



FINANCIAL MARKETS 2021

INNOVATIONS AND SUSTAINABILITY

Proceeding from the 10th International Conference
held in Prague on 27th-28th May, 2021

Otakar Schlossberger (eds.)

Vysoká škola finanční a správní, a.s.
(University of Finance and Administration), Praha, 2021

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Praha, 2021

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Otakar Schlossberger (eds.)

Financial Markets 2021 – Innovations and Sustainability, Proceeding from the 10th International Conference held in Prague on 27th – 28th May, 2021

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- bonds
- capital market
- competitiveness
- education
- financial institutions
- Fintech
- innovation
- investment
- payments
- regulation
- SMEs
- Start-Ups
- pandemic

JEL CLASSIFICATION

F21, G11, G15, K23

FIELD CODES RIV (17+)

AH – Economy

AG – Law

Abstrakt:

Tato publikace je sborníkem příspěvků z desátého ročníku mezinárodní vědecké konference Finanční trhy 2021 – Inovace a udržitelnost. Tato konference byla v minulých letech již tradičním vyvrcholením mezinárodní prezentace výsledků vědy a výzkumu v oblasti finančních trhů, kterou pořádá Vysoká škola finanční a správní každé dva roky. Záštitu nad výročním desátým ročníkem převzal opět guvernér České národní banky pan Jiří Rusnok. Konference se zaměřila na prezentaci a diskusi financování investičního rozvoje malých a středních podniků, na rozvoj akciového a dluhopisového trhu včetně východisek pro rozvoj regulovaného trhu s finančními nástroji v rámci Koncepce kapitálového trhu v letech 2019–2023. Místo konání: Vysoká škola finanční a správní, Estonská 500, 101 00 Praha 10, datum konání: 27. – 28. května 2021.

Abstract:

This publication is a collection of papers from the tenth annual international scientific conference Financial Markets 2021 - Innovation and Sustainability. In recent years, this conference has been the traditional culmination of the international presentation of the results of science and research in the field of financial markets, organized by the University of Finance and Administration every two years. The Governor of the Czech National Bank, Mr. Jiří Rusnok, again took over the auspices of the tenth annual year. The conference focused on the presentation and discussion of financing the investment development of small and medium-sized enterprises, the development of the stock and bond market, including the basis for the development of a regulated market for financial instruments within the Capital Market Concept in 2019–2023. Estonská 500, 101 00 Prague 10, date: May 27 – 28, 2021.

Klíčová slova:

Dluhopisy, kapitálový trh, konkurenceschopnost, vzdělávání, finanční instituce, Fintech, inovace, platební styk, regulace, MSP, Start-Upy, pandemie

Keywords:

Bonds, capital market, competitiveness, education, financial institutions, Fintech, innovation, payments, regulation, SMEs, Start-Ups, pandemic

Pokud není dále uvedeno jinak, publikace zohledňuje právní předpisy a judikaturu ve znění účinném k 31. březnu 2021.

Unless otherwise specified below, the publication takes into account legislation and case-law as in force on 31 March 2021.

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Preface¹

On 27–28 May 2021, the University of Finance and Administration organised the tenth edition of the International Scientific Conference Financial Markets 2021, this time with the subtitle “Innovation and Sustainability”. The conference was held under the auspices of the Governor of the Czech National Bank, Mr. Ing. Jiří Rusnok.

The conference’s organization and course were marked by the fading Covid-19 pandemic, so the organisers decided to hold the conference online for the first time in its ten-year existence via a web application designed for universities.

The content of the conference focused mainly on presentations and discussion of financing the investment development of small and medium-sized enterprises, the development of the stock and bond market, including the basis for the development of the regulated financial instruments market within the framework of the Capital Market Development Concept 2019–2023, in the period affected by the Covid-19 pandemic. The conference included the following general topics:

- Current trends in financial market development in the EU and the Czech Republic.
- The current development of financial market regulation in the EU and its impact on the Czech Republic.
- Starting points and opportunities for small and medium-sized enterprises in terms of raising and strengthening investment resources from the Czech organised capital market in the covid era.
- Support for start-ups after one year in the current situation.
- The impact of Brexit on the financial markets of EU member states.
- Impact of digitalization and robotization on financial markets.
- Analyses of financial market infrastructures in EU countries including the Czech Republic, etc.

The specific structure of the conference was divided by the organizing committee into two days. The first day of the conference was a structured day with pre-addressed Keynote speakers and individual panellists within the conference sessions. The welcome of all participants, which numbered more than 50 including foreign participants, was made on behalf of the University by doc. RNDr. Petr Budinský, CSc. After this formal act, the two protagonists of the opening session, who were Mrs. JUDr. Ing. Lenka Dupáková, Ph.D, Deputy Minister of Finance of the Czech Republic and Ing. Aleš Michl, Ph.D., Member of the Bank Board and Chief Executive Officer of the Czech National Bank. Their speeches were a challenge for the next four blocks of the first day of the conference, as they focused on the role and position of the regulator and the supervisory authority in the implementation of the capital market concept with its role in supporting small and medium-sized enterprises, respectively, the implementation of supervision and ensuring macroeconomic tasks creating space for the entrepreneurship of these entities.

The first panel, moderated again by doc. Budinský, focused on the perspectives of the development of the Czech financial and capital market in the stage of restarting the Czech economy after the

¹ Source: SCHLOSSBERGER, Otakar. The Conference "Financial markets" for the Tenth Time. *ACTA VSFS*. Praha: Vysoká škola finanční a správní, a. s., 2021, roč. 2021, č. 1, s. 114-116. ISSN 1802-792X. doi:10.37355/acta-2021/1-07

pandemic situation caused by the coronavirus. The panel featured presentations and discussions by representatives of the Ministry of Finance and representatives of the Czech Capital Market Association (AKAT ČR) and the Association of Small and Medium-sized Enterprises (AMSP ČR).

This expert panel was followed by a thematic second panel, which presented representatives of the Czech financial and capital market in the stage of restoring economic prosperity and growth after 2020. The moderator of the panel was none other than the Executive Director of AKAT ČR, Ms. Mgr. Ing. Jana Brodani, MBA, LL. M. In her panel she invited representatives of entities active on the capital market to discuss the topic.

The following session was focused on fin-tech and its content included presentations focused on how fin-tech technology can be a tool to deepen and improve the provision of financial services on the financial market in the coming years. The moderator of this innovative session was Ms. Maria Stazskiewicz, Chairman of the Board and Executive Director of the FinTech Association. The keynote speech was delivered by the Deputy Minister of Industry and Trade of the Czech Republic, Mr. Ing. Petr Očko, Ph.D., who was followed by representatives of fin-tech companies and a representative of the academic sphere – Vice-Rector for Strategy and Development of the Czech Technical University in Prague Mrs. Ing. Veronika Kramářiková, MBA.

The last panel of the first day, moderated by Mrs. Ing. Jana Kotěšovcová, Ph.D., from the Department of Finance of the organizing university, was a panel focused on the characteristics of the conditions of the Czech capital market development from the perspective of financing innovative investment programmes of companies in the stage of restoring economic prosperity and growth after 2020. It was no coincidence that the keynote speaker was RNDr. Jan Lánský, Ph.D., also from the University of Finance and Law, who is a recognized expert in the field of cryptocurrencies. The other four speakers complemented his contribution with their views and approaches to help companies raise funds through the capital market, assuming an analysis of the company's financial health as a basis for, among other things, investor confidence.

The second day of the conference was already marked by presentations by representatives of the academic community, both researchers and students of bachelor's, master's or doctoral study programmes. In three blocks, moderated by doc. JUDr. Ing. Otakar Schlossberger, Ph.D., Vice Dean for Research and Publications of the Faculty of Economic Studies of the organizing university, who also serves as the Head of the Department of Finance, and his colleague – Ing. Eva Kostikov, Ph.D., who is his deputy at the Department of Finance. There were more than 15 presenters, including six foreign students, mostly from the Federal Republic of Germany.

This day was dedicated as an acknowledgement for his lifetime work to doc. Ing. Vladislav Pavlát, CSc., who is still an active member of the Department of Finance despite his “blessed” age. Mr. Pavlát was the co-founder and “scriptwriter” of almost all previous Financial Markets conferences, which are regularly held every two years.

Prague, October 2021

Assoc. Prof. JUDr. Ing. Otakar Schlossberger, Ph.D.
Editor and Dean of Faculty of Economic Studies VŠFS



Program 10. ročníku mezinárodní vědecké konference na téma

„FINANČNÍ TRHY 2021 – INOVACE A UDRŽITELNOST“

*Záštitu nad konferencí převzal guvernér České národní banky
pan Ing. Jiří Rusnok*

čtvrtek 27. května – pátek 28. května 2021

On-line prostřednictvím aplikace Teams, přístup do týmu Financial Market Conference 2021:

https://teams.microsoft.com/l/team/19%3azcpTSwnKMkZ47CqDYVnWg16tsQ6EtESiX_LxJGd2HQ1%40thread.tacv2/conversations?groupId=2c70403e-35f0-4640-b7f9-576b24af16fa&tenantId=e4341966-3781-40c1-9948-186e5a4b8852

1. den – 27. května 2021

08:30 – 09:00 – **Registrace účastníků na Teams**

09:00 – 10:00 – **Zahájení konference Finanční trhy 2021 – Inovace a udržitelnost – doc. RNDr. Petr Budinský, CSc., VŠFS, prorektor pro strategii a mezinárodní vztahy.**

Hlavní referát „Keynote speakers“:

Ing. Aleš Michl – člen Bankovní rady České národní banky a vrchní ředitel JUDr. Ing. Lenka Dupáková, Ph.D. – náměstkyně ministryně financí České republiky

10:00 – 11:00 – **I. tematický blok – Perspektivy vývoje českého finančního a kapitálového trhu v etapě restartu české ekonomiky po koronavirové krizi.**

Moderátor: doc. RNDr. Petr Budinský, CSc., prorektor VŠFS

V panelu vystoupí:

Mgr. Ing. Jana Brodani, MBA, LL. M., AKAT – key note speaker, Mgr. Bc. Aleš Králík, LL.M., Ing. Karel Dobeš, předseda Asociace malých a středních podniků.

11:00 – 12:15 – **II. tematický blok – Český finanční a kapitálový trh v etapě obnovení hospodářské prosperity a růstu po roce 2020.**

Moderátorka: Mgr. Ing. Jana Brodani, MBA, LL. M., výkonná ředitelka AKAT
V panelu vystoupí:

Jaromír Sladkovský – key note speaker, Martin Hudeček, Asset Manager of RSJ Tech and RSJ Insurtech, RSJ Investments, Martin Řezáč, vedoucí pobočky Erste Asset Management a zástupce Cyrus – panelista kontaktován.

12:15 – 12:30 – **Přestávka**

12:30 – 13:45 – **III. tematický blok – Technologie fintech a další jako nástroj prohloubení finančního trhu a zkvalitnění finančních služeb v příštích letech.**

Moderuje Maria Stazskiewicz, předsedkyně představenstva a CEO, FinTech Asociace.

V panelu vystoupí:

Ing. Petr Óčko – nám. ministra průmyslu a obchodu ČR – key note speaker, Petr Hojný, Liberis, Ing. Veronika Kramaříková, MBA, prorektorka ČVÚT pro strategii a rozvoj, Marek Šubrt – externí expert ministerstva financí ČR.

13:50 – 15:10 – **IV. tematický blok – Podmínky rozvoje českého kapitálového trhu z hlediska financování inovačních investičních programů podniků v etapě obnovení hospodářské prosperity a růstu po roce 2020.**

Moderuje Ing. Jana Kotěšovcová, Ph.D., VŠFS, Katedra financí.

V panelu vystoupí:

RNDr. Jan Lánský, Ph.D., VŠFS, Katedra informatiky a matematiky – Key note speaker, Ing. Jiří Mesároš, Dluhopisy.cz, Ing. Bc. Jiří Mihola, CSc., VŠFS, Katedra informatiky a matematiky, Ing. Pavel Finger, CRIF, Czech Credit Bureau, Ing. Jana Kotěšovcová, Ph.D., VŠFS, Katedra financí, Ing. Arnošt Klesla, Ph.D., VŠFS, Katedra financí.

15:10 – 15:30 – **Závěrečná diskuse, vyhodnocení a závěr I. dne.**

2. den – 28. května 2021

08:30 – 09:00 – **Registrace účastníků na Teams**

09:00 – 09:10 – **Zahájení – doc. JUDr. Ing. Otakar Schlossberger, Ph.D., VŠFS, proděkan pro výzkum a publikační činnost Fakulty ekonomických studií a vedoucí Katedry financí a Ing. Eva Kostikov, Ph.D., VŠFS, zástupce vedoucího Katedry financí.**

I. Blok – akademický a studentský panel – ČJ. Moderuje doc. JUDr. Ing. Otakar Schlossberger, Ph.D.

09:10 – 09:30 – Prof. Ing. Jaroslav Vostatek, CSc., VŠFS, Katedra financí – Voluntary Pension Arrangements through the OECD Prism.

09:30 – 09:50 – Ing. Jan Mertl, Ph.D, VŠFS, Katedra financí – Public debt amidst low interest rates: the issues of cheap money.

09:50 – 10:10 – PhDr. Ladislava Knihová, VŠFS, Katedra jazyků – Opportunities and challenges of digital customer learning in banking.

10:10 – 10:30 – Doc. Radim Valenčík, CSc., VŠFS, Katedra ekonomie a managementu – Jak chápat dokonalý finanční trh, význam dokonalosti a příčiny nedokonalosti reálných finančních trhů.

10:30 – 10:50 – Kateřina Kraibichová, VŠFS, studentka Bc. – Využití platebních karet v prémiovém bankovníctví.

10:50 – 11:10 – Matouš Král, DiS, VŠFS, student Bc. – Zhodnocení nabídky studentských kont a úvěrů na českém bankovním trhu.

11:10 – 11:30 – Ing. Zuzana Chlumská, Ing. Vlastislav Jandus, VŠFS, oba studenti Ph.D. – Behaviorální aspekty při správě aktiv s ohledem na finanční gramotnost.

11:30 – 11:40 – **Přestávka**

II. Blok – studentský – AJ. Moderuje Ing. Eva Kostikov, Ph.D., VŠFS, zástupkyně vedoucího Katedry financí.

11:40 – 12:00 – Wolfgang Kloppenburg, VŠFS, student Ph.D. – How can the regional rail transport companies achieve further growth - in view of the shortage of skilled workers and macroeconomic consequences of the achievement.

12:00 – 12:20 – Bastian Schulz, VŠFS, student Ph.D. – The cum-ex case in Germany.

12:20 – 12:40 – Martin Zubko, MUP, student Ph.D. – Cyberterrorism: A Global Threat to Financial Institutions.

12:40 – 13:00 – Mick Pirgmann, VŠFS, student Ph.D. – Impact of Tokenization on the Economics of Crowdfunding Investments through a change of Investment Behaviour.

13:00 – 13:10 – **Přestávka**

III. Blok – studentský – AJ. Moderuje Ing. Eva Kostikov, Ph.D., VŠFS, zástupkyně vedoucího Katedry financí.

13:10 – 13:30 – Benedikt Frank, VŠFS, student Ph.D. - The financial crisis in the 2000s: Further effects regarding lending, regulation and efficiency.

13:30 – 13:50 – Azra Muratovic, VŠFS, studentka Ph.D. – Covid Impact on the Euroarea Financial System.

13:50 – 14:10 – Katrin Steyer, VŠFS, studentka Ph.D. – Financial sustainability in Germany during the covid-19 pandemic.

14:10 – 14:30 – **Závěrečné slovo** – doc. JUDr. Ing. Otakar Schlossberger, Ph. D. – proděkan pro výzkum a publikační činnosti FES, VŠFS a Ing. Eva Kostikov, Ph.D., VŠFS, zástupkyně vedoucího Katedry financí.

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Program of the 10th International Scientific Conference on

**„FINANCIAL MARKETS 2021 - INNOVATION
AND SUSTAINABILITY“**

The conference is held under the auspices of the Governor of the Czech National Bank

Ing. Jiří Rusnok

Thursday, May 27 - Friday, May 28, 2021

Online via the Teams application, access to the Financial Market Conference 2021 team:

https://teams.microsoft.com/l/team/19%3azcpTSwnKMkBz47CqDYVnWg16tsQ6EtESiX_LxJGd2HQ1%40thread.tacv2/conversations?groupId=2c70403e-35f0-4640-b7f9-576b24af16fa&tenantId=e4341966-3781-40c1-9948-186e5a4b8852

Day 1 – 27th May 2021

08:30 – 09:00 – **Registration of participants in MS Teams**

09:00 – 10:00 – *Financial Markets 2021 – Innovations and Sustainability - Conference opening address and welcome speech – Assoc. Prof. RNDr. Petr Budinský, CSc., VŠFS, Vice-rector for Strategy and International Relations.*

Keynote speakers:

Ing. Aleš Michl, Ph.D. – Czech National Bank Board member and Chief Executive Director

JUDr. Ing. Lenka Dupáková, Ph.D. – Deputy Minister of Finance of the Czech Republic

10:00 – 11:00 – *Thematic block I – Perspectives of the Development of the Czech Financial and Capital Markets in the stage of the Czech Economy Restart after the Coronavirus Crisis.*

Moderator: Assoc. Prof. RNDr. Petr Budinský, CSc., vice-rector of the VŠFS
Panel members:

Mgr. Ing. Jana Brodani, MBA, LL. M., AKAT – keynote speaker, Mgr. Bc. Aleš Králík, LL.M., Ing. Karel Dobeš, Chairman of the Association of Small and Medium-sized Enterprises.

11:00 – 12:15 – *Thematic block II – The Czech financial and capital market in the stage of restoring economic prosperity and growth after 2020.*

Moderator: Mgr. Ing. Jana Brodani, MBA, LL. M., výkonná ředitelka AKAT.

Panel members:

Jaromír Sladkovský – keynote speaker, Martin Hudeček, Asset Manager of RSJ Tech and RSJ Insurtech, RSJ Investments, Martin Řezáč, Branch Manager Erste Asset Management.

12:15 – 12:30 – **Break**

12:30 – 13:45 – ***Thematic block III – Fintech technology and others as a tool for deepening the financial market and improving financial services in the coming year.***

Moderator: Maria Stazskiewicz, Chairman of the Board of Directors a CEO, FinTech Association.

Panel members:

Ing. Petr Óčko – Deputy Minister of Industry and Trade CR– keynote speaker, Petr Hojný, Liberis, Ing. Veronika Kramaříková, MBA, Vice-Rector for Strategy and Development CTU, Marek Šubrt – external expert of the Ministry of Finance CR.

13:50 – 15:10 – ***Thematic block IV – Conditions for the development of the Czech capital market in terms of financing innovative investment programs of companies in the stage of restoration of economic prosperity and growth after 2020.***

Moderator: Ing. Jana Kotěšovcová, Ph.D., VŠFS, Department of Finance

Panel members:

RNDr. Jan Lánský, Ph.D., VŠFS, Department of Informatics and Mathematics – Keynote speaker, Ing. Jiří Mesároš, Dluhopisy.cz, Ing. Bc. Jiří Mihola, CSc., VŠFS, Department of Informatics and Mathematics, Ing. Pavel Finger, CRIF, Czech Credit Bureau, Ing. Jana Kotěšovcová, Ph.D., VŠFS, Department of Finance, Ing. Arnošt Klesla, Ph.D. VŠFS, Department of Finance.

15:10 – 15:30 – **Final discussion, evaluation and conclusion of the first day.**

Day 2 – 28th May 2021

08:30 – 09:00 – **Registration of participants in MS Teams.**

09:00 – 09:10 – ***Opening – Assoc. Prof. JUDr. Ing. Otakar Schlossberger, Ph.D., VŠFS, Vice-Dean for Research and Publications of the Faculty of Economic Studies and Head of the Department of Finance and Ing. Eva Kostikov, Ph.D., VŠFS, Deputy Head of the Department of Finance.***

I. Block – Academic and student panel – Czech

Moderator: Assoc. Prof. JUDr. Ing. Otakar Schlossberger, Ph.D.

09:10 – 09:30 – Prof. Ing. Jaroslav Vostatek, CSc., VŠFS, Department of Finance – Voluntary Pension Arrangements throughj the OECD Prism.

09:30 – 09:50 – Ing. Jan Mertl, Ph.D, VŠFS, Department of Finance – Public debt amidst low interest rates: the issues of cheap money.

09:50 – 10:10 – PhDr. Ladislava Knihová, VŠFS, Department of Languages and Ph.D. student – Opportunities and challenges of digital customer learning in banking.

10:10 – 10:30 – Assoc. Prof. Radim Valenčík, CSc., VŠFS, Department of Economics and Management – How to understand a perfect financial market, the importance of perfection and the causes of imperfection of real financial markets.

10:30 – 10:50 – Kateřina Kraibichová, VŠFS, Bc. student – Use of payment cards in premium banking.

10:50 – 11:10 – Matouš Král, DiS, VŠFS, Bc. student – Evaluation of the offer of student accounts and loans on the Czech banking market.

11:10 – 11:30 – Ing. Zuzana Chlumská, Ing. Vlastislav Jandus, VŠFS, both Ph.D. students – Behavioral Aspects of Asset Management in Relation of Financial Literacy.

11:30 – 11:40 – **Break**

II. Block – student panel – English

Moderator: Ing. Eva Kostikov, Ph.D., VŠFS, *Deputy Head of the Department of Finance*

11:40 – 12:00 – Wolfgang Kloppenburg, VŠFS, Ph.D. student – How can the regional rail transport companies achieve further growth - in view of the shortage of skilled workers and macroeconomic consequences of the achievement.

12:00 – 12:20 – Bastian Schulz, VŠFS, Ph.D. student – The cum-ex case in Germany.

12:20 – 12:40 – Martin Zubko, MUP, Ph.D. student – Cyberterrorism: A Global Threat to Financial Institutions.

12:40 – 13:00 – Mick Pirgmann, VŠFS, Ph.D. student – Impact of Tokenization on the Economics of Crowdfunding Investments through a change of Investment Behaviour.

13:00 – 13:10 – **Break**

III. Block – student panel – English

Moderator: Ing. Eva Kostikov, Ph.D., VŠFS, *Deputy Head of the Department of Finance*

13:10 – 13:30 – Benedikt Frank, VŠFS, Ph.D. student - The financial crisis in the 2000s: Further effects regarding lending, regulation and efficiency.

13:30 – 13:50 – Azra Muratovic, VŠFS, Ph.D. student – Covid Impact on the Euroarea Financial System.

13:50 – 14:10 – Katrin Steyer, VŠFS, Ph.D. student – Financial sustainability in Germany during the covid-19 pandemic.

14:10 – 14:30 – **Concluding remarks** – Assoc. Prof. JUDr. Ing. Otakar Schlossberger, Ph.D. – Vice-Dean for Research and Publications of the Faculty of Economic Studies and Head of the Department of Finance, VŠFS and Ing. Eva Kostikov, Ph.D., VŠFS, Deputy Head of the Department of Finance.

BASIC QUESTION OF FINANCIAL MARKETS THEORY

ONDŘEJ ČERNÍK, RADIM VALENČÍK

Abstract

The basic question of the financial markets theory can be formulated as follows: Why are investment opportunities (including those associated with the acquisition, retention and use of human capital) not used based on their rate of return. The paper substantiates the importance of this issue for understanding the development trends of financial markets, as well as the problems associated with the failure to use of investment opportunities. Subsequently, the original theoretical apparatus is presented, which is based on the connection of the microeconomic financial market model and the model of the financial market through cooperative games, specifically (S, d) Nash's bargaining problem. The multipoint extension of this model makes it possible to reveal and describe the phenomenon of social position investment, which plays a key role in terms of the fundamental question of financial market theory.

Keywords

Investment opportunity, human capital, Pareto efficiency, cooperative games, Nash's bargaining problem, productive consumption

JEL Classification

D12, D53, G24

Introduction

The paper's title rightly raises some eyebrows: Can such a multifaceted issue as the theory of financial markets be subordinated to one question?

The aim of our paper will be to show and prove the following:

1. Such a question can be formulated.
2. The answer to that question shows the main tendency of the development of financial markets and the pitfalls of this development.
3. There are very effective tools in the field of game theory that help to answer questions derived from the basic question of financial market theory, and these answers are relevant from a practical point of view.
4. This question stimulates the development of tools in the field of game theory.

The issue at hand is directly related to the dynamic concept of social equality and reaching a consensus using the generalised solution of (S, d) Nash's bargaining problem.

1 Subject-matter and method

The subject of the paper is the issue of defining general trends in financial markets in the context of transformations in contemporary society, where the alternative of social growth increased rapidly, which is comparable in importance and scope to the industrial revolution, but which also means a decline represented by the prevailing trend towards a society whose economy is bound by the redistributive power controlled by positional investment.

The basic theoretical tools used are as follows:

1. The concept of transition to a society whose dominant sector are productive services, i.e. services aimed at acquiring, maintaining and applying human capabilities.
2. Defining terms to formulate the basic question of financial markets theory.
3. The original microeconomic model of supply and demand of investment means and investment opportunities.
4. Application of a theory based on Nash's (S, d) bargaining problem (Nash 1950a, 1950b, 1953), especially the generalisation of this problem (Thompson 1989), (Černík, Valenčík, Wawrosz 2020).

2 Defining and reasoning the basic issues of the financial markets development theory

According to the authors of this paper, the basic questions of the financial markets theory are as follows: **What prevents investment opportunities from being used based on their rate of return?**

The deeper meaning and societal context of this question comes to light when we realise that part of the multidimensional spectrum of investment opportunities are also investment opportunities associated with the acquisition, retention and application of human capabilities (Becker 1993), (Carmichel 2017), (Friedman 1957). If investment opportunities were used based on their rate of return, the economic system would be as efficient as possible and at the same time fair (in the sense of a dynamic concept of justice based on ensuring that everyone has the conditions to fully develop and apply their skills so that it is also beneficial for all the other participants). This is a certain view of the general development direction of society and financial markets (Neumann 1945-1946), (Palacios 2007), (Psárská 2019).

At first glance, the answer to the question "What prevents investment opportunities from being used based on their rate of return?" may seem rather trivial (given its importance). The following prevents investment opportunities from being used based on their rate of return:

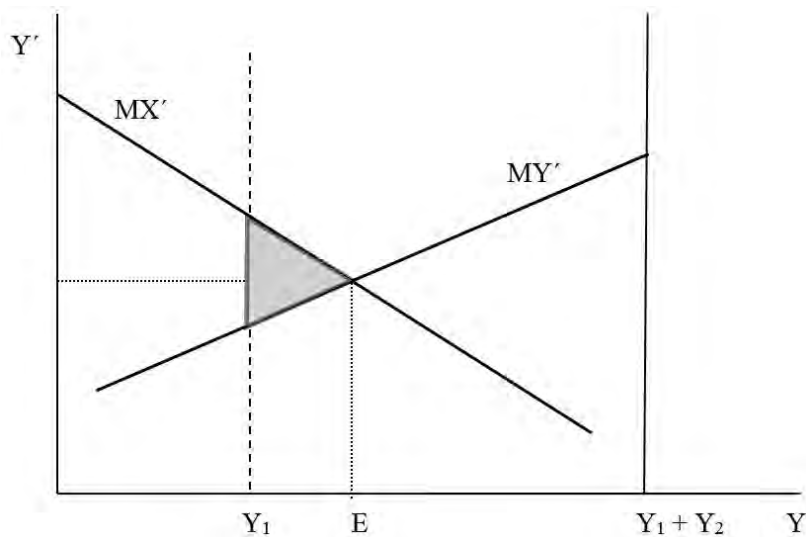
- Lack of information (it is very difficult to assess the return on investment opportunities in general and those associated with the acquisition, retention and application of investment opportunities in particular).
- Insufficient development of financial markets, lack of instruments that would allow the conclusion of contracts between owners of investment opportunities and investment means.

Are the main restrictions in fact the main cause? If this were the case, we would undoubtedly observe a very significant tendency to overcome them both in terms of private financial institutions and national policies.

3 The essence of the problem: Where do the barriers to the development of financial markets arise?

It is time to see how financial markets work. For that, we will use the microeconomic model of financial markets.

Graph No. 1: Supply and demand of investment means and of investment opportunities



Source: prepared by the author

Y is the current income

Y' is the future income

MX' is the marginal yield curve of investment opportunities of the first entity (player A)

MY' is the marginal yield curve of investment opportunities of the second entity (player B)

Y₁ is the current income of player A (in the following we will also use the term “poorer player”)

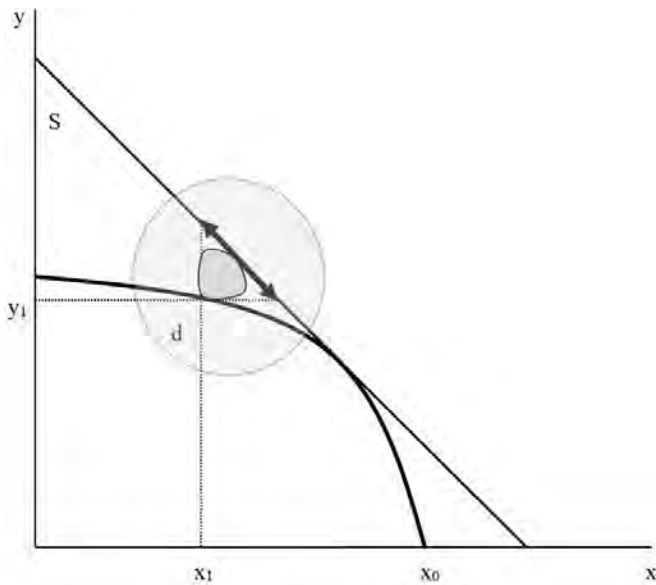
Y₂ is the current income of player B (in the following we will also use the term “richer player”)

E is the point where $MX'_1 = MY'_1$

The shaded triangle shows the possibility of increasing the future income if investment opportunities are based on their rate of return, regardless of who disposes of the relevant investment means (who is their owner).

From here we get to this Nash's (S, d) bargaining problem (it is the same relationship in other coordinates).

Graph No. 2: Expression of supply and demand of investment means and investment opportunities as Nash's (S, d) bargaining problem



Source: prepared by the author

d is the point of disagreement; it corresponds to a situation in which the own investment means are not used to realise investment opportunities of another;

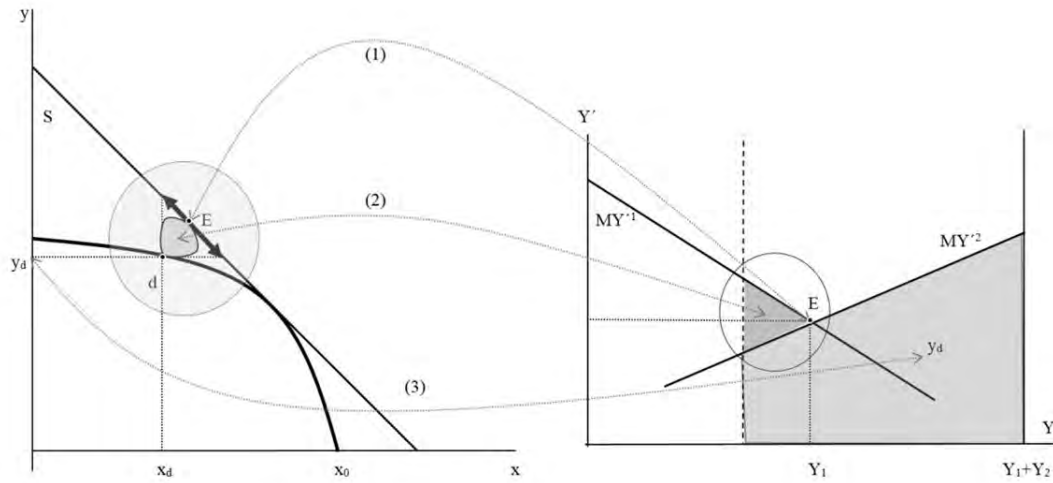
S is the set of maximum attainable sums of income obtained by using investment opportunities based on their rate of return, irrespective of who owns them; it is bounded by a 45° slope with the coordinate axes expressing the payouts of the individual players;

the bold portion of the line bounding the S-set bounded by the arrows is a subset of the S-set that meets the requirements of individual rationality, collective rationality, and accessibility;

the shaded formation between the d point and the bold portion of the line surrounding the S-set are the achievable revenue distribution points using the creditor-debtor relationship at a given budget constraint (i.e. when one player uses the other player's investment means to realise their investment opportunities in such a way that his payout increases without reducing the payout of the other).

If we connect both models, we get a complex dual model:

Graph No. 3: Dual microeconomic model of supply and demand of investment means and investment opportunities



Source: prepared by the author

Left side of the model:

Y current income

Y' future income

Y_1 current income (budget constraint) of the poorer player

Y_2 current income (budget constraint) of the richer player

MY^1 marginal return on investment opportunities available to the poorer player

MY^2 marginal return on investment opportunities available to the richer player

E point where $MY^1 = MY^2$, all investment opportunities are fully exploited regardless of who owns the investment means (can be interpreted as the equilibrium point on the capital market)

Dashed vertical line: Threshold of the budget constraint of the poorer player from the right and the richer player from the left

Darker grey triangle: The area of Pareto improvements of given possibilities to use own investment means of one of the players to realise the investment opportunities of the other player

Lighter grey bevelled quadrangle: Payout (future income) of the richer player at the point of disagreement or in a situation where Pareto improvements of given possibilities are not utilised to utilise one's own investment means to realise the other player's investment opportunities

Right side of the model:

x, y payouts of poorer and richer player

$d(x_d, y_d)$

point of disagreement, or the under-utilisation of the capital market, is determined by the budget constraints of the players and by the MY^1 a MY^2 marginal yield curves

E point where all investment opportunities are fully exploited regardless of who owns the investment means (can be interpreted as the equilibrium point on the capital market)

S a set of all possible distributions of payouts among players

45° slope line: The boundary of set **S**, where $x + y = s$ applies to all points on it, where s is the maximum sum of payouts given by the fact that all investment opportunities are fully utilised regardless of who owns the investment means

Highlighted 45° slope line limited by arrows: The part of the boundary of set **S** that meets the requirements of individual rationality, collective rationality and accessibility

Shaded area between points **d** and **E**: The area of Pareto improvements of given opportunities to use one's own investment means to realise the other player's investment opportunities; an area meeting the prerequisite of individual rationality and achievability in the (S, d) Nash's bargaining problem given by the opportunity to exploit investment opportunities no matter who owns them, the only point here that also meets the prerequisite of collective rationality (Pareto optimality) is point **E**; its shape (of the boundary) is determined by the course of marginal yield curves from investment opportunities (in the left part of the figure MY^1 a MY^2).

Some connections between the left and right sides of the model (shown by dotted lines with arrows):

- (1) Point **E** on the left side of the figure corresponds to point **E** on the right side of the figure
 - (2) The triangle highlighted in dark grey on the left side of the figure corresponds to the shaded closed area between points **d** and **E** on the right side of the figure
 - (3) The bevelled quadrangle highlighted by the lighter colour on the left side of the figure corresponds to value y_d (the coordinate of point **d** of the richer player) on the right side of the figure
- (we do not provide more context in order not to reduce the clarity of the figure)

Nash's bargaining problem means that we are looking for a function $f: \{(S, d)\} \rightarrow \mathbf{R}$ which meets the specified requirements. Where:

f is the corresponding function

S is a set that meets the prerequisite of achievability, i.e. the solution must be a part of it

d is the default point of disagreement

R is the space in which we are looking for solutions

In our case:

- For S it is true that: \mathbf{x}, \mathbf{y} belongs to $S \leftrightarrow (\mathbf{x}+\mathbf{y}) \leq \mathbf{s}$ and at the same time $\geq \mathbf{0}$
- \mathbf{R}^2 , i.e. in the case of two players we consider two-dimensional space
- \mathbf{d} belongs to S
- players' payouts, \mathbf{x}, \mathbf{y} , are interpreted as future returns of players from the combination of investment means and investment opportunities
- the following applies for \mathbf{x} : $\int_0^{Y_1} \mathbf{x}(Y) dY$
- the following applies for \mathbf{y} : $\int_{Y_1}^{Y_1+Y_2} \mathbf{y}(Y_1+Y_2 - Y) dY$
- the following applies for \mathbf{s} : $\mathbf{s} = \mathbf{max} \{ \int_0^{Y_1} \mathbf{x}(Y) dY + \int_{Y_1}^{Y_1+Y_2} \mathbf{y}(Y_1+Y_2 - Y) dY \}$

If the owners of investment means and investment opportunities (players of the relevant cooperative game, i.e. entities on the capital market) behaved in accordance with the model of Nash's bargaining problem, they would find ways to use investment opportunities based on their rate of return. This would be accompanied by an actual tendency to eliminate financial market imperfections that would be observable and verifiable. If we are not observing such tendency, there must be something in reality that prevents the tendency towards Pareto improvements to which the model points out (Nash 1950a, 1950b, 1953), (Osborn 2004), (Peleg 2007), (Selten 1999a, 1999b).

One way to explain what hinders the use of investment opportunities based on their rate of return is positional investing, i.e. investing in a social position in order to reduce the possibility of using the investment opportunities available to the other entity (player), thereby increasing the profitability of their own investment opportunities (Dhami 2017), (Loomes 1999). The original model (based on Nash's bargaining problem) is not enough to describe this phenomenon.

4 The path towards extending the model based on Nash's bargaining problem

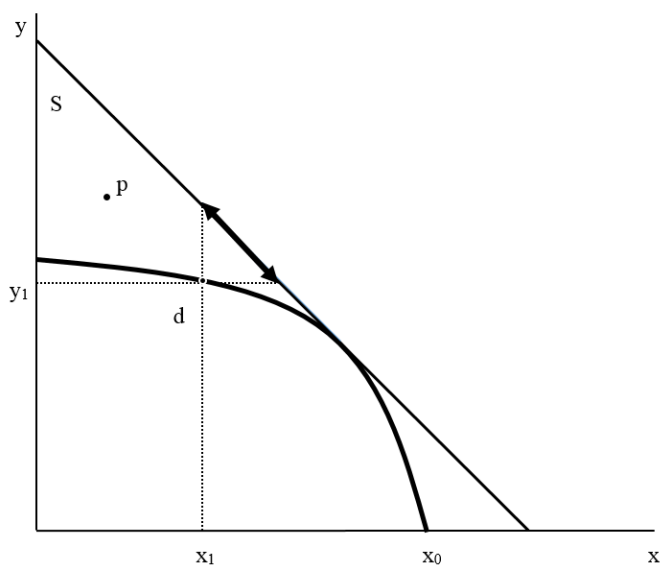
One of the leading figures in contemporary research in the field of game theory, W. Thompson, offers a way to a suitable extension of the model based on Nash's bargaining problem, following a previously published article (Chun, Thomson 1989). Even though Nash's model may seem rather general, it has a number of limitations that are not obvious at first glance. For example, the point of disagreement may not be provided in many tasks.

W. Thompson, who is characteristic with his passion for practical applications, gives an example of a strike, namely a case of negotiations between the company's management (which represents the interests of the owner) and employees. The set of achievable payouts (S) is known, but the costs of the conflict if employees start to strike are not known, i.e. the parameters of the disagreement point (\mathbf{d}) are not known. He proposes certain tools that allow the task to be resolved if the costs of a potential conflict and therefore the point of disagreement are not known. This opens up considerable space for research. When investigating this area, it is important to find suitable interpretations, simplify them

in a suitable way (identify the basic ones in them), convert them into a concept and subsequently a model from the field of game theory.

In our case, the point is that one of the players who is predominant in terms of property (i.e. has a larger amount of investment means) can consider the alternative of positional investment. If we want to express this possibility, we move away from the original Nash's (S, d) bargaining model to models we call the multipoint extension of the original Nash's bargaining problem, i.e. to problems similar to those dealt with by W. Thomson, but with a slightly different interpretation. We will take a look at one of the ways in which the alternative between concluding a contract that leads to Pareto improvement and the conflict arising from positional investment can be expressed.

Graph No. 4: Elementary model of positional investment



Source: prepared by the author

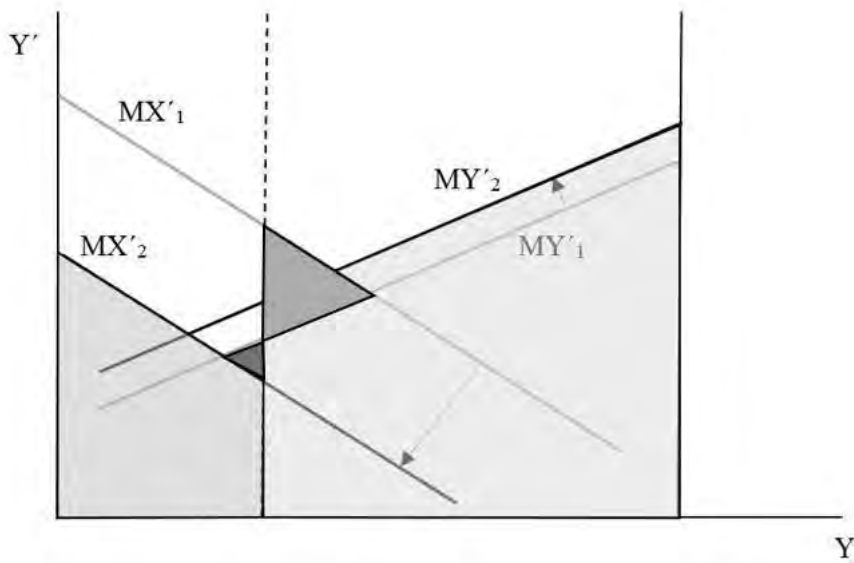
If the richer player has the opportunity to use his or her material advantage to achieve the division at **p** (and the poorer player will not be able to respond), he or she will not have an interest (in terms of individual rationality) to participate in solving Nash's bargaining problem.

Three situations can arise:

- $y_p \geq y_{max}$ the richer player will choose a positional investment strategy
- $y_{max} > y_p > y_{min}$ the solution of Nash's bargaining problem influenced by the position of point **p**
- $y_{min} \geq y_p$ the opportunity of positional investment does not affect the game

One of the interpretations of positional investment is that the profitability of the richer player's investment opportunities increases and that the poorer player's investment opportunity profitability decreases.

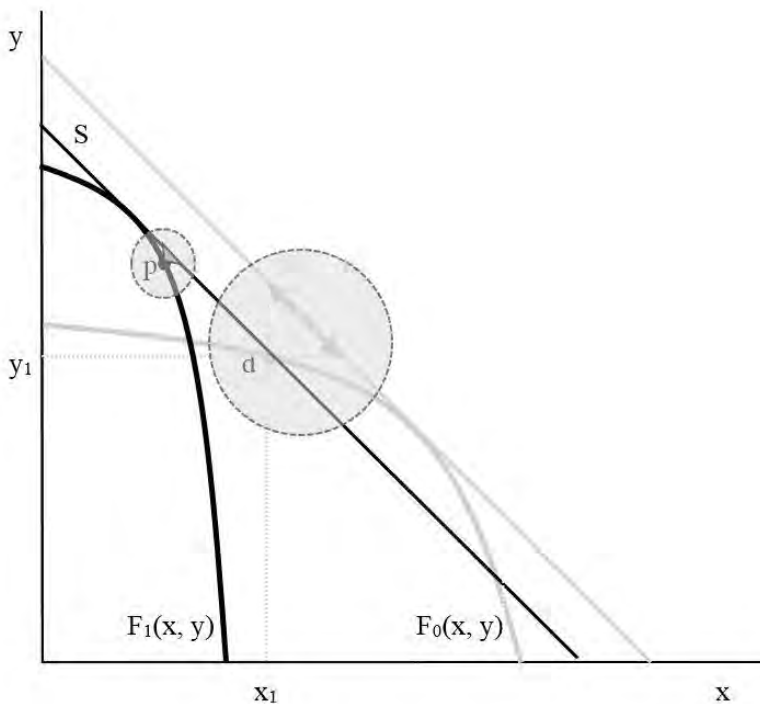
Graph No. 5: One of the interpretations of positional investment



Source: prepared by the author

The following corresponds:

Graph No. 6: One of the interpretations of positional investment



Source: prepared by the author

Note that positional investment, which affects the rate of return on investment opportunities available to players, can “reverse” the relationship between the creditor and the debtor.

A larger lighter triangle indicates the original area of Pareto improvements resulting from the use of the capital market.

A smaller, darker triangle indicates the area of Pareto improvements resulting from the use of the capital market after a change in the profitability of investment opportunities as a result of positional investment.

We know this situation well. Poorer people save not only for the worse, but also because they do not have sufficient investment opportunities (they do not hold the right position in the society). Large projects are realised from their savings by those who in the right position (in terms of image, social contacts, inside information, etc.).

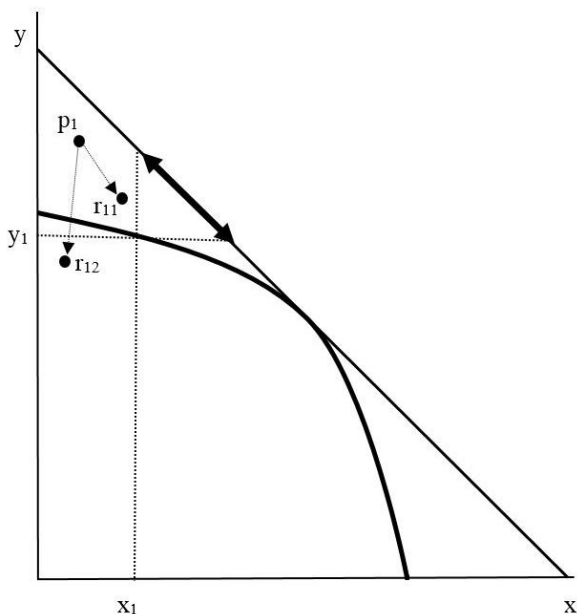
5 Games with opposition action by the players

So far, we have only considered the case where one (the richer) player can invest in his or her social position to increase his or her payout. Either by affecting the cooperative game in question, or by achieving higher payouts than in the cooperative game. The second (poorer) player had no opportunity to respond to the decision of the richer player. However, in reality, the poorer player very often does not have to be just a mere by-stander, but he or she may react or show resistance in order to:

- enforce an increase in his or her payout;
- reduce the payout of the richer player (either by punishing him or her, but mainly to discourage him or her from investing in a social position, even at the cost of reducing his or her own payout).

This is described in the following figure:

Graph No. 7: Poor player reaction to positional investment



Source: prepared by the author

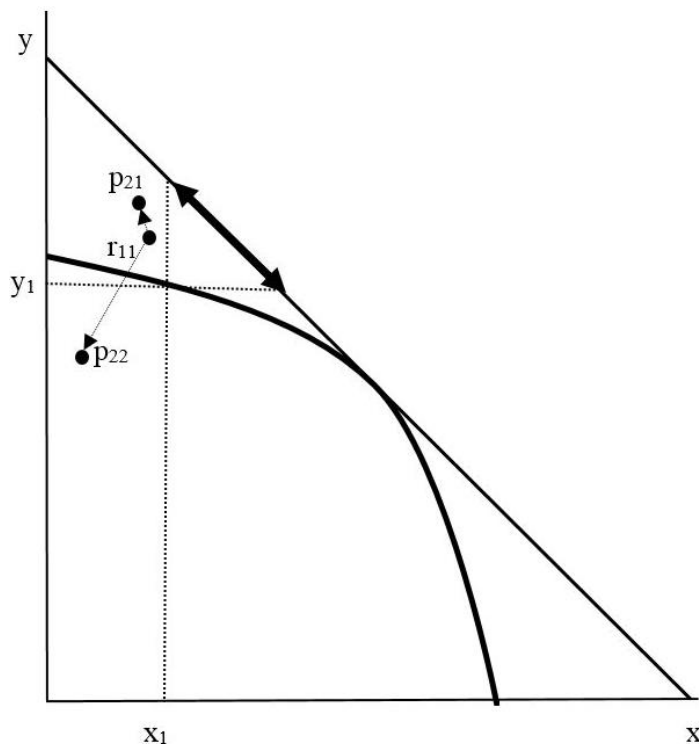
Here, points r_{11} and r_{12} represent the poorer player's reaction to the first player's positional investment (realised or intended), where:

- If point r_{11} is reached, the effect of increasing the income of the poorer player in the form of his or her resistance prevails, and the reduction of the payout of the richer player (punishing the richer player) is an accompanying effect.

