an interesting presentation by *Kenza Benhima* (HEC Lausanne) on her work "Foreign Currency Debt and Expectations." *Isabella Blengini* (EHL Lausanne) and *Ouarda Merrouche* (Université Paris Nanterre) are the co-authors. Companies in emerging markets often borrow in foreign currencies, mostly in US dollars. A common explanation for this is that they have to pay a risk premium on bonds in their domestic currency, as the value of emerging market currencies is more volatile. The paper, however, puts forward a different hypothesis: companies are better informed than foreign investors about the fundamental factors that determine the risk of their local currency being devalued. In a model, the authors show that this information asymmetry can lead, in good times, to foreign lenders systematically viewing the risk of lending in the currency of the emerging market as too high. As a result, financing in foreign currency is cheaper for domestic companies in expectation.

The starting point for the authors is an empirical discrepancy: across countries, the share of foreign currency debt shows no systematic relation with the expectation of exchange rate changes. Movements in the country's fundamental data that predict an appreciation of the domestic currency are, however, significantly positively correlated with the new borrowing in foreign currency, if at the same time the credit rating of the country remains constant. On the other hand, holding fundamentals constant, new borrowing in foreign currency is significantly negatively correlated with the country's credit rating.

The authors develop a model that can explain these observations. The central assumption is that international investors mainly use the credit rating to find out about a country's risk of appreciation, while domestic companies receive additional, private information that is not reflected in the rating. Such private information relates to fundamental data such as GDP growth or the balance of the state budget, which are usually only made public with a delay. Positive signals in the fundamental data with a constant credit rating, or a deterioration in the credit rating with constant fundamental data, increase the information disadvantage of the foreign lenders and thus lead to a higher demand from domestic companies for debt in foreign currency.

In her discussion of the paper, *Fernanda Nechio* (Federal Reserve Bank of San Francisco) initially suggested integrating inflation into the model. This would add an important dimension to the central bank's basis for deciding whether to devalue the domestic currency. In addition, a theoretical justification for the information asymmetry would be interesting. For the empirical part of the paper, she suggested in particular that excessive private debt in foreign currency due to a moral hazard effect, that could arise from insurance by the state against strong exchange rate fluctuations, should be accounted for.

Other seminar participants thought about how to corroborate the evidence for information asymmetry. The global financial crisis of 2008 would be a credit risk shock that could be exploited. In addition, it was suggested to work with company and bank data in order to check for the creditworthiness of the companies and thus to control for the moral hazard effect.

The seminar ended with the obligatory group photo and the prospect of returning to normal conference activities. The 53<sup>rd</sup> Konstanz seminar on monetary theory and policy will take place from May 31, 2022 to June 2, 2022.