- If point r_{12} is reached, the effect of punishing the richer player prevails, even at the cost of the poorer player reducing his or her own payout. This can have two causes. Either the poorer player is trying to discourage the richer player from the positional investment strategy, or the poorer player is preparing for a follow-up game involving the use of positional investment.

The richer player may answer the reaction of the poorer player. The richer player can also react to it, while considering two different effects – either wanting to reduce the payout of the poorer player (to punish him or her or to create better conditions for positional investment in the follow-up game), or wanting to increase his or her payouts despite the resistance of the poorer player. This can be illustrated by the following figure.

Graph No. 8: Reaction of the richer player to the reaction of the poorer player



Source: prepared by the author

Figure 6 shows a case where the richer player responds to point r_{11} (the poorer player attempted to increase his or her payouts by opposing positional investment) while:

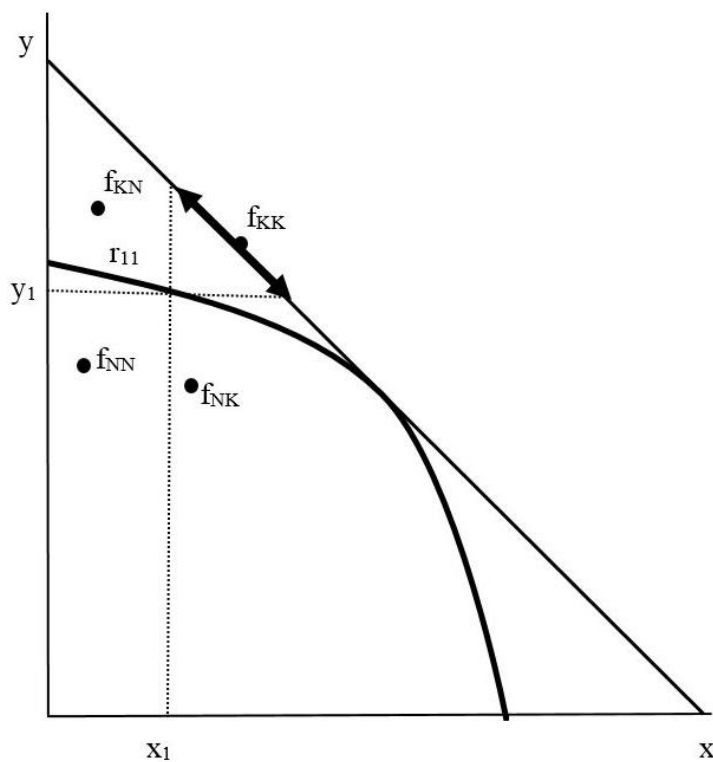
- If point p_{21} is reached, the richer player is mainly concerned with increasing his or her own payout.
- If point p_{22} is reached, the effect of punishing the poorer player for opposing positional investment prevails, even at the cost of the richer player reducing his or her own payout, which in this case may have two causes similar to the case of the poorer player.

The poorer player can respond to the reaction of the richer player, the richer player can respond with another reaction, etc. There are two ways to analyse such a chain of reactions:

- Either we have the opportunity to express the whole chain of reactions through a certain model (for example a game in an explicit form) and investigate it by achievable methods. This is only possible in exceptional cases.
- Or we will assume that both players are in some way able to appreciate the endpoints of the chain of reactions depending on the initial positional investment. This reduces the very complicated, multi-round game to a one-round game, and by analysing it we can gain valuable insights.

Whether we analyse a single-round game or have a game that was created by reducing the chain of events to a single-round game, we get a situation like of this type.

Graph No. 9: Model with final states after mutual reactions



Source: prepared by the author

Here:

f_{KK} is the final situation where both players cooperate, in which case they are solving the relevant cooperative game

f_{KN} is the final situation where the poorer player cooperates and the richer does not

f_{NK} is the final situation where the richer player cooperates and the poorer does not

f_{NN} is the final situation where none of the players cooperate

The general rule here is that if one player does not cooperate, the other player has a lower payout if he or she cooperates than if he or she does not cooperate.

As for the relationship between payouts on a case-by-case basis, there may be a variety of options, which we will discuss below.

It is relatively easy to see that the payout values of the players in each case can be converted into a table of a two-matrix game, where the points have the following values:

$$f_{KK}(x_{KK}, y_{KK})$$

$$f_{KN}(x_{KN}, y_{KN})$$

$$f_{NK}(x_{NK}, y_{NK})$$

$$f_{NN}(x_{NN}, y_{NN})$$

Table No. 1: Expression of dilemmas in the form of a two-matrix game

		Richer player B	
		cooperates	does not cooperate
Poorer Player A	cooperates	$x_{KK} : y_{KK}$	$x_{KN} : y_{KN}$
	does not cooperate	$x_{NK} : y_{NK}$	$x_{NN} : y_{NN}$

Source: prepared by the author

Positional investing can be modelled in the form of a multipoint extension of Nash's (S, d) bargaining problem, which brings us to the type of task pointed out by W. Thompson. In some cases, there are alternatives for opposition action from players, which can be described through two-matrix games.

6 Summary and discussion

The basic question of financial markets theory can be formulated in such a way as to express the general tendency of financial markets development and the barriers that prevent the realisation of these tendencies: What limits the ability to take advantage of investment opportunities (including those associated with the acquisition, retention and use of human capital) based on their rate of return?

Based on this, models can be created that are based on the microeconomic model of financial markets and the models provided by the cooperative games theory. Using these models, the phenomenon of positional investing (investing in a social position) can be identified. Based on this, significant stimuli arise for the generalisation of some basic models in the field of game theory, including the possibility of generalising Nash's bargaining problem.

Further research may lead to the development of a consistent theory, which will include (as a specific case) Nash's bargaining problem (Thomson's theoretical outbursts are on this path). Another significant outcome with practical implications is the revelation of the relationship between positional investing and other phenomena distorting financial markets. This is important for understanding current events and creating a well-founded idea of long-term, but at the same time achievable perspective of the society's development.

Conclusion

The paper complements the mosaic of theoretical materials that seek to create a comprehensive concept expressing the transition from the current post-industrial society to a society with productive services as the dominant sector, i.e. where services contributing to the acquisition, retention and use of human capital will be predominant. It contains some other theoretical instruments that are important for the development of the productive consumption economy as an overlap of mainstream economic theory in the main direction of its development.

Based on the sequence of four consecutive objective we formulated in the introduction, we consider the most important theoretical shift in the area to be the generalised solution (S, d) of Nash's bargaining problem, directly in connection with the work of W. Thompson. The "stronger" (in terms of general applicability, abstraction and mathematical apparatus used) the theoretical instruments we use, the more weight the theoretical approach can have and the more it can influence the real world.

Acknowledgment

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References

- Becker, G. Human Capital: a theoretical and empirical analysis with special reference to education. 3rd edition. Chicago: The University of Chicago Press. 1993.
- Binmore, K. Playing Fair: Game Theory and the Social Contract I. Cambridge (Ma): MIT Press. 1994.
- Binmore, K. Just Playing: Game Theory and the Social Contract II. Cambridge (Ma): MIT Press. 1998.
- Binmore, K. Playing for real: a text on game theory. Oxford: Oxford University Press. 2007.
- Binmore, K. Game theory and institutions. ELSE Working Papers, No.331. London: ESRC Centre for Economic Learning and Social Evolution. 2009.
- Černík, O., R. Valenčík and P. Wawrosz. Economics of Productive Consumption and Multipoint Expansion of Nash Bargaining Problem. Journal of International Scientific Publications: Economy & Business. Burgas: International Scientific Publications, 2020, roč. 14, no. 1, s. 10-25. ISSN 1314-7242.
- Carmichael, F. A guide to game theory. Harlow: Pearson Education Limited. 2005.
- Dhami, S. The Foundations of Behavioral Economic Analysis. Oxford: Oxford University Press. 2017.
- Friedman, M. A theory of the consumption function. Princeton: Princeton University Press. 1957.

- Loomes, G. Some lessons from past experiments and some challenges for the future. *Economic Journal*, 109(2):35-45. 1999.
- Nash, J. The Bargaining Problem, *Econometrica*, vol. 18, pp. 155-162. 1950a.
- Nash, J. Non-Cooperative Games. Ph.D. Dissertation, Princeton University. 1950b.
- Nash, J. Two person cooperative games. *Econometrica*. Vol. 21, pp. 128-140. 1953.
- Neumann, J. A Model of General Economic Equilibrium. *The Review of Economic Studies*, 13(1):1-9. 1945–1946.
- Osborn, M. *An Introduction to Game Theory* (2004). Oxford: Oxford University Press. 2004.
- Palacios, M. *Investing in Human Capital: A Capital Markets Approach To Student Funding*. Cambridge: Cambridge University Press. 2007.
- Peleg, B. and P. Sundohofer. *Introduction to the Theory of Cooperative Games*. 2nd edition. Berlin: Springer. 2007.
- Psárská, M. Determinants of real decision making on productive components of consumption under the current economic conditions of the Slovak Republic, Institute of Technology and Business in, České Budějovice. 2019.
- Selten, R. *Game Theory a behaviour: selected essays*, 1. Cheltenham: Edgar. 1999a.
- Selten, R. *Game Theory a behaviour: selected essays*, 2. Cheltenham: Edgar. 1999b.
- Thomson, W. and T. Lesenberg. *Axiomatic theory of bargaining with a variable number of agents*, Cambridge University Press, Cambridge, 1989.
- Thomson, W. *Bargaining and the Theory of Cooperative Games: John Nash and Beyond*, Edward Elgar, Cheltenham, UK, 2010.
- Valenčík, R. a kol. *Perspektivy a financování odvětví produktivních služeb*. Praha: VŠFS. 2014.

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THE FINANCIAL CRISIS IN THE 2000s: FURTHER EFFECTS REGARDING LENDING, REGULATION AND EFFICIENCY

BENEDIKT FRANK

Abstract

The global financial crisis starting in 2007 was a central element of the new millennium and had a major impact on the global economy. This paper deals with research and insights on the financial crisis in the area of liabilities and future lending, effects of regulations and bank resilience, as well as the changes in the banking industry in relation to the determinants of profitability. The findings revealed that the effect of the external funding shock on banks' domestic lending is significant, strong regulation, characterized as one-size-fits-all international best practice, is not always the blueprint for bank resilience and that efficiency has been a determining factor in bank profitability. So, the paper throws a light on further effects and thoughts on the financial crisis in the late 2000s.

Keywords

financial crisis, liabilities, lending, regulation, resilience, profitability

JEL Classification

G01, G28, P34

Introduction

The economic crisis of the late 2000s was a key event in the economic experience and thinking of the modern era. In addition to the occurrence of a steadily growing price bubble and its sudden bursting, what was particularly frightening at the time were the far-reaching and global effects and linkages, as well as the central lack of foresight and initiation of countermeasures by governing authorities to prevent a crash at an early point in time.

Questionable is, in what way problems arising in a small class of assets in one region, such as the United States, could spread worldwide, triggering a great recession. A traditional stylized description is divided into two sections and is based on the globalization of the banking system. Firstly, strain in the US banking system and those specifically exposed to US mortgages and structured goods spread across foreign borrowing markets, causing a liquidity crisis for banks around the world. Second, the disruption to different countries' banking systems' international financing was conveyed domestically by a decline in credit availability (Aiyar, 2012).

Because of the multinational nature of the situation and the large number of participants affected, such as banks, there were significant differences in their resilience and effects. As a result, it is unclear how the banking sector's resistance to the global financial crisis of 2007–2008 can be clarified (Maxfield & Magaldi de Sousa, 2015). Furthermore, the global economy and many markets have been affected by the financial collapse. Consequently, it is reasonable to conclude that widely respected topics like the study of systemic parameter of profitability have shifted as a consequence,

and that the crash has altered the relationship between bank market share, performance, and profitability, as well as the link between market risk and concentration (Azofra et al., 2013).

The paper is structured as followed with the analyzation of a link between foreign liabilities and future lending at the beginning. Afterwards, the paper examines whether measures taken after previous crises have protected countries in the financial crisis in the late 2000s. In addition, there is a focus on the systemic determinants of profitability as a constant theme in the banking research. Hypotheses formulated in each area are then verified and revised in the results section. The paper ends with a corresponding conclusion.

1 Link between foreign liabilities and future lending

Though there is a large analytical dataset on the tension in the US banking system, there is little information on the disruption to foreign funding. Given the overwhelming policy consensus that this was a bank-led slowdown in most countries, with declining credit supply leading to the decline of the real economy rather than vice versa, this void in the literature is critical. However, defining a connection between the external funding shock and domestic credit availability is difficult. In a cross-country environment, it is important to separate the need and supply components of the domestic credit contraction. Scientists seldom have access to this kind of bank-specific data that might help them solve identifying issues. Shekhar Aiyar (2012) creates and uses a novel bank-level dataset to investigate how the foreign funding shock affects banks' domestic credit offering in a big, industrialized economy like the United Kingdom. Any resident banks in the United Kingdom are required to report accurate balance sheet details to the Bank of England every three months. This confidential data document resident banks' domestic loans, broken down by recipient industry, as well as their liabilities, which enclose varying reports about non-resident liabilities. As a previous work, Aiyar (2011) provides a more detailed overview of the dataset. The bank-specific funding shock is instrumented and thus identified using pre-shock data on market positions of various forms of liabilities, whilst the variation of banks' lending patterns across sectors is utilized to control for demand effects.

As an example, the resident banking industry in the United Kingdom consists of UK-owned banks' domestically incorporated divisions, as well as units and branches of banks headquartered abroad (Aiyar et al., 2012). Moreover, it is the world's biggest financial industry in terms of asset value. At the end of 2009, the UK had over 300 banks, with combined reserves of £7.6 trillion, or more than 500 percent of the country's gross domestic product (GDP). Although UK-owned banks are in the mean larger than international branches and affiliates, the latter are more numerous, resulting in assets of 50.5 percent and 49.5 percent of total assets for foreign-owned and UK-owned banks, respectively. The accumulation of assets is significant but not overpowering. As a result, the top ten banks own about 59.8 percent of all financial assets. Banks based in the United Kingdom are increasingly globalized, with large liabilities to non-residents, rendering them especially vulnerable to international contagion. After the worldwide recession, the disruption to foreign funding was not only high, but also unparalleled. The estimated foreign liabilities of all UK-resident banks dropped by 22 percent on an exchange rate-simplified level from their height in end-March 2008 to end-October 2009, when they began to stabilize one more time, according to data from the Bank for International Settlements (BIS). By contrast, the previous highest 6-quarter drop in external liabilities occurred

during the early 1990s European Exchange Rate Mechanism (ERM) depression, when external liabilities fell by just 9 percent (Aiyar, 2012).

A bank may respond to a disruption to external liabilities in one of three ways, or a mixture of them, according to its balance sheet (Aiyar, 2012):

1. It has the ability to expand its domestic liabilities. That includes borrowing more from local units.
2. By lending less to non-residents, it will flatten its foreign assets.
3. By lending less to residents, it will reduce its domestic claims.

Given the large shock to banks' external funding that occurred during the financial crisis and with focus on 3., the following Hypothesis could be proposed:

Hypothesis 1: *A reduction in banks' foreign liabilities causes a contraction in domestic lending.*

2 Possible protection due to measures taken after previous crises

There is a perception that countries that were affected by economic collapses before the Great Financial Crisis were in fact less distressed. One explanation may be that regulatory changes enacted in response to the previous meltdown discouraged them from participating in reckless practices to the degree that triggered such high exposure anywhere during the late-2000s financial crisis. Cases like Mexico, Thailand or other Asian countries, for instance, have seen banking problems and eventual banking restructuring in the decades leading up to the worldwide financial crisis, but have shown resiliency before and since the 2007–2008 crisis. Firm regulation has also been cited by academics as a reason for banking sector stability in other countries, including India, Egypt, Canada, and Islamic nations for that matter (Maxfield & Magaldi de Sousa, 2015).

Furthermore, some reports claim that financial deepening, or expanded availability of financial markets with a broader range of goods aimed at all layers of society, is a feature of the financial environment that has exacerbated crisis contagion (Reinhart & Rogoff, 2010, Aisen & Franken, 2010). According to this line of study, firms in more mature capital markets rely more heavily on foreign financing, meaning that when a monetary recession arises, the economy experiences a long decline due to the effect of credit contraction on the actual economy. It is indeed a point being made in case reports of nations such as Cyprus, whose underdeveloped financial institutions escaped the global financial crisis largely uninjured (Besim & Mullen, 2009). Based on that logic, another justification for the banking sector's stability in Mexico and other areas is that they have weak financial institutions or so-called shallow banking structures (Maxfield & Magaldi de Sousa, 2015). Moreover, Maxfield and Magaldi de Sousa (2015) created a framework to classify four ideal forms of regulation and bank growth and allocate 129 countries along this typology to provide a summary of countries studied, which can be seen below.

Figure No. 1: Listing of countries with strong regulation and shallow banking

<i>Deep banking & strong regulation</i>	<i>Shallow banking & strong regulation</i>	<i>Deep banking & weak regulation</i>	<i>Shallow banking & weak regulation</i>
Algeria, Australia, Bahrain, Bangladesh, Canada, China, Cyprus, Czech Republic, Denmark, Egypt, El Salvador, Finland, France, Germany, Greece, Hong Kong, Iceland, Ireland, Israel, Italy, Japan, Jordan, Kuwait, Malaysia, Malta, Mauritius, Morocco, Netherlands, New Zealand, Norway, Pakistan, Philippines, Portugal, Singapore, Slovenia, South Africa, Korea (Rep.), Spain, Sweden, Switzerland, Syrian Arab Republic, Thailand, UK, US	Argentina, Brazil, Dominican Republic, Estonia, Hungary, Jamaica, Kazakhstan, Kenya, Latvia, Lithuania, Mexico, Nicaragua, Papua New Guinea, Russian Federation, Sri Lanka, Zimbabwe	Antigua & Barbuda, Austria, Belgium, Bolivia, Chile, Dominica, Ethiopia, Grenada, Guyana, India, Lebanon, Luxembourg, Oman, Panama, Saudi Arabia, Seychelles, Slovak Republic, St. Kitts & Nevis, St. Lucia, St. Vincent & the Grenadines	Angola, Armenia, Belarus, Belize, Benin, Bhutan, Bosnia & Herzegovina, Botswana, Bulgaria, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Colombia, Congo (Rep.), Costa Rica, Côte d'Ivoire, Croatia, Equatorial Guinea, Fiji, Gabon, Ghana, Guatemala, Guinea-Bissau, Honduras, Indonesia, Kyrgyz Republic, Lesotho, Macedonia, Malawi, Maldives, Mali, Moldova, Mozambique, Niger, Nigeria, Peru, Poland, Romania, Senegal, Suriname, Tanzania, Togo, Trinidad & Tobago, Uganda, Uruguay, Vanuatu, Venezuela

Source: Maxfield and Magaldi de Sousa (2015)

Therefore, the liberalization of access and operation conditions, the financial sector could overexpand, resulting in a boom-cycle and the accumulation of threats. Without judicious regulation interventions, these threats will ultimately result in economic crises, known as a bust-cycle, reducing banking resilience (Maxfield & Magaldi de Sousa, 2015).

Based on these findings, the following hypothesis can be formulated:

Hypothesis 2: *Strong regulation allowed for bank resilience to the 2007–2008 financial crisis.*

3 Changes in banking industry

The evaluation of the systemic determinants of profitability is a constant theme in the banking research. Due to the consequences for competitiveness, rules, and bank management, several analyses have focused on the connection regarding profitability, market concentration, and performance (Demsetz, 1973, Berger, 1995). At the one hand, the market power theory holds that greater market concentration, or market power, makes it easier to establish higher prices for consumers, resulting in higher windfall profits for banks. The efficiency theory, on the other hand, suggests a favorable association among efficiency and bank earnings (Azofra et al., 2013).

Existing research that investigated the link between profitability, market concentration, and productivity found that market share and market concentration lead to non-competitive rentals. (Hannan, 1991, Berger and Hannan, 1997, Berger et al., 1999). Deregulation, technical advances, and the internationalization of capital markets have intensified challenges in the banking industry over the years. This may have resulted in a decrease in the impact of market concentration on profitability.

New research, nevertheless, have shown that market concentration continues to be important in deciding bank profitability, particularly in certain goods. In this respect, Carbó-Valverde et al. (2007) observed that market power is greater in non-traditional practices. According to De Jonghe and Vander Vennet (2008), banks with a wide market share in concentrated markets also produce non-competitive rents. They also discovered that banks with the best management had a competitive advantage. Furthermore, several scholars demonstrated that the validity of the performance and market power theory varied across countries (Gonzalez, 2008, Hsieh and Lee, 2010, Goddard et al., 2011). One major disadvantage of these experiments is that they were undertaken during a time of economic recovery and expansion when banks were profitable (Azofra et al., 2013).

Economic collapse may cause significant shifts in the banking industry's relationship between profitability, market power, and efficiency. They have a negative impact on bank profitability. From the other hand, mergers and acquisitions boost the concentration of the banking sector. Industry shocks, as per Mitchell and Mulherin (1996), trigger takeover motions. Despite the fact that greater market concentration can improve bank profitability, acquiring rents from market power is more challenging during crises due to decreased credits, higher borrowing costs, and a growth in non-payments (Demirgüç-Kunt et al., 2006, De Jonghe and Vander Vennet, 2008, Bolt et al., 2012). Furthermore, during a recession, the disparity in profitability between more and less effective banks becomes more apparent when the former are able to cut costs, prevent unnecessary delinquency, and obtain better financing terms (Dietrich & Wanzenried, 2011, Bolt, et al., 2012).

Azofra et al. (2013) investigated previously shifts in the link between bank market share, efficiency, and profitability caused by financial crashes. In addition, the 2008 financial meltdown offered an impetus to examine the consequences of instability and assess the situation before and after a recession. While the severity of the recession varies by region, the gradual departure and consolidation of banks, a huge wave of mergers and acquisitions (Wheelock, 2011), a rise in delinquency, and a downturn in banking operation (Ivashina & Scharfstein, 2010) could be seen. Not only can a crisis change the connection between profitability, efficiency, and market strength, but it could also change the relationship between market concentration and bank risk. Hence, the second approach of Azofra et al. (2013)'s study was to examine the adjustments that the collapse created in this link. Market power has the potential to enhance or reduce bank risk based on two conflicting assertions: concentration-stability and concentration-fragility (Uhde & Heimeshoff, 2009). There may be a suggestion that crises perpetuate the concentration-fragility theory since there is a propensity to consider greater danger in more concentrated markets due to structural risk in the aftermath of a meltdown (Azofra et al., 2013).

Based on the above, the following hypothesis can be formulated:

Hypothesis 3: *A financial crisis strengthen the efficiency hypothesis as well as reinforce the concentration-fragility hypothesis.*

4 Results

Based on the strong assistance from post-estimation checks and the intuitive appeal of the tools used in Shekhar Aiyar (2012)'s study, it is possible to conclude that the effect of the external funding shock on banks' domestic lending is well known and significant, proving Hypothesis 1 correctly. Aiyar (2011) examines the transmission process in greater depth, and multiple robustness tests were

performed. Given the variations in funding trends and the scale of the shock reported, differences in delivery by form of bank - UK-owned, international branch, or foreign affiliate - should be explored in particular. The implication is that foreign extensions and affiliates cut lending by a higher proportion than domestically owned banks, while the latter adjusted domestic lending reductions more similarly to the scale of the funding shock. This implies a race-to-the-exits reaction by foreign-owned banks compared to domestically owned banks, which is a turbulent rush to deleverage regardless of funding pressures. There is some indication that foreign currency lending was reduced more than sterling lending, although this is most definitely due to the fact that foreign-owned banks invest in foreign currency comparably more (Aiyar, 2012).

Inspired by the Mexican situation, Maxfield and Magaldi de Sousa (2015)'s study sought to investigate the impact of policy and banking sector growth on bank resilience in the aftermath of the 2007–2008 financial crisis. They separated bank stability into two parts in their research: resilience in terms of bank profitability and resilience in terms of credit provision. In addition, they developed new analytical metrics of resilience, strict regulation, and shallow banking for 129 countries. According to a large-n quantitative experiment, neither strong regulation nor the mixture of strict control and shallow banking may justify bank stability in terms of credit provision. The only plausible reason for the survival of bank credit after the recession is shallow banking. Solid regulation could not alleviate the influence of the crisis on bank profitability. Rather, it exacerbated the crisis's disruptive effects on profitability in nations with shallow banking. These findings suggest that strong regulation, characterized as one-size-fits-all international best practice, is not always the blueprint for bank resilience, and therefore Hypothesis 2 cannot be completely proven. In reality, it could have an adverse impact on profitability when introduced in countries with comparatively underdeveloped banking systems. It is an interesting finding that requires more attention. The issue is whether robust regulatory frameworks designed to mitigate the effect of a recession end up exacerbating its negative consequences when implemented in countries with weak banking structures. There is guess that, by exposing deficiencies in a deeply dysfunctional financial structure, the recession rapidly causes corrective intervention and investor reactions that reduce bank profitability. This is probably a good idea from a policy standpoint, as it ensures that rules are in effect and working to enact the transparency required as a check on corporate governance. Furthermore, these findings demonstrated that the financial recession is associated with significant decreases in post-crisis credit provision in nations with mature banking systems. The recession has had a significant effect on countries with financial institutions that have a huge deposit base and are effective in issuing large amounts of credit. Finally, the results call into question the suggestion of one-size-fits-all regulation, such as the Basel Accords, for global banking industries (Maxfield & Magaldi de Sousa, 2015). Further than attempting to draw general lessons from the collapse in order to provide a fail-safe regulatory structure that will fit for any nation, the idea that various regulatory focus is needed for different national banking structures should be accepted (Acharya, 2003). An even more complex, multi-layered response to bank regulation is required, one that refers to the rationale of national financial system strengths and vulnerabilities. So even world market integration necessitates greater regulatory harmonization (Maxfield & Magaldi de Sousa, 2015). Other ideas involve reclassifying principles-based regulation as judgment-based and highly responsive risk-based regulation (Black & Baldwin, 2010). Whether or not, these interventions' contribute to increased bank resilience should be the subject of interest of future academic research (Maxfield & Magaldi de Sousa, 2015).

A further argument to consider is that crises change the framework of the banking sector, which can have an effect on the link between market concentration, efficiency, and profitability, as well as the connection between market concentration and risk. Azofra et al. (2013) conducted an observational study of a survey of credit institutions from major OECD countries from 2002 to 2009 to examine the shifts. The empirical research revealed a very substantial shift in the determinants of profitability after the beginning of the financial meltdown. Prior to the recession, most developed-country banks saw a significant rise in business as a result of increased mortgage demand, low interest rates, and favorable economic conditions. In the sense of ample liquidity, strong demand for loans and credit from families and companies prompted financial institutions to pursue financing through bond markets, securitization, and asset packaging. According to the findings of this study, banks in more concentrated markets might have gained the most from this procedure, as suggested by the structure-conduct-performance (SCP) hypothesis. When the recession hit, many banks faced heavy losses due to increasing delinquencies. Moreover, the abrupt disappearance of liquidity in capital markets narrowed the options for funding troubled banks, many of which had to be stabilized or sought government interference. As a result, bank financing declined dramatically, leading in a shift in business strategies. Azofra et al. (2013) found that efficiency has been a determining factor in bank profitability, as suggested by the efficiency hypothesis, which is addressed in Hypothesis 3. Therefore, in a downturn, more profitable banks will achieve higher profits by improved cost containment and the introduction of better accounting and risk control strategies. In terms of risk analysis, these results revealed that the relationship between concentration and risk was quadratic over a time of development and expansion. When market concentration is poor, greater market concentration leads to increased risk. As a result, the concentration-fragility hypothesis was given more weight, which also supports Hypothesis 3. Nevertheless, as market concentration grew, so did its connection to risk, with the concentration-stability theory becoming more significant. Increased market concentration would minimize risk after a certain period. Even so, during a recession, there is little evidence to confirm a connection between concentration and risk, which may be attributed to financing and liquidity issues, as well as an increase in mergers and acquisitions.

Conclusion

The late-2000s global recession was a defining moment in contemporary economic history and thinking. Problems occurring in a specific class of assets in the United States expanded globally and caused a great recession. Due to the overwhelming policy consensus in most countries that the recession was caused by a bank-led slowdown, with decreasing credit supply contributing to a decline in the real economy rather than vice versa, this gap in the literature is important. However, it is complicated to establish a linkage between the external funding shock and domestic credit availability.

According to its balance sheet, a bank could react to a disturbance in external liabilities in one of the following three ways, or a combination of them (Aiyar, 2012). Firstly, it has the ability to expand its domestic liabilities. That includes borrowing more from local units. Secondly, by lending less to non-residents, it will flatten its foreign assets. Or thirdly, by lending less to residents, it will reduce its domestic claims. Based on the strong support provided by post-estimation checks and the intuitive appeal of the methods used in analysis conducted by Shekhar Aiyar (2012), it is possible to infer that the impact of the external funding shock on banks' domestic lending is well recognized and

significant, thus proving Hypothesis 1: *A reduction in banks' foreign liabilities causes a contraction in domestic lending.*

Aiyar (2011) investigated the transmission process in greater depth, and multiple robustness tests were carried out. Given the differences in funding patterns and the magnitude of the recorded shock, disparities in delivery by form of bank should be investigated in particular. The implication is that foreign subsidiaries and branches reduced lending more than domestically owned banks, while the latter modified domestic lending decreases more similarly to the magnitude of the funding shock.

Furthermore, there is a widespread belief that countries that experienced financial crises prior to the financial crisis in the late 2000s were less affected. One possible reason is that reform efforts introduced in response to the recent meltdown prevented these previously hit countries from engaging in risky activities to the extent that caused such high exposure anywhere during the late-2000s financial crisis. Moreover, according to some sources, financial deepening, or the increased availability of financial markets with a wider variety of products targeted at all levels of society, is a characteristic of the financial system that has accelerated crisis contagion.

Another significant observation of this paper was the focus on resilience. In the context of the 2007–2008 financial crisis, Maxfield and Magaldi de Sousa (2015) aimed to explore the effect of regulation and banking sector development on bank resilience. A large-n quantitative experiment found that neither strong regulation nor a combination of close watch and shallow banking would explain bank stability in terms of credit provision. The only logical interpretation for bank credit to survive after the crisis would be shallow banking. These results imply that strong regulation, identified as a one-size-fits-all international recommended solution, is not always the template for bank resilience, and therefore Hypothesis 2: *Strong regulation allowed for bank resilience to the 2007–2008 financial crisis.* cannot be proved completely. When implemented in countries with relatively underdeveloped financial structures, it can even have a negative effect on profitability.

Furthermore, assessing the structural determinants of profitability is a recurring topic in research studies. Because of the implications for competition, rules, and bank management, numerous studies have concentrated on the connection between profitability, market concentration, and performance. The so-called efficiency hypothesis, for example, proposes a favorable association between efficiency and bank earnings. Furthermore, there is a possibility that disasters reinforce the concentration-fragility hypothesis since, in the wake of a meltdown, there is a propensity to perceive greater threat in more concentrated economies due to systemic risk. Azofra et al. (2013) investigated previously observed changes in the relationship between bank market share, efficiency, and profitability as a result of financial crashes. Besides that, the 2008 financial crisis provided motivation to investigate the implications of instability and evaluate the situation before and after a recession. In order to examine Hypothesis 3: *A financial crisis strengthen the efficiency hypothesis as well as reinforce the concentration-fragility hypothesis.* and thus the possible strengthening of the efficiency theory as well as a reinforcing of the concentration-fragility theory by a financial crisis, further literature was reviewed. Azofra et al. (2013), for example, examined the changes in an empirical analysis of a survey of credit institutions from major OECD countries from 2002 until 2009. The empirical analysis showed a significant change in the determinants of profitability following the start of the financial meltdown. When the crisis struck, many banks suffered significant losses as a result of rising delinquencies. Furthermore, the sudden absence of liquidity in financial markets limited the opportunities for financing distressed banks, many of which needed to be stabilized or pursued

government intervention. As a result, bank lending fell precipitously, causing a transition in corporate strategy. According to the efficiency hypothesis, which is discussed in Hypothesis 3, Azofra et al. (2013) discovered that efficiency has been a deciding factor in bank profitability. Throughout terms of risk assessment, research showed that the association between concentration and risk was quadratic over a period of development and expansion. As a consequence, the concentration-fragility hypothesis received more weight, supporting Hypothesis 3.

Although a decade has passed since the financial crisis of the late 2000s, not all of its effects and implications have been fully understood. In this paper, the aspects of bank liabilities and contraction in domestic lending, strong regulation as well as bank resilience could be examined. Some further effects and thoughts on the financial crisis in the late 2000s are recommended to be investigated more profound in the future.

References

- Acharya, V. (2003). Is the international convergence of capital adequacy regulation desirable? *The Journal of Finance* 58, 2745–2782.
- Aisen, A. & M. Franken (2010). Bank credit during the 2008 financial crisis: a cross-Country Comparison. IMF Working Paper WP/10/47.
- Aiyar, S. (2012). From Financial Crisis to Great Recession: The Role of Globalized Banks. *American Economic Review*, 102, 225–230.
- Aiyar, S. (2011). *How did the crisis in international funding markets affect bank lending? Balance sheet evidence from the United Kingdom*. Available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1814991
- Aiyar, S., C.W. Calomiris & T. Wieladek (2012). *Does macro-pru leak? Evidence from a UK policy experiment*. Available at https://www.nber.org/system/files/working_papers/w17822/w17822.pdf
- Azofra, S. S., M. C. Saiz, B. T. Olmo & C. L. Gutierrez (2013). Financial Crises, Concentration and Efficiency: Effects on Performance and Risk of Banks. *Czech Journal of Economics & Finance*, 63, 537–558.
- Berger, A. N. (1995). The profit-structure relationship in banking-tests of market-power and efficient-structure hypotheses. *Journal of Money, Credit and Banking*, 27, 404–431.
- Berger, A. N., R. S. Demsetz & P. E. Strahan (1999). The consolidation of the financial services industry: Causes, consequences, and implications for the future. *Journal of Banking & Finance*, 23, 135–194.
- Berger, A. N. & T. H. Hannan (1997). Using efficiency measures to distinguish among alternative explanations of the structure-performance relationship in banking. *Managerial Finance*, 23, 6–31.
- Besim, M. & F. Mullen (2009). Cyprus in the global financial crisis: how lack of banking sophistication proved an advantage. *South European Society and Politics*, 14, 87–101.
- Black, J. & R. Baldwin (2010). Really responsive risk-based regulation. *Law & Policy*, 32, 181–213.
- Bolt, W., L. De Haan, M. Hoeberichts, M. R. C. Van Oordt & J. Swank (2012). Bank profitability during recessions. *Journal of Banking & Finance*, 36, 2552–2564.
- Carbó-Valverde, S., D. B. Humphrey & R. López del Paso (2007). Do cross-country differences in bank efficiency support a policy of “national champions”? *Journal of Banking & Finance*, 31, 2173–2188.
- Demirgüç-Kunt, A., E. Detragiache & P. Gupta (2006). Inside the crisis: An empirical analysis of banking systems in distress. *Journal of International Money and Finance*, 25, 702–718.
- Demsetz, H. (1973). Industry Structure, Market Rivalry and Public Policy. *Journal of Law and Economics*, 16, 1–9.

- De Jonghe, O. & R. Vander Venet (2008). Competition versus efficiency: What drives franchise values in European banking? *Journal of Banking & Finance*, 32, 1820–1835.
- Dietrich, A. & G. Wanzenried (2011). Determinants of bank profitability before and during the crisis: Evidence from Switzerland. *Journal of International Financial Markets, Institutions & Money*, 21, 307–3027.
- Goddard, J., H. Liu, P. Molyneux & J. O. S. Wilson (2011). The persistence of bank profit. *Journal of Banking & Finance*, 35, 2881–2890.
- González, F. (2008). The relationship between charter value and bank market concentration: the influence of regulations and institutions. *Applied Financial Economics*, 18, 153–172.
- Hannan, T. H. (1991). Foundations of the structure-conduct-performance paradigm in banking. *Journal of Money Credit and Banking*, 23, 68–84.
- Hsieh, M. F. & C. C. Lee (2010). The Puzzle between banking competition and profitability can be solved: International evidence from bank-level data. *Journal of Financial Services Research*, 38, 135–157.
- Ivashina, V. & D. Scharfstein (2010). Bank lending during the financial crisis of 2008. *Journal of Financial Economics*, 97, 319–338.
- Maxfield, S. & M. Magaldi de Sousa (2015). The global financial crisis and banking sector resilience. *Journal of Banking Regulation*, 16, 265–288.
- Mitchell, M. L. & H. Mulherin (1996). The impact of industry shocks on takeover and restructuring activity. *Journal of Financial Economics*, 41, 193–229.
- Reinhart, C. M. & K. S. Rogoff (2010). *This Time is Different: Eight Centuries of Financial Folly*. Princeton, NJ: Princeton Press.
- Uhde, A. & U. Heimeshoff (2009). Consolidation in banking and financial stability in Europe: Empirical evidence. *Journal of Banking & Finance*, 33, 1299–1311.
- Wheelock, D. C. (2011). Banking industry consolidation and market structure: impact of the financial crisis and recession. *Federal Reserve Bank of St. Louis Review*, 93, 419–438.

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BEHAVIORAL ASPECTS OF ASSET MANAGEMENT IN RELATION OF FINANCIAL LITERACY

ZUZANA CHLUMSKÁ, VLASTIMIL JANDUS

Abstract

People have to make financial decisions concerning their expenses and savings on daily basis. However, they frequently decide upon their feelings and emotions instead of their respective knowledge and reason. Behavioral economy deals with the psychological impetuses of man and relevant social influences. Contemporary consumer has a number of options how to get to a decision. The objective of this paper is the analysis of a sample of 100 clients of a chosen company, their profile and chosen investment service with the aim to understand the basic elements of behavioral economy.

Keywords

Behavioral finances, psychology, banking, financial literacy, investment profile

JEL Classification

G24, G41, G53

Introduction

Human behaviour and decision-making is not studied by economy alone but also by marketing, psychology, sociology and other sciences which sometimes overlap each other. An important area which encompasses behaviour and decision-making is the area of financial literacy, defined as a set of knowledge and skills. Behavioral economy is a rather young field, dealing with the impact of social, cognitive and emotional factors on the economical decisions made by individuals or by institutions. In the life of every individual economical behaviour and decision-making takes places almost daily.

The purchase of food or consumer goods, choosing between individual products and decision-making based on the preferences of every given person which goods shall be purchased and which shall not. People spend their time on work for which they receive wage – revenue. From these financial means the individual pays for consumption or these means are set aside – savings, usually deposited in a bank. Taxes are paid to the state and the state, in reverse, allocates transfers (such as child or unemployment support).

The consumer does not think whether his decisions are right or not. In a given situation he forms a decision based on his options and with the intention of maximalising his benefit. However, people often commit behavioral mistakes and are subject to behavioral prejudices as well. According to Nováková – Sobotka (2011) et coll. the necessity of educating citizens in the area of financial literacy became even larger as a consequence of the fact that many citizens have no idea how to manage their finances, or lost their money or are ignorant of their personal or family financial situation. People are, in today's modern world, also influenced by media, social media, references and information that

sway their judgement and in cooperation with the choice architecture set foundations for their decision.

People also have to make financial decisions concerning their expenses and savings every day as Moreno (2018) states. Such a person can make use of a mortgage to purchase a place to live in, leasing or credit to buy a new or used vehicle, household appliances, holiday etc. Financial market offers the consumers credit cards or non-purpose loans for anything. In the non-banking sector high-interest loans are also provided without proof of income.

From the opposite point of view the consumer can, while managing his assets, make use of products of retail banking (savings accounts, building savings, common funds). In the case of assets of higher value services of private banking can be used. That usually focuses on security trading (shares, bonds) but also real estate or investment gold trading. In this case the consumer usually relies on an investment broker who, on the basis of a written contract, makes investment decisions on behalf of the consumer.

The expertise principle emphasizes the expert knowledge of investment brokers who should spread financial literacy successfully and correctly. These individuals should possess sufficient knowledge and skills not only deriving from their education but their experience learnt at the financial market as well. Expertise can be perceived as a set of activities that lead to mastering of key competences of a pedagogue. These activities, according to Tilinger (2014), include professional activity, skills, habits and mastering of behavioral patterns and acting within the chosen field.

As a representative sample for this research 100 clients of a chosen company were picked randomly. Every client, while concluding an asset management agreement, completes a client profile and an investment questionnaire on the basis of which the asset manager decides how to use the client's money and securities. This paper tries to form a basis for understanding of the basic behavioral economy elements using the example of asset management of chosen clients. The research was conducted as a survey of the clients. The results are analyzed and generalized, it is therefore a synthesis. The survey was done in the form of an interview during which the asset manager completes a questionnaire and an investment profile of the client. The answer sheet is customized to the questioner who completes it.

Aim of the survey is to obtain material, thanks to which the client can be provided with a relevant service based on his requests and in accordance with the relevant legal frame and also classifying the client into an adequate group. The prerequisite for a successful cooperation of an investment company with the client is a professional team formed by an asset manager (namely portfolio managers), economists and analysts, necessary technologies and trading systems (Bloomberg, Reuters.)

1 Behavioral economy

Behavioral economy works with human psychological impulses and social influences. Today's consumer has many options how to form a decision. The basis of behavioral economy lies in its psychological approach. This field explores what impulses influence the behaviour of individuals. Sciences such as psychology, sociology or politology are part of this exploration.

Nowadays, an individual does not satisfy only his vital needs but also other desires and whims as well. It can be said that these are „created“ by modern times, since the consumer is heavily influenced

by media and advertisement on TV or on social media. Famous fast food hamburgers are a good example of this phenomenon, creating the need of an immediate satisfaction of hunger (or craving) while driving on highways for example.

These food chains have a detailed and masterfully constructed marketing which targets most of today's population starting with children (selling food packages with toys included, organisation of birthday parties, adjusting the size of the menu etc.). These enterprises keep on perfecting their marketing using the latest trends and technologies. Simply put they force their clients to spend money for something they do not need without even realizing it most of the time. Similar cases can be found throughout the whole market in large numbers, since society lives in consumer times and often with debt. Among important parts of behavioral economy are also psychology, behaviouralism, motivation, emotions and rationality.

1.1 Psychology

Psychology originated as a science in the end of the 19th century. Its development was, besides other things, influenced by economical and technological progress, that came into conflict with the needs of man, which was necessary to solve not only in theory but in practice as well, as Pauknerová states (2012). Human psyche is defined as a subjective reflection of objective reality. It is determined biologically and socially. Biological factors, which are inherent, are the nervous system, sense and hormones. Social factors are then education, environment and the social role of an individual.

1.2 Behaviourism

Behaviourism (from „to behave“) emerged in the USA and is defined as a science studying behaviour. It is one of the three main fields of psychological sciences. It targets behaviour, an observable human expression. Behaviourism is used in working with people, particularly in the work process, process of learning and motivation according to Pauknerová (2012).

The exclusive objective of behaviourism is the analysis of behaviour. In the educational, propagandistic or advertising practice behaviourism aimed to manipulate individuals and groups and to alter the behaviour of a larger number of people. Due to the influences of other factors, such as surrounding environment or social control and social determination, these efforts have never been entirely successful in a socially open environment (Vláčil, 2018).

1.3 Human personality

Personality is one of the fundamental terms of psychology. It means individual formation of human psyche. It can be understood also as a unique „me/myself“ of a person and also a compound or a connection of character, temperament, skills and also constituting traits (Cakirpaloglu, 2012).

1.4 Motivation

A. H. Maslow became famous in the behavioral science field particularly due to his theory of motivation based on the hierarchy of needs where:

- the base of the hierarchy is formed by physiological and existential needs,

- then there are the needs of safety and security – employment, wage etc.
- social needs – the need to belong, social status, identity
- esteem needs – to be successful, earn prestige, reputation, sense of accomplishment
- need of self-actualisation – realisation of one's potential (Smith, 2021)

Human values and attitudes determine how such motivation will be used. Man is motivated to actively participate in the solving of various issues concerning himself, his surroundings or his country (i.e. motivation to vote and decide about the future of the country or become a volunteer to help with the pandemic crisis), as Yelkikalan (2020) states.

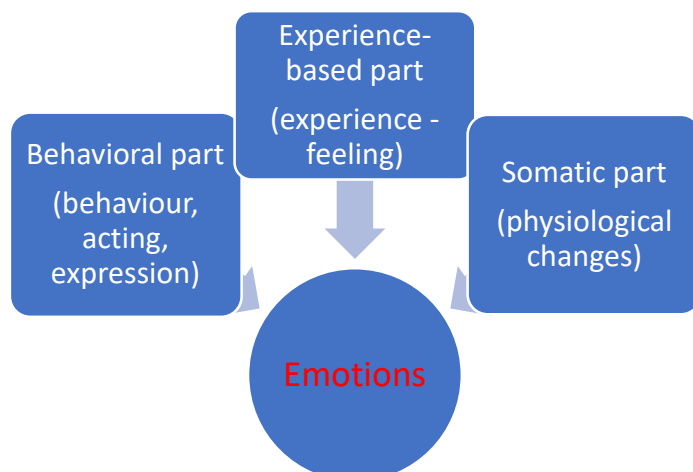
Human values and attitudes change over time during one's life, their preferences are different depending on age, life experience and events. When one starts a family for example, his values change drastically, security and stability become a priority because of the need to financially secure the family and satisfy its material needs (equally important is the existence of spiritual values and attitudes which lead to the securing of a stable emotional background for all family members and a correct upbringing of the children).

1.5 Emotions and rationality

Emotions are often considered as a disturbing element when rational contexts are applied. In fairy tales it can be often observed that the final decision has to be based either on reason or emotions which are usually juxtaposed as completely opposite options. Even nowadays reason and emotions are considered to be two forces which, according to Poláčková – Šolcová (2018), do not work together and are in opposition to each other. Emotions are a changeable process of human psyche. They consist of three basic parts – somatic, behavioral and experience-based.

This division can be seen in Picture 1. Emotions are processed in the amygdala, the part of human brain which is responsible for human emotional responses. It is connected to our nervous system, which can in turn influence blood pressure, heartbeat, hormonal secretion, digestion. That is why emotions can sometimes manifest themselves through visible physical reactions such as excitement, shaking, sweating, faster heartbeat or stomach spasms. In contrast, rational thinking is based in the neocortex, a different part of human brain. Emotion-targeting is therefore widely used strategy in marketing communication with the objective of persuading the client to purchase a certain product or service.

Picture No. 1: Structure of emotions



Source: Vysekalová et col., 2020 – edited by the author

2 Research methodology

To obtain the necessary data, the method of a direct survey was used. Subsequent analysis is a process based on the separation of factual or psychological whole into individual parts. It is an analysis of traits, relationships, wholes of this whole to its parts. For the provision of investment services an investment questionnaire is used.

2.1 Investment questionnaire

Investment questionnaire is a standardized bank document and its completion is required of every client with whom the bank negotiates or concludes any agreement on investment services provision in the sense of Act No. 256/2004 Sb., on Capital Market Business, as amended. Based on the information provided by the client in the investment questionnaire the investment company evaluates, processes and sets the following:

- does a **proportionality test**. It evaluates whether the provision of the main investment service not mentioned in sec. 3 (that is mediation of buying or selling of securities or trading with fund shares outside markets), giving advise concerning an investment instrument or processing of a trade of an investment instrument within such an investment service corresponds with sufficient skill, knowledge and experience of the client, necessary to understand the risk.
- sets a **risk profile**. To its result the offer of investment instruments is adjusted. Funds risk is determined by legal and internationally standardized processes and it is also expressed through the synthetical risk and revenue index (SRRI). This index evaluates the risk from 1 (highly conservative) to 7 (riskiest) with the lowest risk usually meaning lowest revenues and higher risk meaning possible higher revenues.
- does a **suitability test**. This is an evaluation of whether the main investment service according to par. 4 sec. 2 letters d) and e) of Act No. 256/2004 Sb., on Capital Market Business, as amended corresponds with the financial background of the client, his investment objectives and his investment knowledge necessary to comprehend the relevant risks.

- runs (beyond the legally set frame) a **knowledge test** in relation to derivative markets and instruments and in cases of using the Different currency credit or Investment instrument trading credit and loan. Investment company thus provides increased protection to the client, who, trading with derivatives or drawing credits or loans due to investment instrument trading, usually faces a higher risk than trading solely with non-derivative instruments using his own means.

2.2 Research questions and research

The objective of the research is to define in a more detailed way the profile of a client of an asset management company for wealthier clientele. Research was based on the evaluation of a survey of 100 respondents, who became clients of investment companies in the last 5 years (2015-2020). This paper then tries to look for connections, regularities or deviations, which would answer the below stated research questions based on the above mentioned questionnaire.

Research questions

Q 1: What is the client's field of business?

Q 2: What is the client's personal economic situation?

Q 3: What is the source of the assets (savings, inheritance, real estate etc.)?

Q 4: Is the owner of the account also the real owner of the assets (beneficial owner)?

Q 5: What is the client's investment profile based on the completed questionnaire?

While answering the questionnaire the client simultaneously completes a form, which provides regulatory bodies with the necessary AML (anti money-laundering) information. These forms concerning anti money laundering measures (Act No. 253/2008 Coll. on selected measures against legitimisation of proceeds of crime and financing of terrorism) must be properly completed and signed. In the Czech Republic the regulatory body providing financial supervision in this case is the Czech National Bank to which security traders are subject and must fulfill their legal obligations towards it in order to be able to provide services to end clients.

Then the company discusses with the client his knowledge of the risk, willingness to risk and the readiness to bear it. The client confirms that the information in this such created investment profile reflect his answers. The client is acquainted with the Special risks related to security trading brochure, which is an integral part of the banking documentation. He is also told all the essential information.

2.3 Asset management company

Investment company focuses mainly on bond investments and its objective is conservative investing with protection against the depreciation of money due to inflation. For this purpose the company uses CFPM (Cash-flow Protection Model). The structure of this investment model is based on four basic parts: an independent investment professional, conservative interest investments, secure background of a private bank and regular transparent information.

The priority, however, is the protection of the client's capital and the ensuring of the value of assets against depreciation due to inflation. Other typical traits of this model are: a beforehand defined level

of evaluation, regular payments of interest revenue, exclusion of speculative transactions, immediate liquidity without notice periods and a cash-flow guarantee provided by stable companies backed by strong capital.

CFPM allows the client to achieve average asset appreciation above the level of inflation and thus making it possible to obtain real appreciation of the invested funds. Financial means that are paid to the clients as interest revenues can be used either for consumption or can be reinvested. Reinvestments provide clients with another effect, the interest on interest.

As the scientific study published by the Czech National Bank states the results indicate that the inflation trend has been decreasing since the beginning of the millenium, which overlaps with the introduction of the inflation targeting regime and the subsequent changes of inflation objectives of the Czech National Bank. A regression analysis mentioned in this paper moreover indicates that the dominant role in the change of this trend is played by inflation expectations as pointed out by Franta (2020).

3 Evaluation of the research

The data were collected in a company which focuses on professional asset management (mostly investments in corporate bonds, shares, commodities and derivatives investments). 100 respondents participated in the research, the data being collected between 2015 and 2020, when the company acquired these clients. The client questionnaire is being completed by the client with the assistance of the company's key account manager. These records are then being kept as a part of the agreement documentation.

Q 1: What is the client's field of business?

The data collected in the survey show that almost a quarter of the clients are professional sportsmen (i.e. hockey or football players), almost a half – 43% to be exact – of the clients are businessmen or top managers. Another quarter (25%) is formed by rentiers (i.e. owners of betting offices or businessmen who transferred their enterprises to younger generations in their families) and 8% of the clients falls under the category „other“ where people such as lottery winners can be found.

Clients are actively sought out by the asset management company at various events or they come recommended from business partners. The business strategy of the company targets a specific kind of clientele, actively cooperates with sports clubs and lottery companies. Significant part of the company's portfolio is then formed by businessmen or top managers in their productive years.

Based on their area of business clients can also be divided into three different age groups (25-35 years old – professional sportsmen, 35-55 businessmen and top managers in productive years; and 55 years old and above – rentiers and businessmen, who passed their business on their children for example, but still earn profit from it in some way).

Based on their age, a trend of higher consumption and higher expenses can be observed in the youngest group of 25-35 years of age (professional sportsmen), where the money is not used for reinvestments but to purchase luxury goods, expensive holidays, cars, home furnishing etc. The clients in the largest group (35-55 years – businessmen and top managers) tend to make large one-time investments every few years, thus selling their assets or investment bonds.

Rentiers and businessmen (55 years old and above), who already transferred greater part of their business to their successors are the most conservative group, which tends not to seek many changes. Their biggest distress concerns situations, when unexpected events affect the market, such as the British Petrol oil spill or the impending bankruptcy of Greece, alternatively current turbulences caused by the Covid-19 pandemic. Their asset portfolio is usually very diverse, meaning that their investments are placed in different business areas, real estates, shares in other successful companies etc., in order to decrease the risk of asset depreciation.

Q 2: What is the client's personal economic situation?

Due to the area of business of the asset management company it is desirable that the economic situation of the client is favourable with favourable future prospects as well. A specific situation concerns the case of professional sportsmen, who face significant risk of injury and the subsequent inability to proceed with their career either for some time or, in the worst scenario, for good. Voluntary career ending usually happens at a very early age in case of these clients, therefore in a short-term horizon (in comparison to other client groups – i.e. businessmen). This group is also specific due to its different financial behaviour, which can be related to their age and physical condition. These clients tend to rather spend their money than to invest it in order to earn a long-term revenue. Due to professional insurance of sportsmen the risk is evaluated as low with just a slight insecurity and it concerns 24% of the company's clients.

The situation was evaluated as favourable with favourable future prospects in case of 76% of the clients in the years 2015-2020. In 2021 some of them might pass into the area of slight risk due to the Covid-19 pandemic, which has affected some areas of their business. This is not, however, the subject of this research. Significant risk was detected only in 1% of the cases, when the client in question had issues with property settlement during a divorce. Even in such a case can an asset management company prove beneficial. With its help various off-shore companies or trusts can be established and thus the property can be transferred to appointed successors such as children. Similar situation can arise out of criminal prosecutions or civil litigations, when the client is forced to act quickly in regard to his property. In such a case everything is handled with the help of a legal office and in accordance with legislative regulations.

If the client's economic situation is not favourable, conservative asset managers are not sought out at all, since people in such distress look for other investment products and instruments in order to solve their situation. It is not in the interest of the company, which offers mostly conservative investments, to acquire such clients either. Such people are in most cases forced to bear higher or even disproportionate risk in order to solve such problematic situations.

Q 3: What is the asset source (savings, inheritance, real estate etc.)?

In majority of the cases (89%) the source of clients' assets are savings which come from their business activities (business, professional sports). 7% of the clients rely on the ownership of investment real estates such as flats, apartment blocks, hotels or hospitals as the source of their assets. In 4% of the cases the source of the investment funds are gifts or inheritance, usually from family members or relations in the direct line.

Q 4: Is the owner of the account also the real asset owner (beneficial owner)?

As it was mentioned above, a Beneficial Owner is the real owner of the assets. It is a legal term defining a situation when certain ownership rights connected to the property belong to a certain person, even though the legal title to the asset belongs to another person. The real owner needs to follow the laws on interest or property transfers etc. This term is usually used in off-shore structures which are beneficial due to their low or zero taxation. These structures also provide the real asset owners with anonymity. It has been a frequently discussed topic whether it is morally acceptable that wealthy people pay lower or even no taxes at all compared to others. These taxes, if paid, are moreover paid in foreign countries. The laws of many countries, however, states that this procedure is legal. It is a rather controversial topic that has sparked numerous discussions.

Q 5: What is the client's investment profile resulting from the completed questionnaire?

Since the company deals mostly with conservative investments, it is agreed upon that majority of the clients can be defined as careful (15%), thrifty (23%) or consolidated (54%). Consolidated investment profile also corresponds with the duration of corporate bonds investments, which is a few years, when markets are subject to different development and different economic cycles. The benefit of CFPM is that whereas the price of bonds is prone to fluctuate, the interest are paid to investors on a regular basis. It can be determined beforehand what the revenue rate will be and the time frame when the guaranteed interest will be paid. In this way a reasonable rate of asset appreciation can be achieved in the long term. This even applies to times when market prices of investment instruments fall due to many different reasons. Only 8% of the clientele can be classified as „courageous“ meaning that they are willing to undertake higher risks while investing in shares, securities or other instruments. It is of no surprise that this group is mostly formed by young professional sportsmen.

Conclusion

Behavioral aspects of asset management target, in their theoretical part, basic definitions from psychology, behaviorism, behavioural economy and human personality. Motivation, attitudes and values, emotions and human rationality are all important components. The subject of the research was formed by a representative sample of 100 clients of an asset management company.

A questionnaire survey done with these clients is a part of the asset management agreement conclusion process and a part of the banking documentation. Conclusion of these agreements took place between 2015–2020 with the participation of the company's key account manager and under the auspices of a professional employee of the company. The key account manager personally completes these questionnaires so that they correspond with the client's idea of how his property, securities and financial means will be managed.

The objective of the research was to closely define the profile of a client of a company that manages assets for wealthy clientele. It was found out that there are various types of clients in relation to their field of business. Businessmen are one of the groups of society that certainly needs financial literacy. In contrast with workers and employees, businessmen enter the market with their own business activities and a good knowledge of financial terms, as well as the ability to make quality decisions for the successful establishment and development of a company, is paramount. Financial literacy is also linked to the source of the clients' assets, which they invest through the asset management

company. The company deals mostly with conservative investments, therefore the clients' profiles correspond with this trend and the research did not discover any significant or disproportionate deviations.

In summary it can be generalized that behavioral aspects play an important part in the process of asset management. When managing their money, people usually make more or less responsible decisions mostly based on how those finances were earned and how much effort it cost. Age and corresponding life experience, expectations and mental maturity is an important factor as well. Ansong and Gyensare (2012) discovered in their research that there is a connection between financial literacy and age. Older generations of clients also tend to take into account the securing of future generations and aim for the securing of their property in case of unexpected events, such as death. However, all clients show motivation to secure their property against depreciation due to inflation, economic recession or crisis.

In this particular case, when assets are invested in securities, the role of the asset manager – a professional in whom the client places his trust and financial means to manage – is irreplaceable. This person's purpose is to eliminate flawed decisions and he tries to make the client's portfolio as strong as possible and make it generate the highest revenues possible, with the client being able to accept the undertaking of an adequate risk. The asset manager's reward is usually paid every three months based on the performance of the client's portfolio, from which a percentage reward is deducted. The clientele's demand has in the recent years shifted towards more conservative types of investments and instruments which represent a long term perspective of conservation of property. The current Covid-19 pandemic certainly influences the reasoning of people, a trend which is likely to continue and even grow stronger in the foreseeable future.

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References

- ANSONG, Abraham a Michael Asiedu GYENSARE. Determinants of University Working-Students' Financial Literacy at the University of Cape Coast, Ghana. *International Journal of Business and Management* [online]. 2012, 7(9) [cit. 2021-04-03]. ISSN 1833-8119. Dostupné z: doi: 10.5539/ijbm.v7n9p126
- CAKIRPALOGLU, Panajotis. *Úvod do psychologie osobnosti*. Praha: Grada, 2012. Psyché (Grada). ISBN 978-80-247-4033-1.
- FRANTA, Michal a Ivan SUTÓRIS. Dynamics of Czech Inflation: The Role of the Trend and the Cycle. ČNB CZECH NATIONAL BANK. Working Paper Series [online]. 2020, 01/2020, 30 s. [cit. 2021-03-20]. ISSN 1803-7070. Dostupné z: https://www.cnb.cz/export/sites/cnb/en/economic-research/.galleries/research_publications/cnb_wp/cnbwp_2020_01.pdf
- JUREČKA, Václav. *Mikroekonomie*. 3. aktualizované a rozšířené vydání. Praha: Grada Publishing, 2018. Expert (Grada). ISBN 978-80-271-0146-7.
- MORENO HERRERO, Dolores. Factors that influence the level of financial literacy among young people: The role of parental engagement and students' experiences with money matters. *Children and youth services review* [online]. 2018.

NOVÁKOVÁ, Vladimíra a Věroslav SOBOTKA, ed. Slabikář finanční gramotnosti: učebnice základních 7 modulů finanční gramotnosti. 2. aktualiz. vyd. Praha: COFET, 2011. ISBN 978-80-904396-1-0.

PAUKNEROVÁ, Daniela. Psychologie pro ekonomy a manažery. 3. aktualiz. a dopl. vyd. Praha: Grada, 2012. Management (Grada). ISBN 978-80-247-3809-3.

POLÁČKOVÁ ŠOLCOVÁ, Iva. Emoce: regulace a vývoj v průběhu života: funkce a zákonitosti emocí, sociální a kulturní souvislosti, měření emocí. Praha: Grada, 2018. Psyché (Grada). ISBN 978-80-247-5128-3.

Služby: ASSET MANAGEMENT. Accredio: Financial Solutions [online]. Praha: Accredio, c2021 [cit. 2021-03-20]. Dostupné z: <http://www.accredio.cz/services>

SMITH, C M. Analyzing the Relationship between Maslow's Hierarchy of Needs and Consumer Spending Patterns. Journal of Financial Service Professionals [online]. 2021, 75(4), 68-79 [cit. 2021-7-6]. ISSN 1537-1816.

Speciální rizika související s obchodováním s cennými papíry [online]. Praha: Accredio, 2021 [cit. 2021-03-13]. Dostupné z: <http://www.accredio.cz/soubory/35-specialni-rizika-souvisejici-s-obchodovanim-s-cennymi-papiry.pdf>

Teorie motivace podle Maslowa. In: Mentem - brain training, z.s. [online]. Brno, 2018 [cit. 2021-03-13]. Dostupné z: <https://www.mentem.cz/blog/teorie-motivace/>

TILINGER, Pavel. Odborné a pedagogické praxe ve sportu a tělesné výchově. 2. vyd. Praha: Karolinum, 2014. ISBN 978-80-246-2795-3.

VLÁČIL, Jan. Sociologický ústav AV ČR, v.v.i.: Behaviorismus. Sociologická encyklopedie [online]. Praha: Sociologický ústav AV ČR, 10. 11. 2018 [cit. 2021-03-13]. Dostupné z: <https://encyklopedie.soc.cas.cz/w/Behaviorismus>

VYSEKALOVÁ, Jitka, Jiří MIKEŠ a Jan BINAR. Image a firemní identita. 2. aktualizované a rozšířené vydání. Praha: Grada Publishing, 2020. Expert (Grada). ISBN 978-80-271-2841-9.

YELKİKALAN, Nazan. Covid-19'un Maslow'un İhtiyaçlar Hiyerarşisi Kuramına Etkisi: Durumsallık Yaklaşımı Bağlamında Bir Araştırma. Journal of Entrepreneurship & Development / Girişimcilik ve Kalkınma Dergisi [online]. 2020, 15(2), 139-165 [cit. 2021-7-6]. ISSN 1306-8946.

Zákon č. 256/2004 Sb., o podnikání na kapitálovém trhu.

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ARE REAL ESTATE PRICES EVOLVING INTO AN ASSET PRICE BUBBLE?

WOLFGANG KLOPPENBURG

Abstract

The development of real estate prices is of extraordinary importance for the financial and economic system, as undesirable developments could endanger financial stability - as seen in the financial crisis of 2008 and 2009. This applies not only to speculators, but also to private households, which have to borrow to pay the purchase price. The market has been "fueled" in particular by the monetary policy of the central banks - expansion of the money supply and low interest rates. Investors are looking for investment opportunities due to the money glut, and the real estate market still promises a return. Furthermore, many people looking to build are willing to go into debt to buy a property. This demand ultimately has a driving effect on real estate prices. The aim of this paper is to compare and analyze the development of real estate prices in the most important OECD countries with those of Germany. A model of real estate prices is presented, which takes into account the most important indicators and provides information on when a price bubble exists. The model shows that asset price bubbles can be identified in some OECD countries. In Germany, on the other hand, there are only signs of a price bubble in a few major cities. Since private debt is low, it does not seem to be a problem across the board in Germany. A general problem remains with regard to the timely detectability of price bubbles.

Keywords

Asset price bubbles, Monetary policy, Price bubble in

JEL Classification

E44, G12, E52

Introduction

In 2008, the bankruptcy of the U.S. investment bank Lehman Brothers triggered one of the biggest global economic crises (Mishkin, 2011; Shiller, 2013). The bank had been significantly involved in financing the housing price bubble in the U.S. and insuring credit default risks, and eventually had to declare bankruptcy. The U.S. government was no longer willing to prop up Lehman Brothers after support actions for the two government mortgage state agencies, Freddie Mac and Fannie Mae. This fateful step triggered a bursting of the real estate price bubble worldwide. This led to massive real economic problems on the financial markets, characterized by pessimism and uncertainty about future developments. In the United States, the unemployment rate rose to more than 10%. In Germany, for example, overall economic output fell by 5.6% in 2009. Banks stopped lending money to other banks because confidence in the solvency of commercial banks was severely damaged. This ultimately represented a failure of the money market. There was a concern that it would lead to a major credit crunch. Global support measures by governments and, in particular, central banks were therefore necessary. Governments and central banks around the world were forced to introduce support

measures, backed in particular by monetary policy focusing on an expansion of liquidity to banks and a low interest rate policy. As a result, central banks pursued a very expansionary monetary policy and key interest rates, and thus financing costs, became significantly more favorable. Overall, the global economy recovered.

In the years that followed, real estate prices rose sharply (see the following Chart, OECD Data. Housing Prices, 2021). Housing prices include housing rent prices indices, real and nominal house prices indices, and ratios of price to rent and price to income.

Table No. 1: Housing prices



Source: OECD (2021)

Real estate price bubbles are a threat to financial and macroeconomic stability (Blot, 2017). The recent financial crisis has highlighted the importance of housing markets as both a source and a transmission mechanism of financial instability (Bauer, 2014). This view has been forcefully supported by the Bank for International Settlements (BIS). Several prominent BIS economists have argued that monetary policy should “lean against the wind,” i. e. try to prevent the build-up of financial imbalances by reacting early on to upward-trending asset prices (Cecchetti et al. 2000, Borio and Lowe, 2002, White, 2006 and Brunnermeier, Schnabel, 2014). The empirical analysis of this paper shows that there is evidence of a significant multidirectional link between house prices, broad money, private credit and the macroeconomic.

The following section uses data from OECD countries to show whether and to what extent risks have built up again on the international real estate markets. A common answer is that the monetary policy of central banks has encouraged this development. This is followed by a comparison of selected

OECD countries with real estate price developments in Germany. A brief review of the literature opinion as well as empirical tests for the identification of speculative price bubbles follow.

1 Literature Review

In recent years, a large number of research papers have been published dealing with the causes and forecasting models of real estate price bubbles. In the following, some papers on this topic are briefly presented.

Kholodilin and Michelsen compare the experiences of different countries with speculative price bubbles and contrast this with Germany. They focus on the institutional framework and whether this can prevent such a real estate price bubble. Although the authors do not see any signs of a speculative price bubble in Germany, they believe that there is an increased risk in some larger metropolitan areas. The authors see one reason for this in lending to customers with a low equity ratio (Kholodilin and Michelsen, 2019a).

Engsted use econometric methods to examine data from 18 OECD countries from 1970 to 2013 for explosive increases in real estate prices and were able to prove this in all countries - with the exception of Germany and Italy (Engsted, Hviid, and Pedersen, 2016).

Brunnermeier analyze the relationship between asset price bubbles and systemic risk using bank-level data in 17 OECD countries and over a 30-year period. The systemic risk of banks increases already during the build-up phase of a bubble and even more during its bursting. The increase varies considerably across banks and bubbles and depends in particular on the size of the bank. The results show that higher credit growth, stronger maturity mismatch, and especially bank size make financial institutions, and thus the financial system, vulnerable to asset price bubbles. The increase in systemic risk is largest for housing price bubbles (Brunnermeier, Rother, and Schnabel, 2019).

In their paper, Huber and Punzi (2016) propose a model with time-varying parameters for the housing market in the United States, the United Kingdom, Japan and the euro area. The results indicate that the monetary policy transmission mechanism to the housing market has not changed with the implementation of quantitative easing or forward guidance and that central banks can influence the composition of an investor portfolio by investing in the housing market. Furthermore, it is shown that the U.S. was able to influence the consequences of the financial crisis more successfully through unconventional monetary policy than the other countries considered.

In a paper by Wölfle (2017) paper, for example, values were presented for the very unequal cities of Hamburg and Freiburg, in terms of purchase prices of residential real estate, and considered over time. There was already an increase in the bubble risk for both cities in the years 2009 to 2012.

2 Development of the real estate prices in OECD countries

The risks in many OECD countries are high. In Germany, there has been an explosive price development, which has decoupled from the returns on real estate. (Kholodilin, Michelsen, 2017, 2019a). Housing price bubbles have developed especially in the following OECD countries as France, Germany, Italy, Spain, UK and USA.

Table No. 2: Development of real house prices Q1_1970 / Q1_2019

Source: Kholodilin (2019a)

It should be noted that price developments have been supported to a large extent by the very expansive global monetary policy. Almost all central banks lowered their key interest rates to historically low levels in response to the global financial and economic crisis. As a result, yields on government bonds fell significantly, which also made financing costs for real estate investments much more favorable.

In some countries the analyses show that the development of real estate prices points to speculative investment behavior on the part of investors. In particular, the continuing high level of household debt and the generally very low level of interest rates suggest a new bubble in many places. Corresponding patterns can be seen in the time series of the countries examined. For example, price exaggerations have been likely again in Sweden since 2012, in Australia and Belgium since 2014, in Germany, the UK and Italy since 2015, and in Portugal and the USA since 2016.

In view of the breadth and momentum of price increases, concerns are increasingly being voiced that overvaluations on the real estate markets could occur or are already a reality. In this context, two risks are viewed synonymously that should actually be separated from each other. A distinction must be made between the risks arising from the low-interest phase and those attributable to speculative investment behavior. The low interest rates increase demand for real estate, the price of which is rising sharply in view of the rigid supply in the short term.

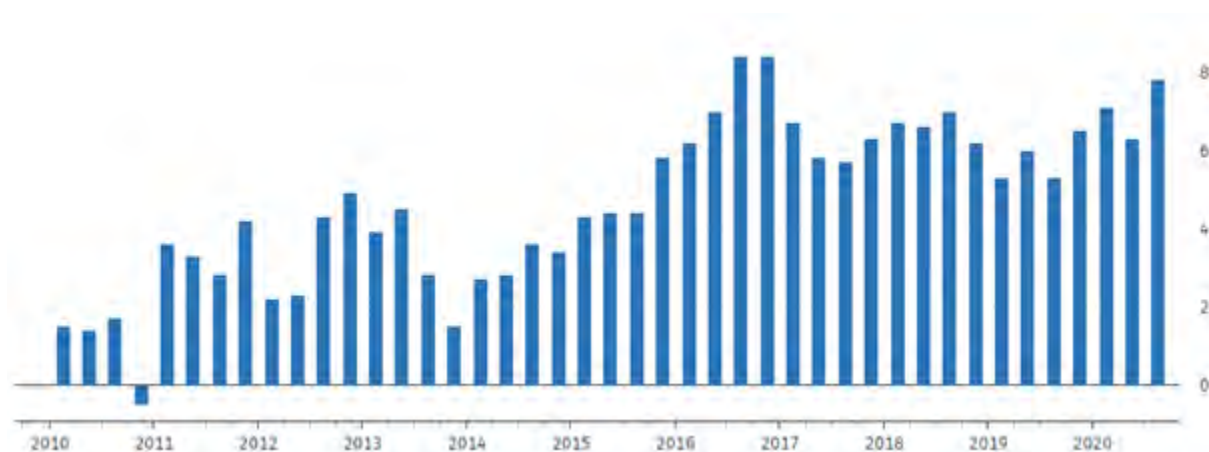
If there are unexpectedly rapid increases in the key interest rate, demand for real estate could fall drastically, whereupon prices are likely to come under pressure. Households that have not taken sufficient account of such developments in their financing could be forced to sell their property. If the market price of the property is lower than the mortgage in the meantime, the household will be over-indebted. These risks are reduced, at least in Germany, with comparatively long fixed-interest periods. This would create severe macroeconomic problems that would have to be addressed by new support measures on the part of policymakers.

3 Development of real estate prices in Germany

Starting from the 1st quarter of 2004 (index = 100), the so-called empirica real estate index in Germany was 165 points in the 4th quarter of 2020. The price index is based on a weighted average of purchase and rental prices (owner-occupied or rented apartments and single- and two-family houses of all construction years) and on over 100 sources of advertisements (empirica - Preisdatenbank 2020).

Steadily rising real estate prices have resulted from strong demand coupled with low supply. Despite the many new buildings, the supply of housing is not enough, as the population has also increased in recent years. This creates a shortage of living space, especially in metropolitan areas, which leads to rising rents or price increases for properties for sale. Another shortage is affordable building land. In 2019, a square meter of land ready for construction in Germany cost an average of around 190 euros. Fifteen years earlier, it was still around 100 euros for the square meter. Scarce building land is becoming more expensive and is therefore also causing property prices to rise overall. Another reason for the development of real estate prices is the current monetary policy of the European Central Bank. Low interest rates are making it cheaper to finance real estate and are crowding out other investment opportunities for lack of an alternative. As a result, more is being invested in real estate and prices on the real estate market are rising due to increased demand (Statista Research Department, 2021 und Statistisches Bundesamt (Destatis), 2021).

According to the Federal Statistical Office (Destatis), the house price index in the third quarter of 2020 was 7.8% higher on average than in the prior-year quarter. Furthermore, prices for apartments as well as for detached and semi-detached houses rose by 2.9% compared with the previous quarter. In the seven largest metropolitan areas, the year-on-year increase was 8.9% for detached and semi-detached houses and 7.3% for condominiums. However, rural counties (less populated counties) also saw price increases of 9.7% (8.4%) for houses and 7.1% (8.1%) for condominiums. Statistisches Bundesamt (Destatis), 2020).

Table No. 3: House price index 2020

Source: Statistisches Bundesamt (2021)

In Germany, signs of speculative overvaluation are seen primarily in the major cities. The macroeconomic risks are considered to be low, not least because of the significantly lower level of private household debt (Kholodilin, Michelsen, 2017 and 2018). According to a UBS study, however, there are warnings of price bubbles on the real estate markets in Europe and Germany, as price growth has accelerated considerably (UBS Study, 2020).

4 Data Description and Methodology

It is important for regulators to identify the emergence of price bubbles at an early stage (see Hagemann and Wohlmann (2019)) which developed an early warning system to signal speculative price bubbles. Evaluations of price-rent ratios are valuable for this purpose - but it is better if the "ingredients" for speculative bubbles are known. There are already assessments of this, according to which loose monetary policy in particular harbors major risks.

Following Gilles and LeRoy (1992) and Gürkaynak (2008), every price system can be decomposed into two parts, namely a fundamental component and a bubble component. In the given context, the fundamental house price equals the sum of the present values of expected future rents. The bubble component equals the difference between the market value and the fundamental value. Two statistical methods are used for the investigation of the price development in the German housing market: tests for stationarity and for explosive behaviour. The terms stationarity and difference stationarity are used simultaneously. In both tests, bubbles are assumed to be rational. The previously explained features of a price system and a rational bubble are modified respectively (Mayer and Gehrke, 2018).

In Germany, the empirical property price index is published regularly on the basis of the empirical price database and is prepared using statistical methods. The index contains data from the Bundesbank, Destatis and information on real estate advertisements (empirical, Preisblasenindex, 2016).

A bubble risk is seen, as purchase prices are rising faster than rents or incomes. The low interest rate may justify this, but it is an unstable equilibrium. The risk of a bubble is also high because prices have escaped middle income or equity in many places. This means that a "rather high" bubble risk is

now indicated for 10 out of 12 major cities (previous quarter 9, three years ago 8). Accordingly, a bubble is imminent if the "normal earner" can no longer afford real estate because purchase prices are rising faster than a) rents or b) incomes and c) more and more housing is being built (in excess of demand) d) and more and more loans are being taken out for this purpose. These four indicators (multiplier, price-income ratio, completions per inhabitant and housing loans relative to GDP) can be observed (empirica, Price Bubble Index (2020)).

Kholodolin and Michelsen (2018) determine the probability of a speculative bubble as a function of various external variables such as (gross value added, real interest rate, credit-to-GDP ratio, and population growth) using a so-called panel logit estimation. Logit models find wide application in determining and predicting economic recessions, currency crises and speculative excesses in asset markets, and allow to estimate the significance and sign of the relevant variables and thus to draw conclusions about the conditions under which a speculative bubble is likely to occur. They calculated logit models for a panel of 20 OECD countries in their model.

Conclusion

The development in Germany does not seem too alarming compared to other countries, but precaution is still necessary. Ten years after the financial crisis, real estate markets worldwide have recovered. Monetary policy probably played a major role in this, as low interest rates make real estate investments more attractive. This also applies to Germany - although the analyses were only carried out for the large metropolises and not for the country as a whole.

In their study, Kholodolin and Michelsen (2019b) show that ten years after the financial crisis, price developments can again be observed in many countries, which are probably also characterized by speculative investment behavior. This applies to eight of the 20 countries studied (in European countries, North America as well as Australia), where corresponding patterns can be identified in the time series.

References

- Bauer, Gregory H. (2014). International House Price Cycles, Monetary Policy and Risk Premiums. Bank of Canada Working Paper 2014-54.
- Blot, Christophe, Paul Hubert and Fabien Labondance (2017). Does monetary policy generate Asset Price Bubbles? Working Paper 5/2017. Paris, Science Po, OFCE.
- Borio, Claudio and Philip Lowe (2002). Asset prices, financial and monetary stability: exploring the nexus. BIS Working Papers No 114.
- Brunnermeier, Markus K., Simon C. Rother and Isabel Schnabel (2019). NBER Working Paper No. 25775. NATIONAL BUREAU OF ECONOMIC RESEARCH. Cambridge, MA, USA.
- Brunnermeier, Markus K. and Isabel Schnabel (2014). Bubbles and Central Banks. Historical Perspectives. Discussion Paper number 1411. Mainz. Johannes Gutenberg University.
- Cecchetti, S., H. Genberg, J. Lipsky and S. Wadhvani (2000). "Asset prices and monetary policy", Report prepared for the conference "Central Banks and Asset Prices" organized by the International Centre for Monetary and Banking Studies, Geneva, May.
- empirica-Preisdatenbank Blasenindex IV/2020: https://www.empirica-institut.de/fileadmin/Redaktion/Publikationen_Referenzen/PDFs/Blasenindex-_Q42020.pdf (Accessed on 2. March 2021).

- empirica-Preisdatenbank Blasenindex I/2016: https://www.empirica-institut.de/fileadmin/Redaktion/Publikationen_Referenzen/PDFs/Blasenindex__Q12016.pdf (Accessed on 27. February 2021).
- Engsted, T., S. J. Hviid and T. Q. Pedersen (2016). Explosive bubbles in house prices? Evidence from the OECD countries, in: *Journal of International Financial Markets, Institutions and Money*, Nr. 40.
- Huber, Florian and Maria Teresa Punzi (2016). *International Housing Markets, Unconventional Monetary Policy and the Zero Lower Bound*. Wien, Vienna of Economics and Business. University Department of Economics Working Paper 2016.
- Gilles, C. and S.F. LeRoy (1992). Bubbles and Charges. *International Economic Review* 33(2):323–339. DOI: 10.2307/2526897.
- Gürkaynak, R.S. (2008). Econometric tests of asset price bubbles: Taking stock. *Journal of Economic Surveys* 22(1):166–186. DOI: 10.1111/j.1467-6419.2007.00530.
- Hagemann, D. and M. Wohlmann (2019): An early warning system to identify house price bubbles. <http://dx.doi.org/10.1108/JERER-03-2019-0006> (Access 2. 3. 2021).
- Kholodilin, Konstantin A. und Claus Michelsen (2019a). Das Risiko einer Immobilienpreisblase ist in Deutschland sowie in den meisten OECD Ländern hoch. *DIW Wochenbericht* Nr. 32/2019.
- Kholodilin, Konstantin A. und Claus Michelsen (2019b). Zehn Jahre nach dem großen Knall: wie ist es um die Stabilität der internationalen Immobilienmärkte bestellt? *Z Immobilienökonomie* (2019) 5:67–87. https://www.diw.de/documents/publikationen/73/diw_01.c.671978.de/19-32-1.pdf
- Kholodilin, Konstantin A. und Claus Michelsen (2018). Anzeichen für neue Immobilienpreisblase in einigen OECD-Ländern: Gefahr in Deutschland geringer. *DIW Wochenbericht*, ISSN 1860-8787.
- Kholodilin, Konstantin A. und Claus Michelsen (2017). Keine Immobilienpreisblase in Deutschland – aber regional begrenzte Übertreibungen in Teilmärkten. *DIW Wochenbericht* Nr. 25/2017.
- Mayer, Thomas and Matthias Gehrke (2018). A Statistical Evaluation of Possible Bubbles in the Price Development in the German Housing Market. doi:10.5445/KSP/1000085951/06. (Accessed on 2 March 2021).
- Mishkin, Frederic S. (2011). *Monetary Policy Strategy: Lessons from the Crisis*. NBER WORKING PAPER SERIES. Working Paper 16755. Cambridge, MA, USA.
- OECD (2021). Housing prices (indicator). doi: 10.1787/63008438-en (Accessed on 19 April 2021).
- Shiller, Robert J. (2013). *Speculative Asset Prices*. New Haven, CT, USA. Yale University.
- Statista Research Department (2021). Immobilienpreisentwicklung in Deutschland bis 2020. <https://de.statista.com/statistik/daten/studie/597304/umfrage/immobilienpreise-alle-baujahre-in-deutschland/> (Accessed on 2. March 2021).
- Statistisches Bundesamt, Destatis (2021). Häuserpreisindex. https://www.destatis.de/DE/Themen/Wirtschaft/Preise/Baupreise-Immobilienpreis-index/_inhalt.html.
- Statistisches Bundesamt, Destatis (2020). Preise für Wohnimmobilien im 3. Quartal 2020: +7,8 % zum Vorjahresquartal. Wohnimmobilien verteuern sich trotz Corona-Krise weiter. https://www.destatis.de/DE/Presse/Pressemitteilungen/2020/12/PD20_534_61262.html.
- UBS Studie (2020). UBS Studie warnt vor Preisblasen auf zahlreichen Immobilienmärkten – Europa besonders heiß gelaufen. <https://www.anlegen-in-immobilien.de/ubs-studie-warnt-vor-preisblasen-auf-zahlreichen-immobilienmaerkten-europa-besonders-heiss-gelaufen>. (Accessed on 28. February 2021).
- White, William R. (2006). Is price stability enough? BIS Working Papers No 205.
- Wölfle, Marco and Felix Löffler (2017). Freiburg. Center for Real Estate Studies (CRES), Discussion Paper No. 1.

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OPPORTUNITIES AND CHALLENGES OF DIGITAL CUSTOMER LEARNING IN BANKING

LADISLAVA KNIHOVÁ

Abstract

In every industry, including the banking sector, we are experiencing two fundamental changes: the ongoing change in the portfolio of products on offer along with the change in the portfolio of customers. The former is the result of fierce competition intensified by the introduction of new technologies; the latter is conditioned by demographic changes. As a rule, the products offered by banking institutions are better and better at meeting the customers' needs but they are also increasingly complex. As for the portfolio of customers, their typical preferences and behaviour patterns differ with their generations. Currently, the market encompasses baby boomers (those born between 1946 and 1964), along with generations X, Y and Z. The aim of this paper is to examine, analyse and critically evaluate the typical buying behaviour of potential clients – that is, those new to the banking industry. Their personal traits and preferred ways of acquiring information and learning are considered in correlation with the content, forms and platforms conducive to the design of effective communication processes typically needed in banking institutions. The design of these communication processes can be optimized and enhanced by the smart selection of digital communication formats and platforms. These can significantly help convey a complex message and achieve the banks' communication strategies' goals. The paper is complemented by a proposal for the focus of five interactive communication strategies based on content marketing. The focus of these strategies reflects the typical needs, wants and expectations of digital customers in information gathering on the customer conversion journey.

Keywords

digital learning, digital learning platforms, education-based content, explainer video, generation Z, in-app marketing, omnichannel marketing, podcast, social media

JEL Classification

G41, M310

Introduction

Gerald Zaltman in his iconic book *How Customers Think – Essential Insights into the Mind of the Market* believes that “*Customers say they want something, companies create it, and once it's available, customers don't buy it. Why? It is just because customers don't know what they want*” (Zaltman, 2003, cover page). In 2003, the same author believed that the marketing tools we used, including surveys and focus group sessions, did not dig deep enough to find out the real customers' preferences (Zaltman, 2003, cover page). Almost twenty years later, with a lot of data on customer behaviour available, we are still trying to find efficient ways of communication with our customers with varying degrees of success. With new generations entering the market, communication experts

now need to know and understand the behavioural patterns of a new type of potential clients who grew up surrounded by modern technologies.

Along with the demographic changes in the portfolio of customers, the communication environment has changed profoundly, in terms of the content of the marketing message, its forms and its distribution platforms. The nature of a bank adviser's job is also changing as communication with customers becomes predominantly digital supported by technology. Hand-in-hand with the increasing complexity of products, these advisers are becoming learning facilitators who use technology as a learning tool. They are less 'a fount of wisdom' as digitally savvy customers prefer looking for information themselves on the basis of 'self-service'. So, they are no longer a 'sage on the stage' but a 'guide by the side'.

Changes in customer behaviour lie at the core of a new role to be embraced by bank advisers. Instead of sharing unemotional information on the product portfolio, they are becoming invaluable companions who empower the customers (in the role of learners) to become independent thinkers through well-elaborated digital learning materials reaching the customers in multiple formats and through multiple communication channels. Customers educated in this way tend to become consistently loyal to the brand that helped educate them. So, this approach not only benefits the customer but also the bank that developed and promoted the digital learning materials.

In the constantly evolving atmosphere, banking industry marketing and communication experts are supposed to design efficient communication processes. The following chapters will focus on selected aspects of customer behaviour in relation to the banking industry, notably customers' typical behavioural patterns and expectations along with banks' success in relation to loyalty boosted by customer education.

1 Digitally savvy clients entering the banking sector

Digitally savvy clients are now entering the banking sector. Simultaneously, the already existing clients are acquiring and upskilling themselves in digital skills. Members of Generation Z, i.e., new clients entering the banking sector who were born after 1997, differ from the previous generations in terms of their attitude to technology. Theirs is the first generation of 'true digital natives' (Generation Z characteristics and its implications for companies | McKinsey, 2020) who have grown up totally surrounded and absorbed by digital technologies. These technologies have influenced their way of seeking and processing information. Most probably, these young people have never put a stamp on a letter. Even email is a somewhat outdated communication channel for them, and they have grown up with smartphones whose use has become an indispensable element in their lives. They are digital. The preceding generation were the millennials.² Today, many of the oldest millennials are likely to have paid off more than a half of their mortgages. However, the new clients, the truly DIGITAL ones (Gen Z), are currently coming to banks as their new clients. Consequently, we need to examine their typical behaviour patterns in acquiring and processing information. Data-driven customer segmentation, with the help of modern analytical tools, is indispensable in creating the profile of the fictionalized prospective customer. Kotler et al. note: *"Big data empowers marketers to segment the market into the most granular unit: an individual customer. [...] Based on it, companies can then*

² Millennials are people born between 1980 and 1996.

execute one-to-one or segments-of-one marketing, tailoring their offerings and campaigns to each customer” (Kotler, Kartajaya, Setiawan, 2021, pp. 133-134).

When we are uncertain, we look for information because uncertainty is not a pleasant feeling. Humans are born curious and we continue to be driven by our curiosity to discover facts. If, for example, we do not understand completely a bank product, it can make us uneasy. “[*Open-mindedness and self-criticism*] are two qualities which not only enhance curiosity, they help satisfy it. They are at the heart of curiosity’s dual nature: the drive to know and the satisfaction we get from finding out” (Zaltman, 2018, p. 79). Members of Generation Z also need to satisfy their curiosity but their ways of doing so – in terms of behaviour patterns and expectations - are rather different from the traditional approach.

Updated annually, McKinsey’s Global Banking Annual Review offers insights into the global banking industry (Staples, 2020). Independently, to get an insight into the local situation, in May 2021, the author of this study conducted an opinion poll among bank clients in the Czech Republic (n = 394). The survey question was: “*How often do you actually visit your primary bank to carry out banking operations or financial transactions, or speak to your bank adviser in a fairly typical year?*” – see Tab. 1.

Table No. 1: The frequency of visiting primary bank branch ‘physical location’ – local and global comparison

Opinion poll in the CR in May 2021		McKinsey’s Global Banking Annual Review in December 2020
not a single time in a year	54%	“Even before the crisis, leading banks in developed markets had achieved 25 per cent less branch use per customer than their peers by migrating payments, transfers, and cash transactions to self-service and digital channels. In addition to those who were already digital-only customers previously, another 10 to 15 per cent of customers will be unlikely to use a branch after the crisis. ”
exceptionally	32%	
once a year	7%	
twice a year	3%	
more than 4 times a year	2%	

Source: own elaboration with the use of the opinion poll results and (Staples, 2020)

We can see that Czech banking clients’ behaviour trends are almost identical with the findings and predictions for the near future reported in McKinsey’s Global Banking Annual Review in December 2020 (GBAR 2020).

Nowadays, traditional bank customers are changing their typical behaviour towards becoming almost exclusively digital customers. The banking sector’s digital customers typically avoid visiting their banks’ physical location. Also, communication with bank advisers is not their favourite way of acquiring information. They expect to find everything they need “within two mouse clicks”, demonstrating their cognitive capability to understand the complexities of various banking products and operations within minutes. Their behaviour and expectations from their bank clearly suggest an omni-channel digital approach. They conduct all their banking operations using smartphones, PCs and tablets. They have quickly adopted mobile banking. It is convenient for them to check their

account balance, pay their bills or even find ATM locations - to name just a few everyday operations - via mobile banking. Thus, their bank is “a bank on the go”.

If the banking sector’s digital customers demonstrate the above-mentioned behaviour patterns and preferences, a relevant digital communication system must be developed. The GBAR 2020 also observes that, despite the global pandemic year 2020, *“Leading banks, fintechs, and platform companies have continued to invest during the crisis, particularly in **digital channels**”* (McKinsey’s *Global Banking Annual Review* | McKinsey 2020). Interestingly, the leading banks operating in the Czech Republic keep up with this trend.

When dealing with a modern bank, customer expectations are changing – as highlighted in the GBAR 2020: (1) *“Customers expect a better, more predictive, and seamless experience than ever before - and better advice - across every channel”*, and (2) *“Customers also are increasingly expecting banks to anticipate not only what products and services they need, but also how and when they need them. In particular, many expect to be able to do everything digitally and remotely”* (McKinsey’s *Global Banking Annual Review* | McKinsey 2020).

All the individual aspects mentioned in the previous paragraphs represent a challenge for banking institutions’ experts in their endeavour to design a fully functioning communication ‘highway’, accommodating all the requirements and expectations of this new, digitally competent type of client entering the banking sector.

2 Customer success in relation to loyalty boosted by customer education

Customer loyalty has been a key topic of numerous research studies. Very often, customer loyalty is examined in relation to customer trust, customer engagement (Iglesias, Markovic, Bagherzadeh, Singh 2020), and customer experience (Rather, 2020). However, research studies examining customer loyalty in relation to customer education are rare. In the research conducted by Bell et al., customer education for firm-specific expertise has been contrasted with customer education aimed at building market-related expertise. The former leads to increased loyalty, unlike the latter (Bell, Auh, Eisingerich, 2017).

A modern communication mix of various digital communication channels can keep banking institutions’ customers updated (mobile app alerts, e-newsletters, push notifications). They can act as early warning messages or timely notifications on investment opportunities etc. In each case, banks not only inform and educate customers but empower them to make informed decisions. Online banking, mobile banking and digital wallets as online payment tools, usually in the form of an app, save customers both time and costs. Unique and highly relevant educational content can lead to improving customers’ well-being.

For the banks, customer success is likely to be attributed to a long-term, high-quality relationship between the bank and its clients. Banks exist, make plans and do business on the premise of customer loyalty. It is usually referred to as *attitudinal (emotional) loyalty* and *behavioural (intellectual) loyalty*. In their work, Nick Mehta et al. describe attitudinal loyalty as follows: *“Attitudinal loyalty is much harder to create and sustain because it’s expensive. It’s expensive to build products that customers love instead of products that they simply own. It’s expensive to create an experience that delights instead of one that just tries to not annoy”* (Mehta, Steinman, Murphy, 2016).

Undoubtedly, every company needs loyal customers. It is becoming obvious that customer education, notably via the use of digital technologies, has the potential to help the creation of attitudinal loyalty. As a premium brand, Apple is not only aware of customer education benefits but keeps it high on its agenda. Even at the most difficult time of restrictions due to the pandemic, they organized virtual learning labs instead of traditional face-to-face learning labs (Today at Apple - Dubai Mall - Apple 2021). This is an example of a company that employs *customer success managers* who are in charge of creating a unique customer experience through customer education.

Every industry, including the banking sector, can achieve similar success through creating attitudinal loyalty boosted by content marketing strategy based on customer education.

3 Five interactive content marketing strategies for banking industry

In attempting to guide prospects and existing clients through a multi-channel world, marketing experts might become overwhelmed by the number of options and their combinations within the communication mix.

Simon Thatcher, a senior learning and development consultant, highlights the importance of the human touch in a multi-channel world: “What’s clear is that there is no one-size-fits-all approach for customer service, or a single communication platform that works for every customer, and therefore businesses must be prepared to offer equally effective customer service on all communication channels if they are to engage and retain customers, and this relies on a confident team of well trained and empowered advisors“ (Thatcher, 2018).

The communication process’ design can be optimized and enhanced by the smart selection of digital communication formats and platforms which can significantly help to get even a complex message across and reach the communication strategies’ goals. Fulfilling the objectives of this study and taking into account the latest developments in digital communication formats, channels and platforms, the author presents five interactive content marketing strategies which reflect typical needs, wishes and expectations of the digital customers in the banking industry in their search for information. Their selection is based on the approach to individual digital communication channels from the viewpoint of varying and changing preferences of different generations with their different levels of tech-savviness. They are the following generations: “(1) *BABY BOOMERS* – the majority of baby boomers are still in the workforce; (2) *GENERATION X* – now holds most of the leadership roles globally; (3) *GENERATION Y* - is now the largest in the workforce; (4) *GENERATION Z* – represents the newest entrants” (Kotler, Kartajaya, Setiawan, 2021, p. 19). Kotler et al. already started to contemplate the so-called *GENERATION ALPHA*, i. e. 21st-century children, born from 2010 to 2025, whose parents from Generation Y often teach their children about money at an early age. (Kotler, Kartajaya, Setiawan, 2021, p. 27).³ Marketing to four, or even five, different generations shaped by the influence of different socio-cultural environment, different levels of education, different access to technologies and different life experience can be a true challenge.

³ The situation might be different in different parts of the world. In the Czech Republic, financial literacy has been a part of the primary school syllabus only for a couple of years.

Having taken into account the PwC's⁴ 2017 Digital Banking Customer Survey enlightening the rapidly changing behaviour of the digital banking customer, Sam Makad in his article for MoEngage Blog expresses the idea that “*interactive marketing strategies can help the banking sector grow its market share while increasing customer satisfaction levels significantly*” (*5 Bank Marketing Strategies that can Enhance the Online Banking Experience* 2019). The author focuses mainly on explainer videos, influencer posts and/or YouTube tutorials as well as on e-mail marketing and mobile marketing.

Taking into account the latest development, the author of this study proposes the following five marketing strategies (Fig. 1) which are based on content marketing⁵ with a focus on educational content prepared in different formats and distributed through different platforms allowing for interactivity.

Figur No. 1: Five interactive content marketing strategies for banking industry



Source: own elaboration, partly based on (*5 Bank Marketing Strategies that can Enhance the Online Banking Experience*, 2019)

It is not the purpose of this paper to go into the details of the proposed digital communication channels and content marketing strategies suitable for the banking industry in the near future. However, providing substantiation of the suggested strategies might be worthwhile to understand the rationale behind it.

⁴ PwC – PricewaterhouseCoopers is a global network of firms delivering world-class assurance, tax, and consulting services for business entities.

⁵ Content marketing is a strategic marketing approach focused on creating and distributing valuable, relevant, and consistent content to attract and retain a clearly-defined audience — and, ultimately, to drive profitable customer action (*What is Content Marketing*, 2021).

EXPLAINER EDUCATIONAL VIDEO – In education-based marketing, we use this type of video in situations where it is necessary to explain, in a simple and understandable way, a banking product or financial concept, which can be complex. This type of video is usually accompanied by animations that make it easier to understand. These are usually short videos with a direct focus on the concept in question.

WEBSITE & SOCIAL MEDIA – a banking institution website is the main touchpoint where the customer comes into contact with his/her primary bank. Currently, it is carefully linked to the selected social networks where the bank also has its corporate profiles. All the online presence is expected to be interactive, responsive, user-friendly, structured with intuitive navigation and eye-pleasing design.

YOUTUBE CHANNEL – YouTube channel of a banking institution will be primarily used for sharing educational content. Typical areas of special focus include the smart organization of videos into categories, monitoring of/posting to the chat below the video, evaluation of success/failure of videos with the help of YouTube metrics, but especially with Google Analytics 4, with the aim of taking appropriate action (even while running the marketing campaign).

PODCASTS – Podcasts include audio programmes or recordings. This relatively new development in this sector is enabled by easily accessible mobile apps and cheap recording equipment. Podcasts have many advantages. They can be listened to anytime/anywhere, even while doing another activity, and a podcast offers rest for eyes tired by looking at a computer monitor. Evidence of customer interest in podcasts is the meteoric rise of CLUBHOUSE, the latest social network for PODCASTS. The availability of recording technology, the increasing fragmentation of the mobile internet and the user-friendly environment of streaming platforms such as Spotify, Apple Podcast, Google Podcast and others have inspired more and more companies, universities and individuals to venture into podcasting. Mobile apps for podcast capture are also making their proliferation easier.

IN-APP MARKETING – In-app marketing means marketing directly inside a mobile app. A bank, in the role of the mobile app operator, shares information about complementary products within its environment. The customers – app users - become familiar with these products through using the app. In mobile games, a similar concept labelled as advergaming has been used for a long time, usually for advertising purposes.

The seamless integration of the new digital communication channels into the marketing mix is inevitable. The term "omnichannel marketing" or "multi-channel marketing" refers to the need to "broadcast a communication message" on multiple digital communication channels simultaneously. The reason is clear: the media market is fragmented and customer preferences in terms of information search and processing are also diversified. Today, the interplay between the different communication channels is the highest priority. Thus, the marketing professional can now be seen as the "conductor of a great orchestra" whose symphony must be in tune as if it were a concert at Carnegie Hall.

Moreover, the customer experience must be appealing, engaging to captivating. It must literally "pull the customer into the action". Designing the process of digital communication offers interesting opportunities but, simultaneously, it poses an enormous challenge. The competitive

environment in which brands fight for customers' precious moments of attention and, more importantly, for brand loyalty or even for brand attachment, is relentless.

4 Discussion and further research

The literature review revealed that research studies examining customer loyalty in relation to customer education are rare. This paper aims to open the door to research studies focused on the role of educational content in marketing in general and its application in the financial sector specifically. The cardinal research question is the relationship among three variables: education-based marketing focusing on educational content and customer loyalty in view of their impact on customer lifetime success. The nature of the marketing communication of financial institutions towards their clients should be examined carefully as financial services represent a socially sensitive sector that has the capacity to influence greatly – positively and negatively - the quality of life of their clients.

Furthermore, there is a need for more in-depth analyses of cognitive information processing, as well as studies on the important role of emotions present in the whole communication process. Also, more studies on attitudinal/emotional and behavioural/intellectual loyalty are needed to help digital communication designers find the ideal communication models. This is especially important in relation to the incorporation of virtual reality elements into the communication process, which we are already experiencing.

The results of further research in the above-suggested directions will help all participants in this area to improve the effectiveness of communication with customers and to set up communication processes in ways that meet customer expectations and anticipate their needs.

Simultaneously, the author is fully aware of constraints on this study. The main constraint is the demographic development which influences the character of new clients entering the market for financial services, along with their personal traits as well as their expectations from interactions with their financial services providers. Apart from that, new marketing communication tools and communication channels are constantly being developed. All these aspects undergo constant change. Therefore, longitudinal research into the topic might be the most effective way to provide much-needed insight for marketing experts who are responsible for all types of marketing communication with customers.

Conclusion

The aim of this paper was to examine, analyse and critically evaluate the typical buying behaviour of the potential clients – newcomers currently entering the realm of banking institutions. Their personal traits and preferred ways of acquiring information and learning are considered in correlation with the content, forms and platforms used to design effective communication processes that are, typically, needed in banking institutions. The author of the study proposes a set of five interactive content marketing strategies for the banking industry, to optimize and enhance their communication process design. Focusing on modern digital communication formats and platforms driven by technological enhancements can help to get even complex messages across and reach communication strategies' goals. Simultaneously, the role of bank advisers is also changing as they become learning facilitators, using technology as a learning tool.

The examined topic is somewhat sensitive because the classical type of face-to-face communication with clients in the banking sector is currently shifting towards digital communication on the basis of ‘self-service’. In this process, technology plays a vital part. Therefore, it is extremely important to set up the communication processes to be well-balanced in terms of combining the much-needed human touch with technology.

Let me conclude the study with the following remark. We often talk about digital technologies, artificial intelligence, virtual reality and/or augmented reality. In this context, I was intrigued by Mark Foster's podcast. In his recent interview for MIT Sloan Management Review, Mark Foster put it like this: “There’s no point having an incredibly powerful technology capability if actually there’s no empathy, no humanity, in the way it’s presented to the people who are going to engage with it” (Michelman, 2020).

This idea should be both a wake-up call and an inspirational encouragement for all participants in the field of communication. This is particularly true for the financial services sector.

References

- 5 Bank Marketing Strategies that can Enhance the Online Banking Experience, 2019. *MoEngage Blog* [online]. [Accessed 26 June 2021]. Available from: <https://www.moengage.com/blog/5-marketing-strategies-that-can-enhance-the-online-banking-experience/>
- BELL, Simon J., Seigyoung AUH and Andreas B. EISINGERICH. 2017. Unraveling the Customer Education Paradox: When, and How, Should Firms Educate Their Customers? *Journal of Service Research* [online]. 1 August 2017. Vol. 20, no. 3, p. 306–321. [Accessed 25 June 2021]. DOI 10.1177/1094670517691847. Available from: <https://doi.org/10.1177/1094670517691847>
- CONTENT MARKETING INSTITUTE, 2021. What is Content Marketing. *Content Marketing Institute* [online]. 2021. [Accessed 26 June 2021]. Available from: <https://contentmarketinginstitute.com/what-is-content-marketing/>
- Generation Z characteristics and its implications for companies | McKinsey, 2020. [online]. [Accessed 25 June 2021]. Available from: <https://www.mckinsey.com/industries/consumer-packaged-goods/our-insights/true-gen-generation-z-and-its-implications-for-companies>
- IGLESIAS, Oriol, Stefan MARKOVIC, Mehdi BAGHERZADEH and Jatinder Jit SINGH. 2020. Co-creation: A Key Link Between Corporate Social Responsibility, Customer Trust, and Customer Loyalty. *Journal of Business Ethics*. April 2020. Vol. 163, no. 1, p. 151–166. DOI 10.1007/s10551-018-4015-y.
- KOTLER, Philip, Hermawan KARTAJAYA and Iwan SETIAWAN. 2021. *Marketing 5.0: technology for humanity*. Hoboken, New Jersey: Wiley. ISBN 978-1-119-66851-0.
- McKinsey’s Global Banking Annual Review | McKinsey, 2020. [online]. [Accessed 25 June 2021]. Available from: <https://www.mckinsey.com/industries/financial-services/our-insights/global-banking-annual-review>
- MEHTA, Nick, Dan STEINMAN and Lincoln MURPHY. 2016. *Customer success: how innovative companies are reducing churn and growing recurring revenue*. Hoboken, New Jersey: Wiley. ISBN 978-1-119-16796-9.
- MICHELMAN, Paul. 2020. The 360 – Degree Approach to Digital Reinvention. *MIT Sloan Management Review* [online]. 2020. [Accessed 26 June 2021]. Available from: <https://sloanreview.mit.edu/audio/the-360-degree-approach-to-digital-reinvention/>
- IBM’s Mark Foster discusses what makes digital transformations succeed — and why it takes humanity.

STAPLES, Mark. 2020. McKinsey's Global Banking Annual Review | McKinsey. [online]. 2020. [Accessed 25 June 2021]. Available from: <https://www.mckinsey.com/industries/financial-services/our-insights/global-banking-annual-review>

THATCHER, Simon. 2018. People hold the key to satisfying customers in a multi-channel world. *Training Journal* [online]. 21 February 2018. [Accessed 26 June 2021]. Available from: <https://www.trainingjournal.com/articles/opinion/people-hold-key-satisfying-customers-multi-channel-world>

Today at Apple – Dubai Mall – Apple, 2021. *Today at Apple* [online]. [Accessed 25 June 2021]. Available from: <https://www.apple.com/ae/today/dubaimall/>

Discover inspiring programs happening every day near you. Find out what's going on at Apple Dubai Mall with Today at Apple.

ZALTMAN, Gerald. 2003. *How customers think: essential insights into the mind of the market*. Boston, Mass: Harvard Business School Press. ISBN 978-1-57851-826-5.

ZALTMAN, Gerald. 2018. *UNLOCKED: Keys to Improve Your Thinking*. USA. Gerald Zaltman. ISBN 978-1983184192.

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PAYMENT CARDS AND THEIR USE IN PREMIUM BANKING

KATEŘINA KRAIBICHOVÁ

Abstract

Payment cards are an integral part of our everyday life. As a result of the population's wealth growth banks started to offer above-standard services with an individual approach in the area of premium banking. The intended contribution will target with payment cards issued in premium banking, with focus on the benefits which they bring to their holders. The contribution will aim to compare benefits offered by premium bank accounts of the following companies: Československá obchodní banka, a. s., Raiffeisenbank, a. s., Komerční banka, a. s., and Česká spořitelna, a. s. All data will be collected mainly from conducted individual interviews with employees of the banks. The accounts will be reviewed from several different points of view and the offered benefits will be compared at the end. It will be evaluated which premium account offers the most benefits and on which group of potential clients the accounts focus. The reader should have a comprehensive overview of all the benefits associated with holding premium payment cards after reading this article and have a knowledge which of the examined account is the most advantageous from various points of view.

Keywords

Payment cards, payments, premium banking, transaction

JEL Classification

G21, G23

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PUBLIC DEBT AMIDST LOW INTEREST RATES: THE ISSUE OF CHEAP MONEY

JAN MERTL

Abstract

This paper will focus on the new reality that has emerged after the financial crisis in 2008, where most European countries increased their public debt level, and the paradigm of relative indebtedness has prevailed. Simultaneously, central banks applied the policy of low interest rates both for stimulating the economy, but also to make the new higher levels of public debt sustainable. That was considered as a single event effort and new regulations and recovery programs have been run so that the European countries will get out of debt traps by increasing GDP and later having mild inflation targets. But new unexpected crisis struck again, this time aggregate supply side shock of Covid, which to some extent negated previous improvements. Thus, we can see that we have got to deal with new paradigm of public debt, and we can hypothesize whether the classic magic square of economic policy has not expanded to magic pentagon, the fifth element being the level of public debt, as it might be difficult to do monetary policy as it was possible when the indebtedness was seen primarily as absolute phenomenon and being able to repay in the long run. Also, the space for central bank's interest rate adjustments might be limited when we consider the debt service changes caused by changing the interest rates. The paper aims to explain these phenomena and discuss the ways how to deal with them.

Keywords

public debt, monetary policy, money stock, magic square

JEL Classification

E40, E50, E62

Introduction

We have been living in times, where money stock became flexible, to some extent virtual and former anchor to gold standard or other fixed amount (at least in short run) has been abandoned (Garber, 1993). We may even say that money stock has become a tool of monetary policy, some economists calling it elastic money (Head & Qiu, 2011). When thinking this way, it becomes easier to borrow the money and actually create money through commercial banks' chain. Therefore, this shifts the shortage of money to the government budget and to the private budgets in economy, as central bank and to the vast extent commercial banks, too have got always enough money to supply when the monetary policy's settings are set to do so.

The price of money is the interest rate, even those have been very low (Baimbridge, Litsios, Jackson, & Lee, 2017) and central banks in OECD countries fought for last decade with the tendency to have even negative interest rates. Therefore, we live in a new paradigm: money is very cheap, easy to create, and the government and fiscal policy is simultaneously under pressure to manage deficits, tax income and public expenditure well. Also, the financial crisis in 2008 brought new challenges and

paradigm changes to the financial system mechanisms and regulations, as reflected in synthetic publications (Hynes, Love, & Stuart, 2020).

So, the aim of this paper is to reflect this reality, think about the issues that it arose and present the new concept of magic pentagon, which tries to incorporate the public debt into basic macroeconomic variables. This is supported by the fact, that unlike it the past, where the public debt was designed to repay as soon as possible, now majority of OECD countries simply “carries” their debt and tries to manage it in time, which can work well, but may also be harmful when the crises (economic downturns) come too fast after another, a country cannot recover well because of structural problems or external shocks, such as Covid-19 pandemics, occurs.

Existence of this pentagon is of course just a hypothesis of this paper, the author is aware that while the magic square is a standard concept of macroeconomics, widely used and proven, the pentagon is a suggestion how we can look at the current phenomenon of maintaining high levels of public debt throughout longer periods, either because of being unable to repay them, or even thinking that having some debt level might be under some circumstances actually better than forcefully create fiscal surpluses, thus being advantageous for the economic growth and living standards.

Before 2020, many papers claimed that the capacity for economic policy (fiscal, monetary) have not fully recovered after the previous crisis (Teulings & Zubanov, 2014) (Hein, Truger, & Treeck, 2012), even now some economists say that we are covering or postponing problems more that resolving them. On the other hand, 2020's development was true external shocks with causes out of economic or financial nature, so it cannot be blamed for previous failures, the situation is that the fiscal and monetary policy's capacity has been already lowered and paths to recovery therefore might be longer.

On one hand, it is advantageous for governments and businesses, because the debt service is kept low this way, on the other hand it encourages to borrow more and take debt as a solution to fiscal policy problems, where in reality it is mainly postponing them.

We saw in the literature, that this approach could be taken to kind of extreme ends – an example being the modern monetary theory (MMT) (Connors & Mitchell, 2013) (Fullwiler, 2010). While this is theoretically interesting concept, we believe that its assumptions are so bold that it is hard to imagine this could be applied in real life. Therefore, we remain in this paper on “classic” position, that the public deficit and debt must not be directly monetized by the monetary policy and the public debt is seen as a burden that a country must carry with itself, albeit it evolved from absolute to relative form (Izák, 2010). The solution offered by MMT, that monetary policy can ease this burden as long as there is not significant (measured) inflation, we do not see as viable option, together with some other well-known economists (Mankiw, 2020).

1 Quantitative theory of money

It is worth mentioning at first, that strictly said and in the long run, changing money stock hasn't got the power that some people and even some empirical evidence from expansive economic policies attribute to it. The pure form of this type of thinking is called the quantitative theory of money, which is based on the following simple equation (Mach, 2019).

$$M \times V = P \times Y$$

Based on this simple equation if we follow it money is completely neutral. Thus, when Y and V is constant, changes in money stock result in proportional changes of price level only. From this relationship the famous recommendation “just increase the money stock as much as the real GDP growth is” outcomes. But this is probably true mainly in the long run and overall equilibrium, and without considering the multiplicative effects in economy. In the short run and as the economic cycle fluctuates, there is some space for monetary (and fiscal) policy, which usually tries to salvage the economy at hard times and diminish the overheating at economic peaks.

Anyway, this theory provides a framework that we cannot neglect in principle, we must be aware that in the long run, after the economy reaches new equilibrium, probably the money stock and price level are tightly related, especially if real economic growth does not occur. In this sense, although kind of weakening all the interventions we are designing and arguing about, we must remember this simple equation and the consequences it might have for the results of monetary policy.

2 The mechanics of public debt – absolute and relative approach

The issue of public debt has become more important in the context of the recent economic crisis, when, as part of an extensive economic policy aimed at macroeconomic stabilisation, public debt increased quite significantly in most developed countries. Whereas until then the debate on the level and nature of public debt was mainly a topic for academic economists and government fiscal policy adjustments, we are now seeing a significant increase in the general interest in the evolution of public debt and how to manage it.

Let us first look at the basic mechanisms involved in public debt. Debt itself arises as a cumulative result of government fiscal management - it varies over time according to the annual balance of government (public) budgets (surplus, balanced, deficit), and in the case of recurrent deficits it is increased by their progressive sum. Like any credit, it is not free, and it is necessary to spend funds on the so-called debt service, which consists in paying interest to the relevant creditors (citizens, investment funds and other holders of government bonds in Czechia and abroad). Thus, in the classical concept of public finance, public debt is the aggregate financial commitment that a state makes in the financial market to raise funds for fiscal policy if it cannot/will not raise these funds at the moment through the tax system (Izák, 2010).

This concept is the basis for the absolute form of deficit and public debt, which is historically older and, for example, at the time of J. M. Keynes was practically the only form used in real fiscal policy. In this view, debt is seen as a 'necessary evil' that will enable the economy to weather a recession at some cost but will be repaid in good times with the aim of sustaining public finances over the long term. It should be noted that at that time there was also still a gold standard and therefore monetary policy was guided by less bold principles than today. The importance and volume of public debt in this absolute form is relatively low, as there is a general tendency to minimise the debt service of the state in the long run. In the 1970s, economist Robert Barro further developed these principles when he formulated his Barro-Ricardian equivalence (Barro, 1974). It consists in the hypothesis that households are even able to internalize (neutralize) an expansionary fiscal policy of the state based on an increase in public debt. For they are aware that this debt will have to be repaid at some point, and through an increase in tax revenues that will cause a reduction in their disposable income in the future, for which they tend to save and thus limit to a large extent the effectiveness of the fiscal impulse. This hypothesis has cast significant theoretical doubt on the efficacy of fiscal expansions for

which the state borrows, but it only applies under certain conditions that may not occur in reality (Buchanan, 1976).

The practical problem with fiscal policy is that the conditions that promote restraint in public borrowing are not always met. At the same time, in most countries, as the economy has grown, the public sector, and to some extent public indebtedness, has grown. Thus, another, relative form of public debt has gradually developed. It is possible that one of the inspirations has been the practices of the commercial sector, where some firms have in practice maintained an "optimal" debt-to-equity ratio over the long term. Another assumption was the abandonment of the gold standard and the move towards inflation targeting in monetary policy. The basic principle of this form is that the ratio of public debt to GDP, i.e., to the performance of the economy over time, is primarily monitored. Its sustainability over time is also an economic policy objective in its own right and leads to a higher dynamism of available resources in the state's economy than the classical absolute concept of "borrow-repay".

At the same time, the relative form of public debt provides additional opportunities for practical fiscal policy. If we disregard the absolute debt as an expression of the liability in units of national currency, the relative debt level can be monitored in the context of economic policy, not only through the repayment of principal, but also in the context of general economic development, as GDP and inflation rates are at work. To give a fictitious theoretical example: if we do not consider debt servicing costs and we do not borrow further, then with economic growth of $Y\%$ (in real terms) and inflation of $\Pi\%$ per annum, every year the relative debt is changed (reduced) by approximately

$$\frac{1}{\left(1 + \frac{Y\%}{100} + \frac{\Pi\%}{100}\right)}$$

which is the equivalent to

$$\frac{1}{\left(1 + \left(\frac{Y_1}{Y_0} - 1\right) + \left(\frac{P_1}{P_0} - 1\right)\right)}$$

where Y is real economic growth and P is price level in two successive years.

E.g., if economic growth be 3% and inflation be 2% , then when having public debt $500 / 1000 = 50\%$ GDP, next year we shall have GDP 1050 billion CZK, the new relative debt size will be $500/1050 = 0,4762$, which also according to the above equation gives $1/1,05 * 50 = 47,62\%$.

This is, of course, a rather tempting path, since the creation of large budget surpluses is not currently part of the typical fiscal policy repertoire of developed countries. If we add to this the current environment of low (or even zero) interest rates, which in real terms minimise the cost of servicing public debt, this option (despite its theoretical questionability) becomes one of the practical practices of economic policy.

Of course, it is not without risks: to some extent, this practice in economics is akin to "riding a tiger", which, if calm and well-fed, can continue to operate in this way in the long term, but if the key parameters of the magic square change, it can easily corner the country. The safety of relative debt is thus closely dependent on the macroeconomic stability of a country.

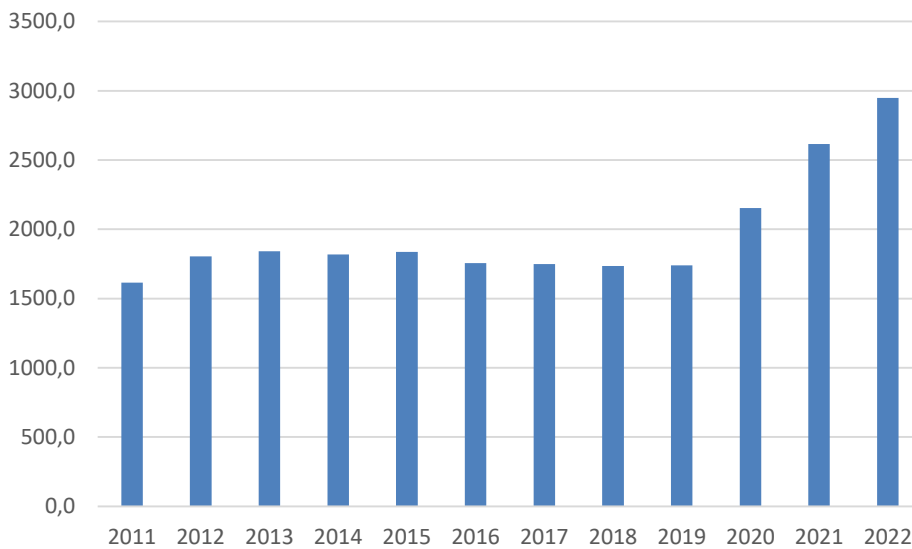
This is described by the so-called debt trap, where relative debt increases even if the country no longer borrows - typically because the interest rate on government debt is higher than the GDP growth rate in a given year. Thus, it can happen that a reduction in a country's creditworthiness, together with developments in the financial markets, causes a country, even by simply servicing its debt, to sink rapidly towards unsustainable public finances, a rising debt-to-GDP ratio and the threat of sovereign bankruptcy. This too is ultimately a "solution" to the debt problem, but only the last one, because at that point the state gives up one of its most important assets - the national currency. The consequences for creditors and debt holders are extreme and there is a long-term loss of confidence in the country. As regards deficit budgets as the cause of the increase in debt, these are mainly the result of an expansionary fiscal policy aimed at satisfying the demands of the population (which cannot be underestimated, but should be moderated), and also of the fall in public revenues during the economic crisis, when tax revenues fell out, especially from companies and banks (if they reduced profits or even made a loss because of the crisis), but also from the population, due to the increase in unemployment and the reduction in consumption.

These principles are behind many of the steps that we have seen in practical economic policy in recent years (Hermitte, 2017), including the construction of the European Stability Mechanism (ESM), which increases the lending capacity available to European countries and makes its use conditional on country-specific stabilisation programmes (Kapp, 2014) (Atik, 2016). They also explain why there is so much pressure for fiscal consolidation on “problematic EU member states” such as Greece, Italy or Portugal - there is a fear that they may not be able to keep their considerable relative debt under control over time and, if they are members of the eurozone, this threatens the euro itself. Conversely, countries with robust economy, such as Germany or Sweden, can make good use of their “tiger” because they are able to predict and influence macroeconomic parameters with a high degree of probability as part of their economic policy.

3 Czech empirical data

As for the empirical data on Czech economy, see the following pictures. On the first graph, there is government debt in absolute terms. We can see the (almost – slight growth up to 2013, slight fluctuation after that) stagnation of absolute debt level in last 10 years (2011–2019), before the Covid-19 epidemic started.

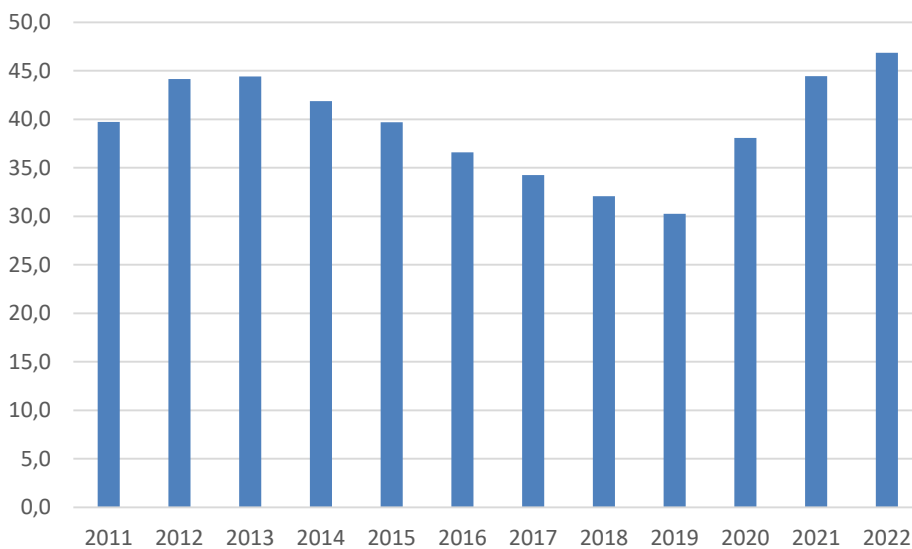
Picture No. 1: Government debt (ESA 2010) (CZK bln, current prices)



Source: data CNB Forecast – spring 2021 (CNB, 2021). 2021-2 est.

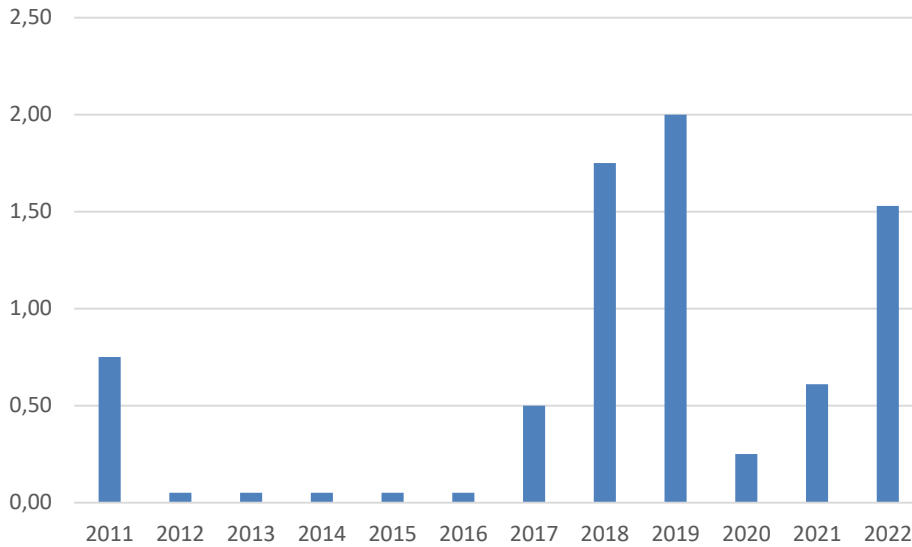
On the second graph, we can see the relative debt development. We can observe that in 2013–2019 the relative debt decreased while the absolute debt stagnated. This is the empirical proof of the theoretical principles about absolute and relative debt we spoke about in the first part of the paper.

Picture No. 2: Government debt/GDP (% , nominal terms)



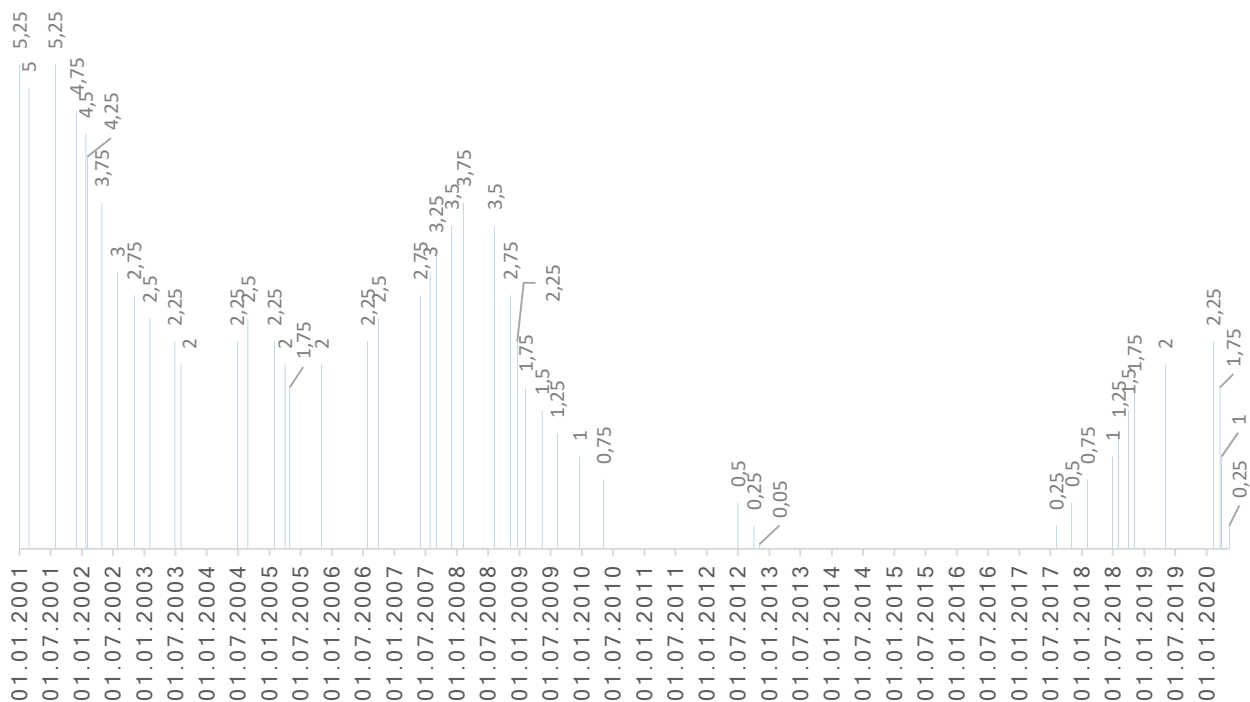
Source: data CNB Forecast – spring 2021 (CNB, 2021). 2021-2 est.

On the next graph, we see the central bank's behaviour during the analysed period. We can observe, that between 2012–2016, the central bank was at the limit of its principal tool – interest rate (more precisely said two-week repo rate). Therefore, in those years money was really *very cheap*, actually they could not be made cheaper using this standard tool, which led to controversial usage of CZK's exchange rate control by interventions on the market.

Picture No. 3: Central bank's 2W repo rate (% , annual average)

Source: data CNB Forecast – spring 2021 (CNB, CNB forecast – Spring 2021, 2021). 2021-2 est.

On the following picture, we can see that the situation in the last decade was new for central bank. This graph is interesting, because it is created so that on horizontal axis there is real time span, thus not averaging values and showing the time when exact changes of repo rate occurred. The decade before the interest rates were much higher, so also the room for monetary policy was bigger and the prices of loans were generally higher, so the money was not cheap. We can say, that the phenomenon of very cheap money for a long time is really a thing of the last decade, after the economic crisis that happened after 2008.

Picture No. 4: Central bank's 2W repo rate in time (% , changes 2000–2020)

Source: data CNB (CNB, 2021a)

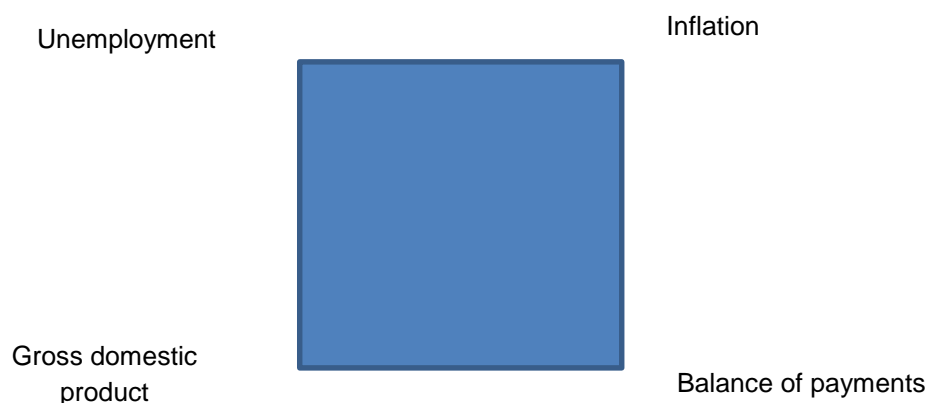
Thinking about this further, we can say that this policy of cheap money and low interest rates had two principal reasons. First, to stimulate the economy to get out of the crisis. But also the second, to keep the public debts that accumulated during the crisis sustainable. Only at the end of the decade, Czech central bank has started to tighten the screws a bit, European central bank was even slower in this process and its interest rates remained low (since 2016 it has been zero) even when the Covid-19 pandemic struck.

There was a good reason for that process in Czech central bank – the money policy makers knew they could not keep that cheap money forever and after finishing the exchange rate interventions in 2017 they started to project and follow the return path (as seen on Picture 3 and 4). For example, in Czechia, it was even accompanied with regulations (or recommendations) for mortgage buyers and everything seemed such a way, that central bank wants to slowly but surely get the economy into more standard environment. But then, sudden external supply side shock, Covid-19 emerged, and the rates must have been lowered again, cancelling this path that was started before.

4 The magic square and the suggested pentagon

If we now come to the magic square of economic policy, we can first show how it looks in its classic form. We know that its magic is rooted in the fact, that it is relatively easy to achieve 2–3 variables (corners) of this square, but very hard and under some conditions unattainable to achieve all four of them. Therefore, they in many cases stand against each other. For example, high tempo of economic growth will generate higher employment, but also a higher rate of inflation. Lower inflation rates reduce economic growth and induces higher unemployment.

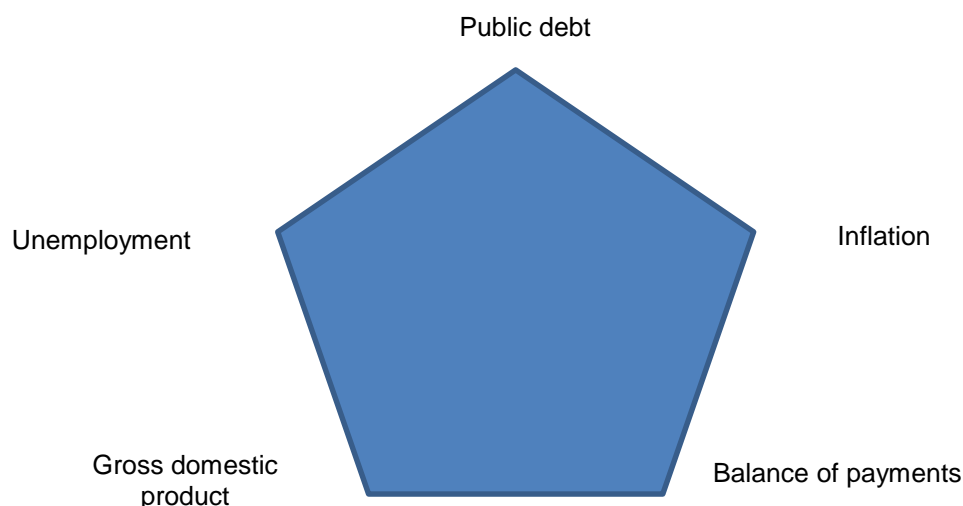
Picture No. 5: Magic square



Source: author

If we are following the logic of this square further, we might see that in the current environment, we are sometimes escaping from the bad situations or economic crises by expansive monetary and fiscal policy, while increasing public debt and carrying it further even when the crisis ends. Therefore, a question arises, whether we are not doing it at the expense of tampering with fiscal sustainability, which was – as we wrote – the classic paradigm of economic policy when the magic square was created and generally accepted. This fiscal approach has been criticised by independent fiscal authorities, such as Czech Fiscal Council (Czech Fiscal Council, 2021). This leads us to thinking within the framework of “magic pentagon”, which is shown on the following picture.

Picture No. 6: Magic pentagon



Source: author

Public debt in this pentagon is directly related to inflation and real GDP growth, and indirectly connected also with unemployment and the balance of payments. Analytically, it seems best to work with the relative form of public debt here: this way the changes in inflation and GDP are most prominently seen in the indicator of indebtedness (% GDP). This was also proven by the equation about relative public debt, where those variables were included.

5 Discussion

The crucial question for the future is whether (and how long) real economic policy in the European Union and the OECD countries will continue to allow and support the concept of sustainable relative public debt and low interest rates, including using quantitative easing and other extensive monetary policy instruments. If so, its sustainability is a function of economic development and stable monetary policy linked to inflation targeting, as well as adequate public debt management in the construction of public budgets. Should there be a future departure from such a policy with a preference for an overall reduction of the debt burden, the debt burden can be gradually reduced over time through balanced or slightly surplus budgets (if accepted as part of the public option) with the aim of optimising both relative and absolute debt and the resulting debt service, which may limit the theoretical risk associated with a possible increase in interest rates in the future (Artzrouni & Tramontana, 2014). However, this only applies to economies that are macroeconomically stable.

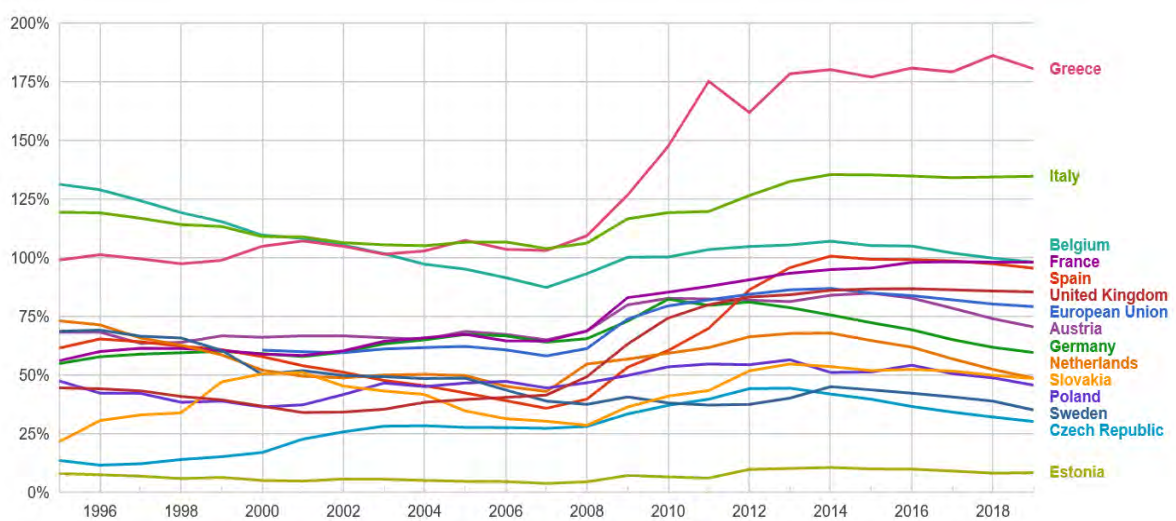
The last resort in the case of a debt trap remains debt restructuring, coupled with some form of sovereign bankruptcy and a declaration of insolvency of (part of) the liabilities, or privatisation of state assets, if available. It is always theoretically possible to forgive part of the debts, but the economic rationality of such steps is problematic. For the economically weaker countries in the euro area, this may involve pressure to leave the currency union, or to leave and re-join on less favourable exchange rate terms. However, these scenarios are extreme and are always accompanied by a substantial reduction in living standards, so they can only be used as a last resort.

Thus, in the case of the most indebted countries with unfavourable macroeconomic parameters, such as Greece, Portugal, Spain or Ireland, stabilisation programmes are used, organised, for example, within the framework of the aforementioned European Stability Mechanism (ESM) (and its

predecessor, the EFSF). The development in these countries, in comparison to other European ones, we can see on the following graph, which ends before Covid-19 onset. The next one shows just the latest data for available countries, that end at Q4 2020, therefore include the impact of Covid pandemics, and we can see that all the countries worsened their relative indebtedness again.

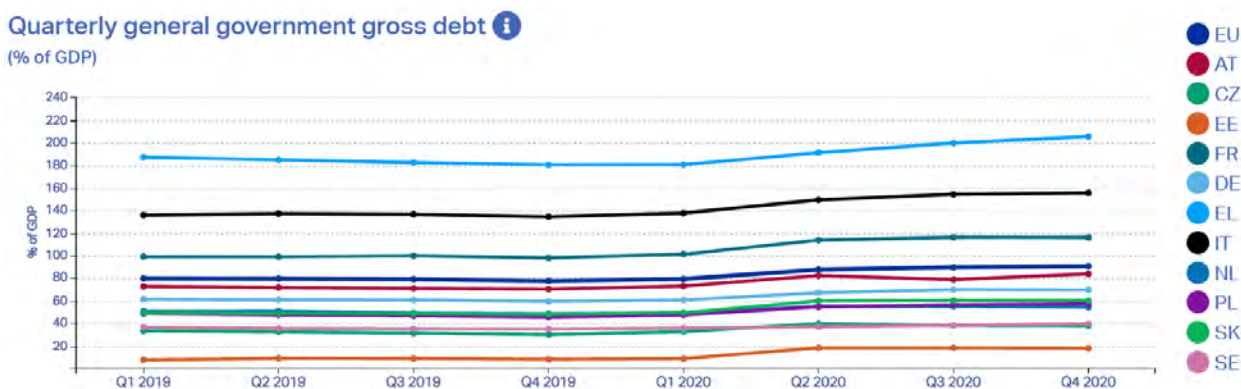
Their essence is the provision of loans on favourable terms (spread over time and low interest rates), strictly and specifically conditional on macroeconomic stabilisation steps in the areas of public finances, banking system regulation (credit policy, bank recapitalisation) and structural economic policy (economic growth and employment). Some countries, such as Ireland, have successfully made use of these programmes in difficult times, have stabilised their situation and do not require further assistance.

Picture No. 7: Relative debt/GDP ratio, selected EU countries, 1996–2019



Source: Google Data Explorer, Eurostat, 2021. Retrieved from https://www.google.com/publicdata/explore?ds=ds22a34krhq5p_&ctype=l&strail=false&bcs=d&nselm=h&met_y=gd_pc_gdp&scale_y=lin&ind_y=false&rdim=country_group&idim=country_group:eu&idim=country:es:sk:de:fr:cz:el:it:u:k:se:at:be:ee:pl:nl&ifdim=country_group&hl=en&dl=en&ind=false

Picture No. 8: Relative debt/GDP ratio, selected EU countries, 2019–2020 (preliminary data)



Source: European Statistical Recovery Dashboard, 2021. Retrieved from <https://ec.europa.eu/eurostat/cache/recovery-dashboard/>

In the Greece's case, the situation is more complex as the conditions of the programmes have only been partially met and the initial debt level is high. However, if debt restructuring is not on the table,

what is left in practice is a long and gradual stabilisation of the economy, coupled with sustained fiscal discipline (but not a contraction of the economy) (Vlachopoulou, 2012).

Conclusion

Three basic forms of public debt paradigm can be seen in theory: absolute debt which serves as burden in absolute form and is expected by everyone to be repaid in the future (and in pure form need not have positive effect on economy if we follow Barro-Ricardian way of thinking), relative debt to the performance of economy that might be carried on and managed as economy runs in time, and ultra-modern monetary theories which see money stock and fiscal balance just as a tool to make economy run well and without significant inflation. We followed the second paradigm in this paper, as it largely prevails in practice of OECD countries and whatever we think about it, it is currently the one that we work with and utilize empirically.

In summary, with sound economic policy and stable macroeconomic development, public debt, even in its relative form, can be managed and refinanced quite well in the long term according to the current market situation. If the government already prioritises debt increases over tax revenues as part of fiscal policy, the funds should primarily be used for investment activities with a foreseeable return. Of course, global risks such as financial crises or structural phenomena such as Industry 4.0 (Mertl & Valenčík, 2016) also affect a country's ability to meet its obligations, and in this sense the level of risk associated with relative indebtedness needs to be well considered, as it is potentially more fragile than for countries that are not overly indebted (even in absolute terms). It should be borne in mind that the nature of debt is to spread financing over time at some cost and to dynamize the available capacity for fiscal policy, although of course conditions can change over time for better or for worse.

Covid-19 pandemic, being an external supply-side shock to economies worldwide, vastly complicated the planned “exit” from the framework of near-zero interest rates and very cheap money. We saw on data from Czechia, that the attempt to achieve this goal occurred gradually since 2017, but was stopped in 2020 facing the new, sudden economic downturn. ECB simply stayed with its previous policy, as it was behind CNB in this regard.

The 2007–2009 crisis solution was aimed at financial and banking sector as it was the root cause. The current situation with Covid-19 is more prominent in public budgets as they suffer from low revenues and high expenditure because of covid support. Therefore, now the main effort would be to “directly” achieve balanced budgets again, as they are not a result of bailouts or downturn caused by stock market failure or banking sector problems, but simple classic downturn based on big supply reduction especially in some sectors like travelling, flying, culture, restaurants etc. Comparison of handling the “inner” crisis rooted in banking sector 2007–2009 and external supply shock in 2020, which came before the European public budgets and central bank interest rates could fully recover from the previous one. It is not true that nothing has been improved in financial regulation and fiscal arrangements, actually a lot of changes and measures have been adopted, but as discussed there was a hope that next crisis will come later and won't be that deep.

By adding one variable, the relative public debt level, to classic magic square of economic policy we created what we call the magic pentagon. This concept reminds us, that if we take public debt as a long-time burden, we probably ought to evaluate it together with other significant macroeconomic variables. Especially, when in its relative form, its level is affected also by the changes in real GDP and inflation.

One further research question this paper indirectly raises is also the ways how to do the measurement of inflation for the purposes of monetary policy. We cannot be sure, if the current indices of inflation based mainly on consumption goods are right in the sense that the prices of some assets (houses and real estate in general, paintings, postal marks, old cars) may rapidly rise while the prices of consumption goods need not. We are not calling for the redefinition of consumer price indices, as the methodology behind them is solid and internationally compatible, but just raising a question (which might be dismissed in further research or reactions to this paper) whether for monetary policy the central banks should not look more also at those other prices' development, e.g. housing costs. Thus, watching, if the money stock changes do not simply "spill over" to the prices of those investment assets or even commodities, in the case of real estate harming the availability of housing to common population that depends on their wages to pay for housing costs.

Looking at the macroeconomic variables including the debt level, European countries (and to some extent USA, too) are in tough situation, as they resolved their downturns at the expense of public debt twice. Within the paradigm of cheap money, this is probably sustainable in the short run, but it can be dangerous to ride on this tiger forever, especially for countries that struggle with economic growth. Therefore, finding a path to more standard environment, both in fiscal and monetary policy is essential. Then monetary policy will have room for necessary adjustments again and interest rates will start to serve better as a price of money and measure for private business projects' evaluation, as well as for reasonable households' decision about mortgages and other types of loans.

References

- Artzrouni, M. & F. Tramontana. (2014). The debt trap: A two-compartment train wreck... and how to avoid it. *Journal of Policy Modeling*, 36(2), 241-256. Retrieved 5 25, 2021, from <https://sciencedirect.com/science/article/pii/S0161893814000234>
- Atik, J. (2016). From 'No Bailout' to the European Stability Mechanism. *Fordham International Law Journal*, 39(5), 1201. Retrieved 5 25, 2021, from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2879387
- Baimbridge, M., I. Litsios, K. Jackson & U. R. Lee. (2017). *Theoretical Foundations and Policy Responses of Contemporary Economic Crises*. Retrieved 5 26, 2021, from https://link.springer.com/chapter/10.1057/978-1-137-59013-8_3
- Barro, R. J. (1974). Are Government Bonds Net Wealth. *Journal of Political Economy*, 82(6), 1095-1117. Retrieved 5 25, 2021, from <https://journals.uchicago.edu/doi/10.1086/260266>
- Buchanan, J. M. (1976). Barro on the Ricardian Equivalence Theorem. *Journal of Political Economy*, 84(2), 337-342. Retrieved 5 25, 2021, from <https://journals.uchicago.edu/doi/10.1086/260436>
- CNB. (2021, 05). *CNB forecast – Spring 2021*. Retrieved 05 09, 2021, from CNB: <https://www.cnb.cz/en/monetary-policy/forecast/>
- CNB. (2021a, 05 09). *Main instruments of monetary policy - history of setting*. Retrieved from CNB: https://www.cnb.cz/export/sites/cnb/en/monetary-policy/.galleries/instruments/monetary_policy_instruments.xlsx
- Connors, L. & W. Mitchell. (2013). *Framing Modern Monetary Theory*. Retrieved 5 25, 2021, from <http://e1.newcastle.edu.au/coffee/pubs/wp/2013/13-06.pdf>
- Czech Fiscal Council. (2021). *Concerning the development of public sector finances and the set-up of fiscal and budgetary policy*. Retrieved 3 15, 2021, from Reports & Statements Of the Czech Fiscal Council: <https://unrr.cz/wp-content/uploads/2021/03/Opinion-of-the-Czech-Fiscal-Council-concerning-the-development-of-public-sector-finances-and-the-set-up-of-fiscal-and-budgetary-policy.pdf>

- Fullwiler, S. T. (2010). *Modern Monetary Theory - A Primer on the Operational Realities of the Monetary System*. Retrieved 5 25, 2021, from <http://moslereconomics.com/wp-content/pdfs/mmt-scott-fullwiler.pdf>
- Garber, P. M. (1993). *The Collapse of the Bretton Woods Fixed Exchange Rate System*. Retrieved 5 25, 2021, from <https://nber.org/chapters/c6876.pdf>
- Head, A. C. & J. Qiu. (2011). *Elastic money, inflation and interest rate policy*. Retrieved 5 25, 2021, from http://qed.econ.queensu.ca/working_papers/papers/qed_wp_1152.pdf
- Hein, E., A. Truger & T. Treeck v. (2012). *The European Financial and Economic Crisis: Alternative Solutions from a (Post-)Keynesian Perspective*. Retrieved 5 25, 2021, from https://link.springer.com/chapter/10.1057/9780230393547_2
- Hermitte, R. B. (2017). *Sovereign Debt Restructuring Mechanisms: Mind the Trap*. Retrieved 5 26, 2021, from https://link.springer.com/chapter/10.1007/978-3-319-52018-6_6
- Hynes, W., P. Love & A. Stuart. (2020). *The Financial System, New Approaches to Economic Challenges*. Paris: OECD Publishing. doi:<https://doi.org/10.1787/d45f979e-en>.
- Izák, V. (2010). *Fiskální politika* (2 ed.). Praha: VŠE Oeconomica.
- Kapp, D. (2014). The Optimal Size of the European Stability Mechanism: A Cost-Benefit Analysis. *European Journal of Finance*, 20(10), 915-933. Retrieved 5 25, 2021, from <https://tandfonline.com/doi/abs/10.1080/1351847x.2014.880998>
- Mach, P. (2019). *Textbook of Elementary Economics*. Prague: VŠFS.
- Mankiw, G. (2020). *A Skeptic's Guide to Modern Monetary Theory* (Vol. 110). NBER.
- Mertl, J. & R. Valenčík. (2016). The socioeconomic consequences of industrial development. *Central European Journal of Management*, 3(1), pp. 37-45.
- Teulings, C. N. & N. Zubanov. (2014). Is economic recovery a myth? Robust estimation of impulse responses. *Journal of Applied Econometrics*, 29(3), 497-514. Retrieved 5 25, 2021, from <https://onlinelibrary.wiley.com/doi/full/10.1002/jae.2333>
- Vlachopoulou, A. (2012). *Crises in Emerging Market Economies: Lessons for Greece*. Retrieved 5 26, 2021, from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2423704

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COVID-19 IMPACT ON THE EUROAREA FINANCIAL SYSTEM

AZRA MURATOVIC

Abstract

The coronavirus crisis has intensified the already existing challenges in the European banking sector. This paper takes a turn on the financial system during the early weeks and months of the Covid-19 crisis and its impact on the banking and equity market in 2021. In the first quarter of 2020, euro area GDP fell by 3.8 percent quarter on quarter and by 3.3 percent on a year-on-year basis. The forecasts are also not promising at the moment, as many have believed that the vaccination process would ease the economic crisis. As long as the economy has no real alternative than its opening, unemployment and consumption rates will remain rather low.

Keywords

Covid-19, financial stability, banking sector, capitalization, euro-area, equity market

JEL Classification

E22, E24, E50

Introduction

In March 2020, the Corona Virus reached Europe as unprepared as possible. The whole world was shutting its doors as an immediate reaction, but the economy had to survive somehow and was left fearing for its existence.

One year later, although still in the hands of the virus, the first data are being published together with some forecasts for the future. As the Covid pandemic is a quite fresh topic, the literature is quite narrow but still diverse enough in order to compare different points of view.

In the first quarter of 2020, euro area GDP fell by 3.8 percent quarter on quarter and by 3.3 percent on a year-on-year basis. The unemployment rates went to a historical maximum in almost a weeks' time and the spending increased as fast as the income decreased. Such huge deviations within a relatively short period have had to leave scars.

The paper will discuss the impact of the Covid Pandemic on the European economy, as the GDP, the unemployment rates and the savings are expected to fluctuate extremely from one quarter to another. Additionally, we are going to take a look at the banking and equity sector and try to find the reason why the first is performing rather poor, while the second is booming. The aim of the paper is to present the current stand of the literature on the Covid outcomes to the Eurozone economy together with the data published. We seek to find out what and to what extent has happened to the European Area GDP, unemployment rate and saving ratio as clearly being caused by the Covid pandemic. Also, we need to find out why the stock markets are currently at a historical high. This topic, although worn out due to the high media interest in it, is of crucial importance for the European future of the economy. It might also have an impact on our future working environment, the way we perceive necessities and how we have and will handle these problems in future.

We are going to proceed in a literature survey comparing pre-Covid GDP, unemployment and savings rates to the current stand and trend they have, as same as picture the current stand of the banking and equity sector while briefly explaining its current limitations. In addition to that, the data published by the European Central Bank and Eurostat will be used as the main official data sources which will be brought together with a literature survey on the given topics.

The European Central Bank (ECB) publishes annually a financial stability report. Other than the previous ones, the report on the year 2020 was rather harsh and will cover the pandemic fluctuations within the financial system in the EU. The literature on the pandemics impact on the economy has set new levels of concern and unpredictability of the future and the financial system as well. For instance, the IMF (2020) in its World Economic Outlook from June 2020 expects a reduction of the real GDP for 1.2% for the Euro Area. Ehnts and Paetz (2021) argue that businesses are currently not constrained by the supply side, but by a general lack of spending.

The paper is organized as follows. In section 2 the current state of the financial markets and its losses will be discussed. As the financial stability has been shaken in its roots, it is necessary to take a look at the statistics and introduce the arguments from the literature; here we take a deeper insight into the GDP, unemployment and saving rates. In section 3, the European banking and equity sector will be discussed as the literature has found that the banks have a weakened profitability during the pandemic, whilst the equity market is performing rather well. The final section 4 concludes.

1 Financial Markets and its losses

After a strong start to 2020, investor-placed European securitization issuance stalled due to the coronavirus pandemic and ended the year down by 33% at €68 billion--the lowest annual total since 2013. Issuance could bounce back from this low base to €75 billion in 2021, assuming a successful rollout of vaccines and an associated easing of restrictions and economic recovery. European benchmark covered bond issuance also declined 34% to €87 billion in 2020. An increase in scheduled covered bond redemptions could support a muted recovery in volumes to €100 billion, despite issuers' continued access to cheaper funding alternatives. (S&P Global Ratings, 2021)

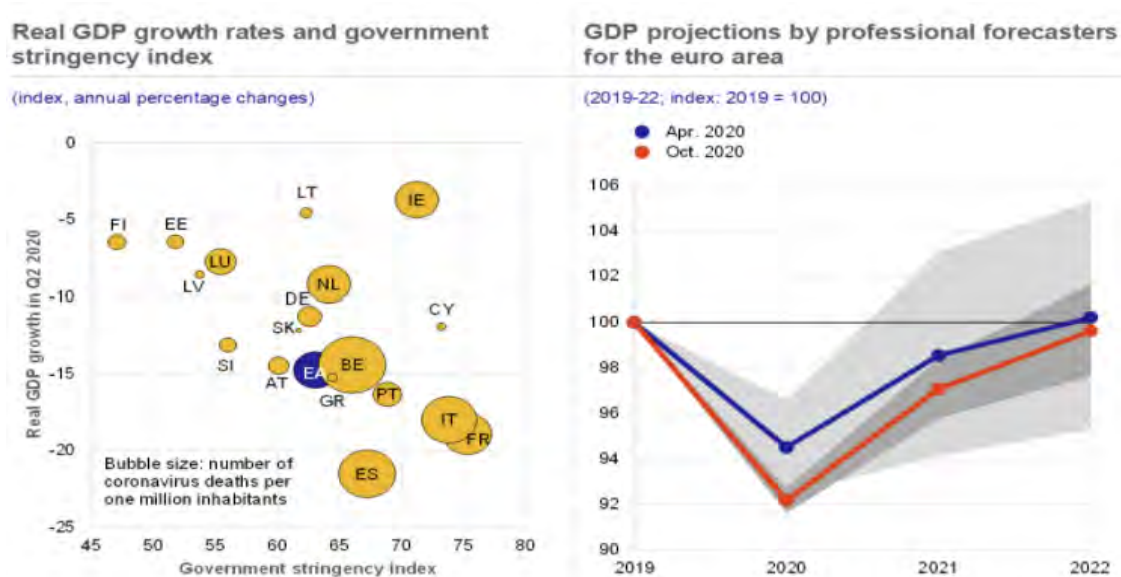
Zhang et al. (2020) has found that the pandemic has had a strong influence on stock markets and that the risk levels of all the countries has increased substantially, from an average of 0.0071 in February to 0.0196 in March. This high increase has been argued to rather have a sentimental aspect as Gormsen and Kojen (2020) explain and has nothing to do with a long-term expectation in the make nor a trend. Namely, as Broadstock and Zhang (2019) argued in their research, the market responded to the outbreak which can be quickly amplified through social media, which then stimulate trade activities and cause extreme price movements.

In the first quarter of 2020, euro area GDP fell by 3.8 percent quarter on quarter and by 3.3 percent on a year-on-year basis. (Eurostat, 2020) The International Monetary Fund forecasts euro area GDP to fall by 7.5 percent this year before rebounding by just under 5 percent in 2021 (IMF, 2020b). The current forecast for 2021 is thus significantly worse than the recession during the Great financial crisis in 2009 when euro area GDP dropped by a shade over 4 percent. If confirmed, this would be the worst peacetime economic deterioration since the Great Depression of the 1930s (IMF, 2020c)

In Figure 1 (below), the left panel portrays the EU countries more affected by the pandemic and associated containment measures facing the sharpest GDP falls – even worse than during the Great Recession. Italy and France, closely followed by Ireland, Spain and Portugal had the highest Covid numbers in the first wave early to mid-2020. After the re-opening of mostly all business activities in late spring, it has been believed that the economy will heal fast.

However, with the resurgence in new infection rates and the related reimplementation of social distancing measures in many countries, the economic recovery in the euro area has lost momentum more rapidly than expected. According to the ECB researchers, the forecast now shows that the euro area economy will not exceed pre-pandemic GDP levels until 2023 (as portrayed on the right panel in Figure 1).

Figure No. 1: GDP Growth Rates and Projections



Source: ECB, Hale et al. 2020

As the report was introduced at end of November 2020, the researchers believed that the Covid vaccines might ease the economy downfalls, as people would get vaccinated and businesses reopened. Unfortunately, no one could have foreseen that the vaccination would last longer than a year (Germany has not even vaccinated 8% of its population) which prolongates openings of any kind. (ECB, 2020)

Although Eurostat has not published official numbers on the GDP rate for 2020 yet, the unofficial numbers are near to the real ones. Namely, the GDP for the whole EU has decreased for 4% on average compared to 2019, which is still better than the forecasted 7% decrease. However, there are significant deviations between the countries. For instance, France has experienced a decrease in GDP for almost 5% while Ireland has had an increase for 1% (Eurostat, 2020). The explanation might be that Ireland is mostly self-sufficient and produces its goods rather than imports them. Additionally, they export a lot they don't need, so the pandemic did not shock them as much as France, which was forced to decrease its exports and businesses due to the lack of work-force (because of the closings of the industries).

Closing businesses, shutting down the leisure and hospitality industry, cancellation of events does not just mean a lower GDP, but also a huge rise in unemployment. According to the data from Statista (2020), the unemployment in EU overall was 7.4% - where Greece was the unfortunate first place having 16.5% unemployment rate and Chechia the fortunate last place with 3.1% - the lowest rate in Europe. And the worse news is that the rates are expected to rise. As the main characteristics of unemployment is the decrease in demand of work-force, it has not been a surprise that the rates went up dramatically. Most of the EU countries have managed it equally good. For instance, Germany has had 27,5% unemployment due to the closing of non-essential business categories (mostly the beauty and leisure industry), while France had 35,52%⁶ unemployment. The southern European countries such as Spain and Italy have already been in a bad shape even before the pandemic and yet experienced an increase in unemployment for 25.58% in Italy and 31,64% in Spain. (EC, 2020)

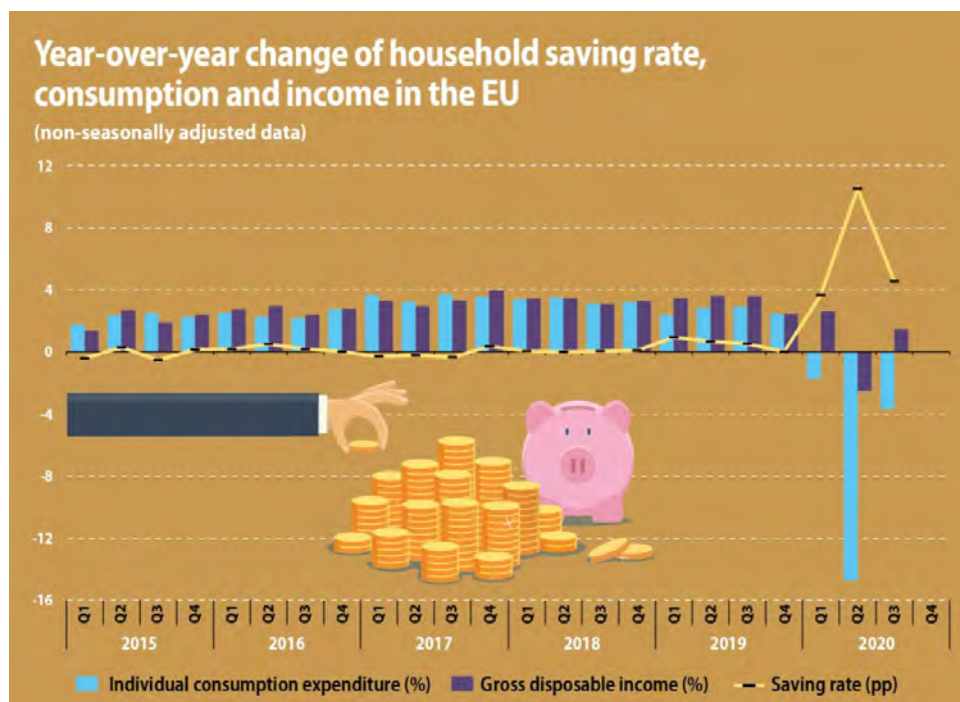
According to the data from Eurostat (2021) however, the unemployment rate has increased, but not as dramatic as many researchers have predicted. Georgiou (2021) implies that due to the Covid pandemic during 2020, unemployment increased in EU mainly in the southern part of EU, which has already suffered from the aftermath of the great financial depression.

Namely, compared to the great financial depression 2007/2008, until which the unemployment rate was quite stable throughout most of the EA countries, the Covid pandemic has increased the unemployment rate more in the southern region than in the northern one. Countries like Greece and Spain experienced a steep increase firstly in the period right after 2008 while Germany and France for instance have had a light tendency for about 2% increase the most. This phenomenon can be explained easily by the fact that during the financial depression 2007/2008 mostly the demand for workforce has diminished, while during the pandemic, the demand has stayed the same, just moved (wherever possible) to the home-office and thus preserved the working places.

Eurostat (2021) has published the first data on spending and income of the European households for the year 2020. Interestingly here is the deviation in between the quarters – in the first quarter of 2020, the average income stayed stable at 3% while the consumption decreased by 1,8%. In the second quarter though, the income decreased to -2,5% and the consumption decreased to 15%. The savings rate went from a long-stable 0% to 1% to an all-time high of 11% in the second quarter. Due to the unknown situation and fear of what the future might bring, people started to save more and consume less.

⁶ Please note that the statistics is just a moment-in-time analysis conducted by the European Commission and does not have to be final or real statistics for the year 2020.

Figure No. 2: Household Saving Rate



Source: Eurostat 2021

As we can see from the above figure, the household saving rate was mostly constant over the past few years while Income and Expenditure have light ups and downs.

Interestingly to notice here is the first quarter of 2020 where Europeans decrease their expenditure by 1.8% having their income at the same level as from the fourth quarter of 2019 being the first reaction to the unknown virus.

In the second quarter however, the expenditure decrease to a long-time minimum of 15% while the income also for the first time decreases for 3%. This statistic is just proving what the research has already estimated. Christelis et al. (2020) found that the household spending has dropped by 16% from 2019 to the beginning of 2021 and argues that at the same time the households are exposed to shocks regarding the access to liquidity and /or personal health as risk factors.

Having seen the literature proving the statistics from the official sides brings us to look at what has been done in order to ease the situation.

2 European Banking and Equity Sector

According to Beck and Carletti (2021), banks have been hit by the economic impact of the COVID-19 public-health crisis, as have other sectors. But unlike during the global financial crisis, this crisis did not start in the financial sector, nevertheless it has quickly become clear that the financial sector (especially its banks) is critical in mitigating the impact of the crisis and in supporting the recovery process. What has happened is that smaller firms with no real access to the capital market have been taking on loans wherever possible in order to have a cash buffer in these uncertain times, which implies that the demand for the banking sector is increasing.

However, Schularick et al. (2020) argues that banks need sufficient capital not only to deal with the loan losses coming from the deep recession but also to support the recovery. A well-capitalized banking sector is crucial for a fast economic recovery from the COVID crisis.

Additionally, Jorda et al. (2020) demonstrates in his research that on a macro level, the speed of economic recovery depends on the capitalization of the banking sector. Insufficiently capitalized banks slow down economic recoveries from recessions, mainly because undercapitalization negatively affects loan supply, leading to a much slower recovery of debt-financed growth.

A closely related paper by Acharya et al. (2020) studies the consequences of the undercapitalization of European banks after the Financial Crisis 2007/08. In particular, they look at the effects of regulatory forbearance and guarantees as an alternative to recapitalization. Fiscally constrained governments in Europe often opted for such form of support for the banking sector. The economic costs were substantial. Weakly capitalized banks loaded up on securities and especially on government debt. Importantly, shrinking their corporate loan books banks did not support the recovery of private investment and became a drag on the recovery. (Acharya et al., 2020)

Beck and Carletti (2021) argue that at the same time as banks across the globe thus play key roles in economic recovery, in Europe, the banking sector itself is in urgent need of restructuring. Unlike banks in the US, European banks had, on average, not recovered their pre-2008 market valuations before the outbreak of the pandemic. Schularick et al. (2020) found too that since the crisis, the Eurozone economy underperformed relative to the US economy by about 10%. For a rapid recovery from the COVID-19 economic shock, Europe needs a well-capitalized banking system.

The IMF (2020) has found in its study that the adverse impact of the COVID-19 shock on banks was rather long-lasting than on the corporates as well as other non-bank financial institutions, revealing the expectation that banks are to absorb at least part of the shock to the corporate sector. Furthermore, their study found that larger banks, public banks, and to some extent better capitalized banks suffered greater reductions in their stock returns, reflecting their greater anticipated role in dealing with the crisis while banks with lower pre-crisis liquidity and oil sector exposure also suffered greater reduction in returns, consistent with their greater vulnerability to such a shock. (Demirguc et al., 2020).

Having in mind this bad situation of the banks, many researchers had a rather negative forecast for the equity market as well. However, as we know today, the capital markets are in a well suited position and are far from a crash. Again, this rather tends to be a sentiment forecast done in early 2020 when remembering how fast the Financial Crisis 2007/08 has spilled over to almost all sectors.

According to Suarez (2020), the European capital markets have continued to operate well following the outbreak of COVID-19, with liquidity ranging from very good to mixed, depending on the sector. In fact, there have been record volumes of new issuance in certain sectors.

As we can see from the chart below, the DAX (the German index) has reached a historical high.

Figure No. 3: DAX Index

Source: Deutsche Börse Frankfurt

The greatest loss in the past three years has been at the same beginning of the crisis in March 2020 due to insecurity in the market. Same as for the unemployment ratio, the capital market was predicted to experience high losses, taking into account the last Financial Crisis. However, this pandemic has not decreased the demand for work force nor were its origins in the financial sector (which ensured an ongoing supply of capital) – and this is why this pandemic has other characteristics.

Frank Häusler, an asset manager from Vontobel, explained why the indices worldwide are in a high rise. He argues that the indices are mirroring the world picture in a momentum; as the gold and barrel prices are high, we can expect their indices to be high. Furthermore, he implies that the stock market needs to “catch up” the lost time during the first few weeks of the pandemic in Europe. His forecast – until the end of 2021 the stock market will be back on track and produce stable prices and indices.

Conclusion

This paper was focusing on the financial outcomes from the Covid pandemic on the Eurozone economy. The main part was to determine the GDP, unemployment and saving rate fluctuations. In addition to that, I have provided a brief picture of the current stand of Eurozone banking and stock market and tried to explain why the stock market is in such a good shape, while the banking sector stays behind.

I have presented the official numbers provided from the ECB, IMF and Eurostat and additionally researched the literature on these given topics I was focusing on. The key findings are a smaller GDP than last year, but a stable (and high) stock market; a rather low expenditure ratio, but not a skyrocketing number of unemployment. To conclude, the outcomes of the pandemic were putting the economy to its knees, but far better than forecasted when remembering the Great Financial Crisis.

Further studies on this topic could include the NPLs, which are forecasted to hit the banks beginning in June this year. This would mean that the banking profitability outlook would remain unstable.

References

- Acharya, V. and S. Steffen (2020). The Risk of Being a Fallen Angel and the Corporate Dash for Cash in the midst of COVID, *COVID Economics* (10), 44-61.
- Aldasoro et al. (2020). Effects of Covid-19 on the banking sector: the market's assessment. At: BIS Bulletin No 12: Effects of Covid-19 on the banking sector: the market's assessment.
- Brandenburg D., M. Toiano, P. Lambert, N. Hardy, C. Romano, A. Dominguez, A. Boratti and A. Hansen. (2020): 2021 European Banking Outlook. First real-life stress test since post-GFC sector de-risking. at: 2021 European Banking Outlook: First real-life stress test since post-GFC sector de-risking (scoperatings.com).
- Broadstock, D. and D. Zhang. (2019). Social-media and intraday stock returns: The pricing power of sentiment. At: Social-media and intraday stock returns: The pricing power of sentiment - ScienceDirect.
- Christelis, D., D. Georgarakos, T. Japelli and G. Kenny. (2020). The Covid-19 Crisis and Consumption: Survey Evidence from Six EU Countries. At: wp590.pdf (csef.it)
- Deutsche Börse Frankfurt. DAX Index. (online). Available from: <https://www.boerse-frankfurt.de/index/dax>
- Demirguc-Kunt, A., M. Pedraza, E. Alvaro and C. Ruiz Ortega. (2020). Banking Sector Performance During the COVID-19 Crisis (English). Policy Research working paper; no. WPS 9363; COVID-19 (Coronavirus) Washington, D.C.: World Bank Group. At: <http://documents.worldbank.org/curated/en/209481597431651590/Banking-Sector-Performance-During-the-COVID-19-Crisis>
- Earnshaw et al. (2020). COVID-19 conspiracy beliefs, health behaviors, and policy support. At: COVID-19 conspiracy beliefs, health behaviors, and policy support (nih.gov)
- Ehnts, D. and M. Paetz. (2021). COVID-19 and its economic consequences for the Euro Area. at: COVID-19 and its economic consequences for the Euro Area | SpringerLink
- Eich, F., T. Küspert and P. Schulz. (2020): The Corona crisis and the stability of the European banking sector. A repeat of the Great Financial Crisis? at: [The_Corona_crisis_and_the_stability_of_the_European_banking_sector.pdf](https://www.bertelsmann-stiftung.de/~/media/Dateien/2020/07/20200720_The_Corona_crisis_and_the_stability_of_the_European_banking_sector.pdf) (bertelsmann-stiftung.de)
- European Banking Federation (2020): Banking in Europe: EBF Facts & Figures 2020. At: [EBF_043537-Banking-in-Europe-EBF-Facts-and-Figures-2020.pdf](https://www.ebf.europa.eu/~/media/Dateien/2020/07/20200720_EBF_Facts_and_Figures_2020.pdf)
- Eurostat (2020): GDP down by 3.8% in the euro area and by 3.5% in the EU, at: <https://ec.europa.eu/eurostat/documents/2995521/10294708/2-30042020-BP-EN.pdf/526405c5-289c-30f5-068a-d907b7d663e6>
- Georgiou, M. (2021). COVID-19 ON UNEMPLOYMENT RATE. At: SSRN: <https://ssrn.com/abstract=3801700>
- Gormsen, N. and R. Koijen. (2020). CORONAVIRUS: IMPACT ON STOCK PRICES AND GROWTH EXPECTATIONS. At: [w27387.pdf](https://www.nber.org/papers/w27387) (nber.org)
- Hale, T., N. Angrist, E. Cameron-Blake, L. Hallas, B. Kira, S. Majumdar, A. Petherick, T. Phillips, H. Tatlow and S. Webster (2020). Oxford COVID-19 Government Response Tracker, Blavatnik School of Government.
- Häusler, F. (2020). Warum die Aktienkurse weiter steigen werden. At: Trotz Coronavirus: Warum die Aktienkurse weiter steigen werden (faz.net)
- IMF. (2020). A crisis like no other, an uncertain recovery. IMF World Economic Outlook Update, June 2020.
- International Monetary Fund (2020b): April 2020 World Economic Outlook, at: <https://www.imf.org/en/Publications/WEO/Issues/2020/04/14/weo-april-2020>

International Monetary Fund. (2020c): The Great Lock-down: Worst Economic Downturn Since the Great Depression, at: <https://blogs.imf.org/2020/04/14/the-great-lockdown-worst-economic-downturn-since-the-great-depression/>

S&P Global Ratings 2021. European Structured Finance Outlook 2021: In Short Supply | S&P Global Ratings. Accessed 18.03.2021

Schularick et al. (2020). Bank capital and the European recovery from the COVID-19 crisis. at: 1702864596.pdf (econstor.eu)

Statista (2020). At: <https://www.statista.com/statistics/1115276/unemployment-in-europe-by-country/> Accessed 18. 3. 2021

Suarez, J. (2020). Initial Impact of COVID-19 on European Capital Markets. At: Initial Impact of COVID-19 on European Capital Markets | AFME

The World Bank. (2016). <https://www.worldbank.org/en/publication/gfdr/gfdr-2016/background/financial-stability>. Accessed 18. 3. 2021

Vlieghe, Gertjan. (2020). Monetary policy and the Bank of England's balance sheet (Speech given by Gertjan Vlieghe, External Member of the Bank of England's Monetary Policy Committee, Bank of England, 23 April 2020), at: <https://www.bankofengland.co.uk/-/media/boe/files/speech/2020/monetary-policy-and-the-boes-balance-sheet-speech-by-gertjan-vlieghe.pdf?la=en&hash=D76269239470F000514B5F6AA76500590254DBDC>

Zhang, D., M. Hu and Q. Ji. (2020). Financial markets under the global pandemic of COVID-19. At: Financial markets under the global pandemic of COVID-19 (nih.gov)

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THE BREXIT PHENOMENON

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Abstract

The paper highlights the complexities of the so-called Brexit process conditioned by many factors. The purpose of the interpretation is to highlight the growing current need for scientific research into this process, which may affect the position of the European continent in the long run. The research study focuses on the complexities of the current development in Europe. It starts from the first idea of the British Kingdom withdrawal from the European Union and continues up to the current proposals for the departure of Scotland from the EU. As a background of the research, the literature review demonstrates the development stages of academic literature (especially in terms of theories of international economic integration) and the results of real-life practice. The analysed time period is presented in the form of an eight-year timeline with the events split into four phases (stages). The interpretation of the Brexit development process is complemented by an assessment of the future development projections of the EU, assuming its preservation, including various modifications. The selected methodological approach combines a qualitative approach with a quantitative one, i.e., mixed research. The interpretation is highly structured: after the introduction (among other things, containing the definition of work objectives and methods), the most important technical terms used by the author in this article are discussed, along with comments on their different concepts in the discussions of experts in relevant disciplines. In the following explanation, the author examines the current discourse embodied in selected opinions. E.g., they concern, among other things, the length of forecasts and projections along with their plausibility and applicability. The literature review implicates fragmentation of different authors' opinions belonging to various interest groups as well as openness towards the further development of different approaches and research results. Due to the limited space of the article, opinions are selected, to the best of the author's knowledge and belief, based on their importance for future EU development.

Keywords

Brexit, Brexit timeline, Brexit classification of phases, impact of Brexit, EU future

JEL Classification

F02, F51

Introduction

The paper highlights the complexities of the so-called Brexit process conditioned by many factors. The purpose of the study is to demonstrate the growing current need for scientific research into this process, which may affect the long-run position of the European continent. The research study focuses on the complexities of the current development in Europe.

The study is divided Introduction, three Chapters and Conclusion. At the beginning of each part of the Study, the author formulates its specific partial aim and content; partial research results based on selected literature reflect the author's view and serve as arguments supporting the Conclusion.

As a background of the research, the literature review demonstrates the development stages of academic literature (especially in terms of theories of international economic integration and international trade theory) and the results of real-life practice. The eight-year timeline of the analysed period divides the relevant events of the whole process into several phases (stages).

The COVID-19 research and legal problems were not included into the analysis of the “Brexit Phenomenon;” they will be dealt separately in other publications.

1 Basics

This chapter contains basic information on the origin of the word Brexit and its different use. The scope of research draws mainly on economic academic literature of the research object (i.e., the analysis of events connected with one or more partial stages of the whole Brexit development process).

1.1 Brexit characteristics and definitions

In the vast world of professional literature, the word “Brexit” is a “newcomer”, a newly coined word, connected with theoretical and applied research. In this subchapter 1.1 - Brexit Story starts from the first idea about the British Kingdom potential withdrawal from the European Union and continues up to the current proposals for the departure of Scotland from the EU.

One can imagine that researchers are able to use any part of real economy as a starting-point of research into the Phenomenon Brexit. To be able to reach meaningful results, the research object has to be analysed, characterized and defined.

At present, *n*-number of different Brexit characteristics and/or usable definitions are available. The word “Brexit” is one of the “immortal” professional words (such as “tunnelling” etc.). It was not invented as a result of academic scientific debates as many people still “take for granted” (*Definition of Brexit | Dictionary.com* 2021). The question is if it is possible to accept fading out memories of a couple of state functionaries and/or political professionals at the end of endless discussion about European integration to be common currency. (Balassa, 1994). If it were so easy, then the question of the neologism ‘Brexit’ would be solved once for ever.

However, this story is true. Let us present several definitions of “Brexit” as examples of the nascent new theory. The following eight attempts of explaining the new phenomena of Grexit and Brexit show that similar “events” were not approved by all EU-member states. Let us briefly go through the credibility of some of the used arguments. Different dictionaries present philological explications. This was the easiest way how to satisfy the bid without breaking the rules.

- ORIGIN OF BREXIT. First recorded in 2012; (originally also spelled Brixit, referencing Britain's possible withdrawal); Br(itain) or Br(itish) + exit¹; probably patterned on Grexit, which dates from earlier that year (*Definition of Brexit | Dictionary.com* 2021).
- British exit. Definition: It is an abbreviation for the “British exit”, similar to “Grexit” that was used for many years to refer to the possibility of Greece leaving the Eurozone. Brexit refers to the possibility of Britain withdrawing from the European Union (EU), (Úřad vlády ČR, 2020).

- Government Explanation “What is Brexit?” (2017): “Brexit’ is the name given to the United Kingdom’s departure from the European Union. It is a combination of ‘Britain’ and ‘exit’ (Zaken, 2018).
- Lexico.com. Brexit. The withdrawal of the United Kingdom from the European Union (*BREXIT | Definition of BREXIT by Oxford Dictionary on Lexico.com also meaning of BREXIT 2021*).
- Clear explanation of BREXIT by Clarke et al. can be found in their comprehensive study of Brexit. The study offers ideas on the Brexit process which are accessible to general readers, students and academics, combining theoretical and methodological rigour with clear storytelling (Clarke, Goodwin, Whiteley, 2017).
- Brexit is a portmanteau of the words "British" and "exit" coined to refer to the U.K.'s decision in a June 23, 2016 referendum to leave the European Union (EU). Brexit took place at 11 p.m. Greenwich Mean Time, Jan. 31, 2020 (Hayes, Scott. 2021).
- European Parliament. 9. Future timetable Key events February / March 2021: European Parliament consent vote on the Trade and Cooperation Agreement. There is some uncertainty about the timing of events in this section and some are indicative only.
If the first item (of 2012) is compared with items published in 2017, it is clear that during the following 4 – 5 years “Brexit” became a real event; therefore, it was worthwhile to study this new phenomenon.

AUTHOR’S COMMENTARY

To be able to understand the real content of Brexit (as a specific historical period), it is necessary to analyse the reasons why the United Kingdom (Britain) finally decided to withdraw from the European Union. Although the “Brexit phenomenon” has been studied by researchers of different sciences for many years, it cannot be said that “everything” from its real history would be successfully proven. The literature shows that the reasons of many historical events were perfectly documented, but other reasons not. (*Brexit: Why Britain Voted to Leave the European Union | Hub Page 2021*; (Clarke, Goodwin, Whiteley, 2017))

1. One of the research question No. 1: “What is BREXIT? Almost all answers were very simple: the word BREXIT means “The withdrawal of the United Kingdom from the European Union“, or „The possibility of Britain withdrawing from the European Union.” Most answers were brief and rudimentary. The word Brexit has been added to the Oxford English Dictionary (OED). It defines Brexit as "the (proposed) withdrawal of the United Kingdom from the European Union, and the political process associated with it". It continues: "Sometimes used specifically with reference to the referendum held in the UK on 23rd June 2016, in which a majority of voters favoured withdrawal from the EU." (BBC News, 2016).

One of the famous answers published by British media: „Prime Minister Theresa May has stated that "Brexit means Brexit" (BBC News, 2016).

2. In most sources, the above brief statement contained complementary data about this surprising event as well. In most cases, the principals of selection (or citation) were not analysed.

3. Minority of academic sources published only „philological“ explanation of the neologism „Brexit“ (for example, pronunciation of the word Brexit in national European languages). Majority of academic sources were trying to find out the “real content” of the process called “Brexit.” Some of the relevant subjects started to publish interesting facts and pose new research questions.

4. Chapter 2 deals with the methodology of the “Brexit Research”. The analysis of research was becoming a crucial question. It opened the door to further research on a larger scale (Walker, 2021).

1.2 Selected questions of methodology

This Subchapter 1.2 deals with selected questions of methodology that are relevant to the research on Brexit.

The general aim of this article is to explain the origin of the word “Brexit”, to comment on a series of historical events connected with its use in theory and practice, and to evaluate the future of the Brexit phenomenon (see Chapter 3).

Methodology is one of the new items on the list of research activities. Up till now, it has become one of the substantial parts of the family of *sciences*.

During historical development of science (or sciences), the leading position of any method/discipline on the top of the triangle was primarily due to the development speed of research activities in the modern human society that needs a recognized set of research rules binding all researches. Today, no serious scientific journal would publish any article presented by any subject without examining the used methodology. And *vice-versa*: no serious researcher would try to publish any result of his/her research without revealing methods used by its birth.

Subchapter 1.2 deals with several questions enumerated in the introduction of Chapter 1 and comments on selected views of different subjects involved in research of the new word “Brexit.”

Majority of the above enumerated questions have been discussed in a numerous academic literature (see References) with different results. Some questions remain unanswered (i.e. without any definite answer). *The frequent reason is the same (or similar): a relevant answer has its roots in different theoretic backgrounds.*

In different documents, there are formal answers without any material or logical content. For example: “What is Brexit”? Answer 1: “Brexit is Brexit”. Answer 2: “Brexit is impossible.”

There are two answers to the same (or similar) questions. Question 1: “What is the substance of the word Brexit?” Answer 1: ”Brexit is an Agreement.” Question 2: “What is the substance of the word Brexit?” Answer 2: “Brexit is a period of time.”

1.3 Selected questions

The new mutual relations between the UK and the EU that have to petrified by a new Agreement depend on the willingness of both subjects (i. e. the UK and the EU) to find a solution acceptable for

both parties. Representatives of both parties have a difficult task to prove that the proposed arrangement is - at the given time – the best one for population of both parties. Both subjects have to find a suitable way how to explain the advantages of the proposed Agreement by acceptable arguments. It is very difficult to achieve such result as soon as possible without hurting national emotions and without hurting the logic. It is clear that quasi-bilateral negotiations need a necessary time to be successful. Both subjects have the similar disadvantage: representatives of the EU need a “qualified” consent of all EU members and representatives of the UK need a tacit consent of its “united” partners of the UK. The final positive result of EU-UK negotiations is surprising, because the obstacles against the Agreement seemed to be unsurmountable. In the history of modern diplomatic negotiations, the Brexit Agreement is a real diplomatic “Meisterstueck” (masterpiece).

In fact, to the last moment nobody expected the final success of Brexit, and – at the same time – even the successful negotiators were aware of additional difficulties that followed after the last signature. It was necessary to negotiate additional partial arrangements to be sure that some “details” would not destroy the whole Construction (the case of fishery etc.).

As for economics, it will be difficult to elaborate a credible “proof of success” of the Brexit “story.” The economic map of Europe has been permanently changing; it will be difficult to present a balance of “profits and losses” caused by the absence of UK in European business. It is no wonder that many economists calculate the “plusses and minuses” very carefully to prove that profits were greater than losses. Reliable data on the “Brexit period” are still missing. To be able to achieve an acceptable “guess”, it would be necessary to answer some theoretical questions. For example, it would be necessary to define the length of the Brexit period - its beginning and its end; to decide which data should be taken in consideration, if some statistical pattern would be elaborated etc. There are doubts whether and how the data about the EU and UK economic growth during the given period are measurable and comparable. Anyway, it would be interesting to compare a set of selected data in 2021 with a similar set of – say – 2014.

2 Brexit development process

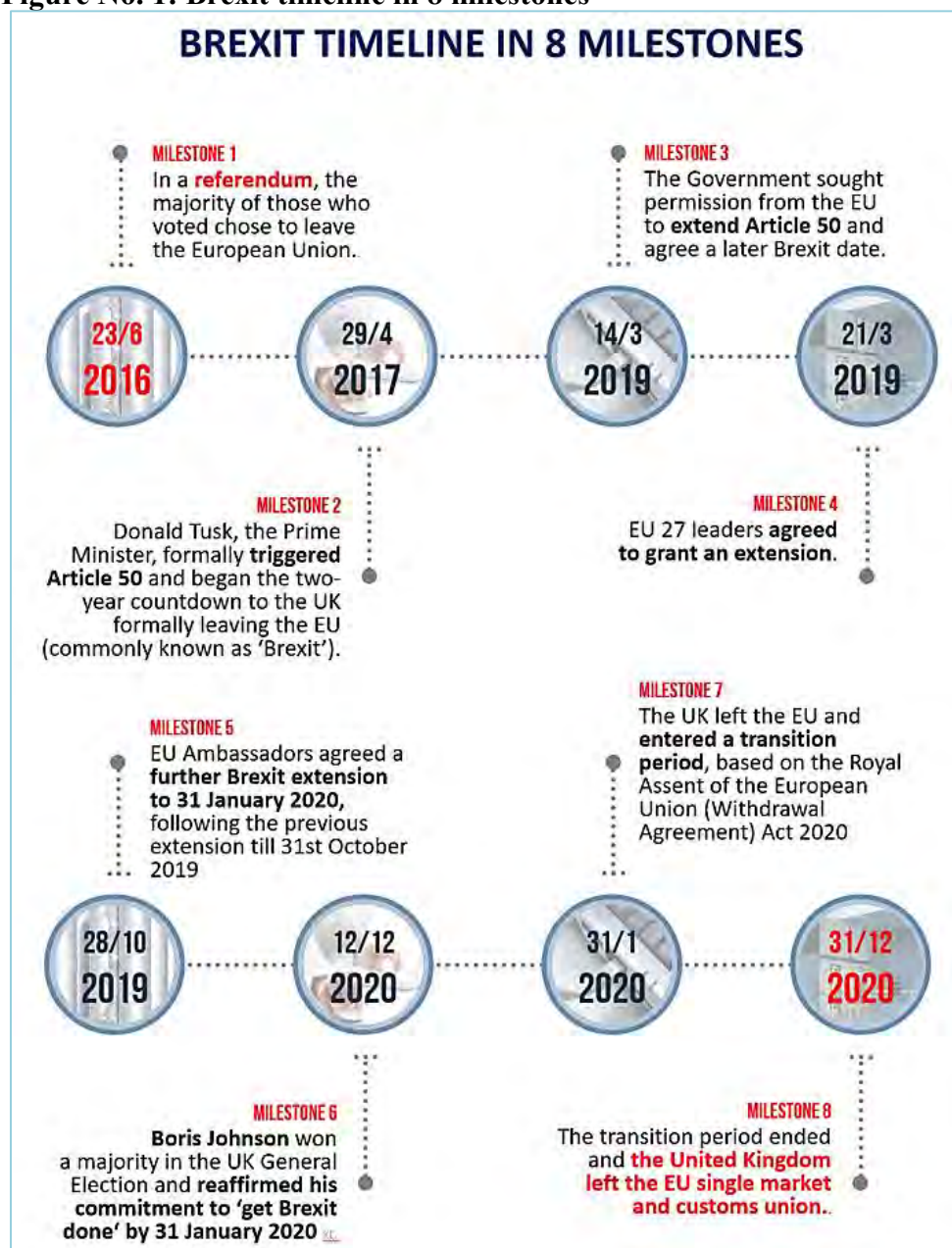
All preceding parts of this study about Brexit suppose that the new word “Brexit” identifies a specific period of the real European historical development process. It has its “beginning”, followed by a shorter or longer list of historical “events” and – as every dynamical process – its ”end”. In democratic units of human society, researchers are (theoretically) free to study any “new event” that emerges and influences the life of human society according to rules invented and approved by its (elected) leaders. Subchapter 2.1 describes the Brexit Development Process (BDP) and Subchapter 2.2 presents the author’s discussion about the Brexit events (general remarks and specific remarks from the point of view of real results/achievements vs. (economic) theory.

2.1 Brexit timeline

This Subchapter 2.1. Brexit Timeline explains selected key words used in academic literature about Brexit. It describes some important components of the real EU economy that are in play during the period of Brexit implementation.

In order to imagine the complexities of the Brexit process, the author has prepared a synoptic timeline with eight milestones representing the crucial decisions made between 2016-2020.

Figure No. 1: Brexit timeline in 8 milestones



Source: own elaboration based on (Walker, 2021)

The paper written by Walker provides a timeline of the major events leading up to the EU referendum and subsequent dates of note, including Brexit Day itself (Walker, 2021).

The author of this study is fully convinced that the term 'Brexit' should be exclusively used to depict the historical period between 23rd June 2016 and 31st December 2020, i.e., the referendum in 2016 and final exit of UK from the EU single market and customs union. It would be helpful to *set up a list of economic events corresponding to the above "political" milestones*.

2.2 Evaluation

This subchapter formulates views of the author about the innovative parts of Brexit events and terminology.

(1) The seven-year time-line is more general than the last new British semi-official list published in April 2021.

A number of British authors apply different criteria. At present, considerable number of authors explain the content and forms of time-line in manifold ways. The construction of time-line accentuates the range of different actions, they are descriptive (positivist approach), they do not try to find out the main causes. They do not take into account theoretical conceptions that represent the base of practical decisions and measures. They mainly put stress on the British negotiation positions and do not satisfactorily react on the standpoints of the EU.

Presented classification is a general classification; its base is primarily the recognized theory of (economic) integration and – partially – the theory of international trade as well.

(2) In the author's opinion, the most credible base of the economic and political decisions of the leading representatives of integration groupings and of EU member states as well is the original English version of the Brexit Treaty. Other versions' reliability, i.e., translations into EU-member states' languages, is limited.

(3) Modern methods of statistics, prognostics, econometrics etc. are undoubtedly very interesting and their use is recommendable. However, it would be misleading and dangerous to rely only on some of these disciplines and not to confront results produced by application of quantitative methods with results of qualitative methods. The "mixed" approach is by many researchers – unfortunately – rejected as "unsuitable" or "unreliable" instruments.

3 Commentaries on Brexit future

If the word "Brexit" means a specific time period, no "Brexit Future" is possible. It definitely ended in 2020. After this date, a new period time probably will have its new "name" derived from characteristic of new events. At present, results of published prognoses are not very reliable (Intereconomics, 2021).

The previous research selected results about Brexit Future will have to be summarized and briefly commented:

1. Recent dynamics observed in the development of societies has demonstrated that predictions were inaccurate or even beside the point.
2. Especially with societal changes, nobody wants to be a false prophet. With long-term predictions, the situation can be even harder.
3. The underlying unpredictable factor is technology that influences all spheres of human activity (Lederman, 2021).

4. Maximum 5-to-10-year *partial predictions* have a chance to be implemented, i.e., credible. This period corresponds to the existing political and economic system. Partial obstacles could be probably eliminated. A deeper analysis of British political and economic systems is necessary.

Conclusion

The Phenomenon Brexit undoubtedly belongs to research objects that are very attractive for academic researchers of many sciences: it is a unique part of modern history of mankind with a vast innovative potential. The aim of this article – defined at its beginning – to analyze a complex of new events and their interconnections on the field of technique, technology, economy, law and social sciences from different points of view was partially implemented. The narrow scope of this article given by the conference rules does not allow for explicit arguments.

In the Conclusion, selected comments to the Introduction and to the three following questions (based on the References) are presented to underpin the autor's research recommendations:

1. It is recommended to enlarge the research scope to be able to analyze the basic interdisciplinary relations between the three research areas, i.e. technic, technology, applied economy, law and social sciences as a compact system revealing the present role and future role of its parts in more detail. It is probable that the innovative leading role of technics and technology in the system as a whole will continue and be dominant; this dominancy will enable a rapid progress of all other parts with an accent on economy and social sciences.
2. It is desirable to support a more flexible interaction between the abstract science disciplines and the block of economy and other social sciences to make the whole system less rigid.
3. On the field of practical international policy, it is desirable to support the role of interdisciplinary co-operation between the worldwide institutions to be able to achieve a real practical solution of projects crucial for the progress of mankind.
4. The UNO (and its connected organizations) does not fulfil the obligations defined by its Statute in a satisfactory way. Only technological progress (digitalization, artificial intelligence and new weapons) "goes its own way." Unfortunately, a considerable part of it is misused to the detriment of mankind. At present, for different reasons, it is (not yet? if ever?) impossible to predict the mankind's future. Many present guesses are just science fiction.
5. The discussion about the main aim of mankind still is going on. There are doubts whether a final solution of worldwide problems recommended by UNO - under existing conditions over the world - is possible. Many of these problems are controversial. Some of them are not supported by political, religious and/or social reasons.

The presented analysis of the term ,Brexit' and related issues has brought important insight into the topic which has far-reaching consequences. The dynamism of technology development represents a crucial phenomenon in the development of future mutual relations between the UK and other countries in economy, trade and finance areas.

At present, no credible universal outlook into the future of mankind really exists. In fact, there are only two ways of progress: the long-term way of an optimistic positively oriented continuous international discussion in the UNO framework, and implementation of realistic policy of peace, or as risky continuation of philosophy of rule, violence and wars. It is necessary to suppress this second way by all means as soon as possible.

References

- BALASSA, Bela. 1994. The Theory of Economic Integration: An Introduction. In: NELSEN, Brent F. and STUBB, Alexander C-G. (eds.), *The European Union: Readings on the Theory and Practice of European Integration* [online]. London: Macmillan Education UK. p.125–137. [Accessed 2 July 2021]. ISBN 978-1-349-23984-9. Available from: https://doi.org/10.1007/978-1-349-23984-9_15
- BBC NEWS. 2016. Brexit added to Oxford English Dictionary. *BBC News* [online]. 15 December 2016. [Accessed 8 July 2021]. Available from: <https://www.bbc.com/news/uk-england-oxfordshire-38326516>
- BREXIT | Definition of BREXIT by Oxford Dictionary on Lexico.com also meaning of BREXIT, 2021. *Lexico Dictionaries | English* [online]. [Accessed 24 June 2021]. Available from: <https://www.lexico.com/definition/brexit>
- Brexit: Why Britain Voted to Leave the European Union | Hub Page. 2021. *Cambridge University Press* [online]. [Accessed 24 June 2021]. Available from: <https://www.cambridge.org/gb/academic/brexit-why-britain-voted-leave-european-union>
- CLARKE, Harold D., Matthew J. GOODWIN and Paul WHITELEY. 2017. *Brexit: why Britain voted to leave the European Union*. Cambridge, United Kingdom; New York, NY: Cambridge University Press. ISBN 978-1-107-15072-0.
- Co je Brexit? – Brexitinfo. 2020. [online]. [Accessed 2 July 2021]. Available from: https://www.brexitinfo.cz/cs_cz/vystoupeni-velke-britanie-z-eu/
- Definition of Brexit | Dictionary.com. 2021. *www.dictionary.com* [online]. [Accessed 24 June 2021]. Available from: <https://www.dictionary.com/browse/brexit>
- GRAUWE, Paul De. 2016. What Future for the EU After Brexit? *Intereconomics* [online]. 2016. Vol. 2016, no. 5, p. 249–251. [Accessed 24 June 2021]. Available from: <https://www.intereconomics.eu/>
- HAYES, Adam. 2021. Brexit. *Investopedia* [online]. 2021. [Accessed 24 June 2021]. Available from: <https://www.investopedia.com/terms/b/brexit.asp>
- HAYES, Adam and Gordon SCOTT. 2021. Brexit. *Investopedia* [online]. 2021. [Accessed 2 July 2021]. Available from: <https://www.investopedia.com/terms/b/brexit.asp>
- INTERECONOMICS. 2021. Intereconomics. *Intereconomics* [online]. 2021. [Accessed 8 July 2021]. Available from: <https://www.intereconomics.eu/>
- Intereconomics is an academic journal that publishes articles by experts on current economic and social policy issues affecting Europe.
- LEDERMAN, Simong. 2021. BBC Radio London - Brexit and technology. *BBC* [online]. 2021. [Accessed 24 June 2021]. Available from: <https://www.bbc.co.uk/programmes/p054hljk>
- ÚŘAD VLÁDY ČR. 2020. Co je Brexit? – Brexitinfo. [online]. 2020. [Accessed 24 June 2021]. Available from: https://www.brexitinfo.cz/cs_cz/vystoupeni-velke-britanie-z-eu/
- WALKER, Nigel. 2021. Brexit timeline: events leading to the UK's exit from the European Union. [online]. 2 July 2021. [Accessed 2 July 2021]. Available from: <https://commonslibrary.parliament.uk/research-briefings/cbp-7960/>

This paper provides a timeline of the major events leading up to the EU referendum and subsequent dates of note, including Brexit Day itself.

ZAKEN, Ministerie van Buitenlandse. 2018. What is Brexit? - Government.nl. [online]. 30 August 2018. [Accessed 24 June 2021]. Available from: <https://www.government.nl/topics/brexit/question-and-answer/topics/brexit/question-and-answer/what-is-brexit>

ŽÍDEK, Bohumír. 2016. Euro byla chyba, tvrdí novopečený nobelista Oliver Hart - Novinky.cz. [online]. 2016. [Accessed 24 June 2021]. Available from: <https://www.novinky.cz/ekonomika/clanek/euro-byla-chyba-tvrdi-novopeceny-nobelista-oliver-hart-40018798>

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IMPACT OF TOKENIZATION ON THE ECONOMICS OF CROWDFUNDING INVESTMENTS THROUGH A CHANGE OF INVESTMENT BEHAVIOUR

MICK PIRGMANN

Abstract

The author analysed data from two crowdfunding investments with a similar underlying asset regarding investments size, gender, and age of the investors regarding the impact of the change of structure from a classical investment to a tokenized investment structure. The results showed no impact from tokenization on the structure of the investors gender and only minor impact on the age of the investors. But the findings also showed that lowering the minimum investment from € 1000 in the classical investment for marketing reasons and because it is technically feasible to € 1 after tokenization diminishes the profit margin for the initiator substantially. Because every investor comes at a cost, only a certain number of loss-making small investments in relation to profitable high investments can be compensated. Because it is not possible to precisely determine the density distribution of investment sizes in advance to placing a new investment, it is highly recommended give up the minimum investments size € 1 to avoid the risk of attracting too many investors at a deficit, hence diminishing the profit margin of the funds.

Keywords

Tokenization, Crowdfunding, Real Estate Crowd Funding, Asset Tokenization

JEL Classification

G24, G41

Introduction

The financial industry currently encounters the combination of two phenomenon which each have the potential to change the traditional way money is invested. Crowdfunding, which gives retail investors access to asset classes which were predominantly reserved for institutional and quasi-institutional investors and Tokenization which can be used to digitize any real-world asset.

The idea of crowdfunding is simple and compelling: To fund a project or a venture, someone seeking for financing raises money from a large number of people or companies instead of a traditional money source like a bank.

Nowadays these projects are always funded through internet platforms to being able to manage the many participations in an efficient way. The platforms predominantly act as intermediaries between the money source and the project and typically collect a fee for the service. Since the early 2000s, when internet-based crowdfunding started with an altruistic approach and was needed to finance charity projects, it became a proliferating form for financing projects and assets, especially in recent years. In 2017 the European market volume for the first time exceeded € 10b (€ 3.37b excluding the UK) with double digit growth rates (63% for 2017 and 35% in 2016). More than 300 platforms entered

the market in the EU until 2017 with models in consumer lending, invoice trading, business lending, real estate crowdfunding and others. With lending to consumers and businesses as well as invoice trading representing the majority of the volume in 2017, real estate crowd funding is moving up the charts with more than € 250m invested (CCAF, 2020).

Crowdfunding for investment purposes biggest advantage is the efficient access for retail investors to certain asset classes which are dominated by institutional or quasi-institutional investors. Being able to participate in larger investments, f. e. in real estate transactions, with amount as low as € 100 or even lower can lead to higher diversification and a better risk/reward ratio for the investors. During the investment process, the investors' money will be invested into the equity or the debt position of a project, giving them some sort of share of the outcome in return.

But these models come with one big downside for the investors. Like most of the underlying assets, they are typically not liquid. And that is where Tokenization comes into play.

Tokenization is a form of digitization of ownership rights over an asset using the distributed ledger technology (DLT), such as blockchain. A distributed ledger is essentially an asset database that does not have a single administrator but is shared across a network of participants (in case of asset tokenization, the investors, issuers, and custodian as the main actors) where all participants have their own identical copy of the ledger. Any changes to the ledger are reflected in all copies within a very short timeframe, ideally within minutes or seconds. From equity issuance to capital raising for companies of any size through Initial Coin Offerings (ICOs) or Security Token Offerings (STOs), to post-trade processes, and settlement of securities. The DLT has the potential to transform financial markets affecting the current infrastructure and all market participants. Basically, all assets from the real world could be tokenized (OECD, 2020).

The whole structure of crowdfunding combined with asset-tokenization has striking advantages compared to conventional forms of investments. It is efficient and allows asset fractionality in a transparent and secure process.

The first company to issue such a security token with real estate as the underlying asset in Europe was the Exporo AG⁷, which is based in Hamburg, Germany. The market leader in Germany for real estate crowd funding started in 2014 as one of the first platforms in Europe to finance real estate developments through crowd investors. Since then, Exporo has placed more than € 750m in equity from more than 30.000 investors among 400 Projects. In mid of 2019 Exporo issued the first token-based bond on the Ethereum blockchain technology in Europe. A volume of € 3m was placed among private investors within hours (*finanzen.net*, 2020). Until September 2020 the company issued 18 more projects with over €150m in equity converted into security tokens.

⁷ Please see www.exporo.de for information.

Despite the obvious advantages for tokenized real-world investments, it is crucial for an initiator of these investment products to analyse whether the tokenization pays off in the end and how to structure the offer of tokens regarding minimum investment size.

No relevant literature could be found regarding this topic, so a research gap is proposed. This paper aims to research the provided data for two investments with the same underlying asset before and after tokenization.

In order to do so, the available data and the assumptions will be described in detail. After that, the methods for the analysis will be described and the available data will be analysed with the methods of descriptive statistics. In the end the results will be presented and discussed before drawing a conclusion on the research.

The following hypotheses are proposed:

H1: The age of the investors of a tokenized investment is significantly lower than the age of investors of a standard investment product with a similar underlying investment.

H2: There is a strong correlation between age and investment amount and no difference in correlations between gender and investment amount before and after tokenization.

H3: The sizes of the investment amounts after tokenization are significantly lower than before tokenization.

To research the hypotheses will be a contribution to issuers of tokenized investments to appraise their return on their investment in the process of tokenization.

1 Data and Assumptions

The available data consists of two crowd-funding investor groups A and B which invested into different funds-like structures. Group A and group B both consist of male and female investors above the age of 18 which are domiciled in Germany. There were no further personal criteria for investors to fulfil. Both groups invested into fractionalized unsecured real estate construction loans with a suggested interest rate of 5.5% p. a. and a lifetime of 3 years. All shares were funded through the internet-based crowd-funding platform of Exporo in 2020 with a similar real estate as underlying asset. The difference between both groups is that group A invested via a classical structure by buying shared interests with a minimum investment of EUR 1,000 while Group B invested into a tokenized investment via a security token offering (STO) with a minimum investment of EUR 1. The data labelled as representative and non-confidential was kindly provided by Exporo in March of 2021 via an Excel Sheet and then imported by the author into R Studio for analysis.

Table No. 1: Summary of the available Data

		Number of investors	Total fund volume (in Euro)	Number of male investors	Number of female investors
Fund A		743	1,802,000	636 (85.6%)	107 (14.4%)
Fund B		949	2,107,320	780 (82.2%)	169 (17.8%)

Source: R Studio

To later interpret the data, we also need to look at some of the Key Performance Indicators (KPI) of the funds, on the income and expense side and put them into perspective to the data received.

The gross profit margin (GPM) for an initiator of these kind of investments is roughly 5% of the fund volume. This margin can be used to cover costs, e. g. for marketing purposes⁸.

To attract an investor, an initiator has Customer Acquisition Costs (CAC), which in case of these crowdfunding products are around € 250 per investor for third party costs (e. g. for buying leads) plus € 100 for further costs associated with each investor (e. g. Know Your Customer (KYC), account set up fee, custodian fees etc). So, for our analysis we assume that the total CAC is € 350 and that this price is fixed, independent of the number of investments an investor might make⁹. The CAC are unrelated to the remaining cost structure of the fund and cost structure for the initiators business operation. Obviously with a fixed marketing budget and a variable cost per investor the goal is to fully place a fund with the least number of investors, hence with investors investing amounts as high as possible.

On the income side we look at the revenue we can generate with each customer. Since there is an obvious proximity of first-time investments to future investments regarding investment size of the same investor (though the experience shows that investment sizes usually increase after the first investment when the investment goes like planned and the investor gains more confidence) we look at the Relative Income Per Customer (RIPC). In this case we assume that the RIPC is in average a multiple of 5 times the investors first investment into an initiators fund¹⁰. We are also assuming that this multiple of 5x applies to all investors in Funds A and B, hence it is irrelevant when the investors invested into which fund of the same issuer. The multiple of 5 brings down the total CAC from € 350 to a CAC of € 70 for each investor per fund.

Further we are assuming that the data provided is representative for all similar structured funds and the industry in general.

⁸ The GPM of 5% is based on the authors experience in the industry.

⁹ A total CAC of € 350.00 is – for confidentiality reasons - not the exact number for these two Funds but an assumption of the author based on his experience with earlier crowdfunding projects of the same initiator.

¹⁰ This multiple is – for confidentiality reasons - not an exact number for these two funds but a close assumption by the author made based on correspondence with the same initiator in April 2021. The number is close enough, not to have an impact on the outcome of the analysis of the provided data.

2 Methods

The data was analysed via descriptive statistical methods in R Studio (RStudio Team, 2015) using the tidyverse package ver. 1.3.0 (Wickham et al., 2019). The data was not altered in any way and all data was used to create data-frames for the analysis.

For the analysis we look at the 3 variables Age, Gender and Investment Amount for each fund and compare the data to see whether there is a change from the classical product to the tokenized investment which could have an impact on the economics of the funds. The following descriptive statistical methods were used for the analysis:

1. Summary function to get the highest and lowest amount invested, median, mean, first and third quantile of both funds separately.
2. Violin function to get a compact image of the continuous density distribution of the investment amounts of both funds.
3. Histogram to get an illustration of the age distribution of both funds compared with each other.
4. Boxplot to get an image of the density distribution and the median of the amounts invested separated by gender for both funds.
5. Simple Regression to see a possible correlation between age and the invested amounts for both funds.

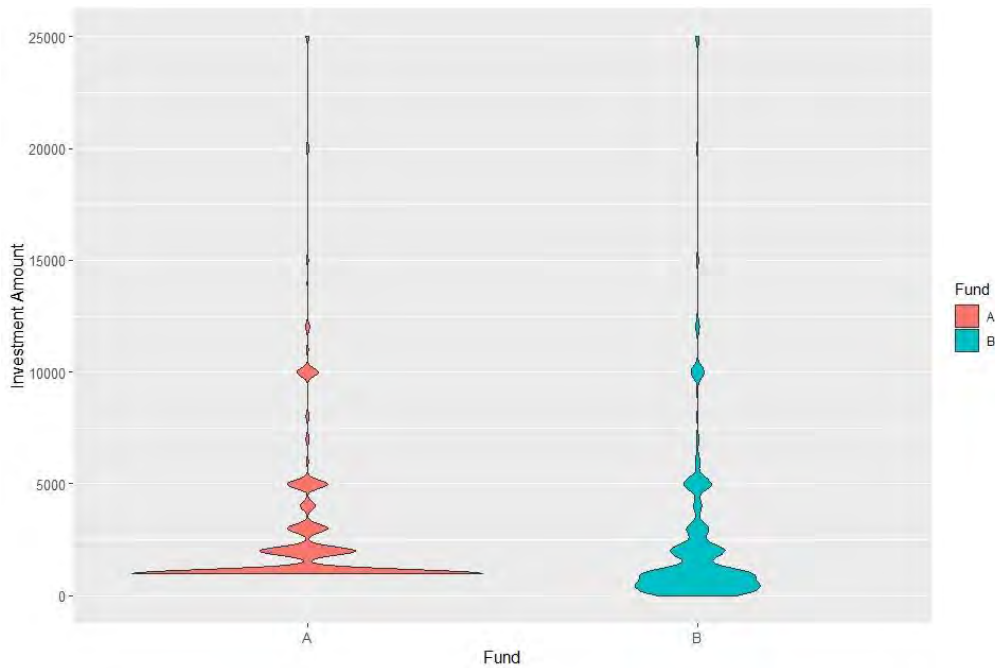
3 Results

The summary function shows a mean of EUR 2425 for fund A and EUR 2221 for fund B. The median, which cuts the number of datasets in each data frame in half, shows the same median of EUR 1000 while the first quantile for fund A is EUR 1000, opposed to EUR 500 of the first fund showing a lower amount for 25% of the data. The third quantile is the same for both funds at EUR 2000.

Violin Function of Investment Amounts

A visualization with the below violin function (Figure 1) shows a more detailed picture. The mirrored density functions for the investment amounts for Fund A and Fund B show a clear difference in the total investment amounts confirming the above data that the overall shape above the third quantile is similar while the lower part of the violin is shifted towards the 1 EUR mark. Fund A has the most investments in the area of the minimum investment amount of EUR 1000. Fund B shows a different picture, showing a larger amount of investments below the EUR 1000 mark which is not surprising as the minimum investment for Fund B was set to EUR 1.

Figure No. 1: Violin Diagram of the Investment Amount Distribution of Fund A and B

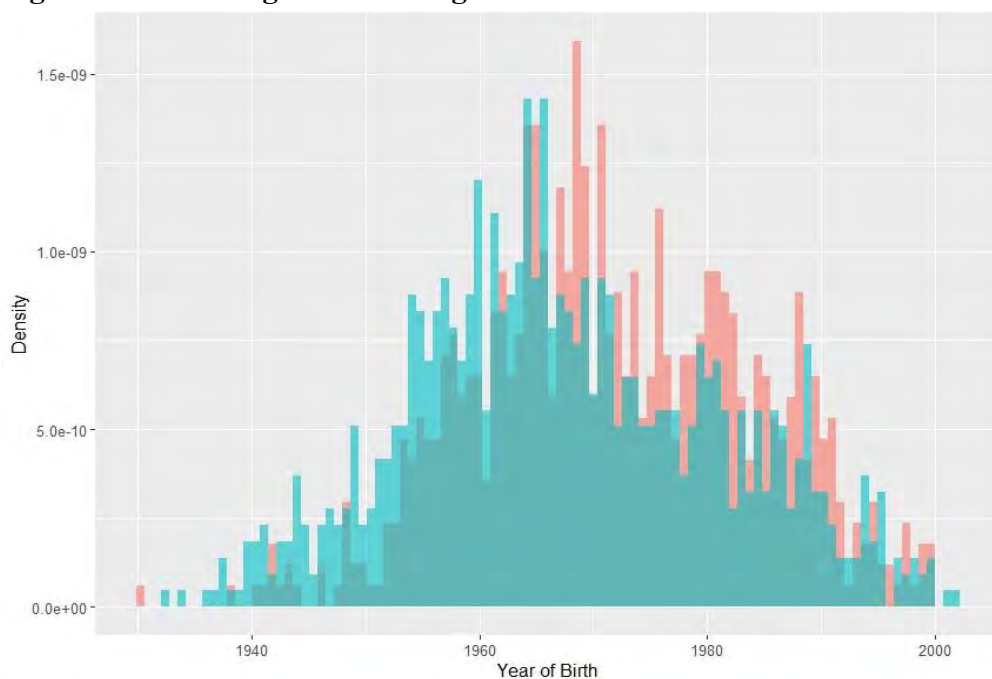


Source: Autor

Histogram of the Age Distribution

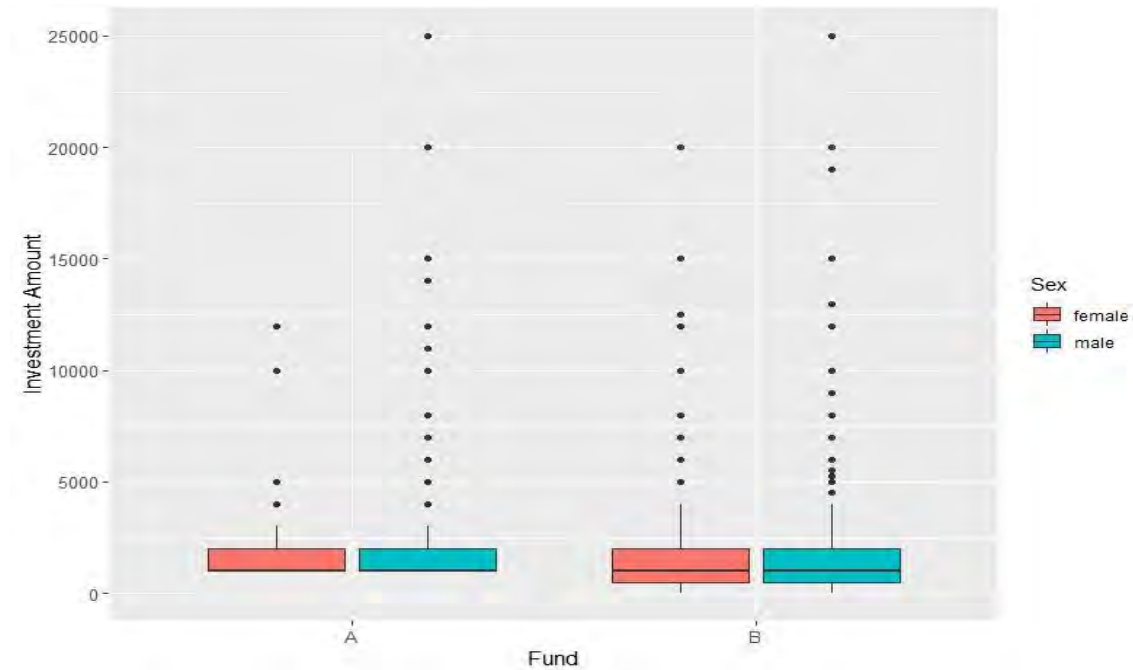
The analysis of age structure in both funds show, that the investors in the tokenized fund tend to be a little older than in the standard investment. A histogram (Figure 2) shows a good picture of the age distribution in Fund A versus Fund B. The histogram shows that the investors in Fund A were born later than in Fund B. The summary function of the histogram shows that the mean in Fund A was born in 1971 while the mean in Fund B was born in 1967.

Figure No. 2: Histogram of the Age Distribution of Fund A and B



Source: Autor

Figure No. 3: Boxplot of Investment Amounts depending on Genders for Fund A and B



Source: Autor

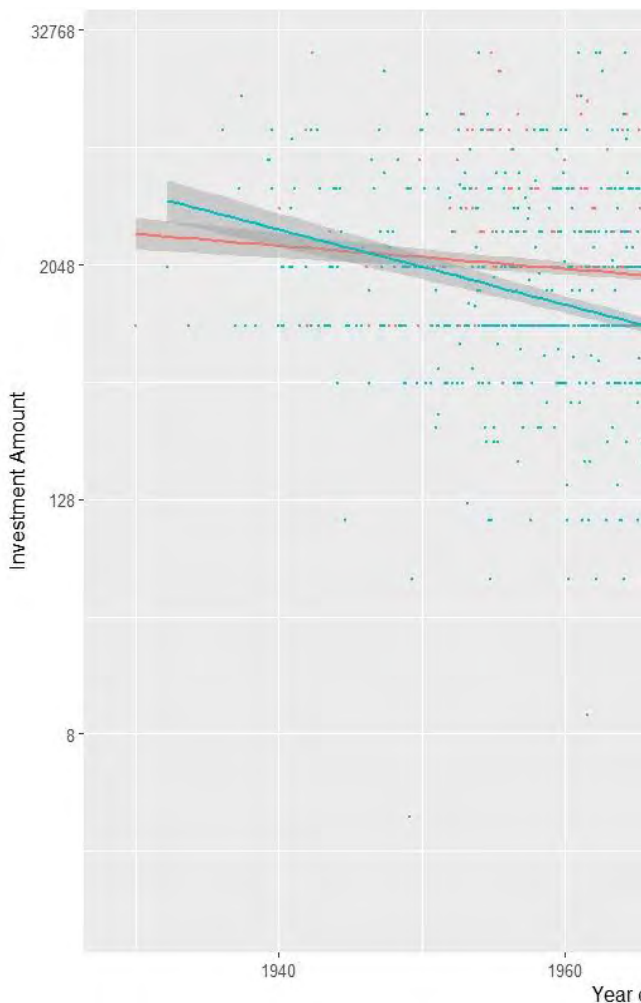
Boxplot of the investment amounts depending on the genders.

The analysis of the distribution in investment amounts of both funds depending on Gender show an evenly distributed picture. No relevant impact of the tokenization on either gender could be found.

Regression of investment sizes depending on the age of the investors.

The simple regressions with the variable Investment Amount depending on the independent variable Age show that the older investors of both funds tend to invest significantly more than the younger investors (figure 4, please note that for better visibility the investment amount is on a logarithmic scale). The low p-values of 4.71^{-11} for Fund A and 4.885^{-11} for Fund B show that the null-hypothesis should be rejected. The test with the Spearman's rank correlation coefficient shows results of -0.22 for Fund A and -0.38 for Fund B with p values of 2.8^{-16} for Fund A and 2.2^{-16} for Fund B, confirming the significance of the results.

Figure No. 4: Simple Regression of Investment Sizes depending on Age (on a logarithmic scale)



Source: Autor

4 Discussion and Conclusion

The goal of the analysis of the funds data was to get a better understanding regarding the composition of the investors and economics of the difference between un-tokenized and tokenized investment vehicles.

The analysis of the data shows the following results:

1. The age distribution shows that the tokenized product has older investors than the standard fund, so H1 that a tokenization attracts younger investors than the standard product is void.
2. The regression analysis showed that older investors in both funds tend to invest more than younger investors, so the first part of H2 could be validated. Hence, efforts to attract more mature investors could increase the margin.

3. There is no correlation of the investors gender and the invested amount in either fund. Hence, the second part of H2 is also correct, and no gender group needs to be specifically targeted. The analysis showed that the efforts to influence the composition regarding gender would not influence the overall profitability.
4. The mean for the standard product is higher at EUR 2425 for Fund A vs. EUR 2221 for Fund B, thus generating a lower margin in the tokenized product overall. Hence H3 could be validated.
5. The summary function and the violin figure clearly show that investors take advantage of the possibility to invest as little as EUR 1 in the tokenized product. There is a high density of investors in Fund B investing below the minimum investment of Fund A. It is to mention that most investors tend to choose even amounts like 2,000, 3,000 etc. for their investment.

It is the intent of an initiator to maximize the profits generated from each fund, so it is the goal to archive the full placement of a fund with the least number of investors possible. Because the overall relative CAC per investor per fund is set at € 70 (based on the assumption that investors invest 5x their initial amount, lowering the initial CAC from € 350 to € 70 for each investment), the GPM of 5% would theoretically allow marketing expenses of € 90,100 for Fund A and € 105,366 for Fund B.

Hence, the maximum number of investors could be 1,287 for Fund A (while the actual number is 743) and 1,505 for Fund B (while the actual number is 949). Obviously, giving up the total margin is not a valid business model and should be avoided.

The GPM and the CAC are the same for both funds, so the average investment per investor to break-even is the same for both funds at approximately € 1,400 (total fund amount / max numbers of investors limited by the possible margin).

When an initiator opens a fund for investment with a set minimum amount for an investment it is impossible to predict the final composition of investors and their investment behaviour.

All predictions are based on past performance data. So, the smaller the fund amount, the higher is the risk to acquire an unusual high percentage of small investors diminishing the margin for the initiator.

At a set average investment size of € 1,400 to break even and only knowing roughly the density function in advance placing a new fund, it is highly recommended to increase the minimum investment from € 1 rather towards the € 1,000 mark to generate a profit margin.

The exact number cannot be determined with the underlying data because changing the eligibility criteria for investors would also lead to a shift of the other parameter and change the investment size density function of the funds. For example, targeting more sophisticated investors would increase the CAC and lower the fund costs due to a smaller number of investors.

This analysis can only give an idea about the challenges an initiator faces when lowering the minimum fund amount.

The weakness of this analysis is clearly the small sample of data which was assumed to be representative for the industry. Some results like the age distribution seems counter-intuitive and

needs to be validated by further analyses. Further research should be done with more underlying data on a larger number of funds to get more representative results.

References

- CCAF. (2020). ‘The Global Alternative Finance Market Benchmarking Report’, (April), p. 228. Available at: <https://www.jbs.cam.ac.uk/faculty-research/centres/alternative-finance/publications/the-global-alternative-finance-market-benchmarking-report/>
- Finanzen.net. (2020). *Paradigmenwechsel im Segment Immobilien - Interview mit Johannes Moormann von Exporo | Nachricht | finanzen.net*. Available at: www.finanzen.net/nachricht/fonds/werbung-paradigmenwechsel-im-segment-immobilien-interview-mit-johannes-moormann-von-exporo-9595004 (Accessed: 13 December 2020).
- OECD. (2020). ‘The Tokenisation of Assets and Potential Implications for Financial Markets’, *OECD Blockchain Policy Series*. Available at: <http://www.oecd.org/finance/The-Tokenisation-of-Assets-and-Potential-Implications-for-Financial-Markets.htm>
- RStudio Team. (2015). RStudio: Integrated Development for R. RStudio, Inc., Boston, MA URL: <http://www.rstudio.com/>
- Wickham, H, M. Averick, J. Bryan, W. Chang, L. McGowan, R. François et al. (2019). “Welcome to the tidyverse”. *J Open Source Softw.* 2019 Nov 21;4(43):1686.

List of abbreviations

- STO - Security Token Offering
 KPI - Key Performance Indicator
 CAC - Customer Acquisition Costs
 CLV - Customer Lifetime Value
 GPM - Gross Profit Margin

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THE CUM-EX CASE IN GERMANY

BASTIAN SCHULZ

Abstract

This paper focuses on a particular form of stock-market trades around ex-dividend days, so-called "cum-ex" transactions, which have resulted in major revenue losses due to illegitimate tax refunds in Germany and other European nations. Until 2012, the loophole in the German withholding tax scheme made it possible for cum-ex traders to receive withholding-tax certificates without prior withholding-tax payment. Because a certain category of investors might use the tax certificates to gain a tax exemption, this opened up the prospect of a particular form of tax arbitration. It was not until 2018 that a cross-border investigation team called the Cum-Ex Files revealed the scandal to its full extent.

This paper will solely focus on the cum-ex scandal in Germany since the literature on the topic is very limited.

Keywords

tax fraud, dividend taxes, cum-ex trading, tax evasion, withholding tax

JEL Classifications

H26, G12

Introduction

A wide body of public economic literature has researched tax evasion and has recognized that restrictions such as withholding taxes and reporting by third parties will significantly mitigate tax evasion (e.g., Kleven et al., 2011; Slemrod and Gillitzer, 2014). Yet, as noted by Slemrod (2008), non-compliance under withholding taxes is seldom debated amid the 'paramount value of withholding'. A theoretical study that investigates determinants of tax avoidance under payroll taxes is given by Yaniv (1988). Yaniv (1992) reveals that tax avoidance will simply rise rather than decrease under tax withholding, allowing for collusion between employer and employee. Both parts might make some secret arrangement on how to avoid the tax and divide the tax evasion among themselves.

Madzharova (2013) claims that the tax on business benefit decreases the employer's ability to partake in such collusion. Kleven et al. (2016) offer an agency model where there is less possibility of collusion between boss and employee as the scale of the company increases. As a result, companies have a role as 'fiscal intermediaries' in promoting the recovery of revenue.

A feature of withholding taxes is that the remitter is not the statutory tax holder. This results in a decreased motive to escape taxation as it is not the remitter who does personally profit from avoidance. Notwithstanding, the use of withholding taxes transfers the burden of non-compliance to the sender (Slemrod, 2008) it may happen that taxes are neither deferred nor remitted to the tax authorities. Another issue exists when withholding taxes is normally combined with a refundable tax credit. Since no taxes have been deferred, the tax refund results

in negative taxes. In addition, illegal tax refunds often exert major negative externalities such as distortions of competitiveness, inequity and transfers of money to organized crime. (de la Feria, 2018).

One situation, when withholding tax is connected with tax evasion is called cum-ex. In the case of cum-ex dealing, the seller fundamentally does not necessarily own the stocks. Instead, the seller sells the stocks briefly. If the seller has agreed to borrow the stocks or has entered into an arrangement with a third party confirming that the stocks are eligible for settlement when they are due, this type of short selling is permitted. However, because the short selling is not accepted as such by the depository bank of the purchaser (or the original owner), a tax certificate is also issued, resulting in double tax refunds. The buyer sells the stocks back to the initial owner in a final move. Then, the proceeds from the extra tax returns are split by the parties. (Wagner and Wei, 2020)

This discrepancy has created a lack of clarity in the withholding tax process that has rendered it susceptible to tax fraud. In order to offer withholding tax certificates without previous withholding tax payment, a new cum-ex trading method has been developed (to be explained in chapter 2). However, since they gave the owner the right to a tax refund, those tax certificates were in fact cash-equivalent. Therefore, for cum-ex trades, their worth opened up fresh lucrative arbitration possibilities. Although such tax certificates were given without a prior withholding tax payment, the value of the certified withholding tax was directly due to the public's income losses. (Holzmann et al. 2017)

The nature of cum-ex trade is disheartening, not only because it joins a lengthy list of controversies and wrongdoings in the finance market, but in particular because it has been well-known and neglected by regulators and government authorities for many years, causing taxpayers' funds to be plundered. Yet, it took a cross-border investigation team called the Cum-Ex Files in 2018 to blow the whistle on the scandal to start getting to the core of the problem and making it a public discussion that could not be ignored anymore. The cum-ex scandal in Germany started in 2001 and was shut down by Germany authorities in 2012. (European Parliament, 2018)

1 Cum-ex

Chapter two focuses on the cum-ex case in Germany. The cum-ex transactions in Europe are explained first, before moving to the main focus that lies on the cum-ex transactions in Germany.

1.1 Cum-ex transactions in Europe

In the form of so-called 'cum-ex trades', withholding tax non-compliance has recently gained media interest. A loophole in European countries' tax codes has allowed a wide network of banks, traders, hedge funds and law firms to receive numerous withholding tax refunds on dividends paid only once and costed European treasuries € 55bn. (Deutsche Welle, 2018) The cum-ex practise entails exchanging stocks rapidly around the ex-dividend date with (cum) and without (ex) dividend rights to hide who the real owner of the securities is. (Spilker, 2017;

Spengel, 2017) Tax officials are unlikely to follow the transition of ownership as a function of the underlying business microstructure and settlement process in operation. Cum-ex trade typically entails a variety of actors. This involves the initial owner of the shares, banks or traders buying and short selling the shares and another person acquiring the shares right before the ex-dividend date (often using loan facilities provided by the banks to lever the trades). In most defense contracts, the termination time is two to three business days, referred to as T+2 or T+3. The payment must be collected and the stocks transferred to the customer on the settlement date. For instance, if a contract happens two days prior to the ex-dividend date, the settlement could coincide with the ex-dividend date resulting in the acquisition of stocks cum dividend yet ex-dividend delivery (Wagner and Wei, 2020).

This includes short-trading during ex-dividend days, where the stock is traded 'cum-dividend' before the dividend record date, but delivered after, i.e. 'ex-dividend'. Even if the subsequent tax payment has not been remitted, cum-ex trades are expressly designed to obtain dividend withholding tax refunds. These transactions have been registered in numerous countries, among them Germany, Austria and Switzerland (Special Investigative Commission, 2017).

The avoidance of tax evasion essentially requires European governments to create adequate tax and regulatory systems that eradicate the possibility of tax arbitrage. Since flaws linked with transnational transactions are very difficult to spot, policymakers should implement compulsory monitoring of cross-border tax planning agreements by taxpayers and intermediaries in order to enhance compliance (e.g., Baker, 2015). However, if the above theory would apply, despite also rigorously adjusting and supervising the capital markets, taxing officials will need to take more steps to make it harder to collude merchants (Buettner et al. 2020).

The activity persisted and was so prevalent that some banks have set up subsidiaries expressly providing cum-ex trading to high net-worth or institutional customers, despite early warnings and testimony from informants as early as 1992. Eventually, a cross-border investigation team called the Cum-Ex Files, helped to put this practice to the fore in 2018 (Cum-Ex Files, 2018, Wagner and Wei, 2020).

The practice mentioned has largely emerged from the manner in which withholding tax is collected. Usually, a dividend-paying corporation withholds tax on dividends and remits it to the treasury, while the shareholder's depository bank issues a reimbursement tax certificate (if applicable). Intuitively, the tax scheme under which the remitter and the issuer of the tax varies should boost the tax enforcement, since the remitter would not personally benefit from the misconduct. Nonetheless, Slemrod (2008) highlights the issues with such a tax scheme and reveals that regulation and the expense of tax administration vary with the name of who actually pays the tax. (Wagner and Wei, 2020) More broadly, Slemrod (2008) claims that the normative economic perception of those who pay tax responsibility is unrelated to the success of a contemporary tax regime does not hold in the presence of tax avoidance or evasion. Buettner et al. (2020) draw on the same tax-remittance economy and analyze the rationality of non-compliance with withholding tax. Centered on a stylised model, they claim that, as compared to carrying out a form of arbitrage to hedge the normal price decline on the ex-dividend day, cum-ex trade is specifically aimed at leveraging current tax laws with collusive elements. Tax

officials and policymakers have refused to respond too slowly on multiple notices or to take action.

After taking a short look at the situation for European countries the author will now focus on Germany, as it is the European country that is at the root of the scandal and stands out both because of the extent of the loss of income and because of the duration of the time during which such transactions were possible. (Buettner et al. 2020)

1.2 Cum-ex transactions in Germany

The shortfall of tax revenue from cum-ex trades in Germany accumulated to a whopping € 10bn just between 2001 and 2012. (European Parliament, 2018) The estimate was also claimed to be optimistic (Flood, 2018) and it is unclear if it is anywhere near justifying the actual severity of the crisis. Hundreds of entities reportedly engaged in various illegal transactions have since been found in criminal proceedings, while funds have been frozen around the world and multiple prosecutions have either begun or are underway at the time of writing. (Jensen and Lassen, 2019) One reason for the vast volume of non-compliance with dividend withholding taxes is that traders searching for arbitrage opportunities simply exploited the tax loophole or, more precisely, the technical error in the way in which the withholding tax was levied and applied. In many media coverage, this perspective has been featured and is intuitive, as the search for arbitration opportunities by traders can be seen as a kind of exploration mechanism that senses all sorts of lucrative transactions. Alternatively, gains associated with illegal tax refunds enable traders to seek withholding tax non-compliance as a deliberate act of tax evasion. Buyers and sellers meet, set up arrangements to receive illegal tax refunds, and conceal their transactions from tax authorities. (Buettner et al. 2020)

Germany, for example, who is at the root of the scandal, did not amend and reform its regulations until 2007. The new rules allowed depository banks to withhold and remit dividend taxes instead of dividend-paying businesses. However, this only applies to domestic depository banks. As a result, only investors with domestic bank accounts were prohibited from receiving illegal tax certificates. After that (at the latest), cum-ex trade went worldwide. The issuing of withholding-tax certificates by depository banks for dividend compensation payments without direct withholding-tax payments is a result of a serious loophole in the withholding tax regime at the period. The key issue is that the withholding tax scheme has established separate parties for the withholding tax (a dividend-paying corporation) and the issuing of a tax certificate (depository banks). Consequently, whether the underlying exchange was a cum-ex deal (without prior withholding tax payment) or an ordinary transaction was not clear for depository banks (with previous tax payment). The depository banks received withholding-tax certificates in both cases. This backdoor was used by cum-ex dealers. (Holzmann et al. 2017)

The German dividend withholding tax scheme was radically reformed in January 2012 in order to discourage cum-ex-trading. More than two decades after the authorities became aware of these trades, that new laws were enforced and the loophole was eventually locked. (Spengel, 2016) Most notably, the difference between 'the party withholding the dividend tax' and 'the party awarding the tax certificate' was removed. After 2012, German depository banks have been responsible both for levying the dividend withholding tax and for issuing a certificate of

withholding tax. Germany's familiarity with cum-ex trades, though, did not lead them to alert other nations (Spengel & Schick, 2018). Since then, it has been the responsibility of all banks (domestic and foreign) to withhold and remit dividend taxes, as well as to issue relevant tax refund certificates. As we will see in the future, the consolidation of all roles under one agency seems to be successful in stopping this dishonest conduct. (Wagner and Wei, 2020)

After a short theoretical description of the cum-ex transactions in Germany the author will now have a look at the cum-cum transactions in Germany.

2 Methodology

Based on the theoretical analysis, the empiric analysis examines trends in stock markets and the number of transactions around the date of the dividend. One or two days prior to the ex-dividend day, cum-ex trades are expected to turn up in high trading numbers. Notwithstanding, a significant body of literature indicates that tax-motivated selling and dividend capture techniques may justify higher trading practices during ex-dividend dates. (Lakonishok and Vermaelen, 1986; Karpoff and Walkling, 1990; Michaely and Vila, 1995; Dhaliwal and Li, 2006; Akhmedov and Jakob, 2010; Haesner and Schanz, 2013; Hartzmark and Solomon, 2013; Henry and Koski, 2017). In order to differentiate these reasons from cum-ex effects, we are effectively dependent on difference-in-difference calculations. These leverage adjustments in the administration of withholding tax over time as well as variations in the tax treatment of dividends.

The variations over time are the product of a reform in the handling of the withholding tax in January 2012. Cum-ex transactions may have resulted in fraudulent tax credits and repayment of unpaid withholding taxes in the period up to 2011. In the period from 2012 to 2015 and 2015-2018, this is not the case because the tax administration was amended.

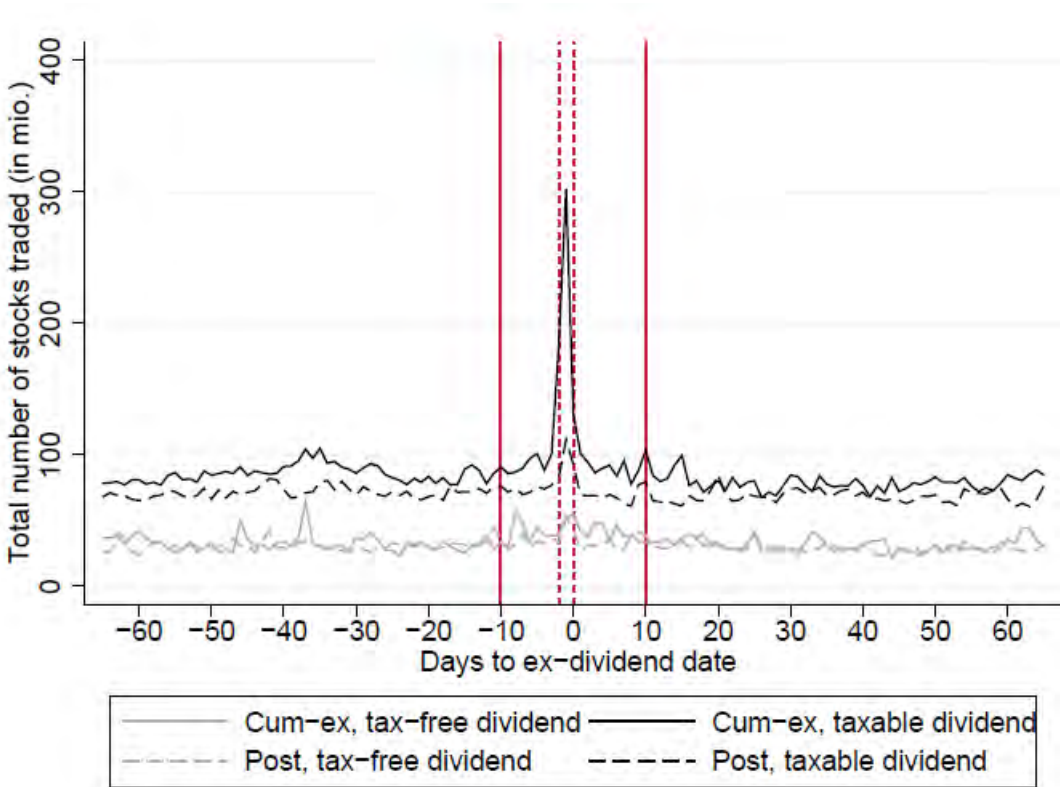
Under German tax law, dividends earned from the current income of companies are subject to a withholding tax of 26.4 percent. Dividends paid out of company capital funds are excluded from tax. These variations in the tax treatment of dividends enable one to test if there are no differences between the shares with taxable dividends in the cum-ex era relative to the shares with tax-exempt dividends in the post period.

3 Results

Descriptive data on the time trend of trades is given in figure 1. As stated in the XETRA statistics, this figure indicates the daily average total number of stocks exchanged. Dividends paid out of existing income are subject to withholding tax (taxable dividends) and are thus ideal for cum-ex trading. Dividends from capital savings are excluded from tax (tax-free dividends) and are thus not appropriate for cum-ex trading. Trading amounts are presented separately for taxable dividend shares (black lines) and tax-free dividend shares (gray lines), both for the cumulative period from 2009 to 2011 (solid lines) and for the postulated period from 2012 to 2015. (dashed lines). Prior to the ex-dividend day, the vertical dotted lines mark a two-day window. About the ex-dividend day, the vertical straight lines mark the 21-day trading window. It indicates, as reported in the XETRA data, the daily average total number of stocks traded

over a 131-day period over the ex-dividend dates, which are normalized to zero. The trade volumes are seen separately for taxable dividends (black lines) and tax-free dividends (gray lines) stocks, both for the cum-ex era (solid lines) and for the post-period period (dashed lines). In the case of taxable dividends for the cum-ex cycle, the figure shows that, in the last two days prior to the ex-dividend date, the overall total amount of stocks exchanged rose significantly by nearly 200 per cent and subsequently dropped down to usual levels after the ex-dividend date. Interestingly, in the cum-ex period and not in the post period, this pattern occurs. For events with tax-exempt dividends, no significant rises are indicated (Buettner et al. 2020).

Figure No. 1: Daily average total number of stocks traded

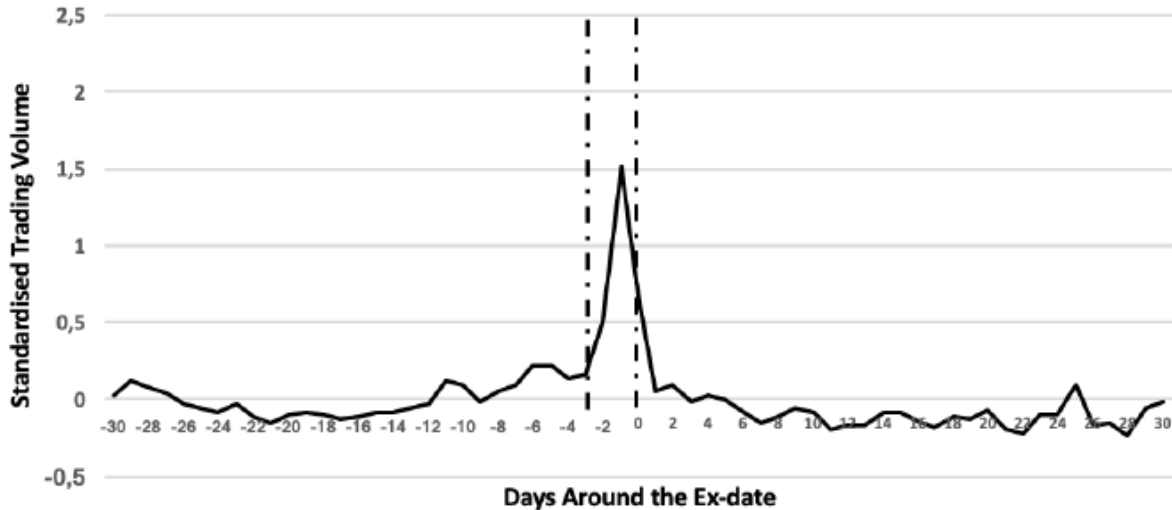


Source: (all German stock exchanges, 2009–2015 (Buettner et al. 2020)

The following figures should help explain the first figure in more detail. The time period 2015-2018 is also added to give a better overview over the topic and to show if the regulations, introduced by the German government, did really help stop the cum-ex schemes.

It is not surprising, that in view of the cum-ex scandal, that Germany has the highest European coefficient for the entire century. The amount traded over the ten-year period on the two days before the ex-date is, on average, 1.0382 standard deviations above regular volume. For the rest of the European countries, the average coefficient is 0,33 standard deviations. The average trading trend in Germany is shown in figure 2 for dividend events between 2009 and 2018. For dividend events between 2009 and 2018, figure 2 shows the average trading pattern in Germany. As the figure reveals, abnormal trading volume on T-1 is primarily driving the cum-ex window coefficient. Whilst the average volume on T-1 is roughly 1.5 standard deviations above normal volume, the volume on T-2 is not substantially high (Jensen and Lassen, 2019).

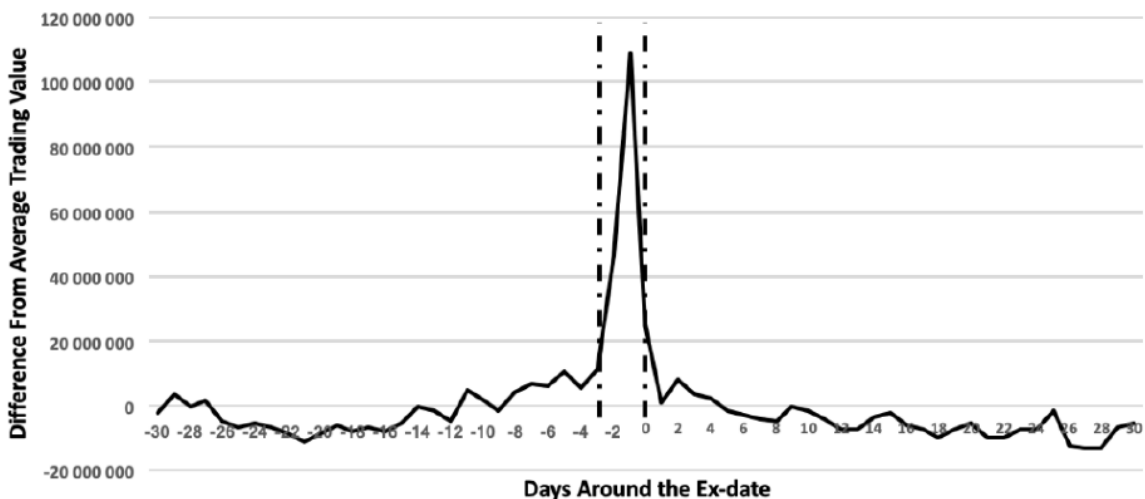
Figure No. 2: Average standardised trading volume in Germany on days around the ex-date for the whole ten-year period (2009-2018). The vertical dashed lines mark the normal cum-ex window (T-2 and T-1)



Source: Jensen and Lassen, 2019

Figure 3 indicates a deviation from the average trading value of the same duration in order to analyze this abnormality in terms of value. The tremendous increase in value of T-1 is striking, as estimated. On average, the disparity in the allocation of dividends between 2009 and 2018 from the average market value of T-1 alone corresponds to approximately EUR 110 million (Jensen and Lassen, 2019).

Figure No. 3: Average difference from average trading value in Germany on days around the ex-date for the whole ten-year period (2009-2018). Trading value is denominated in Euros. The vertical dashed lines mark the normal cum-ex window (T-2 and T-1)

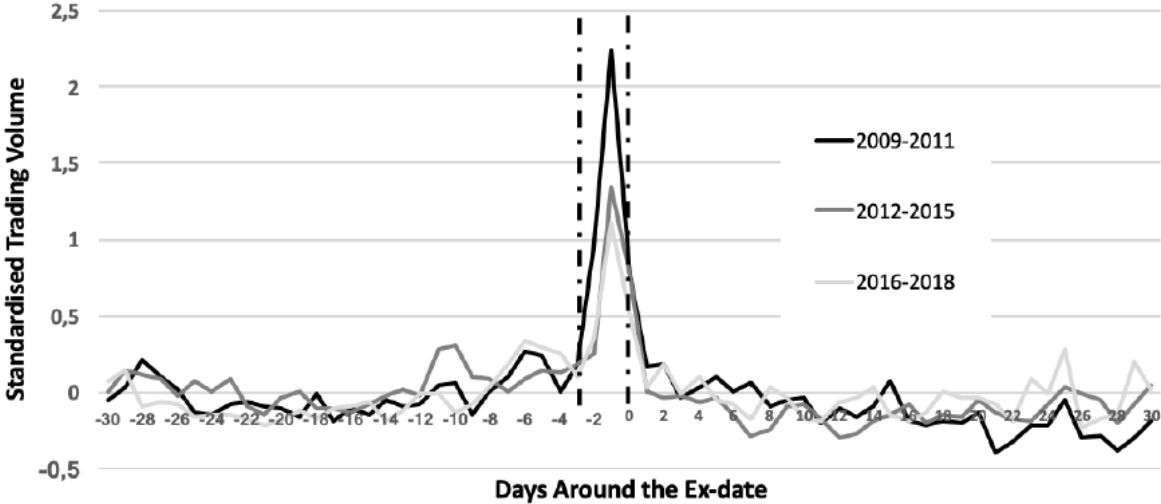


Source: Jensen and Lassen, 2019

It is essential to bear in mind that cum-ex transactions are only expected to occur in the three years from 2009 to 2011, as cum-ex was allegedly stopped in Germany in 2012. It is also not

shocking because, when looking at the individual coefficients for and subperiod, it is obvious that these exact years are the driving force behind much of the overall abnormal exchange. The coefficient for the first period (2009-2011) is 1,6763. The coefficient for the second period (2012-2015) is 0,8236. Lastly the coefficient for the third period (2016-2018) is 0,7621 (Jensen and Lassen, 2019). Figure 4 below shows the trend for different cycles with uniform trading volumes.

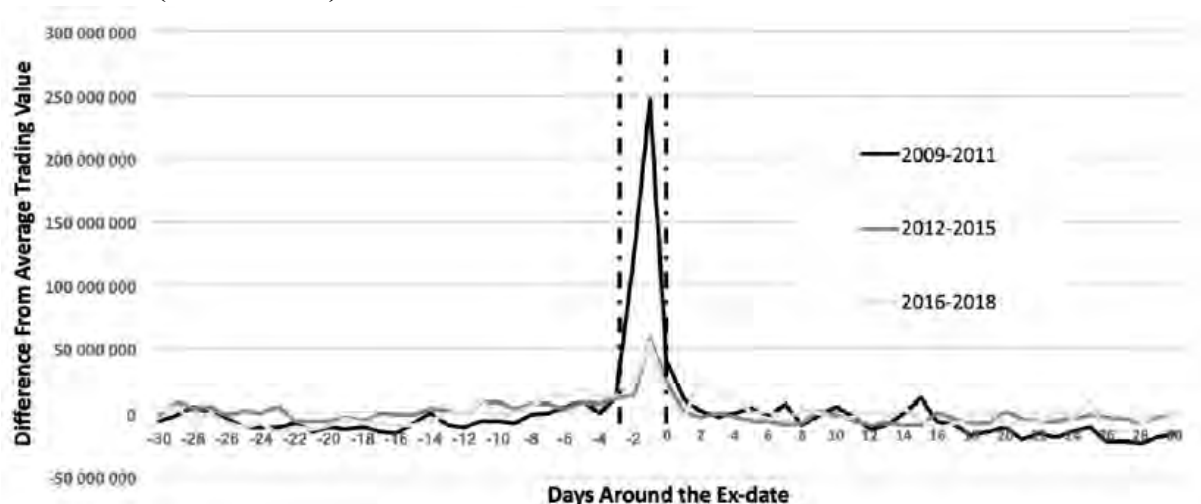
Figure No. 4: Average standardised trading volume in Germany on days around the ex-date for the separate subperiods. The vertical dashed lines mark the normal cum-ex window (T-2 and T-1)



Source: Jensen and Lassen, 2019

The coefficients and the figure clearly demonstrate a drop in the irregular trading rate between both cycles (first and second). This is in accordance with the results of Buettner et al. (2018) and indicates that the administrative reform introduced in 2012 had an impact. It is, however, important to bear in mind when looking at the variations above that figure 4 is showing differences in uniform volumes. Looking at standardized variables is helpful, since it makes for relative similarities between nations, but it may also provide a biased view of the absolute challenge, provided that both big and small businesses are similarly weighted. This is illustrated in figure 5, where the gap between the average trading value for the different times is shown. The graph shows that, in terms of economic benefit, the fall in tax-motivated trade is, in effect, far more important than what one would get from looking at uniform amounts.

Figure No. 5: Average difference from average trading value in Germany on days around the ex-date for the separate subperiods. The vertical dashed lines mark the normal cum-ex window (T-2 and T-1)



Source: Jensen and Lassen, 2019

It is surprising, though, that the erratic exchange patterns in the second and third periods are as high as they are. In particular, for the second and third subperiods, the coefficients, which are equal to 0.82 and 0.76, are the second highest coefficients for the European-wide nation in their period (Jensen and Lassen, 2019). This indicates that Germany has still remained one of the countries most influenced by tax-motivated trade, long though cum-ex was supposedly halted.

One potential explanation for this is that trade in cum-cum may trigger huge volumes. Since Spengel (2016) claims that cum-cum transactions are often carried out through share loans, it is possible that a substantial number of cum-cum transactions are also carried out through repurchase agreements. Purchase of T-1 agreements will also serve as a cause for spikes. The problem with this theory, though, is that very few, let alone any, difference between the second and third periods can be seen. This is not in accordance with the introduction of the latest German legislation to fight cum-cum in 2016. In reality, according to the CumEx-Files (CumEx-Files, 2018), cum-cum trade still takes place in Germany in a less violent manner.

The spikes only constitute a fraction of the real problem, if Spengel (2016) is right in saying that cum-cum is mainly carried out in Germany by share lending and if the spikes as shown in figure 5 are really triggered by cum-cum in 2012–2015 and 2016–2018. Still, even if the spikes are not quite as high in the second and third periods, the trends are worryingly identical to the cum-ex phase trend.

The likelihood, that the cum-ex criminals have invented a new cum-ex system that will make it easier to bypass the administrative reform made in 2012, cannot however be precluded. In any case, it is concerning that Germany, as a nation that has taken steps to tackle both cum-ex and cum-cum, is evidently so influenced by tax-driven trade.

Conclusion

This paper analysed a major tax system loophole in the case of dividend withholding taxes, called cum-ex. The cum-ex transactions in Europe were explained first, before moving to the main focus that lied on the cum-ex transactions in Germany.

Cum-ex trades caused European treasuries a net loss of around €55bn and German treasuries a net loss of around €10bn between the year 2001 and 2012, using irregular trading activity around the ex-dividend date. This calculation is based on market statistics and a frequently used method of cum-ex trading involving short selling and rapidly repurchasing stock around the ex-dividend date, although the full scope of this activity will possibly never be understood. It was not until January 2012 that the German dividend withholding tax scheme was radically reformed in order to discourage cum-ex-trading. More than two decades after the authorities became aware of these trades that new laws were enforced and the loophole was eventually locked. Additionally did it take until 2018, that a European cross-border investigation team called the Cum-Ex Files to blow the whistle on the scandal to start getting to the core of the problem and making it a public discussion that could not be ignored anymore.

On a variety of levels, the cum-ex case is significant. First and foremost, the amounts extracted from German accounts are substantial. The allocation of these funds represents a subtraction from the funds allocated to the government for the procurement of public goods. Adequate and balanced public finances are required to accomplish this aim. Second, the transactions involved are relatively simple and trivial. Perpetrators have been able to take advantage of the long-established resources created by the law to carry out transactions. Contrary to existing stereotypes, large-scale tax evasion does not appear to rest, at least often, on arcane knowledge and the ability to orchestrate impenetrable sophistication. Third, and considering this, the regulatory loopholes that make it possible for the systems to be effectively introduced are equally clear and banal.

Remedies are easily accessible. Increased and timely knowledge exchange, convergence bridges between contiguous regulatory realms and sufficient regulatory capability would help to deter the recurrence of similar practices. Private networks of offenders have been able to pool resources from a wide variety of fields and collaborate across organisations. It is necessary to enable public networks of regulators to do the same. Apparently, the fact that Germany, which has adopted regulations aimed at countering cum-ex, is already one of the country's most highly impacted, may also mean that the European tax authorities are unable to deal with the ingenuity of lawyers and other tax specialists whose goal is to manipulate the system's loopholes.

References

- Akhmedov, U. and K. Jakob (2010). The ex-dividend day: Action on and off the Danish exchange. *Financial Review*, 45:83–103.
- Baker, P. (2015). The BEPS project: disclosure of aggressive tax planning schemes. *Intertax*, 43(1):85–90.
- Buettner, T., C. Holzmann, F. Kreidl & H. Scholz (2018). Withholding-tax Non-compliance: The Case of Cum-Ex Stock-market Transactions.

- Buettner, T., C. Holzmann, F. Kreidl and H. Scholz (2020). Withholding-tax non-compliance: the case of cum-ex stock-market transactions, *International Tax and Public Finance* (2020) 27:1425–1452, <https://doi.org/10.1007/s10797-020-09602-9>
- CumEx-Files (2018). CumEx-Files: A Cross Border Investigation - How Europe's Taxpayers have been Swindled of 55€ billion. Retrieved from CumEx-Files.com: <https://cumex-files.com/en/>, Last accessed on February 8th, 2021.
- de la Feria, R. (2018). Tax fraud and the rule of law. Working Paper, University of Oxford Centre for Business Taxation.
- Deutsche Welle (2018). 'Cum-ex tax scandal cost European treasuries €55 billion' October 18, Retrieved from: <https://www.dw.com/en/cum-ex-tax-scandal-cost-european-treasuries-55-billion/a-45935370>, Last accessed on February 11st, 2021.
- Dhaliwal, D. and O. Z. Li (2006). Investor tax heterogeneity and ex-dividend day trading volume. *Journal of Finance*, 61(1):463–490.
- European Parliament (2018). 'Information Paper on Cum-Ex-Cum-Cum', November 26, <http://www.europarl.europa.eu/cmsdata/158435/2018-11-26%20-%20Information%20paper%20on%20Cum-ex%20-%20Cum-cum.pdf>
- Flood, C. (2018). Call to crack down on multibillion-euro tax tricks as scandal bites. Retrieved from <https://www.ft.com/content/fa032eb1-c615-3a2c-b1fa-31c42655d5be>. Last accessed on January 17st, 2021.
- Haesner, C. and D. Schanz (2013). Payout policy tax clienteles, ex-dividend day stock prices and trading behavior in Germany: The case of the 2001 tax reform. *Journal of Business Finance and Accounting*, 40(3-4):527–563.
- Hartzmark, S. M. and D. H. Solomon (2013). The dividend month premium. *Journal of Financial Economics*, 109:640–660.
- Henry, T. R. and J. L. Koski (2017). Ex-dividend profitability and institutional trading skill. *Journal of Finance*, 72(1):461–494.
- Holzmann, C., H. Scholz, F. Kreidl and T. Büttner (2017). Stock Market Behavior on Ex-Dividend Dates: The Case of Cum-Ex Transactions in Germany, *Beiträge zur Jahrestagung des Vereins für Socialpolitik 2017: Alternative Geld- und Finanzarchitekturen - Session: Asset Pricing*, No. E16-V1, ZBW - Deutsche Zentralbibliothek für Wirtschaftswissenschaften, Leibniz-Informationszentrum Wirtschaft, Kiel, Hamburg.
- Jensen, M. N. and S. H. Lassen (2019). Cum-Ex Transactions in European Countries, Theoretical issues and emperical evidence, Master of Science in Economics and Business Administration, Business Administration and Financial Economics, Norwegian School of Economics, Bergen.
- Karpoff, J. M. and R. A. Walkling (1990). Dividend capture in nasdaq stocks. *Journal of Financial Economics*, 28:39–65.
- Kleven, H. J., M. B. Knudsen, C. T. Kreiner, S. Pedersen and E. Saez (2011). Unwilling or unable to cheat? Evidence from a tax audit experiment in Denmark. *Econometrica*, 79(3):651–692.
- Kleven, H. J., M. B. Knudsen, C. T. Kreiner and E. Saez (2016). Why can modern governments tax so much? An agency model of firms as fiscal intermediaries. *Economica*, 83(330):219–246.
- Lakonishok, J. and T. Vermaelen (1986). Tax-induced trading around ex-dividend days. *Journal of Financial Economics*, 16:287–319.

- Madzharova, B. (2013). The effect of a low corporate tax rate on payroll tax evasion. In Fuest, C. and Zodrow, G. R., editors, *Critical Issues in Taxation and Development*. MIT Press, Cambridge, MA.
- McDonald, R. L. (2001). Cross-border investing with tax arbitrage: The case of German dividend tax credits. *Review of Financial Studies*, 14(3):617–657.
- Michaely, R. and J.-L. Vila (1995). Investors' heterogeneity, prices, and volume around the ex-dividend day. *Journal of Financial and Quantitative Analysis*, 30(2):171–198.
- Slemrod, J. (2008). Does it matter who writes the check to the government? The economics of tax remittances. *National Tax Journal*, 61(2):251–275.
- Slemrod, J. and C. Gillitzer (2014). *Tax systems*. MIT Press.
- Special Investigation Committee (2017). *Beschlussempfehlung und Bericht des 4. Untersuchungsausschusses des Deutschen Bundestags nach Artikel 44 des Grundgesetzes*. Drucksache 18/12700.
- Spengel, C. (2016). *Sachverständigenutachten nach § 28 PUAG für den 4. Untersuchungsausschuss der 18. Wahlperiode*. Retrieved from https://www.bundestag.de/blob/438666/15d27facf097da2d56213e8a09e27008/sv2_spengel-data.pdf. Last accessed on January 17st, 2021.
- Spengel, C. (2017). *Unzulässige Verrechnungspraxis deutscher Banken bei Cum/Ex-Geschäften*. Prof. Dr. Christoph Spengel. DOI: <https://doi.org/10.9785/fr-2017-1202>, *FinanzRundschau*, Band 99: Heft 12.
- Spengel, C., V. Dutt and H. Vay (2017). *Auswertung der Clearstream Beweismittel-Zulieferungen*. Auswertung für den 4. Untersuchungsausschuss der 18. Wahlperiode. Retrieved from https://www.bwl.uni-mannheim.de/media/Lehrstuehle/bwl/Spengel/Dokumente/Medien/Steuerschaden_Cum-Ex__2017-03-31_.pdf, Last accessed on January 17st, 2021.
- Spengel, C. and G. Schick (2018). *Cum-ex Scandal: Financial Crimes and the Loopholes in the Current Legal Framework*. Retrieved from https://www.europarl.europa.eu/cmsdata/158434/TAX3-ECON%20Verbatim%2026%20November%202018_OR.pdf. Last accessed on January 17th, 2021.
- Spilker, B. (2017). *Anrechnung der Kapitalertragsteuer bei Cum/Ex-Geschäften gem. § 36 Abs. 2 Nr. 2 EStG*. Bettina Spilker. DOI: <https://doi.org/10.9785/fr-2017-1005>, *FinanzRundschau*, Band 99: Heft 10.
- Wagner, M. and X. Wei (2020). *Cum-Ex Trading – The Biggest Fraud in History?* Working Paper No. 19/2020, Department of Economics and Finance, School of Business, University of Canterbury, Private Bag 4800, Christchurch, New Zealand.
- Wigan, D. (2019). *Case Study: The cum-cum and cum-ex schemes, Coeffers D4.5*, Copenhagen Business School.
- Yaniv, G. (1988). Withholding and non-withheld tax evasion. *Journal of Public Economics*, 35(2):183–204.
- Yaniv, G. (1992). Collaborated employee-employer tax evasion. *Public Finance - Finances Publiques*, 47(2):312–321.

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FINANCIAL SUSTAINABILITY IN GERMANY DURING THE COVID-19 PANDEMIC

KATRIN STEYER

Abstract

Every crisis changes the economy and society. The political tones and decisions of the acting politicians also change. This paper examines the impact of the covid pandemic on German public finances. In doing so, this paper takes up the opinion of experts on stabilisation measures and describes the effectiveness and evaluates the future prospects of the decisions on measures taken. The result is that the fiscal policy measures are quantitatively sufficient. Nevertheless, it should be noted that the stimulus package helps many affected by the Corona crisis, but not all. In the pandemic, the rise in unemployment and the increase in underemployment could not be avoided despite generous financial aid, such as the instrument of short-time work. Nevertheless, the German labour market has remained comparatively robust overall. The costs of the crisis are sustainable and can be financed. In this regard, the majority of experts recommend a return to the consolidation course.

Keywords

Monetary policy, fiscal policy, public debt, corona effect, German government measures

JEL Classification

E62, E63, G28, H12

Introduction

The Corona pandemic has had a far-reaching impact on life and the economy in both 2020 and 2021. The demand from people and entrepreneurs to politicians was to find ways out of the crisis through government measures and to maintain economic stability. For many affected people, government measures became an anchor of hope. This paper examines how experts evaluate the expansionary fiscal policy by the German government in the Covid 19 pandemic. It is done from the perspective of both economic development and financial stability. The qualitative analysis focuses on research reports of the Institute for Employment Research (IAB), as well as the expert reports of the German Council of Economic Experts. In parallel, quantitative data from data sources of the Federal Statistical Office, the Federal Ministry of Finance and the Federal Employment Agency are assessed and analysed.

Macroeconomic interactions could amplify the negative effects of events such as the Corona pandemic. Guerrieri et al. (2020) show that Corona-induced supply-side constraints can trigger an even sharper decline in demand. The policy response should thus secure sufficient liquidity for businesses and banks with the aim of averting economic damage, unemployment and widespread loan defaults. Measures taken by the federal government here included guarantees, KfW

loans and the emergency and bridging aid, but also tax measures and direct participations. The possible utilisation of the funds was clearly undercut. This suggests that the stimulus package is helping many, but not all. During the pandemic, the rise in unemployment and the increase in underemployment could not be avoided despite generous financial aid. Nevertheless, the German labour market remained comparatively robust overall. After the easing of measures for the pandemic, the labour market recovered later in the year, but number of unemployed averaged 2.65 million for the year, 429,00 higher than in 2019. Underemployment also increased. A major reason for this is that labour market policy measures were not possible or only possible to a limited extent due to the lockdown. With the start of the lock down in March, short-time work rose to an all-time high. The peak in April includes almost 6 million short-time workers, which corresponds to 18% of all employees subject to social insurance contributions (statistics of the Federal Employment Agency, 1/2021). With an average work loss of about 38%, the use of short-time work has arithmetically secured jobs for about one million employees and prevented their (temporary) unemployment (Institute for Employment Research/IAB). The costs of the stabilisation and compensation policy are sustainable and financeable. The course of budget consolidation is indispensable for the future.

At present, the Corona crisis is not yet over. The economic recovery in Germany, after the 5.1% drop in GDP in 2020 compared to the previous year, is not yet complete and depends on the further course of the pandemic. In June 2020, the German government launched an economic stimulus package that, according to the German Council of Economic Experts, should increase economic output by 0.7% to 1.3%.

In this context, the next section provides an overview of the stabilisation measures in the pandemic. Here it is discussed whether expansionary policies were the right and effective starting point to save the German economy.

The following section deals with the current investment policy with its challenges for the future. Here, examples and arguments are used to show what is relevant for future financial stability.

1 Expansionary fiscal policy saves the German economy

1.1 Monetary, fiscal and prudential measures are quantitatively and qualitatively sufficient

The policy makes it possible to increase liquidity for companies and banks with the aim of averting economic damage, unemployment and loan defaults.

Studies in the economic literature suggest that macroeconomic interactions amplify the negative effects of the Corona pandemic. Guerrieri et al. (2020) show that the Corona-induced supply-side constraints can trigger an even stronger decline in demand. A macroeconomic decline in demand is triggered by income losses in particularly affected sectors. This effect is amplified because some households are unable to compensate for falling income due to a lack of reserves. In turn, the drop in consumer demand among firms makes access to credit more difficult. Firms with liquidity constraints reduce investments. This can exacerbate the recession and prolong it

beyond the duration of the quarantine measures (Pfeiffer et al., 2020). Bayer et al. (2020) analyse the economic consequences due to increased uncertainties. Less household income leads households to reduce consumption and increase liquid savings instead.

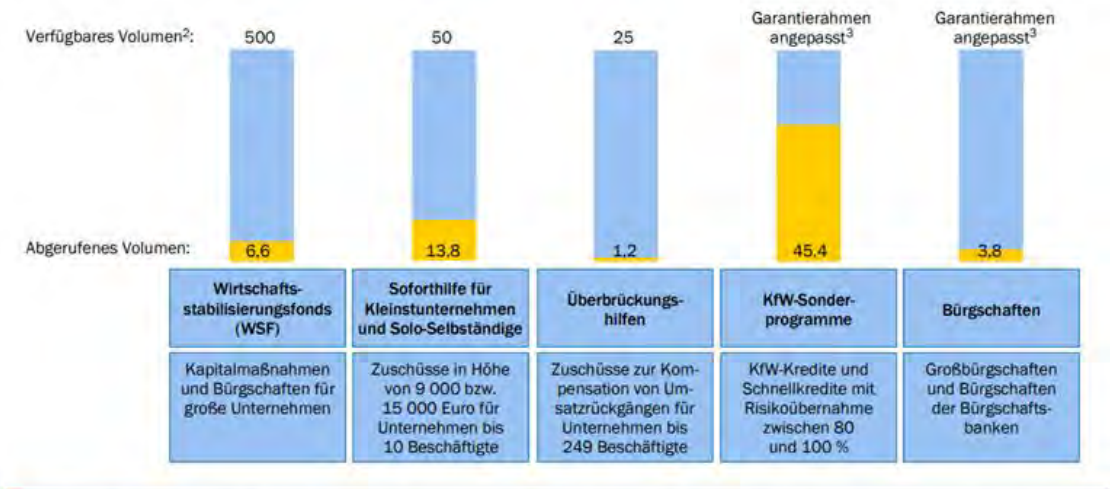
The German government has responded to the Covid 19 crisis with massive fiscal measures, during which the European Central Bank has massively eased monetary policy. In the first phase of the pandemic, the task of stabilisation policy was to help entrepreneurs and citizens to bridge the period of restricted economic activity. Monetary policy provided the banking system with plenty of liquidity at favourable terms, and lending was strengthened. On the part of the ECB, safety margins for refinancing operations were loosened, the interest rate was lowered into the minus range and securities purchases were massively increased. In the opinion of the German Council of Economic Experts, the ECB has thus averted a banking crisis and ensured price stability.

The responsibility of the Federal German government was to adapt the fiscal policy in the area of responsibility to the circumstances. Measures taken by the federal government here were, for example, guarantees, KfW loans and the emergency and bridging aid, but also tax measures and direct participations.

Examples of fiscal assistance

Corona aid from the federal and state governments is made up of the Economic Stabilisation Fund (WSF), tax measures, guarantees, KfW loans, and emergency and bridging aid. By the end of the third quarter, around 71 billion euros in grants and loans had been awarded (BMF, 2020a).

Table No. 1: So far, only a small part of the Corona aid has been used



1 - Stand: 27. Oktober 2020. 2 - Beim Wirtschaftsstabilisierungsfonds sind 100 Mrd Euro für die mögliche Refinanzierung bewilligter KfW-Kredite nicht berücksichtigt. 3 - Dazu hat die Bundesregierung im ersten Nachtragshaushalt den Gewährleistungsrahmen um 357 Mrd Euro auf 822 Mrd Euro erhöht (Deutscher Bundestag, 2020a).

Quellen: BMF, BMWi, KfW, Verband deutscher Bürgschaftsbanken

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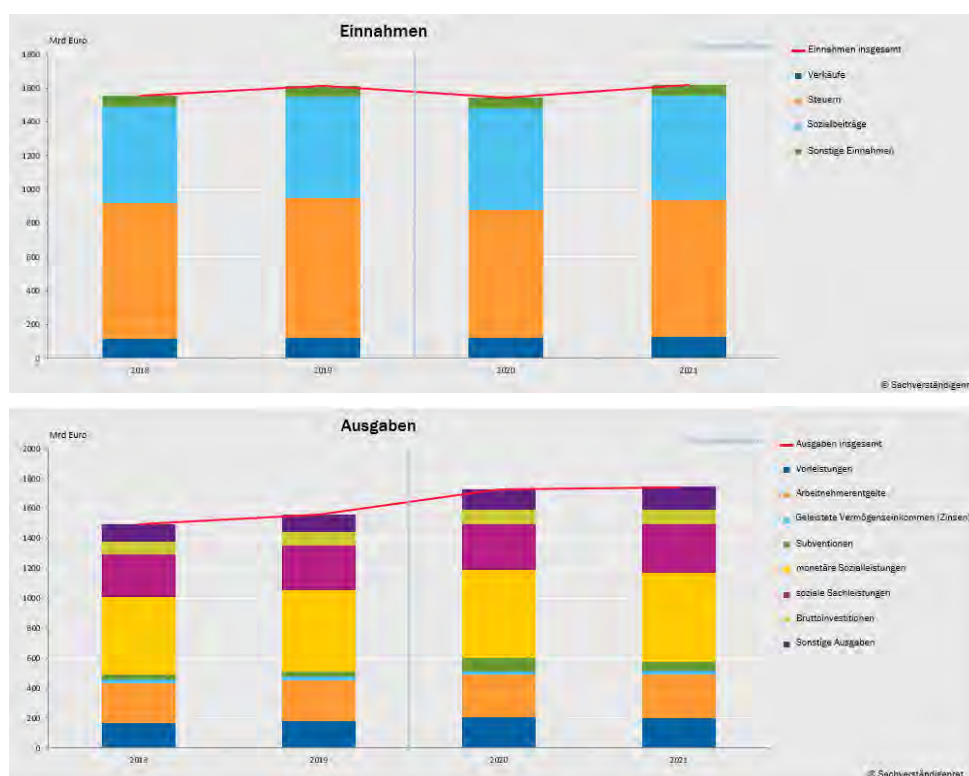
Source: German Council of Economic Experts' Annual Report 2020/21.

The potential utilisation of the funds has been significantly undercut. With the Economic Stabilisation Fund (WSF), the federal government is helping large companies in particular. 100 billion euros are available for capital measures and 400 billion euros for guarantees. The WSF provides companies across all sectors with stabilisation measures to strengthen their capital base and overcome liquidity bottlenecks. The WSF is aimed at companies in the real economy whose survival as a going concern would have a significant impact on Germany as a business location or on the labour market. The WSF provides for two stabilisation instruments (combined application possible): Federal guarantees to secure loans, including credit lines, and capital market products in the debt capital sector and second recapitalisations to directly strengthen equity capital.

Standardised conditions apply in the WSF for guarantees and other guarantees for bank loans, guarantees for bonds and recapitalisations (silent participations, subordinated loans). Another 100 billion euros are earmarked for the possible refinancing of KfW programmes. By the end of August, the WSF had provided 6.6bn euros for equity investments in Lufthansa and TUI Deutschland. In the case of Lufthansa, this consists of a silent partnership of 4.7bn euros, a shareholding of 0.3bn euros and a further silent partnership of 1bn euros. In addition, KfW has provided loans of 3 billion euros (BMW and BMF, 2020a). In the case of TUI, in addition to KfW loans, there is a convertible bond of €150m held by WSF. MV Werften received a bridging loan of 193 million euros from the WSF.

Total public budget expenditure increased by 12.1% to €1 678.6 billion in 2020 compared to 2019. At the same time, revenues fell by 3.5% to €1 489.4 billion. As the Federal Statistical Office (Destatis) further reports, this results in a cash financing deficit of €189.2 billion as defined by the financial statistics. Due to the pandemic, no positive budget balance can be achieved in 2020. The upper graph of Figure 3 shows that revenues, especially for taxes and social contributions, will decrease. The development shows the impact of the pandemic. The increase in expenditure in the general public budget (+166.21 billion euros compared to the previous year) shows the investment policy (lower graph of Figure 3). The item of subsidies, which is below expenditure, is clearly above the previous year's figures with 39.92 billion euros (previous year 14.38 billion) in the first half of the year and 47.23 billion (previous year 16.42 billion) in the second half of the year. This expenditure accounts for 5.1% (previous year 2.0%) of total expenditure. The expenditure graph also shows an increase in expenditure on monetary social benefits of 45.66 billion euros. Both selected figures show that the expansionary policy is clearly increasing in selected positions, even though subsidy expenditure remains in the single digits. To classify the debt burden, it is important to know this classification.

Table No. 2: Crisis year 2020: falling revenues, rising expenditure - the forecast is confident



Source: Statistisches Bundesamt for the German Council of Economic Experts' Annual Report 2020/21

1.2 The economic stimulus package helps many but not all

The Corporate insolvency risk not transparent

The number of corporate insolvencies filed for in the period from January to July this year fell by around 10 % compared to the same period last year, despite the economic slump (Federal Statistical Office, 2020a). The German Council of Economic Experts assumes that the suspended obligation to file for insolvency played a role. The probable claims of creditors have risen from about €10bn in H1 2019 to almost €17bn in H1 2020 (Statistisches Bundesamt, 2020b). In particular, according to calculations by the IWH (2020), three times more employees in larger companies were at risk of insolvency in July than in January 2020. The government aid measures and the suspended insolvency filing obligation could lead to an increase in low-income companies, called zombie companies in the literature (Creditreform, 2020; VID, 2020), which still do not have a viable business model after the pandemic has subsided. These are often identified in studies as companies that have interest coverage ratios of less than one for several consecutive years and have a minimum age of ten or more years (Schwartz et al., 2018). While low interest rates might reduce the financial pressure on low-income firms and thus favour their staying in the market, the empirical evidence on the relationship between low interest rates and the share of low-income firms is not clear. Banerjee and Hofmann (2018) find a statistically significant negative relationship in a panel study for 14 advanced economies, but Cella (2020) for Sweden, the Danish National Bank (2019) for Denmark and the Deutsche Bundesbank (2017) for Germany do not.

Politically, the prevailing opinion in the ruling party is that the self-cleansing process of the market must not be eliminated. Companies that are not healthy and have no economic perspective, regardless of Corona, must leave the market. Firms can weaken the productivity growth of an economy when resources tied up in them could be used more efficiently elsewhere (Caballero et al., 2008; Andrews et al., 2017; Banerjee and Hofmann, 2018). Another government party, on the other hand, argues that companies struggling valiantly through the Corona pandemic should not be allowed to give up prematurely (Johannes Fechner/ SPD). According to the Federal Ministry of Finance, a significant increase in insolvency figures in the four-digit, possibly low five-digit range is to be expected for 2021. According to IMF calculations, the state support measures adopted by the federal government would have saved one in nine companies from insolvency.

The suspension of the obligation to file for insolvency is likely to have mitigated short-term crisis effects, but a further extension would run the risk of delaying many inevitable insolvencies. As a result of the discussion, I therefore endorse the recommendation of the Research Institute of the Federal Employment Agency that in the case of imminent insolvencies, however, the prospect of a recovery of the business after the crisis should be examined in a targeted manner and, accordingly, liquidity assistance or the granting of loans or participation from the public side for a sustainable reorganisation should take place. In the case of unavoidable business closures, skilled workers who have been made redundant represent an opportunity for growth in prospering companies by hiring these skilled workers.

Unemployment rises, short-time work prevents mass unemployment

In the pandemic, the rise in unemployment and the increase in underemployment could not be avoided despite generous financial aid. Nevertheless, the German labour market remained comparatively robust overall. After the relaxation of measures for the pandemic, the labour market recovered in the further course of the year, but the annual average unemployment rate of 2.65 million is 429,00 higher than in 2019. Underemployment also increased. A major reason for this is that the labour market policy measures were not possible or only possible to a limited extent due to the lockdown.

With the start of the lockdown in March, share of short-time work rose to an all-time high. The peak in April includes almost 6 million people on short-time work, which corresponds to 18% of all employees subject to social insurance contributions (statistics of the Federal Employment Agency, 1/2021). With an average work loss of about 38%, the use of short-time work has arithmetically secured jobs for about one million employees and prevented their (temporary) unemployment (IAB).

2 Expansionary fiscal policy does not shake Germany's financial stability

The German Council of Economic Experts expects a general government net lending of -123.5 billion euros (-3.5% of GDP) for 2021.

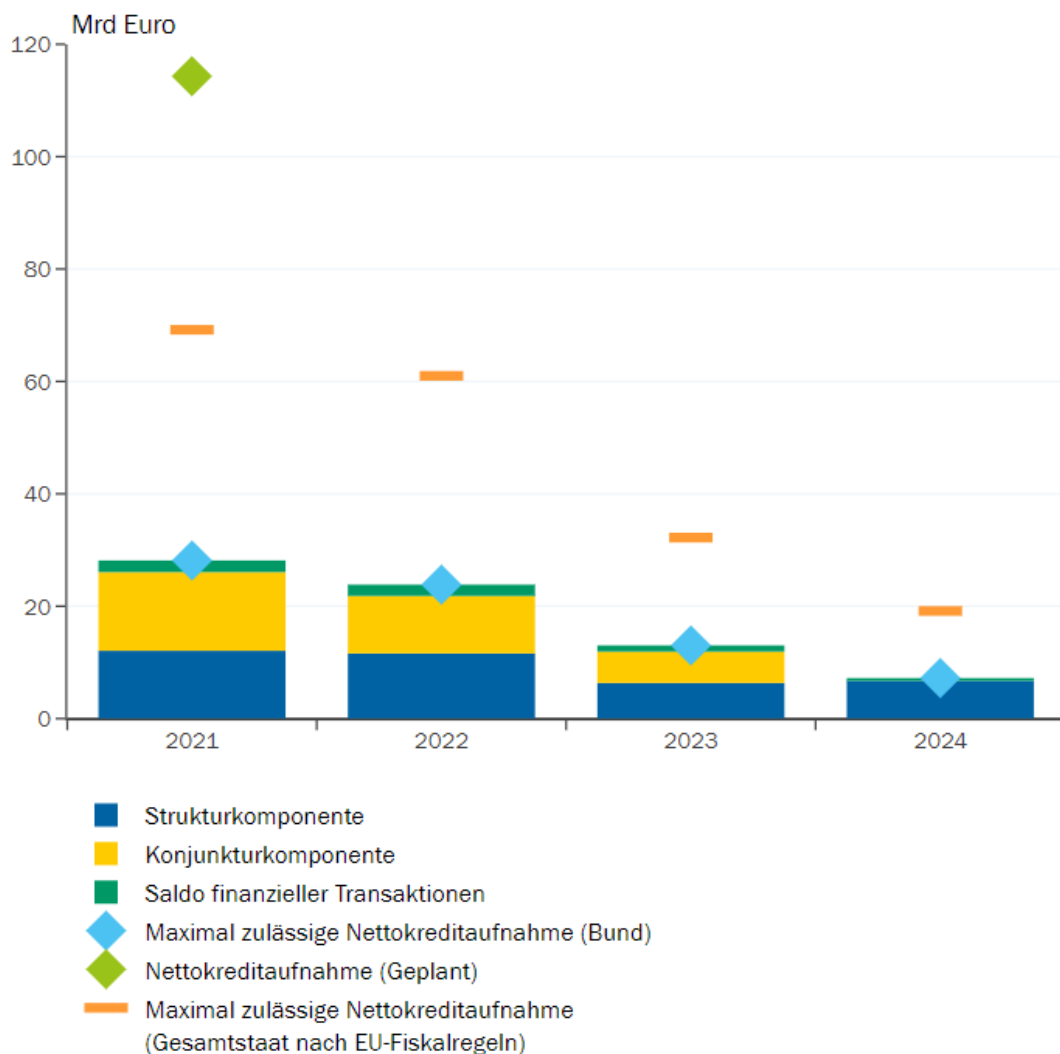
Table No. 3: Trend reversal in net lending/borrowing: expenditure exceeds revenue in 2020/2021

	2019	2020 ²	2021 ²	2020 ²	2021 ²
	Mrd Euro			Veränderung zum Vorjahr in %	
Einnahmen	1.610,6	1.539,6	1.616,3	- 4,4	5,0
Ausgaben	1.558,1	1.724,3	1.739,7	10,7	0,9
Finanzierungssaldo	52,5	- 184,7	- 123,5	x	x

Source: Statistisches Bundesamt for the German Council of Economic Experts' Annual Report 2020/21

Taking into account government credit programmes and government participation in the Corona pandemic, which are included in gross debt but not in general government net lending/net borrowing, the debt-to-GDP ratio is projected to increase to 72.1% in 2020. In 2021, it will be similarly high. This development results from the expansion of public tasks due to the pandemic and a strong decline in tax revenues. For the unscheduled new borrowing, Germany has largely issued short-term bonds and few long-term bonds.

If the debt brake exemption is used, a repayment plan must be adopted in accordance with Article 115 (2) sentence 7 of the Basic Law. This repayment plan adopted by the Bundestag for the supplementary budgets of 2020 provides for linear-proportional repayment over 20 years beginning in 2023 (Deutscher Bundestag, 2020a). Annual payments of around €5.94 billion will thus be due for redemption by 2042, provided that the credit authorisations are fully utilised. The Federal Government plans to comply with the requirements of the debt brake again as of the 2022 budget. To this end, it plans to completely reduce the reserve built up in recent years, which according to its own forecast should amount to 48.2 billion euros by the end of 2021, by 2024. The next Figure illustrates these performances in a compact form.

Table No. 4: Rapid debt reduction enables cushion for future negative impacts

Quellen: BMF, BMWi, Europäische Kommission, eigene Berechnungen

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Source: German Council of Economic Experts' Annual Report 2020/21

The extent to which the consolidation of the national budget prescribed by the debt brake requires concrete revenue or expenditure measures naturally depends on the development of actual revenues and expenditures in the coming years. For example, a swift recovery followed by sustained high growth would increase revenues while reducing the deficit and debt ratios. If the low interest rate environment persists for a long time, interest savings by the government would continue to support consolidation. For instance, Blanchard et al. (2020) and the IMF (2020a) assume that interest rates will remain below the GDP growth rate for a longer period of time and thus make a substantial contribution to reducing the debt ratio. However, there are some risks, for example that the interest rate growth ratio or the economic upswing will be slowed down by demographic developments or that a certain decline in globalisation will have negative effects.

The fiscal consolidation strategy is not supported by everyone. Achim Truger, for example, is of the opinion that against the background of the risks of the debt brake, the stabilisation policy requires a fundamental reform (Truger, 2016; Expertise 2007; JG 2019 para. 562 ff., MV Schnabel and Truger).

Conclusion

The Corona pandemic will accompany the German and global economy for a long time to come. From my point of view, the Federal Government has so far succeeded in significantly supporting the economy in overcoming the crisis through high investments.

The fiscal policy measures are sufficient in quantitative terms. Qualitatively, in my view, there is the shortcoming that the intended use is not always sufficiently defined.

The economic stimulus package helps many, but not all. The suspension of the obligation to file for insolvency may have mitigated short-term crisis effects, but a further extension would delay many inevitable insolvencies. In the pandemic, the rise in unemployment and the increase in underemployment could not be avoided despite generous financial aid. Nevertheless, the German labour market has remained comparatively robust overall. The facilitation of the receipt of short-time allowance and the extended period of receipt can be assessed as an effective instrument.

The costs of the crisis are sustainable. The future course of stabilisation policy should include conclusions from the current crisis. The course of budget consolidation is indispensable in the future.

References

- Andrews, D., M.A. McGowan and V. Millot (2017). *Confronting the zombies: Policies for productivity revival*, Eco-nomic Policy Paper 21, OECD Publishing, Organisation for Economic Co-operation and Development, Paris.
- Banerjee, R. and B. Hofmann (2018). *The rise of zombie firms: Causes and consequences*, BIS Quarterly Review (September 2018), Bank for International Settlements, 67-78.
- Bayer, C., B. Born, R. Luetticke and G. Müller (2020) (Hg.). *The Coronavirus Stimulus Package: How large is the transfer multiplier?* CEPR Discussion Paper DP14600, Centre for Economic Policy Research, London.
- Bellmann, L. et al. (2020). *Kurzarbeit ist nicht alles: Was Betriebe tun, um Entlassungen in der Krise zu vermeiden*, IAB Forum, 25 September 2020, Institute for Employment Research of the Federal Employment Agency, Nuremberg.
- Blanchard, O., Á. Leandro and J. Zettelmeyer (2020). *Revisiting the EU fiscal framework in an era of low interest rates*, 9. März, mimeo.
- BMF, 2020a: Bundesministerium der Finanzen, Berlin, <https://www.bundesfinanzministerium.de/Content/DE/Standardartikel/Themen/Schlaglichter/Corona-Schutzschild/zahlen-derwoche.html>, retrieved on 14. 10. 2020. Available online at <https://www.bundesfinanzministerium.de/Content/DE/Standardartikel/Themen/Schlaglichter/Corona-Schutzschild/zahlen-derwoche.html>

- BMWi und BMF (2020a). Bundesregierung sich verständigt auf finanzielle Unterstützung für die Lufthansa, Press release, Federal Ministry for Economic Affairs and Energy and Federal Ministry of Finance, Berlin, 25 May.
- Bundesregierung (2020a). Reisewarnung gilt automatisch für Corona-Risikogebiete. Available online at www.bundesregierung.de/breg-de/themen/coronavirus/reisewarnung-1783478.
- Bundesregierung (2020b). Konferenz der Bundeskanzlerin mit den Regierungsschefinnen und Regierungschef der Länder am 14. Oktober 2020.
- Caballero, R., T. Hoshi und A. K. Kashyap (2008). Zombie lending and depressed restructuring in Japan, *American Economic Review* 98 (5), 1943-1977.
- Cella (2020). Zombie firms in Sweden: Implications for the real economy and financial stability, Staff memo, Sveriges Riskbank, Stockholm.
- Creditreform (2020). Kommt die Insolvenzwelle? <https://www.creditreform.de/aktuelles-wissen/presse-meldungen-fachbeitraege/news-details/show/default-c50f6151fa>, retrieved on 12. 8. 2020.
- Dänische Nationalbank (2019). Low prevalence of zombie firms in Denmark, *Analysis* 29, Kopenhagen.
- Deutsche Bundesbank (2017). Ertragslage und Finanzierungsverhältnisse deutscher Unternehmen im Jahr 2016, Monatsbericht Dezember 2017, Frankfurt am Main, 35-52.
- Deutscher Bundestag (2020a). Bundestag beschließt zweiter Nachtragshaushalt in der Corona-Krise, <https://www.bundestag.de/dokumente/textarchiv/2020/kw27-de-nachtragshaushaltsgesetz-701728>, accessed 2. 7. 2020.
- Fechner, Johannes. Interview NDR, Unternehmen in der Krise: Etliche Insolvenzen erwartet Stand: 29. 9. 2020 06:00 Uhr. Available online at: <https://www.ndr.de/fernsehen/sendungen/panorama3/Unternehmen-in-der-Krise-Etliche-Insolvenzen-erwartet,insolvenzen114.html>
- Federal Government (2020c). Video Switching Conference of the Federal Chancellor with the Heads of Government of the Länder on 28 October 2020, Press Release 381, Press and Information Office of the Federal Government.
- Federal Statistical Office (2020b). Half-year 2020: Suspended application obligation leads to fewer reported corporate insolvencies than in the same period last year, Press release 348, Wiesbaden, 10 Sept.
- Feld, L. P., V. Grimm, M. Schnitzer, A. Truger und V. Wieland. CORONA-KRISE GEMEINSAMLY BEWÄLTIGEN, RESILIENZ UND WACHSTUM STÄRKEN, Jahresgutachten. Available online at https://www.sachverstaendigenrat-wirtschaft.de/fileadmin/dateiablage/gutachten/jg202021/JG202021_Gesamtausgabe.pdf.
- Feld, Lars P., Achim Truger, Volker Wieland. DIE GESAMTWIRTSCHAFTLICHE LAGE ANGESICHTS DER CORONA-PANDEMIE, Sondergutachten. Available online at <https://www.sachverstaendigenrat-wirtschaft.de/sondergutachten-2020.html>
- Guerrieri, V., G. Lorenzoni, L. Straub und I. Werning (2020) (Hg.). Macroeconomic implications of COVID-19: Can negative supply shocks cause demand shortages? NBER Working Paper 26918, National Bureau of Economic Research, Cambridge, MA.
- IAB (ed.). Statistik der Bundesagentur für Arbeit, Berichte: Blickpunkt Arbeitsmarkt-Monatsbericht zum Arbeits- und Ausbildungsmarkt, Nuremberg, December 2020.
- IMF: Global financial stability report 2017, International Monetary Fund, Washington D.C.
- IMF 2020a: IMF fiscal monitor October 2020, International Monetary Fund, Washington, DC.

IWH, 2020: IWH Insolvency Trend: Number of insolvencies stabilises at low level, number of jobs affected high, Press release 19/2020, Leibniz Institute for Economic Research Halle, Halle (Saale), 6 October.

Pfeiffer, P., W. Roeger und J. in 't Veld (2020) (Hg.). The COVID19-pandemic in the EU: Macroeconomic transmission and economic policy response, ECFIN Discussion Paper 127, Europäische Kommission, Generaldirektion Wirtschaft und Finanzen, Luxemburg.

Schwartz, M., J. Gerstenberger and S. LoBosco (2018). Worries about zombie companies in SMEs unfounded, Fokus Volkswirtschaft 220, KfW Research, Frankfurt am Main.

Statistisches Bundesamt (2020a). Zu den Auswirkungen der Corona-Krise auf die Preiserhebung für den Verbraucherpreisindex / Harmonisierten Verbraucherpreisindex, Stand: 13. 10. 2020, Wiesbaden.

Truger (2016). Reviving fiscal policy in Europe: Towards an implementation of the golden rule of public investment, European Journal of Economics and Economic Policies: Intervention 13 (1), 57-71.

VID, 2020. Partial extension of suspension of insolvency filing obligations: A cautious step towards normality, Press release, Verband Insolvenzverwalter Deutschlands, Berlin, 26 August.

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VOLUNTARY PENSION ARRANGEMENTS THROUGH THE OECD PRISM

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Abstract

Not even the extreme fiscal stimulation of supplementary pension saving schemes has led to them playing a significant role in the provision of financial security for the elderly. The OECD recommends that we should introduce occupational pensions or reform the pension saving schemes in line with the neoliberal model, while at the same time making use of “soft compulsory” instruments. The Ministry of Finance has proposed the introduction of long-term investment accounts. The basic Czech pension pillar is de facto dominated by a flat pension, supplemented with a small earnings-related pension. There is general agreement on separating these two completely different schemes in the interests of making the pension system comprehensible. This confirms the combination of a liberal and a social-democratic model. This paper analyses these proposals with the objective of optimising Czech pension policy, including the introduction of tax-free individual savings accounts.

Keywords

Czech pension reform; pension welfare regimes; voluntary pension schemes; occupational pension schemes; individual savings accounts

JEL Classification

G20, H44, P51

Introduction

The Ministry of Finance ordered an analysis of the pension system from the OECD in response to the “Architecture of the new pension system” presented by the Ministry of Labour and Social Affairs (MoLSA). The proposal from the MoLSA and the OECD review are based on the division of the public old-age pensions into 2 pillars/components: a flat pension in the amount of 30% of the national average wage and an earnings-related pension. This will enable a substantial increase in the transparency and therefore also the comprehensibility of the system and it may become a springboard to further reform steps. “Voluntary private pensions should be better designed to boost their capacity to complement public pensions” (OECD, 2020).

1 Key OECD recommendations

The OECD (2020) recommends strengthening the role of the “voluntary funded pension arrangements”:

- “Strengthen the role of the funded system in the overall pension system by introducing a new, occupational pension scheme, or by improving the design of the existing supplementary pension schemes.
- Improve the performance of pension funds by encouraging or nudging participants to switch to participating funds as they have more flexibility to pursue growth investment strategies because they do not have to provide an annual non-negative return guarantee, and by promoting the access to an appropriate default investment strategy.
- Better align fees charged to participants with the costs incurred by the pension management companies by analysing the cost of investing in different asset classes and applying a regressive scale for management fees to pass on economies of scale to participants as assets under management grow.
- Encourage participants to contribute more by redesigning some elements of state financial incentives, setting up a mechanism where contributions increase automatically up to a pre-set maximum, promoting employer contributions, and providing information about expected benefits from the entire pension system.
- Lengthen contribution periods by increasing the minimum saving period to withdraw retirement benefits and keep the state financial incentives.
- Consider introducing automatic enrolment into an occupational pension plan or a participating fund, with appropriate default contribution rates and investment strategies.
- Extend the take-up of products providing lifelong retirement income by discouraging the lump sum pay-out option and increasing the attractiveness of life annuities through additional product features (e.g. guaranteed period, survivor option, or profit sharing)” (OECD, 2020).

Several countries have seen the development of occupational pensions on the basis of a voluntary choice or collective bargaining between the employers and the trade unions which has resulted in a compulsory or quasi-compulsory system which may be distinctly reminiscent of a social insurance system. Some countries apply behavioural economics here and this leads to the “soft compulsion” of this security provision. In Czechia, occupational pension insurance is de facto prohibited by the law regulating this insurance, by means of which an EU directive aimed at creating a single market for funded occupational pensions within the EU has been (formally) implemented. Occupational supplementary pension insurance was rejected by Prime Minister Klaus on purely ultraliberal ideological grounds and this public policy still de facto applies today. The OECD recommendations are aimed at the neoliberal modifications to occupational pensions in the United Kingdom. In this regard, the author “only” recommends lifting the ban on occupational pensions only.

One of the fundamental OECD recommendations involves motivating the participants of the transformed funds to transition to the “participating funds” with no guarantee of an annual non-negative nominal yield. This should lead to a greater return, while the investment risk is fully borne by the client. At the same time, “3/5 of people’s money in participating funds has been placed in conservative funds... These provide a lower yield than transformed funds... According to pension company representatives, the interest in unprofitable conservative funds is given by several factors: in general, this is due to the more cautious approach of Czechs to

investments. The risk of a loss is more significant to them than the possibility of higher earnings in more dynamic funds which also invest in equities. A significant role is also played by the fact that Czechs often conclude supplementary pension savings schemes after the age of fifty when there is no longer any time for more courageous investments” (Hovorka, 2019).

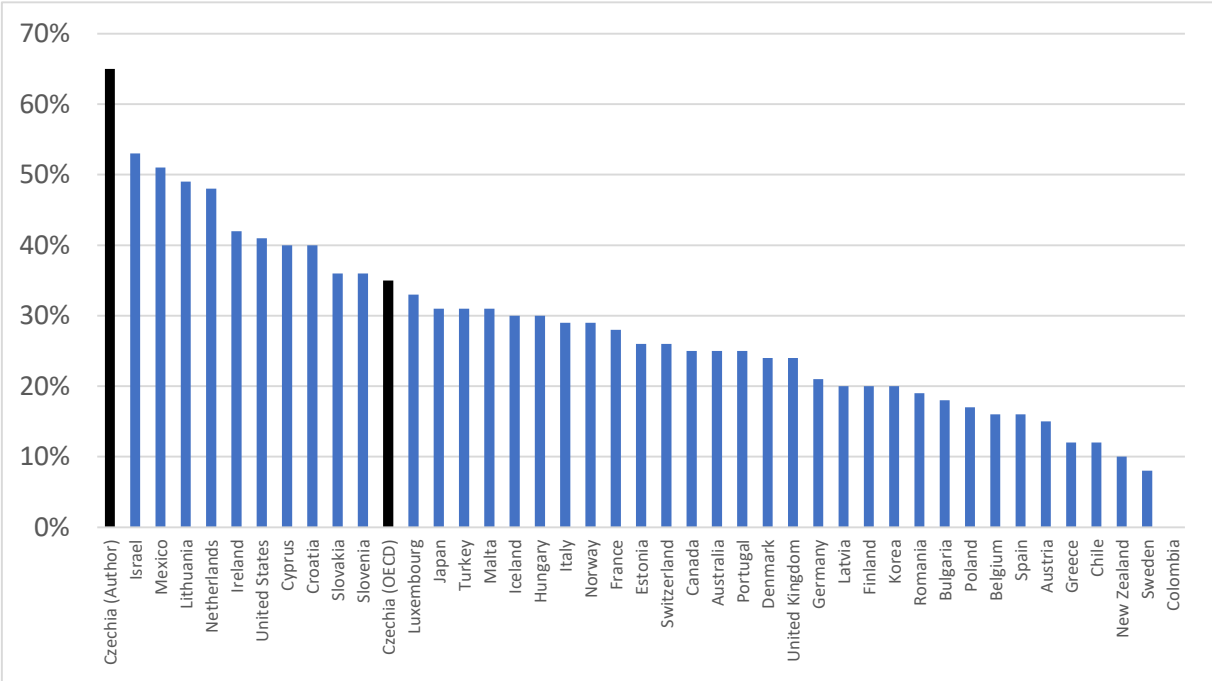
The conspicuous preference for savings without risk is not a specifically Czech characteristic. This has been borne out by, amongst other things, a selective survey undertaken in 10 European countries: 73% of respondents preferred the safety/certainty of pension savings schemes over the yield. Safety is the number one priority for 60% of respondents. Other significant priorities include the option of interrupting the payment of contributions (33%), legacy (32%) and liquidity (regular access to the savings, 32%). On the other hand, the yield/performance ranks among the least significant priorities for pension saving schemes along with the transferability of the savings within the EU (Insurance Europe, 2020). Behavioural economics have reached the conclusion that the absolute majority of clients has no ability or need to choose a pension product or fund.

The main purpose of purchasing Czech supplementary pension insurance does not involve individual security in old age. The purpose is to divest excess liquidity and the tax optimisation. The construct of supplementary pension insurance was also of fundamental significance to a large number of participants: it was a simple bank savings product with a high degree of state support in the form of state contributions (originally up to 50%!) with a guaranteed non-negative nominal yield. The fiscal illusion that the state support was free also played a significant role here. „...the third pillar is not really a pension scheme. It is akin to a tax-advantaged savings account. The system should not be presented to the public as a source of meaningful future replacement income“ (World Bank, 2017). „Personal pensions have relatively wide take-up in only a few Member States (over 60% coverage in Czechia, over 30% in ... Germany) while in most Member States take-up is moderate and fragmented, and in some, nearly non-existent“ (EC, 2017). „Pillar 3 (voluntary retirement savings) should not receive ...subsidies, which are regressive and also have not been shown to have any significant effect on private saving“ (Willmore, 2000). The third pension pillar has practically no significance for most people throughout the world.

The vision of the OECD experts with regard to the need to develop state support for the 3rd pension pillar in Czechia is derived from an international comparison of state support for private pension schemes compiled by the OECD (2018). According to this comparison, Czechia is “only” above average in its fiscal stimulation for the main private pension plans; this is given by the processing method: the OECD study ranked supplementary pension savings paid by participants as the main Czech pension plan here; the calculation presupposes savings at the amount of 5% of the gross wage throughout the entire active life. In reality, the participants’ average saving in this country is at the level of a mere 2.3% of wages which means a state contribution at the amount of 24.3% of the participants’ contributions). As such, the state support for higher contributions on the part of the participants, as modelled by the OECD, is relatively low here. Moreover, a typical Czech client in 2018 had only saved for 8 years; the OECD presupposes the payment of contributions for a period of 45 years. The OECD calculation is marked as Czechia (OECD) in the Figure 1, while the real value of the fiscal

stimulation is marked as Czechia (Author): 65.1% of the employer’s contribution – the highest value among all the countries. Almost all other countries have occupational pensions, which are of considerably greater significance than personal pensions, as their main pension plan; in our country, the occupational pensions have merely been “substituted” by the employers’ contributions to the personal pensions.

Figure No. 1: Financial incentives of the main private pension plans in 2018 (% of the pension contributions of an average earner)



Source: OECD (2018), Author

The OECD recommendations for the reform of the 3rd pension pillar unilaterally prefer the neoliberal pension policy which would lead to its transformation into a so-called 2nd pension pillar according to the World Bank typology. The interest of, for example, Czech pension companies in such reform is understandable, but it is at odds with the standard task of the 3rd pension pillar in the OECD countries. The task of any occupational pension funds should be derived from the interests of the trade unions and the employers. There is a certain amount of room available for their existence (“pension gap”) and public policy may also focus on a social-democratic policy: to strengthen the social pension insurance. Voluntary supplementary pension insurance of this type could also be considered.

2 Proposed reform

Next to the supplementary pension savings, we also have the so-called private life insurance which has an analogous tax support as supplementary pension savings, albeit without the state contribution provided to the contributions of participants in supplementary pension savings schemes up to the amount of 12,000 CZK per annum. Any other participant contributions up to the amount of 24,000 CZK per annum are subject to a tax deduction (with a flat 15% rate). In

the case of the so-called private life insurance, the participants are only entitled to the tax deduction of up to 24,000 CZK per annum. By contrast, employer contributions towards both products are subject to the same tax regime!

An associated Czech problem involves all-purpose so-called building saving schemes. The greatest absurdity lies in the provision of a state contribution on fictitious building savings when concluding a so-called bridging loan; the higher interest on this type of loan then draws off the majority of the state contributions! (The volume of bridging loans is 6 times higher than the volume of so-called loans from building savings that are provided after the completion of the saving period.)

The government's draft bill which changes some of the laws associated with the development of the capital market also includes the introduction of long-term investment accounts held by entities authorised to keep records of investment instruments or entities authorised to receive deposits from the public in the "savings products for old age" (Babiš et al., 2020). The proposal for the introduction of "long-term investment accounts" is a result of lobbying by interested market entities that have pointed to the uneven taxation of various investment products. In this regard, the Czech National Bank has also pointed to the advisability of undertaking a thorough discussion as to the effectiveness of the 3rd pension pillar in association with its tax support. The OECD report also includes a strongly reserved attitude towards long-term investment accounts.

A fundamental reform of the existing (supplementary) pension insurance, pension savings, private life insurance and building savings is essential. A liberal policy would be the simplest one from the technical point of view: cancel all state support for financial products and reduce taxation. A social-democratic policy could have a wider focus: the cancellation of support for financial products may be combined with an increase in public pensions – for example with the argument that the relative amount of old age pensions in our country is (slightly) below the OECD or EU average ("pension gap"). A conservative (Christian-democratic) policy could involve a transition to the exclusive application of a tax deduction whereby the pay-out of any pension savings would be fully subject to personal income tax (EET tax regime). This is the most common practice abroad; it is mainly beneficial for higher income groups. Under the conditions of essentially single income tax rate, this system is equivalent to the TEE tax regime where savings or investments are made from taxed income and capital incomes are tax-free. In our country, the TEE regime is applied to investments made in mutual and investment funds. Over the last decade, the TEE tax regime has been increasingly recommended throughout the world, to the detriment of the EET regime, because it is substantially simpler and also more equitable (an equal approach to all income groups); and that is without mentioning the fact that there is a significant risk when applying the EET system that the tax rates might change in the future (when, for example, the entire pension savings are taxed). For Czechia we may unequivocally recommend the TEE tax regime, if a state support is to be preserved. The state contribution to supplementary pension savings and building savings must be cancelled. (For totally unclear reasons, the aforementioned government draft bill has ignored state contributions despite the fact that this involves groundless preferential treatment for supplementary pension savings!)

Technically, annuities are ideal products for old-age security. However, this suits relatively few clients when they must purchase an (expensive!) annuity using their own money. Annuities are therefore a problem for the private sector as has been borne out by recent British and German experience: the compulsory annuitization of pension savings has been cancelled. Pension savings themselves are a rather imperfect replacement for an annuity, which is borne out by, amongst other things, the fact that these savings are often modified with the option of, for example, purchasing a home or taking out a loan from the savings. Moreover, housing is increasingly a more advantageous investment for old age. The option to withdraw savings prematurely is also used quite frequently; this applies to 30-40% of “pension” savings in the US.

Not only the Ministry of Finance has referred to foreign individual savings accounts (ISA) in context to the proposed “long-term investment account”. Products such as the new British individual savings account (ISA) or the Canadian tax-free savings account (TFSA) may constitute an optimal solution for the Czech third pension pillar. Their fundamental behavioural trick lies in the fact that the client is limited in the amount of annual or life-long deposits/investments that can be made (for example, up to 60,000 CZK per annum under our conditions), but unlimited with regard to the time and amount when making withdrawals from the savings. “The TFSA is a long-term investment vehicle. Its best use is for saving for retirement!” (Kasper, 2019). These products are subject to the TEE tax regime; it is simple and does not require the agendas of state contributions and tax deductions. Tax-free savings/investment accounts also open an equal business opportunity for all the appropriate financial companies; the superfluous companies fall back. The exemption of any yields from taxation can also be supported by the argument that the interest/appreciation (for people) is low, inflation is around 3% and therefore any tax mainly taxes inflation.

Conclusion

The Czech 3rd pension pillar requires fundamental reform simply because it essentially does not perform its general basic function – it is not a tool to secure people in their old age. It does not thoroughly perform this role anywhere in the world, because its compulsory output is not a pension (annuity). Not even state support can help in this regard, albeit that the state support in our country is relatively the largest one in the world – in the case of employer contributions to supplementary pension savings and private life insurance. The fundamental defect of this Czech pension pillar lies in the unconstitutionality of the state support – different fiscal approaches to comparable products and their providers. The solution is the public choice of one of the basic pension social models. The Christian-democratic model, oriented towards public and occupational pension insurance, can be ruled out under the existing Czech conditions. We also do not recommend the neoliberal model which is oriented towards hard or soft compulsory private pensions due to their insufficient yields and the transfer of the investment risk to the clients.

The OECD recommends an expansion of neoliberal elements in the Czech 3rd pension pillar. This may lead to the introduction of occupational pension insurance which is generally

considered to constitute the 2nd pension pillar throughout the world. Tax-free individual saving/investment accounts are the best long-term investment vehicle for saving for retirement.

References

Babiš, A. a kol. (2020). Novela zákonů v souvislosti s rozvojem kapitálového trhu předložena Poslanecké sněmovně. Shrnutí závěrečné zprávy RIA. [online]. Praha: Ministerstvo financí ČR. Available from: <https://www.mfcr.cz/cs/soukromy-sektor/kapitalovy-trh/podnikani-na-kapitalovem-trhu/2020/novela-zakonu-v-souvislosti-s-rozvojem-k-39356>

EC (2017). Commission Staff Working Document accompanying the Proposal for a Regulation of the European Parliament and of the Council on a pan-European Personal Pension Product (PEPP). [online]. Brussels. Available from: <https://data.consilium.europa.eu/doc/document/ST-10654-2017-ADD-1/en/pdf>

Hovorka, J. (2019). Horší než penzijní připojištění. Proč většina lidí v nových fondech nevydělává? [online]. Available from: <https://www.penize.cz/doplukove-penzijni-sporeni/406471-horsi-nez-penzijni-pripojisti-Proc-vetsina-lidi-v-novych-fondech-nevydelava>.

Insurance Europe (2020). What do Europeans want from their pension savings? Pension Survey – Key Findings. [online]. Available from: <https://www.insuranceeurope.eu/sites/default/files/attachments/What%20do%20Europeans%20want%20from%20their%20pension%20savings.pdf>.

Kasper, R. (2019). The New 2020 TFSA Explained. Money after Graduation. [online]. Available from: <https://www.moneyaftergraduation.com/tfsa-explained/>

OECD (2018). OECD Pensions Outlook 2018. [online]. Paris: OECD Publishing. Available from: https://doi.org/10.1787/pens_outlook-2018-en.

OECD (2020). OECD Reviews of Pension Systems: Czech Republic. [online]. Paris: OECD Publishing. Available from: <https://doi.org/10.1787/e6387738-en>.

Willmore, L. (2000). Three Pillars of Pensions? A Proposal to End Mandatory Contributions. [online]. United Nations DESA Discussion Paper No. 13. Available from: <https://www.un.org/esa/desa/papers/2000/esa00dp13.pdf>

World Bank (2017). Capital Market Assessment / Market Development Options: Czech Republic. [online]. Washington: The World Bank. Available from: <https://www.mfcr.cz/cs/soukromy-sektor/kapitalovy-trh/podnikani-na-kapitalovem-trhu/2017/zprava-svetove-banky-o-kapitalovem-trhu-29766>.

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CYBERTERRORISM: A GLOBAL THREAT TO FINANCIAL INSTITUTIONS

MARTIN ZUBKO

Abstract

Cyber threats have emerged to the most sophisticated, devastated, and unpredictable attacks on financial institutions affecting integrated financial systems worldwide. In 2018, Cobalt/Carbanak syndicate was a model example of global cyber-crime resulting in stealing more than €1 billion from over 100 financial institutions in 40 countries. Most of the cyber security concern concentrates on technical parameters or criminal aspects of such incidents. Nevertheless, cyberterrorism remains in the shadows. Therefore, the paper examines a thin line between cyber-crime and cyberterrorism related to financial institutions from an interdisciplinary perspective of international relations and finance. The aim of the article is to reflect on the latest cyberterrorism trends leading to a necessity of a much deeper interdisciplinary cooperation to produce better educated cyber security personnel able to predict a role of terrorism in financial cyber-attacks and determine the responsibility of governments.

Keywords

Cyberterrorism, Financial Institutions, Terrorism, Cyber-crime, Cyber Threats, ISIL

JEL Classification

F52, N20, O33

Introduction

Since 2020, the COVID-19 pandemic has fast-forwarded the digitalisation of financial sector across the industry. New technologies, remote tools and cyber adjustment to financial products were implemented to help people to manage their finance remotely (mainly using their electronic communication devices, mostly mobile phones). Payment methods have shifted from cash-oriented to electronic by contactless methods (mobile phones, electronic watches, contactless cards). Thus, people see physical currency, coins, and notes much less frequently than before.

As finance has advanced to a cyberspace using digital numbers to express a value on a banking account instead of a safe box full of notes, coins, or gold bullion; criminals, hackers and terrorists have followed that path, too. The world has been witnessing unprecedented challenges with an unpredictable human behaviour causing relevant security concerns. In fact, do people differentiate between their behaviour in cyberspace and when entering a bank building? Usually, they claim that a physical bank building represents some sort of 'guarantee' that nothing can happen to their deposits, loans, or other financial instruments.

This originates in the philosophy of national states and maintaining the order within them. In particular, the majority of states implement two principles of rules: “(1) a set of constitutive rules that establish the rights and obligations of the constituent entities and (2) a set of proscriptive rules that outlaw certain types of behaviors” (Brenner, 2004). However, these thoughts assume territorial boundaries as a space of execution. Nevertheless, cyber-crime and cyberterrorism have neither physical boundaries nor global law enforcement regulations.

As people tend to think within physical boundaries, they often overlook cyberspace. This leads to an inability to focus on different methods of securing financial operations and instruments. Moreover, to detect those cyber-crimes (frauds) and prosecute the criminals. Finally, when talking about financial crimes, detected and undetected, it is particularly challenging to track the money through sophisticated schemes. Therefore, cyberterrorism and terrorism should be on the table as viable options to determine the level of security risk when approaching cyber-crimes.

Hence, the paper offers three lenses through which it analyses the topic. First, it reveals some fundamental characteristics and taxonomy of cyber-crime to portrait a foundation for potential cyber-terrorist attacks. Second, it elaborates on cyberterrorism and finance to get a complex picture of how those criminals might related to terrorism. Third, the essay analyses the areas of a relevant cooperation based on the interdisciplinary approach of two disciplines: finance and international relations.

1 Theoretical Framework

The paper deals with cyber-crime, cyberterrorism, and terrorism linked to financial institutions. Therefore, the foundation for the theoretical approach is based on constructivism. As Alexander Wendt¹¹ once gave an example of 500 British nuclear warheads and 5 North Korean ones, those 5 warheads represented much bigger threats to the United States. So, “constructivists go beyond the material reality by including the effect of ideas and beliefs on world politics. This also entails that reality is always under construction, which opens the prospect for change.” (Theys, 2018). This provides a solid foundation for cyberterrorism. It is even possible to compare those 5 North Korean nuclear weapons with one or two laptops that might lead to a collapse of a bank or a regional financial market.

So, a material structure is not irrelevant, but only when scholars provide ideational structure to those two laptops, then they become plausible threats. A cybercriminal needs an action to produce some outputs. Therefore, as Adler pointed out that constructivists’ view is “the manner in which the material world shapes and is shaped by human action and interaction depends on dynamic normative and epistemic interpretations of the material world” (Adler, 1997). Applying this lens to cyberterrorism and terrorism, it is important to focus on “collectively held or intersubjective ideas and understanding on social life” which takes place in the most of decision making processes in those spheres (Finnemore and Sikkink, 2001). Ruggie came up

¹¹ Wendt, A. (1995) ‘Constructing International Politics’, *International Security*, 20(1), pp. 71–81. doi:10.2307/2539217.

with an interesting statement of “human consciousness and its role in international life” as a foundation of constructivism. So, despite more views on constructivism, this theoretical approach provides a solid foundation for researching cyberterrorism; mainly from a philosophical perspective (human behaviour, social engineering, legal norms, security of the weakest link of the chain).

In terms of methods used to conduct the research, the author relies mainly on a critical discourse analysis and systematic analysis of relevant documents/sources. The main impact is on connecting the ideas of the socially constructed world and insights of current practises from experts on financial crime to both, physical and cyberspace.

In terms of legal guidance and philosophical perspective on cyberspace, the key document is the work of Susan W. Brenner, *Toward a Criminal Law for Cyberspace: Distributed Security*. It provides fundamental methodological instruments on how to explore cyberspace in the context of international law and regulations.

The ideological framework is formed in three steps: a) understanding and identifying drivers behind cyber-crime in terms of social engineering and taxonomy; b) describing the links between cyber-crime and cyberterrorism; c) articulating the meaning of an interdisciplinary approach to cyberterrorism as a viable threat to financial institutions.

2 Cybercrime

Cyber-crimes in financial sphere have attracted criminals from all over the world as there are no physical boundaries between an attacker (criminal) and target (financial institution/customers). In other words, how many times can a criminal rob a bank before the authorities identify or arrest him/her? Contrary, how many times can a cybercriminal rob a bank using his laptop, sitting somewhere in the world, and being concealed behind various IP addresses? These elementary questions open the Pandora’s Box of cyber security dimension. It involves, if the quantum computing is excluded, unlimited possibilities on both sides, security system and penetrating criminals.

A model example is Cobalt/Carbanak syndicate that stole more than €1 billion globally. There are tonnes of papers written about this case, however, most of them deal with technical questions, operational procedures, and implications for the future computer systems. However, the focus should also be on a missing link, the weakest element of each security system, a human being.

In fact, cyber criminals did not break security systems of banks, but security thinking of people using “social engineering to convince the user click a link to download a malicious macro” (CBR Staff Writer, 2018). Thus, cyber-crime vulnerabilities should not be determined by measuring the capabilities of technical instruments only, but also by recognizing social construction of human thinking operating in a complex scheme of social engineering. In other words, developing the strongest computer security based on artificial intelligence and sophisticated elements would be a great ‘firewall’ against penetrators, however, only if

administered by non-humans. As soon as a human being enters this equation, the situation will change – a human being becomes the weakest security point of the system.

Therefore, it is not a coincidence that Kevin Mitnick, a world-famous hacker, mentioned ‘social engineering’ 16 times in his book *Ghost in the Wires*. In particular, the book contains one of the most pragmatic and semantically accurate definition of social engineering referring to as “the casual or calculated manipulation of people to influence them to do things they would not ordinarily do. And convincing them without raising the least hint of suspicion.” (Mitnick and Simon, 2011). Thus, since people have progressed further into an online dimension, from ordering the food to international financial transactions, it is necessary to provide trainings to the staff of financial institutions about the phenomenon of social engineering misused by cyber criminals. Certainly, cyber criminals might bypass humans by hacking the security system, however, looking at the level of cyber security in these days worldwide, it is an extremely demanding task in comparison with using a human being as the weakest security element of a particular financial institution.

As cyber crime benefits of a low risk of being detectable as cyber criminals are well camouflaged behind various layers of anonymity, de facto operating in a safe environment, and having virtually limitless options where to strike next, the role of human psychology is turning into a major driving force behind both, attacks, and counter measurements. To put it differently, social engineering works only if people behind it understand human psychology.

Experts cannot come up with effective solution against cyber-crime unless they perceive that “our psychological weaknesses and needs, coupled with our faulty memory and flighty attention span, leave us highly vulnerable to deception and emotional manipulation.” (Conteh and Royer, 2016). Three years after catching the head of the Cobalt/Carbanak syndicate, financial institutions certainly invested millions into cyber security, making their security system more resilient against cyber-crime. According to LexisNexis research group “every \$1 of fraud now costs U.S. retail and ecommerce merchants \$3.60 which is 15% higher than the pre-Covid study in 2019 which was at \$3.13.” (The True cost of FraudTM Study, 2021). As banking is a global industry, similar expenses will be in other countries.

So, three major (none technically related) points that humanity should learn from the Cobalt/Carbanak cyber-crime are: a) cyber-crime affecting financial institutions will be rising due to a relatively secure environment of conducting it, b) the role of social engineering will play the crucial factor as people’s ability to distinguish between a real world and augmented reality will decrease, c) understanding human psychology will be the major advantage of tackling the cyber crime in the future.

These aspects push the topic to the next section of understanding the taxonomy of cyber-crime. Marcus Rogers developed his categorisation of hackers with the help of works of Furnell and Gordon¹² describing the following categories (Rogers, 2006):

¹² Furnell, S. (2003) ‘Cybercrime: Vandalizing the Information Society’, in Lovelle, J.M.C. et al. (eds) *Web Engineering*. Berlin, Heidelberg: Springer Berlin Heidelberg (Lecture Notes in Computer Science), pp. 8–16. doi: 10.1007/3-540-45068-8_2. Gordon, S. (2000) *Virus Writers: The End of The Innocence?* IBM Thomas J.

1. Novice
2. Cyber-punks
3. Internals
4. Petty Thieves
5. Virus Writers
6. Old Guard hackers
7. Professional Criminals
8. Information Warriors
9. Political Activist

Based on this classification, ten years later, Monica Lagazio formed an updated classification adding some current trends in cyber security (Lagazio, 2016):

1. Script kiddies, newbies, novices
2. Hacktivists, political activists
3. Cyberpunks, crashers, thugs
4. Insiders, user malcontents
5. Coders, writers
6. White-hat hackers, old guard, sneakers
7. Black-hat hackers, professionals, elite
8. Cyber terrorists

Although some would dispute this classification as being generalised and dated considering the year of 2021, there are at least three important implications to acknowledge. First, accessibility to computers and information technologies has been enormous in the recent years, multiplying the number of potential cyber adversaries. Second, what used to be a domain of armed robbery or sophisticated criminals has been taken over by cyber criminals of professional grade. Third, cyberspace has been attracting terrorist organisations with a newly emerged way of causing damage, for example, to attack energy infrastructure, financial institutions, or medical facilities.

Taken into consideration the Cobalt/Carbanak syndicate, looking at the development of cyber-criminal taxonomy and enforcing these findings in the post-COVID-19 world; it is evident that cyber criminals will occupy much more of the security forces time than ever before.

In terms of financial institutions, the most dangerous groups are insiders (people working in a particular institution with direct access to the security system), professionals (criminals aiming for the money), and cyber terrorists (people who based their acts on an ideology causing tremendous damage to regional, international, and global systems). Even though motives are different, financial losses are massive. However, cyber-crimes linked to financial institutions are not entirely about financial losses. Reputation, trust, future plans, and innovation are uniformly affected. Nevertheless, there is one group that should get a greater attention –

terrorists. There is a thin line between cyber-crime and terrorism. Therefore, cyberterrorism as a threat should be incorporated in financial institutions' security system prospects.

3 Cyberterrorism

Cyberterrorism is a relatively new domain for terrorists, and it probably remains as a top terrorist instrument in the future (believing that the post-COVID-19 world will be much more about a cyber space). The European Union (EU) published 'Systemic Cyber Risk' document in which there are three classifications of cyber threats (European Systemic Risk Board, 2020):

Table No. 1: Cyber risk: threat actors, motivations and goals

Threat Actor	Motivation	Goals	Examples
Nation-states, proxy groups	geopolitical, ideological	disruption, destruction, damage, theft, espionage, financial gain	permanent data corruption targeted physical damage power grid disruption payment system disruption fraudulent transfers espionage
Cybercriminals	enrichment	theft/financial gain	cash theft fraudulent transfers credential theft
Terrorist groups, hacktivists, insider threats	ideological, discontent	disruption	leaks, defamation distributed denial of service (DDoS) attacks

Source: Author's interpretation according to European Systemic Risk Board, 2020.

The *Table 1* highlights that cyber-crime and terrorism have entered the official discourse of cybersecurity experts. Certainly, there are many reasons behind this shift. However, there is an alarming statistic providing a base for even further investigation. From "February to April 2020, amid the COVID-19 surge, cyberattacks against the financial sector increased by 238 percent" (Kellermann and Murphy, 2020). As COVID-19 accelerates cyber-attacks, it also raises many questions about a destination of the money looted from those financial institutions or a description of impact of cybercriminal activities. In other words, when reading about Cobalt/Carbanak syndicate, it is not necessary to figure out an exact number of how much money was stolen, but to determine how much of that money ended up in the hands of terrorists.

According to the latest report of United Nations Office of Counter-Terrorism from January 2021, "Financial disruptions caused by the pandemic appear to have increased terrorist groups' reliance on criminal activities, including electronic fraud and cybercrime." (*Twelfth report of the Secretary-General on the threat posed by ISIL (Da'esh) to international peace and security and the range of United Nations efforts in support of Member States in countering the threat*, 2021). That means that terrorists have entered cyber space as an additional dimension to classic ways of obtaining funds for their activities (smuggling, trafficking, frauds, counterfeit products,

local people's contribution). Therefore, as Vladimir Voronkov, undersecretary-General for Counter-Terrorism and the head of the United Nations Office of Counter-Terrorism, said: "We must defeat ISIL in the cyberspace." (ISIL Must Be Defeated in Cyberspace, Under-Secretary-General Tells Security Council, as Terrorist Group Takes Advantage of Pandemic-Related Disruptions, 2021).

However, what is a close connection between financial institutions and cyberterrorism? First, a direct connection is related to cyber-crime itself – is it possible to exclude that the stolen money ended up in terrorist groups? Second, a private data security – is it possible to exclude that the stolen private data can allow terrorists to get access to financial resources?

It is certainly difficult to answer both questions with 'No' as a cyber world is incredibly complex. So, what happens if ISIL cyber terrorist groups are added to this analysis?

According to a research report of SITE Intelligence Group, there are three main hacking/cyber-terrorist groups within the ISIL structure, the "Caliphate Cyber Army" (CCA), the "Islamic State Hacking Division" (ISHD), and an umbrella group by the name "United Cyber Caliphate" (UCC)." (Kill lists from pro-is hacking groups, 2016). Except hacking activities, these groups intentionally break into databases to get personal private data of employees. Then, they create so-called 'kill lists' for the ISIL followers.

A good example is a case of Ardit Ferizi, 'a terrorist hacker' and his collaboration with ISHD.

"As alleged in the criminal complaint, Ferizi, also known by his hacking moniker "Th3Dir3ctorY," is believed to be the leader of a Kosovar internet hacking group called Kosova Hacker's Security (KHS). Ferizi hacked into the computer system of a victim company located in the United States and stole the PII¹³ of thousands of individuals. He then provided the PII of over 1,000 U.S. service members and federal employees to ISIL to be used against those employees. Between June and August 2015, Ferizi provided unlawfully obtained PII to ISIL member Junaid Hussain, aka Abu Hussain al-Britani. On Aug. 11, 2015, in the name of the Islamic State Hacking Division (ISHD), Hussain posted a tweet titled "NEW: U.S. Military AND Government HACKED by the Islamic State Hacking Division!" which contained a hyperlink to a 30-page document. ("ISIL-Linked Hacker Arrested in Malaysia on U.S. Charges," 2015).

This example indicates that although cyber criminals can use various instruments to shield themselves, financial institutions should concentrate on links to possible terrorists. Was Ferizi a terrorist or professional cybercriminal? The definitive answer is difficult to enunciate. However, this example shows a thin line between financial crime in cyberspace and terrorism. Moreover, there are three implications worth of re-thinking.

First, through cyber operations targeting the financial sector or private data of people, terrorists can strengthen their financial reserves and spend the money for anything they like. Second, penetrating to financial institutions, directly or indirectly (through private data breaches), terrorists feed their propaganda among potential followers (also targeting young people who

¹³ Personally Identifiable Information (PII).

might support or join cyber operations worldwide). Third, there is a strong educational factor influencing understanding of terrorists among potential followers/fighters.

In the past, the Western media portrayed a terrorist as a simple man with an old Kalashnikov dressed in some traditional suit fanatically following Islam. As cyber space allows various operations to target infrastructures, important security systems and facilities providing life support; the notion of a terrorist is changing. In fact, what's about a sketch of a young man dressed in a hoodie with a second-hand laptop learning Kali Linux while working as a junior security officer in a local bank? So, a picture of a cyber-terrorist is certainly neither defined nor understood by the general public and security forces. A much more research focus is required in this unexplored area. Especially, to vary between terrorism and state-sponsored terrorism in correlation to finance to better track the terrorist money.

4 Interdisciplinary cooperation

Critics would argue that it is hopeless to track cyberterrorism because it is practically undetectable. There would be a partial agreement among security experts, however, also a challenge by interdisciplinary scholars. Since cyberterrorism is a complex issue, it requires expertise from diverse fields.

To learn top-notch cybercriminal skills (hacking, penetration of security systems, online frauds), terrorists need some time to acquire those skills. In fact, a previous generation had almost no needs to learn those techniques. However, the COVID-19 pandemic has moved lots of people's work to cyberspace and home offices, making them much more exposed to cyber threats, including terrorism. Terrorists will follow the trend and world should expect more cyberattacks in the future.

Therefore, expert groups should form an interdisciplinary cooperation targeting cyberterrorism in the financial sector. As "the capacity for deviant behavior is a constant across human populations" (Brenner, 2004), security experts need data from numerous fields to determine (and develop) the most advanced regulations based not only on the past experience, but also on the future behaviour of people. The most noteworthy is to foresee 'creativity' of cybercriminals and terrorists.

This opens the door to a close partnership of security experts from finance and international relations who can produce relevant scenarios with an objective of tackling cyberterrorism and financial crimes. Coming back to social engineering, taxonomy, experience of the past and knowledge of human behaviour, cybersecurity should not neglect the latest trends in geopolitics, international relations, diplomacy, and artificial intelligence development.

On one hand, specialisation of institutions serves adequately as a source of knowledge. However, the forthcoming world will be about connectivity and ability to develop conclusions while engaging in online space. Therefore, interdisciplinary knowledge and research will be indeed more relevant in the future.

A good example is a special report generated by McKinsey & Company predicting the future correlation of cybersecurity in financial institutions.

A traditional way of dealing with financial frauds and cybersecurity is based on “collaboration”. An ongoing implementation of new methods is being based on “partial integration”. The future processes in financial institutions tackling financial crimes will be based on “complete integration” (Hasham et al., 2019). As the report pointed out, financial institutions are generally privately owned and have a solid foundation of cybersecurity experts. However, the problematic is a view of regulators that have no capacity to catch up with the latest trends. Consequently, the rules are changing very slowly. Thus, a more holistic approach is desired to balance the private sector with the state-controlled regulators to accelerate required changes.

The current ineffective way of tackling financial crime and cyber threats has many critics. Since “most financial-crime AML practitioners will say that their focus is on ticking boxes for regulatory compliance rather than investigating leads and intercepting proscribed movements of funds,” it is truly difficult to connect various experts and set up an interdisciplinary approach, data sharing and data analytical frameworks (Murphy et al., 2020). Even major financial crimes like Cobalt/Carbanak, North Korean cyber-crime targeting North American banks or security breach in the central bank of Bangladesh with untraceable \$101 mil still missing have contributed little to some better solutions. This does not mean that an international collaboration is not functioning.

So, despite that fact that an interdisciplinary approach involves many proponents, lots of work needs to be done on an international arena to address specific goals. For example, a better integration of expertise groups, more relevant regulatory policies developed by regulators, a stronger academic cooperation between various disciplines dealing with finance, terrorism, and behavioural science. However, it is not solely about a better integration but also about appropriate ways how to come up with conclusions and predict that a cyber incident will happen.

Especially, international relations could strengthen the recognition of financial cybersecurity experts, as they have trackable research dealing with terrorism based on various points of view. Contrary, finance has never been as global as now. So, this provides an opportunity that many pertinent topics overlap.

The biggest hope in an interdisciplinary approach is to find out the answer to the following statement: “the assessment that a major cyberattack poses a threat to financial stability is axiomatic — not a question of if, but when. Yet the world’s governments and companies continue to struggle to contain the threat because it remains unclear who is responsible for protecting the system.” (Maurer and Nelson, 2021). That means that experts should think in much more advanced scenarios. Who is going to prosecute those criminals and under which jurisdiction? This question cannot be resolved by regulators or experts, it demands an interdisciplinary approach with a global reach, so most countries support the notion in multilateral discussions developing strong frameworks to make lives of cybercriminals as complicated as possible, if not eliminating them at all.

Conclusion

Cyberterrorism has developed into a genuine threat to financial institutions stimulated by the COVID-19 pandemic when more human work, including the financial sector, moved online. Cyber-crime has been established in that online space in a ‘comfortable’ position, seeking a high degree of anonymity and safety for adversaries.

There are, therefore, three tasks for experts and scholars to tackle cyberterrorism in financial institutions worldwide. First, to understand taxonomy and motives behind cyber-crimes. Categorisation of cybercriminals, from people trying to follow some YouTube videos about system penetration to cyber-terrorists, helps to develop more effective security frameworks in financial institutions and guidance for better cybersecurity. Then, understanding direct and indirect links to terrorists clarifies what specific security instruments should financial institutions use in cooperation with other security forces (private/governmental). Behavioural science, international relations, financial transaction knowledge and other disciplines can substantially improve the understanding behind the connectivity of finance and terrorist organisations. The paper, therefore, concludes that although experts have many relevant research papers and ideas to tackle cyber-crimes in finance with possible cyber-terrorist’s links, a much deeper integration and output evaluation are needed to develop effective security frameworks not only in financial institutions but also on a global scale of financial transaction and money tracking. Consequently, the major task is to analyse and predict where the money ends up after detecting cyber-crimes in the financial sector.

References

- Adler, E. 1997. Seizing the Middle Ground: Constructivism in World Politics. *Eur. J. Int. Relat.* 3, 319–363. <https://doi.org/10.1177/1354066197003003003>
- Brenner, S. 2004. Toward a Criminal Law for Cyberspace: Distributed Security 182.
- CBR Staff Writer, 2018. Notorious Bank Hacking Syndicate “Cobalt/Carbanak” Still Active after Mastermind’s Arrest. *Tech Monit.* URL <https://techmonitor.ai/technology/cybersecurity/cobalt-carbanak> (accessed 10. 10. 2021)
- Conteh, D.N.Y. and M. D. Royer. 2016. The Rise in Cybercrime and the Dynamics of Exploiting the Human Vulnerability Factor. *Int. J. Comput. IJC* 20, 1–12.
- European Systemic Risk Board. 2020. Systemic cyber risk. Publications Office, LU.
- Finnemore, M. and K. Sikkink. 2001. TAKING STOCK: The Constructivist Research Program in International Relations and Comparative Politics. *Annu. Rev. Polit. Sci.* 4, 391–416. <https://doi.org/10.1146/annurev.polisci.4.1.391>
- Hasham, S., S. Joshi and D. Mikkelsen. 2019. Financial crime and fraud in the age of cybersecurity. URL <https://www.mckinsey.com/business-functions/risk-and-resilience/our-insights/financial-crime-and-fraud-in-the-age-of-cybersecurity> (accessed 10. 10. 2021)
- ISIL Must Be Defeated in Cyberspace, Under-Secretary-General Tells Security Council, as Terrorist Group Takes Advantage of Pandemic-Related Disruptions [WWW Document], 2021. U. N. - Secur. Counc. URL <https://www.un.org/press/en/2021/sc14433.doc.htm> (accessed 10. 11. 2021)

- ISIL-Linked Hacker Arrested in Malaysia on U.S. Charges, 2015. Dep. Justice. URL <https://www.justice.gov/opa/pr/isil-linked-hacker-arrested-malaysia-us-charges> (accessed 10. 11. 2021)
- Kellermann, T. and R. Murphy. 2020. Modern Bank Heists 3.0, Annual “Modern Bank Heists.” VMware Carbon Black.
- Kill lists from pro-is hacking groups, 2016. SITE Intelligence Group.
- Lagazio, M. 2016. A taxonomy of cyber crime in the financial sector: A comprehensive approach to countermeasures, in: *Managing Cyber Risk in the Financial Sector: Lessons from Asia, Europe and the USA*. Routledge, London, pp. 20–62.
- Maurer, T. and T. Nelson. 2021. *The Global Cyber Threat, Finance & Development*. International Monetary Fund.
- Mitnick, K. D. and W. L. Simon. 2011. *Ghost in the wires: my adventures as the world’s most wanted hacker*. Little, Brown and Company, New York.
- Murphy, A., K. Robu and M. Steinert. 2020. The investigator-centered approach to financial crime: Doing what matters. URL <https://www.mckinsey.com/business-functions/risk-and-resilience/our-insights/the-investigator-centered-approach-to-financial-crime-doing-what-matters> (accessed 10. 11. 2021)
- Rogers, M. K. 2006. A two-dimensional circumplex approach to the development of a hacker taxonomy. *Digit. Investig.* 3, 97–102. <https://doi.org/10.1016/j.diin.2006.03.001>
- The True cost of Fraud™ Study, 2021. LexisNexis Risk Solut. URL <https://risk.lexisnexis.com/insights-resources/research/us-ca-true-cost-of-fraud-study> (accessed 10. 11. 2021)
- Theys, S. 2018. Introducing Constructivism in International Relations Theory. *E-Int. Relat.* URL <https://www.e-ir.info/2018/02/23/introducing-constructivism-in-international-relations-theory/> (accessed 10. 11. 2021)
- Twelfth report of the Secretary-General on the threat posed by ISIL (Da’esh) to international peace and security and the range of United Nations efforts in support of Member States in countering the threat, 2021. United Nations - Security Council, New York.

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